EMID-700091

DEPARTMENT OF ENERGY
Environmental Management Los Alamos Field Office (EM-LA)
Los Alamos, New Mexico 87544

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NMED
Hazardous Waste Bureau

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

Dear Mr. Kieling:

Subject: Submittal of the Phase II Investigation Report for Middle Los Alamos Canyon Aggregate Area, Revision 2

Enclosed please find two hard copies with electronic files of the Phase II Investigation Report for Middle Los Alamos Canyon Aggregate Area, Revision 2. This investigation report evaluates the nature and extent of contamination and potential human health and ecological risks for 40 solid waste management units (SWMUs) and areas of concern (AOCs) in the Middle Los Alamos Canyon Aggregate Area at Los Alamos National Laboratory (the Laboratory). The SWMUs and AOCs addressed in this report are located in Technical Area 02 (TA-02), TA-21, and TA-26. The Phase II investigation was implemented in 2010, and a Phase II investigation report was submitted to the New Mexico Environment Department (NMED) in August 2011. The report was not approved by NMED, and NMED directed the Laboratory to conduct additional investigations to define nature and extent of contamination.

After the investigation report was submitted, 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 Compliance Order on Consent (Consent Order) to identify those sites where the nature and extent of contamination have been adequately characterized. The Phase II investigation results were reevaluated in accordance with this process, and additional sampling and risk assessments were performed. This report is being submitted to fulfill Fiscal Year 2018 Milestone 12 in Appendix B of the 2016 Consent Order.

Pursuant to Section XXIII.C of the Consent Order, a pre-submission review meeting was held with Newport News Nuclear BWXT – Los Alamos, LLC, and NMED on September 20, 2018, to discuss the investigation results and recommendations for the 40 sites.

If you have any questions, please contact Kent Rich at (505) 551-2962 (kent.rich@em-la.doe.gov) or Cheryl Rodriguez at (505) 665-5330 (cheryl.rodriguez@em.doe.gov).

Sincerely,

Arturo Q. Duran
Designated Agency Manager
Environmental Management
Los Alamos Field Office

Enclosures:
1. Phase II Investigation Report for Middle Los Alamos Canyon Aggregate Area, Revision 2 (EM2018-0039)

cc (letter with enclosure[s]):
K. Rich, N3B
C. Rodriguez, EM-LA

cc (letter with electronic enclosure[s]):
L. King, EPA Region 6, Dallas, TX
S. Yanicak, NMED
emla.docs@em.doe.gov
N3B Records
Public Reading Room (EPRR)
PRS Database

cc (letter emailed without enclosure[s]):
B. Bowlby, N3B
E. Evered, N3B
J. Legare, N3B
F. Lockhart, N3B
N. Lombardo, N3B
A. Duran, EM-LA
D. Nickless, EM-LA
D. Rhodes, EM-LA

EM-LA-20AD-00313

September 2018
EM2018-0039

Phase II Investigation Report for Middle Los Alamos Canyon Aggregate Area, Revision 2

N3B Los Alamos

EM2018-0039

Phase II Investigation Report for Middle Los Alamos Canyon Aggregate Area, Revision 2

September 2018

Responsible program director:

Erich Evered		Program Director	RCRA Remediation Program	9/19/18
Printed Name	Signature	Title	Organization	Date

Responsible N3B representative:

Joseph A. Legare		Program Manager	N3B Environmental Remediation Program	9/19/18
Printed Name	Signature	Title	Organization	Date

Responsible DOE-EM-LA representative:

Arturo Q. Duran		Designated Agency Manager	Office of Quality and Regulatory Compliance	9/24/18
Printed Name	Signature	Title	Organization	Date

EXECUTIVE SUMMARY

This Phase II investigation report evaluates the nature and extent of contamination and potential human health and ecological risks for 40 solid waste management units (SWMUs) and areas of concern (AOCs) in the Middle Los Alamos Canyon Aggregate Area at Los Alamos National Laboratory (LANL or the Laboratory). The SWMUs and AOCs addressed in this report are located in Technical Area 02 (TA-02), TA-21, and TA-26. These sites were initially investigated in 2007, and the investigation results were documented in the Middle Los Alamos Canyon Aggregate Area investigation report, submitted by the U.S. Department of Energy (DOE) and Los Alamos National Security, LLC (LANS) to the New Mexico Environment Department (NMED) in May 2008. The investigation report concluded that additional sampling to define the extent of contamination was needed, and additional sampling requirements were documented in the approved Phase II investigation work plan for Middle Los Alamos Canyon Aggregate Area, submitted by DOE and LANS to NMED in February 2009. The Phase II investigation was implemented in 2010 and a Phase II investigation report was submitted to NMED in August 2011. The report was not approved by NMED, and NMED directed the Laboratory to conduct additional investigations to define nature and extent of contamination. In 2018, an additional SWMU was identified in the aggregate area and is addressed in this report, creating a total of 41 sites included in this report.

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

The revised process was used to reevaluate the 2007 and 2010 investigation data and previous decision-level investigation data for the 40 sites identified in the Phase II investigation report. Based on the evaluation of investigation results using the revised process, the extent of contamination has been defined (or a determination has been made that no further sampling for extent is warranted) at all 40 sites. Remediation and sampling is required for one new site identified after the Phase II investigation report was submitted. Human health and ecological risk assessments were performed for all sites.

Based on the results of data evaluations presented in this investigation report, the DOE Environmental Management Los Alamos Field Office and Newport News Nuclear BWXT – Los Alamos, LLC (N3B) recommend the following:

- Corrective action complete without controls is recommended for 36 sites for which extent is defined and which pose no potential unacceptable human health risk under the industrial, construction worker, and residential scenarios and no unacceptable ecological risk.
- Corrective action complete with controls is recommended for four 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.
- Soil removal and additional sampling is recommended for one site having polychlorinated biphenyl contamination.

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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). The Laboratory is located in north-central New Mexico, approximately 60 mi northeast of Albuquerque and 20 mi northwest of Santa Fe. The Laboratory site covers approximately 39 mi^2 of the Pajarito Plateau, which consists of a series of fingerlike mesas 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 has been a participant in a national effort by DOE to clean up sites and facilities formerly involved in weapons research and development. The goal of this effort is to ensure past operations do not threaten human or environmental health and safety in and around Los Alamos County, New Mexico. To achieve this goal, the Laboratory has investigated sites potentially contaminated by past Laboratory operations.

This investigation report addresses solid waste management units (SWMUs) and areas of concern (AOCs) within the Middle Los Alamos Canyon Aggregate Area at the Laboratory (Figure 1.0-1). These sites are potentially contaminated with both hazardous and radioactive components. 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 5400.5, “Radiation Protection of the Public and the Environment”; DOE Order 435.1, “Radioactive Waste Management”; and DOE Order 458.1, “Administrative Change 3, Radiation Protection of the Public and the Environment.” 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.

1.1 General Site Information

The Middle Los Alamos Canyon Aggregate Area, shown on Plate 1, consists of 80 SWMUs and AOCs, 40 of which did not warrant investigation (LANL 2008, 101669.12). The remaining 40 SWMUs and AOCs underwent sampling activities in 2007 and Phase II investigation sampling activities in 2010. These 40 sites are located at Technical Area 02 (TA-02), TA-21, and TA-26 and include 13 SWMUs and 27 AOCs. Details of previous investigations, including the results of the 2007 sampling activities, are provided in the “Investigation Report for the Middle Los Alamos Canyon Aggregate Area, Revision 1” (LANL 2008, 101669.12). This revised Phase II investigation report describes the investigation results from sampling activities conducted in 2010 for the 40 sites, as well as supplemental sampling performed in 2017. Sampling was conducted in accordance with the approved Phase II investigation work plan (hereafter, the approved work plan) (LANL 2009, 105073; NMED 2009, 105595). A new site was identified in the aggregate area in 2018 and is also included in this report. Table 1.1-1 lists the 41 sites and provides a brief description of the site along with associated structures or facilities, a summary of previous investigations, and a summary of investigation activities conducted in 2010 and 2017 for each site.

1.2 Purpose of Investigation

Forty SWMUs and AOCs within the Middle Los Alamos Canyon Aggregate Area were addressed during the 2010 investigation because these sites are potentially contaminated with hazardous chemicals and/or radionuclides, and final assessments of site contamination and associated risks are incomplete. For each site, the objectives of the 2010 investigation were to (1) establish the nature and extent of contamination, (2) determine whether current site conditions pose a potential unacceptable risk to human health or the environment, and (3) assess whether any additional sampling and/or corrective actions are required.

Sampling was conducted during the 2010 investigation at 39 of the 40 SWMUs and AOCs not previously approved for no further action in accordance with the approved work plan (LANL 2009, 105073; NMED 2009, 105595). SWMU 02-008(a) was not sampled in 2010 because data obtained from samples collected from nearby sites [AOCs 02-004(b,c,d,e)] will be used to evaluate this site. At TA-02, sampling locations are proposed at key points in the core area (sites of former Laboratory structures and operations) to determine the vertical extent of contamination for inorganic chemicals, organic chemicals, and radionuclides. Analytical suites were determined by the data needs specific to each location as presented in Table 3.1-1 of the approved work plan (LANL 2009, 105073; NMED 2009, 105595), and were followed closely during the 2010 sampling activities. Additional sampling locations were proposed at points surrounding the core area to define the lateral extent of contamination for TA-02 as a whole. Additional sampling was performed in 2017 at several sites to provide additional data needed to determine extent of contamination. Sampling was also conducted in 2017 and 2018 to support ecological risk studies.

All analytical data collected during the 2010 and 2017/2018 investigation activities are presented and evaluated in this Phase II report in conjunction with decision-level data from previous investigations.

1.3 Document Organization

This investigation report is organized as 11 sections, including this introduction, with multiple supporting appendixes. Section 2 provides details of the site conditions (surface and subsurface) of the aggregate area. 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 to ecological and human receptors. Section 5 describes the data review methods. Sections 6, 7, and 8 present for TA-02, TA-21, and TA-26 an overview of the operational history of each site in the TA, historical releases, summaries of previous investigations, results of the field activities performed during the 2010 and 2017 investigations, site contamination, evaluation of the nature and extent of contamination, and summaries of human health and ecological risk-screening assessments. Section 9 presents the conclusions of the nature and extent of contamination and risk assessments for each TA. Section 10 discusses recommendations based on applicable data and the risk-screening assessments. Section 11 includes a list of cited references and the map data sources for all figures and plates.

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

2.0 AGGREGATE AREA SITE CONDITIONS

2.1 Surface Conditions

2.1.1 Soil

Soil in the canyon bottoms of the Pajarito Plateau is generally derived from the Otowi or Tshirege Member of the Bandelier Tuff (Nyhan et al. 1978, 005702). The surface layers are generally a pale brown, stony or gravelly sandy loam a few inches thick. The substratum is commonly about 60 in. thick and generally consists of a very pale brown or light gray, gravelly loamy sand or sand. The soil has moderate to very high permeability and low available water capacities. The soil is generally underlain by Quaternary alluvium but may also be underlain by tuff.

The canyon slopes between the mesa tops and canyon floors are mostly steep rock outcrops consisting of approximately 90% bedrock outcrop and patches of shallow, weakly developed colluvial (formed of parent material emplaced by the action of gravity) soil. South-facing canyon walls are steep and usually have little or no soil material or vegetation. In contrast, the north-facing walls generally have areas of very shallow dark-colored soil and are typically more heavily vegetated (Nyhan et al. 1978, 005702).

Soil on the mesa tops at TA-21 and TA-26 is mainly shallow, well-drained, sandy loam of the Hackroy series (Nyhan et al. 1978, 005702). The depth to bedrock and the effective rooting depth is 8–20 in. (Nyhan et al. 1978, 005702). Intermixed with the Hackroy soil on the mesa tops are small areas of deeper loam of the Nyjack series and patches of bedrock. The Nyjack soil is texturally similar to Hackroy soil and is distinguished by thicknesses of 8–40 in. and by the common presence of pumice fragments in the lower soil. The soil typically is formed on top of bedrock tuff and has relatively high permeability and low available water capacity. The slope below TA-26 is identified as a steep rock outcrop, which may include widely scattered small areas of weakly developed shallow soil. The soil has relatively high permeability and low available water capacity.

2.1.2 Surface Water

Los Alamos Creek, an intermittent stream, flows from west to east through TA-02 in proximity to the sites under investigation. There are no other substantial drainage channels at TA-02, and surface runoff from precipitation or snowmelt most likely occurs as sheet flow that terminates after a short distance at Los Alamos Creek (the maximum distance from the canyon wall to the creek is approximately 200–300 ft). There is no standing surface water at TA-02.

There is no permanent surface water at TA-21 and TA-26. Surface runoff occurs intermittently as a result of precipitation events, primarily summer thunderstorms or snowmelt. The mesa top in the vicinity of TA-26 is relatively narrow and provides limited surface area to collect precipitation in the form of surface runoff. Runoff occurs in the form of sheet flow across the surface, with little or no flow in channels within the area of TA-26.

2.1.3 Land Use

At TA-02, two concrete surface-water flumes (approximately 50 ft and 80 ft long), their associated catch basins (structures 02-27 and 02-36), the main paved road, two bridges, and Los Alamos Creek's northern retaining wall adjacent to the former facility are the only remaining surface structures at the site. TA-02 is accessible by a paved road from the west but is protected by a locked gate. An unpaved road extends from the perimeter fence eastward through Los Alamos Canyon and is also protected by a locked gate. The current use of TA-02 is industrial and will remain industrial in the foreseeable future.

Structures at TA-21 have undergone decontamination and decommissioning (D&D). The current use of TA-21 is industrial and will remain industrial in the foreseeable future.

The only existing surface structure at the TA-26 site is a concrete retaining wall near the south edge of the mesa top. The wall is 10 in. thick, set into the ground to an unknown depth, and runs east-west for approximately 50 ft. The mesa-top portion of TA-26 is accessible to the public. The current use of TA-26 is primarily recreational and will remain recreational in the foreseeable future.

2.2 Subsurface Conditions

2.2.1 Stratigraphic Units of the Bandelier Tuff

The Laboratory drilled, cored, and sampled several intermediate and deep boreholes to interpret the subsurface stratigraphy across Los Alamos Canyon. The stratigraphy of the Middle Los Alamos Canyon Aggregate Area is summarized in this section. Additional information on the geologic setting of the area and information on the Pajarito Plateau can be found in the Laboratory's hydrogeologic synthesis report (Collins et al. 2005, 092028). Figure 2.2-1 presents the generalized stratigraphy described below.

The Bandelier Tuff under the Middle Los Alamos Canyon Aggregate Area consists of the Otowi and Tshirege Members, which are stratigraphically separated in many places by the tephras and volcanoclastic sediment of the Cerro Toledo interval (unit Qct). The following sections describe the stratigraphic units beginning with the youngest (topmost) and proceeding to the oldest (deepest).

Unit Qbt 3 is a nonwelded to partially welded tuff that forms the upper cliffs in the TA-21 area. Its base consists of a purple-gray, unconsolidated, porous, and crystal-rich nonwelded tuff that underlies a broad, gently sloping bench developed on top of unit Qbt 2. This basal, nonwelded portion forms relatively soft outcrops that weather into low rounded mounds with a white color, which contrast with the cliffs of partially welded tuff in the middle and upper portions of unit Qbt 3.

Unit Qbt 2 forms a distinctive, medium-brown, vertical cliff that stands out in marked contrast to the slope-forming, lighter-colored tuffs above and below. It has the greatest degree of welding found within the Tshirege Member. It is typically nonporous and has low permeability relative to the other units of the Tshirege Member.

Unit Qbt 1v forms alternating steep cliffs and slopes 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 identified as the vapor-phase notch. The tuffs of unit Qbt 1v are commonly nonwelded and have an open, porous structure.

Unit Qbt 1g consists of porous, nonwelded, and poorly sorted ash-flow tuff. This unit is poorly indurated but 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.

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

The Qal deposit consists of stratified, lenticular deposits of unconsolidated fluvial sands, gravels, and cobbles. Smaller canyons that have headwaters located on the Pajarito Plateau contain detritus exclusively of Bandelier Tuff. Larger canyon systems that head in the Sierra de los Valles contain Bandelier detritus mixed with dacite detritus derived from the Tschicoma Formation. Active and inactive channels and floodplains form complex, cross-cutting deposits. The fluvial sediment interfingers laterally with colluvium derived from canyon walls.

At TA-02, the rock unit generally exposed at or near the surface is the Otowi Member of the Bandelier Tuff. The Otowi Member is typically overlain by Quaternary alluvium and surface soil. The alluvium consists of boulders and cobbles of reworked tuff and igneous rocks. In some areas, recent alluvial sediment is present in drainage channels. All rock units mentioned above were encountered during sampling in 2010. Surface soil and Qbt 3 were encountered at TA-21 and TA-26.

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 100–700 ft. The regional aquifer is found at depths of about 600–1200 ft (Collins et al. 2005, 092028).

The hydrogeologic conceptual site model for the Laboratory (LANL 2010, 109830) 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 annual "Interim Facility-Wide Groundwater Monitoring Plan" (LANL 2010, 109830) 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).

Alluvial aquifer wells are located between the Los Alamos Canyon reservoir and the confluence with DP Canyon and have been used to monitor water levels in alluvium in Los Alamos and Pueblo Canyons (LANL 2004, 087390). The observations reported indicate that groundwater levels generally rise rapidly in response to summer and fall precipitation events. Alluvial groundwater rises immediately and generally correlates well with stream flow at gauging stations, indicating that recharge from the streambed to the alluvial aquifer occurs during precipitation events. In Middle Los Alamos Canyon, the saturated thickness in the alluvium varies seasonally from the winter months to the spring and summer months when recharge is the greatest (LANL 1994, 052951.71).

Intermediate-Perched Groundwater

Observations of perched-intermediate water are rare on the Pajarito Plateau. Perched-intermediate waters are thought to form mainly at horizons where medium properties change dramatically, such as at paleosol horizons containing clay or caliche. It is not known whether perched-intermediate water bodies are isolated or connected and to what degree they may influence travel times and pathways for contaminants in the vadose zone.

Intermediate-perched zones have been identified in the Middle Los Alamos Canyon Aggregate Area between TA-02 and the confluence with DP Canyon. The upper intermediate-perched zone occurs within the Guaje Pumice Bed. The saturated thickness of this zone decreases from west to east, from about 22–5 ft (Broxton et al. 1995, 050119; Longmire et al. 1996, 054168).

A deeper intermediate-perched zone has been identified in the Puye Formation from approximately 253–317 ft below ground surface (bgs) on DP Mesa. This corresponds to a depth of approximately 20–70 ft bgs at TA-02, but it is not clear whether the perched zone extends under the SWMUs and AOCs in this investigation. The infiltration pathways, continuity, and chemical quality of groundwater in these known intermediate-perched zones are not well characterized (Purtymun and Stoker 1988, 006879).

Regional Groundwater

The regional aquifer is the only aquifer capable of large-scale municipal water supply in the Los Alamos area (Purtymun 1984, 006513). The surface of the regional aquifer rises westward from the Rio Grande within the Santa Fe Group into the lower part of the Puye Formation beneath the central and western part of the Pajarito Plateau. The depths to the regional aquifer 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 locations of wells and generalized water-level contours on top of the regional aquifer are described in the annual general facility information report (LANL 2010, 109084). The regional aquifer is typically separated from the alluvial groundwater and intermediate-perched zone groundwater by 350–620 ft of tuff, basalt, and sediment (LANL 1993, 023249).

Groundwater in the regional aquifer flows east-southeast toward the Rio Grande. The velocity of groundwater flow ranges from about 20–250 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).

2.2.2.2 Vadose Zone

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

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

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

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

3.0 SCOPE OF ACTIVITIES

This section presents an overview of preliminary activities and the field activities performed during the implementation of the Phase II Middle Los Alamos Canyon Aggregate Area investigation. The field investigation results are presented in detail in sections 6 through 8 and in the appendixes. The scope of activities for the 2010 and 2017 Phase II investigations included site access and premobilization activities, geodetic surveys, surface and shallow-subsurface sampling, borehole drilling and sampling, soil excavation, health and safety monitoring, and waste management activities.

3.1 Site Access and Premobilization Activities

The area encompassing the Middle Los Alamos 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

This section describes the field activities conducted during the 2010 and 2017 investigations. Additional 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 Middle Los Alamos Canyon Aggregate Area investigation to identify surface and subsurface sampling locations. The proposed sampling locations for the 2010 investigation are described in the approved work plan (LANL 2009, 105073; NMED 2009, 105595). An initial geodetic survey was performed to establish and mark the planned locations in the field.

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 (DGPS) unit. Horizontal accuracy of the Trimble 5700 DGPS is within 0.1 ft. During sampling, if the planned location could not be sampled because of surface or subsurface obstruction or other unanticipated field conditions, the relocated sampling location was resurveyed.

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

3.2.2 Field Screening

Environmental samples were field screened for headspace organic vapors with a MiniRAE 2000 photoionization detector (PID) equipped with an 11.7-electron volt lamp. Calibration was performed in accordance with the manufacturer's specifications and SOP-06.33, "Headspace Vapor Screening with a Photo Ionization Detector," and recorded in the field logbook. After collection, the sample was placed in a sealed plastic bag for approximately 5 min. Screening measurements were recorded on the field sample collection logs (SCLs) and in the field logbook. The SCLs are provided on DVD in Appendix F. The organic vapor-screening results 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 alpha and beta/gamma radioactivity were recorded in disintegrations per minute (dpm) on the field SCL/chain-of-custody (COC) forms. The SCLs and COC forms are provided on DVD in Appendix F. The radiological screening results are presented in Table 3.2-2.

3.2.3 Surface and Shallow-Subsurface Soil Investigation

Samples were collected according to the approved work plan (LANL 2009, 105073; NMED 2009, 105595). Table 3.2-1 shows the proposed sampling locations as listed in the work plan, with the corresponding location IDs as assigned.

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." Shallow-subsurface samples were collected using the hand auger method in accordance with SOP-06.10. In 2017, surface and shallow-subsurface samples were collected in accordance with SOP-20069, "Soil, Tuff, and Sediment Sampling." Before collecting any other samples and before breaking core material into smaller pieces for containerization, samples were collected for volatile organic compound (VOC) analysis. Samples were collected using stainless-steel shovels or spoons and placed in stainless-steel bowls. Samples were transferred to sterile sample collection jars or bags for transport to the SMO.

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

All sample collection activities were coordinated with the SMO. Upon collection, samples remained at all times in the controlled custody of the field team until delivered to the SMO. Sample custody was then relinquished to the SMO for delivery to a preapproved off-site contract analytical laboratory for the analyses specified by the approved work plan (LANL 2009, 105073; NMED 2009, 105595).

3.2.4 Subsurface Investigation

3.2.4.1 Borehole Drilling and Subsurface Sampling

At locations where the required sampling depths could not be reached by hand augers, a drill rig with a hollow-stem auger was used to collect subsurface samples. Samples were collected using stainless-steel core barrel samplers in accordance with SOP-06.26, "Core Barrel Sampling for Subsurface Earth Materials." Samples were collected at depth intervals based on criteria established in the approved work plan (LANL 2009, 105073; NMED 2009, 105595).

For the 2010 investigation, nine boreholes were drilled to depths ranging from 10–50 ft bgs, and samples were collected to characterize the sites. The samples were extracted from the core barrels, placed in stainless-steel bowls, and handled the same way as the surface and shallow-subsurface samples were handled, as described in section 3.2.3. Samples were then submitted to the SMO under COC for laboratory analyses as specified by the approved work plan (LANL 2009, 105073; NMED 2009, 105595).

3.2.4.2 Borehole Abandonment

All boreholes were abandoned in accordance with an approved subcontractor procedure technically equivalent to SOP-5034, "Monitoring Well and RFI 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. Pavement was patched as necessary depending on existing site conditions. All cuttings were managed as IDW, as described in Appendix D.

3.2.4.3 Excavation

Excavation was performed at four sites during the 2010 investigation. Excavation was performed as proposed in the approved work plan (LANL 2009, 105073; NMED 2009, 105595) to remove contaminated soil and reduce risk to human health. Details about target cleanup levels, preexcavation sampling, excavation, and waste management are provided in Appendix B.

3.2.4.4 Equipment Decontamination

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

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

3.2.5 Health and Safety Measures

All 2010 and 2017 investigation activities were conducted in accordance with a site-specific health and safety plan, an integrated work document, and two radiological work permits that detailed work steps, potential hazards, hazard controls, and required training to conduct work. These health and safety measures included the use of modified level-D personal protective equipment and field monitoring for organic vapors and for gross-alpha and -beta radioactivity using portable air-monitoring systems.

3.2.6 Waste Management

All IDW generated during the Middle Los Alamos Canyon Aggregate Area Phase II investigation was managed in accordance with the IDW management plan in the approved work plan (LANL 2009, 105073; NMED 2009, 105595) and the approved project waste characterization strategy form (WCSF), which is included in Appendix D (Attachment D-1 on CD). These documents incorporate the requirements of all applicable U.S. Environmental Protection Agency (EPA) and NMED regulations and DOE orders. Characterization and management of IDW was performed in accordance with SOP-5238 (2010) and EP-DIR-SOP-10021 (2017), "Characterization and Management of Environmental Program Waste."

The waste streams associated with the investigation included drill cuttings, contact IDW, excavated media, municipal solid waste, and returned samples.

Each waste stream was containerized and managed in storage areas appropriate to the type of waste. The management of IDW is described in greater detail in Appendix D. All available waste documentation, including WCSFs, WCSF amendments, and waste profile forms are provided in Appendix D (Attachment D-1 on CD).

3.3 Sample Analyses

The SMO shipped all Phase II investigation samples to off-site contract analytical laboratories for the requested analyses. The analyses requested were as specified by the approved work plan (LANL 2009, 105073; NMED 2009, 105595). The samples were analyzed for all or a subset of the following analytes: target analyte list (TAL) metals, total cyanide, hexavalent chromium, polychlorinated biphenyls (PCBs), semivolatile organic compounds (SVOCs), total petroleum hydrocarbons–diesel range organics (TPH-DRO), americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium. Because the original investigation report concluded that the collection of additional samples for dioxins/furans was not warranted (LANL 2008, 101669.12, p. 115), Phase II samples were not analyzed for dioxins and furans in accordance with the approved work plan (LANL 2009, 105073; NMED 2009, 105595). Samples were analyzed in accordance with the analytical services statement of work for contract laboratories in effect at the time of analysis.

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

Analytical methods and summaries of data quality are presented in Appendix E. Analytical results, analytical reports, and SCLs/COCs are included on DVD in Appendix F.

3.4 Deviations

Deviations from the scope of activities defined in the approved work plan (LANL 2009, 105073; NMED 2009, 105595) occurred during the implementation of the Middle Los Alamos Canyon Aggregate Area Phase II investigation. Specific deviations are described in greater detail in Appendix B, section B-9.0. A brief summary is provided as follows.

- TPH-DRO was added to the analytical suite for all subsequent samples collected at location 02-612435.
- Location 02-612983 was moved 20 ft northwest because of safety concerns and supplemented by additional samples collected from location 02-612982 (20 ft northeast).

- Remediation activities for location 02-600449 were not completed because of the unanticipated magnitude of the excavation.
- Remediation could not be performed at location 02-600561, which is on a steep rocky slope inaccessible by mechanized equipment, because of safety concerns and practicability.
- Table B-9.0-1 shows the sampling locations that were moved a significant distance from the proposed location and the reason for the move.

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 Compliance Order on Consent (Consent Order) include cleanup standards, risk-based screening levels, and risk-based cleanup goals.

Human health risk-screening evaluations were conducted using NMED guidance (NMED 2017, 602273). Ecological risk-screening assessments were performed using Laboratory guidance (LANL 2017, 602649).

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 Middle Los Alamos Canyon Aggregate Area is currently industrial and is expected to remain industrial for the reasonably foreseeable future. Recreational access to TA-02 may potentially occur in the future. The residential scenario is evaluated for comparison purposes and is the decision scenario for sites that do not require future controls. For sites to be recommended for corrective action complete without controls under the Consent Order, the residential scenario was evaluated to determine whether that scenario was also protective of construction workers. If not, the construction worker scenario was also evaluated for these sites.

4.2 Screening Levels

Human health and ecological risk-screening evaluations were conducted for the chemicals of potential concern (COPCs) detected in solid media at sites within the Middle Los Alamos Canyon Aggregate Area. The human health risk-screening assessments (Appendix H) were performed on inorganic and organic COPCs using NMED soil screening levels (SSLs) for the industrial, construction worker, and residential scenarios (NMED 2017, 602273) and LANL SSLs for the recreational scenario (LANL 2017, 602581). When an NMED SSL for a COPC was not available, SSLs were obtained from EPA regional tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables) (adjusted to a risk level of 10^{-5} for carcinogens). For this investigation report, the May 2018 online version of the EPA regional tables was used to obtain EPA screening levels. Radionuclides were assessed using the Laboratory screening action levels (SALs) for the same scenarios (LANL 2015, 600929). Surrogate SSLs were used for some COPCs for which no SSLs were available based on structural similarity or breakdown products.

NMED guidance includes total chromium SSLs for the residential, industrial, and construction worker scenarios (NMED 2017, 602273). Because the toxicity of chromium strongly depends on its oxidation state, NMED and EPA also have SSLs for trivalent chromium and hexavalent chromium. For screening purposes, the NMED SSLs for total chromium are used for comparison unless there is a known or suspected source of hexavalent chromium at the SWMU/AOC or site conditions could alter the speciation of chromium in the environment. Total chromium screening levels are appropriate for low-level releases to soil from sources not associated with hexavalent chromium. However, NMED and EPA recommend collecting valence-specific data for chromium if chromium is likely to be an important contaminant at a site and when hexavalent chromium may exist (NMED 2017, 602273; (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-november-2017).

The Laboratory conducted a chromium background study to determine the prevalence of hexavalent chromium in soil, sediment, and tuff samples where there was no evidence of previous releases of chromium (LANL 2017, 602650). The report concluded that naturally occurring chromium is predominantly in the trivalent form and that the appropriate SSL for comparisons to data for purposes of evaluating extent of contamination at sites with no known chromium releases is the trivalent SSL. The chromium background study was approved by NMED in October 2017 (NMED 2017, 602678).

Most SWMUs and AOCs included in this investigation report are not known or suspected to be sources of hexavalent chromium. Cooling towers are a potential source of hexavalent chromium and the SWMU 02-005 cooling tower is a known source of hexavalent chromium. Sites potentially contaminated with hexavalent chromium from cooling tower operations were sampled for hexavalent chromium as well as total chromium. All other sites were analyzed for total chromium and, in accordance with the NMED-approved chromium background study (LANL 2017, 602650; NMED 2017, 602678), total chromium results from these sites are compared with the trivalent chromium SSLs for the purpose of evaluating extent of contamination. SSLs for total chromium, rather than SSLs for trivalent chromium, are conservatively used for the purpose of evaluating potential human-health risk due to exposure to chromium.

4.3 Ecological Screening Levels

The ecological risk-screening assessments (Appendix H) were conducted using ecological screening levels (ESLs) obtained from the Laboratory's ECORISK Database, Version 4.1 (LANL 2017, 602538). The ESLs are based on similar species and are derived from experimentally determined no observed adverse effect levels, 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, is presented in the ECORISK Database, Version 4.1 (LANL 2017, 602538).

4.4 Cleanup Standards

As specified in the Consent Order, screening levels are used as soil cleanup levels unless they are determined to be impracticable or values do not exist for current and reasonably foreseeable future land use. Screening assessments compare COPC concentrations for each site with industrial, residential, and construction worker SSLs/SALs.

The cleanup goals specified in the Consent Order are a target risk of 1×10^{-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 in the risk-screening assessments in Appendix H are based on these cleanup goals.

5.0 DATA REVIEW METHODOLOGY

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

5.1 Identification of COPCs

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

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

5.1.1 Inorganic Chemical and Radionuclide Background Comparisons

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

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

- The maximum detected concentration is statistically determined to be an outlier. (Note: A sufficient number of samples must be collected to show a point is an outlier and is not indicative of a hotspot.)

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

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

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

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

Naturally occurring radionuclides detected at activities above their respective BVs are identified as COPCs. These radionuclides have no background data sets. If there is no associated BV and the radionuclide is detected, it is retained as a COPC.

The FVs for the fallout radionuclides apply to the top 0.0 to 1.0 ft of soil and fill and to sediment regardless of depth. If a fallout radionuclide is detected in a soil or fill sample collected below 1.0 ft or in tuff samples, the radionuclide is identified as a COPC. For soil and fill samples from 1.0 ft bgs or less, if the activity of a fallout radionuclide is greater than the FV, comparisons of the top 0.0 to 1.0 ft sampling data are made with the fallout data set and the radionuclide is eliminated as a COPC if activities are similar to fallout activities 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 only the data from 0.0 to 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 adopted the conservative approach of identifying tritium in soil as a COPC based on detection status.

Sample media encountered during investigations include soil (all soil horizons, designated by the media code ALLH or SOIL); quaternary alluvial (media code QAL), fill material (media code FILL); sediment (media code SED); and Bandelier Tuff (media codes Qbt 1g, Qct, Qbo, Qbt 2, Qbt 3, and Qbt 4). Because no separate BVs are available for fill and Qal material, fill and Qal samples are evaluated by comparison with soil BVs (LANL 1998, 059730). In this report, the discussions of site contamination in soil include fill samples with soil samples in sample counts. The upper and lower units of the Bandelier Tuff (Qbt 2, Qbt 3, and Qbt 4; Qbt 1g, Qct, and Qbo, respectively) 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 data sets. The use of any of these methods depends on how appropriate the method is for the available data. The results of the statistical tests are presented in Appendix G.

5.1.2.1 Distributional Comparisons

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

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

The quantile test is better suited to assessing shifts in a subset of the data. The quantile test determines whether more of the observations in the top chosen quantile of the combined data set come from the site data set than would be expected by chance, given the relative sizes of the site and background data sets. If the relative proportion of the two populations being tested is different in the top chosen quantile of the data 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 data set, application of a quantile test comparing 80th percentiles is appropriate. However, the test cannot be performed if nondetections occur in the top chosen quantile. The threshold percentage can be adjusted to accommodate the detection rate of an analyte or to look for differences further into the distribution tails. The quantile test is more powerful than the Gehan test for detecting differences when only a small percentage of the site concentrations is elevated.

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

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

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

The box plots produced in Appendix G of this report consist of a box, a line across the box, whiskers (lines extended beyond the box and terminated with a short perpendicular line), and points outside the whiskers. The box area of the plot is the region between the 25th percentile and the 75th percentile of the data, the interquartile range or middle half of the data. The horizontal line within the box represents the median (50th percentile) of the data. The whiskers extend to the most extreme point that is not considered an outlier, with a maximum whisker length of 1.5 times the interquartile range, outside of which data may be evaluated for their potential to be outliers. The concentrations are plotted as points overlying the box plot. When a data set contains both detected 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 no release has occurred or there are other sources of contamination.

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

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

The primary focus for defining the extent of contamination is characterizing contamination that potentially poses a potential unacceptable risk and may 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.

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

Calcium, magnesium, potassium, and sodium may be COPCs for some sites. These constituents are essential nutrients and their maximum concentrations are compared with NMED’s essential nutrient screening levels (NMED 2017, 602273). If the maximum concentration is less than the screening level(s), no additional sampling for extent is warranted and the inorganic chemical is eliminated from further evaluation in the risk assessment.

6.0 TA-02 BACKGROUND AND FIELD INVESTIGATION RESULTS

The Middle Los Alamos Canyon Aggregate Area contains 30 sites (and three duplicate sites) associated with TA-02 that are addressed in this investigation report (Table 1.1-1). Each site is described separately in sections 6.2 through 6.35, including site description and operational history, relationship to other SWMUs and AOCs, historical and 2010 and 2017 investigation activities, 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. Section 6.34.6 presents the sampling strategy for the lateral extent at the TA-02 core area, the sampling results, and summaries of human health and ecological risk-screening assessments.

6.1 Background of TA-02

6.1.1 Operational History

TA-02 was used to house a series of research reactors from 1943 to 2003 when D&D of the site occurred. The main reactor building (02-1) was constructed in 1943. It housed five separate nuclear reactors: three iterations of water boiler reactors (WBRs) located on the east side of the building, one plutonium-fueled reactor (the Clementine Reactor) followed by an enriched uranium reactor, and the Omega West Reactor (OWR). A number of facilities were constructed over the years to support the TA-02 research activities. TA-02 was active from 1943 to 1993 (WD-3 2003, 082646, pp. 1–2).

Various remedial actions, such as soil removal and D&D, were conducted in the bottom of Los Alamos Canyon, including at TA-02, after the Cerro Grande fire. These actions were taken to reduce the risk of contaminants dispersing from post-fire floods. Approximately 54 yd^3 of soil contaminated with cesium-137 was removed in 2000, following an extensive field survey for gross-gamma radiation (LANL 2001, 070352). The OWR and associated structures underwent D&D in 2002 and 2003 (WD-3 2003, 082646).

After all structures at TA-02 were removed, field radiological surveys were conducted to confirm that surface contamination release limits were not exceeded (WD-3 2003, 082646, pp. 18–19). The land was returned to its original contour and reseeded (WD-3 2003, 082646, pp. 1–2). The road accessing the reactor site is controlled by the Laboratory via a locked gate.

6.1.2 Summary of Releases

Releases at TA-02 may have occurred from site operations, holding or storage tanks, gaseous effluent lines, waste lines, drainlines, storm drains, outfalls, sumps, a septic system, building footprints, a waste shack, and air emission from a cooling tower. Detailed information on historical releases is provided for each site in the previous investigation report (LANL 2008, 101669.12).

6.1.3 Current Site Usage and Status

TA-02 is accessible by a paved road from the west and is protected by a locked gate. An unpaved road extends from the perimeter fence eastward through Los Alamos Canyon and is also protected by a locked gate where the road ends at NM 4. Although vehicle access is restricted by the locked gates, pedestrians (e.g., joggers, hikers, and bikers) can access the site using the road and trails from the mesa top.

6.2 AOC 02-003(a), Soil Contamination from Stack-Gas Valve House and Gaseous Effluent Line

6.2.1 Site Description and Operational History

AOC 02-003(a) was the site of the stack-gas valve house (structure 02-19) and associated stainless-steel gaseous effluent vent lines (lines 117 and 118) (Figure 6.2-1), as shown on engineering drawing C-1718 (LASL 1947, 089677). This system was associated with the WBR, a homogeneous liquid-fueled reactor fueled by an enriched uranyl-salt compound.

The stack-gas valve house and effluent vent lines system were installed in 1944 and received off-gas from the WBR. The off-gas contained gaseous fission products, including cesium-137, strontium-90, technetium-99, and iodine-131 (LANL 1993, 015314, p. 7.4-1).

The stack-gas valve house was primarily aboveground and was constructed of reinforced concrete, 11 ft × 9 ft × 10 ft high, with 18-in.-thick walls (Elder and Knoell 1986, 006670, p. 4). From 1944 to 1948, gaseous effluent entered the stack-gas valve house from line 117 and was directed via line 118 to the southeast. Line 118 was used as a temporary gas vent until July 1948 when the condensate trap and line 119 [AOC 02-003(b)] became operational. Line 118 was left in place from 1948 to its removal in 1985 (Elder and Knoell 1986, 006670, pp. 8, 29, 43). Line 117 and the stack-gas valve house remained in use until 1974 when they became inactive and were removed and disposed of during D&D efforts in 1985 (Elder and Knoell 1986, 006670, pp. 22-29, p. 43).

6.2.2 Relationship to Other SWMUs and AOCs

The stack-gas valve house and effluent vent lines were connected to the WBR in the reactor building (02-1), AOC 02-004(a). Line 118 extended southeast from the stack-gas valve house to the OWR gaseous effluent vent line, also part of AOC 02-004(a). Line 117 passed from the reactor building to the stack-gas valve house, crossing an area of soil contamination [AOC 02-009(d)].

6.2.3 Summary of Previous Investigations

6.2.3.1 1985 WBR Decommissioning Project, Phase I

Approximately 230 ft of line 117 was removed between the reactor building (02-1) and the stack-gas valve house (structure 02-19) at a depth of 6–7 ft bgs. Screening-level data from soil samples collected in the line 117 pipe trench indicated no radioactivity existed above predetermined cleanup levels (Elder and Knoell 1986, 006670, p. 26). The stack-gas valve house was removed in 1985. Screening-level data from soil samples collected under the floor of the stack-gas valve house indicated no radioactivity existed above predetermined cleanup levels (Elder and Knoell 1986, 006670, p. 22).

Line 118 was removed without excavation. It was pulled from its shallow depth without difficulty (Elder and Knoell 1986, 006670, p. 29). All removed piping material was transported to TA-54 (Elder and Knoell 1986, 006670, p. 16).

6.2.3.2 1995 Investigation Activities

Samples were collected from locations around the stack-gas valve house. The 1995 investigation results are not decision-level data.

6.2.3.3 2000 Post–Cerro Grande Fire Recovery Work

Two boreholes (locations 02-01241 and 02-01242) were drilled and sampled in 2000. One borehole was located in the center of the footprint of the stack-gas valve house, and the other borehole was west of the stack-gas valve house location. Four samples were collected from location 02-01241 and five samples were collected from location 02-01242. Field-instrument screening of recovered cores indicated no elevated activity levels (LANL 2001, 070352, p. 8).

6.2.3.4 2007 Investigation Activities

Twenty-two samples were collected from seven locations at AOC 02-003(a) in 2007. Results from the sampling activities in 2007 were presented in the previous investigation report (LANL 2008, 101669.12). Additional sampling was required to define the extent of contamination at the site.

6.2.4 Site Contamination

6.2.4.1 Soil and Rock Sampling

As part of the 2010 investigation, the following characterization activities were conducted at AOC 02-003(a):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Five samples were collected from location 02-612348 in the northern portion of AOC 02-003(a) from 5–7 ft, 15–16 ft, 25–26 ft, 35–36 ft, and 49–50 ft bgs. These samples were analyzed for TAL metals, hexavalent chromium, PCBs, SVOCs, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium.
- Five samples were collected from location 02-612389 at the former stack house (structure 02-19) from 5–6 ft, 18–19 ft, 25–27 ft, 35–36 ft, and 49–50 ft bgs. These samples were analyzed for TAL metals, PCBs, SVOCs, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium.

The 2010 and historical sampling locations at AOC 02-003(a) are shown in Figure 6.2-1. Table 6.2-1 presents the samples collected and analyses requested for AOC 02-003(a). The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

6.2.4.2 Soil and Rock Sample Field-Screening Results

No organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of the samples. Radiological-screening results exceeded the daily site background levels at location 02-612389. As a result, respirators were used while collecting samples at this location. Field-screening results are presented in Table 3.2-2. No changes were made to sampling depths because of the field-screening results.

6.2.4.3 Soil and Rock Sample Analytical Results

Decision-level data at AOC 02-003(a) consist of results from 41 samples collected from 11 locations in 2000, 2007, and 2010. The 41 samples include 16 soil/fill, 14 Qal, and 11 Qbo samples.

Inorganic Chemicals

A total of 41 samples (16 soil, 14 Qal, and 11 Qbo) were analyzed for TAL metals, 5 samples (2 Qal and 3 Qbo) were analyzed for hexavalent chromium, and 22 samples (7 soil, 10 Qal, and 5 Qbo) were analyzed for nitrate, perchlorate, and total cyanide. Table 6.2-2 presents the inorganic chemicals detected or detected above BVs. Figure 6.2-2 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV (3560 mg/kg) in five samples with a maximum concentration of 9980 mg/kg. The Gehan and quantile tests indicated site concentrations of aluminum in tuff are statistically different from background (Figure G-1 and Table G-1). Aluminum is retained as a COPC.

Antimony was not detected above the soil and Qbt 1g, Qct, Qbo BVs (0.83 mg/kg and 0.5 mg/kg) but had DLs (0.52 mg/kg to 1.32 mg/kg) above BVs in four soil samples and seven tuff samples. The quantile and slippage tests indicated site concentrations of antimony in soil are not statistically different from background (Figure G-2 and Table G-2). There were no detections in the Qbt 1g, Qct, Qbo background data set, so statistics could not be evaluated for tuff. The DLs are greater than the maximum DL in the Qbt 1g, Qct, Qbo background data set (0.2 mg/kg). Antimony is retained as a COPC.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV (0.56 mg/kg) in four samples with a maximum concentration of 2.74 mg/kg and it was not detected above the Qbt 1g, Qct, Qbo BV but had DLs (1.18 mg/kg to 1.9 mg/kg) above BV in seven samples. Arsenic is retained as a COPC.

Barium was detected above the Qbt 1g, Qct, Qbo BV (25.7 mg/kg) in three samples with a maximum concentration of 55.8 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in tuff are not statistically different from background (Figure G-3 and Table G-1). Barium is not a COPC.

Cadmium was detected above the soil BV (0.4 mg/kg) in 4 samples with a maximum concentration of 2.23 mg/kg and was not detected above soil and Qbt 1g, Qct, Qbo BVs (0.4 mg/kg for both) but had DLs (0.531 mg/kg to 0.662 mg/kg) above BV in 6 soil samples and 10 tuff samples. Cadmium is retained as a COPC.

Chromium was detected above the soil and Qbt 1g, Qct, Qbo BVs (19.3 mg/kg and 2.6 mg/kg) in three soil samples and four tuff samples with a maximum concentration of 123 mg/kg and was not detected above the Qbt 1g, Qct, Qbo BV but had DLs (17.8 mg/kg and 30.7 mg/kg) above BV in two samples. The Gehan and quantile tests indicated site concentrations of chromium in soil are not statistically different from background (Figure G-4 and Table G-2) and site concentrations of chromium in tuff are statistically different from background (Figure G-5 and Table G-1). Chromium is retained as a COPC.

Copper was detected above the soil and Qbt 1g, Qct, Qbo BVs (14.7 mg/kg and 3.96 mg/kg) in one soil sample at a concentration of 77 mg/kg and one tuff sample at a concentration of 4.06 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in soil and tuff are not statistically different from background (Figure G-6 and Table G-2, and Figure G-7 and Table G-1, respectively). Copper is not a COPC.

Iron was detected above the Qbt 1g, Qct, Qbo BV (3700 mg/kg) in 11 samples with a maximum concentration of 6430 mg/kg. The Gehan and quantile tests indicated site concentrations of iron in tuff are statistically different from background (Figure G-8 and Table G-1). Iron is retained as a COPC.

Lead was detected above the soil BV (22.3 mg/kg) in one sample at a concentration of 29 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil are not statistically different from background (Figure G-9 and Table G-2). Lead is not a COPC.

Manganese was detected above the soil and Qbt 1g, Qct, Qbo BVs (671 mg/kg and 189 mg/kg) in one soil sample and nine tuff samples with a maximum concentration of 1000 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in soil are not statistically different from background (Figure G-10 and Table G-2) and site concentrations of manganese in tuff are statistically different from background (Figure G-11 and Table G-1). Manganese is retained as a COPC.

Mercury was detected above the soil BV (0.1 mg/kg) in seven samples with a maximum concentration of 1.18 mg/kg. Mercury is retained as a COPC.

Nickel was detected above the Qbt 1g, Qct, Qbo BV (2 mg/kg) in two samples with a maximum concentration of 43.1 mg/kg and was not detected above the soil BV (15.4 mg/kg) and Qbt 1g, Qct, Qbo BV but had DLs (4.04 mg/kg to 22.4 mg/kg) above BVs in one soil sample and two tuff samples. The Gehan and quantile tests indicated site concentrations of nickel in soil are not statistically different from background (Figure G-12 and Table G-2). There are too few detections in the Qbt 1g, Qct, Qbo background data set to perform statistical tests. Nickel is retained as a COPC.

Nitrate was detected in eight soil samples with a maximum concentration of 2.72 mg/kg. Nitrate is naturally occurring, and the concentrations likely reflect naturally occurring levels. In addition, AOC 02-003(a) was used to manage reactor stack gas and is not a source of nitrate. Nitrate is not a COPC.

Perchlorate was detected in five soil samples and one tuff sample with a maximum concentration of 0.00565 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the Qbt 1g, Qct, Qbo BV (0.3 mg/kg) in two samples with a maximum concentration of 7.79 mg/kg and was not detected above the soil BV (1.52 mg/kg) and Qbt 1g, Qct, Qbo BV but had DLs (0.68 mg/kg to 1.84 mg/kg) above BVs in three soil samples and nine tuff samples. The quantile and slippage tests indicated site concentrations of selenium in soil are not statistically different from background (Figure G-13 and Table G-2), but there were too few detections to evaluate statistics for tuff and the DLs are substantially above BV. Selenium is retained as a COPC.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV (4.59 mg/kg) in three samples with a maximum concentration of 6.46 mg/kg. The Gehan and quantile tests indicated site concentrations of vanadium in tuff are statistically different from background (Figure G-14 and Table G-1). Vanadium is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in seven samples with a maximum concentration of 290 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are statistically different from background (Figure G-15 and Table G-2). Zinc is retained as a COPC.

Organic Chemicals

A total of 31 samples (6 soil, 14 Qal, and 11 Qbo) were analyzed for PCBs and SVOCs, and 15 samples (10 Qal and 5 Qbo) were analyzed for VOCs. Table 6.2-3 presents the detected organic chemicals. Figure 6.2-3 shows the spatial distribution of detected organic chemicals.

Polycyclic Aromatic Hydrocarbons

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

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

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

Site Activities

AOC 02-003(a) is part of a radioactive gaseous effluent management system and was identified as an AOC because of possible radioactive soil contamination resulting from releases of radionuclides in condensate. The AOC 02-003(a) drainlines were located adjacent to and beneath asphalt paving. PAHs detected at this site were detected only in surface and shallow subsurface samples. PAHs were not associated with the gaseous nuclear reactor effluent managed at this site. Therefore, the PAHs detected in samples used to characterize this site [acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; fluoranthene; indeno(1,2,3-cd)pyrene; naphthalene, phenanthrene; and pyrene] are associated with the former paved area, are not related to historical Laboratory site operations, and are not COPCs.

Organic COPCs

Other organic chemicals detected at AOC 02-003(a) include Aroclor-1254; Aroclor-1260; bis(2-ethylhexyl)phthalate; 1,4-dichlorobenzene; methylene chloride; and toluene. The detected organic chemicals listed are retained as COPCs.

Radionuclides

A total of 27 samples (7 soil, 12 Qal, and 8 Qbo) were analyzed for americium-241 and 41 samples (16 soil, 14 Qal, and 11 Qbo) were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium. Table 6.2-4 presents the radionuclides detected or detected above BVs/FVs. Figure 6.2-4 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Cesium-137 was detected below 1 ft bgs in 16 soil and Qal samples with a maximum activity of 274 pCi/g. Cesium-137 is retained as a COPC.

Plutonium-239/240 was detected below 1 ft bgs in 12 soil and Qal samples with a maximum activity of 3.34 pCi/g. Plutonium-239/240 is retained as a COPC.

Strontium-90 was detected below 1 ft bgs in nine soil and Qal samples with a maximum activity of 43 pCi/g. Strontium-90 is retained as a COPC.

Tritium was detected in nine samples with a maximum activity of 0.107 pCi/g. Tritium is retained as a COPC.

Uranium-235/236 was detected above the Qbt 1g, Qct, Qbo BV (0.18 pCi/g) in 1 sample at an activity of 0.194 pCi/g. The activity was only 0.014 pCi/g above the BV and uranium-235/236 was not detected or detected above BV in 40 other samples (detected below BV in 36 samples). Uranium-235/236 is not a COPC.

6.2.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at AOC 02-003(a) are discussed below.

Inorganic Chemicals

Inorganic COPCs at AOC 02-003(a) include aluminum, antimony, arsenic, cadmium, chromium, iron, manganese, mercury, nickel, perchlorate, selenium, vanadium, and zinc.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV in five samples with a maximum concentration of 9980 mg/kg. Concentrations increased with depth at locations 02-600119, 02-600120, and 02-600121, decreased with depth at all other locations, and decreased laterally to the north, east, and south. The residential SSL is approximately 11 times the maximum concentration at the locations where concentrations increased with depth. Lateral extent to the west is bounded by AOC 02-004(a). Lateral extent of aluminum is defined and further sampling for vertical extent is not warranted.

Antimony was not detected above the soil and Qbt 1g, Qct, Qbo BVs but had DLs (0.52 mg/kg to 1.32 mg/kg) above BVs in four soil samples and seven tuff samples. The residential SSL is approximately 24 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV in four samples with a maximum concentration of 2.74 mg/kg and was not detected above the Qbt 1g, Qct, Qbo BV but had DLs (1.18 mg/kg to 1.9 mg/kg) above BV in seven samples. Concentrations decreased with depth at all locations and decreased laterally to the north, east, and south. Lateral extent to the west is bounded by AOC 02-004(a). Lateral and vertical extent of arsenic are defined.

Cadmium was detected above the soil BV in 4 samples with a maximum concentration of 2.23 mg/kg and was not detected above soil and Qbt 1g, Qct, Qbo BVs but had DLs (0.531 mg/kg to 0.662 mg/kg) above BV in 6 soil samples and 10 tuff samples. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of cadmium are defined.

Chromium was detected above the soil and Qbt 1g, Qct, Qbo BVs in three soil samples and four tuff samples with a maximum concentration of 123 mg/kg and was not detected above the Qbt 1g, Qct, Qbo BV but had DLs (17.8 mg/kg and 30.7 mg/kg) above BV in two samples. Concentrations increased with depth at location 02-600121, did not change substantially with depth (0.8 mg/kg) at location 02-600119, and decreased with depth at location 02-600120. Concentrations increased laterally to the north at location 02-600120 and decreased laterally in other directions. As described in section 4.2, AOC 02-003(a) is not a potential source of hexavalent chromium and use of the SSL for trivalent chromium to determine whether additional sampling is warranted is appropriate. The residential SSL for trivalent chromium (117,000 mg/kg) is approximately 951 times the maximum concentration. Further sampling for vertical extent of chromium is not warranted.

Iron was detected above the Qbt 1g, Qct, Qbo BV in 11 samples with a maximum concentration of 6430 mg/kg. Concentrations decreased with depth at all locations (concentrations in shallower samples at locations 02-600119, 02-600120, 02-600121, 02-612348, and 02-600389 were 7750 mg/kg, 8190 mg/kg, 8510 mg/kg, 7520 mg/kg, and 9830 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). Concentrations decreased laterally. Lateral and vertical extent of iron are defined.

Manganese was detected above the soil and Qbt 1g, Qct, Qbo BVs in one soil sample and nine tuff samples with a maximum concentration of 1000 mg/kg. Concentrations did not change substantially with depth (9 mg/kg) at location 02-612348 and decreased with depth at all other locations (concentrations in shallower samples at locations 02-600119, 02-600120, 02-600121, and 02-612389 were 304 mg/kg, 280 mg/kg, 295 mg/kg, and 266 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). Concentrations decreased laterally. The lateral and vertical extent of manganese are defined.

Mercury was detected above the soil BV in seven samples with a maximum concentration of 1.18 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. The lateral and vertical extent of mercury are defined.

Nickel was detected above the Qbt 1g, Qct, Qbo BV in two samples with a maximum concentration of 43.1 mg/kg and was not detected above the soil and Qbt 1g, Qct, Qbo BVs but had DLs (4.04 mg/kg to 22.4 mg/kg) above BVs in one soil sample and two tuff samples. Concentrations increased with depth at location 02-600119 and decreased with depth at location 02-600118. Concentrations decreased laterally. The residential SSL is approximately 36 times the maximum concentration. Lateral extent of nickel is defined and further sampling for vertical extent is not warranted.

Perchlorate was detected in five soil samples and one tuff sample with a maximum concentration of 0.00565 mg/kg. Concentrations increased with depth at locations 02-600121, 02-600122, and 02-600123 but were below EQLs; decreased with depth at locations 02-600118, 02-600119, and 02-600120; and decreased laterally. The residential SSL is approximately 9700 times the maximum concentration. Lateral extent of perchlorate is defined and further sampling for vertical extent is not warranted.

Selenium was detected above the Qbt 1g, Qct, Qbo BV in two samples with a maximum concentration of 7.79 mg/kg and was not detected above the soil and Qbt 1g, Qct, Qbo BVs but had DLs (0.68 mg/kg to 1.84 mg/kg) above BVs in three soil samples and nine tuff samples. Concentrations increased with depth at location 02-600118 and decreased laterally to the north, east, and south. Lateral extent to the west is bounded by AOC 02-004(a). The residential SSL is approximately 50 times the maximum concentration. Lateral extent of selenium is defined and further sampling for vertical extent is not warranted.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV in three samples with a maximum concentration of 6.46 mg/kg. Concentrations decreased with depth at all locations (concentrations in shallower samples at locations 02-600118, 02-600120, and 02-612389 were 6.78 mg/kg, 9.67 mg/kg, and 18 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). Concentrations did not change substantially (1.86 mg/kg) laterally. The residential SSL is approximately 61 times the maximum concentration. Vertical extent of vanadium is defined and further sampling for lateral extent is not warranted.

Zinc was detected above the soil BV (48.8 mg/kg) in seven samples with a maximum concentration of 290 mg/kg. Concentrations increased with depth at location 02-01242 and decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 81 times the maximum concentration. Lateral extent of zinc is defined and further sampling for vertical extent is not warranted.

Organic Chemicals

Organic COPCs at AOC 02-003(a) include Aroclor-1254; Aroclor-1260; bis(2-ethylhexyl)phthalate; 1,4-dichlorobenzene; methylene chloride; and toluene.

Ten samples were collected from locations 02-612348 and 02-612389 (depths ranging from 5–50 ft bgs) to evaluate vertical extent of PCBs and SVOCs (Table 3.2-1). As stated in the approved work plan (LANL 2009, 105073; NMED 2009, 105595), the extent of VOCs was defined following the 2007 investigation, and no Phase II samples were analyzed for VOCs.

Aroclor-1254 was detected in 11 samples with a maximum concentration of 0.653 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. The lateral and vertical extent of Aroclor-1254 are defined.

Aroclor-1260 was detected in 15 samples with a maximum concentration of 1.25 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. The lateral and vertical extent of Aroclor-1254 are defined.

Bis(2-ethylhexyl)phthalate was detected in one sample at a concentration of 0.153 mg/kg. Concentrations increased with depth at location 02-600122 and decreased laterally. The residential SSL is approximately 2480 times the maximum concentration. The lateral extent of bis(2-ethylhexyl)phthalate is defined and further sampling for vertical extent is not warranted.

Dichlorobenzene[1,4-] was detected in one sample at a concentration of 0.000563 mg/kg. Concentrations decreased with depth at location 02-600122 and decreased laterally. The lateral and vertical extent of 1,4-dichlorobenzene are defined.

Methylene chloride was detected in two samples with a maximum concentration of 0.00452 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. The lateral and vertical extent of methylene chloride are defined.

Toluene was detected in two samples with a maximum concentration of 0.00037 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. The lateral and vertical extent of toluene are defined.

Radionuclides

Radionuclide COPCs at AOC 02-003(a) include cesium-137, plutonium-239/240, strontium-90, and tritium.

Cesium-137 was detected in 16 samples with a maximum activity of 274 pCi/g. Activities increased with depth at locations 02-600122 and 02-600123, did not change substantially with depth (0.032 pCi/g) at location 02-01242, decreased with depth at all other locations, and decreased laterally. Cesium-137 was not detected in deep samples (18 ft to 50 ft bgs) at location 02-612389, adjacent to location 02-600122, and vertical extent is defined at this location. The residential SAL is approximately 56 times the maximum activity at location 02-600123. The lateral extent of cesium-137 is defined and further sampling for vertical extent is not warranted.

Plutonium-239/240 was detected in 12 samples with a maximum activity of 3.34 pCi/g. Activities increased with depth at locations 02-600122 and 02-600123, decreased with depth at all other locations, and decreased laterally. The residential SAL is approximately 112 times the maximum activity where vertical extent is not defined (0.706 pCi/g at location 02-600123). The lateral extent of plutonium-239/240 is defined and further sampling for vertical extent is not warranted.

Strontium-90 was detected in nine samples with a maximum activity of 43 pCi/g. Activities increased with depth at location 02-600122, decreased with depth at all other locations, and decreased laterally. Strontium-90 was not detected in deep samples (18 ft to 50 ft bgs) at location 02-612389, adjacent to location 02-600122, and vertical extent is defined at this location. The lateral and vertical extent of strontium-90 are defined.

Tritium was detected in nine samples with a maximum activity of 0.107 pCi/g. Activities increased with depth at locations 02-600122 and 02-612348, decreased with depth at all other locations, and decreased laterally. The residential SAL is approximately 15,800 times the maximum activity. The lateral extent of tritium is defined and further sampling for vertical extent is not warranted.

Summary of Nature and Extent at AOC 02-003(a)

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at AOC 02-003(a).

6.2.5 Summary of Human Health Risk Screening

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} (NMED 2017, 602273). The industrial HI is 0.01, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 9×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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 7×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.6, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 160 mrem/yr, which is greater than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Construction Worker Scenario

The residential exposure scenario also demonstrates protection of construction workers for carcinogenic and radionuclide COPCs. The construction worker HI is approximately 1 (with manganese, see Appendix H, section H-4.5.2, Exposure Evaluation), which is equal to the NMED target HI of 1.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, and construction worker scenarios and no potential unacceptable risks exist for the residential scenario at AOC 02-003(a). A potential unacceptable dose exists for the residential scenario at AOC 02-003(a).

6.2.6 Summary of Ecological Risk Screening

AOC 02-003(a) is within the TA-02 core area. Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for threatened and endangered [T&E] species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and results of site-specific ecological risk studies, no potential ecological risks exist for the TA-02 core area.

6.3 AOC 02-003(b), Soil Contamination at Condensate Trap and Line 119

6.3.1 Site Description and Operational History

AOC 02-003(b) consisted of the condensate trap (structure 02-48) and associated stainless-steel line (line 119) (Figure 6.3-1). The WBR off-gas system consisted of the stack-gas valve house, condensate trap, mesa-top vent stack located above TA-02 at TA-61, and associated stainless-steel lines.

The condensate trap was a concrete manhole superstructure and a small-diameter standpipe. It was located at the lowest point of line 119 between the stack-gas valve house [structure 02-19, AOC 02-003(a)] and the delay tanks [structure 02-131, AOC 02-003(c)], as shown on engineering drawing C-1718 (LASL 1947, 089677; Elder and Knoell 1986, 006670, p. 29).

Line 119 consisted of an approximately 78-ft-long east-west trending pipe section that ran from the stack-gas valve house (structure 02-19) to the condensate trap and a 205-ft-long north-south trending section that ran from the condensate trap to the delay tanks.

Line 119 continued from the delay tanks to the junction with the main OWR gaseous effluent vent line and up to the mesa-top stack (structure 02-9) and French drain [SWMU 02-006(a)] located at TA-61 (Elder and Knoell 1986, 006670, pp. 6, 8). The upper portion of the gaseous effluent vent line (line 119) from the delay tanks to the mesa-top stack is addressed as AOC 02-003(d).

The WBR off-gas system was installed in 1948. The off-gas contained gaseous fission products, including cesium-137, strontium-90, technetium-99, and iodine-131 (LANL 1993, 015314, p. 7.4-1).

The condensate trap and line 119 from the stack-gas valve house (structure 02-19) to the delay tanks remained in use through 1974. The units were inactive from 1974 to 1985 and were removed and disposed of during D&D efforts in 1985 (Elder and Knoell 1986, 006670, pp. 22-29, p. 43).

6.3.2 Relationship to Other SWMUs and AOCs

The gaseous effluent line (line 119) was connected to the stack-gas valve house, AOC 02-003(a); to the delay tanks, AOC 02-003(c); and to the mesa-top stack and French drain, SWMU 02-006(a). The condensate trap was located within the area associated with the leach field of SWMU 02-009(c).

6.3.3 Summary of Previous Investigations

6.3.3.1 1985 WBR Decommissioning Project, Phase I

Approximately 205 ft of the 3-in.-diameter stainless-steel gaseous effluent vent line was removed from depths ranging from 2–9 ft bgs (Elder and Knoell 1986, 006670, p. 29). Near the condensate trap (structure 02-48), the depth of the line was approximately 9 ft bgs (Elder and Knoell 1986, 006670, p. 29). Groundwater seepage was pumped out of the excavation site to allow the line to be cut and pulled (Elder and Knoell 1986, 006670, p. 29). Field-screening data from a soil sample collected under the pipe indicated no radioactivity existed above predetermined cleanup goals (Elder and Knoell 1986, 006670, p. 29). The manhole that served as the superstructure for the condensate trap was removed. Field screening did not detect radioactivity inside the manhole (Elder and Knoell 1986, 006670, pp. 29-30).

During removal of the condensate trap, remnants of a leach field were discovered. The leach field consisted of two parallel 6-in.-diameter vitrified clay pipe (VCP) lengths running east from the condensate trap area, parallel to Los Alamos Creek. The pipes were laid in a sand and crushed-rock bed, approximately 2 ft below the overflow drainpipe from the nearby septic tank (structure 02-043) (Elder and Knoell 1986, 006670, p. 31). The leach field was identified as SWMU 02-009(c), and details of its 1985 D&D are provided in the discussion of SWMU 02-009(c) (section 6.25).

The base of the condensate trap and 10 ft of piping formerly connected to the gaseous effluent vent line were removed (Elder and Knoell 1986, 006670, p. 33). Field screening detected elevated radionuclide activity in the condensate trap (Elder and Knoell 1986, 006670, p. 32). Soil with radioactivity greater than predetermined cleanup levels was left in place at 5 ft bgs (Elder and Knoell 1986, 006670, p. 35). Soil was removed laterally until no radioactivity greater than predetermined cleanup levels was found and vertically until saturated conditions were reached. Soil in the area around the condensate trap was removed down to groundwater level and was backfilled with clean crushed tuff. Soil from the adjacent areas with elevated radioactivity was excavated 5–7 ft bgs and backfilled with at least 5 ft of clean crushed tuff (Elder and Knoell 1986, 006670, pp. 30-36). All excavated contaminated material was transported to TA-54 (Elder and Knoell 1986, 006670, p. 16).

6.3.3.2 1995 Investigation Activities

Soil samples were collected from one location near the condensate trap (structure 02-048). The 1995 investigation results are not decision-level data.

6.3.3.3 2000 Post–Cerro Grande Fire Recovery Work

A borehole (location 02-01235) was drilled and sampled in 2000 (Figure 6.3-1). The borehole was located between the condensate trap (02-48) and the gaseous effluent delay tanks (02-131). Six samples were collected from location 02-01235. Field-instrument screening of recovered cores indicated no elevated activity levels (LANL 2001, 070352, p. 8).

6.3.3.4 2007 Investigation Activities

Thirteen samples were collected from five locations at AOC 02-003(b) in 2007. Results from the sampling activities in 2007 were presented in the previous investigation report (LANL 2008, 101669.12). Additional sampling was required to define the extent of contamination at the site.

6.3.4 Site Contamination

6.3.4.1 Soil, Rock, and Sediment Sampling

As part of the 2010 investigation, the following characterization activities were conducted at AOC 02-003(b):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Five samples were collected from location 02-612390 near AOC 02-003(b) from 5–6 ft, 15–17 ft, 26–27 ft, 35–36 ft, and 49–50 ft bgs. These samples were analyzed for TAL metals, PCBs, SVOCs, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium.

The 2010 and historical sampling locations at AOC 02-003(b) are shown in Figure 6.3-1. Table 6.3-1 presents the samples collected and analyses requested for AOC 02-003(b). The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

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

No organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of the samples. No radiological-screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. No changes to sampling or other activities occurred because of the field-screening results.

6.3.4.3 Soil, Rock, and Sediment Sample Analytical Results

Decision-level data at AOC 02-003(b) consist of results from 24 samples collected from 7 locations in 2000, 2007, and 2010. The 24 samples include 9 soil, 6 Qal, 1 Qbt 2, and 7 Qbo samples and 1 sediment sample.

Inorganic Chemicals

A total of 24 samples (9 soil, 6 Qal, 1 Qbt 2, 7 Qbo, and 1 sediment) were analyzed for TAL metals, and 13 samples (4 soil, 5 Qal, 3 Qbo, and 1 sediment) were analyzed for nitrate, perchlorate, and total cyanide. Table 6.3-2 presents the inorganic chemicals detected or detected above BVs. Figure 6.3-2 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 2,3,4 and Qbt 1g, Qct, Qbo BVs (7340 mg/kg and 3560 mg/kg) in one Qbt 2 sample and four Qbo samples with a maximum concentration of 14,000 mg/kg. Aluminum is retained as a COPC.

Antimony was not detected above the soil and Qbt 1g, Qct, Qbo BVs (0.83 mg/kg and 0.5 mg/kg) but had DLs (0.941 mg/kg to 1.27 mg/kg) above BVs in one soil sample and four tuff samples. Antimony is retained as a COPC.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV (0.56 mg/kg) in three samples with a maximum concentration of 1.49 mg/kg and it was not detected above the Qbt 1g, Qct, Qbo BV but had DLs (1.14 mg/kg to 1.24 mg/kg) above BV in four samples. Arsenic is retained as a COPC.

Barium was detected above the Qbt 1g, Qct, Qbo BV (25.7 mg/kg) in two samples with a maximum concentration of 61.7 mg/kg. Barium is retained as a COPC.

Cadmium was not detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs (0.4 mg/kg for all three) but had DLs (0.49 mg/kg to 0.635 mg/kg) above BVs in eight soil samples, one sediment sample, and seven tuff samples. Cadmium is retained as a COPC.

Chromium was detected above the Qbt 1g, Qct, Qbo BV (2.6 mg/kg) in one sample at a concentration of 15 mg/kg and was not detected above the Qbt 1g, Qct, Qbo BV but had DLs (8.77 mg/kg and 58.7 mg/kg) above BV in two samples. Chromium is retained as a COPC.

Copper was detected above the Qbt 1g, Qct, Qbo BV (3.96 mg/kg) in one sample at a concentration of 4.47 mg/kg. The concentration is greater than the maximum Qbt 1g, Qct, Qbo background concentration (2.6 mg/kg). Copper is retained as a COPC.

Iron was detected above the Qbt 1g, Qct, Qbo BV (3700 mg/kg) in seven samples with a maximum concentration of 8300 mg/kg. Iron is retained as a COPC.

Manganese was detected above the Qbt 1g, Qct, Qbo BV (189 mg/kg) in four samples with a maximum concentration of 235 mg/kg. The maximum concentration is greater than the maximum Qbt 1g, Qct, Qbo background concentration (210 mg/kg). Manganese is retained as a COPC.

Mercury was detected above the soil BV (0.1 mg/kg) in one sample at a concentration of 0.443 mg/kg and was not detected but had a DL (0.21 mg/kg) above the soil BV in one sample. Mercury is retained as a COPC.

Nickel was detected above the Qbt 1g, Qct, Qbo BV (2 mg/kg) in one sample at a concentration of 3.12 mg/kg and was not detected above the Qbt 1g, Qct, Qbo BV but had DLs (3.26 mg/kg and 3.42 mg/kg) above BV in two samples. The concentration and both DLs are above the maximum Qbt 1g, Qct, Qbo background concentration (2.8 mg/kg). Nickel is retained as a COPC.

Nitrate was detected in six soil samples, one sediment sample, and one tuff sample with a maximum concentration of 7.94 mg/kg. Nitrate is naturally occurring, and the concentrations likely reflect naturally occurring levels. In addition, AOC 02-003(b) was used to manage reactor stack gas and is not a source of nitrate. Nitrate is not a COPC.

Selenium was not detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs (1.52 mg/kg, 0.3 mg/kg, and 0.3 mg/kg) but had DLs (1.14 mg/kg to 1.78 mg/kg) above BVs in four soil samples, one sediment sample, and seven tuff samples. The Gehan and quantile tests indicated site concentrations of selenium in soil are not statistically different from background (Figure G-16 and Table G-3). There were too few samples to evaluate statistics in sediment but the DL in sediment was greater than the maximum sediment background concentration (0.1 mg/kg) and there is no background data set for Qbo. Selenium is retained as a COPC.

Silver was detected above the soil BV (1 mg/kg) in 2 samples with a maximum concentration of 1.3 mg/kg. The maximum concentration was only 0.3 mg/kg above BV and silver was not detected or detected above BV in 22 other samples (detected below BV in 18 samples). Silver is not a COPC.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV (4.59 mg/kg) in one sample at a concentration of 10.4 mg/kg. Vanadium is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in one sample at a concentration of 49.2 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are not statistically different from background (Figure G-17 and Table G-3). Zinc is not a COPC.

Organic Chemicals

A total of 18 samples (4 soil, 6 Qal, 7 Qbo, and 1 sediment) were analyzed for PCBs, 26 samples (9 soil, 6 Qal, 3 Qbt 2, 7 Qbo, and 1 sediment) were analyzed for SVOCs, and 8 samples (5 Qal and 3 Qbo) were analyzed for VOCs. Table 6.3-3 presents the detected organic chemicals. Figure 6.3-3 shows the spatial distribution of detected organic chemicals.

Polycyclic Aromatic Hydrocarbons

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

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

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

Site Activities

AOC 02-003(b) is part of a radioactive gaseous effluent management system and was identified as an AOC because of possible radioactive soil contamination resulting from releases of radionuclides in condensate. The AOC 02-003(b) condensate trap and drainline were located adjacent to asphalt paving. PAHs detected at this site were detected only in surface and shallow subsurface samples. PAHs were not associated with the gaseous nuclear reactor effluent managed at this site. Therefore, the PAHs detected in samples used to characterize this site [anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; fluoranthene; fluorene; 2-methylnapthalene; phenanthrene; and pyrene] are associated with the former paved area, are not related to historical Laboratory site operations, and are not COPCs.

Organic COPCs

Other organic chemicals detected at AOC 02-003(b) include Aroclor-1248, Aroclor-1254, Aroclor-1260, n-butylbenzene, di-n-butylphthalate, 4-isopropyltoluene, and 1,2,4-trimethylbenzene. The detected organic chemicals listed are retained as COPCs.

Radionuclides

A total of 18 samples (4 soil, 6 Qal, 7 Qbo, and 1 sediment) were analyzed for americium-241 and 24 samples (9 soil, 6 Qal, 1 Qbt 2, 7 Qbo, and 1 sediment) were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium. Table 6.3-4 presents the radionuclides detected or detected above BVs/FVs. Figure 6.3-4 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Cesium-137 was detected below 1 ft bgs in eight soil and Qal samples with a maximum activity of 4.46 pCi/g. Cesium-137 is retained as a COPC.

Plutonium-239/240 was detected above the soil and sediment FVs (0.054 pCi/g and 0.068 pCi/g) in one soil sample and one sediment sample, was detected below 1 ft bgs in five soil and Qal samples, and was detected in one Qbo sample with a maximum activity of 0.768 pCi/g. Plutonium-239/240 is retained as a COPC.

Strontium-90 was detected below 1 ft bgs in three Qal samples with a maximum activity of 0.96 pCi/g. Strontium-90 is retained as a COPC.

Tritium was detected in 12 samples with a maximum activity of 0.121 pCi/g. Tritium is retained as a COPC.

Uranium-234 was detected above the Qbt 2 BV (1.98 pCi/g) in one sample at an activity of 2.8 pCi/g. The activity was only 0.82 pCi/g above the BV and uranium-234 was detected below BV in 23 other samples. Uranium-234 is not a COPC.

Uranium-235/236 was detected above the Qbo BV (0.18 pCi/g) in one sample at an activity of 0.191 pCi/g. The activity was only 0.011 pCi/g above the BV and uranium-235/236 was not detected or detected above BV in 23 other samples (detected below BV in 14 samples). Uranium-235/236 is not a COPC.

Uranium-238 was detected above the Qbt 2 BV (1.93) in one sample at an activity of 2.64 pCi/g. The activity was only 0.71 pCi/g above the BV and uranium-238 was detected below BV in 23 other samples. Uranium-238 is not a COPC.

6.3.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at AOC 02-003(b) are discussed below.

Inorganic Chemicals

Inorganic COPCs at AOC 02-003(b) include aluminum, antimony, arsenic, barium, cadmium, chromium, copper, iron, manganese, mercury, nickel, selenium, and vanadium.

Aluminum was detected above the Qbt 2,3,4 and Qbt 1g, Qct, Qbo BVs in one Qbt 2 sample and four Qbo samples with a maximum concentration of 14,000 mg/kg. Concentrations increased with depth at locations 02-01235, 02-600125, 02-600126, and 02-600127; decreased with depth at location 02-612390; and increased laterally to the south at location 02-01235. The residential SSL is approximately 5.6 times the maximum concentration, and the industrial SSL is approximately 92 times the maximum concentration. The concentrations above BV are all below 10 ft bgs and do not present an exposure risk. Further sampling for extent of aluminum is not warranted.

Antimony was not detected above the soil and Qbt 1g, Qct, Qbo BVs but had DLs (0.941 mg/kg to 1.27 mg/kg) above BVs in one soil sample and four tuff samples. The residential SSL is approximately 25 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV in three samples with a maximum concentration of 1.49 mg/kg and it was not detected above the Qbt 1g, Qct, Qbo BV but had DLs (1.14 mg/kg to 1.24 mg/kg) above BV in four samples. Concentrations decreased with depth at location 02-600125 (the concentration in a shallower sample at location 02-600125 was 3.25 mg/kg and below the soil BV [Appendix F, Pivot Tables]), increased with depth at locations 02-600126 and 02-600127, and decreased laterally. The residential SSL is approximately 4.7 times the maximum concentration, and the industrial SSL is approximately 24 times the maximum concentration. The concentrations above BV are all below 10 ft bgs and do not present an exposure risk. Lateral extent of arsenic is defined and further sampling for vertical extent is not warranted.

Barium was detected above the Qbt 1g, Qct, Qbo BV in two samples with a maximum concentration of 61.7 mg/kg. Concentrations increased with depth at locations 02-600126 and 02-600127 and decreased laterally. The residential SSL is approximately 253 times the maximum concentration. Lateral extent of barium is defined and further sampling for vertical extent is not warranted.

Cadmium was not detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs but had DLs (0.49 mg/kg to 0.635 mg/kg) above BVs in eight soil samples, one sediment sample, and seven tuff samples. The residential SSL is approximately 111 times the maximum DL. Further sampling for extent of cadmium is not warranted.

Chromium was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 15 mg/kg and was not detected above the Qbt 1g, Qct, Qbo BV but had DLs (8.77 mg/kg and 58.7 mg/kg) above BV in two samples. Concentrations increased with depth at location 02-600127 and decreased laterally. As described in section 4.2, AOC 02-003(b) is not a potential source of hexavalent chromium and use of the SSL for trivalent chromium to determine whether additional sampling is warranted is appropriate. The residential SSL for trivalent chromium (117,000 mg/kg) is approximately 7800 times the maximum concentration and 1990 times the maximum DL. Further sampling for vertical extent of chromium is not warranted.

Copper was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 4.47 mg/kg. Concentrations increased with depth at location 02-600127 and decreased laterally. The residential SSL is approximately 700 times the maximum concentration. Lateral extent of copper is defined and further sampling for vertical extent is not warranted.

Iron was detected above the Qbt 1g, Qct, Qbo BV in seven samples with a maximum concentration of 8300 mg/kg. Concentrations increased with depth at location 02-600127, decreased with depth at all other locations (concentrations in shallower samples at locations 02-600125, 02-600126, and 02-612390 were 9160 mg/kg, 6800 mg/kg, and 6980 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]), and decreased laterally. The residential SSL is approximately 6.6 times the maximum concentration, and the industrial SSL is approximately 109 times the maximum concentration. The concentrations above BV are all below 10 ft bgs and do not present an exposure risk. Lateral extent of iron is defined and further sampling for vertical extent is not warranted.

Manganese was detected above the Qbt 1g, Qct, Qbo BV in four samples with a maximum concentration of 235 mg/kg. Concentrations decreased with depth at all locations (concentrations in shallower samples at locations 02-600125, 02-600126, 02-600127, and 02-612390 were 399 mg/kg, 301 mg/kg, 253 mg/kg, and 248 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). Concentrations decreased laterally. The residential SSL is approximately 45 times the maximum concentration. The concentrations above BV are all below 10 ft bgs and do not present an exposure risk. Lateral extent of manganese is defined and further sampling for vertical extent is not warranted.

Mercury was detected above the soil BV in one sample at a concentration of 0.443 mg/kg and was not detected but had a DL (0.21 mg/kg) above the soil BV in one sample. Only a surface sample was sampled at location 02-600129, but mercury was not detected above BV in deeper samples at any other locations. Concentrations increased laterally at location 02-600129. The residential SSL is approximately 53 times the maximum concentration and 112 times the maximum DL. Further sampling for extent of mercury is not warranted.

Nickel was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 3.12 mg/kg and was not detected above the Qbt 1g, Qct, Qbo BV but had DLs (3.26 mg/kg and 3.42 mg/kg) above BV in two samples. Concentrations increased with depth at location 02-600127 and decreased laterally. The residential SSL is approximately 500 times the maximum concentration and 456 times the maximum DL. Further sampling for vertical extent of nickel is not warranted.

Selenium was not detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs but had DLs (1.14 mg/kg to 1.78 mg/kg) above BVs in four soil samples, one sediment sample, and seven tuff samples. The residential SSL is approximately 220 times the maximum DL. Further sampling for extent of selenium is not warranted.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV (4.59 mg/kg) in one sample at a concentration of 10.4 mg/kg. Concentrations increased with depth at location 02-600127 and decreased laterally. The residential SSL is approximately 38 times the maximum DL. Lateral extent of vanadium is defined and further sampling for vertical extent is not warranted.

Organic Chemicals

Organic COPCs at AOC 02-003(b) include Aroclor-1248, Aroclor-1254, Aroclor-1260, n-butylbenzene, 4-isopropyltoluene, and 1,2,4-trimethylbenzene.

Aroclor-1248 was detected in one sample at a concentration of 0.0076 mg/kg. Concentrations decreased with depth and decreased laterally. The lateral and vertical extent of Aroclor-1248 are defined.

Aroclor-1254 was detected in nine samples with a maximum concentration of 0.844 mg/kg. Only surface samples were collected at locations 02-600128 and 02-600129 and concentrations decreased with depth at all other locations and decreased laterally. The residential SSL is approximately 18 times the maximum concentration of 0.0644 mg/kg at location 02-600128, where only a surface sample was collected. Lateral extent of Aroclor-1254 is defined and further sampling for vertical extent is not warranted.

Aroclor-1260 was detected in 12 samples with a maximum concentration of 0.369 mg/kg. Only surface samples were collected at locations 02-600128 and 02-600129 and concentrations decreased with depth at all other locations and decreased laterally. The residential SSL is approximately 27 times the maximum concentration of 0.0896 mg/kg at location 02-600128, where only a surface sample was collected. Lateral extent of Aroclor-1260 is defined and further sampling for vertical extent is not warranted.

Butylbenzene[n-] was detected in one sample at a concentration of 0.000661 mg/kg. Concentrations decreased with depth and decreased laterally. The lateral and vertical extent of n-butylbenzene are defined.

Isopropyltoluene[4-] was detected in one sample at a concentration of 0.000403 mg/kg. Concentrations decreased with depth and decreased laterally. The lateral and vertical extent of 4-isopropyltoluene are defined.

Trimethylbenzene[1,2,4-] was detected in one sample at a concentration of 0.000229 mg/kg. Concentrations decreased with depth and decreased laterally. The lateral and vertical extent of 1,2,4-trimethylbenzene are defined.

Radionuclides

Radionuclide COPCs at AOC 02-003(b) include cesium-137, plutonium-239/240, strontium-90, and tritium.

Cesium-137 was detected below 1 ft bgs in eight soil and Qal samples with a maximum activity of 4.46 pCi/g. Activities decreased with depth at all locations and increased laterally to the west at location 02-612390. Lateral extent to the west is bounded by SWMU 02-007. The residential SAL is approximately 2.7 times the maximum activity, and the industrial SAL is approximately 9.2 times the maximum activity. The vertical extent of cesium-137 is defined and further sampling for lateral extent is not warranted.

Plutonium-239/240 was detected above the soil and sediment FVs in one soil sample and one sediment sample, was detected below 1 ft bgs in five soil and Qal samples, and was detected in one Qbo sample with a maximum activity of 0.768 pCi/g. Only surface samples were collected at locations 02-600128 and 02-600129, activities decreased with depth at all other locations, and activities decreased laterally. The residential SAL is approximately 103 times the maximum activity. The lateral extent of plutonium-239/240 is defined and further sampling for vertical extent is not warranted.

Strontium-90 was detected below 1 ft bgs in three Qal samples with a maximum activity of 0.96 pCi/g. Activities decreased with depth at all locations and increased laterally to the west at location 02-612390. Lateral extent to the west is bounded by SWMU 02-007. The residential SAL is approximately 16 times the maximum activity, and the industrial SAL is approximately 160 times the maximum activity. The vertical extent of strontium-90 is defined and further sampling for lateral extent is not warranted.

Tritium was detected in 12 samples with a maximum activity of 0.121 pCi/g. Only a surface sample was collected at location 02-600129 and activities increased with depth at all other locations and increased laterally to the west at location 02-612390. Lateral extent to the west is bounded by SWMU 02-007. The residential SAL is approximately 14,000 times the maximum activity. Further sampling for extent of tritium is not warranted.

Summary of Nature and Extent at AOC 02-003(b)

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at AOC 02-003(b).

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 less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.05, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 1×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.01 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Residential Scenario

The total excess cancer risk for the residential scenario is 6×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.8, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 8 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Construction Worker Scenario

The residential exposure scenario also demonstrates protection of construction workers for carcinogenic and radionuclide COPCs. The construction worker HI is approximately 1 (with manganese, see Appendix H, section H-4.5.2, Exposure Evaluation), which is equal to the NMED target HI of 1.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, residential, and construction worker scenarios at AOC 02-003(b).

6.3.6 Summary of Ecological Risk Screening

AOC 02-003(b) is within the TA-02 core area. Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and results of site-specific ecological risk studies, no potential ecological risks exist for the TA-02 core area.

6.4 AOC 02-003(c), Soil Contamination at Gaseous Effluent Delay Tanks

6.4.1 Site Description and Operational History

AOC 02-003(c) consisted of two parallel underground stainless-steel gaseous effluent delay tanks (each 1 ft in diameter by 20 ft long and buried 4 ft deep) (Figure 6.4-1). The tanks were part of the gaseous effluent vent line system associated with the WBR.

The 1990 SWMU report (LANL 1990, 007511) describes the tanks as being “in series”; however, excavation of the tanks during the 1985 D&D indicated that they were parallel and oriented east to west (Elder and Knoell 1986, 006670, p. 8).

The gaseous effluent vent system was in place by 1951 and received off-gas from the WBR. The off-gas contained gaseous fission products, including cesium-137, strontium-90, technetium-99, and iodine-131 (LANL 1993, 015314, p. 7.4-1). It is unclear when the delay tanks were installed. The original as-built drawing of the condensate trap and line 119 (LASL 1947, 089677) dated 1947 does not show the delay tank system. The tanks appear to have been installed in 1951 when other modifications to the gaseous effluent vent line system were made (Montoya 1991, 006997, p. 2); however, no installation record is available. The delay tanks remained in use until 1974 and were inactive from 1974 to 1985. The tanks were removed and disposed of during D&D efforts in 1985 (Elder and Knoell 1986, 006670, pp. 22-29, p. 43).

6.4.2 Relationship to Other SWMUs and AOCs

The delay tanks were connected to the gaseous effluent vent line 119, part of AOC 02-003(b). The gaseous effluent line (line 119) was connected to the stack-gas valve house, AOC 02-003(a), and to the mesa-top stack and French drain, SWMU 02-006(a).

6.4.3 Summary of Previous Investigations

6.4.3.1 1985 WBR Decommissioning Project, Phase I

The delay tanks were excavated from approximately 4 ft bgs. Their connection to the OWR vent line was plugged with a threaded cap. Field-screening data from beneath the tanks indicated no radioactivity existed above predetermined cleanup goals (Elder and Knoell 1986, 006670, p. 29).

6.4.3.2 1995 Investigation Activities

Samples were collected at three locations around the delay tanks. The 1995 investigation results are not decision-level data.

6.4.3.3 2000 Post–Cerro Grande Fire Recovery Work

Samples were collected from two boreholes (locations 02-01237 and 02-01238) near the delay tanks. Field-screening data from recovered cores indicated no elevated radionuclide levels existed (LANL 2001, 070352, p. 7).

6.4.3.4 2007 Investigation Activities

Thirty-three samples were collected from ten locations at AOC 02-003(c) in 2007. Results from the sampling activities in 2007 were presented in the previous investigation report (LANL 2008, 101669.12). Additional sampling was required to define the extent of contamination at the site.

6.4.4 Site Contamination

6.4.4.1 Soil, Rock, and Sediment Sampling

As part of the 2010 investigation, the following characterization activities were conducted at AOC 02-003(c):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Five samples were collected from location 02-612420 between AOC 02-003(a) and the southern part of SWMU 02-009(c) from 6–7 ft, 15.5–16.5 ft, 26–27 ft, 35–37 ft, and 49–50 ft bgs. These samples were analyzed for TAL metals, PCBs, SVOCs, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium.

The 2010 and historical sampling locations at AOC 02-003(c) are shown in Figure 6.4-1. Table 6.4-1 presents the samples collected and analyses requested for AOC 02-003(c). The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

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

No organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of the samples. No radiological-screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. No changes to sampling or other activities occurred because of the field-screening results.

6.4.4.3 Soil, Rock, and Sediment Sample Analytical Results

Decision-level data at AOC 02-003(c) consist of results from 40 samples collected from 13 locations in 2000, 2007, and 2010. The 40 samples include 12 soil, 16 Qal, and 11 Qbo samples and 1 sediment sample.

Inorganic Chemicals

A total of 40 samples (12 soil, 16 Qal, 11 Qbo, and 1 sediment) were analyzed for TAL metals, and 33 samples (10 soil, 14 Qal, 8 Qbo, and 1 sediment) were analyzed for nitrate, perchlorate, and total cyanide. Table 6.4-2 presents the inorganic chemicals detected or detected above BVs. Figure 6.4-2 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV (3560 mg/kg) in 10 samples with a maximum concentration of 13,600 mg/kg. The Gehan and quantile tests indicated site concentrations of aluminum in tuff are statistically different from background (Figure G-18 and Table G-4). Aluminum is retained as a COPC.

Antimony was not detected above the soil and Qbt 1g, Qct, Qbo BVs (0.83 mg/kg and 0.5 mg/kg) but had DLs (0.513 mg/kg to 1.39 mg/kg) above BVs in two soil samples and six tuff samples. The DLs are greater than the maximum Qbt 1g, Qct, Qbo background concentration (DL of 0.2 mg/kg). Antimony is retained as a COPC.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV (0.56 mg/kg) in eight samples with a maximum concentration of 2.76 mg/kg and was not detected above the Qbt 1g, Qct, Qbo BV but had DLs (1.28 mg/kg to 1.32 mg/kg) above BV in three samples. The quantile and slippage tests indicated site concentrations of arsenic in tuff are statistically different from background (Figure G-19 and Table G-4). Arsenic is retained as a COPC.

Barium was detected above the soil and Qbt 1g, Qct, Qbo BVs (295 mg/kg and 25.7 mg/kg) in three soil samples and four tuff samples with a maximum concentration of 2230 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in soil are not statistically different from background (Figure G-20 and Table G-5) but site concentrations of barium in tuff are statistically different from background (Figure G-21 and Table G-4). Barium is retained as a COPC.

Cadmium was not detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs (0.4 mg/kg for all 3) but had DLs (0.474 mg/kg to 0.693 mg/kg) above BVs in 19 soil samples, 1 sediment sample, and 11 tuff samples. Cadmium is retained as a COPC.

Calcium was detected above the soil BV (6120 mg/kg) in one sample at a concentration of 7440 mg/kg. This concentration is below the maximum soil background concentration (14,000 mg/kg). The Gehan and quantile tests indicated site concentrations of calcium in soil are not statistically different from background (Figure G-22 and Table G-5). Calcium is not a COPC.

Chromium was detected above the soil and Qbt 1g, Qct, Qbo BVs (19.3 mg/kg and 2.6 mg/kg) in two soil samples and nine tuff samples with a maximum concentration of 23.2 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in soil are not statistically different from background (Figure G-23 and Table G-5) but site concentrations in tuff are statistically different from background (Figure G-24 and Table G-4). Chromium is retained as a COPC.

Copper was detected above the soil BV (14.7 mg/kg) in four samples with a maximum concentration of 80 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in soil are not statistically different from background (Figure G-25 and Table G-5), but the maximum concentration is substantially greater than the maximum soil background concentration (16 mg/kg). Copper is retained as a COPC.

Iron was detected above the Qbt 1g, Qct, Qbo BV (3700 mg/kg) in all 11 samples with a maximum concentration of 8750 mg/kg. The Gehan and quantile tests indicated site concentrations of iron in tuff are statistically different from background (Figure G-26 and Table G-4). Iron is retained as a COPC.

Lead was detected above the soil and Qbt 1g, Qct, BVs (22.3 mg/kg and 13.5 mg/kg, respectively) in two samples with a maximum concentration of 62 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil are not statistically different from background (Figure G-27 and Table G-5). Lead is not a COPC.

Manganese was detected above the Qbt 1g, Qct, Qbo BV (189 mg/kg) in eight samples with a maximum concentration of 309 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in tuff are statistically different from background (Figure G-28 and Table G-4). Manganese is retained as a COPC.

Mercury was detected above the soil BV (0.1 mg/kg) in 13 samples with a maximum concentration of 2.43 mg/kg. Mercury is retained as a COPC.

Nickel was detected above the Qbo BV (2 mg/kg) in five samples with a maximum concentration of 4.69 mg/kg. The Qbt 1g, Qct, Qbo background data set has too few detections to evaluate statistics but the maximum concentration is greater than the maximum Qbt 1g, Qct, Qbo background concentration (2.8 mg/kg). Nickel is retained as a COPC.

Nitrate was detected in 12 soil samples with a maximum concentration of 2.95 mg/kg. Nitrate is naturally occurring, and the concentrations likely reflect naturally occurring levels. In addition, AOC 02-003(c) was used to manage reactor stack gas and is not a source of nitrate. Nitrate is not a COPC.

Perchlorate was detected in four soil samples with a maximum concentration of 0.00113 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs (1.52 mg/kg, 0.3 mg/kg, and 0.3 mg/kg) in 11 soil samples, 1 sediment sample, and 5 tuff samples with a maximum concentration of 14.6 mg/kg and was not detected above the soil and Qbt 1g, Qct, Qbo BVs but had DLs (1.28 mg/kg to 1.98 mg/kg) above BVs in 6 soil samples and 6 tuff samples. The Gehan and quantile tests indicated site concentrations of selenium in soil are statistically different from background (Figure G-29 and Table G-5). Selenium is retained as a COPC.

Thallium was detected above the soil BV (0.73 mg/kg) in one sample at a concentration of 8.21 mg/kg. The Gehan and quantile tests indicated site concentrations of thallium in soil are not statistically different from background (Figure G-30 and Table G-5). Thallium is retained as a COPC.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV (4.59 mg/kg) in four samples with a maximum concentration of 10.2 mg/kg. The Gehan and quantile tests indicated site concentrations of vanadium in tuff are statistically different from background (Figure G-31 and Table G-4). Vanadium is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in two samples with a maximum concentration of 61.6 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are not statistically different from background (Figure G-32 and Table G-5). Zinc is not a COPC.

Organic Chemicals

A total of 9 samples (2 soil, 3 Qal, and 4 Qbo) were analyzed for PCBs, 36 samples (9 soil, 15 Qal, 11 Qbo, and 1 sediment) were analyzed for SVOCs, and 22 samples (14 Qal and 8 Qbo) were analyzed for VOCs. Table 6.4-3 presents the detected organic chemicals. Figure 6.4-3 shows the spatial distribution of detected organic chemicals.

Polycyclic Aromatic Hydrocarbons

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

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

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

water. PAH concentrations in excess of soil cleanup levels may result from common anthropogenic sources, such as runoff from asphalt parking lots.

Site Activities

AOC 02-003(c) is part of a radioactive gaseous effluent management system and was identified as an AOC because of possible radioactive soil contamination resulting from releases of radionuclides. The AOC 02-003(c) tanks were located adjacent to asphalt paving. PAHs detected at this site were detected only in surface and shallow subsurface samples. PAHs were not associated with the gaseous nuclear reactor effluent managed at this site. Therefore, the PAHs detected in samples used to characterize this site [acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; fluoranthene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene, naphthalene, phenanthrene; and pyrene] are associated with the former paved area, are not related to historical Laboratory site operations, and are not COPCs.

Organic COPCs

Other organic chemicals detected at AOC 02-003(c) include acetone, Aroclor-1254, Aroclor-1260, chloroform, and toluene. The detected organic chemicals listed are retained as COPCs.

Radionuclides

A total of 38 samples (10 soil, 16 Qal, 11 Qbo, and 1 sediment) were analyzed for americium-241 and 40 samples (12 soil, 16 Qal, 11 Qbo, and 1 sediment) were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium. Table 6.4-4 presents the radionuclides detected or detected above BVs/FVs. Figure 6.4-4 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Cesium-137 was detected above the soil FV (1.65 pCi/g) in 3 samples, detected below 1 ft bgs in 12 soil and Qal samples, and detected in 1 Qbo sample, with a maximum activity of 3.32 pCi/g. Cesium-137 is retained as a COPC.

Cobalt-60 was detected in one sample at an activity of 0.24 pCi/g. Cobalt-60 is retained as a COPC.

Plutonium-239/240 was detected above the soil and sediment FVs (0.054 pCi/g and 0.068 pCi/g) in seven soil samples and one sediment sample, detected below 1 ft bgs in five soil and Qal samples, and detected in one Qbo sample, with a maximum activity of 2.72 pCi/g. Plutonium-239/240 is retained as a COPC.

Tritium was detected in eight samples with a maximum activity of 0.155 pCi/g. Tritium is retained as a COPC.

Uranium-235/236 was detected above the Qbt 1g, Qct, Qbo BV (0.18 pCi/g) in 1 sample with a maximum activity of 0.186 pCi/g. The activity was only 0.006 pCi/g above BV and uranium-235/236 was not detected or detected above BV in 39 other samples (detected below BV in 28 samples). Uranium-235/236 is not a COPC.

Uranium-238 was detected above the soil BV (2.29 pCi/g) in 1 sample at an activity of 2.54 pCi/g. The activity was only 0.25 pCi/g above BV and uranium-238 was detected below BVs in 39 other samples. Uranium-238 is not a COPC.

6.4.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at AOC 02-003(c) are discussed below.

Inorganic Chemicals

Inorganic COPCs at AOC 02-003(c) include aluminum, antimony, arsenic, barium, cadmium, chromium, copper, iron, manganese, mercury, nickel, perchlorate, selenium, and vanadium.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV in 10 samples with a maximum concentration of 13,600 mg/kg. Concentrations increased with depth at locations 02-600196, 02-600197, 02-600198, 02-600200, 02-600203, 02-600204, and 02-612420 and did not change substantially with depth (110 mg/kg) at location 02-600201 (the concentration in a shallower sample at location 02-600201 was 5380 mg/kg, and below the soil BV [Appendix F, Pivot Tables]). Concentrations increased to the east at location 02-600197. Lateral extent to the east is bounded by SWMU 02-009(c). The residential SSL is approximately 5.7 times the maximum concentration, and the industrial SSL is approximately 95 times the maximum concentration. The concentrations above BV are all below 10 ft bgs and do not present an exposure risk. Further sampling for extent of aluminum is not warranted.

Antimony was not detected above the soil and Qbt 1g, Qct, Qbo BVs but had DLs (0.513 mg/kg to 1.39 mg/kg) above BVs in two soil samples and six tuff samples. The residential SSL is approximately 22 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV in eight samples with a maximum concentration of 2.76 mg/kg and was not detected above the Qbt 1g, Qct, Qbo BV but had DLs (1.28 mg/kg to 1.32 mg/kg) above BV in three samples. Concentrations did not change substantially with depth (0.74 mg/kg or less) at locations 02-600196, 02-600203, and 02-600204 and decreased with depth at all other locations (concentrations in shallower samples at locations 02-600196, 02-600197, 02-600198, 02-600201, 02-600203, and 02-600204 were 1.9 mg/kg, 3.09 mg/kg, 1.86 mg/kg, 2.67 mg/kg, 2.59 mg/kg, and 2.76 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). Concentrations increased laterally to the west at location 02-600204. Lateral extent to the west is bounded by AOC 02-003(d). The residential SSL is approximately 2.6 times the maximum concentration, and the industrial SSL is approximately 13 times the maximum concentration. The residential SSL is approximately 5.4 times the maximum DL, and the industrial SSL is approximately 27 times the maximum DL. Further sampling for extent of arsenic is not warranted.

Barium was detected above the soil and Qbt 1g, Qct, Qbo BVs in three soil samples and four tuff samples with a maximum concentration of 2230 mg/kg. Concentrations did not change substantially with depth (2.0 mg/kg) at location 02-600204 and decreased with depth at all other locations (concentrations in shallower samples at locations 02-600200 and 02-600204 were 82.2 mg/kg and 57.9 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). Concentrations increased laterally to the east at location 02-600197. Lateral extent to the east is bounded by SWMU 02-009(c). The residential SSL is approximately 7 times the maximum concentration, and the industrial SSL is approximately 114 times the maximum concentration. Further sampling for extent of barium is not warranted.

Cadmium was not detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs but had DLs (0.474 mg/kg to 0.693 mg/kg) above BVs in 19 soil samples, 1 sediment sample, and 11 tuff samples. The residential SSL is approximately 102 times the maximum DL. Further sampling for extent of cadmium is not warranted.

Chromium was detected above the soil and Qbt 1g, Qct, Qbo BVs in two soil samples and nine tuff samples with a maximum concentration of 23.2 mg/kg. Concentrations increased with depth at location 02-600198, did not change substantially with depth (0.074 mg/kg) at location 02-600201, and decreased with depth at all other locations (concentrations in shallower samples at locations 02-600199, 02-600201, 02-600203, and 02-600204 were 10.5 mg/kg, 8.08 mg/kg, 13 mg/kg, and 8.02 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). Concentrations decreased laterally. As described in section 4.2, AOC 02-003(c) is not a potential source of hexavalent chromium and use of the SSL for trivalent chromium to determine whether additional sampling is warranted is appropriate. The residential SSL for trivalent chromium (117,000 mg/kg) is approximately 5040 times the maximum concentration. Lateral extent of chromium is defined and further sampling for vertical extent is not warranted.

Copper was detected above the soil BV in four samples with a maximum concentration of 80 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. The lateral and vertical extent of copper are defined.

Iron was detected above the Qbt 1g, Qct, Qbo BV in 11 samples with a maximum concentration of 8750 mg/kg. Concentrations did not change substantially with depth (1680 mg/kg) at location 02-600204 and decreased with depth at all other locations (concentrations in shallower samples at locations 02-600196, 02-600197, 02-600198, 02-600200, 02-600201, 02-600203, 02-600204, and 02-612420 were 8960 mg/kg, 9820 mg/kg, 14,400 mg/kg, 7660 mg/kg, 7490 mg/kg, 8220 mg/kg, 7070 mg/kg, and 6600 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). Concentrations increased laterally to the west at location 02-600204. Lateral extent to the west is bounded by AOC 02-003(d). The residential SSL is approximately 6.3 times the maximum concentration, and the industrial SSL is approximately 104 times the maximum concentration. Further sampling for extent of iron is not warranted.

Manganese was detected above the Qbt 1g, Qct, Qbo BV in eight samples with a maximum concentration of 309 mg/kg. Concentrations did not change substantially with depth (9 mg/kg or less) at locations 02-600196, 02-600198, and 02-600204 and decreased with depth at all other locations (concentrations in shallower samples at locations 02-600196, 02-600197, 02-600198, 02-600200, 02-600203, and 02-600204 were 318 mg/kg, 255 mg/kg, 259 mg/kg, 299 mg/kg, 360 mg/kg, and 250 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). Concentrations decreased laterally. The residential SSL is approximately 34 times the maximum concentration. Further sampling for extent of manganese is not warranted.

Mercury was detected above the soil BV in 13 samples with a maximum concentration of 2.43 mg/kg. Concentrations increased with depth at locations 02-600202 and 02-600203; only one depth was sampled at location 02-01237; and concentrations decreased with depth at all other locations, including 02-600196, which is adjacent to location 02-01237 and which was sampled at deeper depths than location 02-01237. Concentrations decreased laterally. The residential SSL is approximately 9.7 times the maximum concentration, and the industrial SSL is approximately 160 times the maximum concentration. Lateral extent of mercury is defined and further sampling for vertical extent is not warranted.

Nickel was detected above the Qbo BV in five samples with a maximum concentration of 4.69 mg/kg. Concentrations did not change substantially with depth (1.15 mg/kg or less) at locations 02-600200, 02-600203, and 02-600204 and decreased with depth at all other locations (concentrations in shallower samples at locations 02-600196, 02-600198, 02-600200, 02-600203, and 02-600204 were 3.68 mg/kg, 4.04 mg/kg, 3.4 mg/kg, 3.56 mg/kg, and 2.63 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). Concentrations decreased laterally. The residential SSL is approximately 333 times the maximum concentration. Lateral extent of nickel is defined and further sampling for vertical extent is not warranted.

Perchlorate was detected in four soil samples with a maximum concentration of 0.00113 mg/kg. Concentrations increased with depth at location 02-600199, did not change substantially with depth (0.000154 mg/kg) at location 02-600196, decreased with depth at location 02-600198, and increased laterally to the south at location 02-600199. Lateral extent to the south is bounded by AOC 02-003(d). The residential SSL is approximately 48,500 times the maximum concentration. Further sampling for extent of perchlorate is not warranted.

Selenium was detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs in 11 soil samples, 1 sediment sample, and 5 tuff samples with a maximum concentration of 14.6 mg/kg and was not detected above the soil and Qbt 1g, Qct, Qbo BVs but had DLs (1.28 mg/kg to 1.98 mg/kg) above BVs in 6 soil samples and 6 tuff samples. Concentrations did not change substantially with depth (1.15 mg/kg or less) at locations 02-600197, 02-600199, and 02-600203; decreased with depth at all other locations; and increased laterally to the south at location 02-600198. Lateral extent to the south is bounded by SWMU 02-009(a). The residential SSL is approximately 27 times the maximum concentration and 197 times the maximum DL. Further sampling for extent of selenium is not warranted.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV in four samples with a maximum concentration of 10.2 mg/kg. Concentrations increased with depth at location 02-600204, did not change substantially with depth (0.01 mg/kg) at location 02-600200, and decreased with depth at all other locations (concentrations in shallower samples at locations 02-600199, 02-600200, and 02-600203 were 7.52 mg/kg, 7.63 mg/kg, and 11.2 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). Concentrations decreased laterally. The residential SSL is approximately 38 times the maximum concentration. Lateral extent of vanadium is defined and further sampling for vertical extent is not warranted.

Organic Chemicals

Organic COPCs at AOC 02-003(c) include acetone, Aroclor-1254, Aroclor-1260, chloroform, and toluene.

Aroclor-1254 was detected in two samples with a maximum concentration of 0.0065 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. The lateral and vertical extent of Aroclor-1254 are defined.

Aroclor-1260 was detected in four samples with a maximum a concentration of 0.0077 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. The lateral and vertical extent of Aroclor-1260 are defined.

Chloroform was detected in six samples with a maximum concentration of 0.000322 mg/kg. Concentrations did not change substantially with depth (0.000062 mg/kg or less) at locations 02-600197 and 02-600201 and did not change substantially laterally (0.000062 mg/kg). All detected concentrations were below EQLs. The residential SSL is approximately 18,200 times the maximum concentration. Further sampling for extent of chloroform is not warranted.

Toluene was detected in six samples with a maximum concentration of 0.000928 mg/kg. Only one depth was sampled at locations 02-600196 and 02-600202, concentrations decreased with depth at all other locations, and concentrations did not change substantially laterally (0.000558 mg/kg). All detected concentrations were below EQLs. The residential SSL is approximately 5,959,000 times the maximum concentration. Further sampling for extent of toluene is not warranted.

Radionuclides

Radionuclide COPCs at AOC 02-003(c) include cesium-137, cobalt-60, plutonium-239/240, and tritium.

Cesium-137 was detected above the soil FV in 3 samples, detected below 1 ft bgs in 12 soil and Qal samples, and detected in 1 Qbo sample, with a maximum activity of 3.32 pCi/g. Activities increased with depth at locations 02-600199 and 02-600202 and did not change substantially with depth (0.044 pCi/g) at location 02-600204. Only one depth was sampled at locations 02-01237 and 02-01238, and activities decreased with depth at all other locations. Activities increased laterally to the east at location 02-600197. Lateral extent to the east is bounded by SWMU 02-009(c). The residential SAL is approximately 3.6 times the maximum activity, and the industrial SAL is approximately 12 times the maximum activity. Further sampling for extent of cesium-137 is not warranted.

Cobalt-60 was detected in one sample at an activity of 0.24 pCi/g. Activities decreased with depth and increased to the west at location 02-600201. Lateral extent to the west is bounded by AOC 02-003(d). The residential SAL is approximately 11 times the maximum activity, and the industrial SAL is approximately 38 times the maximum activity. Further sampling for extent of cobalt-60 is not warranted.

Plutonium-239/240 was detected above the soil and sediment FVs (0.054 pCi/g and 0.068 pCi/g) in seven soil samples and one sediment sample, detected below 1 ft bgs in five soil and Qal samples, and detected in one Qbo sample, with a maximum activity of 2.72 pCi/g. Activities increased with depth at location 02-600203; only a surface sample was collected at location 02-600205; and activities decreased with depth at all other locations. Activities decreased laterally. The residential SAL is approximately 29 times the maximum activity. Lateral extent of plutonium-239/240 is defined and further sampling for vertical extent is not warranted.

Tritium was detected in eight samples with a maximum activity of 0.16 pCi/g. Activities increased with depth at location 02-600199; only one depth was sampled at location 02-01238; and activities decreased with depth at all other locations. Activities increased to the west at location 02-600201. Lateral extent to the west is bounded by AOC 02-003(d). The residential SAL is approximately 10,600 times the maximum activity. Further sampling for extent of tritium is not warranted.

Summary of Nature and Extent at AOC 02-003(c)

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at AOC 02-003(c).

6.4.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 1×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.004, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 1×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.01, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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.

Residential Scenario

The total excess cancer risk for the residential scenario is 4×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 3, which is greater than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 4 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Construction Worker Scenario

The residential exposure scenario also demonstrates protection of construction workers for carcinogenic and radionuclide COPCs. The construction worker HI is approximately 1 (with manganese, see Appendix H, section H-4.5.2, Exposure Evaluation), which is equal to the NMED target HI of 1.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, and construction worker scenarios at AOC 02-003(c). A potential unacceptable noncancer risk exists for the residential scenario at AOC 02-003(c).

6.4.6 Summary of Ecological Risk Screening

AOC 02-003(c) is within the TA-02 core area. Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and results of site-specific ecological risk studies, no potential ecological risks exist for the TA-02 core area.

6.5 AOC 02-003(d), Soil Contamination at Site of Upper Part of Line 119 and Temporary Vent Line

6.5.1 Site Description and Operational History

AOC 02-003(d) consists of two distinct areas (Plate 2). One is the potential soil contamination area associated with a temporary gaseous effluent vent, the garden hose that reportedly served as a temporary vent line for the WBR during initial operations (LANL 1993, 015314, p. 7.4-3). This area is located approximately 120 ft northeast of the former OWR building.

The second and primary area of AOC 02-003(d) is the 1200-ft gaseous effluent vent line from the delay tanks (structure 02-131) to the mesa-top stack [structure 02-009, SWMU 02-006(a)].

The garden hose discharge was reportedly used from 1943 to 1948 when the stack on the mesa top (structure 02-9, located at TA-61) was built (LANL 1993, 015314, 7.4-3). The gaseous effluent vent line received gaseous effluent from the WBR from 1948 to 1974 and from the OWR from 1953 to 1993 (Elder and Knoell 1986, 006670, p. 8).

The mesa-top stack remained in use from 1948 to 1993. The stack received gaseous effluent from only the WBR from 1948 to 1956, when the OWR was brought online. The stack received effluent from both the WBR and the OWR from 1956 to 1974. The stack received effluent from only the OWR from 1974 to 1993. The stack became inactive in 1993 when the OWR was deactivated, and the stack was removed and disposed of in November 2002 (LANL 2003, 090089, p. 2). Line 119 was removed in April 2003 (WD-3 2003, 082646, p. 2).

6.5.2 Relationship to Other SWMUs and AOCs

The gaseous effluent line (line 119) was connected to the stack-gas valve house, AOC 02-003(a); to the delay tanks, AOC 02-003(c); and to the mesa-top stack and French drain, SWMU 02-006(a). The condensate trap was located within the area associated with the leach field of SWMU 02-009(c). The line passed through a soil contamination area associated with SWMU 02-009(a).

6.5.3 Summary of Previous Investigations

6.5.3.1 1995 Investigation Activities

Soil samples were collected from locations around the garden hose discharge area. Supporting QA/QC information is not available for these samples, so the sample results are not included in this report.

6.5.3.2 2000 Post–Cerro Grande Fire Recovery Work

Six samples were collected from three locations (02-01254 to 02-01256) in the garden hose discharge area near previous screening locations (LANL 2001, 070352, p. 13).

6.5.3.3 2007 Investigation Activities

Fifty-seven samples were collected from sixteen locations at AOC 02-003(d) in 2007. Results from the sampling activities in 2007 were presented in the previous investigation report (LANL 2008, 101669.12). Additional sampling was required to define the extent of contamination at the site.

6.5.4 Site Contamination

6.5.4.1 Soil and Rock Sampling

As part of the 2010 investigation, the following characterization activities were conducted at AOC 02-003(d):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Three samples were collected from location 02-612412 near previous location 02-600218 at AOC 02-003(d) from 0–0.5 ft, 4–5 ft, and 9–10 ft bgs. These samples were analyzed for TAL metals, total cyanide, hexavalent chromium, PCBs, SVOCs, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium.

The 2010 and historical sampling locations at AOC 02-003(d) are shown on Plate 2. Table 6.5-1 presents the samples collected and analyses requested for AOC 02-003(d). The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

6.5.4.2 Soil and Rock Sample Field-Screening Results

No organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of the samples. No radiological-screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. No changes to sampling or other activities occurred because of the field-screening results.

6.5.4.3 Soil and Rock Sample Analytical Results

Decision-level data at AOC 02-003(d) consist of results from 66 samples collected from 20 locations in 2000, 2007, and 2010. The 66 samples include 40 soil/fill, 16 Qal, 4 Qbt 3, and 6 Qct samples.

Inorganic Chemicals

A total of 39 samples (24 soil, 9 Qal, 2 Qbt 3, and 4 Qct) were analyzed for TAL metals, 3 samples (1 soil and 2 Qct) were analyzed for hexavalent chromium, 30 samples (17 soil, 9 Qal, 2 Qbt 3, and 2 Qct) were analyzed for nitrate and perchlorate, and 33 samples (18 soil, 9 Qal, 2 Qbt 3, and 4 Qct) were analyzed for total cyanide. Table 6.5-2 presents the inorganic chemicals detected or detected above BVs. Plate 3 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV (3560 mg/kg) in three samples with a maximum concentration of 11,400 mg/kg. Aluminum is retained as a COPC.

Antimony was not detected above the soil and Qbt 1g, Qct, Qbo BVs (0.83 mg/kg and 0.5 mg/kg) but had DLs (1.05 mg/kg to 1.08 mg/kg) above BVs in one soil sample and two tuff samples. Antimony is retained as a COPC.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV (0.56 mg/kg) in four samples with a maximum concentration of 2.11 mg/kg. Arsenic is retained as a COPC.

Barium was detected above the Qbt 1g, Qct, Qbo BV (25.7 mg/kg) in three samples with a maximum concentration of 63.7 mg/kg. Barium is retained as a COPC.

Beryllium was detected above the soil and Qbt 1g, Qct, Qbo BVs (1.83 mg/kg and 1.44 mg/kg) in two soil samples and three tuff samples with a maximum concentration of 5.84 mg/kg. The Gehan and quantile tests indicated site concentrations of beryllium in soil are not statistically different from background (Figure G-33 and Table G-6). There were too few Qct samples for statistical tests and the maximum Qct concentration (5.84 mg/kg) was greater than the maximum Qbt 1g, Qct, Qbo background concentration (1.4 mg/kg). Beryllium is retained as a COPC.

Cadmium was not detected above the soil and Qbt 1g, Qct, Qbo BVs (0.4 mg/kg for both) but had DLs (0.495 mg/kg to 0.572 mg/kg) above the soil BV in 22 soil samples and 2 tuff samples. Cadmium is retained as a COPC.

Calcium was detected above the Qbt 1g, Qct, Qbo BV (1900 mg/kg) in two samples with a maximum concentration of 3250 mg/kg. The maximum concentration was greater than the maximum Qbt 1g, Qct, Qbo background concentration (2300 mg/kg). Calcium is retained as a COPC.

Chromium was detected above the soil; Qbt 2,3,4; and Qbt 1g, Qct, Qbo BVs (19.3 mg/kg, 7.14 mg/kg, and 2.6 mg/kg) in one soil sample, one Qbt 3 sample, and three Qct samples with a maximum concentration of 29.5 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in soil are not statistically different from background (Figure G-34 and Table G-6). The maximum Qbt 3 concentration (8.14 mg/kg) is less than the maximum Qbt 2,3,4 background concentration (13 mg/kg), but the maximum Qct concentration (17.1 mg/kg) is greater than the maximum Qbt 1g, Qct, Qbo background concentration (2.3 mg/kg). Chromium is retained as a COPC.

Copper was detected above the Qbt 1g, Qct, Qbo BV (3.96 mg/kg) in two samples with a maximum concentration of 5.81 mg/kg. The maximum concentration is greater than the maximum Qbt 1g, Qct, Qbo background concentration (2.6 mg/kg). Copper is retained as a COPC.

Iron was detected above the Qbt 1g, Qct, Qbo BV (3700 mg/kg) in three samples with a maximum concentration of 9040 mg/kg. Iron is retained as a COPC.

Lead was detected above the Qbt 1g, Qct, Qbo BV (13.5 mg/kg) in 1 sample at a concentration of 16.6 mg/kg. This concentration is only 3.1 mg/kg above the BV and is below the highest concentration in the Qbt 1g, Qct, Qbo background data set (20 mg/kg). Lead was detected below BV in 38 other samples. Lead is not a COPC.

Magnesium was detected above the Qbt 1g, Qct, Qbo BV (739 mg/kg) in three samples with a maximum concentration of 2380 mg/kg. Magnesium is retained as a COPC.

Manganese was detected above the Qbt 1g, Qct, Qbo BV (189 mg/kg) in three samples with a maximum concentration of 324 mg/kg. The maximum concentration was greater than the maximum Qbt 1g, Qct, Qbo background concentration (210 mg/kg). Manganese is retained as a COPC.

Mercury was detected above the soil BV (0.1 mg/kg) in two samples with a maximum concentration of 0.139 mg/kg. Mercury is retained as a COPC.

Nickel was detected above the Qbt 1g, Qct, Qbo BV (2 mg/kg) in three samples with a maximum concentration of 7.69 mg/kg. Nickel is retained as a COPC.

Nitrate was detected in 24 samples with a maximum concentration of 22.6 mg/kg. Nitrate is naturally occurring but the maximum concentration likely exceeds naturally occurring levels. Nitrate is retained as a COPC.

Perchlorate was detected in 18 samples with a maximum concentration of 0.00271 mg/kg. Perchlorate is retained as a COPC.

Potassium was detected above the Qbt 1g, Qct, Qct BV (2390 mg/kg) in 1 sample at a concentration of 2420 mg/kg. This concentration is only 30 mg/kg above the BV and is below the highest concentration in the Qbt 1g, Qct, Qbo background data set (2500 mg/kg). Potassium was not detected or detected below BV in 38 other samples (detected below BV in 34 samples). Potassium is not a COPC.

Selenium was detected above the soil; Qbt 2,3,4; and Qbt 1g, Qct, Qbo BVs (1.52 mg/kg, 0.3 mg/kg, and 0.3 mg/kg, respectively) in five soil samples, two Qbt 3 samples, and two Qct samples with a maximum concentration of 12 mg/kg and was not detected above soil and Qbt 1g, Qct, Qbo BVs but had DLs (1.03 mg/kg to 1.73 mg/kg) above BV in seven soil samples and two Qct samples. The Gehan and quantile tests indicated site concentrations of selenium in soil are statistically different from background (Figure G-35 and Table G-6). Selenium is retained as a COPC.

Silver was detected above the soil BV (1 mg/kg) in 1 sample at a concentration of 1.3 mg/kg. The maximum concentration was only 0.3 mg/kg above BV and silver was not detected or detected above BV in 38 other samples (detected below BV in 27 samples). Silver is not a COPC.

Thallium was not detected above the soil BV (0.73 mg/kg) but had a DL (1.13 mg/kg) above BV. The Gehan and quantile tests indicated site concentrations of thallium in soil are statistically different from background (Figure G-36 and Table G-6). Thallium is not a COPC.

Uranium was detected above the soil BV (1.82 mg/kg) in two samples with a maximum concentration of 3.63 mg/kg. Because uranium was analyzed as part of the TAL metals suite in only six samples, statistical tests could not be performed. The two concentrations above BV (3.63 mg/kg and 2.33 mg/kg) are equivalent to the two highest concentrations in the soil background data set (3.6 mg/kg and 2.4 mg/kg) and uranium isotopes were not retained as radionuclide COPCs. Uranium is not a COPC.

Vanadium was detected above the Qct BV (4.59 mg/kg) in three samples with a maximum concentration of 13.5 mg/kg. Vanadium is retained as a COPC.

Zinc was detected above the soil and Qbt 1g, Qct, Qbo BVs (48.8 mg/kg and 40 mg/kg) in 12 soil samples and 3 tuff samples with a maximum concentration of 78.2 mg/kg. All 12 concentrations are below the maximum soil background concentration (75.5 mg/kg). The Gehan and quantile tests indicated site concentrations of zinc in soil are statistically different from background (Figure G-37 and Table G-6). Zinc is retained as a COPC.

Organic Chemicals

A total of 17 samples (6 soil, 6 Qal, 2 Qbt 3, and 3 Qct) were analyzed for PCBs, 33 samples (18 soil, 9 Qal, 2 Qbt 3, and 4 Qct) were analyzed for SVOCs, and 14 samples (1 soil, 8 Qal, 2 Qbt 3, and 3 Qct) were analyzed for VOCs. Table 6.5-3 presents the detected organic chemicals. Plate 4 shows the spatial distribution of detected organic chemicals.

Polycyclic Aromatic Hydrocarbons

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

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

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

Site Activities

AOC 02-003(d) is part of a radioactive gaseous effluent management system and was identified as an AOC because of possible radioactive soil contamination resulting from releases of radionuclides. The AOC 02-003(d) vent lines were located on a canyon slope that received storm water runoff from the Los Alamos townsite. PAHs were detected only in surface samples and one shallow subsurface sample, at locations impacted by urban runoff. PAHs were not associated with the gaseous nuclear reactor effluent managed at this site. Therefore, the PAHs detected in samples used to characterize this site [benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(k)fluoranthene; chrysene; fluoranthene; phenanthrene; and pyrene] are associated with urban storm water runoff, are not related to historical Laboratory site operations, and are not COPCs.

Organic COPCs

Other organic chemicals detected at AOC 02-003(d) include Aroclor-1254, Aroclor-1260, and toluene. The detected organic chemicals listed are retained as COPCs.

Radionuclides

A total of 33 samples (18 soil, 9 Qal, 2 Qbt 3, and 4 Qct) were analyzed for americium-241; 39 samples (24 soil, 9 Qal, 2 Qbt 3, and 4 Qct) were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and strontium-90; and 38 samples (23 soil, 9 Qal, 2 Qbt 3, and 4 Qct) were analyzed for tritium. Table 6.5-4 presents the radionuclides detected or detected above BVs/FVs. Plate 5 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Cesium-137 was detected below 1 ft bgs in seven soil and Qal samples and was detected in one Qbt 3 sample with a maximum activity of 0.799 pCi/g. Cesium-137 is retained as a COPC.

Cobalt-60 was detected in one soil sample at an activity of 0.97 pCi/g. Cobalt-60 is identified as a COPC.

Plutonium-239/240 was detected above the soil FV (0.054 pCi/g) in 10 samples and detected below 1 ft bgs in 5 soil and Qal samples with a maximum activity of 0.198 pCi/g. Plutonium-239/240 is retained as a COPC.

Tritium was detected in 12 samples with a maximum activity of 0.103 pCi/g. Tritium is retained as a COPC.

Uranium-234 was detected above the soil BV (2.59 pCi/g) in 1 sample at an activity of 2.89 pCi/g. The activity was only 0.3 pCi/g above BV and uranium-234 was detected below BV in 38 other samples. Uranium-234 is not a COPC.

Uranium-235/236 was detected above the Qbt 2,3,4 and Qbt 1g, Qct, Qbo BVs (0.09 pCi/g and 0.18 pCi/g) in 1 Qbt 3 sample and 1 Qct sample at activities of 0.133 pCi/g and 0.185 pCi/g, respectively. The activities were only 0.043 pCi/g and 0.005 pCi/g above BVs and uranium-235/236 was not detected or detected above BV in 37 other samples (detected below BV in 30 samples). Uranium-235/236 is not a COPC.

Uranium-238 was detected above the soil BV (2.29 pCi/g) in 2 samples with a maximum activity of 2.86 pCi/g. The activities were only 0.28 pCi/g and 0.57 pCi/g above BV and uranium-238 was detected below BV in 37 other samples. Uranium-238 is not a COPC.

6.5.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at AOC 02-003(d) are discussed below.

Inorganic Chemicals

Inorganic COPCs at AOC 02-003(d) include aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, copper, iron, magnesium, manganese, mercury, nickel, nitrate, perchlorate, selenium, vanadium, and zinc.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV in three samples with a maximum concentration of 11,400 mg/kg. Concentrations increased with depth at location 02-612412 and did not change substantially with depth (100 mg/kg) at location 02-600218 (the concentration in a shallower sample at location 02-600218 was 11,300 mg/kg and below the soil BV [Appendix F, Pivot Tables]). Concentrations increased laterally to the west of where the temporary gaseous effluent vent was located. The residential SSL is approximately 6.8 times the maximum concentration, and the industrial SSL is approximately 113 times the maximum concentration. Further sampling for extent of aluminum is not warranted.

Antimony was not detected above the soil and Qbt 1g, Qct, Qbo BVs but had DLs (1.05 mg/kg to 1.08 mg/kg) above BVs in one soil sample and two tuff samples. The residential SSL is approximately 29 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV in four samples with a maximum concentration of 2.11 mg/kg. Concentrations did not change substantially with depth (0.211 mg/kg or less) at locations 02-600218 and 02-612412 and decreased with depth at location 02-600229 (concentrations in shallower samples at locations 02-600218, 02-600229, and 02-612412 were 1.89 mg/kg, 1.74 mg/kg, and 1.04 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). Concentrations increased laterally. The residential SSL is approximately 3.4 times the maximum concentration, and the industrial SSL is approximately 17 times the maximum concentration. Further sampling for extent of arsenic is not warranted.

Barium was detected above the Qbt 1g, Qct, Qbo BV in three samples with a maximum concentration of 63.7 mg/kg. Concentrations did not change substantially with depth (9.4 mg/kg or less) at locations 02-600218 and 02-612412 (concentrations in shallower samples at locations 02-600218 and 02-612412 were 58.5 mg/kg and 53.8 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). Concentrations increased laterally to the west of where the temporary gaseous effluent vent was located. The residential SSL is approximately 245 times the maximum concentration. Further sampling for extent of barium is not warranted.

Beryllium was detected above the soil and Qbt 1g, Qct, Qbo BVs in two soil samples and three tuff samples with a maximum concentration of 5.84 mg/kg. Concentrations increased with depth at locations 02-01254 and 02-600218, did not change substantially with depth (0.42 mg/kg) at location 02-612412, and increased laterally. The residential SSL is approximately 26.7 times the maximum concentration. Further sampling for extent of beryllium is not warranted.

Cadmium was not detected above the soil and Qbt 1g, Qct, Qbo BVs but had DLs (0.495 mg/kg to 0.572 mg/kg) above the soil BV in 22 soil samples and 2 tuff samples. The residential SSL is approximately 123 times the maximum DL. Further sampling for extent of cadmium is not warranted.

Calcium was detected above the Qbt 1g, Qct, Qbo BV in two samples with a maximum concentration of 3250 mg/kg. Concentrations decreased with depth at both locations (the concentration in a shallower sample at location 02-600218 was 3850 mg/kg and below the soil BV [Appendix F, Pivot Tables]). Concentrations increased laterally. The residential essential nutrient SSL (13,000,000) is approximately 40,000 times the maximum concentration. Further sampling for extent of calcium is not warranted.

Chromium was detected above the soil; Qbt 2,3,4; and Qbt 1g, Qct, Qbo BVs in one soil sample, one Qbt 3 sample, and three Qct samples with a maximum concentration of 29.5 mg/kg. Concentrations increased with depth at locations 02-600218, 02-600230, 02-600231, and 02-612412 and decreased laterally. As described in section 4.2, AOC 02-003(d) is not a potential source of hexavalent chromium and use of the SSL for trivalent chromium to determine whether additional sampling is warranted is appropriate. The residential SSL for trivalent chromium (117,000 mg/kg) is approximately 3970 times the maximum concentration. Lateral extent of chromium is defined and further sampling for vertical extent is not warranted.

Copper was detected above the Qbt 1g, Qct, Qbo BV in two samples with a maximum concentration of 5.81 mg/kg. Concentrations did not change substantially with depth (0.63 mg/kg or less) at locations 02-600218 and 02-612412 (concentrations in shallower samples at locations 02-600218 and 02-612412 were 5.4 mg/kg and 3.73 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). Concentrations increased laterally to the west of where the temporary gaseous effluent vent was located. The residential SSL is approximately 539 times the maximum concentration. Further sampling for extent of copper is not warranted.

Iron was detected above the Qbt 1g, Qct, Qbo BV in three samples with a maximum concentration of 9040 mg/kg. Concentrations did not change substantially with depth (530 mg/kg) at location 02-600218 and decreased with depth at location 02-612412 (concentrations in shallower samples at locations 02-600218 and 02-612412 were 8510 mg/kg and 7220 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). Concentrations increased laterally to the west of where the temporary gaseous effluent vent was located. The residential SSL is approximately 6.1 times the maximum concentration, and the industrial SSL is approximately 100 times the maximum concentration. Further sampling for extent of iron is not warranted.

Magnesium was detected above the Qbt 1g, Qct, Qbo BV in three samples with a maximum concentration of 2380 mg/kg. Concentrations increased with depth at locations 02-600218 and 02-612412 and increased laterally. The residential essential nutrient SSL (20,900,000 mg/kg) is approximately 8780 times the maximum concentration. Further sampling for extent of magnesium is not warranted.

Manganese was detected above the Qbt 1g, Qct, Qbo BV in three samples with a maximum concentration of 324 mg/kg. Concentrations did not change substantially with depth (29 mg/kg) at location 02-600218 and decreased with depth at location 02-612412 (concentrations in shallower samples at locations 02-600218 and 02-612412 were 353 mg/kg and 385 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). Concentrations increased laterally to the west of where the temporary gaseous effluent vent was located. The residential SSL is approximately 32 times the maximum concentration. Further sampling for extent of manganese is not warranted.

Mercury was detected above the soil BV in two samples with a maximum concentration of 0.139 mg/kg. Only surface samples were collected at locations 02-600216 and 02-600222, and concentrations did not change substantially laterally (0.029 mg/kg). The residential SSL is approximately 169 times the maximum concentration. Further sampling for extent of mercury is not warranted.

Nickel was detected above the Qbt 1g, Qct, Qbo BV in two samples with a maximum concentration of 7.69 mg/kg. Concentrations increased with depth at locations 02-600218 and 02-612412 and increased laterally to the west of where the temporary gaseous effluent vent was located. The residential SSL is approximately 203 times the maximum concentration. Further sampling for extent of nickel is not warranted.

Nitrate was detected in 24 samples with a maximum concentration of 22.6 mg/kg. Concentrations increased with depth at location 02-600221 and did not change substantially with depth (0.67 mg/kg) at location 02-600218; only one depth was sampled at locations 02-600216, 02-600217, 02-600220, 02-600222, and 02-600223; and concentrations decreased with depth at all other locations. Concentrations increased laterally. The residential SSL is approximately 5530 times the maximum concentration. Further sampling for extent of nitrate is not warranted.

Perchlorate was detected in 18 samples with a maximum concentration of 0.00271 mg/kg. Concentrations increased with depth at locations 02-600221, 02-600227, and 02-600230; concentrations did not change substantially with depth (0.00113 mg/kg) at location 02-600228; only one depth was sampled at locations 02-600216, 02-600217, 02-600220, 02-600222, and 02-600223; and concentrations decreased with depth at all other locations. Concentrations decreased laterally. The residential SSL is approximately 20,200 times the maximum concentration. Lateral extent of perchlorate is defined and further sampling for vertical extent is not warranted.

Selenium was detected above the soil; Qbt 2,3,4; and Qbt 1g, Qct, Qbo BVs in five soil samples, two Qbt 3 samples, and two Qct samples with a maximum concentration of 12 mg/kg and was not detected above soil and Qbt 1g, Qct, Qbo BVs but had DLs (1.03 mg/kg to 1.73 mg/kg) above BV in seven soil samples and two Qct samples. Concentrations increased with depth at location 02-600230, did not change substantially with depth (0.02 mg/kg) at location 02-600227, and decreased with depth at all other locations. Concentrations decreased laterally. The residential SSL is approximately 33 times the maximum concentration. Lateral extent of selenium is defined and further sampling for vertical extent is not warranted.

Vanadium was detected above the Qct BV in three samples with a maximum concentration of 13.5 mg/kg. Concentrations did not change substantially with depth (1.8 mg/kg or less) at locations 02-600218 and 02-612412 (concentrations in shallower samples at locations 02-600218 and 02-612412 were 11.7 mg/kg and 6.57 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). Concentrations increased laterally to the west of where the temporary gaseous effluent vent was located. The residential SSL is approximately 29 times the maximum concentration. Further sampling for extent of vanadium is not warranted.

Zinc was detected above the soil and Qbt 1g, Qct, Qbo BVs in 12 soil samples and 3 tuff samples with a maximum concentration of 71.3 mg/kg. Concentrations increased with depth at locations 02-600218, 02-600219, and 02-612412; concentrations did not change substantially with depth (3 mg/kg) at location 02-01254; only one depth was sampled at locations 02-600222 and 02-600225; and concentrations decreased with depth at all other locations. Concentrations increased laterally. The residential SSL is approximately 330 times the maximum concentration. Further sampling for extent of zinc is not warranted.

Organic Chemicals

Organic COPCs at AOC 02-003(d) include Aroclor-1254, Aroclor-1260, and toluene.

Aroclor-1254 was detected in five samples with a maximum concentration of 0.0082 mg/kg. Concentrations increased with depth at location 02-612412 and decreased with depth at all other locations. Concentrations did not change substantially laterally (0.0016 mg/kg). The residential SSL is approximately 139 times the maximum concentration. Further sampling for extent of Aroclor-1254 is not warranted.

Aroclor-1260 was detected in three samples with a maximum concentration of 0.0053 mg/kg. Concentrations decreased with depth at all locations and did not change substantially laterally (0.0026 mg/kg). The residential SSL is approximately 458 times the maximum concentration. Vertical extent of Aroclor-1260 is defined and further sampling for lateral extent is not warranted.

Toluene was detected in three samples with a maximum concentration of 0.000646 mg/kg. Concentrations increased with depth at location 02-600230, did not change substantially with depth (0.000188 mg/kg) at location 02-600219, and did not change substantially laterally (0.000271 mg/kg). All concentrations were below EQLs. The residential SSL is approximately 8,080,000 times the maximum concentration. Further sampling for extent of toluene is not warranted.

Radionuclides

Radionuclide COPCs at AOC 02-003(d) include cesium-137, cobalt-60, plutonium-239/240, and tritium.

Cesium-137 was detected below 1 ft bgs in seven soil and Qal samples and was detected in one Qbt 3 sample with a maximum activity of 0.799 pCi/g. Activities increased with depth at locations 02-01255, 02-01256, 02-600221, and 02-600224; decreased with depth at all other locations; and increased laterally. The residential SAL is approximately 15 times the maximum activity, and the industrial SAL is approximately 51 times the maximum activity. Further sampling for extent of cesium-137 is not warranted.

Cobalt-60 was detected in one soil sample at an activity of 0.97 pCi/g. Only a surface sample was collected at location 02-600223, and activities decreased laterally. The residential SAL is approximately 2.7 times the maximum activity, and the industrial SAL is approximately 9.3 times the maximum activity. Further sampling for extent of cobalt-60 is not warranted.

Plutonium-239/240 was detected above the soil FV in 10 samples and detected below 1 ft bgs in 5 soil and Qal samples with a maximum activity of 0.198 pCi/g. Activities increased with depth at locations 02-600221 and 02-600224; only one depth was sampled at locations 02-600216, 02-600217, 02-600222, 02-600223, and 02-600225; activities did not change substantially with depth (0.005 pCi/g) at location 02-01255; and activities decreased with depth at all other locations. Activities decreased laterally. The residential SAL is approximately 399 times the maximum activity. Lateral extent of plutonium-239/240 is defined and further sampling for vertical extent is not warranted.

Tritium was detected in 12 samples with a maximum activity of 0.103 pCi/g. Activities increased with depth at locations 02-600218, 02-600226, 02-600228, 02-600229, and 02-612412; only one depth was sampled at location 02-01254; activities did not change substantially with depth (0.0155 pCi/g) at location 02-01255; and activities decreased with depth at all other locations. Activities decreased laterally. The residential SAL is approximately 16,500 times the maximum activity. Lateral extent of tritium is defined and further sampling for vertical extent is not warranted.

Summary of Nature and Extent at AOC 02-003(d)

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at AOC 02-003(d).

6.5.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 1×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.009, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 1×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.004, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.5, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 10 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Construction Worker Scenario

The residential exposure scenario also demonstrates protection of construction workers for carcinogenic and radionuclide COPCs. The construction worker HI is approximately 1 (with manganese, see Appendix H, section H-4.5.2, Exposure Evaluation), which is equal to the NMED target HI of 1.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, residential, and construction worker scenarios at AOC 02-003(d).

6.5.6 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 screening levels to background concentrations, no potential ecological risks exist for AOC 02-003(d).

6.6 AOC 02-003(e), Soil Contamination

6.6.1 Site Description and Operational History

AOC 02-003(e) is the former location of an 800-L stainless-steel holding tank (structure 02-62) (Figure 6.6-1), installed in approximately 1944, which was associated with operation of the WBR. The holding tank was adjacent to the stack-gas valve house (structure 02-19) and was designed to collect WBR cooling water in the event of a cooling coil breach.

The WBR holding tank was installed in approximately 1944 and may have been used until 1974, when the WBR was placed in safe-shutdown mode. The holding tank was removed and disposed of during D&D activities in 1985. During D&D, the tank reportedly showed no sign of having been used. However, reports of a “surge tank” running over indicate an original tank may have been used and replaced during its active life (Elder and Knoell 1986, 006670, p. 2; DOE 1987, 008663).

6.6.2 Relationship to Other SWMUs and AOCs

The WBR holding tank was located adjacent to the stack-gas valve house, AOC 02-003(a), and the condensate trap and gaseous effluent vent line, AOC 02-003(b). The tank was connected to the WBR system in building 02-1, AOC 02-004(a) from 1944 to at least 1974.

6.6.3 Summary of Previous Investigations

6.6.3.1 1985 WBR Decommissioning Project, Phase I

The WBR holding tank (structure 02-62) was drained and removed in 1985. Soil under the tank was excavated until field-screening levels of radioactivity were below predetermined cleanup levels (Elder and Knoell 1986, 006670, p. 22). All excavated contaminated material was transported to TA-54 (Elder and Knoell 1986, 006670, p. 16).

6.6.3.2 2000 Post–Cerro Grande Fire Recovery Work

Seven samples were collected from one borehole (location 02-01240) in the approximate center of the tank area.

6.6.3.3 2007 Investigation Activities

Sixteen samples were collected from four locations at AOC 02-003(e) in 2007. Results from the sampling activities in 2007 were presented in the previous investigation report (LANL 2008, 101669.12). Additional sampling was required to define the extent of contamination at the site.

6.6.4 Site Contamination

6.6.4.1 Soil and Rock Sampling

As part of the 2010 investigation, the following characterization activities were conducted at AOC 02-003(e):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Five samples were collected from location 02-612389 at the former stack house (structure 02-19) from 5–6 ft, 18–19 ft, 25–27 ft, 35–36 ft, and 49–50 ft bgs. These samples were analyzed for TAL metals, PCBs, SVOCs, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium.

The 2010 and historical sampling locations at AOC 02-003(e) are shown in Figure 6.6-1. Table 6.6-1 presents the samples collected and analyses requested for AOC 02-003(e). The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

6.6.4.2 Soil and Rock Sample Field-Screening Results

No organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of the samples. Radiological-screening results exceeded twice the daily site background levels at location 02-612389. As a result, respirators were used while collecting samples at this location. Field-screening results are presented in Table 3.2-2. No changes were made to sampling depths because of the field-screening results.

6.6.4.3 Soil and Rock Sample Analytical Results

Decision-level data at AOC 02-003(e) consist of results from 28 samples collected from 6 locations in 2000, 2007, and 2010. The 28 samples include 10 soil, 10 Qal, 1 Qbt 3, and 7 Qbo samples.

Inorganic Chemicals

A total of 28 samples (10 soil, 10 Qal, 1 Qbt 3, and 7 Qbo) were analyzed for TAL metals, and 16 samples (4 soil, 8 Qal, and 4 Qbo) were analyzed for nitrate, perchlorate, and total cyanide. Table 6.6-2 presents the inorganic chemicals detected or detected above BVs. Figure 6.6-2 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 2,3,4 and Qbt 1g, Qct, Qbo BVs (7340 mg/kg and 3560 mg/kg) in one Qbt 3 sample and four Qbo samples with a maximum concentration of 13,300 mg/kg. Aluminum is retained as a COPC.

Antimony was detected above the soil BV (0.83 mg/kg) in one sample at a concentration of 2.3 mg/kg and was not detected but had DLs (0.513 mg/kg and 1.17 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs (0.5 mg/kg) in two soil samples and four tuff samples. The quantile and slippage tests indicated site concentrations of antimony in soil are not statistically different from background (Figure G-38 and Table G-7). The DLs are above the maximum Qbt 1g, Qct, Qbo background concentration (0.2 mg/kg). Antimony is retained as a COPC.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV (0.56 mg/kg) in two samples with a maximum concentration of 2.09 mg/kg and it was not detected but had DLs (1.26 mg/kg to 1.8 mg/kg) above BV in five Qbo samples. Arsenic is retained as a COPC.

Barium was detected above the Qbt 1g, Qct, Qbo BV (25.7 mg/kg) in two samples with a maximum concentration of 47.7 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 1.18 mg/kg and was not detected above the soil BV or Qbt 1g, Qct, Qbo BV (0.4 mg/kg) but had DLs (0.486 mg/kg to 0.65 mg/kg) above BVs in seven soil samples and seven tuff samples. Cadmium is retained as a COPC.

Calcium was detected above the soil BV (6120 mg/kg) in one sample at a concentration of 12,300 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in soil are not statistically different from background (Figure G-39 and Table G-7). Calcium is not a COPC.

Chromium was detected above the soil and Qbt 1g, Qct, Qbo BVs (19.3 mg/kg and 2.6 mg/kg) in one soil sample and two tuff samples with a maximum concentration of 72.9 mg/kg and was not detected but had DLs (7.45 mg/kg to 34.7 mg/kg) above BVs in one soil sample and two tuff samples. The Gehan and quantile tests indicated site concentrations of chromium in soil are not statistically different from background (Figure G-40 and Table G-7) but the maximum concentration in tuff (61.5 mg/kg) was substantially greater than the maximum Qbt 1g, Qct, Qbo background concentration (2.3 mg/kg). Chromium is retained as a COPC.

Copper was detected above the soil BV (14.7 mg/kg) in one sample at a concentration of 16 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in soil are not statistically different from background (Figure G-41 and Table G-7). Copper is not a COPC.

Iron was detected above the Qbt 1g, Qct, Qbo BV (3700 mg/kg) in seven tuff samples with a maximum concentration of 7890 mg/kg. Iron is retained as a COPC.

Lead was detected above the soil; Qbt 2,3,4; and Qbt 1g, Qct, Qbo BVs (22.3 mg/kg, 11.2 mg/kg, and 13.5 mg/kg) in four soil samples, one Qbt 3 sample, and one Qbo sample with a maximum concentration of 3400 mg/kg. The maximum concentration is substantially above the maximum soil background concentration (28 mg/kg). Lead is retained as a COPC.

Manganese was detected above the Qbt 1g, Qct, Qbo BV (189 mg/kg) in five samples with a maximum concentration of 348 mg/kg. The maximum concentration is greater than the maximum Qbt 1g, Qct, Qbo background concentration (210 mg/kg). Manganese is retained as a COPC.

Mercury was detected above the soil BV (0.1 mg/kg) in five samples with a maximum concentration of 2.58 mg/kg. Mercury is retained as a COPC.

Nickel was detected above the Qbt 1g, Qct, Qbo BV (2 mg/kg) in one sample at a concentration of 7.23 mg/kg and it was not detected but had DLs (2.11 mg/kg to 8.66 mg/kg) above the Qbt 1g, Qct, Qbo BV in three samples. Nickel is retained as a COPC.

Nitrate was detected in four samples with a maximum concentration of 2.13 mg/kg. Nitrate is naturally occurring, and the concentrations likely reflect naturally occurring levels. In addition, AOC 02-003(e) was used to manage reactor cooling water and is not a source of nitrate. Nitrate is not a COPC.

Perchlorate was detected in three samples with a maximum concentration of 0.0296 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs (1.52 mg/kg and 0.3 mg/kg) in two soil samples and two tuff samples with a maximum concentration of 2.63 mg/kg and was not detected but had DLs (0.32 mg/kg to 1.74 mg/kg) above the soil; Qbt 1g, Qct, Qbo; and Qbt 2,3,4 BV (0.3 mg/kg) in two soil samples, five Qbo samples, and one Qbt 3 sample. The Gehan and quantile tests indicated site concentrations of selenium in soil are not statistically different from background (Figure G-42 and Table G-7), but the maximum concentration in Qbo (2.02 mg/kg) is substantially above BV. Selenium is retained as a COPC.

Silver was detected above the soil BV (1 mg/kg) in one sample at a concentration of 1.06 mg/kg. The concentration was only 0.06 mg/kg above BV and silver was not detected or detected above BV in 27 other samples (detected below BV in 15 samples). Silver is not a COPC.

Uranium was detected above the soil BV (1.82 mg/kg) in one sample at a concentration of 1.97 mg/kg. This concentration is only 0.15 mg/kg above BV and is below the five highest concentrations in the soil background data set (2.0 mg/kg, 2.0 mg/kg, 2.1 mg/kg, 2.4 mg/kg, and 3.6 mg/kg). Uranium is not a COPC.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV (4.59 mg/kg) in four samples with a maximum concentration of 8.5 mg/kg. Vanadium is retained as a COPC.

Zinc was detected above the soil and Qbt 1g, Qct, Qbo BVs (48.8 mg/kg and 40 mg/kg) in four soil samples and one tuff sample with a maximum concentration of 543 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are statistically different from background (Table G-43 and Table G-7). Zinc is retained as a COPC.

Organic Chemicals

A total of 21 samples (4 soil, 10 Qal, and 7 Qbo) were analyzed for PCBs and SVOCs, and 12 samples (8 Qal and 4 Qbo) were analyzed for VOCs. Table 6.6-3 presents the detected organic chemicals. Figure 6.6-3 shows the spatial distribution of detected organic chemicals.

Polycyclic Aromatic Hydrocarbons

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

PAHs are known to be widely distributed in the environment from a number of sources, both natural, such as forest fires, and anthropogenic, such as combustion of fossil fuels, oil drips off motor vehicles, vehicle tires, coal tar pitch, and weathering or eroding of asphalt pavement (Kose et al. 2008, 219977; Teaf 2008, 219976). PAHs from these sources generally occur as complex mixtures, not as single compounds.

Individual PAH compounds can be manufactured for research purposes, and some PAHs (e.g., anthracene, fluorene, naphthalene, and pyrene) are used in dye production, the manufacture of synthetic fibers, and in plastics and pesticides.

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

Site Activities

AOC 02-003(e) was a reactor cooling water storage tank and was identified as an AOC because of possible radioactive soil contamination resulting from releases of radionuclides. The AOC 02-003(e) tank was located adjacent to asphalt paving. PAHs detected at this site were detected only in surface and shallow subsurface samples. PAHs were not associated with the nuclear reactor cooling water managed at this site. Therefore, the PAHs detected in samples used to characterize this site [benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; indeno(1,2,3-cd)pyrene; phenanthrene; and pyrene] are associated with the former paved area, are not related to historical Laboratory site operations, and are not COPCs.

Organic COPCs

Other organic chemicals detected at AOC 02-003(e) include Aroclor-1254, Aroclor-1260, bis(2-ethylhexyl)phthalate, and toluene. The detected organic chemicals listed are retained as COPCs.

Radionuclides

A total of 21 samples (4 soil, 10 Qal, and 7 Qbo) were analyzed for americium-241, and 28 samples (10 soil, 10 Qal, 1 Qbt 3, and 7 Qbo) were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium. Table 6.6-4 presents the radionuclides detected or detected above BVs/FVs. Figure 6.6-4 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Americium-241 was detected below 1 ft bgs in one Qal sample with an activity of 0.0376 pCi/g. Americium-241 is retained as a COPC.

Cesium-137 was detected below 1 ft bgs in 12 soil and Qal samples and was detected in 1 Qbo sample with a maximum activity of 450 pCi/g. Cesium-137 is retained as a COPC.

Plutonium-239/240 was detected below 1 ft bgs in eight soil and Qal samples with a maximum activity of 2.9 pCi/g. Plutonium-239/240 is retained as a COPC.

Strontium-90 was detected below 1 ft bgs in 10 soil and Qal samples with a maximum activity of 32.8 pCi/g. Strontium-90 is retained as a COPC.

Tritium was detected in 11 samples with a maximum activity of 0.0779 pCi/g. Tritium is retained as a COPC.

Uranium-234 was detected above the Qbt 2,3,4 BV (1.98 pCi/g) in 1 sample at an activity of 2.55 pCi/g. The activity was only 0.57 pCi/g above BV and uranium-234 was detected below BV in 27 other samples. Uranium-234 is not a COPC.

Uranium-235/236 was detected above the Qbt 1g, Qct, Qbo BV (0.18 pCi/g) in 1 sample at an activity of 0.194 pCi/g. The activity was only 0.014 pCi/g above BV and uranium-235/236 was not detected or detected above BV in 27 other samples (detected below BV in 22 samples). Uranium-235/236 is not a COPC.

Uranium-238 was detected above the Qbt 2,3,4 BV (1.93 pCi/g) in 1 sample at an activity of 2.48 pCi/g. The activity was only 0.55 pCi/g above BV and uranium-238 was detected below BV in 27 other samples. Uranium-238 is not a COPC.

6.6.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at AOC 02-003(e) are discussed below.

Inorganic Chemicals

Inorganic COPCs at AOC 02-003(e) include aluminum, antimony, arsenic, barium, cadmium, chromium, iron, lead, manganese, mercury, nickel, perchlorate, selenium, vanadium, and zinc.

Aluminum was detected above the Qbt 2,3,4 and Qbt 1g, Qct, Qbo BVs in one Qbt 3 sample and four Qbo samples with a maximum concentration of 13,300 mg/kg. Concentrations increased with depth at all locations and increased laterally to the southeast at location 02-600208. Lateral extent to the southeast is bounded by AOC 02-008(c)(i). The residential SSL is approximately 5.9 times the maximum concentration, and the industrial SSL is approximately 99 times the maximum concentration. Further sampling for extent of aluminum is not warranted.

Antimony was detected above the soil BV in one sample at a concentration of 2.3 mg/kg and was not detected but had DLs (0.513 mg/kg and 1.17 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs in two soil samples and four tuff samples. Concentrations decreased with depth at location 02-01240 and decreased laterally. The residential SSL is approximately 14 times the maximum concentration and 27 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV in two samples with a maximum concentration of 2.09 mg/kg and it was not detected but had DLs (1.26 mg/kg to 1.8 mg/kg) above BV in five Qbo samples. Concentrations did not change substantially with depth (0.23 mg/kg) at locations 02-600207 and 02-600208 (concentrations in shallower samples at locations 02-600207 and 02-600208 were 1.73 mg/kg and 2.9 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). Concentrations increased laterally to the southeast at location 02-600208. Lateral extent to the southeast is bounded by AOC 02-008(c)(i). The residential SSL is approximately 3.4 times the maximum concentration, and the industrial SSL is approximately 17 times the maximum concentration. The residential SSL is approximately 3.9 times the maximum DL, and the industrial SSL is approximately 20 times the maximum DL. Further sampling for extent of arsenic is not warranted.

Barium was detected above the Qbt 1g, Qct, Qbo BV in two samples with a maximum concentration of 47.7 mg/kg. Concentrations decreased with depth at locations 02-600207 and 02-600208 (concentrations in shallower samples at locations 02-600207 and 02-600208 were 51.9 mg/kg and 70 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). Concentrations increased laterally to the southeast at location 02-600208. Lateral extent to the southeast is bounded by AOC 02-008(c)(i). The residential SSL is approximately 327 times the maximum concentration. Vertical extent of barium is defined and further sampling for lateral extent is not warranted.

Cadmium was detected above the soil BV in one sample at a concentration of 1.18 mg/kg and was not detected above the soil BV or Qbt 1g, Qct, Qbo BV but had DLs (0.486 mg/kg to 0.65 mg/kg) above BVs in seven soil samples and seven tuff samples. Concentrations decreased with depth at location 02-600208 and increased laterally to the southeast at location 02-600208. Lateral extent to the southeast is bounded by AOC 02-008(c)(i). The residential SSL is approximately 60 times the maximum concentration and 108 times the maximum DL. Further sampling for extent of cadmium is not warranted.

Chromium was detected above the soil and Qbt 1g, Qct, Qbo BVs in one soil sample and two tuff samples with a maximum concentration of 72.9 mg/kg and was not detected but had DLs (7.45 mg/kg to 34.7 mg/kg) above BVs in one soil sample and two tuff samples. Concentrations increased with depth at location 02-600208 and decreased with depth at location 02-600209. Concentrations increased laterally to the north at location 02-600209. Lateral extent to the north is bounded by SWMU 02-009(c). As described in section 4.2, AOC 02-003(e) is not a potential source of hexavalent chromium and use of the SSL for trivalent chromium to determine whether additional sampling is warranted is appropriate. The residential SSL for trivalent chromium (117,000 mg/kg) is approximately 1600 times the maximum concentration and 3370 times the maximum DL. Further sampling for extent of chromium is not warranted.

Iron was detected above the Qbt 1g, Qct, Qbo BV in seven tuff samples with a maximum concentration of 7890 mg/kg. Concentrations did not change substantially with depth (390 mg/kg) at location 02-600207 and decreased with depth at locations 02-600206, 02-600208, 02-600209, and 02-612389 (concentrations in shallower samples at locations 02-600206, 02-600207, 02-600208, 02-600209, and 02-612389 were 8530 mg/kg, 7500 mg/kg, 8230 mg/kg, 8050 mg/kg, and 9830 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). Concentrations increased laterally to the south at location 02-600207. Lateral extent to the south is bounded by AOC 02-003(a). The residential SSL is approximately 7 times the maximum concentration, and the industrial SSL is approximately 115 times the maximum concentration. Further sampling for extent of iron is not warranted.

Lead was detected above the soil; Qbt 2,3,4; and Qbt 1g, Qct, Qbo BVs in four soil samples, one Qbt 3 sample, and one Qbo sample with a maximum concentration of 3400 mg/kg. Concentrations increased with depth at location 02-600209 and decreased with depth at all other locations and decreased laterally. The residential SSL is approximately 18 times the maximum concentration and the industrial SSL is approximately 36 times the maximum concentration where vertical extent is not defined (22.3 mg/kg at location 02-600209). Lateral extent of lead is defined and further sampling for vertical extent is not warranted.

Manganese was detected above the Qbt 1g, Qct, Qbo BV in five samples with a maximum concentration of 348 mg/kg. Concentrations did not change substantially with depth (37 mg/kg or less) at locations 02-600207, 02-600209, and 02-612389 and decreased with depth at location 02-600208 (concentrations in shallower samples at locations 02-600207, 02-600208, 02-600209, and 02-612389 were 311 mg/kg, 324 mg/kg, 339 mg/kg, and 266 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). Concentrations increased laterally to the south at location 02-600207. Lateral extent to the south is bounded by AOC 02-003(a). The residential SSL is approximately 30 times the maximum concentration. Further sampling for extent of manganese is not warranted.

Mercury was detected above the soil BV in five samples with a maximum concentration of 2.58 mg/kg. Concentrations decreased with depth at locations 02-600207 and 02-600208 and increased laterally to the south at location 02-600207. Lateral extent to the south is bounded by AOC 02-003(a). The residential SSL is approximately 9.1 times the maximum concentration, and the industrial SSL is approximately 150 times the maximum concentration. Vertical extent of mercury is defined and further sampling for lateral extent is not warranted.

Nickel was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 7.23 mg/kg and was not detected but had DLs (2.11 mg/kg to 8.66 mg/kg) above the Qbt 1g, Qct, Qbo BV in three samples. Concentrations increased with depth at location 02-600209 and increased laterally to the east at location 02-600209. Lateral extent to the east is bounded by SWMU 02-009(c). The residential SSL is approximately 216 times the maximum concentration and 180 times the maximum DL. Further sampling for extent of nickel is not warranted.

Perchlorate was detected in three samples with a maximum concentration of 0.0296 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. The lateral and vertical extent of perchlorate are defined.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs in two soil samples and two tuff samples with a maximum concentration of 2.63 mg/kg and was not detected but had DLs (0.32 mg/kg to 1.74 mg/kg) above the soil; Qbt 1g, Qct, Qbo; and Qbt 2,3,4 BV in two soil samples, five Qbo samples, and one Qbt 3 sample. Concentrations decreased with depth at location 02-600208 and did not change substantially with depth (0.333 mg/kg) at location 02-600209 and increased laterally to the south at location 02-600207. Lateral extent to the south is bounded by AOC 02-003(a). The residential SSL is approximately 149 times the maximum concentration and 225 times the maximum DL. Further sampling for extent of selenium is not warranted.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV in four samples with a maximum concentration of 8.5 mg/kg. Concentrations did not change substantially with depth (0.58 mg/kg) at location 02-600207 and decreased with depth at locations 02-600208 and 02-600209 (concentrations in shallower samples at locations 02-600207, 2-600208, and 02-600209 were 9.08 mg/kg, 11.6 mg/kg, and 8.17 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). Concentrations increased laterally to the south at location 02-600207. Lateral extent to the south is bounded by AOC 02-003(a). The residential SSL is approximately 46 times the maximum concentration. Further sampling for extent of vanadium is not warranted.

Zinc was detected above the soil and Qbt 1g, Qct, Qbo BVs in four soil samples and one tuff sample with a maximum concentration of 543 mg/kg. Concentrations decreased with depth at all locations and increased laterally to the southeast at location 02-600208. Lateral extent to the southeast is bounded by AOC 02-008(c)(i). The residential SSL is approximately 43 times the maximum concentration. Further sampling for extent of zinc is not warranted.

Organic Chemicals

Organic COPCs at AOC 02-003(e) include Aroclor-1254, Aroclor-1260, bis(2-ethylhexyl)phthalate, and toluene.

Aroclor-1254 was detected in five samples with a maximum concentration of 0.0974 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. The lateral and vertical extent of Aroclor-1254 are defined.

Aroclor-1260 was detected in nine samples with a maximum concentration of 0.611 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. The lateral and vertical extent of Aroclor-1260 are defined.

Bis(2-ethylhexyl)phthalate was detected in two samples with a maximum concentration of 0.11 mg/kg. Concentrations decreased with depth at all locations and increased laterally to the east at location 02-600209. Lateral extent to the east is bounded by SWMU 02-009(c). The residential SSL is approximately 3450 times the maximum concentration. Vertical extent of bis(2-ethylhexyl)phthalate is defined and further sampling for lateral extent is not warranted.

Toluene was detected in one sample at a concentration of 0.00043 mg/kg. Concentrations decreased with depth and decreased laterally. The concentration was below the EQL. The residential SSL is approximately 12,100,000 times the maximum concentration. The lateral and vertical extent of toluene are defined.

Radionuclides

Radionuclide COPCs at AOC 02-003(e) include americium-241, cesium-137, plutonium-239/240, strontium-90, and tritium.

Americium-241 was detected below 1 ft bgs in one Qal sample with an activity of 0.0376 pCi/g. Activities decreased with depth and increased laterally to the south at location 02-600207. Lateral extent to the south is bounded by AOC 02-003(a). The residential SAL is approximately 2210 times the maximum concentration. Vertical extent of americium-241 is defined and further sampling for lateral extent is not warranted.

Cesium-137 was detected below 1 ft bgs in 12 soil and Qal samples and was detected in 1 Qbo sample with a maximum activity of 450 pCi/g. Activities decreased with depth at all locations and decreased laterally. The lateral and vertical extent of cesium-137 are defined.

Plutonium-239/240 was detected below 1 ft bgs in eight soil and Qal samples with a maximum activity of 2.9 pCi/g. Activities decreased with depth at all locations and increased laterally to the south at location 02-600207. Lateral extent to the south is bounded by AOC 02-003(a). The residential SAL is approximately 27 times the maximum concentration. Vertical extent of plutonium-239/240 is defined and further sampling for lateral extent is not warranted.

Strontium-90 was detected below 1 ft bgs in 10 soil and Qal samples with a maximum activity of 32.8 pCi/g. Activities decreased with depth at all locations and increased laterally to the west at location 02-612389. Lateral extent to the west is bounded by AOC 02-003(a). The residential SAL is approximately 27 times the maximum concentration. Vertical extent of strontium-90 is defined and further sampling for lateral extent is not warranted.

Tritium was detected in 11 samples with a maximum activity of 0.0779 pCi/g. Activities did not change substantially with depth (0.0565 pCi/g) at location 02-01240, decreased with depth at all other locations, and decreased laterally. The residential SAL is approximately 21,800 times the maximum activity. The lateral extent of tritium is defined and further sampling for vertical extent is not warranted.

Summary of Nature and Extent at AOC 02-003(e)

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at AOC 02-003(e).

6.6.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 6×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.007, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.0000001 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 6×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.02, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.00000004 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 3×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 3, which is greater than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 400 mrem/yr, which is greater than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The residential exposure scenario also demonstrates protection of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks exist for the industrial, recreational, and construction worker scenarios at AOC 02-003(e) and no potential unacceptable doses exist for the industrial, recreational, and construction worker scenarios. A potential unacceptable dose and noncancer risk exists for the residential scenario.

6.6.6 Summary of Ecological Risk Screening

AOC 02-003(e) is within the TA-02 core area. Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and results of site-specific ecological risk studies, no potential ecological risks exist for the TA-02 core area.

6.7 AOC 02-004(a), Former Reactor Facility

6.7.1 Site Description and Operational History

AOC 02-004(a) is the OWR facility (building 02-1) and is composed of the OWR, the OWR fuel-handling area, the OWR cooling-liquid recirculating piping, the OWR gaseous effluent vent line, the OWR material storage area, and the WBR (Plate 6). To facilitate discussion, AOC 02-004(a) is divided into the following three areas.

OWR, Fuel-Handling Area, Cooling-Liquid Recirculating Piping, and Gaseous Effluent Vent Line

A 25-kilowatt fast-neutron research reactor, Clementine, was located in the western third of building 02-1. The reactor was self-contained and operated from 1946 to 1953 (LANL 1993, 015314, p. E-8). Clementine was the precursor to the OWR and was dismantled in 1954 (WD-3 2003, 082646, p. 2).

The OWR was built above the former Clementine site in the western third of building 02-1. The OWR was an 8-megawatt water-cooled tank-type research reactor fueled by enriched solid uranium. It was put online in 1956 and operated until it was put on standby status in 1993. The reactor remained inactive until it was decommissioned, removed, and disposed of in 2003 (WD-3 2003, 082646, p. 2).

The OWR fuel-handing area consisted of a fuel pit and a closed recirculating system that serviced only the fuel pit. It was located adjacent to the OWR and was used for temporary storage of fuel rods before they were recycled.

The OWR operated with a cooling-liquid recirculating system that consisted of a series of closed-loop pipes in a 100-ft-long corridor that extended from the OWR west to the reactor facility equipment building [building 02-44, AOC 02-004(f)]. The water was routed through pumps, filters, and chillers in the reactor facility equipment building and back to the reactor. The cooling tower (structure 02-49) was added in 1959 to supplement the building 02-44 chillers in this closed system. The recirculating system was active from 1956 to 1993, when it was put on standby status during the OWR shutdown.

Off-gas from the OWR was routed through the gaseous effluent vent line to a connection into Line 119 on the east side of TA-02, where the effluent continued up to the mesa-top stack [structure 02-9, SWMU 02-006(a)]. The gaseous effluent vent line teed off from the piping corridor between the OWR and OWR equipment building (02-44), as shown on engineering drawing C-10473 (LASL 1957, 090082).

OWR Material Storage Area

Operation of the OWR included the temporary storage of material (isotope columns, through-put port metal sleeves, etc.) that became activated during contact in the reactor neutron flux field. The material was stored in a structure adjacent to the guard quarters (building 02-4), located south of the reactor, to await final disposition. The material storage structure was present in as-built engineering drawing R-391 in 1958 (LASL 1958, 090085) and was removed in 2000 (LANL 2000, 090087).

WBR

The WBR was the name used for a series of three small research reactors, low power (LOPO), high power (HYPO), and super power (SUPO), located in the eastern third of the OWR building (02-1). The reactors were each progressively stronger in power output, each consisted generally of a 1-ft-diameter sphere filled with liquid fuel, and each was surrounded with neutron-reflecting blocks sitting on a graphite base. The LOPO reactor became functional in May 1944 (Montoya 1991, 006997, p. 5). The LOPO was dismantled, removed, and disposed of in September 1944. The HYPO reactor became operational in December 1944 and was later upgraded to SUPO, which became operational in 1951. The SUPO was decommissioned, removed, and disposed of in 1990 (Montoya 1991, 006997, p. 2).

The reactors were surrounded by a 15-ft × 15-ft × 11-ft concrete biological shield. A shallow sand pit and a utility trench were present beneath the reactor sphere and were used to collect liquids and gases from the reactor and transport them to support structures on the east side of building 02-1. External structures and underground piping associated with the gaseous effluent vent line system were removed and disposed of in 1986 (Elder and Knoell 1986, 006670, p. 43). Six concrete structures were dismantled, and 435 ft of contaminated underground piping was removed and disposed of. Cesium-137 contamination was found in the OWR building (02-1) near the sand pit and the utility trench during D&D activities. The soil was removed and disposed of during D&D activities (Montoya 1991, 006996, p. 5).

At peak operation, the WBR generated approximately 0.25 L/min of excess gas containing some fission products. These gases were managed through the WBR gaseous effluent vent line system (LANL 1993, 015314, p. E-8). Some radionuclides may have been deposited on the ground surface as gaseous effluent drifted from this system, and condensate from the gaseous effluent may have leaked from portions of the vent line system. These releases are addressed as AOCs 02-003(a,b,c,d).

The OWR experienced a cooling system water leak in January 1993. As a result, the reactor was put on standby status in 1993 and remained inactive until it was decommissioned in 2003 (WD-3 2003, 082646, p. 2).

6.7.2 Relationship to Other SWMUs and AOCs

All the SWMUs and AOCs at TA-02 are related to AOC 02-004(a) because the OWR was the primary operational facility, with all additional structures providing support to the OWR. Most of the other SWMUs and AOCs are in peripheral locations or are immediately adjacent to the former OWR building (02-1) footprint. Thus, the OWR and associated activities were the primary source for potential contamination at all of the TA-02 SWMUs and AOCs.

6.7.3 Summary of Previous Investigations

6.7.3.1 OWR, Fuel-Handling Area, Cooling-Liquid Recirculating Piping, and Gaseous Effluent Vent Line

2003 Omega West Decommissioning Project

Structures associated with the former OWR area were removed and disposed of in 2003. Associated activities included soil excavation, radiological walkover surveys, radiological (structure) screening, soil sampling, and surveying of sample coordinates. Radiological walkover surveys and radiological (structure) screening were conducted to segregate waste, primarily equipment and construction materials. Limited soil surveys were conducted, but no formal report of soil survey results was prepared.

Low-level radioactive waste (LLW) (construction debris and/or soil) was packaged and shipped to Envirocare of Utah, Inc. (Envirocare), or TA-54 for disposal. Mixed waste was packaged and transferred to TA-54 for further processing and/or storage at the Laboratory. Radioactively contaminated lead from the OWR bioshield was shipped to Envirocare for disposal. Hazardous waste was packaged and disposed of at a licensed facility or stored at the Laboratory pending final disposition. All asbestos-containing materials were shipped to the Painted Desert licensed facility. Clean concrete was transported to an off-site facility, crushed, and returned to the site for use as backfill. In total, 360 yd^3 of material was shipped to Envirocare for disposal. Material from the OWR and fuel-handling area, OWR cooling-liquid recirculating piping, and the OWR gaseous effluent vent line was included in this total volume (WD-3 2003, 082646, pp. 1–6).

As part of the Omega West decommissioning project, eight samples were collected from four boreholes (locations 02-22359 and 02-22369 to 02-22371) located within the footprint of the OWR. No samples specific to the OWR cooling-liquid recirculating piping or the gaseous effluent vent line were collected in 2003.

6.7.3.2 OWR Material Storage Area

2000 Post–Cerro Grande Fire Recovery Work

All building and structural components, piping, and aboveground earthen barricades were removed and disposed of during the fire recovery activities in 2000. The material storage area D&D included removing the structure and foundation and returning the building footprint to a natural grade. All material removed was screened and disposed of at TA-54. Approximately 154 yd^3 of material was removed during the 2000 D&D activity and disposed of at TA-54. Specific volumes associated with the OWR material storage structure are not available (LANL 2000, 090087). No soil samples were collected from the OWR material storage area during the 2000 activities.

6.7.3.3 WBR

1990 WBR Decommissioning, Phase II

The WBR was decommissioned in April 1990. Phase II D&D of the WBR consisted of removing and disposing of the reactor and associated equipment within the reactor building (02-1), room 122. The 1990 D&D activities consisted of removing and disposing of the WBR vessel, gas recombination system, and graphite-lined concrete biological shield. Removable contamination on building surfaces (walls, floors, etc.) was surveyed and cleaned up where possible or encased in place. Cesium-137 and strontium-90 were the primary radionuclides. Soil beneath the biological shield portion of room 122 (the area beneath the WBR) contained cesium-137 and strontium-90 above established site-specific remediation levels, and 2.6 yd^3 of soil was removed from the sand pit and utility trench area beneath the WBR. The soil was stored in a secured area (Laboratory property), pending permanent disposal (Montoya 1991, 006996, pp. 3-6), and later disposed of at TA-54.

Following removal of the flooring below the former WBR, soil-screening samples were collected to measure residual beta/gamma activity. The exposed soil area was approximately 150 ft^2, and screening samples were collected at this location. The highest screened activities were along the utility trench leading to the stack-gas valve house and condensate trap area (Montoya 1991, 006996, pp. 5–6, 29). A limited number of soil samples were collected from the excavated soil and analyzed for Resource Conservation and Recovery Act (RCRA) hazardous constituents. Supporting QA/QC information is not available for these samples, so the sample results are not included in this report. The D&D report indicated that no RCRA hazardous constituents were present in these samples (Montoya 1991, 006996, pp. 10, 29).

2003 Omega West Decommissioning Project

Structures associated with the former OWR area were decommissioned, and the waste was transported to an appropriate disposal facility during the 2003 D&D activities. Limited soil surveys were conducted; however, no formal report of soil survey results is available (WD-3 2003, 082646, pp. 1–6).

No samples were collected within the former WBR footprint in building 02-1. Soil samples potentially associated with the liquid and gaseous effluent lines from the WBR are presented in the discussions of AOCs 02-003(a,b,c,d,e) (sections 6.2 through 6.6) and 02-010 (section 6.28) and SWMUs 02-006(a) (section 6.15) and 02-009(c) (section 6.25).

6.7.3.4 2007 Investigation Activities

A total of 114 samples were collected from 34 locations at AOC 02-004(a) in 2007. Results from the sampling activities in 2007 were presented in the previous investigation report (LANL 2008, 101669.12). Additional sampling was required to define the extent of contamination at the site.

6.7.4 Site Contamination

6.7.4.1 Soil and Rock Sampling

As part of the 2010 investigation, the following characterization activities were conducted at AOC 02-004(a):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.

- Location 02-600580 was excavated to remove PAH contamination in accordance with the approved work plan (LANL 2009, 105073; NMED 2009, 105595). The surface soil at this location was excavated to approximately 3 ft bgs. The remediated area was approximately 64 ft^2 (Figure 6.7-1). The total volume of excavated material was approximately 7 yd^3.
- Confirmation samples were collected below the excavation (3–3.2 ft and 5–5.2 ft bgs), and from four step-out locations: 4 ft to the north (3–3.2 ft and 5–5.2 ft bgs from location 02-612352), 4 ft to the south (3–3.4 ft and 5–5.2 ft bgs from location 02-612353), 4 ft to the east (3–3.2 ft and 5–5.2 ft bgs from location 02-612351), and 4 ft to the west (3–3.2 ft and 5–5.2 ft bgs from location 02-612350). Confirmation samples were analyzed for SVOCs only.
- Five samples were collected from location 02-612346 at the waste line associated with AOC 02-004(a) from 8–9 ft, 15–16 ft, 25–26 ft, 35–36 ft, and 49–50 ft bgs. These samples were analyzed for TAL metals, hexavalent chromium, PCBs, SVOCs, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium.
- Twenty samples were collected from four locations (02-612325 to 02-612328) within the west, middle, northeast, and southeast portions of the footprint of AOC 02-004(a) (depths ranging from 5–50 ft bgs). These samples were analyzed for TAL metals, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium.

The 2010 and historical sampling locations at AOC 02-004(a) are shown on Plate 6. Table 6.7-1 presents the samples collected and analyses requested for AOC 02-004(a). The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

6.7.4.2 Soil and Rock Sample Field-Screening Results

No organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of the samples. No radiological-screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. No changes to sampling or other activities occurred because of the field-screening results.

6.7.4.3 Soil and Rock Sample Analytical Results

Decision-level data at AOC 02-004(a) consist of results from 157 samples (63 soil and 94 tuff) collected from 47 locations in 2003, 2007, and 2010. The 157 samples include 63 soil, 41 Qal, and 53 Qbo samples.

Inorganic Chemicals

A total of 124 samples (46 soil, 33 Qal, and 45 Qbo) were analyzed for TAL metals, 13 samples (8 soil, 2 Qal, and 3 Qbo) were analyzed for hexavalent chromium, 90 samples (34 soil, 26 Qal, and 30 Qbo) were analyzed for nitrate, and 91 samples (35 soil, 26 Qal, and 30 Qbo) were analyzed for perchlorate and total cyanide. Table 6.7-2 presents the inorganic chemicals detected or detected above BVs. Plate 7 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV (3560 mg/kg) in 27 samples with a maximum concentration of 15,800 mg/kg. The Gehan and quantile tests indicated site concentrations of aluminum in tuff are statistically different from background (Figure G-44 and Table G-8). Aluminum is retained as a COPC.

Antimony was not detected above the soil and Qbt 1g, Qct, Qbo BVs (0.83 mg/kg and 0.5 mg/kg) but had DLs (0.512 mg/kg to 1.31 mg/kg) above BV in 10 soil samples and 18 tuff samples. There were too few detections to perform statistical tests. Antimony is retained as a COPC.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV (0.56 mg/kg) in 19 samples with a maximum concentration of 3.18 mg/kg and was not detected but had DLs (0.686 mg/kg to 2.79 mg/kg) above the Qbt 1g, Qct, Qbo BV in 24 samples. The quantile and slippage tests indicated site concentrations of arsenic in tuff are statistically different from background (Figure G-45 and Table G-8). Arsenic is retained as a COPC.

Barium was detected above the Qbt 1g, Qct, Qbo BV (25.7 mg/kg) in 17 samples with a maximum concentration of 102 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in tuff are statistically different from background (Figure G-46 and Table G-8). Barium is retained as a COPC.

Beryllium was detected above the Qbt 1g, Qct, Qbo BV (1.44 mg/kg) in one sample at a concentration of 1.48 mg/kg. The Gehan test indicated site concentrations of beryllium in tuff are statistically different from background (Table G-8). However, the quantile and slippage tests indicated site concentrations of beryllium in tuff are not statistically different from background Figure G-47 and Table G-8). Beryllium is not a COPC.

Cadmium was detected above the soil and Qbt 1g, Qct, Qbo BVs (0.4 mg/kg for each) in 3 soil samples and 1 tuff sample with a maximum concentration of 14.8 mg/kg and was not detected but had DLs (0.498 mg/kg to 0.712 mg/kg) above BV in 64 soil samples and 43 tuff samples. The maximum concentration is substantially above the maximum concentration in the soil background data set (2.6 mg/kg). Cadmium is retained as a COPC.

Calcium was detected above the soil and Qbt 1g, Qct, Qbo BVs (6120 mg/kg and 1900 mg/kg) in six soil samples and one tuff sample with a maximum concentration of 17,600 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in soil and tuff are not statistically different from background (Figure G-48 and Table G-9, and Figure G-49 and Table G-8, respectively). Calcium is not a COPC.

Chromium was detected above the soil and Qbt 1g, Qct, Qbo BVs (19.3 mg/kg and 2.6 mg/kg) in 6 soil samples and 28 tuff samples with a maximum concentration of 49.3 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in soil are not statistically different from background (Figure G-50 and Table G-9) but site concentrations of chromium in tuff are statistically different from background (Figure G-51 and Table G-8). Chromium is retained as a COPC.

Cobalt was detected above the soil BV (8.64 mg/kg) in one sample at a concentration of 18 mg/kg. The Gehan and quantile tests indicated site concentrations of cobalt in soil are not statistically different from background (Figure G-52 and Table G-9). Cobalt is not a COPC.

Copper was detected above the soil and Qbt 1g, Qct, Qbo BVs (14.7 mg/kg and 3.96 mg/kg) in 2 soil samples and 11 tuff samples with a maximum concentration of 43.4 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in soil are not statistically different from background (Figure G-53 and Table G-9). The quantile and slippage tests indicated site concentrations of copper in tuff are statistically different from background (Figure G-54 and Table G-8). Copper is retained as a COPC.

Cyanide was detected above the soil BV (0.5 mg/kg) in five samples with a maximum concentration of 2.59 mg/kg. Cyanide is retained as a COPC.

Hexavalent chromium was detected in eight samples with a maximum concentration of 0.448 mg/kg. Hexavalent chromium is retained as a COPC.

Iron was detected above the Qbt 1g, Qct, Qbo BV (3700 mg/kg) in 45 samples with a maximum concentration of 11,500 mg/kg. The Gehan and quantile tests indicated site concentrations of iron in tuff are statistically different from background (Figure G-55 and Table G-8). Iron is retained as a COPC.

Lead was detected above the soil and Qbt 1g, Qct, Qbo BVs (22.3 mg/kg and 13.5 mg/kg) in two soil samples and two tuff samples with a maximum concentration of 43.7 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil and tuff are not statistically different from background (Figure G-56 and Table G-9, and Figure G-57 and Table G-8, respectively). Lead is not a COPC.

Magnesium was detected above the Qbo BV (739 mg/kg) in two samples with a maximum concentration of 3710 mg/kg. The Gehan and quantile tests indicated site concentrations of magnesium in tuff are not statistically different from background (Figure G-58 and Table G-8). Magnesium is not a COPC.

Manganese was detected above the soil and Qbt 1g, Qct, Qbo BVs (671 mg/kg and 189 mg/kg) in 1 soil sample and 37 tuff samples with a maximum concentration of 1860 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in soil and not statistically different from background (Figure G-59 and Table G-9) but site concentrations of manganese in tuff are statistically different from background (Figure G-60 and Table G-8). Manganese is retained as a COPC.

Mercury was detected above the soil and Qbt 1g, Qct, Qbo BVs (0.1 mg/kg for both) in 56 soil samples and 10 tuff samples with a maximum concentration of 40.6 mg/kg. Mercury is retained as a COPC.

Nickel was detected above the Qbt 1g, Qct, Qbo BV (2 mg/kg) in 20 samples with a maximum concentration of 6.33 mg/kg. There were too few detections in the tuff background data set to perform statistical tests. Nickel is retained as a COPC.

Nitrate was detected in 36 samples with a maximum concentration of 14.5 mg/kg. Nitrate is naturally occurring, and the concentrations likely reflect naturally occurring levels. In addition, AOC 02-004(a) is a former nuclear reactor facility and is not a source of nitrate. Nitrate is not a COPC.

Perchlorate was detected in 11 soil/Qal samples with a maximum concentration of 0.00254 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs (1.52 mg/kg and 0.3 mg/kg) in 21 soil samples and 17 tuff samples with a maximum concentration of 11.4 mg/kg and was not detected but had DLs (1.09 mg/kg to 2.14 mg/kg) above BV in 13 soil samples and 28 tuff samples. The Gehan and quantile tests indicated site concentrations of selenium in soil are statistically different from background (Figure G-61 and Table G-9). Selenium is retained as a COPC.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV (4.59 mg/kg) in 16 samples with a maximum concentration of 14.2 mg/kg. The Gehan and quantile tests indicated site concentrations of vanadium in tuff are statistically different from background (Figure G-62 and Table G-8). Vanadium is retained as a COPC.

Zinc was detected above the soil and Qbt 1g, Qct, Qbo BVs (48.8 mg/kg and 40 mg/kg) in 15 soil samples and 3 tuff samples with a maximum concentration of 90.5 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are statistically different from background (Figure G-63 and Table G-9). The Gehan test indicated site concentrations of zinc in tuff are statistically different from background (Table G-8). However, the quantile and slippage tests indicated site concentrations of zinc in tuff are not statistically different from background (Figure G-64 and Table G-8). Zinc is retained as a COPC.

Organic Chemicals

A total of 32 samples (10 soil, 15 Qal, and 7 Qbo) were analyzed for dioxins and furans, 85 samples (30 soil, 26 Qal, and 29 Qbo) were analyzed for PCBs, 108 samples (45 soil, 32 Qal, and 31 Qbo) were analyzed for SVOCs, 46 samples (18 soil, 15 Qal, and 13 Qbo) were analyzed for TPH-DRO, and 60 samples (3 soil, 30 Qal, and 27 Qbo) were analyzed for VOCs. Table 6.7-3 presents the detected organic chemicals. Plates 8 and 9 show the spatial distribution of detected organic chemicals.

Dioxins and Furans

Dioxins and furans are frequently detected as a result of environmental sampling but generally are not associated with industrial activities conducted at the Laboratory or released from SWMUs or AOCs being investigated at the Laboratory. The investigation work plan for Middle Los Alamos Canyon Aggregate Area (LANL 2006, 092571.12) notes the potential for presence of dioxins and furans in the OWR fuel pit recirculation pump system, and a small percentage of the investigation samples collected around the OWR were analyzed for dioxins and furans to determine whether a release may have occurred. If the results were indicative of a release, additional sampling for dioxins and furans would be proposed. Based on the results of the 2007 sampling, additional sampling for dioxins and furans was not proposed for the Phase II investigation and was not performed.

Dioxins and furans are known to be widely distributed in the environment from a number of sources, both natural, such as forest fires, and anthropogenic, such as industrial sources and burning of municipal trash and other waste materials. Industrial sources of dioxins and furans are primarily associated with impurities in the production of chlorinated chemical products (e.g., pentachlorophenol, chlorinated herbicides) and the wastes associated with production of those materials. Another industrial source is the pulp and paper industry and processes that bleach wood pulp (EPA 2006, 600913). None of these common industrial process-related source activities have occurred at the Laboratory. Other anthropogenic sources of dioxins and furans include the combustion of materials containing chlorine, such as the incineration of municipal trash containing chlorinated plastics, and other waste materials (EPA 2006, 600913). Forest fires have occurred in the Los Alamos area, including upgradient of TA-02 in the Los Alamos Canyon watershed, and are a potential source of dioxins and furans.

Polycyclic Aromatic Hydrocarbons

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

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

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

Site Activities

AOC 02-004(a) consists of the former OWR facility building and was identified as an AOC because of the potential for releases of radioactive materials. As noted above, the potential for dioxins and furans to have been associated with the OWR fuel pit was noted and some samples collected in 2007 around the former OWR facility were analyzed for dioxins and furans, but the results of the 2007 sampling were not indicative of a release and no additional sampling was required or performed. There are no known site-related sources of PAHs, although PAHs may have been present in building materials (e.g., asphalt).

The dioxin and furan congeners detected at AOC 02-004(a) were detected at concentrations ranging from 0.0000000332 mg/kg to 0.0022 mg/kg, with hepta- and hexa-chlorinated congeners being the most frequently detected. These results likely reflect natural and/or anthropogenic background rather than a site-related release. The dioxin and furan congeners detected in samples used to characterize this site [1,2,3,4,6,7,8-heptachlorodibenzodioxin; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,6,7,8,9-hexachlorodibenzofuran; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; and 2,3,7,8-tetrachlorodibenzofuran] are not related to historical Laboratory site operations and are not COPCs.

AOC 02-004(a) is located in the central portion of the TA-02 site and the OWR facility was surrounded by asphalt paving. Samples were collected in areas formerly paved with asphalt or adjacent to formerly paved areas. PAH concentrations ranged from 0.00012 mg/kg to 2.78 mg/kg. Over 50% of the PAH detections were in surface samples. Approximately 80% of the results were less than 0.1 mg/kg and only 8 of 475 detected concentrations were greater than 1 mg/kg (all in 2 samples). Samples collected during the 2007 sampling at AOC 02-004(a) were analyzed for TPH-DRO, but the highest concentrations of TPH-DRO are not correlated to the highest PAH concentrations and TPH-DRO does not appear to be the source of PAH contamination. The PAHs detected in samples used to characterize these sites [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, 2-methylnaphthalene, naphthalene, phenanthrene; and pyrene] appear to be associated with asphalt paving, are not related to historical Laboratory site operations, and are not COPCs.

Other organic chemicals detected at AOC 02-004(a) include acetone; Aroclor-1242; Aroclor-1248; Aroclor-1254; Aroclor-1260; chloroform; chrysene; dibenzofuran; 4-isopropyltoluene; methylene chloride; toluene; TPH-DRO; 1,2-xylene; and 1,3-xylene+1,4-xylene. The detected organic chemicals listed are retained as COPCs.

Radionuclides

A total of 90 samples (35 soil, 25 Qal, and 30 Qbo) were analyzed for americium-241; 123 samples (46 soil, 32 Qal, and 45 Qbo) were analyzed for gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium; 98 samples (43 soil, 25 Qal, and 30 Qbo) were analyzed for strontium-90; 8 soil samples were analyzed for technetium-99; and 121 samples (44 soil, 32 Qal, and 45 Qbo) were analyzed for tritium. Table 6.7-4 presents the radionuclides detected or detected above BVs/FVs. Plate 10 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Amercium-241 was detected below 1 ft bgs in one soil sample at an activity of 0.0532 pCi/g. Amercium-241 is retained as a COPC.

Cesium-137 was detected above the soil FV (1.65 pCi/g) in two samples, detected below 1 ft bgs in eight soil and Qal samples, and detected in two Qbo samples with a maximum activity of 4.76 pCi/g. Cesium-137 is retained as a COPC.

Cobalt-60 was detected in eight samples with a maximum activity of 4.29 pCi/g. Cobalt-60 is retained as a COPC.

Plutonium-239/240 was detected above the soil FV (0.054 pCi/g) in 4 samples and detected below 1 ft bgs in 10 soil and Qal samples with a maximum activity of 2.44 pCi/g. Plutonium-239/240 is retained as a COPC.

Strontium-90 was detected above the soil FV (1.31 pCi/g) in one sample at an activity of 1.61 pCi/g. The activity is greater than the maximum soil fallout activity (1.1 pCi/g). Strontium-90 is retained as a COPC.

Tritium was detected in 64 samples with a maximum activity of 20 pCi/g. Tritium is retained as a COPC.

Uranium-235/236 was detected above the Qbt 1g, Qct, Qbo BV (0.18 pCi/g) in 4 samples with a maximum activity of 0.286 pCi/g. The maximum activity was only 0.106 pCi/g above the BV and uranium-235/236 was not detected or detected above BV in 119 other samples (detected below BV in 91 samples). The samples where uranium-235/236 was detected above BV were the deepest samples collected at each location and the results appear indicative of variations in natural background rather than a release. Uranium-235/236 is not a COPC.

6.7.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at AOC 02-004(a) are discussed below.

Inorganic Chemicals

Inorganic COPCs at AOC 02-004(a) include aluminum, antimony, arsenic, barium, cadmium, chromium, copper, cyanide, hexavalent chromium, iron, manganese, mercury, nickel, perchlorate, selenium, vanadium, and zinc.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV in 27 samples with a maximum concentration of 15,800 mg/kg. The detections above BV were generally in the deepest samples collected at each location and aluminum was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations increased laterally to the west. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 4.9 times the maximum concentration, and the industrial SSL is approximately 82 times the maximum concentration. Further sampling for extent of aluminum is not warranted.

Antimony was not detected above the soil and Qbt 1g, Qct, Qbo BVs but had DLs (0.512 mg/kg to 1.31 mg/kg) above BV in 10 soil samples and 18 tuff samples. The residential SSL is approximately 24 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV in 19 samples with a maximum concentration of 3.18 mg/kg and was not detected but had DLs (0.686 mg/kg to 2.79 mg/kg) above the Qbt 1g, Qct, Qbo BV in 24 samples. The detections above BV were generally in the deepest samples collected at each location and arsenic was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations did not change substantially laterally (2.27 mg/kg). All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 2.2 times the maximum concentration, and the industrial SSL is approximately 11 times the maximum concentration. The residential SSL is approximately 2.5 times the maximum DL, and the industrial SSL is approximately 13 times the maximum DL. Further sampling for extent of arsenic is not warranted.

Barium was detected above the Qbt 1g, Qct, Qbo BV in 17 samples with a maximum concentration of 102 mg/kg. The detections above BV were generally in the deepest samples collected at each location and barium was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations increased laterally to the west. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 153 times the maximum concentration. Further sampling for extent of barium is not warranted.

Cadmium was detected above the soil and Qbt 1g, Qct, Qbo BVs in 3 soil samples and 1 tuff sample with a maximum concentration of 14.8 mg/kg and was not detected but had DLs (0.498 mg/kg to 0.712 mg/kg) above BV in 64 soil samples and 43 tuff samples. Concentrations increased with depth at location 02-600379 and decreased with depth at locations 02-600378, 02-600381, and 02-612325. Concentrations increased laterally to the east at location 02-600381. Lateral extent to the east is bounded by AOC 02-009(d). The residential SSL is approximately 4.8 times the maximum concentration, and the industrial SSL is approximately 75 times the maximum concentration. The residential SSL is approximately 99 times the maximum DL, and the industrial SSL is approximately 1560 times the maximum DL. Further sampling for extent of cadmium is not warranted.

Chromium was detected above the soil and Qbt 1g, Qct, Qbo BVs in 6 soil samples and 28 tuff samples with a maximum concentration of 49.3 mg/kg. Only one depth was sampled at locations 02-600463 and 02-600464 and concentrations decreased with depth at locations 02-600415, 02-600416, 02-600458, and 02-600462. At all other locations, chromium was detected above BV only in deep (at or below 10 ft bgs) Qbo samples and not in overlying soil samples. Many of the concentrations in soil samples at these locations were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations decreased laterally. The residential SSL is approximately 2 times the maximum concentration, and the industrial SSL is approximately 10 times the maximum concentration. Further sampling for extent of chromium is not warranted.

Copper was detected above the soil and Qbt 1g, Qct, Qbo BVs in 2 soil samples and 11 tuff samples with a maximum concentration of 43.4 mg/kg. Concentrations decreased with depth at locations 02-600465 and 02-600584. At all other locations, copper was detected above BV only in deep (at or below 10 ft bgs) Qbo samples and not in overlying soil samples. Many of the concentrations in soil samples at these locations were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations decreased laterally. The residential SSL is approximately 72 times the maximum concentration. Further sampling for extent of copper is not warranted.

Cyanide was detected above the soil BV in five samples with a maximum concentration of 2.59 mg/kg. Only one depth was sampled at location 02-600582 and concentrations decreased with depth at locations 02-600378, 02-600417, 02-600456, and 02-600459. Concentrations decreased laterally. The residential SSL is approximately 4.3 times the maximum concentration, and the industrial SSL is approximately 24 times the maximum concentration. Further sampling for extent of cyanide is not warranted.

Hexavalent chromium was detected in eight samples with a maximum concentration of 0.448 mg/kg. Concentrations did not change substantially with depth (0.046 mg/kg) at locations 02-22359, 02-22369, and 02-22370 and did not change substantially laterally (0.0659 mg/kg). The residential SSL is approximately 6.8 times the maximum concentration, and the industrial SSL is approximately 161 times the maximum concentration. Further sampling for extent of hexavalent chromium is not warranted.

Iron was detected above the Qbt 1g, Qct, Qbo BV in 45 samples with a maximum concentration of 11,500 mg/kg. The detections above BV were generally in the deepest samples collected at each location and iron was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations decreased laterally. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 4.8 times the maximum concentration, and the industrial SSL is approximately 79 times the maximum concentration. Further sampling for extent of iron is not warranted.

Lead was detected above the soil and Qbt 1g, Qct, Qbo BVs in two soil samples and two tuff samples with a maximum concentration of 43.7 mg/kg. Concentrations decreased with depth at locations 02-600380 and 02-600584. At the other locations, lead was detected above BV only in deep (at or below 10 ft bgs) Qbo samples and not in overlying soil samples. Concentrations decreased laterally. The residential SSL is approximately 9.2 times the maximum concentration, and the industrial SSL is approximately 18 times the maximum concentration. Further sampling for extent of lead is not warranted.

Manganese was detected above the soil and Qbt 1g, Qct, Qbo BVs in 1 soil sample and 37 tuff samples with a maximum concentration of 1860 mg/kg. Concentrations decreased with depth at location 02-612326. At all other locations, manganese was detected above BV only in deep (at or below 10 ft bgs) Qbo samples and not in overlying soil samples. Many of the concentrations in soil samples at these locations were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations decreased laterally. The residential SSL is approximately 5.6 times the maximum concentration, and the industrial SSL is approximately 86 times the maximum concentration. Further sampling for extent of manganese is not warranted.

Mercury was detected above the soil and Qbt 1g, Qct, Qbo BVs in 56 soil samples and 10 tuff samples with a maximum concentration of 40.6 mg/kg. Concentrations increased with depth at location 02-600580; concentrations did not change substantially with depth (0.072 mg/kg or less) at locations 02-22369, 02-22370, and 02-600380; only one depth was sampled at locations 02-600463, 02-600464, 02-600582, and 02-600583; and concentrations decreased with depth at all other locations. Concentrations decreased laterally. The residential SSL is approximately 6.6 times and the industrial SSL is approximately 108 times the maximum concentration where vertical extent is not defined (3.58 mg/kg at location 02-22370). Lateral extent of mercury is defined and further sampling for vertical extent is not warranted.

Nickel was detected above the Qbt 1g, Qct, Qbo BV in 20 samples with a maximum concentration of 6.33 mg/kg. The detections above BV were generally in the deepest samples collected at each location and nickel was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations decreased laterally. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 246 times the maximum concentration. Further sampling for extent of nickel is not warranted.

Perchlorate was detected in 11 soil/Qal samples with a maximum concentration of 0.00254 mg/kg. Concentrations did not change substantially with depth (0.000299 mg/kg) at location 02-600381 and decreased with depth at all other locations and did not change substantially laterally (0.00202 mg/kg). The residential SSL is approximately 21,600,000 times the maximum concentration. Further sampling for extent of perchlorate is not warranted.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs in 21 soil samples and 17 tuff samples with a maximum concentration of 11.4 mg/kg and was not detected but had DLs (1.09 mg/kg to 2.14 mg/kg) above BV in 13 soil samples and 28 tuff samples. Concentrations increased with depth at locations 02-600409, 02-600411, 02-600417, and 02-600460; concentrations did not change substantially with depth (0.75 mg/kg or less) at locations 02-600458, 02-600459, and 02-600581; only one depth was sampled at locations 02-600464 and 02-600465; and concentrations decreased with depth at all other locations. Concentrations decreased laterally. The residential SSL is approximately 34 times the maximum concentration and 183 times the maximum DL. Further sampling for extent of selenium is not warranted.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV in 16 samples with a maximum concentration of 14.2 mg/kg. The detections above BV were generally in the deepest samples collected at each location and vanadium was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations decreased laterally. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 28 times the maximum concentration. Further sampling for extent of vanadium is not warranted.

Zinc was detected above the soil and Qbt 1g, Qct, Qbo BVs in 15 soil samples and 3 tuff samples with a maximum concentration of 90.5 mg/kg. Concentrations increased with depth at location 02-600412, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 260 times the maximum concentration. Lateral extent of zinc is defined and further sampling for vertical extent is not warranted.

Organic Chemicals

Organic COPCs at AOC 02-004(a) include acetone; Aroclor-1242; Aroclor-1248; Aroclor-1254; Aroclor-1260; chloroform; dibenzofuran; 4-isopropyltoluene; methylene chloride; toluene; TPH-DRO; 1,2-xylene; and 1,3-xylene+1,4-xylene.

Acetone was detected in four samples with a maximum concentration of 0.00865 mg/kg. Concentrations increased with depth at location 02-600467; only one depth was sampled at locations 02-600383 and 02-600456; concentrations decreased with depth at location 02-600456, and concentrations decreased laterally. The residential SSL was approximately 7,670,000 times the maximum concentration. Further sampling for extent of acetone is not warranted.

Aroclor-1242 was detected in one sample at a concentration of 0.0209 mg/kg. Concentrations decreased with depth and decreased laterally. The lateral and vertical extent of Aroclor-1242 are defined.

Aroclor-1248 was detected in two samples with a maximum concentration of 0.0867 mg/kg. Concentrations decreased with depth at locations 02-600412 and 02-600417 and decreased laterally. The lateral and vertical extent of Aroclor-1248 are defined.

Aroclor-1254 was detected in 26 samples with a maximum concentration of 0.659 mg/kg. Concentrations increased with depth at locations 02-600417 and 02-600346; only one depth was sampled at location 02-600463; concentrations decreased with depth at all other locations; and concentrations decreased laterally. The residential SSL was approximately 52 times the maximum concentration where vertical extent is not defined (0.0219 mg/kg at location 02-600457). Lateral extent of Aroclor-1254 is defined and further sampling for vertical extent is not warranted.

Aroclor-1260 was detected in 50 samples with a maximum concentration of 2.42 mg/kg. Concentrations increased with depth at locations 02-600457 and 02-600346; only one depth was sampled at locations 02-600463, 02-600464, 02-600465, and 02-600466; concentrations decreased with depth at all other locations; and concentrations decreased laterally. The residential SSL was approximately 24 times the maximum concentration where vertical extent is not defined (0.103 mg/kg at location 02-600464). Lateral extent of Aroclor-1260 is defined and further sampling for vertical extent is not warranted.

Chloroform was detected in three samples with a maximum concentration of 0.000268 mg/kg. Concentrations increased with depth at location 02-600413, decreased with depth at locations 02-600415 and 02-600583, and decreased laterally. All detected concentrations were below EQLs. The residential SSL was approximately 21,800 times the maximum concentration. Lateral extent of chloroform is defined and further sampling for vertical extent is not warranted.

Dibenzofuran was detected in one sample at a concentration of 0.0006 mg/kg. Concentrations decreased with depth at location 02-600413 and decreased laterally. Lateral and vertical extent of dibenzofuran are defined.

Isopropyltoluene[4-] was detected in one sample at a concentration of 0.174 mg/kg. Concentrations decreased with depth at location 02-600415 and decreased laterally. Lateral and vertical extent of 4-isopropyltoluene are defined.

Methylene chloride was detected in one sample at a concentration of 0.00242 mg/kg. Concentrations increased with depth at location 02-600583 and decreased laterally. The residential SSL is approximately 169,000 times the maximum concentration. Lateral extent of methylene chloride is defined and further sampling for vertical extent is not warranted.

Toluene was detected in three samples with a maximum concentration of 0.00107 mg/kg. Only one depth was sampled at location 02-600410; concentrations decreased with depth at locations 02-600462 and 02-600467; and concentrations decreased laterally. All detected concentrations were below EQLs. The residential SSL was approximately 4,880,000 times the maximum concentration. Lateral extent of toluene is defined and further sampling for vertical extent is not warranted.

TPH-DRO was detected in 32 samples with a maximum concentration of 454 mg/kg. Only one depth was sampled at locations 02-600464, 02-600465, and 02-600466; concentrations decreased with depth at all other locations; and concentrations decreased laterally. The residential SSL was approximately 76 times and the industrial SSL was approximately 290 times the maximum concentration where vertical extent is not defined (13.1 mg/kg at location 02-600464). Lateral extent of toluene is defined and further sampling for vertical extent is not warranted.

Xylene[1,2-] was detected at one location at a concentration of 0.000353 mg/kg. Concentrations decreased with depth at location 02-600583 and decreased laterally. Lateral and vertical extent of 1,2-xylene are defined.

Xylene[1,3-]+1,4-xylene was detected at one location at a concentration of 0.000839 mg/kg. Concentrations decreased with depth at location 02-600583 and decreased laterally. Lateral and vertical extent of 1,3-xylene+1,4-xylene are defined.

Radionuclides

Radionuclide COPCs at AOC 02-004(a) include americium-241, cesium-137, cobalt-60, plutonium-239/240, strontium-90, and tritium.

Amercium-241 was detected below 1 ft bgs in one soil sample at an activity of 0.0532 pCi/g. Activities decreased with depth at location 02-600584 and decreased laterally. Lateral and vertical extent of americium-241 are defined.

Cesium-137 was detected above the soil FV in two samples, detected below 1 ft bgs in eight soil and Qal samples, and detected in two Qbo samples with a maximum activity of 4.76 pCi/g. Activities increased with depth at location 02-600380, decreased with depth at all other locations, and decreased laterally. The residential SAL is approximately 32 times and the industrial SAL is approximately 108 times the maximum activity where vertical extent is not defined (0.378 pCi/g at location 02-600380). Lateral extent of cesium-137 is defined and further sampling for vertical extent is not warranted.

Cobalt-60 was detected in eight samples with a maximum activity of 4.29 pCi/g. Activities increased with depth at location 02-22369, decreased with depth at all other locations, and decreased laterally. The residential SAL is approximately 32 times and the industrial SAL is approximately 108 times the maximum activity where vertical extent is not defined (0.0822 pCi/g at location 02-22369). Lateral extent of cobalt-60 is defined and further sampling for vertical extent is not warranted.

Plutonium-239/240 was detected above the soil FV in 4 samples and detected below 1 ft bgs in 10 soil and Qal samples with a maximum activity of 2.44 pCi/g. Activities increased with depth at locations 02-22359 and 02-22369, decreased with depth at all other locations, and increased laterally to the south at location 02-600584. Lateral extent to the south is bounded by AOC 02-004(f). The residential SAL is approximately 32 times the maximum activity, and the industrial SAL is approximately 492 times the maximum activity. Further sampling for extent of plutonium-239/240 is not warranted.

Strontium-90 was detected above the soil FV in one sample at an activity of 1.61 pCi/g. Activities decreased with depth at location 02-600381 and decreased laterally. Lateral and vertical extent of strontium-90 are defined.

Tritium was detected in 64 samples with a maximum activity of 20 pCi/g. Activities increased with depth at locations 02-22369, 02-600378, 02-600379, 02-600380, 02-600410, 02-600416, and 02-600456; did not change substantially with depth (0.2 pCi/g or less) at locations 02-22359, 02-22370, 02-22371, 02-600457, 02-600459, 02-600583, 02-612326, 02-600378, and 02-612346; and decreased with depth at all other locations. Activities decreased laterally. The residential SAL is approximately 85 times the maximum activity. Lateral extent of tritium is defined and further sampling for vertical extent is not warranted.

Summary of Nature and Extent at AOC 02-004(a)

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at AOC 02-004(a).

6.7.5 Summary of Human Health Risk Screening

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} (NMED 2017, 602273). The industrial HI is 0.03, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 9 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 2×10^{-6}, which is less than the NMED target risk level of 1 × 10–5 (NMED 2017, 602273). The recreational HI is 0.06, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Residential Scenario

The total excess cancer risk for the residential scenario is 7×10^{-6}, which is less than to the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.08, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 8 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Construction Worker Scenario

The residential exposure scenario also demonstrates protection of construction workers for carcinogenic and radionuclide COPCs. The construction worker HI is approximately 1 (with manganese, see Appendix H, section H-4.5.2, Exposure Evaluation), which is equal to the NMED target HI of 1.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, residential, and construction worker scenarios at AOC 02-004(a).

6.7.6 Summary of Ecological Risk Screening

AOC 02-004(a) is within the TA-02 core area. Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and results of site-specific ecological risk studies, no potential ecological risks exist for the TA-02 core area.

6.8 AOC 02-004(b), Former Storage Tank for Effluent from OWR and Equipment Building

6.8.1 Site Description and Operational History

AOCs 02-004(b,c,d) consisted of a system of three individual liquid waste storage tanks (Figure 6.8-1). Each tank is a separate AOC, but because of their proximity to one another and identical processes associated with all three tanks, the three AOCs are discussed together and the data for all three are evaluated together in this section. The system contained three underground 1200-gal. stainless-steel effluent storage tanks (structures 02-54, 02-55, and 02-56) with rubberized liners, approximately 150 ft west of building 02-1. The tanks received liquid waste that was primarily flushed effluent from the ion-exchange system associated with the OWR [AOC 02-004(a)]. The tanks also received any spills or leaks collected from the floor of the OWR equipment building [02-44, AOC 02-004(f)], as shown on engineering drawing C-29861 (LASL 1962, 090055).

The tanks were approximately 5-ft-high and 6-ft-diameter cylinders with approximately 2 ft of spacing between them within a single reinforced-concrete vault. The vault was rectangular and approximately 8 ft × 23 ft. The top of the vault was approximately 4 ft bgs, as shown on engineering drawing C-29861 (LASL 1962, 090055). The vault was adjacent to the reactor facility acid pit/transfer sump [structure 02-53, AOC 02-004(e)] and aligned perpendicular to Los Alamos Creek. The southernmost tank was structure 02-54 [AOC 02-004(b)], structure 02-55 [AOC 02-004(c)] was the center tank, and structure 02-56 [AOC 02-004(d)] was the northernmost tank. The bottom of the vault was approximately 10 ft bgs. The lines from the tanks to the reactor facility acid pit/transfer sump [(AOC 02-004(e)] were approximately 8 ft long and were used to temporarily store the liquid until it was transferred to the liquid acid waste line [AOC 02-004(f)] leading to TA-50 or to the aboveground portable tank [AOC 02-004(g)].

The tanks, vault, transfer sump, and lines were installed in 1962 according to engineering drawing C-29861, sheet 4 of 13 (LASL 1962, 090055). Leaks in the OWR cooling-liquid system led to the shutdown of the OWR in 1993. All systems were put on standby status in 1993; in 1995, all lines and tanks were drained and the liquids were disposed of (LANL 2000, 090087). In 2000, the tanks, vault, and transfer sump were removed and disposed of (LANL 2000, 090087). In 2003, the lines connecting the tanks to the acid pit/transfer sump [structure 02-53, AOC 02-004(e)], OWR equipment building [02-44, AOC 02-004(f)], the liquid acid waste line leading to TA-50, and the acid pit/transfer sump [structure 02-53, AOC 02-004(e)] outfall [AOC 02-011(d)] were removed and disposed of (WD-3 2003, 082646).

6.8.2 Relationship to Other SWMUs and AOCs

The OWR effluent storage tanks received effluent from the ion-exchange system of the OWR [AOC 02-004(a)] and from the floor of the OWR equipment building [AOC 02-004(f)]. The OWR acid pit, AOC 02-004(e), was located immediately adjacent to the vault on the southeast side. The drainline from the OWR equipment building, AOC 02-004(f), to the acid pit ran from northeast to southwest near the southeast side of the vault near AOC 02-004(d). A storm drain and outfall, AOC 02-011(c), terminated on the surface, approximately 20 ft to the northeast of the vault.

6.8.3 Summary of Previous Investigations

6.8.3.1 1995 Investigation Activities

A radiological screening survey was conducted at locations across AOCs 02-004(b,c,d). Alpha activity was detected at levels above instrument background, and beta/gamma activity was detected at levels above site background.

Soil samples were collected during the investigation activities from boreholes near the tank vault. Supporting QA/QC information is not available for these samples, so the sample results are not included in this report.

6.8.3.2 2000 Post–Cerro Grande Fire Recovery Work

During 2000 post–Cerro Grande fire recovery activities, the tanks, vault structure, and piping between the tanks and acid pit/transfer sump [structure 02-53, AOC 02-004(e)] were removed and disposed of. The structure footprint was returned to a natural grade. Approximately 154 yd^3 of material was removed during this 2000 D&D activity and disposed of at TA-54; waste volumes associated with AOCs 02-004(b,c,d) are not available (LANL 2000, 090087).

Soil samples were collected from boreholes across the general AOCs 02-004(b,c,d) area during the 2000 D&D activities. However, the borehole location coordinates were not surveyed, and accurate information is not available for these locations. Therefore, these data are not useable and are not included in this report.

6.8.3.3 2003 Omega West Decommissioning Project

Any piping that remained on-site after the 2000 D&D effort was decommissioned and removed, and the waste was disposed of at an appropriate disposal facility. Site activities included soil excavation, radiological walkover surveys, radiological (structure) screening, soil sampling, sample analysis, and surveying of sample coordinates. Limited soil surveys were conducted, but no formal report of soil survey results is available.

LLW (construction debris and/or soil) was packaged and shipped to Envirocare and/or TA-54 for disposal. Mixed waste was packaged and transferred to TA-54 for further processing and/or storage at the Laboratory. In total, 360 yd^3 of material was shipped to Envirocare for disposal; material from the OWR effluent storage tanks was included in this total volume (WD-3 2003, 082646, pp. 1–6). No soil samples were collected in 2003 at AOCs 02-004(b,c,d) as part of the Omega West decommissioning project activities.

6.8.3.4 2007 Investigation Activities

Nineteen samples were collected from nine locations at AOCs 02-004(b,c,d) in 2007. Results from the sampling activities in 2007 were presented in the previous investigation report (LANL 2008, 101669.12). Additional sampling was required to define the extent of contamination at the site.

6.8.4 Site Contamination

6.8.4.1 Soil and Rock Sampling

As part of the 2010 investigation, the following characterization activities were conducted at AOCs 02-004(b,c,d):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Five samples were collected from location 02-612280, where AOCs 02-004(b,c,d,e) and 02-011(d) are collocated, from 5–7 ft, 15–16 ft, 25–27 ft, 35–36 ft, and 49–50 ft bgs. These samples were analyzed for TAL metals, hexavalent chromium, PCBs, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium.

The 2010 and historical sampling locations at AOCs 02-004(b,c,d) are shown in Figure 6.8-1. Table 6.8-1 presents the samples collected and analyses requested for AOCs 02-004(b,c,d). The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

6.8.4.2 Soil and Rock Sample Field-Screening Results

No organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of the samples. No radiological-screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. No changes to sampling or other activities occurred because of the field-screening results.

6.8.4.3 Soil and Rock Sample Analytical Results

Decision-level data at AOCs 02-004(b,c,d) consist of results from 24 samples (9 soil and 15 tuff) collected from 10 locations in 2007 and 2010. The 24 samples include 9 soil, 6 Qal, and 9 Qbo samples.

Inorganic Chemicals

A total of 24 samples (9 soil, 6 Qal, and 9 Qbo) were analyzed for TAL metals, 5 samples (1 Qal and 4 Qbo) were analyzed for hexavalent chromium, and 19 samples (9 soil, 5 Qal, and 5 Qbo) were analyzed for nitrate, perchlorate, and total cyanide. Table 6.8-2 presents the inorganic chemicals detected or detected above BVs. Figure 6.8-2 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV (3560 mg/kg) in six samples with a maximum concentration of 13,700 mg/kg. The Gehan and quantile tests indicated site concentrations of aluminum in tuff are statistically different from background (Figure G-65 and Table G-10). Aluminum is retained as a COPC.

Antimony was not detected above the soil and Qbt 1g, Qct, Qbo BVs (0.5 mg/kg) but had DLs (0.525 mg/kg to 1.26 mg/kg) above the BV in five samples. Antimony is retained as a COPC.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV (0.56 mg/kg) in four samples with a maximum concentration of 1.71 mg/kg and it was not detected but had DLs (1.25 mg/kg to 1.95 mg/kg) above BV in four samples. The quantile and slippage tests indicated site concentrations of arsenic in tuff are statistically different from background (Figure G-66 and Table G-10). Arsenic is retained as a COPC.

Barium was detected above the Qbt 1g, Qct, Qbo BV (25.7 mg/kg) in three samples with a maximum concentration of 65.8 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in tuff are not statistically different from background (Figure G-67 and Table G-10). Barium is not a COPC.

Cadmium was not detected above the soil and Qbt 1g, Qct, Qbo BVs (0.4 mg/kg for both) but had DLs (0.492 mg/kg to 0.649 mg/kg) above the soil BV in seven soil samples and eight tuff samples. Cadmium is retained as a COPC.

Calcium was detected above the soil BV (6120 mg/kg) in one sample at a concentration of 7960 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in soil are not statistically different from background (Figure G-68 and Table G-11). Calcium is not a COPC.

Chromium was detected above soil and Qbt 1g, Qct, Qbo BVs (19.3 mg/kg and 2.6 mg/kg) in five soil samples and five tuff samples with a maximum concentration of 37.3 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in soil and tuff are statistically different from background (Figure G-69 and Table G-11, and Figure G-70 and Table G-10, respectively). Chromium is retained as a COPC.

Cyanide was detected above the soil BV (0.5 mg/kg) in 1 sample at a concentration of 0.54 mg/kg. The detection was only 0.04 mg/kg above BV and cyanide was not detected or detected above BV in 18 other samples (detected below BV in 8 samples). Cyanide is not a COPC.

Iron was detected above the Qbt 1g, Qct, Qbo BV (3700 mg/kg) in nine samples with a maximum concentration of 8090 mg/kg. The Gehan and quantile tests indicated site concentrations of iron in tuff are statistically different from background (Figure G-71 and Table G-10). Iron is retained as a COPC.

Manganese was detected above the soil and Qbt 1g, Qct, Qbo BVs (671 mg/kg and 189 mg/kg) in one soil sample and seven tuff samples with a maximum concentration of 733 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in soil are not statistically different from background (Figure G-72 and Table G-11) but site concentrations of manganese in tuff are statistically different from background (Figure G-73 and Table G-10). Manganese is retained as a COPC.

Nickel was detected above the Qbo BV (2 mg/kg) in four samples with a maximum concentration of 2.57 mg/kg. There are too few detections in the tuff background data set to perform statistical tests. Nickel is retained as a COPC.

Nitrate was detected in 12 samples with a maximum concentration of 17.3 mg/kg. Nitrate is naturally occurring, and the concentrations likely reflect naturally occurring levels. In addition, AOCs 02-004(b,c,d) managed liquid radioactive waste from the OWR and are not a source of nitrate. Nitrate is not a COPC.

Perchlorate was detected in seven samples with a maximum concentration of 0.00216 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the Qbt 1g, Qct, Qbo BV (0.3 mg/kg) in three samples with a maximum concentration of 0.781 mg/kg and was not detected above the soil BV (1.52 mg/kg) and Qbt 1g, Qct, Qbo BV but had DLs (1.19 mg/kg to 1.95 mg/kg) above BVs in five soil samples and six tuff samples. The quantile and slippage tests indicated site concentrations of selenium in soil are not statistically different from background (Figure G-74 and Table G-11). Selenium was detected substantially above BV in Qbo samples. Selenium is retained as a COPC.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV (4.59 mg/kg) in three samples with a maximum concentration of 4.88 mg/kg. The Gehan and slippage tests indicated site concentrations of vanadium in tuff are statistically different from background (Figure G-75 and Table G-10). Vanadium is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in six samples with a maximum concentration of 158 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are statistically different from background (Figure G-76 and Table G-11). Zinc is retained as a COPC.

Organic Chemicals

A total of 19 samples (9 soil, 5 Qal, and 5 Qbo) were analyzed for dioxins and furans, 24 samples (9 soil, 6 Qal, and 9 Qbo) were analyzed for PCBs, 19 samples (9 soil, 5 Qal, and 5 Qbo) were analyzed for SVOCs, and 10 samples (5 Qal and 5 Qbo) were analyzed for VOCs. Table 6.8-3 presents the detected organic chemicals. Plates 11 and 12 show the spatial distribution of detected organic chemicals.

Dioxins and Furans

Dioxins and furans are frequently detected as a result of environmental sampling but generally are not associated with industrial activities conducted at the Laboratory or released from SWMUs or AOCs being investigated at the Laboratory. The investigation work plan for Middle Los Alamos Canyon Aggregate Area (LANL 2006, 092571.12) notes the potential for presence of dioxins and furans in the OWR fuel pit recirculation pump system, and a small percentage of the investigation samples collected around the OWR were analyzed for dioxins and furans to determine whether a release may have occurred. If the results were indicative of a release, additional sampling for dioxins and furans would be proposed. Based on the results of the 2007 sampling, additional sampling for dioxins and furans was not proposed for the Phase II investigation and was not performed.

Dioxins and furans are known to be widely distributed in the environment from a number of sources, both natural, such as forest fires, and anthropogenic, such as industrial sources and burning of municipal trash and other waste materials. Industrial sources of dioxins and furans are primarily associated with impurities in the production of chlorinated chemical products (e.g., pentachlorophenol, chlorinated herbicides) and the wastes associated with production of those materials. Another industrial source is the pulp and paper industry and processes that bleach wood pulp (EPA 2006, 600913). None of these common industrial process-related source activities have occurred at the Laboratory. Other anthropogenic sources of dioxins and furans include the combustion of materials containing chlorine, such as the incineration of municipal trash containing chlorinated plastics, and other waste materials (EPA 2006, 600913). Forest fires have occurred in the Los Alamos area, including upgradient of TA-02 in the Los Alamos Canyon watershed, and are a potential source of dioxins and furans.

Polycyclic Aromatic Hydrocarbons

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

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

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

Site Activities

AOCs 02-004(b), 02-004(c), and 02-004(d) were radioactive liquid waste storage tanks and were identified as AOCs because of possible radioactive soil contamination resulting from releases of radionuclides. As noted above, the potential for dioxins and furans to have been associated with the OWR fuel pit was noted and some samples collected in 2007 around the former OWR facility were analyzed for dioxins and furans, but the results of the 2007 sampling were not indicative of a release and no additional sampling was required or performed. There are no known site-related sources of PAHs.

The dioxin and furan congeners detected at AOCs 02-004(b,c,d) were detected at concentrations ranging from 0.0000000382 mg/kg to 0.0494 mg/kg, with hepta- and hexa-chlorinated congeners being the most frequently detected. These results likely reflect natural and/or anthropogenic background rather than a site-related release. The dioxin and furan congeners detected in samples used to characterize this site [1,2,3,4,6,7,8-heptachlorodibenzodioxin; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,6,7,8,9-hexachlorodibenzofuran; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran;

1,2,3,7,8-pentachlorodibenzodioxin; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; 2,3,7,8-tetrachlorodibenzodioxin; and 2,3,7,8-tetrachlorodibenzofuran] are not related to historical Laboratory site operations and are not COPCs.

The AOC 02-004(b,c,d) tanks were located on asphalt paving, which was removed as part of D&D. Most of the samples with detectable PAHs at these sites were surface samples, which would have been beneath the former asphalt paving. PAHs were not associated with the radioactive liquid waste managed at these sites. Therefore, the PAHs detected in samples used to characterize these sites [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] are associated with the former paved area, are not related to historical Laboratory site operations, and are not COPCs.

Organic COPCs

Other organic chemicals detected at AOCs 02-004(b,c,d) include Aroclor-1248, Aroclor-1254, Aroclor-1260, and dibenzofuran. The detected organic chemicals listed are retained as COPCs.

Radionuclides

A total of 16 samples (9 soil, 2 Qal, and 5 Qbo) were analyzed for americium-241 and strontium-90, 21 samples (9 soil, 3 Qal, and 9 Qbo) were analyzed for gamma-emitting radionuclides, isotopic plutonium, and isotopic uranium, and 22 samples (9 soil, 4 Qal, and 9 Qbo) were analyzed for tritium. Table 6.8-4 presents the radionuclides detected or detected above BVs/FVs. Figure 6.8-3 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Cesium-137 was detected below 1 ft bgs in one Qal sample at an activity of 0.23 pCi/g. Cesium-137 is retained as a COPC.

Cobalt-60 was detected in three samples with a maximum activity of 0.884 pCi/g. Cobalt-60 is retained as a COPC.

Plutonium-239/240 was detected above the soil FV (0.054 pCi/g) in six samples and was detected below 1 ft bgs in one Qal sample with a maximum activity of 0.756 pCi/g. Plutonium-239/240 is retained as a COPC.

Tritium was detected in seven samples with a maximum activity of 0.916 pCi/g. Tritium is retained as a COPC.

Uranium-235/236 was detected above the Qbt 1g, Qct, Qbo BV (0.18 pCi/g) in 2 Qbo samples with a maximum activity of 0.251 pCi/g. The maximum activity was only 0.071 pCi/g above the BV and uranium-235/236 was not detected or detected above BV in 19 other samples (detected below BV in 17 samples). The samples where uranium-235/236 was detected above BV were the deepest samples collected at each location and the results appear indicative of variations in natural background rather than a release. Uranium-235/236 is not a COPC.

6.8.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at AOCs 02-004(b,c,d) are discussed below.

Inorganic Chemicals

Inorganic COPCs at AOCs 02-004(b,c,d) are aluminum, antimony, arsenic, cadmium, chromium, iron, manganese, nickel, perchlorate, selenium, vanadium, and zinc.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV in six samples with a maximum concentration of 13,700 mg/kg. Concentrations increased with depth at all locations but the detections above BV were deep samples collected at each location and aluminum was not detected above BV in overlying soil samples. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. Concentrations decreased laterally. The residential SSL is approximately 6 times the maximum concentration, and the industrial SSL is approximately 94 times the maximum concentration. Further sampling for extent of aluminum is not warranted.

Antimony was not detected above the soil and Qbt 1g, Qct, Qbo BVs but had DLs (0.525 mg/kg to 1.26 mg/kg) above the BV in five samples. The residential SSL is approximately 25 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV in four samples with a maximum concentration of 1.71 mg/kg and it was not detected but had DLs (1.25 mg/kg to 1.95 mg/kg) above BV in four samples. The detections above BV were deep samples collected at each location and arsenic was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. Concentrations did not change substantially laterally (0.989 mg/kg). The residential SSL is approximately 4.1 times the maximum concentration, and the industrial SSL is approximately 21 times the maximum concentration. The residential SSL is approximately 3.6 times the maximum DL, and the industrial SSL is approximately 18 times the maximum DL. Further sampling for extent of arsenic is not warranted.

Barium was detected above the Qbt 1g, Qct, Qbo BV in three samples with a maximum concentration of 65.8 mg/kg. The detections above BV were deep samples collected at each location and barium was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. Concentrations decreased laterally. The residential SSL is approximately 237 times the maximum concentration. Further sampling for extent of barium is not warranted.

Chromium was detected above soil and Qbt 1g, Qct, Qbo BVs in five soil samples and five tuff samples with a maximum concentration of 37.3 mg/kg. Concentrations increased with depth at location 02-600546 and decreased with depth at all other locations (concentrations in shallow samples at locations 02-600508 and 02-600545 were 16.1 mg/kg and 19.1 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). Concentrations did not change substantially laterally (2.9 mg/kg). As described in section 4.2, AOC 02-004(b) is not a potential source of hexavalent chromium and use of the SSL for trivalent chromium to determine whether additional sampling is warranted is appropriate. The residential SSL for trivalent chromium (117,000 mg/kg) is approximately 3140 times the maximum concentration. Further sampling for extent of chromium is not warranted.

Iron was detected above the Qbt 1g, Qct, Qbo BV in nine samples with a maximum concentration of 8090 mg/kg. The detections above BV were deep samples collected at each location and iron was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. Concentrations decreased laterally. The residential SSL is approximately 6.8 times the maximum concentration, and the industrial SSL is approximately 112 times the maximum concentration. Further sampling for extent of iron is not warranted.

Manganese was detected above the soil and Qbt 1g, Qct, Qbo BVs in one soil sample and seven tuff samples with a maximum concentration of 733 mg/kg. Concentrations increased with depth at location 02-600546. At all other locations, detections above BV were deep samples and manganese was not detected above BV in overlying soil samples. Some of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. Concentrations increased laterally to the west at location 02-600546. The residential SSL is approximately 14 times the maximum concentration, and the industrial SSL is approximately 218 times the maximum concentration. Further sampling for extent of manganese is not warranted.

Nickel was detected above the Qbo BV in four samples with a maximum concentration of 2.57 mg/kg. The detections above BV were deep samples collected at each location and nickel was not detected above BV in overlying soil samples. Some of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. Concentrations did not change substantially laterally (0.55 mg/kg). The residential SSL is approximately 607 times the maximum concentration. Further sampling for extent of nickel is not warranted.

Perchlorate was detected in seven samples with a maximum concentration of 0.00216 mg/kg. Concentrations did not change substantially with depth (0.00061 mg/kg), decreased with depth at all other locations, and did not change substantially laterally (0.00156 mg/kg). The residential SSL is approximately 25,400 times the maximum concentration. Further sampling for extent of perchlorate is not warranted.

Selenium was detected above the Qbt 1g, Qct, Qbo BV in three samples with a maximum concentration of 0.781 mg/kg and was not detected above the soil and Qbt 1g, Qct, Qbo BVs but had DLs (1.19 mg/kg to 1.95 mg/kg) above BVs in five soil samples and six tuff samples. Concentrations increased with depth at locations 02-600508 and 02-600509, did not change substantially with depth (0.008 mg/kg) at location 02-600511 (the concentration in the shallow sample at location 02-600511 was 0.671 mg/kg and below the soil BV [Appendix F, Pivot Tables]), and did not change substantially laterally (0.119 mg/kg). The residential SSL is approximately 501 times the maximum concentration and 200 times the maximum DL. Further sampling for extent of selenium is not warranted.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV in three samples with a maximum concentration of 4.88 mg/kg. Concentrations decreased with depth at all locations (concentrations in the shallow samples at locations 02-600508, 02-600509, and 02-600511 were 8.16 mg/kg, 9.82 mg/kg, and 8.56 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). Concentrations did not change substantially laterally (0.27 mg/kg). The residential SSL is approximately 81 times the maximum concentration. Vertical extent of vanadium is defined and further sampling for lateral extent is not warranted.

Zinc was detected above the soil BV in six samples with a maximum concentration of 158 mg/kg. Concentrations decreased with depth at all locations and increased laterally at location 02-600509. The residential SSL is approximately 149 times the maximum concentration. Vertical extent of zinc is defined and further sampling for lateral extent is not warranted.

Organic Chemicals

Organic COPCs at AOCs 02-004(b,c,d) include Aroclor-1248, Aroclor-1254, Aroclor-1260, and dibenzofuran.

Aroclor-1248 was detected in one sample at a concentration of 0.306 mg/kg. Concentrations increased with depth at location 02-600545 and decreased laterally. The residential SSL is approximately 94 times the maximum concentration, and the industrial SSL is approximately 35 times the maximum concentration. The lateral extent of Aroclor-1248 is defined and further sampling for vertical extent is not warranted.

Aroclor-1254 was detected in nine samples with a maximum concentration of 0.197 mg/kg. Concentrations increased with depth at location 02-600546, concentrations decreased with depth at all other locations, and concentrations decreased laterally. The residential SSL was approximately 76 times the maximum concentration where vertical extent is not defined (0.0149 mg/kg at location 02-600546). 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 0.431 mg/kg. Concentrations decreased with depth at all locations, and concentrations decreased laterally. Lateral and vertical extent of Aroclor-1260 are defined.

Dibenzofuran was detected in one sample at a concentration of 0.163 mg/kg. Concentrations decreased with depth at location 02-600545 and decreased laterally. Lateral and vertical extent of dibenzofuran are defined.

Radionuclides

Radionuclide COPCs at AOCs 02-004(b,c,d) include cesium-137, cobalt-60, plutonium-239/240, and tritium.

Cesium-137 was detected below 1 ft bgs in one Qal sample at an activity of 0.23 pCi/g. Activities decreased with depth at location 02-612280 and increased laterally. The residential SAL is approximately 52 times the maximum activity. Vertical extent of cesium-137 is defined and further sampling for lateral extent is not warranted.

Cobalt-60 was detected in three samples with a maximum activity of 0.884 pCi/g. Activities decreased with depth at locations 02-600508, 02-600509, and 02-612280 and did not change substantially laterally (0.078 pCi/g). The residential SAL is approximately 2.9 times the maximum activity, and the industrial SAL is approximately 10 times the maximum activity. Vertical extent of cobalt-60 is defined and further sampling for lateral extent is not warranted.

Plutonium-239/240 was detected above the soil FV in six samples and was detected below 1 ft bgs in one Qal sample with a maximum activity of 0.756 pCi/g. Activities decreased with depth at all locations and increased laterally. The residential SAL is approximately 105 times the maximum activity. Vertical extent of plutonium-239/240 is defined and further sampling for lateral extent is not warranted.

Tritium was detected in seven samples with a maximum activity of 0.916 pCi/g. Activities increased with depth at locations 02-600526 and 02-600546, decreased with depth at all other locations, and increased laterally. The residential SAL is approximately 1860 times the maximum activity. Further sampling for extent of tritium is not warranted.

Summary of Nature and Extent at AOCs 02-004(b,c,d)

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at AOCs 02-004(b,c,d).

6.8.5 Summary of Human Health Risk Screening

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} (NMED 2017, 602273). The industrial HI is 0.008, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 1×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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 7×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.5, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 10 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Construction Worker Scenario

The residential exposure scenario also demonstrates protection of construction workers for carcinogenic and radionuclide COPCs. The construction worker HI is approximately 1 (due to manganese; see Appendix H, section H-4.5.2, Exposure Evaluation), which is greater than the NMED target HI of 1.

Based on the risk-screening assessment results, no potential unacceptable carcinogenic risks or doses exist for the industrial, recreational, residential, and construction worker scenarios at AOCs 02-004(b,c,d). No potential unacceptable noncarcinogenic risks exist for the industrial or recreational scenarios, but potential unacceptable noncarcinogenic risks exist for the residential and construction worker scenarios.

6.8.6 Summary of Ecological Risk Screening

AOCs 02-004(b,c,d) are within the TA-02 core area. Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and results of site-specific ecological risk studies, no potential ecological risks exist for the TA-02 core area.

6.9 AOC 02-004(c), Former Storage Tank for Effluent from OWR and Equipment Building

AOCs 02-004(b,c,d) consisted of a system of three individual liquid waste storage tanks (Figure 6.8-1). Each tank is a separate AOC, but because of their proximity to one another and identical processes associated with all three tanks, the three AOCs are discussed together and the data for all three are evaluated together in section 6.8.

6.10 AOC 02-004(d), Former Storage Tank for Effluent from OWR and Equipment Building

AOCs 02-004(b,c,d) consisted of a system of three individual liquid waste storage tanks (Figure 6.8-1). Each tank is a separate AOC, but because of their proximity to one another and identical processes associated with all three tanks, the three AOCs are discussed together and the data for all three are evaluated together in section 6.8.

6.11 AOC 02-004(e), Former Acid Pit/Transfer Sump

6.11.1 Site Description and Operational History

AOC 02-004(e) was a liquid transfer system that consisted of a series of valves and pumps that transferred waste from the OWR equipment building (02-44) to the structure 02-54, 02-55, or 02-56 tanks, the portable aboveground tank [no structure number, AOC 02-004(g)], or the liquid acid waste line leading to TA-50 (Figure 6.11-1). The equipment was housed in a partially belowground transfer sump, referred to as the acid pit/transfer sump (structure 02-53). The unit was a reinforced-concrete pit that measured 7 ft wide × 11 ft long × 7 ft deep. Approximately 1 ft of the pit was aboveground, as indicated on engineering drawing C-29861 (LASL 1962, 090055).

The liquid waste line entered the sump from the OWR equipment building [02-44, AOC 02-004(f)] at approximately 5 ft bgs and connected to the tanks at 8 ft bgs.

The acid pit/transfer sump was operational beginning in 1963. The system transferred liquid wastes from the OWR equipment building to three storage tanks [AOCs 02-004(b,c,d)]. The tanks were used to store the liquid temporarily until it was transferred to the liquid acid waste line (no structure number) leading to TA-50 or to the portable aboveground tank [(no structure number) AOC 02-004(g)].

Use of the acid pit/transfer sump was discontinued in 1993 when the OWR was shut down (WD-3 2003, 082646, p. 2). All liquid waste was drained from the system in 1995, and in 2000 the structure and equipment were decommissioned and removed (LANL 2000, 090087). All remaining buried pipes and drains were removed and disposed of in 2003 (WD-3 2003, 082646).

6.11.2 Relationship to Other SWMUs and AOCs

The acid pit/transfer sump received liquid wastes from the OWR equipment building [AOC 02-004(f)] and transferred those wastes to the tanks at AOCs 02-004(b,c,d) to an aboveground tank, AOC 02-004(g), or to the liquid acid waste line leading to TA-50. The acid pit/transfer sump was immediately adjacent to AOCs 02-004(b,c,d).

6.11.3 Summary of Previous Investigations

6.11.3.1 1995 Investigation Activities

A radiological screening survey was conducted at locations across the acid pit/transfer sump area [structure 02-53, AOC 02-004(e)]. Alpha activity was detected at levels above site background, and beta/gamma activity was detected at levels above site background.

Soil samples were collected from locations near the acid pit/transfer sump. Supporting QA/QC information is not available for these samples, so the sample results are not included in this report.

6.11.3.2 2000 Post–Cerro Grande Fire Recovery Work

The scope of decommissioning activities following the Cerro Grande fire in 2000 included removing and disposing of all building and structural components, piping, and aboveground earthen barricades. The OWR acid pit/transfer sump was removed, and all underground piping leading to and away from the acid pit/transfer sump was capped and left in place. Specific waste volumes associated with AOC 02-004(e) are not available (LANL 2000, 090087).

Soil samples were collected from boreholes across the AOC 02-004(e) area. However, the borehole location coordinates were not surveyed, and accurate information is not available for these locations. Therefore, these data are not useable and are not included in this report.

6.11.3.3 2003 Omega West Decommissioning Project

AOC 02-004(e) piping that remained on-site after the 2000 activities was removed, and the waste was disposed of in 2003. Site activities included soil excavation, radiological walkover surveys, radiological (structure) screening, soil sampling, sample analysis, and surveying of sample coordinates. Limited soil surveys were conducted, but no formal report of soil survey results is available.

LLW (construction debris and/or soil) was packaged and shipped to Envirocare or TA-54 for disposal. Mixed waste was packaged and transferred to TA-54 for further processing and/or storage at the Laboratory. In total, 360 yd^3 of material was shipped to Envirocare for disposal; piping and/or soil material from the OWR acid pit/transfer sump was included in this total volume (WD-3 2003, 082646, pp. 1–6).

No soil samples were collected in 2003 at AOC 02-004(e) as part of the Omega West decommissioning project activities.

6.11.3.4 2007 Investigation Activities

Eight samples were collected from three locations at AOC 02-004(e) in 2007. Results from the sampling activities in 2007 were presented in the previous investigation report (LANL 2008, 101669.12). Additional sampling was required to define the extent of contamination at the site.

6.11.4 Site Contamination

6.11.4.1 Soil and Rock Sampling

As part of the 2010 investigation, the following characterization activities were conducted at AOC 02-004(e):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Five samples were collected from location 02-612280, where AOCs 02-004(b,c,d,e) and 02 011(d) are collocated, from 5–7 ft, 15–16 ft, 25–27 ft, 35–36 ft, and 49–50 ft bgs. These samples were analyzed for TAL metals, hexavalent chromium, PCBs, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium.

The 2010 and historical sampling locations at AOC 02-004(e) are shown in Figure 6.11-1. Table 6.11-1 presents the samples collected and analyses requested for AOC 02-004(e). The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

6.11.4.2 Soil and Rock Sample Field-Screening Results

No organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of the samples. No radiological-screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. No changes to sampling or other activities occurred because of the field-screening results.

6.11.4.3 Soil and Rock Sample Analytical Results

Decision-level data at AOC 02-004(e) consist of results from 13 samples collected from 4 locations in 2007 and 2010. The 13 samples include 3 soil, 3 Qal, and 7 Qbo samples.

Inorganic Chemicals

A total of 13 samples (3 soil, 3 Qal, and 7 Qbo) were analyzed for TAL metals, 5 samples (1 Qal and 4 Qbo) were analyzed for hexavalent chromium, and 8 samples (3 soil, 2 Qal, and 3 Qbo) were analyzed for nitrate, perchlorate, and total cyanide. Table 6.11-2 presents the inorganic chemicals detected or detected above BVs. Figure 6.11-2 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV (3560 mg/kg) in four samples with a maximum concentration of 9700 mg/kg. Aluminum is retained as a COPC.

Antimony was not detected above the Qbt 1g, Qct, Qbo BV (0.5 mg/kg) but had DLs (1.18 mg/kg to 1.26 mg/kg) above the BV in four samples. Antimony is retained as a COPC in tuff.

Arsenic was detected above the Qbo BV (0.56 mg/kg) in three samples with a maximum concentration of 2.28 mg/kg, and was not detected but had DLs (1.25 mg/kg to 1.26 mg/kg) above the BV in three samples. Arsenic is retained as a COPC.

Barium was detected above the Qbo BV (25.7 mg/kg) in two samples with a maximum concentration of 30.9 mg/kg. Barium is retained as a COPC.

Cadmium was not detected above the soil and Qbt 1g, Qct, Qbo BVs (0.4 mg/kg for both) but had DLs (0.529 mg/kg to 0.631 mg/kg) above BVs in two soil samples and seven tuff samples. Cadmium is retained as a COPC.

Chromium was detected above soil and Qbt 1g, Qct, Qbo BVs (19.3 mg/kg and 2.6 mg/kg) in two soil samples and two tuff samples with a maximum concentration of 31.6 mg/kg and was not detected but had DLs (11.6 mg/kg to 66.2 mg/kg) above BVs in two soil samples and two tuff samples. Chromium is retained as a COPC.

Copper was detected above the soil and Qbt 1g, Qct, Qbo BVs (14.7 mg/kg and 3.96 mg/kg) in one soil sample and one tuff sample with a maximum concentration of 19 mg/kg. The maximum concentration is above the maximum soil background concentration (16 mg/kg). Copper is retained as a COPC.

Iron was detected above the Qbt 1g, Qct, Qbo BV (3700 mg/kg) in seven samples with a maximum concentration of 9850 mg/kg. Iron is retained as a COPC.

Lead was detected above the soil and Qbt 1g, Qct, Qbo BVs (22.3 mg/kg and 13.5 mg/kg) in one soil sample and one tuff sample with a maximum concentration of 26.5 mg/kg. The concentration in the soil sample (23.2 mg/kg) was below the six highest concentrations in the soil background data set (24 mg/kg, 25 mg/kg, 25 mg/kg, 25 mg/kg, 27 mg/kg, and 28 mg/kg) but the concentration in Qbo is above the highest concentration in the Qbt 1g, Qct, Qbo background data set (20 mg/kg). Lead is retained as a COPC.

Magnesium was detected above the Qbt 1g, Qct, Qbo BV (739 mg/kg) in one sample at a concentration of 988 mg/kg. This concentration is above the highest concentration in the Qbt 1g, Qct, Qbo background data set (690 mg/kg). Magnesium is retained as a COPC.

Manganese was detected above the Qbt 1g, Qct, Qbo BV (189 mg/kg) in six samples with a maximum concentration of 399 mg/kg. Manganese is retained as a COPC.

Mercury was detected above the soil BV (0.1 mg/kg) in one sample at a concentration of 1.2 mg/kg. Mercury is retained as a COPC.

Nickel was detected above the Qbt 1g, Qct, Qbo BV (2 mg/kg) in one sample at a concentration of 2.49 mg/kg, and was not detected but had DLs (2.14 mg/kg and 3.26 mg/kg) above the BV in two samples. Nickel is retained as a COPC.

Nitrate was detected in two samples with a maximum concentration of 3.44 mg/kg. Nitrate is naturally occurring, and the concentrations likely reflect naturally occurring levels. In addition, AOC 02-004(e) managed liquid radioactive waste from the OWR and is not a source of nitrate. Nitrate is not a COPC.

Perchlorate was detected in three soil samples with a maximum concentration of 0.00162 mg/kg. Perchlorate is identified as a COPC.

Selenium was detected above the Qbt 1g, Qct, Qbo BV (0.3 mg/kg) in one sample at a concentration of 2.51 mg/kg, and was not detected above the soil BV (1.52 mg/kg) and Qbt 1g, Qct, Qbo BV but had DLs (1.19 mg/kg to 1.76 mg/kg) above BVs in one soil sample and six tuff samples. Selenium is retained as a COPC.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV (4.59 mg/kg) in two samples with a maximum concentration of 8.86 mg/kg. Vanadium is retained as a COPC.

Zinc was detected above the soil and Qbt 1g, Qct, Qbo BVs (48.8 mg/kg and 40 mg/kg) in three soil samples and one tuff sample with a maximum concentration of 120 mg/kg. Zinc is retained as a COPC.

Organic Chemicals

A total of 8 samples (3 soil, 2 Qal, and 3 Qbo) were analyzed for dioxins and furans and SVOCs, 13 samples (3 soil, 3 Qal, and 7 Qbo) were analyzed for PCBs, and 5 samples (2 Qal and 3 Qbo) were analyzed for VOCs. Table 6.11-3 presents the detected organic chemicals. Figure 6.11-3 and Plate 13 show the spatial distribution of detected organic chemicals.

Dioxins and Furans

Dioxins and furans are frequently detected as a result of environmental sampling but generally are not associated with industrial activities conducted at the Laboratory or released from SWMUs or AOCs being investigated at the Laboratory. The investigation work plan for Middle Los Alamos Canyon Aggregate Area (LANL 2006, 092571.12) notes the potential for presence of dioxins and furans in the OWR fuel pit recirculation pump system, and a small percentage of the investigation samples collected around the OWR were analyzed for dioxins and furans to determine whether a release may have occurred. If the results were indicative of a release, additional sampling for dioxins and furans would be proposed. Based on the results of the 2007 sampling, additional sampling for dioxins and furans was not proposed for the Phase II investigation and was not performed.

Dioxins and furans are known to be widely distributed in the environment from a number of sources, both natural, such as forest fires, and anthropogenic, such as industrial sources and burning of municipal trash and other waste materials. Industrial sources of dioxins and furans are primarily associated with impurities in the production of chlorinated chemical products (e.g., pentachlorophenol, chlorinated herbicides) and the wastes associated with production of those materials. Another industrial source is the pulp and paper industry and processes that bleach wood pulp (EPA 2006, 600913). None of these common industrial process-related source activities have occurred at the Laboratory. Other anthropogenic sources of dioxins and furans include the combustion of materials containing chlorine, such as the incineration of municipal trash containing chlorinated plastics, and other waste materials (EPA 2006, 600913). Forest fires have occurred in the Los Alamos area, including upgradient of TA-02 in the Los Alamos Canyon watershed, and are a potential source of dioxins and furans.

Polycyclic Aromatic Hydrocarbons

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

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

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

Site Activities

AOC 02-004(e) was a radioactive liquid waste transfer system and was identified as an AOC because of possible radioactive soil contamination resulting from releases of radionuclides. As noted above, the potential for dioxins and furans to have been associated with the OWR fuel pit was noted and some samples collected in 2007 around the former OWR facility were analyzed for dioxins and furans, but the results of the 2007 sampling were not indicative of a release and no additional sampling was required or performed. There are no known site-related sources of PAHs.

The dioxin and furan congeners detected at AOC 02-004(e) were detected at concentrations ranging from 0.0000000293 mg/kg to 0.0285 mg/kg, with hepta- and hexa-chlorinated congeners being the most frequently detected. These results likely reflect natural and/or anthropogenic background rather than a site-related release. The dioxin and furan congeners detected in samples used to characterize this site [1,2,3,4,6,7,8-heptachlorodibenzodioxin; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,6,7,8,9-hexachlorodibenzofuran; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran;

1,2,3,7,8-pentachlorodibenzodioxin; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; 2,3,7,8-tetrachlorodibenzodioxin; and 2,3,7,8-tetrachlorodibenzofuran] are not related to historical Laboratory site operations and are not COPCs.

The AOC 02-004(e) transfer system was located on asphalt paving, which was removed as part of D&D. PAHs detected at this site were detected only in surface samples, which would have been beneath the former asphalt paving. PAHs were not associated with the radioactive liquid waste managed at this site. Therefore, the PAHs detected in samples used to characterize this site [acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; phenanthrene; and pyrene] are associated with the former paved area, are not related to historical Laboratory site operations, and are not COPCs.

Organic COPCs

Other organic chemicals detected at AOC 02-004(e) include Aroclor-1254 and Aroclor-1260. The detected organic chemicals listed are retained as COPCs.

Radionuclides

A total of 8 samples (3 soil, 2 Qal, and 3 Qbo) were analyzed for americium-241 and strontium-90, and 13 samples (3 soil, 3 Qal, and 7 Qbo) were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium. Table 6.11-4 presents the radionuclides detected or detected above BVs/FVs. Figure 6.11-4 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Cesium-137 was detected below 1 ft bgs in two Qal samples with a maximum activity of 0.23 pCi/g. Cesium-137 is retained as a COPC.

Cobalt-60 was detected in one sample at an activity of 0.139 pCi/g. Cobalt-60 is retained as a COPC.

Plutonium-239/240 was detected above the soil FV (0.054 pCi/g) in two samples and detected below 1 ft bgs in two Qal samples with a maximum activity of 0.392 pCi/g. Plutonium-239/240 is retained as a COPC.

Tritium was detected in three soil/Qal samples with a maximum activity of 0.217 pCi/g. Tritium is retained as a COPC.

6.11.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at AOC 02-004(e) are discussed below.

Inorganic Chemicals

Inorganic COPCs at AOC 02-004(e) include aluminum, antimony, arsenic, barium, cadmium, chromium, copper, iron, lead, magnesium, manganese, mercury, nickel, perchlorate, selenium, vanadium, and zinc.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV in four samples with a maximum concentration of 9700 mg/kg. Concentrations decreased with depth at location 02-612280. Concentrations increased with depth at all other locations but the detections above BV were deep samples collected at each location and aluminum was not detected above BV in overlying soil samples. All detections above BV were below 10 ft bgs, beyond the depth intervals evaluated for risk. Concentrations decreased laterally. The residential SSL is approximately 8 times the maximum concentration, and the industrial SSL is approximately 133 times the maximum concentration. Further sampling for extent of aluminum is not warranted.

Antimony was not detected above the Qbt 1g, Qct, Qbo BV but had DLs (1.18 mg/kg to 1.26 mg/kg) above the BV in four samples. The residential SSL is approximately 25 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbo BV in three samples with a maximum concentration of 2.28 mg/kg and was not detected but had DLs (1.25 mg/kg to 1.26 mg/kg) above the BV in three samples. Concentrations did not change substantially with depth (0.51 mg/kg or less) at locations 02-600537 and 02-600538, decreased with depth at location 02-600539 (concentrations in shallow samples at locations 02-600537, 02-600538, and 02-600539 were 2.01 mg/kg, 1.86 mg/kg, and 2.73 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). Concentrations did not change substantially laterally (0.96 mg/kg). The residential SSL is approximately 3.1 times the maximum concentration, and the industrial SSL is approximately 16 times the maximum concentration. The residential SSL is approximately 5.6 times the maximum DL, and the industrial SSL is approximately 28 times the maximum DL. Further sampling for extent of arsenic is not warranted.

Barium was detected above the Qbo BV in two samples with a maximum concentration of 30.9 mg/kg. Concentrations decreased with depth at locations 02-600537 and 02-600539 (concentrations in shallow samples at locations 02-600537 and 02-600539 were 66 mg/kg and 46.3 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). Concentrations did not change substantially laterally (2 mg/kg). The residential SSL is approximately 505 times the maximum concentration. Vertical extent of barium is defined and further sampling for lateral extent is not warranted.

Cadmium was not detected above the soil and Qbt 1g, Qct, Qbo BVs but had DLs (0.529 mg/kg to 0.631 mg/kg) above BVs in two soil samples and seven tuff samples. The residential SSL is approximately 112 times the maximum DL. Further sampling for extent of cadmium is not warranted.

Chromium was detected above soil and Qbt 1g, Qct, Qbo BVs in two soil samples and two tuff samples with a maximum concentration of 31.6 mg/kg and was not detected but had DLs (11.6 mg/kg to 66.2 mg/kg) above BVs in two soil samples and two tuff samples. Concentrations decreased with depth at locations 02-600537, 02-600538, and 02-612280 (the concentrations in the shallow sample at location 02-612280 was 15.6 mg/kg and below the soil BV [Appendix F, Pivot Tables]). Concentrations did not change substantially laterally (2.6 mg/kg). As described in section 4.2, AOC 02-004(e) is not a potential source of hexavalent chromium and use of the SSL for trivalent chromium to determine whether additional sampling is warranted is appropriate. The residential SSL for trivalent chromium (117,000 mg/kg) is approximately 3700 times the maximum concentration and 1770 times the maximum DL. Vertical extent of chromium is defined and further sampling for lateral extent is not warranted.

Copper was detected above the soil and Qbt 1g, Qct, Qbo BVs in one soil sample and one tuff sample with a maximum concentration of 19 mg/kg. Concentrations decreased with depth at locations 02-600537 and 02-600539 (the concentration in the shallow sample at location 02-600537 was 6.59 mg/kg and below the soil BV [Appendix F, Pivot Tables]). Concentrations increased laterally. The residential SSL is approximately 165 times the maximum concentration. Vertical extent of copper is defined and further sampling for lateral extent is not warranted.

Iron was detected above the Qbt 1g, Qct, Qbo BV in seven samples with a maximum concentration of 9850 mg/kg. Concentrations decreased with depth at all locations (concentrations in shallow samples at locations 02-600537, 02-600538, 02-600539, and 02-612280 were 9790 mg/kg, 10,300 mg/kg, 8330 mg/kg, and 8300 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]) and increased laterally at location 02-600537. The residential SSL is approximately 5.6 times the maximum concentration, and the industrial SSL is approximately 92 times the maximum concentration. Vertical extent of iron is defined and further sampling for lateral extent is not warranted.

Lead was detected above the soil and Qbt 1g, Qct, Qbo BVs in one soil sample and one tuff sample with a maximum concentration of 26.5 mg/kg. Concentrations increased with depth at location 02-600537, decreased with depth at location 02-600539, and did not change substantially laterally (3.3 mg/kg). The residential SSL is approximately 15 times the maximum concentration, and the industrial SSL is approximately 30 times the maximum concentration. Further sampling for extent of lead is not warranted.

Magnesium was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 988 mg/kg. Concentrations increased with depth at location 02-600537, but the detection above BV was a deep sample and magnesium was not detected above BV in the overlying soil samples. The detection above BV was below 10 ft bgs, beyond the depth intervals evaluated for risk. Concentrations increased laterally. The residential essential nutrient SSL is approximately 212,000 times the maximum concentration. Further sampling for extent of magnesium is not warranted.

Manganese was detected above the Qbt 1g, Qct, Qbo BV in six samples with a maximum concentration of 399 mg/kg. Concentrations decreased with depth at all locations (concentrations in shallow samples at locations 02-600537, 02-600538, 02-600539, and 02-612280 were 324 mg/kg, 291 mg/kg, 342 mg/kg, and 253 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]) and increased laterally at location 02-600537. The residential SSL is approximately 26 times the maximum concentration, and the industrial SSL is approximately 401 times the maximum concentration. Vertical extent of manganese 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 1.2 mg/kg. Concentrations decreased with depth at location 02-600539 and increased laterally. The residential SSL is approximately 20 times the maximum concentration. Further sampling for extent of mercury is not warranted.

Nickel was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 2.49 mg/kg and was not detected but had DLs (2.14 mg/kg and 3.26 mg/kg) above the BV in two samples. Concentrations did not change substantially with depth (1.7 mg/kg) at location 02-612280 (the concentration in the shallow sample at location 02-612280 was 4.19 mg/kg and below the soil BV [Appendix F, Pivot Tables]). Concentrations decreased laterally. The residential SSL is approximately 626 times the maximum concentration and approximately 478 times the maximum DL. Further sampling for extent of nickel is not warranted.

Perchlorate was detected in three soil samples with a maximum concentration of 0.00162 mg/kg. Concentrations decreased with depth at all locations and did not change substantially laterally (0.00108 mg/kg). The residential SSL is approximately 33,800 times the maximum concentration. Further sampling for extent of perchlorate is not warranted.

Selenium was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 2.51 mg/kg and was not detected above the soil and Qbt 1g, Qct, Qbo BVs but had DLs (1.19 mg/kg to 1.76 mg/kg) above BVs in one soil sample and six tuff samples. Concentrations did not change substantially with depth (1 mg/kg) at location 02-600537 (the concentration in the shallow sample at location 02-600537 was 1.51 mg/kg and below the soil BV [Appendix F, Pivot Tables]). Concentrations increased laterally. The residential SSL is approximately 156 times the maximum concentration and approximately 222 times the maximum DL. Further sampling for extent of selenium is not warranted.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV in two samples with a maximum concentration of 8.86 mg/kg. Concentrations decreased with depth at locations 02-600537 and 02-600538 (concentrations in shallow samples at locations 02-600537 and 02-600538 were 10.9 mg/kg and 11.3 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). Concentrations increased laterally. The residential SSL is approximately 44 times the maximum concentration. Further sampling for extent of vanadium is not warranted.

Zinc was detected above the soil and Qbt 1g, Qct, Qbo BVs in three soil samples and one tuff sample with a maximum concentration of 120 mg/kg. Concentrations decreased with depth at locations 02-600537, 02-600538, and 02-600539 and increased laterally. The residential SSL is approximately 196 times the maximum concentration. Vertical extent of zinc is defined and further sampling for lateral extent is not warranted.

Organic Chemicals

Organic COPCs at AOC 02-004(e) include Aroclor-1254 and Aroclor-1260.

Aroclor-1254 was detected in two samples with a maximum concentration of 0.0736 mg/kg. Concentrations decreased with depth at locations 02-600539 and 02-612280 and did not change substantially laterally (0.00298 mg/kg). The residential SSL is approximately 155 times the maximum concentration. Vertical extent of Aroclor-1254 is defined and further sampling for lateral extent is not warranted.

Aroclor-1260 was detected in six samples with a maximum concentration of 0.18 mg/kg. Concentrations decreased with depth at locations 02-600537, 02-600538, 02-600539, and 02-612280 and increased laterally. The residential SSL is approximately 13 times the maximum concentration, and the industrial SSL is approximately 62 times the maximum concentration. Vertical extent of Aroclor-1260 is defined and further sampling for lateral extent is not warranted.

Radionuclides

Radionuclide COPCs at AOC 02-004(e) include cesium-137, cobalt-60, plutonium-239/240, and tritium.

Cesium-137 was detected below 1 ft bgs in two Qal samples with a maximum activity of 0.23 pCi/g. Concentrations increased with depth at location 02-612280 and decreased with depth at location 02-600539 and did not change substantially laterally (0.122 mg/kg). The residential SAL is approximately 52 times the maximum concentration. Further sampling for extent of cesium-137 is not warranted.

Cobalt-60 was detected in one sample at an activity of 0.139 pCi/g. Concentrations decreased with depth at location 02-612280 and decreased laterally. Lateral and vertical extent of cobalt-60 are defined.

Plutonium-239/240 was detected above the soil FV in two samples and detected below 1 ft bgs in two Qal samples with a maximum activity of 0.392 pCi/g. Concentrations decreased with depth at locations 02-600538, 02-600539, and 02-612280; and increased laterally. The residential SAL is approximately 202 times the maximum concentration. Vertical extent of plutonium-239/240 is defined and further sampling for lateral extent is not warranted.

Tritium was detected in three soil/Qal samples with a maximum activity of 0.217 pCi/g. Concentrations decreased with depth at locations 02-600537, 02-600538, and 02-612280; and decreased laterally. Lateral and vertical extent of tritium are defined.

Summary of Nature and Extent at AOC 02-004(e)

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at AOC 02-004(e).

6.11.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 9×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.008 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 1×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.008 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^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The residential exposure scenario also demonstrates protection of construction workers.

Based on the risk-screening assessment results, no potential unacceptable carcinogenic risks or doses exist for the industrial, recreational, residential, and construction worker scenarios at AOC 02-004(e).

6.11.6 Summary of Ecological Risk Screening

AOC 02-004(e) is within the TA-02 core area. Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and results of site-specific ecological risk studies, no potential ecological risks exist for the TA-02 core area.

6.12 AOC 02-004(f), Former Equipment Building and Acid Waste Line to TA-50

6.12.1 Site Description and Operational History

AOC 02-004(f) was a 49-ft × 26-ft equipment building (02-44) that contained several pumps, including the main circulating pump for the OWR cooling water, a buffalo chiller (a cooling system), and an ion-exchange filter system to maintain the OWR cooling-liquids system (Plate 14). At a later date, these systems were also connected to TA-50 by a liquid acid waste line. Lines associated with the OWR equipment building were present at approximately 4 ft bgs.

Building 02-44 became operational in 1954 and had floor drains that discharged to Los Alamos Creek through an outfall located at SWMU 02-008(a). Modifications to the cooling water system, with the addition of the cooling tower (structure 02-49) and associated outfall, were made in 1959, as shown on engineering drawing C-21327 (LASL 1957, 090058). The drain from the OWR equipment building was connected to the cooling tower outfall in 1959, as shown on engineering drawing C-48768 (LANL 1993, 090056). The outfalls in Los Alamos Creek were physically the same [location of SWMU 02-008(a)]. When the acid pit/transfer sump (structure 02-53) and effluent storage tank structures (02-54, 02-55, and 02-56) were added in 1962, the wastewater discharge from the OWR equipment building was routed through the acid pit/transfer sump, thus minimizing direct discharge to Los Alamos Creek from building 02-44, as noted on engineering drawing C-29861 (LASL 1962, 090055).

The OWR equipment building operated until 1993, when the OWR was shut down. In 1995, all liquid waste was removed from the system and disposed of at TA-54 (WD-3 2003, 082646, p. 2). In 2003, the building and all remaining buried pipes and drains were removed and disposed of at approved disposal facilities (WD-3 2003, 082646, pp. 26–31).

6.12.2 Relationship to Other SWMUs and AOCs

Discharge associated with the OWR equipment building operations from 1954 to 1962 is addressed in the cooling tower outfall [SWMU 02-008(a)] discussion (section 6.21). Discharge from 1962 to 1993 is addressed in the OWR equipment building outfall [AOC 02-011(d)] discussion (section 6.32).

6.12.3 Summary of Previous Investigations

6.12.3.1 2003 Omega West Decommissioning Project

During D&D activities in 2003, eight soil samples were collected from four locations (02-22376, 02-22377, 02-22378, and 02-22379) within or near the footprint of the former OWR equipment building.

6.12.3.2 2007 Investigation Activities

Fifty-six samples were collected from twenty locations at AOC 02-004(f) in 2007. Additional sampling was required to define the extent of contamination at the site.

6.12.4 Site Contamination

6.12.4.1 Soil and Rock Sampling

As part of the 2010 investigation, the following characterization activities were conducted at AOC 02-004(f):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Locations 02-600469, 02-600470, 02-600474, and 02-600567 were excavated to remove PCB contamination in accordance with the approved work plan (LANL 2009, 105073; NMED 2009, 105595). The surface soil at locations 02-600469, 02-600470, and 02-600474 was excavated to approximately 4 ft bgs, and the soil at location 02-600567 was excavated from the surface to 4–8 ft bgs. The remediated area was approximately 64 ft^2 each at locations 02-600469, 02-600470, and 02-600474 (Figure 6.12-1), and the volume of excavated material was approximately 10 yd^3 at each of these locations. The remediated area was approximately 176 ft^2 at location 02-600567, and the volume of excavated material at this location was approximately 36 yd^3.

- Confirmation samples were collected as follows.
  - At location 02-600469, confirmation samples were collected below the excavation from 4–4.2 ft and 6–6.2 ft bgs at location 02-612365, which is 1 ft away from location 02-600469 where the excavation was conducted, and from four step-out locations: 4 ft to the north (4–4.4 ft and 6–6.4 ft bgs from location 02-612364), 4 ft to the south (4–4.2 ft and 6–6.2 ft bgs from location 02-612366), 4 ft to the east (4–4.2 ft and 6–6.2 ft bgs from location 02-612368), and 4 ft to the west (4–4.2 ft and 6–6.2 ft bgs from location 02-612367).
  - At location 02-600470, confirmation samples were collected below the excavation (4–4.2 ft and 6–6.2 ft bgs) and from four step-out locations: 4 ft to the north (4–4.2 ft and 6–6.2 ft bgs from location 02-612354), 4 ft to the south (4–4.2 ft and 6–6.4 ft bgs from location 02-612358), 4 ft to the east (4–4.2 ft and 6–6.2 ft bgs from location 02-612357), and 4 ft to the west (4–4.4 ft and 6–6.2 ft bgs from location 02-612355).
  - At location 02-600474, confirmation samples were collected below the excavation from 4–4.2 ft and 6–6.2 ft bgs at location 02-612360, which is 1 ft away from location 02-600474 where the excavation was conducted, and from four step-out locations: 4 ft to the north (4–4.2 ft and 6–6.2 ft bgs from location 02-612362), 4 ft to the south (4–4.2 ft and 6–6.2 ft bgs from location 02-612363), 4 ft to the east (4–4.2 ft and 6–6.2 ft bgs from location 02-612359), and 4 ft to the west (4–4.4 ft and 6–6.2 ft bgs from location 02-612361).
  - At location 02-600567, confirmation samples were collected below the excavation (8–8.2 ft bgs) and from four step-out locations: 8 ft to the north (2–3 ft, 4–5 ft, and 6–7 ft bgs from location 02-613624), 4 ft to the south (2–2.2 ft and 4–4.2 ft bgs from location 02-613005), 8 ft to the east (2–3 ft and 4–5 ft bgs from location 02-613625), and 8 ft to the west (2–3 ft and 4–5 ft bgs from location 02-613623).

All confirmation samples were analyzed for PCBs only.

- Ten samples were collected from locations 02-612346 and 02-612347 within the footprint of AOC 02-004(f) (depths ranging from 5–50 ft bgs). All 10 samples were analyzed for TAL metals, hexavalent chromium, PCBs, SVOCs, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium.

The 2010 and historical sampling locations at AOC 02-004(f) are shown on Plate 14. Table 6.12-1 presents the samples collected and analyses requested for AOC 02-004(f). The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

6.12.4.2 Soil and Rock Sample Field-Screening Results

No organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of the samples. No radiological-screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. No changes to sampling or other activities occurred because of the field-screening results.

6.12.4.3 Soil and Rock Sample Analytical Results

Decision-level data at AOC 02-004(f) consist of results from 114 samples collected from 45 locations in 2003, 2007, and 2010. The 114 samples include 67 soil, 22 Qal, and 25 Qbo samples.

Inorganic Chemicals

A total of 74 samples (27 soil, 22 Qal, and 25 Qbo) were analyzed for TAL metals, 18 samples (8 soil, 4 Qal, and 6 Qbo) were analyzed for hexavalent chromium, and 56 samples (19 soil, 18 Qal, and 19 Qbo) were analyzed for nitrate, perchlorate, and total cyanide. Table 6.12-2 presents the inorganic chemicals detected or detected above BVs. Plate 15 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV (3560 mg/kg) in 20 samples with a maximum concentration of 13,000 mg/kg. The Gehan and quantile tests indicated site concentrations of aluminum in tuff are statistically different from background (Figure G-77 and Table G-12). Aluminum is retained as a COPC.

Antimony was not detected above the soil and Qbt 1g, Qct, Qbo BVs (0.83 mg/kg and 0.5 mg/kg) but had DLs (0.518 mg/kg to 1.28 mg/kg) above BV in four soil samples and eight tuff samples. There were too few detections to perform statistical tests. Antimony is retained as a COPC.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV (0.56 mg/kg) in 14 samples with a maximum concentration of 2.35 mg/kg and was not detected but had DLs (1.18 mg/kg to 1.93 mg/kg) above the BV in 11 samples. The quantile and slippage tests indicated site concentrations of arsenic in tuff are statistically different from background (Figure G-78 and Table G-12). Arsenic is retained as a COPC.

Barium was detected above the Qbt 1g, Qct, Qbo BV (25.7 mg/kg) in 15 samples with a maximum concentration of 109 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in tuff are statistically different from background (Figure G-79 and Table G-12). Barium is retained as a COPC in tuff.

Cadmium was detected above the soil BV (0.4 mg/kg) in 2 samples with a maximum concentration of 0.718 mg/kg and it was not detected but had DLs (0.481 mg/kg to 0.723 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs (0.4 mg/kg) in 37 soil samples and 23 tuff samples. There were too few detections in site or background data sets to perform statistical tests. Cadmium is retained as a COPC.

Chromium was detected above the soil and Qbt 1g, Qct, Qbo BVs (19.3 mg/kg and 2.6 mg/kg) in 8 soil samples and 7 tuff samples with a maximum concentration of 80.3 mg/kg and was not detected but had DLs (3.8 mg/kg to 22.7 mg/kg) above the Qbt 1g, Qct, Qbo BV in 11 samples. The quantile and slippage tests indicated site concentrations of chromium in soil are statistically different from background (Figure G-80 and Table G-13). The Gehan and quantile tests indicated site concentrations of chromium in tuff are statistically different from background (Figure G-81 and Table G-12). Chromium is retained as a COPC.

Copper was detected above the soil and Qbt 1g, Qct, Qbo BVs (14.7 mg/kg and 2.6 mg/kg) in three soil samples and five tuff samples with a maximum concentration of 148 mg/kg and was not detected but had DLs (4.36 mg/kg to 27.3 mg/kg) above BV in one soil sample and three tuff samples. The quantile and slippage tests indicated site concentrations of copper in soil and tuff are statistically different from background (Figure G-82 and Table G-13, and Figure G-83 and Table G-12, respectively). Copper is retained as a COPC.

Cyanide was detected above the soil BV (0.5 mg/kg) in 1 sample at a concentration of 1.06 mg/kg. The concentration was only 0.56 mg/kg above BV and cyanide was not detected or detected above BV in 55 other samples (detected below BV in 5 samples). Cyanide is not a COPC in soil.

Hexavalent chromium was detected in seven samples with a maximum concentration of 0.448 mg/kg. Hexavalent chromium is retained as a COPC.

Iron was detected above the Qbt 1g, Qct, Qbo BV (3700 mg/kg) in 25 samples with a maximum concentration of 11,900 mg/kg. The Gehan and quantile tests indicated site concentrations of iron in tuff are statistically different from background (Figure G-84 and Table G-12). Iron is retained as a COPC.

Lead was also detected above the soil and Qbt 1g, Qct, Qbo BVs (22.3 mg/kg and 13.5 mg/kg) in one soil sample and one tuff sample with a maximum concentration of 45.6 mg/kg and was not detected but had a DL (19.5 mg/kg) above the Qbt 1g, Qct, Qbo BV in one sample. The Gehan and quantile tests indicated site concentrations of lead in soil and tuff are not statistically different from background (Figure G-85 and Table G-13, and Figure G-86 and Table G-12, respectively). Lead is not a COPC.

Manganese was detected above the Qbt 1g, Qct, Qbo BV (189 mg/kg) in 17 samples with a maximum concentration of 1370 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in tuff are statistically different from background (Figure G-87 and Table G-12). Manganese is retained as a COPC.

Mercury was detected above the soil and Qbt 1g, Qct, Qbo BVs (0.1 mg/kg for both) in 16 soil samples and 2 tuff samples with a maximum concentration of 40.6 mg/kg. The maximum concentration is substantially above BV. Mercury is retained as a COPC.

Nickel was detected above the Qbt 1g, Qct, Qbo BV (2 mg/kg) in six samples with a maximum concentration of 6.36 mg/kg and was not detected but had DLs (2.04 mg/kg and 5.76 mg/kg) above the BV in eight samples. There are too few detections in the tuff background data set to perform statistical tests. Nickel is retained as a COPC.

Nitrate was detected in 27 samples with a maximum concentration of 9.16 mg/kg. Nitrate is naturally occurring, and the concentrations likely reflect naturally occurring levels. In addition, AOC 02-004(f) managed reactor cooling water and is not a source of nitrate. Nitrate is not a COPC.

Perchlorate was detected in nine samples with a maximum concentration of 0.00657 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs (1.52 mg/kg and 0.3 mg/kg) in 3 soil samples and 11 tuff samples with a maximum concentration of 2.48 mg/kg and was not detected but had DLs (1.18 mg/kg to 2.17 mg/kg) above BV in 7 soil samples and 14 tuff samples. The Gehan test indicated site concentrations of selenium in soil are statistically different from background (Table G-13). However, the quantile and slippage tests indicated site concentrations of selenium in soil are not statistically different from background (Figure G-88 and Table G-13). The maximum Qbo concentration (2.48 mg/kg) is substantially above the BV. Selenium is retained as a COPC.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV (4.59 mg/kg) in six samples with a maximum concentration of 13.7 mg/kg. The Gehan and quantile tests indicated site concentrations of vanadium in tuff are statistically different from background (Figure G-89 and Table G-12). Vanadium is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in 14 samples with a maximum concentration of 270 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are statistically different from background (Figure G-90 and Table G-13). Zinc is retained as a COPC.

Organic Chemicals

A total of 56 samples (19 soil, 18 Qal, and 19 Qbo) were analyzed for dioxins and furans, 106 samples (59 soil, 22 Qal, and 25 Qbo) were analyzed for PCBs, 66 samples (19 soil, 22 Qal, and 25 Qbo) were analyzed for SVOCs, and 39 samples (2 soil, 18 Qal, and 19 Qbo) were analyzed for VOCs. Table 6.12-3 presents the detected organic chemicals. Plates 16, 17, and 18 show the spatial distribution of detected organic chemicals.

Dioxins and Furans

Dioxins and furans are frequently detected as a result of environmental sampling but generally are not associated with industrial activities conducted at the Laboratory or released from SWMUs or AOCs being investigated at the Laboratory. The investigation work plan for Middle Los Alamos Canyon Aggregate Area (LANL 2006, 092571.12) notes the potential for presence of dioxins and furans in the OWR fuel pit recirculation pump system, and a small percentage of the investigation samples collected around the OWR were analyzed for dioxins and furans to determine whether a release may have occurred. If the results were indicative of a release, additional sampling for dioxins and furans would be proposed. Based on the results of the 2007 sampling, additional sampling for dioxins and furans was not proposed for the Phase II investigation and was not performed.

Dioxins and furans are known to be widely distributed in the environment from a number of sources, both natural, such as forest fires, and anthropogenic, such as industrial sources and burning of municipal trash and other waste materials. Industrial sources of dioxins and furans are primarily associated with impurities in the production of chlorinated chemical products (e.g., pentachlorophenol, chlorinated herbicides) and the wastes associated with production of those materials. Another industrial source is the pulp and paper industry and processes that bleach wood pulp (EPA 2006, 600913). None of these common industrial process-related source activities have occurred at the Laboratory. Other anthropogenic sources of dioxins and furans include the combustion of materials containing chlorine, such as the incineration of municipal trash containing chlorinated plastics, and other waste materials (EPA 2006, 600913). Forest fires have occurred in the Los Alamos area, including upgradient of TA-02 in the Los Alamos Canyon watershed, and are a potential source of dioxins and furans.

Polycyclic Aromatic Hydrocarbons

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

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

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

Site Activities

AOC 02-004(f) was an equipment building housing equipment associated with reactor cooling water and radioactive liquid waste and was identified as an AOC because of possible radioactive soil contamination resulting from releases of radionuclides. As noted above, the potential for dioxins and furans to have been associated with the OWR fuel pit was noted and some samples collected in 2007 around the former OWR facility were analyzed for dioxins and furans, but the results of the 2007 sampling were not indicative of a release and no additional sampling was required or performed. There are no known site-related sources of PAHs.

The dioxin and furan congeners detected at AOC 02-004(f) were detected at concentrations ranging from 0.0000000319 mg/kg to 0.0388 mg/kg, with hepta- and hexa-chlorinated congeners being the most frequently detected. These results likely reflect natural and/or anthropogenic background rather than a site-related release. The dioxin and furan congeners detected in samples used to characterize this site [1,2,3,4,6,7,8-heptachlorodibenzodioxin; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,6,7,8,9-hexachlorodibenzofuran; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; 2,3,7,8-tetrachlorodibenzodioxin; and 2,3,7,8-tetrachlorodibenzofuran] are not related to historical Laboratory site operations and are not COPCs.

The AOC 02-004(f) building was adjacent to asphalt paving, which was removed as part of D&D. PAHs detected at this site were detected mainly in surface samples, which would have been beneath or adjacent to the former asphalt paving. PAHs were not associated with the cooling water or radioactive liquid waste managed at this site. Therefore, the PAHs detected in samples used to characterize this site [acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenanthrene; and pyrene] are associated with the former paved area, are not related to historical Laboratory site operations, and are not COPCs.

Organic COPCs

Other organic chemicals detected at AOC 02-004(f) include acetone, Aroclor-1248, Aroclor-1254, Aroclor-1260, bis(2-ethylhexyl)phthalate, chloroform, di-n-butylphthalate, isopropylbenzene, methylene chloride, pentachlorophenol, and toluene. The detected organic chemicals listed are retained as COPCs.

Radionuclides

A total of 56 samples (19 soil, 18 Qal, and 19 Qbo) were analyzed for americium-241; 74 samples (27 soil, 22 Qal, and 25 Qbo) were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium; 64 samples (27 soil, 18 Qal, and 19 Qbo) were analyzed for strontium-90; and 8 soil samples were analyzed for technetium-99. Table 6.12-4 presents the radionuclides detected or detected above BVs/FVs. Figure 6.12-2 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Cesium-137 was detected below 1 ft bgs in one soil sample at an activity of 0.0454 pCi/g. Cesium-137 is retained as a COPC.

Cobalt-60 was detected in one sample at an activity of 0.11 pCi/g. Cobalt-60 is retained as a COPC.

Plutonium-239/240 was detected above the soil FV (0.054 pCi/g) in five samples, detected below 1 ft bgs in one Qal sample, and detected in two Qbo samples with a maximum activity of 0.133 pCi/g. Plutonium-239/240 is retained as a COPC.

Strontium-90 was detected below 1 ft bgs in one Qal sample at an activity of 0.716 pCi/g. Strontium-90 is retained as a COPC.

Tritium was detected in 34 samples with a maximum activity of 3.81 pCi/g. Tritium is retained as a COPC.

Uranium-235/236 was detected above the Qbt 1g, Qct, Qbo BV (0.18 pCi/g) in 4 Qbo samples with a maximum activity of 0.225 pCi/g. The maximum activity was only 0.045 pCi/g above the BV and uranium-235/236 was not detected or detected above BV in 70 other samples (detected below BV in 56 samples). The samples where uranium-235/236 was detected above BV were the deepest samples collected at each location and the results appear indicative of variations in natural background rather than a release. Uranium-235/236 is not a COPC.

6.12.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at AOC 02-004(f) are discussed below.

Inorganic Chemicals

Inorganic COPCs at AOC 02-004(f) include aluminum, antimony, arsenic, barium, cadmium, chromium, copper, hexavalent chromium, iron, lead, manganese, mercury, nickel, perchlorate, selenium, vanadium, and zinc.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV in 20 samples with a maximum concentration of 13,000 mg/kg. Concentrations increased with depth at all locations except 02-600473 and 02-612346, but the detections above BV were deep samples collected at each location and aluminum was not detected above BV in overlying soil samples. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. Concentrations decreased laterally. The residential SSL is approximately 6 times the maximum concentration, and the industrial SSL is approximately 94 times the maximum concentration. Lateral extent of aluminum is defined and further sampling for vertical extent is not warranted.

Antimony was not detected above the soil and Qbt 1g, Qct, Qbo BVs but had DLs (0.518 mg/kg to 1.28 mg/kg) above BV in four soil samples and eight tuff samples. The residential SSL is approximately 24 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV in 14 samples with a maximum concentration of 2.35 mg/kg and was not detected but had DLs (1.18 mg/kg to 1.93 mg/kg) above the BV in 11 samples. The detections above BV were deep samples collected at each location and arsenic was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. Concentrations did not change substantially laterally (1.63 mg/kg). The residential SSL is approximately 3 times the maximum concentration, and the industrial SSL is approximately 15 times the maximum concentration. The residential SSL is approximately 3.6 times the maximum DL, and the industrial SSL is approximately 18 times the maximum DL. Further sampling for extent of arsenic is not warranted.

Barium was detected above the Qbt 1g, Qct, Qbo BV in 15 samples with a maximum concentration of 109 mg/kg. The detections above BV were generally in the deepest samples collected at each location and barium was not detected above BV in overlying soil samples. Some of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations decreased laterally. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 143 times the maximum concentration. Lateral extent of barium is defined and further sampling for vertical extent is not warranted.

Cadmium was detected above the soil BV in 2 samples with a maximum concentration of 0.718 mg/kg and it was not detected but had DLs (0.481 mg/kg to 0.723 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs in 37 soil samples and 23 tuff samples. Concentrations decreased with depth at locations 02-22377 and 02-600479 and decreased laterally. The residential SSL is approximately 98 times the maximum DL. Further sampling for extent of cadmium is not warranted.

Chromium was detected above the soil and Qbt 1g, Qct, Qbo BVs in 8 soil samples and 7 tuff samples with a maximum concentration of 80.3 mg/kg and was not detected but had DLs (3.8 mg/kg to 22.7 mg/kg) above the Qbt 1g, Qct, Qbo BV in 11 samples. Concentrations increased with depth at location 02-600474, did not change substantially with depth (2.7 mg/kg) at location 02-600568, decreased with depth at all other locations, and decreased laterally (concentrations in shallow samples at locations 02-600472, 02-600475, and 02-600568 were 5.35 mg/kg, 8.64 mg/kg, and 10.2 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 7.3 times and the industrial SSL is approximately 38 times the maximum concentration where vertical extent is not defined (13.3 mg/kg at location 02-600475). The residential SSL is approximately 4.2 times the maximum DL, and the industrial SSL is approximately 22 times the maximum DL. Further sampling for extent of chromium is not warranted.

Copper was detected above the soil and Qbt 1g, Qct, Qbo BVs in three soil samples and five tuff samples with a maximum concentration of 148 mg/kg and was not detected but had DLs (4.36 mg/kg to 27.3 mg/kg) above BV in one soil sample and three tuff samples. Concentrations increased with depth at location 02-600480, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 27 times the maximum concentration where vertical extent is not defined and 115 times the maximum DL. Further sampling for extent of copper is not warranted.

Hexavalent chromium was detected in seven samples with a maximum concentration of 0.448 mg/kg. Concentrations did not change substantially with depth (0.041 mg/kg or less) at locations 02-22377 and 02-22379, decreased with depth at locations 02-22376 and 02-22378, and decreased laterally. The residential SSL is approximately 14 times and the industrial SSL is approximately 332 times the maximum concentration where vertical extent is not defined (0.217 mg/kg at location 02-22377). Further sampling for extent of hexavalent chromium is not warranted.

Iron was detected above the Qbt 1g, Qct, Qbo BV in 25 samples with a maximum concentration of 11,900 mg/kg. The detections above BV were deep samples collected at each location and iron was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. Concentrations increased laterally to the west at location 02-600566. The residential SSL is approximately 4.6 times the maximum concentration, and the industrial SSL is approximately 76 times the maximum concentration. Further sampling for extent of iron is not warranted.

Lead was also detected above the soil and Qbt 1g, Qct, Qbo BVs in one soil sample and one tuff sample with a maximum concentration of 45.6 mg/kg and was not detected but had a DL (19.5 mg/kg) above the Qbt 1g, Qct, Qbo BV in one sample. Concentrations increased with depth at location 02-600474, decreased with depth at location 02-22377, and decreased laterally. The residential SSL is approximately 8.8 times the maximum concentration, and the industrial SSL is approximately 18 times the maximum concentration. The residential SSL is approximately 20 times the maximum DL, and the industrial SSL is approximately 41 times the maximum DL. Further sampling for extent of lead is not warranted.

Manganese was detected above the Qbt 1g, Qct, Qbo BV in 17 samples with a maximum concentration of 1370 mg/kg. The detections above BV were deep samples collected at each location and manganese was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. Concentrations decreased laterally. The residential SSL is approximately 7.7 times the maximum concentration, and the industrial SSL is approximately 117 times the maximum concentration. Lateral extent of manganese is defined and further sampling for vertical extent is not warranted.

Mercury was detected above the soil and Qbt 1g, Qct, Qbo BVs in 16 soil samples and 2 tuff samples with a maximum concentration of 40.6 mg/kg. Concentrations increased with depth at location 02-22376, decreased with depth at all other locations, and increased laterally to the west at location 02-612346. Lateral extent to the west is bounded by AOC 02-004(a). The maximum concentration is 1.7 times the residential SSL, and the industrial SSL is 9.6 times the maximum concentration. Further sampling for extent of mercury is not warranted.

Nickel was detected above the Qbt 1g, Qct, Qbo BV in six samples with a maximum concentration of 6.36 mg/kg and was not detected but had DLs (2.04 mg/kg and 5.76 mg/kg) above the BV in eight samples. Concentrations increased with depth at location 02-600474; did not change substantially with depth (1.57 mg/kg or less) at locations 02-600475, 02-600568, and 02-600571; decreased with depth at locations 02-600479 and 02-600572; and decreased laterally (concentrations in shallow samples at locations 02-600475, 02-600479, 02-600568, 02-600571, and 02-600572 were 3.87 mg/kg, 6.83 mg/kg, 2.95 mg/kg, 4.3 mg/kg, and 6.79 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 245 times the maximum concentration and 271 times the maximum DL. Further sampling for extent of nickel is not warranted.

Perchlorate was detected in nine samples with a maximum concentration of 0.00657 mg/kg. Concentrations decreased with depth at all locations and did not change substantially laterally (0.006 mg/kg). The residential SSL is approximately 8,340,000 times the maximum concentration. Vertical extent of perchlorate is defined and further sampling for lateral extent is not warranted.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs in 3 soil samples and 11 tuff samples with a maximum concentration of 2.48 mg/kg and was not detected but had DLs (1.18 mg/kg to 2.17 mg/kg) above BV in 7 soil samples and 14 tuff samples. Concentrations increased with depth at locations 02-600478 and 02-600480; did not change substantially with depth (1.03 mg/kg or less) at locations 02-600469, 02-600474, 02-600475, 02-600476, 02-600477, and 02-600566; decreased with depth at locations 02-600564, 02-600565, 02-600568, and 02-600571; and did not change substantially laterally (1.65 mg/kg) (concentrations in shallow samples at locations 02-600469, 02-600474, 02-600475, 02-600476, 02-600477, and 02-600566 were 0.788 mg/kg, 1.3 mg/kg, 0.635 mg/kg, 1.38 mg/kg, 0.671 mg/kg, and 1.45 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 158 times the maximum concentration and 180 times the maximum DL. Further sampling for extent of selenium is not warranted.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV in six samples with a maximum concentration of 13.7 mg/kg. Concentrations did not change substantially with depth (1.77 mg/kg or less) at locations 02-600480, 02-600565, 02-600566, 02-600570, and 02-600572; decreased with depth at location 02-600479; and decreased laterally (concentrations in shallow samples at locations 02-600479, 02-600480, 02-600565, 02-600566, 02-600570, and 02-600572 were 13.4 mg/kg, 12.9 mg/kg, 6.56 mg/kg, 7.78 mg/kg, 7.54 mg/kg, and 6.19 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 28 times the maximum concentration. Lateral extent of vanadium is defined and further sampling for vertical extent is not warranted.

Zinc was detected above the soil BV in 14 samples with a maximum concentration of 270 mg/kg. Concentrations decreased with depth at all locations and increased laterally. The residential SSL is approximately 87 times the maximum concentration. Vertical extent of zinc is defined and further sampling for lateral extent is not warranted.

Organic Chemicals

Organic COPCs at AOC 02-004(f) include acetone, Aroclor-1248, Aroclor-1254, Aroclor-1260, bis(2-ethylhexyl)phthalate, chloroform, di-n-butylphthalate, isopropylbenzene, methylene chloride, pentachlorophenol, and toluene.

Acetone was detected in one sample at a concentration of 0.00356 mg/kg. Concentrations increased with depth and decreased laterally. The residential SSL is approximately 18,600,000 times the maximum concentration. 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 0.042 mg/kg. Concentrations increased with depth and decreased laterally. The residential SSL is approximately 58 times the maximum concentration. Lateral extent of Aroclor-1248 is defined and further sampling for vertical extent is not warranted.

Aroclor-1254 was detected in 33 samples with a maximum concentration of 0.822 mg/kg. Concentrations increased with depth at locations 02-612623 and 02-612624; only one depth was sampled at location 02-600567; concentrations did not change substantially with depth (0.054 mg/kg or less) at locations 02-612359, 02-613005, and 02-613625; concentrations decreased with depth at all other locations; and concentrations decreased laterally. The residential SSL is approximately 1.4 times the maximum concentration, and the industrial SSL is approximately 13 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 55 samples with a maximum concentration of 1.11 mg/kg. Concentrations increased with depth at locations 02-600470, 02-612346, 02-612362, and 02-613624; only one depth was sampled at location 02-600567; concentrations did not change substantially with depth (0.054 mg/kg or less) at locations 02-612359, 02-612364, 02-613005, and 02-613625; concentrations decreased with depth at all other locations; and concentrations decreased laterally. The residential SSL is approximately 2.2 times the maximum concentration, and the industrial SSL is approximately 10 times the maximum concentration. The lateral extent of Aroclor-1260 is defined and further sampling for vertical extent is not warranted.

Bis(2-ethylhexyl)phthalate was detected in one sample at a concentration of 0.591 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

Chloroform was detected in two samples with a maximum concentration of 0.000317 mg/kg. Concentrations increased with depth at all locations and decreased laterally. The detected concentrations were below EQLs. The residential SSL is approximately 18,400 times the maximum concentration. Lateral extent of chloroform is defined and further sampling for vertical extent is not warranted.

Di-n-butylphthalate was detected in 14 samples with a maximum concentration of 0.0954 mg/kg. Concentrations increased with depth at location 02-600476; did not change substantially with depth (0.0162 mg/kg or less) at locations 02-600469, 02-600476, 02-600564, and 02-600568; and decreased laterally. The residential SSL is approximately 64,600 times the maximum concentration. Lateral extent of di-n-butylphthalate is defined and further sampling for vertical extent is not warranted.

Isopropylbenzene was detected in one sample at a concentration of 0.00251 mg/kg. Concentrations increased with depth and decreased laterally. The residential SSL is approximately 936,000 times the maximum concentration. Lateral extent of isopropylbenzene is defined and further sampling for vertical extent is not warranted.

Methylene chloride was detected in six samples with a maximum concentration of 0.00968 mg/kg. Concentrations increased with depth at location 02-600475, did not change substantially with depth (0.00409 mg/kg) at location 02-600477, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 42,200 times the maximum concentration. Lateral extent of methylene chloride is defined and further sampling for vertical extent is not warranted.

Pentachlorophenol was detected in one sample at a concentration of 0.301 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of pentachlorophenol are defined.

Toluene was detected in six samples with a maximum concentration of 0.00112 mg/kg. Only one depth was sampled at location 02-600470, and concentrations decreased with depth at all other locations and decreased laterally. The residential SSL is approximately 4,660,000 times the maximum concentration. Lateral extent of toluene is defined and further sampling for vertical extent is not warranted.

Radionuclides

Radionuclide COPCs at AOC 02-004(f) include cesium-137, cobalt-60, plutonium-239/240, strontium-90, and tritium.

Cesium-137 was detected below 1 ft bgs in one soil sample at an activity of 0.0454 pCi/g. Activities increased with depth and decreased laterally. The residential SAL is approximately 264 times the maximum activity. Lateral extent of cesium-137 is defined and further sampling for vertical extent is not warranted.

Cobalt-60 was detected in one sample at an activity of 0.11 pCi/g. Activities decreased with depth and decreased laterally. Lateral and vertical extent of cobalt-60 are defined.

Plutonium-239/240 was detected above the soil FV in five samples, detected below 1 ft bgs in one Qal sample, and detected in two Qbo samples with a maximum activity of 0.133 pCi/g. Activities increased with depth at locations 02-600476 and 02-600480, decreased with depth at all other locations, and decreased laterally. Lateral extent of plutonium-239/240 is defined and further sampling for vertical extent is not warranted.

Strontium-90 was detected below 1 ft bgs in one Qal sample at an activity of 0.716 pCi/g. Activities decreased with depth and decreased laterally. Lateral and vertical extent of strontium-90 are defined.

Tritium was detected in 34 samples with a maximum activity of 3.81 pCi/g. Activities increased with depth at locations 02-22379, 02-600473, and 02-600570; did not change substantially with depth (0.0139 pCi/g or less) at location 02-22377; decreased with depth at all other locations; and decreased laterally. Lateral extent of tritium is defined and further sampling for vertical extent is not warranted.

Summary of Nature and Extent at AOC 02-004(f)

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at AOC 02-004(f).

6.12.5 Summary of Human Health Risk Screening

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} (NMED 2017, 602273). The industrial HI is 0.009, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 1×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.02, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.03 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Residential Scenario

The total excess cancer risk for the residential scenario is 4×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.01, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The residential exposure scenario also demonstrates protection of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, residential, and construction worker scenarios at AOC 02-004(f).

6.12.6 Summary of Ecological Risk Screening

AOC 02-004(f) is within the TA-02 core area. Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and results of site-specific ecological risk studies, no potential ecological risks exist for the TA-02 core area.

6.13 AOC 02-004(g), Soil Contamination

6.13.1 Site Description and Operational History

AOC 02-004(g) was a 300-gal. portable storage tank located on a platform near the guard station (structure 02-12) at the west end of the OWR facility (Figure 6.13-1).

The storage tank was used for temporarily storing liquids to supplement the three OWR effluent storage tanks [AOCs 02-004(b,c,d)]. The portable aboveground storage tank was installed and began operations in 1962 (Bunker 1985, 036231). The platform and portable aboveground storage tank were removed by 1993, but removal and disposal details are not available (LANL 1993, 015314).

6.13.2 Relationship to Other SWMUs and AOCs

The portable aboveground storage tank was used to supplement the capacity of the three OWR effluent storage tanks, AOCs 02-004(b,c,d), which received effluent from the ion exchange system of the OWR [AOC 02-004(a)] and from the floor of the OWR equipment building [AOC 02-004(f)].

6.13.3 Summary of Previous Investigations

6.13.3.1 2003 Omega West Decommissioning Project

The portable aboveground storage tank platform area was decommissioned and evaluated during the 2003 D&D activities. Site activities included soil excavation, radiological walkover surveys, radiological (structure) screening, soil sampling, sample analysis, and surveying of sample coordinates. Limited soil surveys were conducted; however, no formal report of soil survey results is available.

Samples were collected from five boreholes (locations 02-22383 to 02-22387) near the former location of the storage tank as part of the 2003 D&D activities at AOC 02-004(g) (WD-3 2003, 082646, pp. 1–6).

6.13.3.2 2007 Investigation Activities

Twenty-one samples were collected from nine locations at AOC 02-004(g) in 2007. Results from the sampling activities in 2007 were presented in the previous investigation report (LANL 2008, 101669.12). Additional sampling was required to define the extent of contamination at the site.

6.13.4 Site Contamination

6.13.4.1 Soil, Rock, and Sediment Sampling

As part of the 2010 investigation, the following characterization activities were conducted at AOC 02-004(g):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Five samples were collected from location 02-612293 near AOC 02-004(g) from 5–6 ft, 15–16 ft, 25–26 ft, 35–36 ft, and 49–50 ft bgs. These samples were analyzed for TAL metals, PCBs, SVOCs, americium-241, gamma-emitting radionuclides, isotopic plutonium, strontium-90, and tritium.

The 2010 and historical sampling locations at AOC 02-004(g) are shown in Figure 6.13-1. Table 6.13-1 presents the samples collected and analyses requested for AOC 02-004(g). The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

6.13.4.2 Soil, Rock, and Sediment Sample Field-Screening Results

No organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of the samples. No radiological-screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. No changes to sampling or other activities occurred because of the field-screening results.

6.13.4.3 Soil, Rock, and Sediment Sample Analytical Results

Decision-level data at AOC 02-004(g) consist of results from 34 samples collected from 15 locations in 2003, 2007, and 2010. The 34 samples include 15 soil/fill, 9 Qal, and 9 Qbo samples and 1 sediment sample.

Inorganic Chemicals

A total of 34 samples (15 soil, 9 Qal, 9 Qbo, and 1 sediment) were analyzed for TAL metals, 8 soil samples were analyzed for hexavalent chromium, and 21 samples (7 soil, 7 Qal, 6 Qbo, and 1 sediment) were analyzed for nitrate, perchlorate, and total cyanide. Table 6.13-2 presents the inorganic chemicals detected or detected above BVs. Plate 19 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV (3560 mg/kg) in seven samples with a maximum concentration of 12,500 mg/kg. The Gehan and quantile tests indicated site concentrations of aluminum in tuff are statistically different from background (Figure G-91 and Table G-14). Aluminum is retained as a COPC.

Antimony was not detected above the soil and Qbt 1g, Qct, Qbo BVs (0.83 mg/kg and 0.5 mg/kg) but had DLs (0.536 mg/kg to 1.33 mg/kg) above BV in one soil sample and four tuff samples, and the DLs exceeded the maximum Qbo background concentration (0.2 mg/kg) in four samples. There were too few detections to perform statistical tests. Antimony is retained as a COPC.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV (0.56 mg/kg) in four samples with a maximum concentration of 1.57 mg/kg and was not detected but had DLs (1.17 mg/kg to 1.8 mg/kg) above the BV in five samples. There were too few detections to perform statistical tests. Arsenic is retained as a COPC.

Barium was detected above the Qbt 1g, Qct, Qbo BV (25.7 mg/kg) in five samples with a maximum concentration of 72.4 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in tuff are statistically different from background (Figure G-92 and Table G-14). Barium is retained as a COPC.

Cadmium was detected above the soil BV (0.4 mg/kg) in 1 sample at a concentration of 0.958 mg/kg and was not detected but had DLs (0.501 mg/kg to 0.668 mg/kg) above the soil BV and sediment and Qbt 1g, Qct, Qbo BVs (0.4 for both) in 15 soil samples, 1 sediment sample, and 9 tuff samples. The quantile and slippage tests indicated site concentrations of cadmium in soil are statistically different from background (Figure G-93 and Table G-15). Cadmium is retained as a COPC.

Calcium was detected above the soil BV (6120 mg/kg) in one sample at a concentration of 6610 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in soil are not statistically different from background (Figure G-94 and Table G-15). Calcium is not a COPC.

Chromium was detected above soil and Qbt 1g, Qct, Qbo BVs (19.3 mg/kg and 2.6 mg/kg) in three soil samples and four tuff samples with a maximum concentration of 56.4 mg/kg and was not detected but had DLs (9.21 mg/kg and 19.5 mg/kg) above the Qbt 1g, Qct, Qbo BV in two samples. The quantile and slippage tests indicated site concentrations of chromium in soil are statistically different from background (Figure G-95 and Table G-15). The Gehan and quantile tests indicated site concentrations of chromium in tuff are statistically different from background (Figure G-96 and Table G-14). Chromium is retained as a COPC.

Copper was detected above the soil and Qbt 1g, Qct, Qbo BVs (14.7 mg/kg and 3.96 mg/kg) in two soil samples and one tuff sample with a maximum concentration of 51.3 mg/kg. The quantile and slippage tests indicated site concentrations of copper in soil are statistically different from background (Figure G-97 and Table G-15). The Gehan and quantile tests indicated site concentrations of copper in tuff are not statistically different from background (Figure G-98 and Table G-14). Copper is retained as a COPC.

Hexavalent chromium was detected in five samples with a maximum concentration of 0.262 mg/kg. Hexavalent chromium is retained as a COPC.

Iron was detected above the Qbt 1g, Qct, Qbo BV (3700 mg/kg) in nine samples with a maximum concentration of 7880 mg/kg. The Gehan and quantile tests indicated site concentrations of iron in tuff are statistically different from background (Figure G-99 and Table G-14). Iron is retained as a COPC.

Lead was detected above the soil BV (22.3 mg/kg) in two samples with a maximum concentration of 53.9 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil are not statistically different from background (Figure G-100 and Table G-15). Lead is not a COPC.

Manganese was detected above the soil and Qbt 1g, Qct, Qbo BVs (671 mg/kg and 189 mg/kg) in one soil sample and eight tuff samples with a maximum concentration of 698 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in soil are not statistically different from background (Figure G-101 and Table G-15) but site concentrations of manganese in tuff are statistically different from background (Figure G-102 and Table G-14). Manganese is retained as a COPC.

Mercury was detected above the soil BV (0.1 mg/kg) in four samples with a maximum concentration of 1.07 mg/kg. Mercury is retained as a COPC.

Nickel was detected above the Qbt 1g, Qct, Qbo BV (2 mg/kg) in two samples with a maximum concentration of 3.81 mg/kg and was not detected but had DLs (2.43 mg/kg and 3.56 mg/kg) above the BV in two samples. There are too few detections in the tuff background data set to perform statistical tests. Nickel is retained as a COPC.

Nitrate was detected in 13 samples with a maximum concentration of 4.55 mg/kg. Nitrate is naturally occurring, and the concentrations likely reflect naturally occurring levels. In addition, AOC 02-004(g) managed liquid radioactive waste from the OWR and is not a source of nitrate. Nitrate is not a COPC.

Perchlorate was detected in two samples with a maximum concentration of 0.000966 mg/kg. Perchlorate is identified as a COPC.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs (1.52 mg/kg and 0.3 mg/kg) in six soil samples and four tuff samples with a maximum concentration of 14.7 mg/kg and was not detected but had DLs (1.17 mg/kg to 1.77 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs and sediment BV (0.3 mg/kg) in one soil sample, five tuff samples, and one sediment sample. The Gehan and quantile tests indicated site concentrations of selenium in soil are statistically different from background (Figure G-103 and Table G-15). Selenium is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in five samples with a maximum concentration of 92.8 mg/kg. The Gehan test indicated site concentrations of zinc in soil are statistically different from background (Table G-15). However, the quantile and slippage tests indicated site concentrations of zinc in soil are not statistically different from background (Figure G-104 and Table G-15). Zinc is not a COPC.

Organic Chemicals

A total of 21 samples (7 soil, 7 Qal, 6 Qbo, and 1 sediment) were analyzed for dioxins and furans, 26 samples (7 soil, 9 Qal, 9 Qbo, and 1 sediment) were analyzed for PCBs and SVOCs, and 12 samples (6 Qal and 6 Qbo) were analyzed for VOCs. Table 6.13-3 presents the detected organic chemicals. Plate 20 shows the spatial distribution of detected organic chemicals.

Dioxins and Furans

Dioxins and furans are frequently detected as a result of environmental sampling but generally are not associated with industrial activities conducted at the Laboratory or released from SWMUs or AOCs being investigated at the Laboratory. The investigation work plan for Middle Los Alamos Canyon Aggregate Area (LANL 2006, 092571.12) notes the potential for presence of dioxins and furans in the OWR fuel pit recirculation pump system, and a small percentage of the investigation samples collected around the OWR were analyzed for dioxins and furans to determine whether a release may have occurred. If the results were indicative of a release, additional sampling for dioxins and furans would be proposed. Based on the results of the 2007 sampling, additional sampling for dioxins and furans was not proposed for the Phase II investigation and was not performed.

Dioxins and furans are known to be widely distributed in the environment from a number of sources, both natural, such as forest fires, and anthropogenic, such as industrial sources and burning of municipal trash and other waste materials. Industrial sources of dioxins and furans are primarily associated with impurities in the production of chlorinated chemical products (e.g., pentachlorophenol, chlorinated herbicides) and the wastes associated with production of those materials. Another industrial source is the pulp and paper industry and processes that bleach wood pulp (EPA 2006, 600913). None of these common industrial process-related source activities have occurred at the Laboratory. Other anthropogenic sources of dioxins and furans include the combustion of materials containing chlorine, such as the incineration of municipal trash containing chlorinated plastics, and other waste materials (EPA 2006, 600913). Forest fires have occurred in the Los Alamos area, including upgradient of TA-02 in the Los Alamos Canyon watershed, and are a potential source of dioxins and furans.

Polycyclic Aromatic Hydrocarbons

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

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

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

Site Activities

AOC 02-004(g) was a radioactive liquid waste storage tank and was identified as an AOC because of possible radioactive soil contamination resulting from releases of radionuclides. As noted above, the potential for dioxins and furans to have been associated with the OWR fuel pit was noted and some samples collected in 2007 around the former OWR facility were analyzed for dioxins and furans, but the results of the 2007 sampling were not indicative of a release and no additional sampling was required or performed. There are no known site-related sources of PAHs.

The dioxin and furan congeners detected at AOC 02-004(g) were detected at concentrations ranging from 0.0000000289 mg/kg to 0.015 mg/kg, with hepta- and hexa-chlorinated congeners being the most frequently detected. These results likely reflect natural and/or anthropogenic background rather than a site-related release. The dioxin and furan congeners detected in samples used to characterize this site [1,2,3,4,6,7,8-heptachlorodibenzodioxin; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,6,7,8,9-hexachlorodibenzofuran; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; 2,3,7,8-tetrachlorodibenzodioxin; and 2,3,7,8-tetrachlorodibenzofuran] are not related to historical Laboratory site operations and are not COPCs.

The AOC 02-004(g) tank was located within a paved area, which was removed as part of D&D. All samples with detectable PAHs at this site were surface samples or shallow subsurface samples, which would have been beneath the former asphalt paving. PAHs were not associated with the radioactive liquid waste managed at this site. Therefore, the PAHs detected in samples used to characterize this site [acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenanthrene; and pyrene] are associated with the former paved area, are not related to historical Laboratory site operations, and are not COPCs.

Organic COPCs

Other organic chemicals detected at AOC 02-004(g) include Aroclor-1254, Aroclor-1260, chloroform, di-n-butylphthalate, methylene chloride, tetrachloroethene, toluene, and trichloroethene. The detected organic chemicals listed are retained as COPCs.

Radionuclides

A total of 26 samples (7 soil, 9 Qal, 9 Qbo, and 1 sediment) were analyzed for americium-241; 34 samples (15 soil, 9 Qal, 9 Qbo, and 1 sediment) were analyzed for gamma-emitting radionuclides, isotopic plutonium, and strontium-90; 29 samples (15 soil, 7 Qal, 6 Qbo, and 1 sediment) were analyzed for isotopic uranium; 8 soil samples were analyzed for technetium-99; and 33 samples (15 soil, 9 Qal, 8 Qbo, and 1 sediment) were analyzed for tritium. Table 6.13-4 presents the radionuclides detected or detected above BVs/FVs. Figure 6.13-2 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Americium-241 was detected above the soil FV (0.013 pCi/g) in one sample at an activity of 0.165 pCi/g. Americium-241 is retained as a COPC.

Cesium-137 was detected above the soil FV (1.65 pCi/g) in one sample and detected below 1 ft bgs in one soil sample with a maximum activity of 2.88 pCi/g. Cesium-137 is retained as a COPC.

Cobalt-60 was detected in one sample at an activity of 0.504 pCi/g. Cobalt-60 is retained as a COPC.

Plutonium-239/240 was detected above the soil and sediment FVs (0.054 pCi/g and 0.068 pCi/g) in five soil samples and one sediment sample and was detected below 1 ft bgs in four soil and Qal samples with a maximum activity of 1.85 pCi/g. Plutonium-239/240 is retained as a COPC.

Strontium-90 was detected below 1 ft bgs in two soil samples with a maximum activity of 0.233 pCi/g. Strontium-90 is retained as a COPC.

Tritium was detected in 11 samples with a maximum activity of 0.187 pCi/g. Tritium is retained as a COPC.

6.13.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at AOC 02-004(g) are discussed below.

Inorganic Chemicals

Inorganic COPCs at AOC 02-004(g) include aluminum, antimony, arsenic, barium, cadmium, chromium, copper, hexavalent chromium, iron, manganese, mercury, nickel, perchlorate, and selenium.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV in seven samples with a maximum concentration of 12,500 mg/kg. Concentrations increased with depth at all locations, but the detections above BV were deep samples collected at each location and aluminum was not detected above BV in overlying soil samples. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. Concentrations decreased laterally. The residential SSL is approximately 6.2 times the maximum concentration, and the industrial SSL is approximately 103 times the maximum concentration. Lateral extent of aluminum is defined and further sampling for vertical extent is not warranted.

Antimony was not detected above the soil and Qbt 1g, Qct, Qbo BVs but had DLs (0.536 mg/kg to 1.33 mg/kg) above BV in one soil sample and four tuff samples. The residential SSL is approximately 24 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV in four samples with a maximum concentration of 1.57 mg/kg and was not detected but had DLs (1.17 mg/kg to 1.8 mg/kg) above the BV in five samples. Concentrations did not change substantially with depth (0.88 mg/kg) at location 02-600490; decreased with depth at locations 02-600492, 02-600494, and 02-600497; and did not change substantially laterally (0.842 mg/kg) (concentrations in shallow samples at locations 02-600490, 02-600492, 02-600494, and 02-600497 were 2.23 mg/kg, 2.21 mg/kg, 2.77 mg/kg and 3.13 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 4.5 times the maximum concentration, and the industrial SSL is approximately 23 times the maximum concentration. The residential SSL is approximately 3.9 times the maximum DL, and the industrial SSL is approximately 20 times the maximum DL. Further sampling for extent of arsenic is not warranted.

Barium was detected above the Qbt 1g, Qct, Qbo BV in five samples with a maximum concentration of 72.4 mg/kg. Concentrations increased with depth at location 02-600492; did not change substantially with depth (3 mg/kg) at location 02-600490; decreased with depth at locations 02-600491, 02-600494, and 02-600497; and did not change substantially laterally (0.842 mg/kg) and decreased laterally (concentrations in shallow samples at locations 02-600490, 02-600491, 02-600494, and 02-600497 were 54.3 mg/kg, 60.4 mg/kg, 55.5 mg/kg and 44.3 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 215 times the maximum concentration. Further sampling for extent of barium is not warranted.

Cadmium was detected above the soil BV in one sample at a concentration of 0.958 mg/kg and was not detected but had DLs (0.501 mg/kg to 0.668 mg/kg) above the soil; sediment; and Qbt 1g, Qct, Qbo BVs in 15 soil samples, 1 sediment sample, and 9 tuff samples. Concentrations decreased with depth at location 02-600495 and decreased laterally. The residential SSL is approximately 105 times the maximum BV. Further sampling for extent of cadmium is not warranted.

Chromium was detected above soil and Qbt 1g, Qct, Qbo BVs in three soil samples and four tuff samples with a maximum concentration of 56.4 mg/kg and was not detected but had DLs (9.21 mg/kg and 19.5 mg/kg) above the Qbt 1g, Qct, Qbo BV in two samples. Concentrations did not change substantially with depth (1.35 mg/kg) at location 02-600492; decreased with depth at locations 02-600491, 02-600493, and 02-600494; and did not change substantially laterally (5.7 mg/kg) (concentrations in shallow samples at locations 02-600491 and 02-600492 were 7.95 mg/kg and 9.42 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 12 times and the industrial SSL is approximately 63 times the maximum concentration where vertical extent is not defined (8.07 mg/kg at location 02-600492). The residential SSL is approximately 4.9 times the maximum DL, and the industrial SSL is approximately 26 times the maximum DL. Further sampling for extent of chromium is not warranted.

Copper was detected above the soil and Qbt 1g, Qct, Qbo BVs in two soil samples and one tuff sample with a maximum concentration of 51.3 mg/kg. Concentrations increased with depth at location 02-600490, decreased with depth at locations 02-600493 and 02-600494, and increased laterally. The residential SSL is approximately 61 times the maximum concentration. Further sampling for extent of copper is not warranted.

Hexavalent chromium was detected in five samples with a maximum concentration of 0.262 mg/kg. Concentrations increased with depth at location 02-22385; decreased with depth at locations 02-22383, 02-22384, and 02-22386; and did not change substantially laterally (1.96 mg/kg). The residential SSL is approximately 12 times the maximum concentration, and the industrial SSL is approximately 275 times the maximum concentration. Further sampling for extent of hexavalent chromium is not warranted.

Iron was detected above the Qbt 1g, Qct, Qbo BV in nine samples with a maximum concentration of 7880 mg/kg. Concentrations decreased with depth at all locations (concentrations in shallow samples at locations 02-600490, 02-600491, 02-600492, 02-600493, 02-600494, 02-600497, and 02-612293 were 8050 mg/kg, 7200 mg/kg, 7020 mg/kg, 11,600 mg/kg, 8040 mg/kg, 6980 mg/kg, and 8990 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]) and increased laterally. The residential SSL is approximately 6.9 times the maximum concentration, and the industrial SSL is approximately 115 times the maximum concentration. Vertical extent of iron is defined and further sampling for lateral extent is not warranted.

Manganese was detected above the soil and Qbt 1g, Qct, Qbo BVs in one soil sample and eight tuff samples with a maximum concentration of 698 mg/kg. Concentrations did not change substantially with depth (2 mg/kg) at location 02-600497, decreased with depth at all other locations, and decreased laterally (concentrations in shallow samples at locations 02-600490, 02-600491, 02-600492, 02-600493, 02-600494, and 02-600497 were 420 mg/kg, 286 mg/kg, 253 mg/kg, 439 mg/kg, 275 mg/kg, and 208 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]) and increased laterally. The residential SSL is approximately 15 times the maximum concentration, and the industrial SSL is approximately 229 times the maximum concentration. Lateral extent of manganese is defined and further sampling for lateral extent is not warranted.

Mercury was detected above the soil BV in four samples with a maximum concentration of 1.07 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of mercury are defined.

Nickel was detected above the Qbt 1g, Qct, Qbo BV in two samples with a maximum concentration of 3.81 mg/kg and was not detected but had DLs (2.43 mg/kg and 3.56 mg/kg) above the BV in two samples. Concentrations did not change substantially with depth (0.73 mg/kg) at location 02-600492, decreased with depth at location 02-600494, and did not change substantially laterally (1.31 mg/kg) (concentrations in shallow samples at locations 02-600492 and 02-600494 were 3.23 mg/kg and 8.9 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 409 times the maximum concentration. Further sampling for extent of nickel is not warranted.

Perchlorate was detected in two samples with a maximum concentration of 0.000966 mg/kg. Concentrations decreased with depth at all locations and did not change substantially laterally (0.000346 mg/kg). The residential SSL is approximately 56,700 times the maximum concentration. Vertical extent of perchlorate is defined and further sampling for lateral extent is not warranted.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs in six soil samples and four tuff samples with a maximum concentration of 14.7 mg/kg and was not detected but had DLs (1.17 mg/kg to 1.77 mg/kg) above the soil; sediment; and Qbt 1g, Qct, Qbo BVs in one soil sample, five tuff samples, and one sediment sample. Concentrations increased with depth at location 02-600494, did not change substantially with depth (0.28 mg/kg) at location 02-600497, decreased with depth at all other locations, and increased laterally. The residential SSL is approximately 42 times the maximum concentration. Further sampling for extent of selenium is not warranted.

Organic Chemicals

Organic COPCs at AOC 02-004(g) include Aroclor-1254; Aroclor-1260; chloroform; di-n-butylphthalate; methylene chloride; tetrachloroethene; toluene; and trichloroethene.

Aroclor-1254 was detected in five samples with a maximum concentration of 0.0528 mg/kg. Concentrations decreased with depth at all locations and did not change substantially laterally (0.0283 mg/kg). The residential SSL is approximately 22 times the maximum concentration, and the industrial SSL is approximately 208 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 five samples with a maximum concentration of 0.382 mg/kg. Concentrations decreased with depth at all locations and did not change substantially laterally (0.0348 mg/kg). The residential SSL is approximately 64 times the maximum concentration. The vertical extent of Aroclor-1260 is defined and further sampling for lateral extent is not warranted.

Chloroform was detected in one sample at a concentration of 0.000313 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of chloroform are defined.

Di-n-butylphthalate was detected in three samples with a maximum concentration of 0.0703 mg/kg. Concentrations increased with depth at location 02-600493, did not change substantially with depth (0.0143 mg/kg) at location 02-600491, and decreased laterally. The residential SSL is approximately 87,600 times the maximum concentration. Lateral extent of di-n-butylphthalate is defined and further sampling for vertical extent is not warranted.

Methylene chloride was detected in one sample at a concentration of 0.00254 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of methylene chloride are defined.

Tetrachloroethene was detected in one sample at a concentration of 0.000302 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of tetrachloroethene are defined.

Toluene was detected in three samples with a maximum concentration of 0.00336 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of toluene are defined.

Trichloroethene was detected in one sample at a concentration of 0.000884 mg/kg. Concentrations decreased with depth and increased laterally. The detected concentration was below the EQL. The residential SSL is approximately 7600 times the maximum concentration. Vertical extent of trichloroethene is defined and further sampling for lateral extent is not warranted.

Radionuclides

Radionuclide COPCs at AOC 02-004(g) include americium-241, cesium-137, cobalt-60, plutonium-239/240, strontium-90, and tritium.

Americium-241 was detected above the soil FV in one sample at an activity of 0.165 pCi/g. Activities decreased with depth and increased laterally. The residential SAL is approximately 503 times the maximum activity. Vertical extent of americium-241 is defined and further sampling for lateral extent is not warranted.

Cesium-137 was detected above the soil FV in one sample and detected below 1 ft bgs in one soil sample with a maximum activity of 2.88 pCi/g. Activities decreased with depth at all locations and increased laterally. The residential SAL is approximately 4.2 times the maximum activity, and the industrial SAL is approximately 14 times the maximum activity. Vertical extent of cesium-137 is defined and further sampling for lateral extent is not warranted.

Cobalt-60 was detected in one sample at an activity of 0.504 pCi/g. Activities decreased with depth and increased laterally. The residential SAL is approximately 5.2 times the maximum activity, and the industrial SAL is approximately 18 times the maximum activity. Vertical extent of cobalt-60 is defined and further sampling for lateral extent is not warranted.

Plutonium-239/240 was detected above the soil and sediment FVs in five soil samples and one sediment sample and was detected below 1 ft bgs in four soil and Qal samples with a maximum activity of 1.85 pCi/g. Activities increased with depth at location 02-22385, decreased with depth at all other locations, and increased laterally. The residential SAL is approximately 43 times the maximum activity. Further sampling for extent of plutonium-239/240 is not warranted.

Strontium-90 was detected below 1 ft bgs in two soil samples with a maximum activity of 0.233 pCi/g. Activities increased with depth at all locations and decreased laterally. The residential SAL is approximately 64 times the maximum activity. Lateral extent of strontium-90 is defined and further sampling for vertical extent is not warranted.

Tritium was detected in 11 samples with a maximum activity of 0.187 pCi/g. Activities increased with depth at location 02-22385 and 02-600491, did not change substantially with depth (0.0151 pCi/g or less) at locations 02-22383 and 02-22384, decreased with depth at all other locations, and increased laterally. The residential SAL is approximately 9090 times the maximum activity. Further sampling for extent of tritium is not warranted.

Summary of Nature and Extent at AOC 02-004(g)

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at AOC 02-004(g).

6.13.5 Summary of Human Health Risk Screening

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} (NMED 2017, 602273). The industrial HI is 0.004, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 9×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.01, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.4 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

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} (NMED 2017, 602273). The residential HI is 0.05, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 13 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The residential exposure scenario also demonstrates protection of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, residential, and construction worker scenarios at AOC 02-004(g).

6.13.6 Summary of Ecological Risk Screening

AOC 02-004(g) is within the TA-02 core area. Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and results of site-specific ecological risk studies, no potential ecological risks exist for the TA-02 core area.

6.14 SWMU 02-005, Soil Contamination

6.14.1 Site Description and Operational History

SWMU 02-005 consists of an area potentially affected by airborne drift of potassium dichromate that was used to inhibit corrosion in the OWR cooling tower (structure 02-49) (Figure 6.14-1).

The cooling tower was installed and became operational in 1957. It was constructed with aluminum heat exchangers that were prone to corrosion. Potassium dichromate was added to the make-up water to inhibit corrosion of the heat exchangers. Stainless-steel heat exchangers were installed to eliminate the use of potassium dichromate in 1975 (LANL 1993, 015314).

The cooling tower operated until the OWR was shut down in 1993. In 1995, all liquid was drained from the system (WD-3 2003, 082646, p. 2). In 2000, the cooling tower structure and equipment were removed and disposed of at TA-54 (LANL 2000, 090087). In 2003, the remaining buried pipes and drains were removed and disposed of at TA-54 or Envirocare (WD-3 2003, 082646, pp. 26–31).

6.14.2 Relationship to Other SWMUs and AOCs

SWMU 02-005 is located north of the former structures of the OWR facility. The SWMU originated from the water used in the OWR cooling tower (structure 02-49), which is not a distinct SWMU or AOC.

6.14.3 Summary of Previous Investigations

6.14.3.1 1995 Investigation Activities

Soil samples were collected in 1994 and 1995. Supporting QA/QC information is not available for these samples, so the sample results are not included in this report.

6.14.3.2 2007 Investigation Activities

Twenty-eight samples were collected from sixteen locations at SWMU 02-005 in 2007. Results from the sampling activities in 2007 were presented in the previous investigation report (LANL 2008, 101669.12). Additional sampling was required to define the extent of contamination at the site.

6.14.4 Site Contamination

6.14.4.1 Soil and Rock Sampling

As part of the 2010 investigation, the following characterization activities were conducted at SWMU 02-005:

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Excavation could not be performed at location 02-600561, which is on a steep rocky slope inaccessible by mechanized equipment. As shown in Figure 6.14-2, access was limited to areas between boulders, and excavation was not practicable because of inaccessibility of equipment. Instead, deeper and step-out samples were collected to evaluate the extent of PCB contamination at location 02-600561. Samples were collected below the surface soil at location 02-600561 (1–1.2 ft and 2–2.2 ft bgs), and from seven step-out locations: 4 ft and 8 ft to the north (1–1.2 ft and 2–2.2 ft bgs from location 02-612379, and 1–1.2 ft bgs from location 02-613291, respectively), 4 ft to the south (1–1.2 ft and 2–2.2 ft bgs from location 02-612377), 4 ft and 8 ft to the east (1–1.2 ft and 2–2.2 ft bgs from location 02-612376, and 2–2.2 ft and 4–4.2 ft bgs from location 02-613622, respectively), and 4 ft and 8 ft to the west (1–1.2 ft and 2–2.2 ft bgs from location 02-612378, and 2–2.2 ft and 4–4.2 ft bgs from location 02-613290, respectively). These samples were analyzed for PCBs only.
- Three samples were collected from location 02-612407 near previous location 02-600559 from 0–0.5 ft, 4–5 ft, and 9–10 ft bgs. These samples were analyzed for TAL metals, hexavalent chromium, total cyanide, PCBs, SVOCs, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium.
- Sixteen samples were collected from eight locations (02-612379 to 02-612386) farther north than the previous sampling locations on the south-facing slope from 0–0.5 ft and 1.5–2.5 ft bgs. These samples were analyzed for TAL metals, americium-241, gamma-emitting radionuclides, isotopic plutonium, and tritium.

Additional sampling was performed in 2017–2018 to define the extent of PCB contamination detected in the westernmost samples previously collected at SWMU 02-005.

- Twenty samples were collected from ten step out locations around the previous locations. A surface sample was collected at each location and additional depth intervals were sampled if possible, barring refusal from the hand auger. All samples were analyzed for PCBs.
- Twelve samples were collected from six additional locations based on the results from the first sampling event. Samples were generally collected from intervals of 0–1 ft and 2–3 ft bgs, with some adjustments for site conditions. All samples were analyzed for PCBs.

The 2010, 2017–2018, and historical sampling locations at SWMU 02-005 are shown in Figures 6.14-1 and 6.14-2. Table 6.14-1 presents the samples collected and analyses requested for SWMU 02-005. The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

6.14.4.2 Soil and Rock Sample Field-Screening Results

No organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of the samples. No radiological-screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. No changes to sampling or other activities occurred because of the field-screening results.

6.14.4.3 Soil and Rock Sample Analytical Results

Decision-level data at SWMU 02-005 consist of results from 62 samples collected from 31 locations in 2007 and 2010. The 62 samples include 49 soil and 12 Qal samples and 1 Qct sample.

Inorganic Chemicals

A total of 47 samples (34 soil, 12 Qal, and 1 Qct) were analyzed for TAL metals, 31 samples (19 soil, 11 Qal, and 1 Qct) were analyzed for hexavalent chromium, 28 samples (16 soil, 11 Qal, and 1 Qct) were analyzed for nitrate and perchlorate, and 31 samples (19 soil, 11 Qal, and 1 Qct) were analyzed for total cyanide. Table 6.14-2 presents the inorganic chemicals detected or detected above BVs. Plate 21 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 (0.926 mg/kg to 1.16 mg/kg) above the BV in 19 samples. There were too few detections to perform statistical tests. Antimony is retained as a COPC.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV (0.56 mg/kg) in one sample at a concentration of 1.51 mg/kg. There were too few Qct samples to perform statistical tests. Arsenic is retained as a COPC.

Cadmium was not detected above the soil and Qbt 1g, Qct, Qbo BVs (0.4 mg/kg for both) but had DLs (0.463 mg/kg to 0.578 mg/kg) above BV in 38 soil samples and 1 tuff sample. The DLs were only 0.063 mg/kg to 0.178 mg/kg above the BVs; the maximum DL in soil (0.578 mg/kg) is below or equivalent to the 3 highest concentrations (0.6 mg/kg, 1.4 mg/kg, and 2.6 mg/kg) and 3 highest DLs (2 mg/kg, 2 mg/kg, and 2 mg/kg) in the soil background data set; and there is no Qbt 1g, Qct, Qbo data set (the BV is based on a DL). Cadmium is not a COPC.

Chromium was detected above the Qbt 1g, Qct, Qbo BV (2.6 mg/kg) in one sample at a concentration of 6.8 mg/kg. There were too few Qct samples to perform statistical tests. Chromium is retained as a COPC.

Copper was detected above the soil BV (14.7 mg/kg) in one sample at a concentration of 34.9 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in soil are not statistically different from background (Figure G-105 and Table G-16). Copper is not a COPC.

Cyanide was detected above the soil BV (0.5 mg/kg) in 1 sample at a concentration of 0.547 mg/kg. The concentration was only 0.047 mg/kg above BV and cyanide was not detected or detected above BV in 27 samples (detected below BV in 13 samples). Cyanide is not a COPC.

Hexavalent chromium was detected in 12 samples with a maximum concentration of 1.06 mg/kg. Hexavalent chromium is retained as a COPC.

Iron was detected above the Qbt 1g, Qct, Qbo BV (3700 mg/kg) in one sample at a concentration of 5150 mg/kg. There were too few Qct samples to perform statistical tests. Iron is retained as a COPC.

Lead was detected above the soil BV (22.3 mg/kg) in four samples with a maximum concentration of 66.6 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil are not statistically different from background (Figure G-106 and Table G-16). Lead is not a COPC.

Manganese was detected above the Qbt 1g, Qct, Qbo BV (189 mg/kg) in one sample at a concentration of 304 mg/kg. There were too few Qct samples to perform statistical tests. Manganese is retained as a COPC.

Mercury was detected above the soil BV (0.1 mg/kg) in two samples with a maximum concentration of 2.17 mg/kg. Mercury is retained as a COPC.

Nickel was detected above the Qbt 1g, Qct, Qbo BV (2 mg/kg) in one sample at a concentration of 2.43 mg/kg. There were too few Qct samples to perform statistical tests. Nickel is retained as a COPC.

Nitrate was detected in 18 soil/Qal samples with a maximum concentration of 4.74 mg/kg. No background data are available for nitrate. Nitrate is naturally occurring, and the concentrations likely reflect naturally occurring levels. In addition, SWMU 02-005 is associated with cooling tower drift and is not a source of nitrate. Nitrate is not a COPC.

Perchlorate was detected in eight soil/Qal samples with a maximum concentration of 0.00253 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs (1.52 mg/kg and 0.3 mg/kg) in 19 soil samples and 1 tuff sample with a maximum concentration of 8.37 mg/kg and was not detected above the soil BV but had DLs (1.71 mg/kg to 2.24 mg/kg) above the BV in 3 samples. The quantile and slippage tests indicated site concentrations of selenium in soil are statistically different from background (Figure G-107 and Table G-16). Selenium is retained as a COPC.

Zinc was detected above the soil and Qbt 1g, Qct, Qbo BVs (48.8 mg/kg and 40 mg/kg) in 16 soil samples and 1 tuff sample with a maximum concentration of 164 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are statistically different from background (Figure G-108 and Table G-16). Zinc is retained as a COPC.

Organic Chemicals

A total of 54 samples (43 soil, 10 Qal, and 1 Qct) were analyzed for PCBs, 5 samples (4 soil and 1 Qal) were analyzed for SVOCs, and 1 Qal sample was analyzed for VOCs. Table 6.14-3 presents the detected organic chemicals. Plate 22 shows the spatial distribution of detected organic chemicals and Figure 6.14-2 shows the spatial distribution of PCBs detected to the west of SMWU 02-005.

Organic chemicals detected at SWMU 02-005 include Aroclor-1242, Aroclor-1254, Aroclor-1260, benzo(b)fluoranthene, fluoranthene, phenanthrene, pyrene, and toluene. The detected organic chemicals are retained as COPCs.

Radionuclides

A total of 47 samples (34 soil, 12 Qal, and 1 Qct) were analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, and tritium, and 31 samples (19 soil, 11 Qal, and 1 Qct) were analyzed for isotopic uranium and strontium-90. Table 6.14-4 presents the radionuclides detected or detected above BVs/FVs. Plate 23 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Americium-241 was detected above the soil FV (0.013 pCi/g) in two samples and detected below 1 ft bgs in one sample with a maximum activity of 0.139 pCi/g. Americium-241 is retained as a COPC.

Cesium-137 was detected below 1 ft bgs in six samples with a maximum activity of 0.745 pCi/g. Cesium-137 is retained as a COPC.

Plutonium-238 was detected below 1 ft bgs in one sample at an activity of 0.0138 pCi/g. Plutonium-238 is retained as a COPC.

Plutonium-239/240 was detected above the soil FV (0.054 pCi/g) in 13 samples and detected below 1 ft bgs in 6 samples with a maximum activity of 6.8 pCi/g. Plutonium-239/240 is retained as a COPC.

Tritium was detected in 11 samples with a maximum activity of 0.251 pCi/g. Tritium is retained as a COPC.

6.14.4.4 Nature and Extent of Contamination at SWMU 02-005

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 02-005 are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 02-005 include antimony, arsenic, chromium, hexavalent chromium, iron, manganese, mercury, nickel, perchlorate, selenium, and zinc.

Antimony was not detected above the soil BV but had DLs (0.926 mg/kg to 1.16 mg/kg) above the BV in 19 samples. The residential SSL is approximately 27 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 1.51 mg/kg. Concentrations decreased with depth at location 02-600554 and increased laterally (the concentration in the shallow sample at location 02-600554 was 2.53 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 4.7 times and the industrial SSL is approximately 24 times the maximum concentration. Vertical extent of arsenic is defined and further sampling for lateral extent is not warranted.

Chromium was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 6.8 mg/kg. Concentrations increased with depth at location 02-600554 and increased laterally. The residential SSL is approximately 14 times the maximum concentration, and the industrial SSL is approximately 74 times the maximum concentration. Further sampling for extent of chromium is not warranted.

Hexavalent chromium was detected in 12 samples with a maximum concentration of 1.06 mg/kg. Concentrations increased with depth at location 02-600553, did not change substantially with depth (0.056 mg/kg or less) at locations 02-600555 and 02-600559, decreased with depth at all other locations, and increased laterally. The residential SSL is approximately 2.9 times the maximum concentration, and the industrial SSL is approximately 68 times the maximum concentration. Further sampling for extent of hexavalent chromium is not warranted.

Iron was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 5150 mg/kg. Concentrations decreased with depth at location 02-600554 and increased laterally (the concentration in the shallow sample at location 02-600554 was 7100 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 11 times the maximum concentration, and the industrial SSL is approximately 176 times the maximum concentration. Vertical extent of iron is defined and further sampling for lateral extent is not warranted.

Manganese was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 304 mg/kg. Concentrations decreased with depth at location 02-600554 and increased laterally (the concentration in the shallow sample at location 02-600554 was 308 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 34 times the maximum concentration. Vertical extent of manganese is defined and further sampling for lateral extent is not warranted.

Mercury was detected above the soil BV in two samples with a maximum concentration of 2.17 mg/kg. Concentrations decreased with depth at location 02-600553 and increased laterally. The residential SSL is approximately 11 times the maximum concentration, and the industrial SSL is approximately 179 times the maximum concentration. Vertical extent of mercury is defined and further sampling for lateral extent is not warranted.

Nickel was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 2.43 mg/kg. Concentrations decreased with depth at location 02-600554 and increased laterally (the concentration in the shallow sample at location 02-600554 was 3.33 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 642 times the maximum concentration. Vertical extent of nickel is defined and further sampling for lateral extent is not warranted.

Perchlorate was detected in eight soil/Qal samples with a maximum concentration of 0.00253 mg/kg. Concentrations increased with depth at location 02-600553, only one depth was sampled at location 02-600552; concentrations did not change substantially with depth (0.000098 mg/kg) at location 02-600547, concentrations decreased with depth at all other locations, and concentrations increased laterally. The residential SSL is approximately 21,700 times the maximum concentration. Further sampling for extent of perchlorate is not warranted.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs in 19 soil samples and 1 tuff sample with a maximum concentration of 8.37 mg/kg and was not detected above the soil BV but had DLs (1.71 mg/kg to 2.24 mg/kg) above the BV in 3 samples. Only one depth was sampled at locations 02-600548, 02-600549, 02-600550, 02-600551, and 02-600552; concentrations did not change substantially with depth (0.43 mg/kg or less) at locations 02-600553, 02-600554, and 02-600560; concentrations decreased with depth at all other locations; and concentrations increased laterally. The residential SSL is approximately 47 times the maximum concentration and 175 times the maximum DL. Further sampling for extent of selenium is not warranted.

Zinc was detected above the soil and Qbt 1g, Qct, Qbo BVs in 16 soil samples and 1 tuff sample with a maximum concentration of 164 mg/kg. Concentrations increased with depth at locations 02-600554, 02-600555, and 02-612382; only one depth was sampled at locations 02-600549, 02-600550, and 02-600551; concentrations did not change substantially with depth (5.9 mg/kg or less) at locations 02-600559 and 02-612386; concentrations decreased with depth at all other locations, and concentrations increased laterally. The residential SSL is approximately 143 times the maximum concentration. Further sampling for extent of zinc is not warranted.

Organic Chemicals

Organic COPCs at SWMU 02-005 include Aroclor-1242, Aroclor-1254, Aroclor-1260, benzo(b)fluoranthene, fluoranthene, phenanthrene, pyrene, and toluene.

Aroclor-1242 was detected in one sample at a concentration of 0.0062 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of Aroclor-1242 are defined.

Aroclor-1254 was detected in 13 samples with a maximum concentration of 0.206 mg/kg. Concentrations increased with depth at location 02-613290, only one depth was sampled at locations 02-600549 and 02-600552, concentrations decreased with depth at all locations, and did not change substantially laterally (0.0283 mg/kg). The residential SSL is approximately 22 times the maximum concentration, and the industrial SSL is approximately 208 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 49 samples with a maximum concentration of 8.23 mg/kg. Concentrations increased with depth at locations 02-600559, 02-612378, 02-61498, and 02-61499; only one depth was sampled at locations 02-600548, 02-600549, 02-600550, 02-600551, 02-600552, 02-600557, 02-613291, 02-61421, 02-61423, 02-61424, and 02-61500; concentrations decreased with depth at all other locations; and decreased laterally. Vertical extent at location 02-612378 was defined by a deeper sample at location 02-613290, which is approximately 5 ft from location 02-612378. Vertical extent at location 02-61500 was defined by a deeper sample at location 02-61502, which is approximately 5 ft from location 02-61500. The residential SSL is approximately 3.0 times and the industrial SSL is approximately 13 times the maximum concentration where vertical extent is not defined (0.821 mg/kg) at location 02-61499. The lateral extent of Aroclor-1260 is defined and further sampling for vertical extent is not warranted.

Benzo(b)fluoranthene, fluoranthene, and pyrene were each detected in two samples with maximum concentrations of 0.0182 mg/kg, 0.0232 mg/kg, and 0.0283 mg/kg, respectively. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of benzo(b)fluoranthene, fluoranthene, and pyrene are defined.

Phenanthrene was detected in one sample at a concentration of 0.0149 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of phenanthrene are defined.

Toluene was detected in one sample at a concentration of 0.00142 mg/kg. Only one depth was sampled at location 02-600547 and concentrations decreased laterally. The residential SSL is approximately 3,680,000 times the maximum concentration. Lateral extent of toluene is defined and further sampling for vertical extent is not warranted.

Radionuclides

Radionuclide COPCs at SWMU 02-005 include americium-241, cesium-137, plutonium-238, plutonium-239/240, and tritium.

Americium-241 was detected above the soil FV in two samples and detected below 1 ft bgs in one sample with a maximum activity of 0.139 pCi/g. Activities increased with depth at location 02-600559, decreased with depth at location 02-612385, and increased laterally. The residential SAL is approximately 597 times the maximum activity. Further sampling for extent of americium-241 is not warranted.

Cesium-137 was detected below 1 ft bgs in six samples with a maximum activity of 0.745 pCi/g. Activities increased with depth at locations 02-600559, 02-612379, 02-612382, 02-612384, and 02-612385; decreased with depth at location 02-600554; and increased laterally. The residential SAL is approximately 16 times the maximum activity, and the industrial SAL is approximately 55 times the maximum activity. Further sampling for extent of cesium-137 is not warranted.

Plutonium-238 was detected below 1 ft bgs in one sample at an activity of 0.0138 pCi/g. Activities increased with depth and increased laterally. The residential SAL is approximately 6080 times the maximum activity. Further sampling for extent of plutonium-238 is not warranted.

Plutonium-239/240 was detected above the soil FV in 13 samples and detected below 1 ft bgs in 6 samples with a maximum activity of 6.8 pCi/g. Activities increased with depth at locations 02-600559 and 02-612384; only one depth was sampled at locations 02-600549, 02-600550, and 02-600552; activities decreased with depth at all other locations, and activities increased laterally. The residential SAL is approximately 12 times the maximum activity, and the industrial SAL is approximately 176 times the maximum activity. Further sampling for extent of plutonium-239/240 is not warranted.

Tritium was detected in 11 samples with a maximum activity of 0.251 pCi/g. Activities increased with depth at locations 02-600547, 02-600555, 02-600559, and 02-612384; only one depth was sampled at locations 02-600549, 02-600550, 02-600559, and 02-612384; activities decreased with depth at all other locations; and activities increased laterally. The residential SAL is approximately 6770 times the maximum activity. Further sampling for extent of tritium is not warranted.

Summary of Nature and Extent at SWMU 02-005

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at SWMU 02-005.

6.14.5 Summary of Human Health Risk Screening

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} (NMED 2017, 602273). The industrial HI is 0.003, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.01 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 2×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.008, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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.

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 2017, 602273). The residential HI is 0.4, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.9 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Construction Worker Scenario

The residential exposure scenario also demonstrates protection of construction workers for carcinogenic and radionuclide COPCs. The construction worker HI is approximately 1 (with manganese, see Appendix H, section H-4.5.2, Exposure Evaluation), which is equal to the NMED target HI of 1.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, residential, and construction worker scenarios at SWMU 02-005.

6.14.6 Summary of Ecological Risk Screening

SWMU 02-005 is within the TA-02 core area. Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and results of site-specific ecological risk studies, no potential ecological risks exist for the TA-02 core area.

6.15 SWMU 02-006(a), Former French Drain

6.15.1 Site Description and Operational History

SWMU 02-006(a) was an 8-ft-deep French drain system (Figure 6.15-1). The system consisted of the exhaust stack and French drain, all located in TA-61 on the Los Alamos Canyon south rim mesa top, above TA-02. The stack system was the termination point of the gaseous effluent vent line (line 119) from the OWR and WBR at TA-02.

The French drain was installed in 1948, designated as structure 02-9, and was also identified as structure 61-26, according to engineering drawing C-1716 (LASL 1948, 090083). The French drain was designed to catch condensate that collected as reactor exhaust gases cooled during venting through the tower exhaust stack. The vent stack and French drain system were active from their installation in 1948 to the OWR deactivation in 1993. The French drain system and contaminated soil were removed and disposed of during D&D activities in 2003 (LANL 2003, 090089).

6.15.2 Relationship to Other SWMUs and AOCs

The French drain is primarily related to the gaseous effluent vent line, AOC 02-003(d), which vented through the stack associated with the French drain.

6.15.3 Summary of Previous Investigations

6.15.3.1 2003 Omega West Decommissioning Project

The French drain and associated structures located in TA-61 were removed as part of the Omega West decommissioning project in 2003. Field screening and radiological surveys were performed during site characterization and D&D activities to guide soil removal and sampling activities. RESRAD computer code was used to determine radiological cleanup goals and to guide excavation (LANL 2003, 090089, p. 3).

Excavation of the French drain was conducted in three phases. First, surface soil was removed from an area approximately 30 ft × 30 ft × 1 ft deep. Second, the French drain structure was removed, resulting in an excavation 9 ft × 9 ft × 10 ft deep. Third, the drainline was removed, and an area 2 ft × 20 ft × 6 ft deep was excavated. The trench excavated at the north end of the drainline was extended to a depth of 10 ft bgs to remove contaminated soil/tuff encountered beneath that portion of the line (LANL 2003, 090089, p. 6). The excavated material was containerized in rolloff bins and shipped off-site for disposal.

A total of 2160 ft^3 of excavated material was shipped off-site for disposal at Envirocare (LANL 2003, 090089, pp. 1-8). After field screening indicated that the sides and bottom of the excavation met preestablished remediation goals, confirmation samples were collected near the north and south ends of the drainline and below the bottom of the French drain excavation.

Samples were collected from eight boreholes on the north, south, east, and west sides of the French drain structure excavation (locations 02-22055 to 02-22058) and near the north and south ends of the drainline below the bottom of the excavation (locations 02-22052 to 02-22054 and 02-22059) (LANL 2003, 090089, p. 5).

6.15.3.2 2007 Investigation Activities

Seventy-two samples were collected from twelve locations at SWMU 02-006(a) in 2007. Results from the sampling activities in 2007 were presented in the previous investigation report (LANL 2008, 101669.12). Additional sampling was required to define the extent of contamination at the site.

6.15.4 Site Contamination

6.15.4.1 Soil and Rock Sampling

As part of the 2010 investigation, the following characterization activities were conducted at SWMU 02-006(a):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Five samples were collected from location 02-612651 in the central area of the site from 5–6 ft, 15–16 ft, 25–26 ft, 35–36 ft, and 49–50 ft bgs. These samples were analyzed for tritium.
- Three samples were collected from location 02-612652 near previous location 02-600258 from 25–26 ft, 35–36 ft, and 49–50 ft bgs. These samples were analyzed for hexavalent chromium, total cyanide, and tritium.
- Fifty-five samples were collected from eleven step-out locations (02-612640 to 02-612650) from 5–6 ft, 15–16 ft, 25–26 ft, 35–36 ft, and 49–50 ft bgs. These samples were analyzed for TAL metals and tritium.

The 2010 and historical sampling locations at SWMU 02-006(a) are shown in Figure 6.15-1. Table 6.15-1 presents the samples collected and analyses requested for SWMU 02-006(a). The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

6.15.4.2 Soil and Rock Sample Field-Screening Results

No organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of the samples. No radiological-screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. No changes to sampling or other activities occurred because of the field-screening results.

6.15.4.3 Soil and Rock Sample Analytical Results

Decision-level data at SWMU 02-006(a) consist of results from 178 samples collected from 33 locations in 2003, 2007, and 2010. The 178 samples include 35 soil and 143 Qbt 3 samples.

Inorganic Chemicals

A total of 154 samples (29 soil and 125 Qbt 3) were analyzed for TAL metals, 91 samples (18 soil and 73 Qbt 3) were analyzed for hexavalent chromium, 72 samples (12 soil and 60 Qbt 3) were analyzed for nitrate and perchlorate, and 75 samples (12 soil and 63 Qbt 3) were analyzed for total cyanide. Table 6.15-2 presents the inorganic chemicals detected or detected above BVs. Plate 24 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 twelve samples with a maximum concentration of 15,750 mg/kg. The Gehan and quantile tests indicated site concentrations of aluminum in tuff are not statistically different from background (Figure G-109 and Table G-17). Aluminum is not a COPC.

Antimony was detected above the soil BV (0.83 mg/kg) in 1 sample at a concentration of 1.12 mg/kg and was not detected but had DLs (0.506 mg/kg to 1.14 mg/kg) above the soil and Qbt 2,3,4 BVs (0.5 mg/kg) in 4 soil samples and 46 tuff samples. The Gehan and quantile tests indicated site concentrations of antimony in soil are not statistically different from background (Figure G-110 and Table G-18). There were too few detections to perform statistical tests for tuff. Antimony is retained as a COPC.

Arsenic was detected above the Qbt 2,3,4 BV (2.79 mg/kg) in 16 samples with a maximum concentration of 17 mg/kg. The Gehan and quantile tests indicated site concentrations of arsenic in tuff are statistically different from background (Figure G-111 and Table G-17). Arsenic is retained as a COPC.

Barium was detected above the soil and Qbt 2,3,4 BVs (295 mg/kg and 46 mg/kg) in 1 soil sample and 24 tuff samples with a maximum concentration of 395 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in soil are not statistically different from background (Figure G-112 and Table G-18). The quantile and slippage tests indicated site concentrations of barium in tuff are statistically different from background (Figure G-113 and Table G-17). Barium is retained as a COPC.

Beryllium was detected above the Qbt 2,3,4 BV (1.21 mg/kg) in seven samples with a maximum concentration of 2.33 mg/kg. The Gehan and quantile tests indicated site concentrations of beryllium in tuff are not statistically different from background (Figure G-114 and Table G-17). Beryllium is not a COPC.

Cadmium was not detected above the soil BV (0.4 mg/kg) but had DLs (0.484 mg/kg to 0.596 mg/kg) above the BV in 24 samples. The DLs are only 0.084 mg/kg to 0.196 mg/kg above BV and the maximum DL is below or equivalent to the 3 highest concentrations (0.6 mg/kg, 1.4 mg/kg, and 2.6 mg/kg) and 3 highest DLs (2 mg/kg, 2 mg/kg, and 2 mg/kg) in the background data set. Cadmium is not a COPC.

Calcium was detected above the Qbt 2,3,4 BV (2200 mg/kg) in 12 samples with a maximum concentration of 6190 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in tuff are not statistically different from background (Figure G-115 and Table G-17). Calcium is not a COPC.

Chromium was detected above the Qbt 2,3,4 BV (7.14 mg/kg) in 13 samples with a maximum concentration of 28 mg/kg and was not detected but had DLs (7.75 mg/kg to 13 mg/kg) above the BV in 6 samples. The Gehan and quantile tests indicated site concentrations of chromium in tuff are statistically different from background (Figure G-116 and Table G-17). Chromium is retained as a COPC.

Hexavalent chromium was detected in 27 samples with a maximum concentration of 0.41 mg/kg. Hexavalent chromium is retained as a COPC.

Copper was detected above the Qbt 2,3,4 BV (4.66 mg/kg) in 11 samples with a maximum concentration of 7.15 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in tuff are statistically different from background (Figure G-117 and Table G-17). Copper is retained as a COPC.

Cyanide was detected above the soil and Qbt 2,3,4 BVs (0.5 mg/kg for both) in one soil sample and two tuff samples with a maximum concentration of 2.89 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 3 soil samples and 26 tuff samples with a maximum concentration of 116 mg/kg. The Gehan test indicated site concentrations of lead in soil are statistically different from background (Table G-18). However, the quantile and slippage tests indicated site concentrations of lead in soil are not statistically different from background (Figure G-118 and Table G-18). The Gehan and quantile tests indicated site concentrations of lead in tuff are statistically different from background (Figure G-119 and Table G-17). Lead is retained as a COPC.

Magnesium was detected above the Qbt 3 BV (1690 mg/kg) in 10 samples with a maximum concentration of 2880 mg/kg. The Gehan and quantile tests indicated site concentrations of magnesium in tuff are not statistically different from background (Figure G-120 and Table G-17). Magnesium is not a COPC.

Nickel was detected above the Qbt 2,3,4 BV (6.58 mg/kg) in eight samples with a maximum concentration of 14.4 mg/kg and was not detected but had a DL (12.7 mg/kg) above the BV in one sample. The slippage test indicated site concentrations of nickel in tuff are statistically different from background (Figure G-121 and Table G-17). Nickel is retained as a COPC.

Nitrate was detected in 14 samples with a maximum concentration of 8.68 mg/kg. Nitrate is naturally occurring, and the concentrations likely reflect naturally occurring levels. In addition, SWMU 02-006(a) was used to manage reactor stack gas condensate and is not a source of nitrate. Nitrate is not a COPC.

Perchlorate was detected in 54 samples with a maximum concentration of 0.0147 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the soil and Qbt 2,3,4 BVs (1.52 mg/kg and 0.3 mg/kg) in 10 soil samples and 52 tuff samples with a maximum concentration of 14.1 mg/kg and was not detected but had DLs (0.484 mg/kg to 2.42 mg/kg) above BV in 1 soil sample and 72 tuff samples. The Gehan and quantile tests indicated site concentrations of selenium in soil are statistically different from background (Figure G-122 and Table G-18). Selenium is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in four samples with a maximum concentration of 120 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are not statistically different from background (Figure G-123 and Table G-18). Zinc is not a COPC.

Organic Chemicals

A total of 72 samples (12 soil and 60 Qbt 3) were analyzed for PCBs and SVOCs, and 60 tuff samples (Qbt 3) were analyzed for VOCs. Table 6.15-3 presents the detected organic chemicals. Figure 6.15-2 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 02-006(a) include Aroclor-1242; Aroclor-1254; Aroclor-1260; 1,4-dichlorobenzene; toluene; and trichloroethene. The detected organic chemicals are retained as COPCs.

Radionuclides

A total of 72 samples (12 soil and 60 Qbt 3) were analyzed for americium-241; 88 samples (18 soil and 70 Qbt 3) were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and strontium-90; 16 samples (6 soil and 10 Qbt 3) were analyzed for technetium-99; and 162 samples (29 soil and 133 Qbt 3) were analyzed for tritium. Table 6.15-4 presents the radionuclides detected or detected above BVs/FVs. Plate 25 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Cesium-137 was detected above the soil FV (1.65 pCi/g) in 1 sample, detected below 1 ft bgs in 12 soil samples, and detected in 18 tuff samples with a maximum activity of 45.4 pCi/g. Cesium-137 is retained as a COPC.

Plutonium-239/240 was detected above the soil FV (0.054 pCi/g) in one sample at an activity of 0.0626 pCi/g. The activity is above the maximum activity in the background data set (0.055 pCi/g). Plutonium-239/240 is retained as a COPC.

Strontium-90 was detected above the soil FV (1.31 pCi/g) in 1 sample, detected below 1 ft bgs in 6 soil samples, and detected in 10 tuff samples with a maximum activity of 2.69 pCi/g. Strontium-90 is retained as a COPC.

Tritium was detected in 105 samples with a maximum activity of 167 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 seven samples with a maximum activity of 0.132 pCi/g. Uranium-235/236 is retained as a COPC.

6.15.4.4 Nature and Extent of Contamination at SWMU 02-006(a)

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 02-006(a) are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 02-006(a) include antimony, arsenic, barium, chromium, hexavalent chromium, copper, cyanide, lead, nickel, perchlorate, and selenium.

Antimony was detected above the soil BV in one sample at a concentration of 1.12 mg/kg and was not detected but had DLs (0.506 mg/kg to 1.14 mg/kg) above the soil and Qbt 2,3,4 BVs (0.5 mg/kg) in 4 samples and 46 tuff samples. Concentrations decreased with depth and decreased laterally at location 02-612646. The residential SSL is approximately 27 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbt 2,3,4 BV in 16 samples with a maximum concentration of 17 mg/kg. Concentrations increased with depth at locations 02-612641 and 02-612648; concentrations did not change substantially with depth (0.57 mg/kg or less) at locations 02-22055, 02-22056, 02-22057, 02-22058, and 02-22059; and decreased with depth at all other locations (the concentration in the shallow sample at location 02-22055 was 2.32 mg/kg and below the Qbt 2,3,4 BV [Appendix F, Pivot Tables]). Concentrations increased laterally at location 02-612641, where the maximum concentration was detected. At locations 02-612641 and 02-612648, where concentrations increased with depth, arsenic was only detected above BV at 49 ft to 50 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 2.1 times the maximum concentration, and the industrial SSL is approximately 11 times the maximum concentration where concentrations did not change substantially with depth (3.34 mg/kg at location 02-22056). Further sampling for extent of arsenic is not warranted.

Barium was detected above the soil and Qbt 2,3,4 BVs in 1 soil sample and 24 tuff samples with a maximum concentration of 395 mg/kg. Concentrations increased with depth at locations 02-22055 and 02-22059, did not change substantially with depth (8.4 mg/kg or less) at locations 02-22056 and 02-22057, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 39 times the maximum concentration. Lateral extent of barium is defined and further sampling for vertical extent is not warranted.

Chromium was detected above the Qbt 2,3,4 BV in 13 samples with a maximum concentration of 28 mg/kg and was not detected but had DLs (7.75 mg/kg to 13 mg/kg) above the BV in 6 samples. Concentrations did not change substantially with depth (1.66 mg/kg) at location 02-22059, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 3.4 times the maximum concentration, and the industrial SSL is approximately 18 times the maximum concentration. Lateral extent of chromium is defined and further sampling for vertical extent is not warranted.

Hexavalent chromium was detected in 27 samples with a maximum concentration of 0.41 mg/kg. Concentrations increased with depth at location 02-600258, concentrations did not change substantially with depth (0.0108 mg/kg or less) at locations 02-600250 and 02-600252, only one depth was sampled at locations 02-22058 and 02-22059, concentrations decreased with depth at all other locations, and concentrations decreased laterally. The residential SSL is approximately 7.4 times the maximum concentration, and the industrial SSL is approximately 176 times the maximum concentration. Lateral extent of hexavalent chromium is defined and further sampling for vertical extent is not warranted.

Copper was detected above the Qbt 2,3,4 BV in 11 samples with a maximum concentration of 7.15 mg/kg. Concentrations increased with depth at location 02-22059; did not change substantially with depth (0.49 mg/kg or less) at locations 02-22056, 02-22057, and 02-22058; decreased with depth at all other locations; and decreased laterally. The residential SSL is approximately 420 times the maximum concentration. 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 BVs in one soil sample and two tuff samples with a maximum concentration of 2.89 mg/kg. Concentrations increased with depth at location 02-600258, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 3.8 times the maximum concentration, and the industrial SSL is approximately 22 times the maximum concentration. 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 3 soil samples and 26 tuff samples with a maximum concentration of 116 mg/kg. Concentrations increased with depth at locations 02-22054, 02-22056, 02-22059, and 02-612650; decreased with depth at all other locations; and decreased laterally. The residential SSL is approximately 3.8 times and the industrial SSL is approximately 22 times the maximum concentration where vertical extent is not defined (22.7 mg/kg at location 02-22054). Lateral extent of lead is defined and further sampling for vertical extent is not warranted.

Nickel was detected above the Qbt 2,3,4 BV in eight samples with a maximum concentration of 14.4 mg/kg and was not detected but had a DL (12.7 mg/kg) above the BV in one sample. Concentrations increased with depth at location 02-22055, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 111 times the maximum concentration. Lateral extent of nickel is defined and further sampling for vertical extent is not warranted.

Perchlorate was detected in 54 samples with a maximum concentration of 0.0147 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of perchlorate are defined.

Selenium was detected above the soil and Qbt 2,3,4 BVs in 10 soil samples and 52 tuff samples with a maximum concentration of 14.1 mg/kg and was not detected but had DLs (0.484 mg/kg to 2.42 mg/kg) above BV in 1 soil sample and 72 tuff samples. Concentrations decreased with depth at all locations and decreased laterally. The residential SSL is approximately 162 times the maximum DL. Further sampling for extent of selenium is not warranted.

Organic Chemicals

Organic COPCs at SWMU 02-006(a) include Aroclor-1242, Aroclor-1254, Aroclor-1260, 1,4-dichlorobenzene, toluene, and trichloroethene.

Aroclor-1242 was detected in four samples with a maximum concentration of 0.009 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of Aroclor-1242 are defined.

Aroclor-1254 was detected in 10 samples with a maximum concentration of 0.011 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of Aroclor-1254 are defined.

Aroclor-1260 was detected in four samples with a maximum concentration of 0.0028 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of Aroclor-1260 are defined.

Dichlorobenzene[1,4-] was detected in one sample at a concentration of 0.000215 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of 1,4-dichlorobenzene are defined.

Toluene was detected in one sample at a concentration of 0.000313 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of toluene are defined.

Trichloroethene was detected in three samples with a maximum concentration of 0.009 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of trichloroethene are defined.

Radionuclides

Radionuclide COPCs at SWMU 02-006(a) include cesium-137, plutonium-239/240, strontium-90, tritium, and uranium-235/236.

Cesium-137 was detected above the soil FV in 1 sample, detected in below 1 ft bgs in 12 soil samples, and detected in 18 tuff samples with a maximum activity of 45.4 pCi/g. Activities increased with depth at locations 02-22055 and 02-22058, decreased with depth at all other locations, and decreased laterally. The maximum activity was detected at location 02-22055. Cesum-137 was not detected in deep samples at location 02-600250, adjacent to location 02-22055, and location 02-600252, adjacent to location 02-22058. Lateral and vertical extent of cesium-137 are defined.

Plutonium-239/240 was detected above the soil FV in one sample at an activity of 0.0626 pCi/g. Activities decreased with depth and decreased laterally. Lateral and vertical extent of cesium-137 are defined.

Strontium-90 was detected above the soil FV in 1 sample, detected below 1 ft bgs in 6 soil samples, and detected in 10 tuff samples with a maximum activity of 2.69 pCi/g. Activities increased with depth at locations 02-22052, 02-22055, and 02-22058; did not change substantially with depth (0.083 mg/kg or less) at locations 02-22053 and 02-22056; decreased with depth at all other locations; and decreased laterally. The residential SAL is approximately 5.6 times the maximum activity, and the industrial SAL is approximately 892 times the maximum activity. Lateral extent of strontium-90 is defined and further sampling for vertical extent is not warranted.

Tritium was detected in 105 samples with a maximum activity of 167 pCi/g. Activities increased with depth at locations 02-22053, 02-22054, 02-22055, 02-22056, 02-22057, 02-600247, 02-600250, 02-600252, 02-600255, and 02-600256 and decreased laterally. The residential SAL is approximately 10 times the maximum activity, and the industrial SAL is approximately 14,400 times the maximum activity. 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 seven samples with a maximum activity of 0.132 pCi/g. Activities increased with depth at location 02-600248, did not change substantially with depth (0.008 pCi/g) at location 02-600254, decreased with depth at all other locations, and decreased laterally (the activity in the shallow sample at location 02-600254 was 0.122 pCi/g and below the soil BV [Appendix F, Pivot Tables]). The residential SAL is approximately 318 times the maximum activity. Lateral extent of uranium-235/235 is defined and further sampling for vertical extent is not warranted.

Summary of Nature and Extent at SWMU 02-006(a)

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at SWMU 02-006(a).

6.15.5 Summary of Human Health Risk Screening

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} (NMED 2017, 602273). The industrial HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 8 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 1×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.06, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.9 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Residential Scenario

The total excess cancer risk for the residential scenario is 4×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.3, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 11 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The residential exposure scenario also demonstrates protection of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, residential, and construction worker scenarios at SWMU 02-006(a).

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 screening levels to background concentrations, no potential ecological risks exist for SWMU 02-006(a).

6.16 SWMU 02-006(b), Former Acid Waste Line, Laboratory Effluent

6.16.1 Site Description and Operational History

SWMU 02-006(b) was an acid waste line that carried effluent from several laboratory rooms in the center of the OWR building (02-1) south to a discharge point into Los Alamos Creek (Figure 6.16-1).

Construction of the OWR building (02-1) and associated laboratory rooms, sinks, and waste line [SWMU 02-006(b)] was completed in 1946 (engineering drawing C-1703, LASL 1946, 089678). The OWR became operational in 1956. The acid waste line was reportedly taken out of service in the 1960s; however, no record of its removal is available (DOE 1987, 008663). All SWMU 02-006(b) lines and connections were removed and disposed of in 2003 (WD-3 2003, 082646, p. 2).

6.16.2 Relationship to Other SWMUs and AOCs

The OWR acid waste line was related to the OWR facility, AOC 02-004(a). The laboratory rooms and sinks that discharged into the acid waste line were all located within the OWR facility.

6.16.3 Summary of Previous Investigations

6.16.3.1 1995 Investigation Activities

Samples were collected as part of the investigation activities in 1995. Supporting QA/QC information is not available for these samples, so the sample results are not included in this report.

6.16.3.2 2000 Post–Cerro Grande Recovery Work

As part of the post–Cerro Grande fire recovery work, samples were collected from two locations (02-01094 and 02-01251) near the southern end of the drainline (LANL 2001, 070352).

6.16.3.3 2003 Omega West Decommissioning Project

All SWMU 02-006(b) piping was removed, and the waste was disposed of at an appropriate disposal facility. Site activities included soil excavation, radiological walkover surveys, radiological (structure) screening, soil sampling, sample analysis, and surveying of sample coordinates. Limited soil surveys were conducted; however, no formal report of soil survey results is available.

LLW (construction debris and/or soil) was packaged and shipped to Envirocare or TA-54 for disposal. Mixed waste was packaged and transferred to TA-54 for further processing and/or storage at the Laboratory. In total, 9800 ft^3 of material was shipped to Envirocare for disposal; material from the OWR acid waste line was included in this total volume (WD-3 2003, 082646, pp. 1–6). The volume of material specifically associated with SWMU 02-006(b) was not documented.

6.16.3.4 2007 Investigation Activities

Sixty-one samples were collected from seventeen locations at SWMU 02-006(b) in 2007. Results from the sampling activities in 2007 were presented in the previous investigation report (LANL 2008, 101669.12). Additional sampling was required to define the extent of contamination at the site.

6.16.4 Site Contamination

6.16.4.1 Soil, Rock, and Sediment Sampling

As part of the 2010 investigation, the following characterization activities were conducted at SWMU 02-006(b):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Five samples were collected from location 02-612374 near SWMU 02-006(b) from 5–6 ft, 15–16 ft, 25–26 ft, 35–36 ft, and 49–50 ft bgs. These samples were analyzed for TAL metals, PCBs, TPH-DRO, SVOCs, isotopic plutonium, isotopic uranium, strontium-90, and tritium.

The 2010 and historical sampling locations at SWMU 02-006(b) are shown in Figure 6.16-1. Table 6.16-1 presents the samples collected and analyses requested for SWMU 02-006(b). The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

6.16.4.2 Soil, Rock, and Sediment Sample Field-Screening Results

No organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of the samples. No radiological-screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. No changes to sampling or other activities occurred because of the field-screening results.

6.16.4.3 Soil, Rock, and Sediment Sample Analytical Results

Decision-level data at SWMU 02-006(b) consist of results from 70 samples collected from 21 locations in 2000, 2003, 2007, and 2010. The 70 samples include 19 soil, 29 Qal, 19 Qbo, and 3 sediment samples.

Inorganic Chemicals

A total of 70 samples (19 soil, 29 Qal, 19 Qbo, and 3 sediment) were analyzed for TAL metals, 2 soil samples were analyzed for hexavalent chromium, 65 samples (18 soil, 29 Qal, 15 Qbo, and 3 sediment) were analyzed for nitrate, and 61 samples (16 soil, 29 Qal, 15 Qbo, and 1 sediment) were analyzed for perchlorate and total cyanide. Table 6.16-2 presents the inorganic chemicals detected or detected above BVs. Plate 26 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV (3560 mg/kg) in 16 samples with a maximum concentration of 13,200 mg/kg. The Gehan and quantile tests indicated site concentrations of aluminum in tuff are statistically different from background (Figure G-124 and Table G-19). Aluminum is retained as a COPC.

Antimony was not detected above the Qbt 1g, Qct, Qbo BV (0.5 mg/kg) but had DLs (0.508 mg/kg to 1.37 mg/kg) above the BV in six samples. Antimony is retained as a COPC.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV (0.56 mg/kg) in 8 samples with a maximum concentration of 1.87 mg/kg and was not detected but had DLs (0.718 mg/kg to 1.98 mg/kg) above the Qbo BV in 11 samples. The quantile and slippage tests indicated site concentrations or arsenic in tuff are statistically different from background (Figure G-125 and Table G-19). Arsenic is retained as a COPC.

Barium was detected above the Qbt 1g, Qct, Qbo BV (25.7 mg/kg) in 10 samples with a maximum concentration of 92.1 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in tuff are statistically different from background (Figure G-126 and Table G-19). Barium is retained as a COPC.

Cadmium was detected above the soil BV (0.4 mg/kg) in 5 samples with a maximum concentration of 2 mg/kg and it was not detected but had DLs (0.488 mg/kg to 0.683 mg/kg) above the soil and sediment and Qbt 1g, Qct, Qbo BVs (0.4 for both) in 33 soil samples, 1 sediment sample, and 19 tuff samples. Cadmium is retained as a COPC.

Calcium was detected above the soil BV (6120 mg/kg) in five samples with a maximum concentration of 35,200 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in soil are not statistically different from background (Figure G-127 and Table G-20). Calcium is not a COPC.

Chromium was detected above the soil and Qbt 1g, Qct, Qbo BVs (19.3 mg/kg and 2.6 mg/kg) in 4 soil samples and 11 tuff samples with a maximum concentration of 39.5 mg/kg and was not detected but had DLs (8.9 mg/kg to 12.5 mg/kg) above the Qbt 1g, Qct, Qbo BV in 3 samples. The Gehan and quantile tests indicated site concentrations of chromium in soil are not statistically different from background (Figure G-128 and Table G-20) but site concentrations of chromium in tuff are statistically different from background (Figure G-129 and Table G-19). Chromium is retained as a COPC.

Copper was detected above the Qbt 1g, Qct, Qbo BV (3.96 mg/kg) in three samples with a maximum concentration of 5.42 mg/kg. The quantile and slippage tests indicated site concentrations of copper in tuff are statistically different from background (Figure G-130 and Table G-19). Copper is retained as a COPC.

Hexavalent chromium was detected in one sample at a concentration of 0.158 mg/kg. Hexavalent chromium is retained as a COPC.

Iron was detected above the Qbt 1g, Qct, Qbo BV (3700 mg/kg) in 19 samples with a maximum concentration of 8890 mg/kg. The Gehan and quantile tests indicated site concentrations of iron in tuff are statistically different from background (Figure G-131 and Table G-19). Iron is retained as a COPC.

Lead was detected above the soil and sediment BVs (22.3 mg/kg and 19.7 mg/kg) in three soil samples and two sediment samples with a maximum concentration of 3970 mg/kg. The quantile and slippage tests indicated site concentrations of lead in soil are statistically different from background (Figure G-132 and Table G-20). Lead is retained as a COPC.

Manganese was detected above the Qbt 1g, Qct, Qbo BV (189 mg/kg) in 16 samples with a maximum concentration of 548 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in tuff are statistically different from background (Figure G-133 and Table G-19). Manganese is retained as a COPC.

Mercury was detected above the soil and sediment BVs (0.1 mg/kg for both) in 25 soil samples and 3 sediment samples with a maximum concentration of 6.04 mg/kg. Mercury is retained as a COPC.

Nickel was detected above the Qbt 1g, Qct, Qbo BV (2 mg/kg) in six samples with a maximum concentration of 4.26 mg/kg and was not detected but had DLs (2.06 mg/kg to 4.46 mg/kg) above the BV in three samples. There are too few detections in the tuff background data set to perform statistical tests. Nickel is retained as a COPC.

Nitrate was detected in 28 samples with a maximum concentration of 25.8 mg/kg. Nitrate is naturally occurring but the maximum concentration likely exceeds naturally occurring levels. Nitrate is retained as a COPC.

Perchlorate was detected in 12 soil/Qal/tuff samples with a maximum concentration of 0.0115 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs (1.52 mg/kg, 0.3 mg/kg, and 0.3 mg/kg) in 3 soil samples, 3 sediment samples, and 12 tuff samples with a maximum concentration of 1.99 mg/kg and was not detected but had DLs (1.21 mg/kg to 1.8 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs in 11 soil samples and 7 tuff samples. The Gehan and slippage tests indicated site concentrations of selenium in soil are statistically different from background (Figure G-134 and Table G-20). Selenium is retained as a COPC.

Silver was detected above the sediment BV (1 mg/kg) in one sample at a concentration of 1.7 mg/kg. Silver is retained as a COPC.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV (4.59 mg/kg) in seven samples with a maximum concentration of 10.3 mg/kg. The Gehan and quantile tests indicated site concentrations of vanadium in tuff are statistically different from background (Figure G-135 and Table G-19). 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 nine soil samples and two sediment samples with a maximum concentration of 140 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are statistically different from background (Figure G-136 and Table G-20). Zinc is retained as a COPC.

Organic Chemicals

A total of 68 samples (17 soil, 29 Qal, 19 Qbo, and 3 sediment) were analyzed for PCBs, 70 samples (19 soil, 29 Qal, 19 Qbo, and 3 sediment) were analyzed for SVOCs, 21 samples (6 soil, 7 Qal, and 8 Qbo) were analyzed for TPH-DRO, and 46 samples (29 Qal, 15 Qbo, and 2 sediment) were analyzed for VOCs. Table 6.16-3 presents the detected organic chemicals. Plate 27 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 02-006(b) include acenaphthene; acetone; anthracene; Aroclor-1242; Aroclor-1248; 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; carbon disulfide; chrysene; dibenz(a,h)anthracene; dibenzofuran; 1,4-dichlorobenzene; diethylphthalate; di-n-butylphthalate; ethylbenzene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; 4-methyl-2-pentanone; methylene chloride; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; styrene; toluene; TPH-DRO; trichloroethene; trichlorofluoromethane; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; 1,2-xylene; and 1,3-xylene+1,4-xylene. The detected organic chemicals are retained as COPCs.

Radionuclides

A total of 61 samples (16 soil, 29 Qal, 15 Qbo, and 1 sediment) were analyzed for americium-241; 65 samples (18 soil, 29 Qal, 15 Qbo, and 3 sediment) were analyzed for gamma-emitting radionuclides; 70 samples (19 soil, 29 Qal, 19 Qbo, and 3 sediment) were analyzed for isotopic plutonium, strontium-90, and tritium; 69 samples (19 soil, 29 Qal, 19 Qbo, and 2 sediment) were analyzed for isotopic uranium; and 2 soil samples were analyzed for technetium-99. Table 6.16-4 presents the radionuclides detected or detected above BVs/FVs. Figure 6.16-2 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Cesium-137 was detected below 1 ft bgs in six soil and Qal samples with a maximum activity of 1.83 pCi/g. Cesium-137 is retained as a COPC.

Plutonium-239/240 was detected above the sediment BV (0.068 pCi/g) in three samples, detected below 1 ft bgs in two Qal samples, and detected in one Qbo sample with a maximum activity of 2.11 pCi/g. Plutonium-239/240 is retained as a COPC.

Strontium-90 was detected below 1 ft bgs in three soil and Qal samples with a maximum activity of 1.29 pCi/g. Strontium-90 is retained as a COPC.

Tritium was detected in 32 soil/tuff/sediment samples with a maximum activity of 2.46 pCi/g. Tritium is retained as a COPC.

Uranium-234 was detected above the sediment BV (2.59 pCi/g) in one sample at an activity of 7.87 pCi/g. Uranium-234 is retained as a COPC.

Uranium-235/236 was detected above the sediment and Qbt 1g, Qct, Qbo BVs (0.2 pCi/g and 0.18 pCi/g) in 1 sediment sample and 1 Qbo sample with a maximum activity of 0.278 pCi/g. The maximum activity was only 0.078 pCi/g above BV and uranium-235/236 was not detected or detected above BV in 67 other samples (detected below BV in 57 samples). Uranium-235/236 is not a COPC.

6.16.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 02-006(b) are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 02-006(b) include aluminum, antimony, arsenic, barium, cadmium, chromium, copper, hexavalent chromium, iron, lead, manganese, mercury, nickel, nitrate, perchlorate, selenium, silver, vanadium, and zinc.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV in 16 samples with a maximum concentration of 13,200 mg/kg. Concentrations increased with depth at all locations. The detections above BV were generally in the deepest samples collected at each location and aluminum was not detected above BV in overlying soil samples. Concentrations increased laterally to the west. Lateral extent to the west is bounded by AOC 02-004(a). All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 5.9 times and the industrial SSL is approximately 98 times the maximum concentration. Further sampling for extent of aluminum is not warranted.

Antimony was not detected above the Qbt 1g, Qct, Qbo BV but had DLs (0.508 mg/kg to 1.37 mg/kg) above the BV in six samples. The residential SSL is approximately 23 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV in eight samples with a maximum concentration of 1.87 mg/kg and was not detected but had DLs (0.718 mg/kg to 1.98 mg/kg) above the Qbo BV in 11 samples. The detections above BV were generally in the deepest samples collected at each location and arsenic was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations did not change substantially laterally (1.26 mg/kg). All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 3.8 times the maximum concentration, and the industrial SSL is approximately 19 times the maximum concentration. The residential SSL is approximately 3.6 times the maximum DL, and the industrial SSL is approximately 18 times the maximum DL. Further sampling for extent of arsenic is not warranted.

Barium was detected above the Qbt 1g, Qct, Qbo BV in 10 samples with a maximum concentration of 92.1 mg/kg. The detections above BV were generally in the deepest samples collected at each location and barium was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations increased laterally to the west. Lateral extent to the west is bounded by AOC 02-004(a). All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 169 times the maximum concentration. Further sampling for extent of barium is not warranted.

Cadmium was detected above the soil BV in 5 samples with a maximum concentration of 2 mg/kg and it was not detected but had DLs (0.488 mg/kg to 0.683 mg/kg) above the soil; sediment; and Qbt 1g, Qct, Qbo BVs in 33 soil samples, 1 sediment sample, and 19 tuff samples. Concentrations decreased with depth at all locations and did not change substantially laterally (1.59 mg/kg). The residential SSL is approximately 35 times the maximum concentration and 103 times the maximum DL. Further sampling for extent of cadmium is not warranted.

Chromium was detected above the soil and Qbt 1g, Qct, Qbo BVs in 4 soil samples and 11 tuff samples with a maximum concentration of 39.5 mg/kg and was not detected but had DLs (8.9 mg/kg to 12.5 mg/kg) above the Qbt 1g, Qct, Qbo BV in 3 samples. Concentrations increased with depth at locations 02-600354, 02-600355, 02-600362, and 02-600363; did not change substantially with depth (1.5 mg/kg or less) at locations 02-600366 and 02-612374; decreased with depth at all other locations; and increased laterally to the west (concentrations in shallow samples at locations 02-600357, 02-600358, 02-600366 and 02-612374 were 11.9 mg/kg, 15.7 mg/kg, 8.8 mg/kg, and 6.97 mg/kg and below the soil BV [Appendix F, Pivot Tables]. Lateral extent to the west is bounded by AOC 02-004(a). The residential SSL is approximately 2.4 times the maximum concentration, and the industrial SSL is approximately 13 times the maximum concentration. The residential SSL is approximately 7.7 times the maximum DL, and the industrial SSL is approximately 40 times the maximum DL. Further sampling for extent of chromium is not warranted.

Copper was detected above the Qbt 1g, Qct, Qbo BV in three samples with a maximum concentration of 5.42 mg/kg. Concentrations did not change substantially with depth (1.46 mg/kg or less) at locations 02-600358 and 02-600362, decreased with depth at location 02-600360, and did not change substantially laterally (0.84 mg/kg) (concentrations in shallow samples at locations 02-600358, 02-600360 and 02-600362 were 5.05 mg/kg, 9.34 mg/kg, and 3.96 mg/kg and below the soil BV [Appendix F, Pivot Tables]. The residential SSL is approximately 577 times the maximum concentration. Further sampling for extent of copper is not warranted.

Hexavalent chromium was detected in one sample at a concentration of 0.158 mg/kg. Concentrations decreased with depth and decreased laterally at location 02-22345. Lateral and vertical extent of hexavalent chromium are defined.

Iron was detected above the Qbt 1g, Qct, Qbo BV in 19 samples with a maximum concentration of 8890 mg/kg. The detections above BV were generally in the deepest samples collected at each location and iron was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations increased laterally to the east. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. Lateral extent to the east is bounded by AOC 02-006(c). The residential SSL is approximately 6.2 times the maximum concentration, and the industrial SSL is approximately 102 times the maximum concentration. Further sampling for extent of iron is not warranted.

Lead was detected above the soil and sediment BVs in three soil samples and two sediment samples with a maximum concentration of 3970 mg/kg. Only one depth was sampled at locations 02-01094 and 02-01251, concentrations decreased with depth at locations 02-22345, 02-600351, and 02-600352, and concentrations decreased laterally. The residential SSL is approximately 13 times the maximum concentration, and the industrial SSL is approximately 26 times the maximum concentration where lateral extent is defined (31 mg/kg at location 02-01094). Lateral extent of lead is defined and further sampling for vertical extent is not warranted.

Manganese was detected above the Qbt 1g, Qct, Qbo BV in 16 samples with a maximum concentration of 548 mg/kg. The detections above BV were generally in the deepest samples collected at each location and manganese was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations increased laterally to the west. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. Lateral extent to the west is bounded by AOC 02-004(a). The residential SSL is approximately 19 times the maximum concentration, and the industrial SSL is approximately 292 times the maximum concentration. Further sampling for extent of manganese is not warranted.

Mercury was detected above the soil and sediment BVs in 25 soil samples and 3 sediment samples with a maximum concentration of 6.04 mg/kg. Only one depth was sampled at locations 02-01094 and 02-01251, concentrations decreased with depth at all other locations, and increased laterally to the west. Lateral extent to the west is bounded by AOC 02-006(e). The residential SSL is approximately 3.9 times the maximum concentration, and the industrial SSL is approximately 64 times the maximum concentration. Further sampling for extent of mercury is not warranted.

Nickel was detected above the Qbt 1g, Qct, Qbo BV in six samples with a maximum concentration of 4.26 mg/kg and was not detected but had DLs (2.06 mg/kg to 4.46 mg/kg) above the BV in three samples. Concentrations did not change substantially with depth (1.32 mg/kg or less) at locations 02-600354, 02-600358, 02-600363, and 02-612374; decreased with depth at all other locations; and did not change substantially laterally (2.23 mg/kg) (concentrations in shallow samples at locations 02-600354, 02-600358, 02-600360, 02-600363, 02-600366, and 02-612374 were 3.34 mg/kg, 3.64 mg/kg, 6.62 mg/kg, 3.43 mg/kg, 4.56 mg/kg and 3.5 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]. The residential SSL is approximately 366 times the maximum concentration. Further sampling for extent of nickel is not warranted.

Nitrate was detected in 28 samples with a maximum concentration of 25.8 mg/kg. Concentrations increased with depth at location 02-600356, only one depth was sampled at location 02-600367, concentrations decreased with depth at all other locations, and concentrations decreased laterally. The residential SSL is approximately 4840 times the maximum concentration. Lateral extent of nitrate is defined and further sampling for vertical extent is not warranted.

Perchlorate was detected in 12 soil/Qal/tuff samples with a maximum concentration of 0.0115 mg/kg. Concentrations increased with depth at locations 02-600356 and 02-600366, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 4760 times the maximum concentration. Lateral extent of perchlorate is defined and further sampling for vertical extent is not warranted.

Selenium was detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs in 3 soil samples, 3 sediment samples, and 12 tuff samples with a maximum concentration of 1.99 mg/kg and was not detected but had DLs (1.21 mg/kg to 1.8 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs in 11 soil samples and 7 tuff samples. Concentrations increased with depth at location 02-600354 and 02-600363; only one depth was sampled at locations 02-01094 and 02-01251; concentrations did not change substantially with depth (0.78 mg/kg or less) at locations 02-600355, 02-600357, 02-600358, 02-600360, 02-600365, and 02-600366; concentrations decreased with depth at all other locations; and concentrations did not change substantially laterally (1.59 mg/kg) (concentrations in shallow samples at locations 02-600355, 02-600357, 02-600358, 02-600359, 02-600360, and 02-600366 were 1.16 mg/kg, 1.19 mg/kg, 0.962 mg/kg, 1.45 mg/kg, 0.953mg/kg and 0.985 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]. The residential SSL is approximately 196 times the maximum concentration and 217 times the maximum DL. Further sampling for extent of selenium is not warranted.

Silver was detected above the sediment BV in one sample at a concentration of 1.7 mg/kg. Only one depth was sampled at location 02-01251. Concentrations increased laterally. The residential SSL is approximately 230 times the maximum concentration. Further sampling for extent of silver is not warranted.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV in seven samples with a maximum concentration of 10.3 mg/kg. The detections above BV were all in deep samples collected at each location and vanadium was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations increased laterally to the east. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. Lateral extent to the east is bounded by AOC 02-006(c). The residential SSL is approximately 38 times the maximum concentration, and the industrial SSL is approximately 634 times the maximum concentration. Further sampling for extent of vanadium is not warranted.

Zinc was detected above the soil and sediment BVs in nine soil samples and two sediment samples with a maximum concentration of 140 mg/kg. Concentrations increased with depth at location 02-600356, only one depth was sampled at locations 02-01094 and 02-01251, concentrations decreased with depth at all other locations, and concentrations decreased laterally. The residential SSL is approximately 168 times the maximum concentration. Lateral extent of zinc is defined and further sampling for vertical extent is not warranted.

Organic Chemicals

Organic chemicals detected at SWMU 02-006(b) include acenaphthene; acetone; anthracene; Aroclor-1242; Aroclor-1248; 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; 1,4-dichlorobenzene; diethylphthalate; di-n-butylphthalate; ethylbenzene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; 4-methyl-2-pentanone; methylene chloride; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; styrene; toluene; TPH-DRO; trichloroethene; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; 1,2-xylene; and 1,3-xylene+1,4-xylene.

The PAHs acenaphthene, 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 from 2 to 87 samples and, except for fluoranthene and phenanthrene, were only detected in the 2 uppermost sample depths and were not detected in deeper samples. Fluoranthene and phenanthrene were each detected in 2 deeper samples at location 02-600351 but concentrations decreased with depth. Vertical extent of PAHs is defined. The highest concentrations of these PAHs occurred in samples collected at locations 02-600355, 02-600356, and 02-600366 and concentrations increased laterally to the north at these locations. Lateral extent to the north is bounded by AOC 02-012. The residential SSLs for PAHs were all greater than 10 times the maximum concentrations except for benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene. The residential SSL for benzo(a)anthracene is approximately 1.1 times the maximum concentration (1.4 mg/kg) and the industrial SSL is approximately 23 times the maximum concentration. The maximum concentration of benzo(a)pyrene (1.51 mg/kg) is approximately 1.4 times the residential SSL and the industrial SSL is approximately 16 times the maximum concentration. The residential SSL for benzo(b)fluoranthene is approximately 1.4 times the maximum concentration (2.1 mg/kg) and the industrial SSL is approximately 15 times the maximum concentration. The maximum concentration of dibenz(a,h)anthracene (0.194 mg/kg) is approximately 1.3 times the residential SSL and the industrial SSL is approximately 17 times the maximum concentration. The residential SSL for indeno(1,2,3-cd)pyrene is approximately 3.3 times the maximum concentration (0.468 mg/kg) and the industrial SSL is approximately 69 times the maximum concentration. Vertical extent of PAHs is defined and further sampling for lateral extent is not warranted.

Acetone was detected in one sample at a concentration of 0.00434 mg/kg. Only one depth was sampled at location 02-600360 and concentrations increased laterally. The residential SSL is approximately 15,300,000 times the maximum concentration. Further sampling for extent of acetone is not warranted.

Aroclor-1242 was detected in one sample at a concentration of 0.0151 mg/kg. Concentrations increased with depth at location 02-600362 and increased laterally. The residential SSL is approximately 15 times and the industrial SSL is approximately 682 times the maximum concentration. Further sampling for extent of Aroclor-1242 is not warranted.

Aroclor-1248 was detected in one sample at a concentration of 0.0287 mg/kg. Concentrations decreased with depth at location 02-600354 and decreased laterally. The lateral and vertical extent of Aroclor-1248 are defined.

Aroclor-1254 was detected in 20 samples with a maximum concentration of 0.234 mg/kg. Concentrations increased with depth at location 02-600360, decreased with depth at all other locations, and increased laterally. The residential SSL is approximately 4.9 times the maximum concentration, and the industrial SSL is approximately 47 times the maximum concentration. Vertical extent of Aroclor-1254 is defined and further sampling for lateral extent is not warranted.

Aroclor-1260 was detected in 40 samples with a maximum concentration of 1 mg/kg. Only one depth was sampled at locations 02-01094 and 02-01252, concentrations decreased with depth at all other locations, and concentrations increased laterally. The residential SSL is approximately 2.2 times the maximum concentration, and the industrial SSL is approximately 11 times the maximum concentration. Further sampling for extent of Aroclor-1260 is not warranted.

Bis(2-ethylhexyl)phthalate was detected in two samples with a maximum concentration of 0.109 mg/kg. Concentrations did not change substantially with depth (0.0108 mg/kg) at location 02-22345 and decreased laterally. The residential SSL is approximately 3490 times the maximum concentration. Lateral extent of bis(2-ethylhexyl)phthalate is defined and further sampling for vertical extent is not warranted.

Carbon disulfide and trichlorofluoromethane were each detected in one sample at concentrations of 0.004 mg/kg and 0.002 mg/kg, respectively. Only one depth was sampled at location 02-01251 and concentrations increased laterally. The residential SSLs are approximately 385,000 times and 610,000 times the detected concentrations, respectively. Further sampling for extent of carbon disulfide and trichlorofluoromethane is not warranted.

Dibenzofuran was detected in 11 samples with a maximum concentration of 0.329 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of dibenzofuran are defined.

Dichlorobenzene[1,4-] was detected in one sample at a concentration of 0.000282 mg/kg. Concentrations decreased with depth at location 02-600360 and increased laterally. The detected concentration was below the EQL. The residential SSL is approximately 4,570,000 times the maximum concentration. Vertical extent of 1,4- dichlorobenzene is defined and further sampling for lateral extent is not warranted.

Diethylphthalte was detected in one sample at a concentration of 0.37 mg/kg. Only one depth was sampled at location 02-01094 and concentrations increased laterally. The residential SSL is approximately 3490 times the maximum concentration. Further sampling for extent of diethylphthalte is not warranted.

Di-n-butylphthalte was detected in two samples with a concentration of 0.155 mg/kg. Concentrations decreased with depth at all locations and increased laterally. The residential SSL is approximately 39,700 times the maximum concentration. Vertical extent of di-n-butylphthalte is defined and further sampling for lateral extent is not warranted.

Ethylbenzene was detected in one sample at a concentration of 0.000276 mg/kg. Concentrations decreased with depth at location 02-600358 and increased laterally. The detected concentration was below the EQL. The residential SSL is approximately 270,000 times the maximum concentration. Vertical extent of ethylbenzene is defined and further sampling for lateral extent is not warranted.

Isopropyltoluene[4-] was detected in one sample at a concentration of 0.000507 mg/kg. Concentrations decreased with depth at location 02-600360 and increased laterally. The detected concentration was below the EQL. The residential SSL is approximately 6,330,000 times the maximum concentration. Vertical extent of 4-isopropyltoluene is defined and further sampling for lateral extent is not warranted.

Methyl-2-pentanone[4-] was detected in one sample at a concentration of 0.01 mg/kg. Concentrations decreased with depth at location 02-600358 and increased laterally. The residential SSL is approximately 595,000 times the maximum concentration. Vertical extent of 4-methyl-2-pentanone is defined and further sampling for lateral extent is not warranted.

Methylene chloride was detected in three samples with a maximum concentration of 0.003 mg/kg. Concentrations did not change substantially with depth (0.00035mg/kg) at location 02-600358 and increased laterally. The residential SSL is approximately 39,300 times the maximum concentration. Further sampling for extent of methylene chloride is not warranted.

Styrene was detected in one sample at a concentration of 0.00023 mg/kg. Concentrations decreased with depth at location 02-600360 and increased laterally. The detected concentration was below the EQL. The residential SSL is approximately 31,400 times the maximum concentration. Vertical extent of styrene is defined and further sampling for lateral extent is not warranted.

Toluene was detected in one sample at a concentration of 0.000433 mg/kg. Concentrations decreased with depth at location 02-600364 and increased laterally. The detected concentration was below the EQL. The residential SSL is approximately 12,100,000 times the maximum concentration. Vertical extent of toluene is defined and further sampling for lateral extent is not warranted.

TPH-DRO was detected in 14 samples with a maximum concentration of 66.7 mg/kg. Concentrations did not change substantially with depth (1.8 mg/kg) at location 02-600356, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 15 times the maximum concentration, and the industrial SSL is approximately 57 times the maximum concentration. Further sampling for extent of TPH-DRO is not warranted.

Trichloroethene was detected in one sample at a concentration of 0.000265 mg/kg. Concentrations decreased with depth at location 02-600364 and increased laterally. The residential SSL is approximately 25,300 times the maximum concentration. Vertical extent of trichloroethene is defined and further sampling for lateral extent is not warranted.

Trimethylbenzene[1,2,4-] was detected in two samples with a maximum concentration of 0.000494 mg/kg. Concentrations decreased with depth at all locations and did not change substantially laterally (0.000201 mg/kg). The residential SSL is approximately 546,000 times the maximum concentration. Vertical extent of 1,2,4-trimethylbenzene is defined and further sampling for lateral extent is not warranted.

Trimethylbenzene[1,3,5-] was detected in two samples with a maximum concentration of 0.000234 mg/kg. Concentrations decreased with depth at all locations and did not change substantially laterally (0.000002 mg/kg). The residential SSL is approximately 1,150,000 times the maximum concentration. Vertical extent of 1,3,5-trimethylbenzene is defined and further sampling for lateral extent is not warranted.

Xylene[1,2-] was detected in one sample at a concentration of 0.000493 mg/kg. Concentrations decreased with depth at location 02-600358 and increased laterally. The residential SSL is approximately 1,620,000 times the maximum concentration. Vertical extent of 1,2-xylenle is defined and further sampling for lateral extent is not warranted.

Xylene[1,3-]+xylene[1,4-] was detected in three samples with a maximum concentration of 0.000469 mg/kg. Concentrations decreased with depth at all locations and increased laterally. The residential SSL is approximately 1,840,000 times the maximum concentration. Vertical extent of 1,3-xylenle+1,4-xylene is defined and further sampling for lateral extent is not warranted.

Radionuclides

Radionuclide COPCs at SWMU 02-006(b) include cesium-137, plutonium-239/240, strontium-90, tritium, and uranium-234.

Cesium-137 was detected below 1 ft bgs in six soil and Qal samples with a maximum activity of 1.83 pCi/g. Activities decreased with depth at all locations and decreased laterally. Lateral and vertical extent of cesium-137 are defined.

Plutonium-239/240 was detected above the sediment BV in three samples, detected below 1 ft bgs in two Qal samples, and detected in one Qbo sample with a maximum activity of 2.11 pCi/g. Only one depth was sampled at locations 02-01094, 02-01251, and 02-600367; activities decreased with depth at all other locations; and activities increased laterally. The residential SAL is approximately 37 times the maximum activity. Further sampling for extent of plutonium-239/240 is not warranted.

Strontium-90 was detected below 1 ft bgs in three soil and Qal samples with a maximum activity of 1.29 pCi/g. Activities did not change substantially with depth (0.341 PCi/g) at location 02-22345, decreased with depth at location 02-600351, and decreased laterally. The residential SAL is approximately 12 times and the industrial SAL is approximately 1860 times the maximum activity. Lateral extent of strontium-90 is defined and further sampling for vertical extent is not warranted.

Tritium was detected in 32 soil/tuff/sediment samples with a maximum activity of 2.46 pCi/g. Only one depth was sampled at location 02-01094, activities decreased with depth at all locations, and activities increased laterally. The residential SAL is approximately 691 times the maximum activity. Further sampling for extent of tritium is not warranted.

Uranium-234 was detected above the sediment BV in one sample at an activity of 7.87 pCi/g. Only one depth was sampled at location 02-01094 and activities increased laterally. The residential SAL is approximately 37 times the maximum activity. Further sampling for extent of uranium-234 is not warranted.

Summary of Nature and Extent at SWMU 02-006(b)

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs are defined or no further sampling for extent is warranted at SWMU 02-006(b).

6.16.5 Summary of Human Health Risk Screening

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} (NMED 2017, 602273). The industrial HI is 0.03, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 2×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.06 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 3×10^{-5}, which is greater than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 2, which is greater than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Construction Worker Scenario

The residential exposure scenario also demonstrates protection of construction workers for carcinogenic and radionuclide COPCs. The construction worker HI is approximately 1 (due to manganese; see Appendix H, section H-4.5.2, Exposure Evaluation), which is equal to the NMED target HI of 1.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, and construction worker scenarios at SWMU 02-006(b). Potential unacceptable cancer and noncancer risks exist for the residential scenario at SWMU 02-006(b).

6.16.6 Summary of Ecological Risk Screening

SWMU 02-006(b) is within the TA-02 core area. Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and results of site-specific ecological risk studies, no potential ecological risks exist for the TA-02 core area.

6.17 AOC 02-006(c), Former Drainline from Offices, Restrooms, Control Room

6.17.1 Site Description and Operational History

AOC 02-006(c) was a waste line that extended from the office areas in the reactor building to the septic tank (structure 02-43, SWMU 02-007) (Figure 6.17-1). AOC 02-006(c) was identified in the 1990 SWMU report (LANL 1990, 007511) as a drainline that was connected to the chemical room in the OWR building (02-1) and several OWR laboratories. Closer review of the available engineering drawings, C-1703 (LASL 1946, 089678) and C-1750 (LASL 1949, 089680), provided the following information regarding the connection and use of AOC 02-006(c).

AOC 02-006(c) was the drainline that served the office or central portion of the OWR building 02-1. As indicated on engineering drawing C-1750 (LASL 1949, 089680), the line was separate from the OWR acid waste line [SWMU 02-006(b)] that connected to the chemical laboratories.

The AOC 02-006(c) waste line received wastewater from the evaporative cooler and drinking fountain associated with the control room, restrooms, and office areas. The sanitary service provided by AOC 02-006(c) was transferred to TA-41 in the mid-1970s (DOE 1987, 008663). However, the AOC 02-006(c) drainline continued to convey basement seepage to the AOC 02-008(c) outfalls installed in 1985 and 1988. The AOC 02-006(c) sewer line was removed and disposed of during D&D activities in 2003 (WD-3 2003, 082646).

6.17.2 Relationship to Other SWMUs and AOCs

The AOC 02-006(c) sewer line originated in the OWR facility, AOC 02-004(a). The sewer line crossed the path of, or ran parallel to, lines associated with SWMU 02-006(b) and AOC 02-011(a)(ix) and AOC 02-011(a)(x). The line ran near the former chemical waste shack (AOC 02-010), the stack-gas valve house [AOC 02-003(a)], and the drainlines of AOC 02-003(a) and AOC 02-011(b). The sewer line terminated at the SWMU 02-007 septic tank.

6.17.3 Summary of Previous Investigations

6.17.3.1 2003 Omega West Decommissioning Project

AOC 02-006(c) piping was removed, and the waste was disposed of at an approved facility during D&D activities in 2003. Site activities included soil excavation, radiological walkover surveys, radiological (structure) screening, soil sampling, sample analysis, and surveying of sample coordinates. Limited soil surveys were conducted, but no formal report of soil survey results is available.

LLW (construction debris and/or soil) was packaged and shipped to Envirocare or TA-54 for disposal. Mixed waste was packaged and transferred to TA-54 for further processing and/or storage at the Laboratory. In total, 9800 ft^3 of material was shipped to Envirocare for disposal; material from the AOC 02-006(c) sewer line was included in this total volume (WD-3 2003, 082646, pp. 1–6). The specific volume of material associated with AOC 02-006(c) was not documented.

No soil samples were collected from AOC 02-006(c) as part of the Omega West decommissioning project activities in 2003.

6.17.3.2 2007 Investigation Activities

Twenty-two samples were collected from seven locations at AOC 02-006(c) in 2007. Results from the sampling activities in 2007 were presented in the previous investigation report (LANL 2008, 101669.12). Additional sampling was required to define the extent of contamination at the site.

6.17.4 Site Contamination

6.17.4.1 Soil and Rock Sampling

As part of the 2010 investigation, the following characterization activities were conducted at AOC 02-006(c):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Five samples were collected from location 02-612345 in the southern portion of AOC 02-006(c) from 5–6 ft, 15–16 ft, 25–26 ft, 35–36 ft, and 49–50 ft bgs. These samples were analyzed for TAL metals, hexavalent chromium, PCBs, SVOCs, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium.
- Five samples were collected from location 02-612463 near AOC 02-006(c) from 5–6 ft, 15–16 ft, 25–27 ft, 35–36 ft, and 49–50 ft bgs. These samples were analyzed for TAL metals, hexavalent chromium, PCBs, americium-241, gamma-emitting radionuclides, isotopic uranium, strontium-90, and tritium.

The 2010 and historical sampling locations at AOC 02-006(c) are shown in Figure 6.17-1. Table 6.17-1 presents the samples collected and analyses requested for AOC 02-006(c). The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

6.17.4.2 Soil and Rock Sample Field-Screening Results

Organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of one sample at location 02-612345. As a result, the samples collected at this location were analyzed for TPH-DRO, in addition to the planned suites. No radiological-screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2.

6.17.4.3 Soil and Rock Sample Analytical Results

Decision-level data at AOC 02-006(c) consist of results from 32 samples collected from 9 locations in 2000, 2007, and 2010. The 32 samples include 8 soil, 13 Qal, and 11 Qbo samples.

Inorganic Chemicals

A total of 32 samples (8 soil, 13 Qal, and 11 Qbo) were analyzed for TAL metals and hexavalent chromium, and 22 samples (7 soil, 11 Qal, and 4 Qbo) were analyzed for nitrate, perchlorate, and total cyanide. Table 6.17-2 presents the inorganic chemicals detected or detected above BVs. Figure 6.17-2 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV (3560 mg/kg) in eight samples with a maximum concentration of 12,700 mg/kg. The Gehan and quantile tests indicated site concentrations of aluminum in tuff are statistically different from background (Figure G-137 and Table G-21). Aluminum is retained as a COPC.

Antimony was not detected above the soil and Qbt 1g, Qct, Qbo BVs (0.83 mg/kg and 0.5 mg/kg) but had DLs (1.03 mg/kg to 5.73 mg/kg) above BV in three soil samples and seven tuff samples. There were too few detections for perform statistical tests. Antimony is retained as a COPC.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV (0.56 mg/kg) in four samples with a maximum concentration of 2.35 mg/kg and was not detected but had DLs (1.26 mg/kg to 1.94 mg/kg) above the BV in six samples. All four concentrations and all six DLs are above the maximum Qbo background concentration (0.7 mg/kg). The site concentrations are substantially above background. Arsenic is retained as a COPC.

Barium was detected above the Qbt 1g, Qct, Qbo BV (25.7 mg/kg) in four samples with a maximum concentration of 56.5 mg/kg and was not detected above BV but had a DL (38.1 mg/kg) above BV in one sample. The Gehan and quantile tests indicated site concentrations of barium in tuff are statistically different from background (Figure G-138 and Table G-21). Barium is retained as a COPC.

Cadmium was not detected above the soil and Qbt 1g, Qct, Qbo BVs (0.4 mg/kg for both) but had DLs (0.499 mg/kg to 0.699 mg/kg) above BV in 14 soil samples and 10 tuff samples. Cadmium is retained as a COPC.

Calcium was detected above the soil BV (6120 mg/kg) in one sample at a concentration of 9020 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in soil are not statistically different from background (Figure G-139 and Table G-22). Calcium is not a COPC.

Chromium was detected above the soil and Qbt 1g, Qct, Qbo BVs (19.3 mg/kg and 6.5 mg/kg) in four soil samples and eight tuff samples with a maximum concentration of 404 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in soil are not statistically different from background (Figure G-140 and Table G-22) but site concentrations of chromium in tuff are statistically different from background (Figure G-141 and Table G-21). Chromium is retained as a COPC.

Copper was detected above the soil and Qbt 1g, Qct, Qbo BVs (14.7 mg/kg and 2.6 mg/kg) in one soil sample and one tuff sample with a maximum concentration of 15 mg/kg and was not detected above the Qbt 1g, Qct, Qbo BV but had a DL (6.27 mg/kg) above the BV in one sample. The Gehan and quantile tests indicated site concentrations of copper in soil are not statistically different from background (Figure G-142 and Table G-22), but the quantile and slippage tests indicated site concentrations of copper in tuff are statistically different from background (Figure G-143 and Table G-21). Copper is retained as a COPC.

Hexavalent chromium was detected in 10 samples with a maximum concentration of 0.365 mg/kg. Hexavalent chromium is retained as a COPC.

Iron was detected above the Qbt 1g, Qct, Qbo BV (3700 mg/kg) in 11 samples with a maximum concentration of 10,700 mg/kg. The Gehan and quantile tests indicated site concentrations of iron in tuff are statistically different from background (Figure G-144 and Table G-21). Iron is identified as a COPC in tuff.

Lead was detected above the soil BV (22.3 mg/kg) in one sample at a concentration of 44.2 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil are statistically different from background (Figure G-145 and Table G-22). Lead is not a COPC.

Magnesium was detected above the Qbt 1g, Qct, Qbo BV (739 mg/kg) in one sample at a concentration of 1570 mg/kg. The Gehan and quantile tests indicated site concentrations of magnesium in tuff are not statistically different from background (Figure G-146 and Table G-21). Magnesium is not a COPC.

Manganese was detected above the Qbt 1g, Qct, Qbo BV (189 mg/kg) in nine samples with a maximum concentration of 838 mg/kg and was not detected above the Qbt 1g, Qct, Qbo BV but had a DL (199 mg/kg) above the BV in one sample. The Gehan and quantile tests indicated site concentrations of manganese in tuff are statistically different from background (Figure G-147 and Table G-21). Manganese is retained as a COPC.

Mercury was detected above the soil BV (0.1 mg/kg) in eight samples with a maximum concentration of 1.36 mg/kg. Mercury is retained as a COPC.

Nickel was detected above the Qbt 1g, Qct, Qbo BV (2 mg/kg) in three samples with a maximum concentration of 22.4 mg/kg and was not detected above the Qbt 1g, Qct, Qbo BV but had a DL (2.04 mg/kg) above BV in one sample. There are too few detections in the tuff background data set to perform statistical tests. Nickel is retained as a COPC.

Nitrate was detected in 10 samples with a maximum concentration of 6.67 mg/kg. Although nitrate is naturally occurring, AOC 02-006(c) received discharges from a chemical room and laboratories. As a result, the concentrations detected might be site related rather than reflecting only naturally occurring levels. Nitrate is retained as a COPC.

Perchlorate was detected in three samples with a maximum concentration of 0.00242 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs (1.52 mg/kg and 0.3 mg/kg) in one soil sample and three tuff samples with a maximum concentration of 2.3 mg/kg and was not detected above the soil and Qbt 1g, Qct, Qbo BVs but had DLs (1.18 mg/kg to 1.75 mg/kg) above BVs in three soil samples and eight tuff samples. The Gehan test indicated site concentrations of selenium in soil are statistically different from background (Table G-22). However, the quantile and slippage tests indicated site concentrations of selenium in soil are not statistically different from background (Figure G-148 and

Table G-22). There is no Qbo background data set so statistical tests could not be performed. Selenium is retained as a COPC.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV (4.59 mg/kg) in three samples with a maximum concentration of 15.1 mg/kg. The Gehan and quantile tests indicated site concentrations of vanadium in tuff are statistically different from background (Figure G-149 and Table G-21). Vanadium is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in five samples with a maximum concentration of 92.7 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are statistically different from background (Figure G-150 and Table G-22). Zinc is retained as a COPC.

Organic Chemicals

A total of 32 samples (8 soil, 13 Qal, and 11 Qbo) were analyzed for PCBs, 27 samples (7 soil, 13 Qal, and 7 Qbo) were analyzed for SVOCs, 11 samples (2 soil, 6 Qal, and 3 Qbo) were analyzed for TPH-DRO, and 15 samples (11 Qal and 4 Qbo) were analyzed for VOCs. Table 6.17-3 presents the detected organic chemicals. Figure 6.17-3 shows the spatial distribution of detected organic chemicals.

Polycyclic Aromatic Hydrocarbons

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

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

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

Site Activities

AOC 02-006(c) was a waste line that received sanitary wastewater from within the OWR facility and was identified as an AOC because of possible soil contamination resulting from releases of wastewater. The AOC 02-006(c) tank was located beneath asphalt paving adjacent to the OWR, which was removed as part of D&D. Samples with detectable PAHs at this site were surface samples or shallow subsurface samples, which would have been beneath the former asphalt paving. PAHs were not known to be associated with the sanitary wastewater managed at this site. Because petroleum products were used within the OWR and may have been released to the sanitary wastewater system, samples were analyzed for TPH-DRO. Although TPH-DRO was detected, there does not appear to be a correlation between TPH-DRO and PAH concentrations and most samples with detectable TPH-DRO did not have detectable PAHs. Therefore, the source of TPH-DRO does not appear to also be a source of PAHs. Based on the above, the PAHs detected in samples used to characterize this site [acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; benzo(k)fluoranthene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenanthrene; and pyrene] are associated with the former paved area, are not related to historical Laboratory site operations, and are not COPCs.

Organic COPCs

Other organic chemicals detected at AOC 02-006(c) include Aroclor-1242; Aroclor-1254; Aroclor-1260; di-n-butylphthalate; methylene chloride; toluene; and TPH-DRO. The detected organic chemicals listed are retained as COPCs.

Radionuclides

A total of 27 samples (8 soil, 11 Qal, and 8 Qbo) were analyzed for americium-241 and strontium-90; 32 samples (8 soil, 13 Qal, and 11 Qbo) were analyzed for gamma-emitting radionuclides, isotopic uranium, and tritium; and 27 samples (7 soil, 13 Qal, and 7 Qbo) were analyzed for isotopic plutonium. Table 6.17-4 presents the radionuclides detected or detected above BVs/FVs. Figure 6.17-4 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Cesium-137 was detected above the soil FV (1.65 pCi/g) in two samples and detected below 1 ft bgs in three soil and Qal samples with a maximum activity of 16.9 pCi/g. Cesium-137 is retained as a COPC.

Plutonium-239/240 was detected above the soil FV (0.054 pCi/g) in one sample and detected below 1 ft bgs in one Qal sample with a maximum activity of 0.112 pCi/g. Plutonium-239/240 is retained as a COPC.

Strontium-90 was detected above the soil FV (1.31 pCi/g) in two samples and detected below 1 ft bgs in two Qal samples with a maximum activity of 3.86 pCi/g. Strontium-90 is retained as a COPC.

Tritium was detected in 14 samples with a maximum activity of 0.506 pCi/g. Tritium is retained as a COPC.

6.17.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 02-006(c) are discussed below.

Inorganic Chemicals

Inorganic COPCs at AOC 02-006(c) include aluminum, antimony, arsenic, barium, cadmium, chromium, copper, hexavalent chromium, iron, manganese, mercury, nickel, nitrate, perchlorate, selenium, vanadium, and zinc.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV in eight samples with a maximum concentration of 12,700 mg/kg. Concentrations increased with depth at most locations. The detections above BV were generally in the deepest samples collected at each location and aluminum was not detected above BV in overlying soil samples. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 6.1 times the maximum concentration, and the industrial SSL is approximately 102 times the maximum concentration. Further sampling for extent of aluminum is not warranted.

Antimony was not detected above the soil and Qbt 1g, Qct, Qbo BVs but had DLs (1.03 mg/kg to 5.73 mg/kg) above BV in three soil samples and seven tuff samples. The residential SSL is approximately 5.5 and the industrial SSL is approximately 91 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV in four samples with a maximum concentration of 2.35 mg/kg and was not detected but had DLs (1.26 mg/kg to 1.94 mg/kg) above the BV in six samples. The detections above BV were generally in the deepest samples collected at each location and arsenic was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 3 times the maximum concentration, and the industrial SSL is approximately 15 times the maximum concentration. The residential SSL is approximately 3.6 times the maximum DL, and the industrial SSL is approximately 18 times the maximum DL. Further sampling for extent of arsenic is not warranted.

Barium was detected above the Qbt 1g, Qct, Qbo BV in four samples with a maximum concentration of 56.5 mg/kg and was not detected above BV but had a DL (38.1 mg/kg) above BV in one sample. The detections above BV were generally in the deepest samples collected at each location and barium was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 276 times the maximum concentration. Further sampling for extent of barium is not warranted.

Cadmium was not detected above the soil and Qbt 1g, Qct, Qbo BVs but had DLs (0.499 mg/kg to 0.699 mg/kg) above BV in 14 soil samples and 10 tuff samples. The residential SSL is approximately 101 times the maximum DL. Further sampling for extent of cadmium is not warranted.

Chromium was detected above the soil and Qbt 1g, Qct, Qbo BVs in four soil samples and eight tuff samples with a maximum concentration of 404 mg/kg. Concentrations increased with depth at location 02-600587 and 02-600590, did not change substantially with depth (1.8 mg/kg or less) at locations 02-600586 and 02-600588, and decreased with depth at all other locations (concentrations in shallow samples at locations 02-600586 and 02-612345 were 13.8 mg/kg and 11.7 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]. The maximum concentrations where vertical extent is not defined are all Qbo samples collected below 10 ft bgs, beyond the depth intervals evaluated for risk. Chromium concentrations at the site do not result in unacceptable risk (Appendix H, Tables H-2.3-29 and 2.3-30). Further sampling for extent of chromium is not warranted.

Copper was detected above the soil and Qbt 1g, Qct, Qbo BVs in one soil sample and one tuff sample with a maximum concentration of 15 mg/kg and was not detected above the Qbt 1g, Qct, Qbo BV but had a DL (6.27 mg/kg) above the BV in one sample. Concentrations did not change substantially with depth (0.79 mg/kg) at location 02-600590 and decreased with depth at location 02-600587. The residential SSL is approximately 208 times the maximum concentration. Further sampling for extent of copper is not warranted.

Hexavalent chromium was detected in 10 samples with a maximum concentration of 0.365 mg/kg. Concentrations increased with depth at locations 02-600587 and 02-600588, did not change substantially with depth (0.0361 mg/kg) at location 02-600591, and decreased with depth at all other locations. The residential SSL is approximately 8.4 times the maximum concentration, and the industrial SSL is approximately 198 times the maximum concentration. Further sampling for extent of hexavalent chromium is not warranted.

Iron was detected above the Qbt 1g, Qct, Qbo BV in 11 samples with a maximum concentration of 10,700 mg/kg. The detections above BV were generally in the deepest samples collected at each location and iron was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 5.1 times the maximum concentration, and the industrial SSL is approximately 85 times the maximum concentration. Further sampling for extent of iron is not warranted.

Manganese was detected above the Qbt 1g, Qct, Qbo BV in nine samples with a maximum concentration of 838 mg/kg and was not detected above the Qbt 1g, Qct, Qbo BV but had a DL (199 mg/kg) above the BV in one sample. The detections above BV were generally in the deepest samples collected at each location and manganese was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 12 times the maximum concentration, and the industrial SSL is approximately 191 times the maximum concentration. Further sampling for extent of manganese is not warranted.

Mercury was detected above the soil BV in eight samples with a maximum concentration of 1.36 mg/kg. Concentrations decreased with depth at all locations. Vertical extent of mercury is defined.

Nickel was detected above the Qbt 1g, Qct, Qbo BV in three samples with a maximum concentration of 22.4 mg/kg and was not detected above the Qbt 1g, Qct, Qbo BV but had a DL (2.04 mg/kg) above BV in one sample. Concentrations increased with depth at locations 02-600587 and 02-600590 and did not change substantially with depth (0.43 mg/kg) at location 02-600586 (the concentration in the shallow sample at location 02-600586 was 2.57 mg/kg and below the soil BV [Appendix F, Pivot Tables]. The residential SSL is approximately 70 times the maximum concentration. Further sampling for extent of nickel is not warranted.

Nitrate was detected in 10 samples with a maximum concentration of 6.67 mg/kg. Concentrations decreased with depth at all locations. Vertical extent of nitrate is defined.

Perchlorate was detected in three samples with a maximum concentration of 0.00242 mg/kg. Concentrations decreased with depth at all locations. Vertical extent of perchlorate is defined.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs in one soil sample and three tuff samples with a maximum concentration of 2.3 mg/kg and was not detected above the soil and Qbt 1g, Qct, Qbo BVs but had DLs (1.18 mg/kg to 1.75 mg/kg) above BVs in three soil samples and eight tuff samples. Concentrations did not change substantially with depth (0.46 mg/kg or less) at locations 02-600586, 02-600587, and 02-600591 (concentrations in shallow samples at locations 02-600586 and 02-600587 were 1.1 mg/kg and 0.978 mg/kg and below the soil BV [Appendix F, Pivot Tables]. The residential SSL is approximately 170 times the maximum concentration and 223 times the maximum DL. Further sampling for extent of selenium is not warranted.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV in three samples with a concentration of 15.1 mg/kg. Concentrations increased with depth at location 02-612463 and decreased with depth at locations 02-600586 and 02-612345 (concentrations in shallow samples at locations 02-600586 and 02-612345 were 11.2 mg/kg and 10.5 mg/kg and below the soil BV [Appendix F, Pivot Tables]. The residential SSL is approximately 26 times the maximum concentration. Further sampling for extent of vanadium is not warranted.

Zinc was detected above the soil BV in five samples with a maximum concentration of 92.7 mg/kg. Concentrations decreased with depth at all locations. Vertical extent of zinc is defined.

Organic Chemicals

Organic COPCs at AOC 02-006(c) include Aroclor-1242, Aroclor-1254, Aroclor-1260, di-n-butylphthalate, methylene chloride, toluene, and TPH-DRO.

Aroclor-1242 was detected in one sample at a concentration of 0.0992 mg/kg. Concentrations decreased with depth at location 02-600585. Vertical extent of Aroclor-1242 is defined.

Aroclor-1254 was detected in six samples with a maximum concentration of 0.118 mg/kg. Concentrations decreased with depth at all locations. Vertical extent of Aroclor-1254 is defined.

Aroclor-1260 was detected in 15 samples with a maximum concentration of 0.169 mg/kg. Concentrations decreased with depth at all locations. Vertical extent of Aroclor-1260 is defined.

Di-n-butylphthalate was detected in six samples with a maximum concentration of 0.121 mg/kg. Concentrations increased with depth at locations 02-600588 and 02-600591 and did not change substantially with depth (0.0068 mg/kg) at location 02-600590. The residential SSL is approximately 50,900 times the maximum concentration. Further sampling for extent of di-n-butylphthalate is not warranted.

Methylene chloride was detected in two samples with a maximum concentration of 0.00272 mg/kg. Concentrations increased with depth at location 02-600589 and only one depth was sampled at location 02-600587. The residential SSL is approximately 43,400 times the maximum concentration. Further sampling for extent of methylene chloride is not warranted

Toluene was detected in one sample at a concentration of 0.00037 mg/kg. Concentrations decreased with depth at location 02-600588. Vertical extent of toluene is defined.

TPH-DRO was detected in nine samples with a maximum concentration of 537 mg/kg. Concentrations decreased with depth at all locations. Vertical extent of TPH-DRO is defined.

Radionuclides

Radionuclide COPCs at AOC 02-006(c) include cesium-137, plutonium-239/240, strontium-90, and tritium.

Cesium-137 was detected above the soil FV in two samples and detected below 1 ft bgs in three soil and Qal samples with a maximum activity of 16.9 pCi/g. Activities decreased with depth at all locations. Vertical extent of cesium-137 is defined.

Plutonium-239/240 was detected above the soil FV in one sample and detected below 1 ft bgs in one Qal sample with a maximum activity of 0.112 pCi/g. Activities decreased with depth at all locations. Vertical extent of plutonium-239/240 is defined.

Strontium-90 was detected above the soil FV in two samples and detected below 1 ft bgs in two Qal samples with a maximum activity of 3.86 pCi/g. Activities decreased with depth at all locations. Vertical extent of strontium-90 is defined.

Tritium was detected in 14 samples with a maximum activity of 0.506 pCi/g. Activities did not change substantially with depth (0.0082 pCi/g) at location 02-612463 and decreased with depth at all other locations. The residential SAL is approximately 3360 times the maximum activity. Further sampling for extent of tritium is not warranted.

Summary of Nature and Extent at AOC 02-006(c)

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at AOC 02-006(c).

6.17.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 3×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.01, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 10 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 3×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.03, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

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} (NMED 2017, 602273). The residential HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 20 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The residential exposure scenario also demonstrates protection of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, residential, and construction worker scenarios at SWMU 02-006(c).

6.17.6 Summary of Ecological Risk Screening

SWMU 02-006(c) is within the TA-02 core area. Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and results of site-specific ecological risk studies, no potential ecological risks exist for the TA-02 core area.

6.18 AOC 02-006(d), Duplicate of AOC 02-006(c)

AOC 02-006(d) is a duplicate of AOC 02-006(c). All activities for AOC 02-006(d) are addressed with respect to AOC 02-006(c), which is discussed in section 6.17.

6.19 AOC 02-006(e), Former Sump for Reactor Room Floor Drains and Mezzanine

6.19.1 Site Description and Operational History

AOC 02-006(e) was a sump (structure 02-26) and drainline that received effluent from the OWR building (02-1) reactor room floor drains and mezzanine (Figure 6.19-1).

The AOC 02-006(e) drainline was connected to floor drains in the main reactor room and became operational in 1944. A second collection sump (structure 02-82) was added to the AOC 02-006(e) drainline in 1990, as shown on engineering drawing C-45924 (LANL 1990, 089679). A drainline from the structure 02-82 sump was connected directly to the AOC 02-004(e) acid pit/transfer sump (structure 02-53), possibly replacing the AOC 02-006(e) direct discharge to Los Alamos Creek; however, the sump (structure 02-26) and the original drainline remained in place until they were removed and disposed of during D&D activities in 2003 (WD-3 2003, 082646, p. 6). The second sump (structure 02-82) and the drainline to structure 02-53 [AOC 02-004(e)] were also removed and disposed of during D&D activities in 2003 (WD-3 2003, 082646, p. 6).

6.19.2 Relationship to Other SWMUs and AOCs

The floor drains and drainlines of AOC 02-006(e) originated within the OWR facility, AOC 02-004(a). The drainlines and sumps south of the OWR building were located in proximity to the drainlines included in AOC 02-011(a), which ran parallel to the AOC 02-006(e) lines between the OWR building and the outfall at Los Alamos Creek.

6.19.3 Summary of Previous Investigations

6.19.3.1 1995 Investigation Activities

One location was sampled in 1995. Supporting QA/QC information is not available for these samples, so the sample results are not included in this report.

6.19.3.2 2000 Post–Cerro Grande Fire Recovery Work

As part of the post–Cerro Grande fire recovery work, three samples were collected from two locations (02-01095 and 02-01250).

6.19.3.3 2003 Omega West Decommissioning Project

All AOC 02-006(e) piping and sumps were removed during the OWR decommissioning project. Site activities included soil excavation, radiological walkover surveys, radiological (structure) screening, soil sampling, sample analysis, and surveying of sample coordinates. Radiological walkover surveys and radiological (structure) screening were conducted to segregate waste, primarily equipment and construction materials. Limited soil surveys were conducted; however, no formal report of soil survey results is available.

LLW (construction debris and/or soil) was packaged and shipped to Envirocare or TA-54 for disposal. Mixed waste was packaged and transferred to TA-54 for further processing and/or storage at the Laboratory. In total, 360 yd^3 of material was shipped to Envirocare for disposal; material from the OWR floor drains, lines, and waste sumps was included in this total volume (WD-3 2003, 082646, pp. 1–6). Six samples were collected from three boreholes (locations 02-22356, 02-22357, and 02-22358) in 2003.

6.19.3.4 2007 Investigation Activities

Forty-one samples were collected from eleven locations at AOC 02-006(e) in 2007. Results from the sampling activities in 2007 were presented in the previous investigation report (LANL 2008, 101669.12). Additional sampling was required to define the extent of contamination at the site.

6.19.4 Site Contamination

6.19.4.1 Soil, Rock, and Sediment Sampling

As part of the 2010 investigation, the following characterization activities were conducted at AOC 02-006(e):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Five samples were collected from location 02-612292 near the drainline of AOC 02-006(e) from 5–6 ft, 15–16.5 ft, 25–26 ft, 35–36 ft, and 49–50 ft bgs. These samples were analyzed for TAL metals, hexavalent chromium, PCBs, SVOCs, gamma-emitting radionuclides, isotopic plutonium, and tritium.

The 2010 and historical sampling locations at AOC 02-006(e) are shown in Figure 6.19-1. Table 6.19-1 presents the samples collected and analyses requested for AOC 02-006(e). The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

6.19.4.2 Soil, Rock, and Sediment Sample Field-Screening Results

No organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of the samples. No radiological-screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. No changes to sampling or other activities occurred because of the field-screening results.

6.19.4.3 Soil, Rock, and Sediment Sample Analytical Results

Decision-level data at AOC 02-006(e) consist of results from 55 samples collected from 17 locations in 2003, 2007, and 2010. The 55 samples include 29 soil, 7 Qal, 16 Qbo, and 3 sediment samples.

Inorganic Chemicals

A total of 55 samples (29 soil, 7 Qal, 16 Qbo, and 3 sediment) were analyzed for TAL metals, 52 samples (29 soil, 7 Qal, and 16 Qbo) were analyzed for hexavalent chromium, 44 samples (23 soil, 6 Qal, 12 Qbo, and 3 sediment) were analyzed for nitrate, and 41 samples (23 soil, 6 Qal, and 12 Qbo) were analyzed for perchlorate and total cyanide. Table 6.19-2 presents the inorganic chemicals detected or detected above BVs. Plate 28 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV (3560 mg/kg) in 14 samples with a maximum concentration of 22,800 mg/kg. The site concentrations are substantially above background. The Gehan and quantile tests indicated site concentrations of aluminum in tuff are statistically different from background (Figure G-151 and Table G-23). Aluminum is retained as a COPC.

Antimony was not detected above the soil and Qbt 1g, Qct, Qbo BVs (0.83 mg/kg and 0.5 mg/kg) but had DLs (0.514 mg/kg to 1.03 mg/kg) above BVs in 1 soil sample and 10 tuff samples. There were too few detections to perform statistical tests. Antimony is retained as a COPC.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV (0.56 mg/kg) in 10 samples with a maximum concentration of 2.7 mg/kg and was not detected but had DLs (1.28 mg/kg to 1.81 mg/kg) above the Qbt 1g, Qct, Qbo BV in 5 samples. The slippage test indicated site concentrations of arsenic in tuff are statistically different from background (Figure G-152 and Table G-23). Arsenic is retained as a COPC.

Barium was detected above the Qbt 1g, Qct, Qbo BV (25.7 mg/kg) in eight samples with a maximum concentration of 113 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in tuff are statistically different from background (Figure G-153 and Table G-23). Barium is retained as a COPC.

Cadmium was detected above the soil BV (0.4 mg/kg) in 2 samples with a maximum concentration of 0.464 mg/kg and was not detected but had DLs (0.499 mg/kg to 0.667 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs (0.4 mg/kg) in 25 soil samples and 16 tuff samples. Cadmium is retained as a COPC.

Calcium was detected above the soil BV (6120 mg/kg) in five samples with a maximum concentration of 31,600 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in soil are not statistically different from background (Figure G-154 and Table G-24). Calcium is not a COPC.

Chromium was detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs (19.3 mg/kg, 10.5 mg/kg, and 2.6 mg/kg) in 6 soil samples, 1 sediment sample, and 13 tuff samples with a maximum concentration of 59.1 mg/kg. The quantile and slippage tests indicated site concentrations of chromium in soil are statistically different from background (Figure G-155 and Table G-24). The Gehan and quantile tests indicated site concentrations of chromium in tuff are statistically different from background (Figure G-156 and Table G-23). Chromium is retained as a COPC.

Copper was detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs (14.7 mg/kg, 11.2 mg/kg, 2.6 mg/kg) in one soil sample, two sediment samples, and four tuff samples with a maximum concentration of 16 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in soil are not statistically different from background (Figure G-157 and Table G-24). The quantile and slippage tests indicated site concentrations of copper in tuff are statistically different from background (Figure G-158 and Table G-23). Copper is retained as a COPC.

Hexavalent chromium was detected in 21 samples with a maximum concentration of 1.01 mg/kg. Hexavalent chromium is retained as a COPC.

Iron was detected above the Qbt 1g, Qct, Qbo BV (3700 mg/kg) in 16 samples with a maximum concentration of 8910 mg/kg. The Gehan and quantile tests indicated site concentrations of iron in tuff are statistically different from background (Figure G-159 and Table G-23). Iron is retained as a COPC.

Lead was detected above the sediment BV (19.7 mg/kg) in two samples with a maximum concentration of 110 mg/kg. The maximum concentration is substantially above background. Lead is retained as a COPC.

Manganese was detected above the Qbt 1g, Qct, Qbo BV (189 mg/kg) in 13 samples with a maximum concentration of 400 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in tuff are statistically different from background (Figure G-160 and Table G-23). Manganese is retained as a COPC.

Mercury was detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs (0.1 mg/kg for each) in 24 soil samples, 3 sediment samples, and 2 tuff samples with a maximum concentration of 17.2 mg/kg. The site concentrations are substantially above background. Mercury is retained as a COPC.

Nickel was detected above the soil and Qbt 1g, Qct, Qbo BVs (15.4 mg/kg and 2 mg/kg) in one soil sample and nine tuff samples with a maximum concentration of 24.4 mg/kg. The Gehan and quantile tests indicated site concentrations of nickel in soil are not statistically different from background (Figure G-161 and Table G-24). There are too few detections in the tuff background data set to perform statistical tests. Nickel is retained as a COPC.

Nitrate was detected in 24 samples with a maximum concentration of 6.94 mg/kg. Nitrate is naturally occurring, and the concentrations likely reflect naturally occurring levels. In addition, AOC 02-006(e) received floor drainage from a reactor room and is not a source of nitrate. Nitrate is not a COPC.

Perchlorate was detected in six samples with a maximum concentration of 0.000863 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the sediment and Qbt 1g, Qct, Qbo BVs (0.3 mg/kg for both) in 1 sediment sample and 5 tuff samples with a maximum concentration of 1.45 mg/kg and was not detected above the soil BV (1.52 mg/kg) and Qbt 1g, Qct, Qbo BV but had DLs (1.28 mg/kg to 2.04 mg/kg) above BVs in 13 soil samples and 11 tuff samples. Selenium is retained as a COPC.

Silver was detected above the sediment BV (1 mg/kg) in 1 sample at a concentration of 1.4 mg/kg. The concentration was only 0.4 mg/kg above BV and silver was not detected or detected above BV in 54 other samples (detected below BV in 45 samples). Silver is not a COPC.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV (4.59 mg/kg) in four samples with a maximum concentration of 15.4 mg/kg. The Gehan and quantile tests indicated site concentrations of vanadium in tuff are statistically different from background (Figure G-162 and Table G-23). 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 six soil samples and three sediment samples with a maximum concentration of 320 mg/kg. The Gehan test indicated site concentrations of zinc in soil are statistically different from background (Table G-24). However, the quantile and slippage tests indicated site concentrations of zinc in soil are not statistically different from background (Figure G-163 and Table G-24). There were too few sediment samples to perform statistical tests. Zinc is retained as a COPC.

Organic Chemicals

A total of 48 samples (23 soil, 7 Qal, 16 Qbo, and 2 sediment) were analyzed for PCBs, 49 samples (23 soil, 7 Qal, 16 Qbo, and 3 sediment) were analyzed for SVOCs, and 32 samples (12 soil, 6 Qal, 12 Qbo, and 2 sediment) were analyzed for VOCs. Table 6.19-3 presents the detected organic chemicals. Plate 29 shows the spatial distribution of detected organic chemicals.

Polycyclic Aromatic Hydrocarbons

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

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

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

Site Activities

AOC 02-006(e) was a sump and drainline that received effluent from the OWR building reactor room floor drains and mezzanine and was identified as an AOC because of possible soil contamination resulting from releases of radioactive wastewater. The AOC 02-006(e) drainline was located beneath asphalt paving adjacent to the OWR, which was removed as part of D&D. Samples with detectable PAHs at this site were surface samples or shallow subsurface samples, which would have been beneath the former asphalt paving. PAHs were not known to be associated with the effluent managed at this site. Based on the above, the PAHs detected in samples used to characterize this site [acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenanthrene; and pyrene] are associated with the former paved area, are not related to historical Laboratory site operations, and are not COPCs.

Organic COPCs

Other organic chemicals detected at AOC 02-006(e) include Aroclor-1242; Aroclor-1248; Aroclor-1254; Aroclor-1260; bis(2-ethylhexyl)phthalate; chloroform; dibenzofuran; 1,4-dichlorobenzene; isopropylbenzene; methylene chloride; toluene; and 1,3-xylene + 1,4-xylene. The detected organic chemicals listed are retained as COPCs.

Radionuclides

A total of 41 samples (23 soil, 6 Qal, and 12 Qbo) were analyzed for americium-241; 55 samples (29 soil, 7 Qal, 16 Qbo, and 3 sediment) were analyzed for gamma-emitting radionuclides, isotopic plutonium, and tritium; 50 samples (29 soil, 6 Qal, 12 Qbo, and 3 sediment) were analyzed for isotopic uranium and strontium-90; and 6 soil samples were analyzed for technetium-99. Table 6.19-4 presents the radionuclides detected or detected above BVs/FVs. Figure 6.19-2 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Cesium-137 was detected above the soil FV (1.65 pCi/g) in one sample and detected below 1 ft bgs in three soil samples with a maximum activity of 1.75 pCi/g. Cesium-137 is retained as a COPC.

Cobalt-60 was detected in seven samples with a maximum activity of 1.05 pCi/g. Cobalt-60 has no BV in either soil or sediment. Cobalt-60 is retained as a COPC.

Plutonium-239/240 was detected above the soil and sediment FVs (0.054 pCi/g and 0.068 pCi/g) in one soil and three sediment samples, detected below 1 ft bgs in nine soil and Qal samples, and detected in one Qbo sample, with a maximum activity of 1.62 pCi/g. Plutonium-239/240 is retained as a COPC.

Tritium was detected above the sediment BV (0.093 pCi/g) in 1 sample and was detected in 28 soil, Qal, and Qbo samples with a maximum activity of 0.833 pCi/g. Tritium is retained as a COPC.

Uranium-235/236 was detected above the soil and Qbt 1g, Qct, Qbo BVs (0.2 pCi/g and 0.18 pCi/g) in 1 soil sample and 1 Qbo sample with a maximum activity of 0.292 pCi/g. The maximum activity was only 0.092 pCi/g above BV and uranium-235/236 was not detected or detected above BV in 48 other samples (detected below BV in 39 samples). Uranium-235/236 is not a COPC.

6.19.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at AOC 02-006(e) are discussed below.

Inorganic Chemicals

Inorganic COPCs at AOC 02-006(e) include aluminum, antimony, arsenic, barium, cadmium, chromium, copper, hexavalent chromium, iron, lead, manganese, mercury, nickel, perchlorate, selenium, vanadium, and zinc.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV in 14 samples with a maximum concentration of 22,800 mg/kg. Concentrations increased with depth at most locations. The detections above BV were generally in the deepest samples collected at each location and aluminum was not detected above BV in overlying soil samples. Concentrations increased laterally. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 3.4 times the maximum concentration, and the industrial SSL is approximately 56 times the maximum concentration. Further sampling for extent of aluminum is not warranted.

Antimony was not detected above the soil and Qbt 1g, Qct, Qbo BVs but had DLs (0.514 mg/kg to 1.03 mg/kg) above BVs in 1 soil sample and 10 tuff samples. The residential SSL is approximately 30 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV in 10 samples with a maximum concentration of 2.7 mg/kg and was not detected but had DLs (1.28 mg/kg to 1.81 mg/kg) above the Qbt 1g, Qct, Qbo BV in 5 samples. The detections above BV were in the deepest samples collected at each location and arsenic was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations did not change substantially laterally (1.98 mg/kg). All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 2.6 times the maximum concentration, and the industrial SSL is approximately 13 times the maximum concentration. The residential SSL is approximately 3.9 times the maximum DL, and the industrial SSL is approximately 20 times the maximum DL. Further sampling for extent of arsenic is not warranted.

Barium was detected above the Qbt 1g, Qct, Qbo BV in eight samples with a maximum concentration of 113 mg/kg. The detections above BV were in the deepest samples collected at each location and barium was not detected above BV in overlying soil samples. Some of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations increased laterally. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 138 times the maximum concentration. Further sampling for extent of barium is not warranted.

Cadmium was detected above the soil BV in 2 samples with a maximum concentration of 0.464 mg/kg and was not detected but had DLs (0.499 mg/kg to 0.667 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs in 25 soil samples and 16 tuff samples. Concentrations decreased with depth at all locations and did not change substantially laterally (0.034 mg/kg). The residential SSL is approximately 152 times the maximum concentration and 106 times the maximum BV. Further sampling for extent of cadmium is not warranted.

Chromium was detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs in 6 soil samples, 1 sediment sample, and 13 tuff samples with a maximum concentration of 59.1 mg/kg. Concentrations increased with depth at location 02-600282, did not change substantially with depth (1.4 mg/kg) at location 02-600290, and decreased with depth at all other locations (concentrations in shallow samples at locations 02-600284, 02-600286, 02-600289, and 02-600290 were 14.5 mg/kg, 18.5 mg/kg, 18 mg/kg, and 12.7 mg/kg and below the soil BV [Appendix F, Pivot Tables]. Concentrations decreased laterally. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 3.9 times and the industrial SSL is approximately 20 times the maximum concentration where vertical extent is not defined (25 mg/kg at location 02-600282). Lateral extent of chromium is defined and further sampling for vertical extent is not warranted.

Copper was detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs in one soil sample, two sediment samples, and four tuff samples with a maximum concentration of 16 mg/kg. Concentrations did not change substantially with depth (1.14 mg/kg or less) at locations 02-01095, 02-600289, and 02-600291; decreased with depth at location 02-600285; and decreased laterally (the concentration in a shallow sample at location 02-600289 was 5.32 mg/kg and below the soil BV [Appendix F, Pivot Tables]. The residential SSL is approximately 196 times the maximum concentration. Lateral extent of copper is defined and further sampling for vertical extent is not warranted.

Hexavalent chromium was detected in 21 samples with a maximum concentration of 1.01 mg/kg. Concentrations increased with depth at location 02-22357, did not change substantially with depth (0.003 mg/kg) at location 02-600289, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 3 times the maximum concentration, and the industrial SSL is approximately 71 times the maximum concentration. Lateral extent of hexavalent chromium is defined and further sampling for vertical extent is not warranted.

Iron was detected above the Qbt 1g, Qct, Qbo BV in 16 samples with a maximum concentration of 8910 mg/kg. The detections above BV were in the deepest samples collected at each location and iron was not detected above BV in overlying soil samples. Some of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations increased laterally. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 6.2 times the maximum concentration, and the industrial SSL is approximately 102 times the maximum concentration. Further sampling for extent of iron is not warranted.

Lead was detected above the sediment BV in two samples with a maximum concentration of 110 mg/kg. The maximum concentration is substantially above background. Only one depth was sampled at location 02-01250, concentrations decreased with depth at location 02-010950, and concentrations decreased laterally. Lead was not detected above BV in deeper samples collected at location 02-600292 adjacent to location 02-01250 and vertical extent is defined at this location. Lateral and vertical extent of lead are defined.

Manganese was detected above the Qbt 1g, Qct, Qbo BV in 13 samples with a maximum concentration of 400 mg/kg. The detections above BV were in the deepest samples collected at each location and iron was not detected above BV in overlying soil samples. Some of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations decreased laterally. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 26 times the maximum concentration, and the industrial SSL is approximately 400 times the maximum concentration. Further sampling for extent of manganese is not warranted.

Mercury was detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs in 24 soil samples, 3 sediment samples, and 2 tuff samples with a maximum concentration of 17.2 mg/kg. Concentrations increased with depth at locations 02-01095 and 02-22356, only one depth was sampled at location 02-01250, concentrations decreased with depth at all other locations, and concentrations decreased laterally. Mercury was not detected above BV in deeper samples collected at location 02-600292 adjacent to locations 02-01095 and 02-01250 and was not detected above BV in deep samples at location 02-600290 approximately 10 ft from location 02-22356; vertical extent is defined at these locations. Lateral and vertical extent of mercury are defined.

Nickel was detected above the soil and Qbt 1g, Qct, Qbo BVs in one soil sample and nine tuff samples with a maximum concentration of 24.4 mg/kg. At all locations except 02-600285, the detections above BV were in the deepest samples collected at each location and nickel was not detected above BV in overlying soil samples. Some of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations decreased with depth at location 02-600285 where nickel was also detected above BV in soil. Concentrations decreased laterally. All detections above BV in Qbo were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 64 times the maximum concentration. Lateral extent of nickel is defined and further sampling for vertical extent is not warranted.

Perchlorate was detected in six samples with a maximum concentration of 0.000863 mg/kg. Only one depth was sampled at location 02-600292, concentrations decreased with depth at all other locations, and concentrations did not change substantially laterally (0.000304 mg/kg). The residential SSL is approximately 63,500 times the maximum concentration. Further sampling for extent of perchlorate is not warranted.

Selenium was detected above the sediment and Qbt 1g, Qct, Qbo BVs in 1 sediment sample and 5 tuff samples with a maximum concentration of 1.45 mg/kg and was not detected above the soil and Qbt 1g, Qct, Qbo BVs but had DLs (1.28 mg/kg to 2.04 mg/kg) above BVs in 13 soil samples and 11 tuff samples. Concentrations did not change substantially with depth (0.13mg/kg or less) at locations 02-600285, 02-600289, and 02-600291; decreased with depth at all other locations; and did not change substantially laterally (0.96 mg/kg) (concentrations in shallow samples at locations 02-600289 and 02-600291 were 1.18 mg/kg and 1.34 mg/kg and below the soil BV [Appendix F, Pivot Tables]. The residential SSL is approximately 297 times the maximum concentration. Further sampling for extent of selenium is not warranted.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV in four samples with a maximum concentration of 15.4 mg/kg. Concentrations decreased with depth at all locations, and increased laterally (the concentration in a shallow sample at location 02-600289 was 14.5 mg/kg and below the soil BV [Appendix F, Pivot Tables]. The residential SSL is approximately 26 times the maximum concentration. Further sampling for extent of vanadium is not warranted.

Zinc was detected above the soil and sediment BVs in six soil samples and three sediment samples with a maximum concentration of 320 mg/kg. Concentrations increased with depth at location 02-22356, only one depth was sampled at location 02-01250, concentrations decreased with depth at all other locations, and concentrations increased laterally. Zinc was not detected above BV in deeper samples collected at location 02-600292 adjacent to location 02-01250 and was not detected above BV in deep samples at location 02-600290 approximately 10 ft from location 02-22356 and vertical extent is defined at these locations. The residential SSL is approximately 73 times the maximum concentration. Vertical extent of zinc is defined and further sampling for lateral extent is not warranted.

Organic Chemicals

Organic COPCs at AOC 02-006(e) include Aroclor-1242; Aroclor-1248; Aroclor-1254; Aroclor-1260; bis(2-ethylhexyl)phthalate; chloroform; dibenzofuran; 1,4-dichlorobenzene; isopropylbenzene; methylene chloride; toluene; and 1,3-xylene + 1,4-xylene.

Aroclor-1242 was detected in two samples with a maximum concentration of 0.213 mg/kg. Concentrations increased with depth at location 02-612292, decreased with depth at location 02-600288, and decreased laterally. The residential SSL is approximately 10 times the maximum concentration, and the industrial SSL is approximately 51 times the maximum concentration. Lateral extent of Aroclor-1242 is defined and further sampling for vertical extent is not warranted.

Aroclor-1248 was detected in two samples with a maximum concentration of 0.408 mg/kg. Concentrations decreased with depth at all locations and increased laterally. The residential SSL is approximately 5.4 times the maximum concentration, and the industrial SSL is approximately 26 times the maximum concentration. Further sampling for extent of Aroclor-1248 is not warranted.

Aroclor-1254 was detected in 18 samples with a maximum concentration of 0.334 mg/kg. Concentrations increased with depth at locations 02-600285 and 02-612292, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 3.4 times the maximum concentration, and the industrial SSL is approximately 33 times the maximum concentration. Lateral extent of Aroclor-1254 is defined and further sampling for vertical extent is not warranted.

Aroclor-1260 was detected in 28 samples with a maximum concentration of 0.115 mg/kg. Concentrations increased with depth at location 02-600289, did not change substantially with depth (0.04 mg/kg) at location 02-612292, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 19 times the maximum concentration, and the industrial SSL is approximately 96 times the maximum concentration. Lateral extent of Aroclor-1260 is defined and further sampling for vertical extent is not warranted.

Bis(2-ethylhexyl)phthalate was detected in three samples with a maximum concentration of 0.231 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

Dibenzofuran was detected in two samples with a maximum concentration of 0.165 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of dibenzofuran are defined.

Dichlorobenzene[1,4-] was detected in three samples with a maximum concentration of 0.000384 mg/kg. Concentrations did not change substantially with depth (0.000118 mg/kg) at location 02-600284 and decreased laterally. The residential SSL is approximately 3,360,000 times the maximum concentration. Lateral extent of 1,4-dichlorobenzene is defined and further sampling for vertical extent is not warranted.

Isopropylbenzene was detected in three samples with a maximum concentration of 0.000433 mg/kg. Concentrations decreased with depth at all locations and did not change substantially laterally (0.000105mg/kg). All detected concentrations were below EQLs. The residential SSL is approximately 5,430,000 times the maximum concentration. Vertical extent of isopropylbenzene is defined and further sampling for lateral extent is not warranted.

Methylene chloride was detected in three samples with a maximum concentration of 0.00456 mg/kg. Concentrations increased with depth at locations 02-600286 and 02-600291 and did not change substantially laterally (0.00138mg/kg). All detected concentrations were below EQLs. The residential SSL is approximately 25,800 times the maximum concentration. Further sampling for extent of methylene chloride is not warranted.

Toluene was detected in one sample at a concentration of 0.000522 mg/kg. Concentrations decreased with depth at location 02-600287 and increased laterally. The detected concentration was below the EQL. The residential SSL is approximately 10,000,000 times the maximum concentration. Further sampling for extent of toluene is not warranted.

Xylene[1,3-]+xylene[1,4-] was detected in one sample at a concentration of 0.000282 mg/kg. Concentrations increased with depth at location 02-600283 and decreased laterally. The detected concentration was below the EQL. The residential SSL is approximately 3,060,000 times the maximum concentration. Lateral extent of 1,3-xylene+1,4-xylene is defined and further sampling for vertical extent not warranted.

Radionuclides

Radionuclide COPCs at AOC 02-006(e) include cesium-137, cobalt-60, plutonium-239/240, and tritium.

Cesium-137 was detected above the soil FV in one sample and detected below 1 ft bgs in three soil samples with a maximum activity of 1.75 pCi/g. Activities increased with depth at location 02-22356, decreased with depth at all other locations, and decreased laterally. The residential SAL is approximately 6.9 times the maximum activity, and the industrial SAL is approximately 23 times the maximum activity. Lateral extent of cesium-137 is defined and further sampling for vertical extent is not warranted.

Cobalt-60 was detected in seven samples with a maximum activity of 1.05 pCi/g. Activities increased with depth at location 02-22357, decreased with depth at all other locations, and increased laterally. The residential SAL is approximately 2.5 times the maximum activity, and the industrial SAL is approximately 8.6 times the maximum activity. Cobalt-60 does not result in an unacceptable dose under the industrial scenario (Appendix H, Table H-2.3-31). further sampling for extent of cobalt-60 is not warranted.

Plutonium-239/240 was detected above the soil and sediment FVs in one soil and three sediment samples, detected below 1 ft bgs in nine soil and Qal samples, and detected in one Qbo sample, with a maximum activity of 1.62 pCi/g. Activities increased with depth at location 02-600287, decreased with depth at all other locations, and increased laterally. The residential SAL is approximately 49 times the maximum activity. Further sampling for extent of plutonium-239/240 is not warranted.

Tritium was detected above the sediment BV in 1 sample and was detected in 28 soil, Qal, and Qbo samples with a maximum activity of 0.833 pCi/g. Activities increased with depth at location 02-600291, only one depth was sampled at location 02-01250, activities did not change substantially with depth (0.0217 pCi/g) at location 02-22356, activities decreased with depth at all other locations, and activities decreased laterally. The residential SAL is approximately 2040 times the maximum activity. Lateral extent of tritium is defined and further sampling for vertical extent is not warranted.

Summary of Nature and Extent at AOC 02-006(e)

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at AOC 02-006(e).

6.19.5 Summary of Human Health Risk Screening

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} (NMED 2017, 602273). The industrial HI is 0.1, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 2×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.1, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Residential Scenario

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 2017, 602273). The residential HI is 0.8, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The residential exposure scenario also demonstrates protection of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, residential, and construction worker scenarios at AOC 02-006(e).

6.19.6 Summary of Ecological Risk Screening

AOC 02-006(e) is within the TA-02 core area. Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and results of site-specific ecological risk studies, no potential ecological risks exist for the TA-02 core area.

6.20 SWMU 02-007, Septic System for Floor Drains in OWR Building and Chemical Shack

6.20.1 Site Description and Operational History

SWMU 02-007 is a former septic tank (structure 02-43) and outfall (Figure 6.20-1). The septic tank was constructed of reinforced concrete and measured 13 ft long × 8 ft wide × 6 ft deep. The septic system received effluent from drains in the OWR facility (building 02-1).

The SWMU 02-007 septic tank and outfall were installed in 1944 and removed in 1985. Overflow from the tank discharged to the stream channel through a 6-in.-diameter VCP. However, the location of the outfall discharge is not known (Elder and Knoell 1986, 006670, p. 26). Laboratory wastes were discharged into the septic system. In 1947, the chemical waste shack (building 02-3, AOC 02-010) was connected to the septic system, as shown on engineering drawing C-1683 (LASL 1944, 090081), and remained connected until the chemical waste shack was decommissioned in 1971 (LASL no date, 034172). The septic tank and overflow outfall and surrounding soils were removed and disposed of in 1986 (Elder and Knoell 1986, 006670, pp. 26-41).

6.20.2 Relationship to Other SWMUs and AOCs

The septic tank (SWMU 02-007) and the leach field [SWMU 02-009(c)] are located near AOCs 02-003(a,b,e) but were not known to be directly connected to those structures. The septic system received effluent from drains in the OWR building [AOC 02-004(a)] and the chemical waste shack (AOC 02-010).

6.20.3 Summary of Previous Investigations

6.20.3.1 1985 WBR Decommissioning Project, Phase I

During Phase I of the TA-02 WBR decommissioning project, the septic tank and overflow drain were removed and disposed of at TA-54 (Elder and Knoell 1986, 006670, p. 43). A sludge sample collected from the tank was screened and showed no detectable radionuclide activity. A 6-in.-diameter VCP drainline from the septic tank overflow to the stream was also discovered during D&D activities. It was removed from depths of 3–8 ft bgs where it angled across the area east of the septic tank. No radioactivity above site background was detected at the time the drainline was removed (Elder and Knoell 1986, 006670, p. 26).

No samples were collected from the septic tank area. Samples collected in the area of the tank overflow drain are addressed in the discussion of SWMU 02-009(c) (section 6.25).

6.20.3.2 2007 Investigation Activities

Twenty-two samples were collected from six locations at SWMU 02-007 in 2007. Results from the sampling activities in 2007 were presented in the previous investigation report (LANL 2008, 101669.12). Additional sampling was required to define the extent of contamination at the site.

6.20.4 Site Contamination

6.20.4.1 Soil, Rock, and Sediment Sampling

As part of the 2010 investigation, the following characterization activities were conducted at SWMU 02-007:

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Five samples were collected from location 02-612390 near SWMU 02-007 from 5–6 ft, 15–17 ft, 26–27 ft, 35–36 ft, and 49–50 ft bgs. These samples were analyzed for TAL metals, PCBs, SVOCs, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium.

The 2010 and historical sampling locations at SWMU 02-007 are shown in Figure 6.20-1. The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

6.20.4.2 Soil and Rock Sample Field-Screening Results

No organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of the samples. No radiological-screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. No changes to sampling or other activities occurred because of the field-screening results.

6.20.4.3 Soil and Rock Sample Analytical Results

Decision-level data at SWMU 02-007 consist of results from 27 samples collected from 7 locations in 2007 and 2010. The 27 samples include 6 soil, 12 Qal, and 9 Qbo samples. Table 6.20-1 presents the samples collected and analyses requested for SWMU 02-007.

Inorganic Chemicals

A total of 26 samples (6 soil, 11 Qal, and 9 Qbo) were analyzed for TAL metals, and 21 samples (6 soil, 10 Qal, and 5 Qbo) were analyzed for nitrate, perchlorate, and total cyanide. Table 6.20-2 presents the inorganic chemicals detected or detected above BVs. Plate 30 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV (3560 mg/kg) in six samples with a maximum concentration of 11,500 mg/kg. The Gehan and quantile tests indicated site concentrations of aluminum in tuff are statistically different from background (Figure G-164 and Table G-25). Aluminum is retained as a COPC.

Antimony was not detected above the soil and Qbt 1g, Qct, Qbo BVs (0.83 mg/kg and 0.5 mg/kg) but had DLs (0.508 mg/kg to 1.27 mg/kg) above BVs in one soil sample and six tuff samples. Antimony is retained as a COPC.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV (0.56 mg/kg) in four samples with a maximum concentration of 1.11 mg/kg and was not detected but had DLs (1.14 mg/kg to 1.61 mg/kg) above the BV in five samples. The maximum concentration is greater than the maximum tuff background concentration (0.7 mg/kg). Arsenic is retained as a COPC.

Barium was detected above the soil and Qbt 1g, Qct, Qbo BVs (295 mg/kg and 25.7 mg/kg) in one soil sample and two tuff samples with a maximum concentration of 533 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in soil and tuff are not statistically different from background (Figure G-165 and Table G-26, and Figure G-166 and Table G-25, respectively). Barium is not a COPC.

Cadmium was not detected above the soil and Qbt 1g, Qct, Qbo BVs (0.4 mg/kg for both) but had DLs (0.492 mg/kg to 0.678 mg/kg) above BV in 10 soil samples and 9 tuff samples. The DLs were only 0.092 mg/kg to 0.278 mg/kg above the BVs and the maximum DL in soil (0.567 mg/kg) is below or equivalent to the three highest concentrations (0.6 mg/kg, 1.4 mg/kg, and 2.6 mg/kg) and three highest DLs (2 mg/kg, 2 mg/kg, and 2 mg/kg) in the soil background data set. There is no Qbt 1g, Qct, Qbo data set (the BV is based on a DL), but cadmium was not detected in any Qbo samples. Cadmium is not a COPC.

Chromium was detected above the Qbt 1g, Qct, Qbo BV (2.6 mg/kg) in four samples with a maximum concentration of 19.8 mg/kg and was not detected but had a DL (9.74 mg/kg) above the BV in one sample. The Gehan and quantile tests indicated site concentrations of chromium in tuff are statistically different from background (Figure G-167 and Table G-25). Chromium is retained as a COPC.

Cyanide was detected above the soil BV (0.5 mg/kg) in one sample at a concentration of 0.762 mg/kg. Cyanide has no background data set for soil. Cyanide is retained as a COPC.

Iron was detected above the Qbt 1g, Qct, Qbo BV (3700 mg/kg) in nine samples with a maximum concentration of 6380 mg/kg. The Gehan and quantile tests indicated site concentrations of iron in tuff are statistically different from background (Figure G-168 and Table G-25). Iron is retained as a COPC.

Lead was detected above the soil BV (22.3 mg/kg) in one sample at a concentration of 66 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil are not statistically different from background (Figure G-169 and Table G-26). Lead is not a COPC.

Manganese was detected above the Qbo BV (189 mg/kg) in four samples with a maximum concentration of 258 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in tuff are statistically different from background (Figure G-170 and Table G-25). Manganese is retained as a COPC.

Mercury was detected above the soil BV (0.1 mg/kg) in two samples with a maximum concentration of 2.91 mg/kg. Mercury is retained as a COPC.

Nickel was detected above the Qbt 1g, Qct, Qbo BV (2 mg/kg) in two samples with a maximum concentration of 6.54 mg/kg and was not detected but had DLs (2.88 mg/kg and 3.31 mg/kg) above the BV in two samples. There are too few detections in the tuff background data set to perform statistical tests. Nickel is retained as a COPC.

Nitrate was detected in five samples with a maximum concentration of 1.94 mg/kg. Although nitrate is naturally occurring, SWMU 02-007 is a septic system that managed sanitary wastewater. As a result, the concentrations detected may be site related rather than reflecting only naturally occurring levels. Nitrate is retained as a COPC.

Perchlorate was detected in six samples with a maximum concentration of 0.0048 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs (1.52 mg/kg and 0.3 mg/kg) in two soil samples and one tuff sample with a maximum concentration of 2.52 mg/kg and was not detected but had DLs (1.14 mg/kg and 1.88 mg/kg) above BV in four soil samples and eight tuff samples. The Gehan test indicated site concentrations of selenium in soil are statistically different from background (Table G-26). However, the quantile and slippage tests indicated site concentrations of selenium in soil are not statistically different from background (Figure G-171 and Table G-26). There is no Qbo background data set so statistical tests could not be performed. Selenium is retained as a COPC in tuff.

Zinc was detected above the soil BV (48.8 mg/kg) in one sample at a concentration of 49.2 mg/kg. The concentration was only 0.4 mg/kg above BV and was below the six highest concentrations in the soil background data set (53 mg/kg to 75.5 mg/kg). Zinc is not a COPC.

Organic Chemicals

A total of 26 samples (6 soil, 11 Qal, and 9 Qbo) were analyzed for PCBs and SVOCs, and 13 samples (9 Qal and 4 Qbo) were analyzed for VOCs. Table 6.20-3 presents the detected organic chemicals. Plate 31 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 02-007 include acenaphthene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; butylbenzylphthalate; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; and toluene. The detected organic chemicals are retained as COPCs.

Radionuclides

A total of 26 samples (6 soil, 11 Qal, and 9 Qbo) were analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium. Table 6.20-4 presents the radionuclides detected or detected above BVs/FVs. Plate 32 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Cesium-137 was detected in the subsurface below 1 ft bgs in three Qal samples with a maximum activity of 4.44 pCi/g. Cesium-137 is retained as a COPC.

Plutonium-239/240 was detected above the soil FV (0.054 pCi/g) in one sample, detected below 1 ft bgs in three Qal samples, and detected in one Qbo sample, with a maximum activity of 0.595 pCi/g. Plutonium-239/240 is retained as a COPC.

Strontium-90 was detected above the soil FV (1.31 pCi/g) in one sample and detected below 1 ft bgs in three Qal samples. Strontium-90 is retained as a COPC.

Tritium was detected in nine samples with a maximum activity of 0.159 pCi/g. Tritium is retained as a COPC.

Uranium-235/236 was detected above the Qbt 1g, Qct, Qbo BV (0.18 pCi/g) in 1 sample at an activity of 0.191 pCi/g. The maximum activity was only 0.011 pCi/g above the BV and uranium-235/236 was not detected or detected above BV in 25 other samples (detected below BV in 21 samples). The sample where uranium-235/236 was detected above BV was the deepest sample collected at that location and the result appears indicative of variations in natural background rather than a release. Uranium-235/236 is not a COPC.

6.20.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 02-007 are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 02-007 include aluminum, antimony, arsenic, chromium, cyanide, iron, manganese, mercury, nickel, nitrate, perchlorate, and selenium.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV in six samples with a maximum concentration of 11,500 mg/kg. Concentrations increased with depth at most locations. The detections above BV were generally in the deepest samples collected at each location and aluminum was not detected above BV in overlying soil samples. Concentrations increased laterally. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 6.8 times the maximum concentration, and the industrial SSL is approximately 113 times the maximum concentration. Further sampling for extent of aluminum is not warranted.

Antimony was not detected above the soil and Qbt 1g, Qct, Qbo BVs but had DLs (0.508 mg/kg to 1.27 mg/kg) above BVs in one soil sample and six tuff samples. The residential SSL is approximately 25 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV in four samples with a maximum concentration of 1.11 mg/kg and was not detected but had DLs (1.14 mg/kg to 1.61 mg/kg) above the BV in five samples. The detections above BV were in the deepest samples collected at each location and arsenic was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations did not change substantially laterally (0.391 mg/kg). All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 6.4 times the maximum concentration, and the industrial SSL is approximately 32 times the maximum concentration. The residential SSL is approximately 4.4 times the maximum DL, and the industrial SSL is approximately 22 times the maximum DL. Further sampling for extent of arsenic is not warranted.

Chromium was detected above the Qbt 1g, Qct, Qbo BV in four samples with a maximum concentration of 19.8 mg/kg and was not detected but had a DL (9.74 mg/kg) above the BV in one sample. The detections above BV were in the deepest samples collected at each location and chromium was not detected above BV in overlying soil samples. Some of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations increased laterally. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 4.8 times the maximum concentration, and the industrial SSL is approximately 26 times the maximum concentration. The residential SSL is approximately 10 times the maximum DL, and the industrial SSL is approximately 52 times the maximum DL. Further sampling for extent of chromium is not warranted.

Cyanide was detected above the soil BV in one sample at a concentration of 0.762 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of cyanide are defined.

Iron was detected above the Qbt 1g, Qct, Qbo BV in nine samples with a maximum concentration of 6380 mg/kg. The detections above BV were in the deepest samples collected at each location and iron was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations did not change substantially laterally (1750 mg/kg). All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 8.6 times the maximum concentration, and the industrial SSL is approximately 142 times the maximum concentration. Further sampling for extent of iron is not warranted.

Manganese was detected above the Qbo BV in four samples with a maximum concentration of 258 mg/kg. The detections above BV were in the deepest samples collected at each location and manganese was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations did not change substantially laterally (67 mg/kg). All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 41 times the maximum concentration. Further sampling for extent of manganese is not warranted.

Mercury was detected above the soil BV in two samples with a maximum concentration of 2.91 mg/kg. Concentrations decreased with depth at locations 02-600593 and 02-600594 and increased laterally at location 02-600594. The residential SSL is approximately 8.1 times the maximum concentration, and the industrial SSL is approximately 134 times the maximum concentration. Further sampling for extent of mercury is not warranted.

Nickel was detected above the Qbt 1g, Qct, Qbo BV in two samples with a maximum concentration of 6.54 mg/kg and was not detected but had DLs (2.88 mg/kg and 3.31 mg/kg) above the BV in two samples. Concentrations did not change substantially with depth (0.49 mg/kg) at location 02-600596, decreased with depth at location 02-600592, and increased laterally (concentrations in shallow samples at locations 02-600592 and 02-600596 were 4.48 mg/kg and 6.05 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 238 times the maximum concentration and 471 times the maximum DL. Further sampling for extent of nickel is not warranted.

Nitrate was detected in five samples with a maximum concentration of 1.94 mg/kg. Concentrations decreased with depth at all locations and did not change substantially laterally (0.581 mg/kg). The residential SSL is approximately 64,400 times the maximum concentration. Vertical extent of nitrate is defined and further sampling for lateral extent is not warranted.

Perchlorate was detected in six samples with a maximum concentration of 0.0048 mg/kg. Concentrations increased with depth at location 02-600597, decreased with depth at all other locations, and increased laterally. The residential SSL is approximately 11,400 times the maximum concentration. Further sampling for extent of perchlorate is not warranted.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs in two soil samples and one tuff sample with a maximum concentration of 2.52 mg/kg and was not detected but had DLs (1.14 mg/kg and 1.88 mg/kg) above BV in four soil samples and eight tuff samples. Concentrations did not change substantially with depth (0.75 mg/kg) at location 02-600595 and increased laterally. The residential SSL is approximately 155 times the maximum concentration and 208 times the maximum DL. Further sampling for extent of selenium is not warranted.

Organic Chemicals

Organic COPCs at SWMU 02-007 include acenaphthene, acetone, anthracene; Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, butylbenzylphthalate, chrysene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 2-methylnaphthalene, naphthalene, phenanthrene, pyrene, and toluene.

The PAHs acenaphthene, benzo(g,h,i)perylene, chrysene, fluorene, indeno(1,2,3-cd)pyrene, 2-methylnaphthalene, naphthalene, and pyrene were each detected in one sample at location 02-600594 and benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, fluoranthene, phenanthrene, and phenanthrene were each detected in one sample at location 02-600592 and one sample at location 02-600594. Concentrations decreased with depth at both locations. Concentrations increased laterally to the east at location 02-600594. Lateral extent to the east is bounded by SWMU 02-009(c). The residential SSLs for PAHs were all greater than 10 times the maximum concentrations except for benzo(a)pyrene and benzo(b)fluoranthene. The residential SSL for benzo(a)pyrene is approximately 6.1 times the maximum concentration (0.183 mg/kg) and the industrial SSL is approximately 129 times the maximum concentration. The residential SSL for benzo(b)fluoranthene is approximately 9.4 times the maximum concentration (0.163 mg/kg) and the industrial SSL is approximately 198 times the maximum concentration. Vertical extent of PAHs is defined and further sampling for lateral extent is not warranted.

Aroclor-1254 was detected in 12 samples with a maximum concentration of 1.63 mg/kg. Concentrations decreased with depth at all locations and increased to the east at location 02-600597. Lateral extent to the east is bounded by SWMU 02-009(c). The maximum concentration is approximately 1.5 times the residential SSL and the industrial SSL is approximately 6.8 times the maximum concentration. Aroclor-1254 does not pose an unacceptable risk at SMWU 02-007 (Appendix H, Table H-2.3-33). Vertical extent of Aroclor-1260 is defined and further sampling for lateral extent is not warranted.

Aroclor-1260 was detected in 12 samples with a maximum concentration of 0.859 mg/kg. Concentrations decreased with depth at all locations and increased to the east at location 02-600597. Lateral extent to the east is bounded by SWMU 02-009(c). The residential SSL is approximately 2.6 times the maximum concentration, and the industrial SSL is approximately 13 times the maximum concentration. Vertical extent of Aroclor-1260 is defined and further sampling for lateral extent is not warranted.

Butylbenzylphthalate was detected in one sample at a concentration of 0.254 mg/kg. Concentrations decreased with depth and increased laterally at location 02-600597. The residential SSL is approximately 11,400 times the maximum concentration. Vertical extent of butylbenzylphthalate is defined and further sampling for lateral extent is not warranted.

Toluene was detected in one sample at a concentration of 0.000311 mg/kg. Concentrations decreased with depth and increased laterally at location 02-600596. The residential SSL is approximately 16,800,000 times the maximum concentration. Vertical extent of toluene is defined and further sampling for lateral extent is not warranted.

Radionuclides

Radionuclide COPCs at SWMU 02-007 include cesium-137, plutonium-239/240, strontium-90, and tritium.

Cesium-137 was detected in the subsurface below 1 ft bgs in three Qal samples with a maximum activity of 4.44 pCi/g. Activities decreased with depth at locations 02-600593 and 02-612390 and increased laterally to the south at location 02-612390. Lateral extent to the south is bounded by AOC 02-003(a). The residential SAL is approximately 2.7 times the maximum activity, and the industrial SAL is approximately 9.2 times the maximum activity. Vertical extent of cesium-137 is defined and further sampling for lateral extent is not warranted.

Plutonium-239/240 was detected above the soil FV in one sample, detected below 1 ft bgs in three Qal samples, and detected in one Qbo sample, with a maximum activity of 0.595 pCi/g. Activities increased with depth at location 02-600596, decreased with depth at all other locations, and increased laterally. The residential SAL is approximately 133 times the maximum activity. Further sampling for extent of plutonium-239/240 is not warranted.

Strontium-90 was detected above the soil FV and one sample and detected below 1 ft bgs in three Qal samples with a maximum activity of 1.41 pCi/g. Activities decreased with depth at all locations and increased laterally. The residential SAL is approximately 11 times the maximum activity, and the industrial SAL is approximately 1700 times the maximum activity. Further sampling for extent of strontium-90 is not warranted.

Tritium was detected in nine samples with a maximum activity of 0.159 pCi/g. Activities increased with depth at locations 02-600592 and 02-612390, decreased with depth at all other locations, and decreased laterally. The residential SAL is approximately 10,700 times the maximum activity. Further sampling for extent of tritium is not warranted.

Summary of Nature and Extent

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at SWMU 02-007.

6.20.5 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} (NMED 2017, 602273). The industrial HI is 0.1, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 3×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.3, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.008 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 6×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.4, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 6 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The residential exposure scenario also demonstrates protection of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, residential, and construction worker scenarios at SWMU 02-007.

6.20.6 Summary of Ecological Risk Screening

SWMU 02-007 is within the TA-02 core area. Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and results of site-specific ecological risk studies, no potential ecological risks exist for the TA-02 core area.

6.21 SWMU 02-008(a), Outfall

6.21.1 Site Description and Operational History

SWMU 02-008(a) is a former National Pollutant Discharge Elimination System (NPDES) permitted outfall (EPA 03A020) that discharged cooling water from the OWR cooling tower (structure 02-49) (Figure 6.21-1).

The SWMU 02-008(a) outfall was also identified as AOC 02-011(e), NPDES-permitted outfall EPA 03A020. All discussions regarding outfall EPA 03A020 are addressed with respect to SWMU 02-008(a) (LANL 1990, 007511). Therefore, all activities associated with AOC 02-011(e) are addressed with respect to SWMU 02-008(a).

The cooling tower became an operational component of the OWR system in 1957. The cooling tower facility began use of potassium dichromate to control aluminum heat exchanger corrosion in 1959. The aluminum heat exchangers were replaced by stainless-steel heat exchangers in 1975, thus eliminating the use of potassium dichromate. A shutdown of the OWR in 1993 placed the cooling tower on standby status; in 1995, all liquid waste was drained from the system (WD-3 2003, 082646, p. 2). In 2000, the cooling tower structure and equipment were decommissioned and removed (LANL 2000, 090087). In 2003, the remaining buried pipes and drains were removed and disposed of (WD-3 2003, 082646, pp. 26–31). The outfall (EPA 03A020) was removed from the Laboratory's NPDES permit in July 1990 (LANL 1990, 007511).

6.21.2 Relationship to Other SWMUs and AOCs

The cooling tower was used to cool water used in the OWR facility, AOC 02-004(a). The water was directed through the OWR equipment building, AOC 02-004(f), before reaching the cooling tower. No other SWMUs or AOCs are directly related to SWMU 02-008(a).

6.21.3 Summary of Previous Investigations

6.21.3.1 2000 Post–Cerro Grande Recovery Work

During the post–Cerro Grande fire recovery work in July 2000, the cooling tower (structure 02-49) was decommissioned, removed, and disposed of. The underground piping associated with the cooling tower was capped and left in place until the remainder of the site was decommissioned and the material was disposed of. Surface soil samples were collected from across the area. However, survey coordinates were not collected for the sampling locations, and accurate information is not available for these locations. Data from these locations are not useable, and they are not presented in this report.

A sample was collected from one location (02-01249) in September 2000.

6.21.3.2 2003 Omega West Decommissioning Project

SWMU 02-008(a) piping was removed in 2003, and the waste was disposed of at an approved facility. Site activities included soil excavation, radiological walkover surveys, radiological (structure) screening, soil sampling, sample analysis, and surveying of sample coordinates. Limited soil surveys were conducted, but no formal report of soil survey results is available.

LLW (construction debris and/or soil) was packaged and shipped to Envirocare or TA-54 for disposal. Mixed waste was packaged and transferred to TA-54 for further processing and/or storage at the Laboratory. In total, 9800 ft^3 of material was shipped to Envirocare for disposal; material from the OWR cooling tower (structure 02-49) outfall was included in this total volume (WD-3 2003, 082646, pp. 1–6). The volume of waste material specifically associated with SWMU 02-008(a) was not documented.

No soil samples were collected from SWMU 02-008(a) during the D&D activities in 2003.

6.21.3.3 2007 Investigation Activities

Fifteen samples were collected from four locations at SWMU 02-008(a) in 2007. Results from the sampling activities in 2007 were presented in the previous investigation report (LANL 2008, 101669.12). Additional sampling was required to define the extent of contamination at the site.

6.21.4 Site Contamination

6.21.4.1 Soil, Rock, and Sediment Sampling

Sampling was not conducted for SWMU 02-008(a) in 2010. Location 02-612280, sampled for AOCs 02-004(b,c,d,e) in 2010, was only approximately 25 ft northwest of the site (Figures 6.8-1 and 6.11-1).

6.21.4.2 Soil, Rock, and Sediment Sample Field-Screening Results

Sampling was not conducted, so this section is not applicable.

6.21.4.3 Soil, Rock, and Sediment Sample Analytical Results

Decision-level data at SWMU 02-008(a) consist of results from 16 samples collected from 5 locations in 2000 and 2007. The 16 samples include 5 soil, 7 Qal, and 3 Qbo samples and 1 sediment sample. Table 6.21-1 presents the samples collected and analyses requested for SWMU 02-008(a).

Inorganic Chemicals

A total of 16 samples (5 soil, 7 Qal, 3 Qbo, and 1 sediment) were analyzed for TAL metals, and 15 samples (5 soil, 7 Qal, and 3 Qbo) were analyzed for hexavalent chromium, nitrate, perchlorate, and total cyanide. Table 6.21-2 presents the inorganic chemicals detected or detected above BVs. Figure 6.21-2 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV (3560 mg/kg) in three samples with a maximum concentration of 11,600 mg/kg. Aluminum is retained as a COPC.

Antimony was not detected above the Qbt 1g, Qct, Qbo BV (0.5 mg/kg) but had DLs (0.53 mg/kg and 0.534 mg/kg) above the BV in 2 samples. The DLs were only 0.03 mg/kg and 0.034 mg/kg above the BV and antimony was not detected in 13 other samples. Antimony is not a COPC.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV (0.56 mg/kg) in one sample at a concentration of 1.25 mg/kg and was not detected but had DLs (1.25 mg/kg and 1.95 mg/kg) above the BV in two samples. Arsenic is retained as a COPC.

Barium was detected above the Qbt 1g, Qct, Qbo BV (25.7 mg/kg) in one sample at a concentration of 29.3 mg/kg. The concentration was greater than the maximum Qbt 1g, Qct, Qbo background concentration (23 mg/kg). Barium is retained as a COPC.

Cadmium was not detected above the soil or Qbt 1g, Qct, Qbo BVs (0.4 mg/kg for both) but had DLs (0.501 mg/kg to 0.66 mg/kg) above BV in 10 soil samples and 3 tuff samples. The DLs were only 0.101 mg/kg to 0.26 mg/kg above the BVs, and the maximum DL in soil (0.569 mg/kg) is below or equivalent to the three highest concentrations (0.6 mg/kg, 1.4 mg/kg, and 2.6 mg/kg) and three highest DLs (2 mg/kg, 2 mg/kg, and 2 mg/kg) in the soil background data set. There is no Qbt 1g, Qct, Qbo data set (the BV is based on a DL), but cadmium was not detected in any Qbo samples. Cadmium is not a COPC.

Chromium was detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs (19.3 mg/kg, 10.5 mg/kg, and 2.6 mg/kg) in seven soil samples, one sediment sample, and two tuff samples with a maximum concentration of 104 mg/kg and was not detected above the soil BV but had a DL (30.9 mg/kg) above the BV in one sample. The Gehan and quantile tests indicated site concentrations of chromium in soil are statistically different from background (Figure G-172 and Table G-27). Chromium is retained as a COPC.

Copper was detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs (14.7 mg/kg, 11.2 mg/kg, and 2.6 mg/kg) in three soil samples, one sediment sample, and one tuff sample with a maximum concentration of 230 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in soil are statistically different from background (Figure G-173 and Table G-27). Copper is retained as a COPC.

Cyanide was detected above the soil BV (0.5 mg/kg) in 1 sample at a concentration of 0.723 mg/kg. The concentration is only 0.223 mg/kg above BV and cyanide was not detected or detected above BV in 14 other samples (detected below BV in 3 samples). Cyanide is not a COPC.

Hexavalent chromium was detected in four soil/Qal/tuff samples with a maximum concentration of 1.12 mg/kg. Hexavalent chromium is retained as a COPC.

Iron was detected above the Qbt 1g, Qct, Qbo BV (3700 mg/kg) in three samples with a maximum concentration of 7520 mg/kg. Iron is retained as a COPC.

Lead was detected above the soil and sediment BVs (22.3 mg/kg and 19.7 mg/kg) in 2 soil samples and 1 sediment sample with a maximum concentration of 57.7 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil are statistically different from background (Figure G-174 and Table G-27). There were too few sediment samples to perform statistical tests, but the maximum concentration in sediment (22 mg/kg) is less than the highest value in the sediment background data set (25.6 mg/kg) and equivalent to the soil BV. Lead was not detected or detected above BV in 13 other samples (detected below BV in 11 samples). Lead is not a COPC.

Manganese was detected above the Qbt 1g, Qct, Qbo BV (189 mg/kg) in three samples with a maximum concentration of 233 mg/kg. The maximum concentration is above the maximum concentration in the Qbt 1g, Qct, Qbo background data set (210 mg/kg). Manganese is retained as a COPC.

Nitrate was detected in six samples with a maximum concentration of 2.39 mg/kg. Nitrate is naturally occurring, and the concentrations likely reflect naturally occurring levels. In addition, SWMU 02-008(a) received cooling water and is not a source of nitrate. Nitrate is not a COPC.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs (1.52 mg/kg and 0.3 mg/kg) in five soil samples and two tuff samples with a maximum concentration of 10.7 mg/kg and was not detected above the soil BV but had DLs (1.53 mg/kg to 2.56 mg/kg) above the BV in five samples. The Gehan and quantile tests indicated site concentrations of selenium in soil are statistically different from background (Figure G-175 and Table G-27). Selenium is retained as a COPC.

Silver was detected above the sediment BV (1 mg/kg) in 1 sample at a concentration of 1.1 mg/kg. The concentration was only 0.1 mg/kg above BV and silver was not detected or detected above BV in 15 other samples (detected below BV in 11 samples). Silver is not a COPC.

Thallium was not detected above the soil BV (0.73 mg/kg) but had a DL (1.06 mg/kg) above the soil BV in one sample. The Gehan and quantile tests indicated site concentrations of thallium in soil are not statistically different from background (Figure G-176 and Table G-27). Thallium is not a COPC.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV (4.59 mg/kg) in one sample at a concentration of 6.77 mg/kg. Vanadium is retained as a COPC.

Zinc was detected above the soil and sediment BVs (48.8 mg/kg and 56.2 mg/kg) in five soil samples and one sediment sample with a maximum concentration of 78.9 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are statistically different from background (Figure G-177 and Table G-27). Zinc is retained as a COPC.

Organic Chemicals

A total of 15 samples (5 soil, 7 Qal, and 3 Qbo) were analyzed for PCBs and SVOCs, and 10 samples (7 Qal and 3 Qbo) were analyzed for VOCs. Table 6.21-3 presents the detected organic chemicals. Figure 6.21-3 shows the spatial distribution of detected organic chemicals.

Polycyclic Aromatic Hydrocarbons

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

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

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

Site Activities

SWMU 02-008(a) was an outfall that discharged cooling water from the OWR cooling tower and was identified as a SWMU because of potential inorganic chemical and radionuclide contamination in cooling water. The SWMU 02-008(a) outfall was located adjacent to asphalt paving west of the OWR and received runoff from the paved area. Samples with detectable PAHs at this site were surface samples located in the former paved area or surface and shallow subsurface samples in the area receiving runoff from the paved area. PAHs were not known to be associated with the OWR cooling water. Based on the above, the PAHs detected in samples used to characterize this site [acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; phenanthrene; and pyrene] are associated with the former paved area, are not related to historical Laboratory site operations, and are not COPCs.

Organic COPCs

Other organic chemicals detected at SWMU 02-008(a) include Aroclor-1254; Aroclor-1260; bis(2-ethylhexyl)phthalate; methylene chloride; styrene; and toluene. The detected organic chemicals listed are retained as COPCs.

Radionuclides

A total of 15 samples (5 soil, 7 Qal, and 3 Qbo) were analyzed for americium-241, and 16 samples (5 soil, 7 Qal, 3 Qbo, and 1 sediment,) were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium. Table 6.21-4 presents the radionuclides detected or detected above BVs/FVs. Figure 6.21-4 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Cesium-137 was detected below 1 ft bgs in three Qal samples with a maximum activity of 0.353 pCi/g. Cesium-137 is retained as a COPC.

Plutonium-239/240 was detected above the soil and sediment FVs (0.054 pCi/g and 0.068 pCi/g) in four soil samples and one sediment sample and detected below 1 ft bgs in six soil and Qal samples with a maximum activity of 1.87 pCi/g. Plutonium-239/240 is retained as a COPC.

Tritium was detected in five samples with a maximum activity of 0.257 pCi/g. Tritium is retained as a COPC.

Uranium-235/236 was detected above the Qbt 1g, Qct, Qbo BV (0.18 pCi/g) in 1 sample at an activity of 0.213 pCi/g. The maximum activity was only 0.033 pCi/g above the BV and uranium-235/236 was not detected or detected above BV in 15 other samples (detected below BV in 9 samples). The sample where uranium-235/236 was detected above BV was the deepest sample collected at that location and the result appears indicative of variations in natural background rather than a release. Uranium-235/236 is not a COPC.

6.21.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 02-008(a) are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 02-008(a) include aluminum, arsenic, barium, chromium, copper, cyanide, hexavalent chromium, iron, manganese, selenium, vanadium, and zinc.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV in three samples with a maximum concentration of 11,600 mg/kg. Concentrations increased with depth at all locations. The detections above BV were in the deepest samples collected at each location and aluminum was not detected above BV in overlying soil samples. Concentrations increased laterally. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 6.7 times the maximum concentration, and the industrial SSL is approximately 111 times the maximum concentration. Further sampling for extent of aluminum is not warranted.

Antimony was not detected above the Qbt 1g, Qct, Qbo BV but had DLs (0.53 mg/kg and 0.534 mg/kg) above the BV in two samples. The residential SSL is approximately 59 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 1.25 mg/kg and was not detected but had DLs (1.25 mg/kg and 1.95 mg/kg) above the BV in two samples. Concentrations decreased with depth at location 02-600481 and increased laterally (the concentration in a shallow sample at location 02-600481 was 2.58 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 5.7 times the maximum concentration, and the industrial SSL is approximately 29 times the maximum concentration. The residential SSL is approximately 3.6 times the maximum DL, and the industrial SSL is approximately 18 times the maximum DL. Further sampling for extent of arsenic is not warranted.

Barium was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 29.3 mg/kg. Concentrations decreased with depth at location 02-600481 and increased laterally (the concentration in a shallow sample at location 02-600481 was 39.8 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 532 times the maximum concentration. Further sampling for extent of barium is not warranted.

Chromium was detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs in seven soil samples, one sediment sample, and two tuff samples with a maximum concentration of 104 mg/kg and was not detected above the soil BV but had a DL (30.9 mg/kg) above the BV in one sample. Concentrations increased with depth at location 02-600484, only one depth was sampled at location 02-01249, concentrations decreased with depth at all other locations, and concentrations increased laterally. The maximum concentration was detected in sample RE02-07-2055. The concentration of hexavalent chromium detected in this sample was 1.12 mg/kg, indicating a trivalent chromium concentration of approximately 103 mg/kg. The residential SSL for trivalent chromium (117,000 mg/kg) is approximately 1140 times this value. Further sampling for extent of chromium is not warranted.

Copper was detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs in three soil samples, one sediment sample, and one tuff sample with a maximum concentration of 230 mg/kg. Concentrations increased with depth at location 02-600484, did not change substantially with depth (2.8 mg/kg) at location 02-600481, decreased with depth at location 02-600482, and decreased laterally (the concentration in a shallow sample at location 02-600481 was 11.8 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 14 times the maximum concentration, and the industrial SSL is approximately 226 times the maximum concentration. Further sampling for extent of copper is not warranted.

Hexavalent chromium was detected in four soil/Qal/tuff samples with a maximum concentration of 1.12 mg/kg. Concentrations did not change substantially with depth 0.096 mg/kg at location 02-600481, decreased with depth at location 02-600482, and increased laterally. The residential SSL is approximately 2.7 times the maximum concentration, and the industrial SSL is approximately 64 times the maximum concentration. Further sampling for extent of hexavalent chromium is not warranted.

Iron was detected above the Qbt 1g, Qct, Qbo BV in three samples with a maximum concentration of 7520 mg/kg. The detections above BV were in the deepest samples collected at each location and iron was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations did not change substantially laterally (1910 mg/kg). All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 7.3 times the maximum concentration, and the industrial SSL is approximately 121 times the maximum concentration. Further sampling for extent of iron is not warranted.

Manganese was detected above the Qbt 1g, Qct, Qbo BV in three samples with a maximum concentration of 233 mg/kg. The detections above BV were in the deepest samples collected at each location and manganese was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations did not change substantially laterally (1910 mg/kg). All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 45 times the maximum concentration. Further sampling for extent of manganese is not warranted.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs in five soil samples and two tuff samples with a maximum concentration of 10.7 mg/kg and was not detected above the soil BV but had DLs (1.53 mg/kg to 2.56 mg/kg) above the BV in five samples. Concentrations did not change substantially with depth (0.7 mg/kg or less) at locations 02-600481 and 02-600483 and did not change substantially laterally (2.11 mg/kg). The residential SSL is approximately 36 times the maximum concentration and 153 times the maximum DL. Further sampling for extent of selenium is not warranted.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 6.77 mg/kg. Concentrations decreased with depth at location 02-600481 and decreased laterally (the concentration in a shallow sample at location 02-600481 was 11 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 58 times the maximum concentration. Further sampling for extent of vanadium is not warranted.

Zinc was detected above the soil and sediment BVs in five soil samples and one sediment sample with a maximum concentration of 78.9 mg/kg. Concentrations increased with depth at location 02-600484, only one depth was sampled at location 02-01249, concentrations decreased with depth at all other locations, and concentrations decreased laterally. The residential SSL is approximately 298 times the maximum concentration. Further sampling for extent of zinc is not warranted.

Organic Chemicals

Organic COPCs at SWMU 02-008(a) include Aroclor-1254, Aroclor-1260, bis(2-ethylhexyl)phthalate, methylene chloride, styrene, and toluene.

Aroclor-1254 was detected in six samples with a maximum concentration of 0.186 mg/kg. Concentrations decreased with depth at all locations and increased laterally. The residential SSL was approximately 6 times the maximum concentration, and the industrial SSL was approximately 59 times the maximum concentration. 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 0.246 mg/kg. Concentrations did not change substantially with depth (0.024 mg/kg) at location 02-600484, decreased with depth at all other locations, and increased laterally. The residential SSL was approximately 9 times the maximum concentration, and the industrial SSL was approximately 45 times the maximum concentration. Further sampling for extent of Aroclor-1260 is not warranted.

Bis(2-ethylhexyl)phthalate was detected in one sample at a concentration of 0.164 mg/kg. Concentrations decreased with depth at location 02-600483 and increased laterally. The residential SSL was approximately 2320 times the maximum concentration. Vertical extent of bis(2-ethylhexyl)phthalate is defined and further sampling for lateral extent is not warranted.

Methylene chloride was detected in three samples with a maximum concentration of 00.003856 mg/kg. Concentrations did not change substantially with depth (0.0009 mg/kg) at location 02-600482 and decreased laterally. The residential SSL was approximately 30,600 times the maximum concentration. Lateral extent of methylene chloride is defined and further sampling for vertical extent is not warranted.

Styrene was detected in one sample at a concentration of 0.00589 mg/kg. Concentrations increased with depth at location 02-600484 and increased laterally. The detected concentration was below the EQL. The residential SSL was approximately 1,230,000 times the maximum concentration. Further sampling for extent of styrene is not warranted.

Toluene was detected in one sample at a concentration of 0.000665 mg/kg. Concentrations increased with depth at location 02-600484 and increased laterally. The detected concentration was below the EQL. The residential SSL was approximately 7,850,000 times the maximum concentration. Further sampling for extent of toluene is not warranted.

Radionuclides

Radionuclide COPCs at SWMU 02-008(a) include cesium-137, plutonium-239/240, and tritium.

Cesium-137 was detected below 1 ft bgs in three Qal samples with a maximum activity of 0.353 pCi/g. Activities increased with depth at locations 02-600483 and 02-600484, decreased with depth at location 02-600482, and did not change substantially laterally (0.198 pCi/g). The residential SAL is approximately 34 times the maximum activity. Further sampling for extent of cesium-137 is not warranted.

Plutonium-239/240 was detected above the soil and sediment FVs in four soil samples and one sediment sample and detected below 1 ft bgs in six soil and Qal samples with a maximum activity of 1.87 pCi/g. Only one depth was sampled at location 02-01249, activities decreased with depth at all other locations, and activities decreased laterally. Activities decreased with depth in deeper samples at location 02-600484 adjacent to location 02-01249 and vertical extent is defined at this location. Lateral and vertical extent of plutonium-239/240 are defined.

Tritium was detected in five samples with a maximum activity of 0.257 pCi/g. Only one depth was sampled at location 02-01249, activities decreased with depth at all other locations, and activities decreased laterally. Tritium was not detected in deeper samples at location 02-600484 adjacent to location 02-01249 and vertical extent is defined at this location. Lateral and vertical extent of tritium are defined.

Summary of Nature and Extent at SWMU 02-008(a)

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at SWMU 02-008(a).

6.21.5 Summary of Human Health Risk Screening

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} (NMED 2017, 602273). The industrial HI is 0.02, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.04 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 2×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.04 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.

Residential Scenario

The total excess cancer risk for the residential scenario is 1×10^{-5}, which is equivalent the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.6, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.6 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Construction Worker Scenario

The residential exposure scenario also demonstrates protection of construction workers for carcinogenic and radionuclide COPCs. The construction worker HI is approximately 1 (due to manganese; see Appendix H, section H-4.5.2, Exposure Evaluation), which is equal to the NMED target HI of 1.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, residential, and construction worker scenarios at SWMU 02-008(a).

6.21.6 Summary of Ecological Risk Screening

SWMU 02-008(a) is within the TA-02 core area. Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and results of site-specific ecological risk studies, no potential ecological risks exist for the TA-02 core area.

6.22 AOC 02-008(c), Outfall for Seepage into Basement of OWR Building

6.22.1 Site Description and Operational History

AOC 02-008(c) consists of two specific areas: outfall drains AOC 02-008(c)(i) and AOC 02-008(c)(ii). The outfall drains were two unpermitted outfalls that received OWR building (02-1) basement groundwater seepage (Figure 6.22-1).

In 1985, the AOC 02-008(c)(i) outfall drain was created to discharge groundwater seepage from the basement sump of the OWR building (02-1) to Los Alamos Creek, as shown on engineering drawing C-39551 (LASL 1971, 089682). In 1988, the AOC 02-008(c)(i) outfall drain became plugged and was abandoned in place. A second drainline was installed, and the outfall of AOC 02-008(c)(ii) was created approximately 100 ft west of the original outfall (LANL 1993, 015314, p. 7.9-1). Both drainpipes and outfalls were removed and disposed of during D&D activities in 2003 (WD-3 2003, 082646, pp. 26–31).

6.22.2 Relationship to Other SWMUs and AOCs

The AOC 02-006(c) sewer line connected the AOC 02-008(c)(ii) drainline to building 02-1.

6.22.3 Summary of Previous Investigations

6.22.3.1 1995 Investigation Activities

One sample was collected from location 02-01154 at AOC 02-008(c) in 1995. The 1995 investigation results are not decision-level data.

6.22.3.2 2000 Post–Cerro Grande Recovery Work

Soil samples were collected from two locations (02-01252 and 02-01253) at SWMU 02-008(c) during post–Cerro Grande recovery activities in 2000.

2003 Omega West Decommissioning Project

AOC 02-008(c) piping was removed and disposed of at an approved off-site facility during the 2003 decommissioning activities. Activities included soil excavation, radiological walkover surveys, and radiological screening. Limited soil surveys were conducted, but no formal report of soil survey results is available.

LLW (construction debris and/or soil) was packaged and shipped to Envirocare or TA-54 for disposal. Mixed waste was packaged and transferred to TA-54 for further processing and/or storage at the Laboratory. In total, 9800 ft^3 of material was shipped to Envirocare for disposal; material from the AOC 02-008(c)(i) outfall was included in this total volume (WD-3 2003, 082646, pp. 1–6, 24).

No soil samples were collected from AOC 02-008(c)(i) during Omega West decommissioning project activities in 2003.

6.22.3.3 2007 Investigation Activities

Nine samples were collected from four locations at AOC 02-008(c) in 2007. Results from the sampling activities in 2007 were presented in the previous investigation report (LANL 2008, 101669.12). Additional sampling was required to define the extent of contamination at the site.

6.22.4 Site Contamination

6.22.4.1 Soil, Rock, and Sediment Sampling

AOC 02-008(c)(i)

As part of the 2010 investigation, the following characterization activities were conducted at AOC 02-008(c)(i):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Five samples were collected from location 02-612390 near AOC 02-008(c)(i) from 5–6 ft, 15–17 ft, 26–27 ft, 35–36 ft, and 49–50 ft bgs. These samples were analyzed for TAL metals, PCBs, SVOCs, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium.

The 2010 and historical sampling locations at AOC 02-008(c)(i) are shown in Figure 6.22-1. Table 6.22-1 presents the samples collected and the analyses requested for AOC 02-008(c)(i). The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

AOC 02-008(c)(ii)

As part of the 2010 investigation, the following characterization activities were conducted at AOC 02-008(c)(ii):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Five samples were collected from location 02-612982 near AOC 02-008(c)(ii) from 6–7 ft, 15–16 ft, 25–26 ft, 35–37 ft, and 49–50 ft bgs. These samples were analyzed for TAL metals, hexavalent chromium, PCBs, SVOCs, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium.

The 2010 and historical sampling locations at AOC 02-008(c)(ii) are shown in Figure 6.22-1. Table 6.22-2 presents the samples collected and the analyses requested for AOC 02-008(c)(ii). The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

6.22.4.2 Soil, Rock, and Sediment Sample Field-Screening Results

No organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of the samples. No radiological-screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. No changes to sampling or other activities occurred because of the field-screening results.

6.22.4.3 Soil, Rock, and Sediment Sample Analytical Results

AOC 02-008(c)(i)

Decision-level data at AOC 02-008(c)(i) consist of the results from eight samples (one soil, one Qal, and six Qbo) collected from two locations.

Inorganic Chemicals

Eight samples (one soil, one Qal, and six Qbo) were analyzed for TAL metals and one soil sample was analyzed for nitrate, perchlorate, and total cyanide. Table 6.22-3 presents the results of the inorganic chemicals above BVs and the detected inorganic chemicals that have no BVs. Figure 6.22-2 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV (3560 mg/kg) in one sample at a concentration of 5810 mg/kg. Aluminum is retained as a COPC.

Antimony was not detected above the soil or Qbt 1g, Qct, Qbo BVs (0.83 mg/kg and 0.5 mg/kg) but had DLs (0.941 mg/kg to 1.27 mg/kg) above BV in one soil sample and four tuff samples. Antimony is retained as a COPC.

Arsenic was not detected above the Qbt 1g, Qct, Qbo BV (0.56 mg/kg) but had DLs (1.14 mg/kg to 1.24 mg/kg) above BV in four samples. Arsenic is retained as a COPC.

Cadmium was not detected above the soil or Qbt 1g, Qct, Qbo BVs (0.4 mg/kg for both) but had DLs (0.573 mg/kg to 0.635 mg/kg) above BV in one soil sample and four tuff samples. Cadmium is retained as a COPC.

Iron was detected above the Qbt 1g, Qct, Qbo BV (3700 mg/kg) in four samples with a maximum concentration of 5850 mg/kg. Iron is retained as a COPC.

Manganese was detected above the Qbt 1g, Qct, Qbo BV (189 mg/kg) in one sample at a concentration of 219 mg/kg. Manganese is retained as a COPC.

Selenium was not detected above the Qbt 1g, Qct, Qbo BV (0.3 mg/kg) but had DLs (1.14 mg/kg to 1.24 mg/kg) above BV in four tuff samples. Selenium is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in two samples with a maximum concentration of 65.3 mg/kg. Zinc is retained as a COPC.

Organic Chemicals

Three samples (one soil, one Qal, and one Qbo) were analyzed for PCBs and SVOCs. Table 6.22-4 presents the detected organic chemicals. Figure 6.22-3 shows the spatial distribution of detected organic chemicals.

Polycyclic Aromatic Hydrocarbons

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

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

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

Site Activities

AOC 02-008(c)(i) was one of two outfalls that discharged groundwater that seeped into the basement of the OWR and was identified as an AOC because of potential radionuclide contamination in the groundwater seeping into the building. The AOC 02-008(c)(i) outfall was located adjacent to asphalt paving south of the OWR and received runoff from the paved area. Samples with detectable PAHs at this site were surface samples located in the former paved area or in the area receiving runoff from the paved area. PAHs were not known to be associated with groundwater discharged from these outfalls. Based on the above, the PAHs detected in samples used to characterize this site [anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; indeno(1,2,3-cd)pyrene; phenanthrene; and pyrene] are associated with the former paved area, are not related to historical Laboratory site operations, and are not COPCs.

Organic COPCs

Other organic chemicals detected at AOC 02-008(c)(i) include Aroclor-1254 and Aroclor-1260. The detected organic chemicals listed are retained as COPCs.

Radionuclides

Six samples (one soil, one Qal, and four Qbo) were analyzed for americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium. Table 6.22-5 presents the radionuclides detected or detected above BVs/FVs. Figure 6.22-4 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Cesium-137 was detected below 1 ft bgs in one soil sample at an activity of 4.44 pCi/g. Cesium-137 is retained as a COPC.

Plutonium-239/240 was detected above the soil FV (0.054 pCi/g) in one sample, detected below 1 ft bgs in one soil sample, and detected in one tuff sample with a maximum activity of 0.556 pCi/g. Plutonium-239/240 is retained as a COPC.

Strontium-90 was detected below 1 ft bgs in one soil sample at an activity of 0.347 pCi/g. Strontium-90 is retained as a COPC.

Tritium was detected in four samples with a maximum activity of 0.121 pCi/g/ Tritium is retained as a COPC.

Uranium-235/236 was detected above the Qbt 1g, Qct, Qbo BV (0.18 pCi/g) in one sample at an activity of 0.191 pCi/g. The activity was only 0.011 pCi/g) above BV and uranium-235/236 was not detected or detected above BV in five other samples (detected below BV in four samples). Uranium-235/236 is not a COPC.

AOC 02-008(c)(ii)

Decision-level data at AOC 02-008(c)(ii) consist of results from 16 samples (4 soil, 5 Qal, 5 Qbo, and 2 sediment) collected from 7 locations.

Inorganic Chemicals

A total of 15 samples (3 soil, 5 Qal, 5 Qbo, and 2 sediment) were analyzed for TAL metals, 5 samples (2 Qal and 3 Qbo) were analyzed for hexavalent chromium, 10 samples (3 soil, 3 Qal, 2 Qbo, and 2 sediment) were analyzed for nitrate, and 8 samples (3 soil, 3 Qal, and 2 Qbo) were analyzed for perchlorate and total cyanide. Table 6.22-6 presents the inorganic chemicals detected or detected above BVs. Figure 6.22-2 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV (3560 mg/kg) in two samples with a maximum concentration of 5950 mg/kg. Aluminum is retained as a COPC.

Antimony was not detected above the soil or Qbt 1g, Qct, Qbo BVs (0.83 mg/kg and 0.5 mg/kg) but had DLs (1.08 mg/kg to 1.2 mg/kg) above BV in one soil sample and two tuff samples. Antimony is retained as a COPC.

Arsenic was not detected above the Qbt 1g, Qct, Qbo BV (0.56 mg/kg) but had DLs (1.23 mg/kg to 1.79 mg/kg) above BV in five samples. Arsenic is retained as a COPC.

Barium was detected above the Qbt 1g, Qct, Qbo BV (25.7 mg/kg) in one sample at a concentration of 34.1 mg/kg. Barium is retained as a COPC.

Cadmium was not detected above the soil or Qbt 1g, Qct, Qbo BVs (0.4 mg/kg for both) but had DLs (0.508 mg/kg to 0.674 mg/kg) above BV in six soil samples and five tuff samples. Cadmium is retained as a COPC.

Chromium was detected above the soil and Qbt 1g, Qct, Qbo BVs (19.3 mg/kg and 2.6 mg/kg) in one soil sample and three tuff samples with a maximum concentration of 66.7 mg/kg. Chromium is retained as a COPC.

Copper was detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs (14.7 mg/kg, 11.2 mg/kg, and 3.96 mg/kg) in two soil samples, one sediment sample, and one tuff sample with a maximum concentration of 22.5 mg/kg. Copper is retained as a COPC.

Hexavalent chromium was detected in two samples with a maximum concentration of 0.413 mg/kg. Hexavalent chromium is retained as a COPC.

Iron was detected above the Qbt 1g, Qct, Qbo BV (3700 mg/kg) in five samples with a maximum concentration of 9230 mg/kg. Iron is retained as a COPC.

Manganese was detected above the Qbt 1g, Qct, Qbo BV (189 mg/kg) in three samples with a maximum concentration of 419 mg/kg. Manganese is retained as a COPC.

Mercury was detected above the soil and sediment BVs (0.1 mg/kg for both) in four soil samples and one sediment sample with a maximum concentration of 3.46 mg/kg. Mercury is retained as a COPC.

Nickel was detected above the Qbt 1g, Qct, Qbo BV (2 mg/kg) in two samples with a maximum concentration of 4.91 mg/kg. Nickel is retained as a COPC.

Nitrate was detected in two samples with a maximum concentration of 1.87 mg/kg. Nitrate is naturally occurring, and the concentrations likely reflect naturally occurring levels. In addition, AOC 02-008(c)(ii) was used to manage groundwater seepage and is not a source of nitrate. Nitrate is not a COPC.

Perchlorate was detected in two samples with a maximum concentration of 0.00168 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs (1.52 mg/kg and 0.3 mg/kg) in four soil samples and one tuff sample with a maximum concentration of 2.77 mg/kg and was not detected above the Qbt 1g, Qct, Qbo BV but had DLs (1.23 mg/kg to 1.72 mg/kg) above BV in four samples. Selenium is retained as a COPC.

Silver was detected above the sediment BV (1 mg/kg) in one sample at a concentration of 1.8 mg/kg. Silver is retained as a COPC.

Vanadium was detected above the sediment and Qbt 1g, Qct, Qbo BVs (17 mg/kg and 4.59 mg/kg) in one sediment and two tuff samples with a maximum concentration of 21 mg/kg. Vanadium is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in two samples with a maximum concentration of 80.7 mg/kg. Zinc is retained as a COPC.

Organic Chemicals

A total of 13 samples (3 soil, 5 Qal, and 5 Qbo) were analyzed for PCBs, 15 samples (3 soil, 5 Qal, 5 Qbo, and 2 sediment) were analyzed for SVOCs, and 5 samples (3 Qal and 2 Qbo) were analyzed for VOCs. Table 6.22-7 presents the detected organic chemicals. Figure 6.22-3 shows the spatial distribution of detected organic chemicals.

Polycyclic Aromatic Hydrocarbons

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

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

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

water. PAH concentrations in excess of soil cleanup levels may result from common anthropogenic sources, such as runoff from asphalt parking lots.

Site Activities

AOC 02-008(c)(ii) was one of two outfalls that discharged groundwater that seeped into the basement of the OWR and was identified as an AOC because of potential radionuclide contamination in the groundwater seeping into the building. The AOC 02-008(c)(ii) outfall was located adjacent to asphalt paving south of the OWR and received runoff from the paved area. Samples with detectable PAHs at this site were surface samples located in the former paved area or in the area receiving runoff from the paved area. PAHs were not known to be associated with groundwater discharged from these outfalls. Based on the above, the PAHs detected in samples used to characterize this site [acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenanthrene; and pyrene] are associated with the former paved area, are not related to historical Laboratory site operations, and are not COPCs.

Organic COPCs

Other organic chemicals detected at AOC 02-008(c)(ii) include Aroclor-1242, Aroclor-1254, Aroclor-1260, 4-isopropyltoluene, and toluene. The detected organic chemicals listed are retained as COPCs.

Radionuclides

A total of 8 samples (3 soil, 3 Qal, and 2 Qbo) were analyzed for americium-241; 15 samples (3 soil, 5 Qal, 5 Qbo, and 2 sediment) were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium; and 10 samples (3 soil, 3 Qal, 2 Qbo, and 2 sediment) were analyzed for strontium-90. Table 6.22-8 presents the radionuclides detected or detected above BVs/FVs. Figure 6.22-4 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Cesium-137 was detected below 1 ft bgs in three soil samples with a maximum activity of 0.485 pCi/g. Cesium-137 is retained as a COPC.

Plutonium-239/240 was detected above the soil and sediment FVs (0.054 pCi/g and 0.068 pCi/g) in two soil samples and two sediment samples and detected below 1 ft bgs in two soil samples with a maximum activity of 0.808 pCi/g. Plutonium-239/240 is retained as a COPC.

Strontium-90 was detected below 1 ft bgs in one soil sample at an activity of 0.388 pCi/g. Strontium-90 is retained as a COPC.

Tritium was detected in one sample at an activity of 0.117 pCi/g/ Tritium is retained as a COPC.

Uranium-235/236 was detected above the Qbt 1g, Qct, Qbo BV (0.18 pCi/g) in 1 sample at an activity of 0.236 pCi/g. The activity was only 0.056 pCi/g) above BV and uranium-235/236 was not detected or detected above BV in 15 other samples (detected below BV in 14 samples). Uranium-235/236 is not a COPC.

6.22.4.4 Nature and Extent of Contamination

AOC 02-008(c)(i)

The nature and extent of inorganic, organic, and radionuclide COPCs at AOC 02-008(c)(i) are discussed below.

Inorganic Chemicals

Inorganic COPCs at AOC 02-008(c)(i) include aluminum, antimony, arsenic, cadmium, iron, manganese, selenium, and zinc.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 5810 mg/kg. Concentrations increased with depth at location 02-612390 and decreased downgradient. The residential SSL is approximately 13 times the maximum concentration, and the industrial SSL is approximately 222 times the maximum concentration. Further sampling for extent of aluminum is not warranted.

Antimony was not detected above the soil or Qbt 1g, Qct, Qbo BVs but had DLs (0.941 mg/kg to 1.27 mg/kg) above BV in one soil sample and four tuff samples. The residential SSL is approximately 25 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was not detected above the Qbt 1g, Qct, Qbo BV but had DLs (1.14 mg/kg to 1.24 mg/kg) above BV in four samples. The residential SSL is approximately 6.2 times the maximum DL, and the industrial SSL is approximately 29 times the maximum DL. Further sampling for extent of arsenic is not warranted.

Cadmium was not detected above the soil or Qbt 1g, Qct, Qbo BVs but had DLs (0.573 mg/kg to 0.635 mg/kg) above BV in one soil sample and four tuff samples. The residential SSL is approximately 111 times the maximum DL. Further sampling for extent of cadmium is not warranted.

Iron was detected above the Qbt 1g, Qct, Qbo BV in four samples with a maximum concentration of 5850 mg/kg. Concentrations decreased with depth and decreased downgradient at location 02-612390 (the concentration in the shallow sample at location 02-612390 was 6980 mg/kg and below the soil BV [Appendix F, Pivot Tables]). Lateral and vertical extent of iron are defined.

Manganese was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 219 mg/kg. Concentrations decreased with depth and decreased downgradient at location 02-612390. Lateral and vertical extent of manganese are defined.

Selenium was not detected above the Qbt 1g, Qct, Qbo BV but had DLs (1.14 mg/kg to 1.24 mg/kg) above BV in four tuff samples. The residential SSL is approximately 315 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 65.3 mg/kg. Only one depth was sampled at location 02-600210, concentrations decreased with depth at location 02-612390, and concentrations did not change substantially laterally (16.1 mg/kg). The residential SSL is approximately 360 times the maximum concentration. Further sampling for extent of zinc is not warranted.

Organic Chemicals

Organic COPCs at AOC 02-008(c)(i) include Aroclor-1254 and Aroclor-1260.

Aroclor-1254 was detected in one sample at a concentration of 0.0121 mg/kg. Concentrations decreased with depth at location 02-612390 and decreased laterally. Lateral and vertical extent of Aroclor-1254 are defined.

Aroclor-1260 was detected in two samples with a maximum concentration of 0.0158 mg/kg. Only one depth was sampled at location 02-600210, concentrations decreased with depth at location 02-612390, and concentrations did not change substantially (0.0072 mg/kg) laterally. The residential SSL is approximately 140 times the maximum concentration. Further sampling for extent of Aroclor-1260 is not warranted.

Radionuclides

Radionuclide COPCs at AOC 02-008(c)(i) include cesium-137, plutonium-239/240, strontium-90, and tritium.

Cesium-137 was detected below 1 ft bgs in one soil sample at an activity of 4.44 pCi/g. Activities decreased with depth at location 02-612390 and decreased laterally. Lateral and vertical extent of cesium-137 are defined.

Plutonium-239/240 was detected above the soil FV in one sample, detected below 1 ft bgs in one soil sample, and detected in one tuff sample with a maximum activity of 0.556 pCi/g. Only one depth was sampled at location 02-600210, activities decreased with depth at location 02-612390, and activities did not change substantially (0.039 pCi/g) laterally. The residential SAL is approximately 133 times the maximum activity. Further sampling for extent of plutonium-239/240is not warranted.

Strontium-90 was detected below 1 ft bgs in one soil sample at an activity of 0.347 pCi/g. Activities decreased with depth at location 02-612390 and decreased laterally. Lateral and vertical extent of strontium-90 are defined.

Tritium was detected in four samples with a maximum activity of 0.121 pCi/g. Activities increased with depth at location 02-612390 and decreased laterally. The residential SAL is approximately 14,000 times the maximum activity. Lateral extent of tritium is defined and further sampling for vertical extent is not warranted.

AOC 02-008(c)(ii)

The nature and extent of inorganic, organic, and radionuclide COPCs at AOC 02-008(c)(ii) are discussed below.

Inorganic Chemicals

Inorganic COPCs at AOC 02-008(c)(ii) include aluminum, antimony, arsenic, barium, cadmium, chromium, copper, hexavalent chromium, iron, manganese, mercury, nickel, perchlorate, selenium, silver, vanadium, and zinc.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV in two samples with a maximum concentration of 5950 mg/kg. Concentrations increased with depth at location 02-600625, decreased with depth at location 02-612982, and decreased downgradient. The residential SSL is approximately 13 times the maximum concentration, and the industrial SSL is approximately 217 times the maximum concentration. Lateral extent of aluminum is defined and further sampling for vertical extent is not warranted.

Antimony was not detected above the soil or Qbt 1g, Qct, Qbo BVs but had DLs (1.08 mg/kg to 1.2 mg/kg) above BV in one soil sample and two tuff samples. The residential SSL is approximately 26 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was not detected above the Qbt 1g, Qct, Qbo BV but had DLs (1.23 mg/kg to 1.79 mg/kg) above BV in five samples. The residential SSL is approximately 4 times the maximum DL, and the industrial SSL is approximately 20 times the maximum DL. Further sampling for extent of arsenic is not warranted.

Barium was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 34.1 mg/kg. Concentrations decreased with depth at location 02-600625 and decreased downgradient (the concentration in the shallow sample at location 02-600625 was 165 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The lateral and vertical extent of barium are defined.

Cadmium was not detected above the soil or Qbt 1g, Qct, Qbo BVs but had DLs (0.508 mg/kg to 0.674 mg/kg) above BV in six soil samples and five tuff samples. The residential SSL is approximately 105 times the maximum DL. Further sampling for extent of cadmium is not warranted.

Chromium was detected above the soil and Qbt 1g, Qct, Qbo BVs in one soil sample and three tuff samples with a maximum concentration of 66.7 mg/kg. Concentrations increased with depth at locations 02-600625 and 02-600626, decreased with depth at location 02-612982, and decreased downgradient. The residential SSL is approximately 1.4 times the maximum concentration, and the industrial SSL is approximately 7.6 times the maximum concentration. Chromium does not pose an unacceptable risk at the site (Appendix H, Table H-2.3-40). Lateral extent of chromium is defined and further sampling for extent of chromium is not warranted.

Copper was detected above the soil, sediment, and Qbt 1g, Qct, Qbo BVs in two soil samples, one sediment sample, and one tuff sample with a maximum concentration of 22.5 mg/kg. Only one depth was sampled at location 02-01253, concentrations decreased with depth at locations 02-600625 and 02-600626, and concentrations decreased downgradient. The residential SSL is approximately 139 times the maximum concentration. Lateral extent of copper is defined and further sampling for vertical extent is not warranted.

Hexavalent chromium was detected in two samples with a maximum concentration of 0.413 mg/kg. Concentrations decreased with depth at location 02-612982 but only one location was sampled. The residential SSL is approximately 7.4 times the maximum concentration, and the industrial SSL is approximately 175 times the maximum concentration. Vertical extent of hexavalent chromium is defined and further sampling for lateral extent is not warranted.

Iron was detected above the Qbt 1g, Qct, Qbo BV in five samples with a maximum concentration of 9230 mg/kg. Concentrations did not change substantially with depth (120 mg/kg) at location 02-600625, decreased with depth at locations 02-600626 and 02-612982, and decreased downgradient (concentrations in shallow samples at locations 02-600625 and 02-600626 were 9350 mg/kg and 11,200 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 5.9 times the maximum concentration, and the industrial SSL is approximately 98 times the maximum concentration. Lateral extent of iron is defined and further sampling for vertical extent is not warranted.

Manganese was detected above the Qbt 1g, Qct, Qbo BV in three samples with a maximum concentration of 419 mg/kg. Concentrations increased with depth at location 02-600626, did not change substantially with depth (15 mg/kg or less) at locations 02-600625 and 02-612982, and decreased downgradient (concentrations in shallow samples at locations 02-600625 and 02-612982 were 308 mg/kg and 288 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 25 times the maximum concentration, and the industrial SSL is approximately 382 times the maximum concentration. Lateral extent of manganese is defined and further sampling for vertical extent is not warranted.

Mercury was detected above the soil and sediment BVs in four soil samples and one sediment sample with a maximum concentration of 3.46 mg/kg. Only one depth was sampled at locations 02-01253 and 02-600627, concentrations decreased with depth at locations 02-600625 and 02-600626, and concentrations decreased downgradient. The residential SSL is approximately 6.8 times the maximum concentration, and the industrial SSL is approximately 112 times the maximum concentration. Lateral extent of mercury is defined and further sampling for vertical extent is not warranted.

Nickel was detected above the Qbt 1g, Qct, Qbo BV in two samples with a maximum concentration of 4.91 mg/kg. Concentrations did not change substantially with depth (0.51 mg/kg) at location 02-600626, decreased with depth at location 02-600625, and decreased downgradient (concentrations in shallow samples at locations 02-600625 and 02-600626 were 6.4 mg/kg and 4.71 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 318 times the maximum concentration. Lateral extent of nickel is defined and further sampling for vertical extent is not warranted.

Perchlorate was detected in two samples with a maximum concentration of 0.00168 mg/kg. Concentrations decreased with depth at locations 02-600625 and 02-600626 and decreased downgradient. Lateral and vertical extent of perchlorate are defined.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs in four soil samples and one tuff sample with a maximum concentration of 2.77 mg/kg and was not detected above the Qbt 1g, Qct, Qbo BV but had DLs (1.23 mg/kg to 1.72 mg/kg) above BV in four samples. Only one depth was sampled at location 02-600627, concentrations decreased with depth at locations 02-600625 and 02-600626, and concentrations decreased downgradient. The residential SSL is approximately 141 times the maximum concentration and 227 times the maximum DL. Lateral extent of selenium is defined and further sampling for vertical extent is not warranted.

Silver was detected above the sediment BV in one sample at a concentration of 1.8 mg/kg. Only one depth was sampled at location 02-01253 and concentrations decreased downgradient. The residential SSL is approximately 217 times the maximum concentration. Lateral extent of silver is defined and further sampling for vertical extent is not warranted.

Vanadium was detected above the sediment and Qbt 1g, Qct, Qbo BVs in one sediment and two tuff samples with a maximum concentration of 21 mg/kg. Only one depth was sampled at location 02-01253, concentrations decreased with depth at locations 02-600625 and 02-600626, and concentrations decreased downgradient (concentrations in shallow samples at locations 02-600625 and 02-600626 were 8.81 mg/kg and 12.8 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 19 times the maximum concentration. Lateral extent of vanadium is defined and further sampling for vertical extent is not warranted.

Zinc was detected above the soil BV in two samples with a maximum concentration of 80.7 mg/kg. Concentrations decreased with depth at both locations and decreased downgradient. Lateral and vertical extent of zinc are defined.

Organic Chemicals

Organic COPCs at AOC 02-008(c)(ii) include Aroclor-1242, Aroclor-1254, Aroclor-1260, 4-isopropyltoluene, and toluene.

Aroclor-1242 was detected in one sample at a concentration of 0.191 mg/kg. Concentrations decreased with depth at location 02-612982 and decreased downgradient. Lateral and vertical extent of Aroclor-1242 are defined.

Aroclor-1254 was detected in four samples with a maximum concentration of 0.308 mg/kg. Concentrations decreased with depth at locations 02-600626 and 02-612982 and decreased downgradient. Lateral and vertical extent of Aroclor-1254 are defined.

Aroclor-1260 was detected in eight samples with a maximum concentration of 0.0874 mg/kg. Concentrations decreased with depth at locations 02-600625, 02-600626, and 02-612982, and decreased downgradient. Lateral and vertical extent of Aroclor-1260 are defined.

Isopropyltoluene[4-] was detected in one sample at a concentration of 0.0029 mg/kg. Concentrations decreased with depth at location 02-600626 and decreased downgradient. Lateral and vertical extent of 4-isopropyltoluene are defined.

Toluene] was detected in two samples with a concentration of 0.000516 mg/kg. Concentrations decreased with depth at locations 02-600625 and 02-600626 and decreased downgradient. Lateral and vertical extent of toluene are defined.

Radionuclides

Radionuclide COPCs at AOC 02-008(c)(i) include cesium-137, plutonium-239/240, strontium-90, and tritium.

Cesium-137 was detected below 1 ft bgs in three soil samples with a maximum activity of 0.485 pCi/g. Activities decreased with depth at locations 02-600625, 02-600626, and 02-612982 and decreased downgradient. Lateral and vertical extent of cesium-137 are defined.

Plutonium-239/240 was detected above the soil and sediment FVs (0.054 pCi/g and 0.068 pCi/g) in two soil samples and two sediment samples and detected below 1 ft bgs in two soil samples with a maximum activity of 0.808 pCi/g. Only one depth was sampled at locations 02-01252, 02-01253, and 02-600627; activities decreased with depth at locations 02-600625 and 02-600626; and activities decreased downgradient. The residential SAL is approximately 98 times the maximum activity. Lateral extent of plutonium-239/240 is defined and further sampling for vertical extent is not warranted.

Strontium-90 was detected below 1 ft bgs in one soil sample at an activity of 0.388 pCi/g. Activities decreased with depth at location 02-600625 and decreased downgradient. Lateral and vertical extent of strontium-90 are defined.

Tritium was detected in one sample at an activity of 0.117 pCi/g. Activities decreased with depth at location 02-612982 and decreased downgradient. Lateral and vertical extent of tritium are defined.

Summary of Nature and Extent at AOC 02-008(c)

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at AOC 02-008(c)(i) and AOC 02-008(c)(ii).

6.22.5 Summary of Human Health Risk Screening

6.22.5.1 AOC 02-008(c)(i)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 1×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.0007, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.01 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 2×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.002, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.01 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

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} (NMED 2017, 602273). The residential HI is 0.01, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The residential exposure scenario also demonstrates protection of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, residential, and construction worker scenarios at AOC 02-008(c)(i).

6.22.5.1 AOC 02-008(c)(ii)

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} (NMED 2017, 602273). The industrial HI is 0.02, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 2×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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.

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} (NMED 2017, 602273). The residential HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The residential exposure scenario also demonstrates protection of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, residential, and construction worker scenarios at AOC 02-008(c)(ii).

6.22.6 Summary of Ecological Risk Screening

6.22.6.1 AOC 02-008(c)(i)

AOC 02-008(c)(i) is within the TA-02 core area. Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and results of site-specific ecological risk studies, no potential ecological risks exist for the TA-02 core area.

6.22.5.2 AOC 02-008(c)(i)

AOC 02-008(c)(ii) is within the TA-02 core area. Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and results of site-specific ecological risk studies, no potential ecological risks exist for the TA-02 core area.

6.23 SWMU 02-009(a), Soil Contamination

6.23.1 Site Description and Operational History

SWMU 02-009(a) is an area of beta/gamma radioactive soil contamination located around a boulder, south of the southeast fence corner east of the former Omega-50 storage building (02-50) (Figure 6.20-1).

SWMU 02-009(a) was identified in 1986 during D&D of the WBR (Elder and Knoell 1986, 006670, p. 40). No other information regarding the origin of contamination in this SWMU is available (LANL 1990, 007511). A limited amount of soil was removed at the site, and the soil was disposed of in 1986 (Elder and Knoell 1986, 006670, pp. 26–41).

6.23.2 Relationship to Other SWMUs and AOCs

The gaseous effluent vent line (line 119) passed through the area identified as SWMU 02-009(a), but it is not known whether the line was the source of the soil contamination.

6.23.3 Summary of Previous Investigations

6.23.3.1 1985 WBR Decommissioning Project, Phase I

During Phase I of the TA-02 WBR decommissioning project, a radioactively contaminated soil area was discovered and included in soil removal activities. The area was excavated to a depth of 6 ft bgs across the downhill face of a large boulder. The remaining soil had screening results below predetermined cleanup levels. Another nearby contamination area uphill from the boulder was also discovered, but this soil could not be removed at that time. The location was flagged and logged for future decontamination (Elder and Knoell 1986, 006670, p. 40). All removed material was transported to TA-54 (Elder and Knoell 1986, 006670, p. 16).

6.23.3.2 1995 Investigation Activities

Samples were collected from locations within the soil contamination area. Supporting QA/QC information is not available for these samples, so the sample results are not included in this report.

6.23.3.3 2000 Post–Cerro Grande Recovery Work

During the post–Cerro Grande fire recovery work project, a portion of the soil area near the large boulder was included in soil removal activities. This area was excavated by hand until no areas with elevated radionuclide screening levels were identified. Surveys of the excavation area were hampered by radiation from contamination on the nearby boulder. The boulder was moved to allow access for soil removal. The total volume of soil removed during the project was approximately 58 yd^3 (LANL 2001, 070352, p. 16). Ten confirmatory samples were collected from four locations after the soil was removed (LANL 2001, 070352, p. 17).

6.23.3.4 2007 Investigation Activities

A total of 67 samples were collected from 23 locations at SWMU 02-009(a) in 2007. Results from the sampling activities in 2007 were presented in the previous investigation report (LANL 2008, 101669.12). Additional sampling was required to define the extent of contamination at the site.

6.23.4 Site Contamination

6.23.4.1 Soil and Rock Sampling

As part of the 2010 investigation, the following characterization activities were conducted at SWMU 02-009(a):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Five samples were collected from location 02-612421 from 5–6 ft, 15–16 ft, 28–29 ft, 35–36 ft, and 48–50 ft bgs, and five samples were collected from location 02-612422 from 5–6 ft, 15–16 ft, 25–26 ft, 35–36 ft, and 49–50 ft bgs at SWMU 02-009(a). These samples were analyzed for TAL metals, PCBs, SVOCs, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium.

The 2010 and historical sampling locations at SWMU 02-009(a) are shown in Figure 6.20-1. The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

6.23.4.2 Soil and Rock Sample Field-Screening Results

No organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of the samples. No radiological-screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. No changes to sampling or other activities occurred because of the field-screening results.

6.23.4.3 Soil and Rock Sample Analytical Results

Decision-level data at SWMU 02-009(a) consist of results from 87 samples collected from 29 locations in 2000, 2007, and 2010. The 87 samples include 43 soil, 39 Qal, and 5 Qbo samples. Table 6.23-1 presents the samples collected and analyses requested for SWMU 02-009(a).

Inorganic Chemicals

A total of 87 samples (43 soil, 39 Qal, and 5 Qbo) were analyzed for TAL metals, and 67 samples (33 soil and 34 Qal) were analyzed for nitrate, perchlorate, and total cyanide. Table 6.23-2 presents the inorganic chemicals detected or detected above BVs. Plate 30 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV (3560 mg/kg) in one sample at a concentration of 4260 mg/kg. Because there were fewer than eight Qbo samples, statistical tests could not be performed. Aluminum is retained as a COPC.

Antimony was not detected above the soil and Qbt 1g, Qct, Qbo BVs (0.83 mg/kg and 0.5 mg/kg) but had DLs (1.03 mg/kg to 1.26 mg/kg) above the BVs in four soil samples and five tuff samples. All four DLs in the soil samples are above the maximum soil background concentration (1 mg/kg). There were too few detections in soil or tuff samples to perform statistical tests. Antimony is retained as a COPC.

Arsenic was not detected above the Qbo BV (0.56 mg/kg) but had DLs (1.06 mg/kg to 1.28 mg/kg) above the BV in four samples. The DLs are above the maximum arsenic concentration in the Qbt 1g, Qct, Qbo background data set (0.7 mg/kg). Arsenic is retained as a COPC.

Cadmium was not detected above the soil and Qbt 1g, Qct, Qbo BVs (0.4 mg/kg for both) but had DLs (0.495 mg/kg to 2.69 mg/kg) above BV in 70 soil/Qal samples and 5 tuff samples. Because there were too few detections in the soil background data set and too few tuff samples, statistical tests could not be performed. Cadmium is retained as a COPC in tuff.

Calcium was detected above the soil BV (6120 mg/kg) in six samples with a maximum concentration of 26,700 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in soil are not statistically different from background (Figure G-178 and Table G-28). Calcium is not a COPC.

Chromium was detected above the soil BV (19.3 mg/kg) in one sample at a concentration of 59.3 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in soil are not statistically different from background (Figure G-179 and Table G-28). Chromium is not a COPC.

Copper was detected above the soil BV (14.7 mg/kg) in four samples with a maximum concentration of 80.7 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in soil are not statistically different from background (Figure G-180 and Table G-28). Copper is not a COPC.

Cyanide was detected above the soil BV (0.5 mg/kg) in one sample at a concentration of 0.51 mg/kg, and was not detected but had a DL (1.21 mg/kg) above BV in one sample. Cyanide is retained as a COPC.

Iron was detected above the soil and Qbt 1g, Qct, Qbo BVs (21,500 mg/kg and 3700 mg/kg) in two soil samples and five tuff samples with a maximum concentration of 63,200 mg/kg. The Gehan and quantile tests indicated site concentrations of iron in soil are not statistically different from background (Figure G-181 and Table G-28). There were too few tuff samples to perform statistical tests and the maximum concentration in tuff (6050 mg/kg) is greater than the maximum Qbt 1g, Qct, Qbo background concentration (3700 mg/kg). Iron is retained as a COPC.

Magnesium was detected above the soil BV (4610 mg/kg) in two samples with a maximum concentration of 5170 mg/kg. The Gehan and quantile tests indicated site concentrations of magnesium in soil are not statistically different from background (Figure G-182 and Table G-28). Magnesium is not a COPC.

Manganese was detected above the Qbt 1g, Qct, Qbo BV (189 mg/kg) in three samples with a maximum concentration of 225 mg/kg. Because there were fewer than eight Qbo samples, statistical tests could not be performed. Manganese is retained as a COPC.

Mercury was detected above the soil BV (0.1 mg/kg) in two samples with a maximum concentration of 0.35 mg/kg. Because there are too few detections in the background data set, statistical tests could not be performed. Mercury is retained as a COPC.

Nitrate was detected in 47 samples with a maximum concentration of 6.34 mg/kg. Nitrate is naturally occurring, and the concentrations likely reflect naturally occurring levels. In addition, SWMU 02-009(a) consists of radioactive soil contamination and is not a source of nitrate. Nitrate is not a COPC.

Perchlorate was detected in 38 samples with a maximum concentration of 0.00623 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs (1.52 mg/kg and 0.3 mg/kg) in 51 soil samples with a maximum concentration of 70.5 mg/kg and it was not detected but had DLs (1.06 mg/kg to 1.65 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs in 5 soil samples and 5 tuff samples. The Gehan and quantile tests indicated site concentrations of selenium in soil are not statistically different from background (Figure G-183 and Table G-28). Selenium is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in 10 samples with a maximum concentration of 120 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are not statistically different from background (Figure G-184 and Table G-28). Zinc is not a COPC in soil.

Organic Chemicals

A total of 77 samples (33 soil, 39 Qal, and 5 Qbo) were analyzed for PCBs and SVOCs, and 44 samples (10 soil and 34 Qal) were analyzed for VOCs. Table 6.23-3 presents the detected organic chemicals. Plate 31 shows the spatial distribution of detected organic chemicals.

Polycyclic Aromatic Hydrocarbons

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

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

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

water. PAH concentrations in excess of soil cleanup levels may result from common anthropogenic sources, such as runoff from asphalt parking lots.

Site Activities

SWMU 02-009(a) is an area of radioactive soil contamination and was identified as a SWMU because it was the location of an apparent release of radioactive materials. SWMU 02-009(a) is located adjacent to former asphalt paving south of the OWR and received runoff from the paved area. Samples with detectable PAHs at this site were all surface samples located in the area receiving runoff from the paved area. PAHs were not known to be associated with the radioactive materials released at this site. Based on the above, the PAHs detected in samples used to characterize this site [anthracene; benzo(a)pyrene; benzo(b)fluoranthene; chrysene; fluoranthene; phenanthrene; and pyrene] are associated with the former paved area, are not related to historical Laboratory site operations, and are not COPCs.

Organic COPCs

Other organic chemicals detected at SWMU 02-009(a) include acetone; Aroclor-1248; Aroclor-1254; Aroclor-1260; butylbenzylphthalate; chloroform; chloromethane; 1,4-dichlorobenzene; di-n-butylphthalate; 4-isopropyltoluene; pentachlorophenol; phenol; toluene; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; and 1,2-xylene. The detected organic chemicals listed are retained as COPCs.

Radionuclides

A total of 77 samples (33 soil, 39 Qal, and 5 Qbo) were analyzed for americium-241, and 87 samples (43 soil, 39 Qal, and 5 Qbo) were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium. Table 6.23-4 presents the radionuclides detected or detected above BVs/FVs. Plate 32 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Cesium-137 was detected above the soil FV (1.65 pCi/g) in 6 samples and detected below 1 ft bgs in 17 soil samples with a maximum activity of 12.1 pCi/g. Cesium-137 is retained as a COPC.

Plutonium-238 was detected below 1 ft bgs in one Qal sample at an activity of 0.047 pCi/g. Plutonium-238 is retained as a COPC.

Plutonium-239/240 was detected above the soil FV (0.054 pCi/g) in seven samples and detected below 1 ft bgs in four Qal samples with a maximum activity of 4.17 pCi/g. Plutonium-239/240 is retained as a COPC.

Strontium-90 was detected below 1 ft bgs in four soil and Qal samples with a maximum activity of 0.483 pCi/g. Strontium-90 is retained as a COPC.

Tritium was detected in 27 samples with a maximum activity of 0.106 pCi/g. Tritium is retained as a COPC.

6.23.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 02-009(a) are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 02-009(a) include aluminum, antimony, arsenic, cadmium, cyanide, iron, manganese, mercury, perchlorate, and selenium.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 4260 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of aluminum are defined.

Antimony was not detected above the soil and Qbt 1g, Qct, Qbo BVs but had DLs (1.03 mg/kg to 1.26 mg/kg) above the BVs in four soil samples and five tuff samples. The residential SSL is approximately 25 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was not detected above the Qbo BV but had DLs (1.06 mg/kg to 1.28 mg/kg) above the BV in four samples. The residential SSL is approximately 5.5 times the maximum DL, and the industrial SSL is approximately 28 times the maximum DL. Further sampling for extent of arsenic is not warranted.

Cadmium was not detected above the soil and Qbt 1g, Qct, Qbo BVs but had DLs (0.495 mg/kg to 2.69 mg/kg) above BV in 70 soil/Qal samples and 5 tuff samples. The residential SSL is approximately 26 times the maximum DL. Further sampling for extent of cadmium is not warranted.

Cyanide was detected above the soil BV in one sample at a concentration of 0.51 mg/kg, and was not detected but had a DL (1.21 mg/kg) above BV in one sample. Concentrations decreased with depth and increased laterally at location 02-600276. The residential SSL is approximately 22 times the maximum concentration and 9.2 times the maximum DL. Further sampling for extent of cyanide is not warranted.

Iron was detected above the soil and Qbt 1g, Qct, Qbo BVs in two soil samples and five tuff samples with a maximum concentration of 63,200 mg/kg. Concentrations decreased with depth at locations 02-600269, 02-612421, and 02-612422 and decreased laterally. Lateral and vertical extent of iron are defined.

Manganese was detected above the Qbt 1g, Qct, Qbo BV in three samples with a maximum concentration of 225 mg/kg. Concentrations decreased with depth at locations 02-612421 and 02-6612422 and decreased laterally. Lateral and vertical extent of manganese are defined.

Mercury was detected above the soil BV in two samples with a maximum concentration of 0.35 mg/kg. Concentrations decreased with depth at locations 02-600260 and 02-600262 and did not change substantially laterally (0.001 mg/kg). The residential SSL is approximately 67 times the maximum concentration. Vertical extent of mercury is defined and further sampling for lateral extent is not warranted.

Perchlorate was detected in 38 samples with a maximum concentration of 0.00623 mg/kg. Concentrations increased with depth at locations 02-600259, 02-600261, 02-600264, 02-600267, 02-600272, and 02-600277; did not change substantially with depth (0.00043 mg/kg or less) at locations 02-600260, 02-600270, and 02-600273; decreased with depth at all other locations; and decreased laterally. The residential SSL is approximately 8800 times the maximum concentration. Lateral extent of perchlorate is defined and further sampling for vertical extent is not warranted.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs in 51 soil samples with a maximum concentration of 70.5 mg/kg and it was not detected but had DLs (1.06 mg/kg to 1.65 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs in 5 soil samples and 5 tuff samples. Concentrations increased with depth at locations 02-600270, 02-600271, 02-600273, and 02-600276; only one depth was sampled at location 02-600278; concentrations did not change substantially with depth (1.28 mg/kg or less) at locations 02-600260, 02-600274, 02-600280, and 02-600281; concentrations decreased with depth at all other locations; and concentrations increased laterally. The residential SSL is approximately 5.6 times the maximum concentration, and the industrial SSL is approximately 92 times the maximum concentration. Further sampling for extent of selenium is not warranted.

Organic Chemicals

Organic COPCs at SWMU 02-009(a) include acetone, Aroclor-1248, Aroclor-1254, Aroclor-1260, butylbenzylphthalate, chloroform, chloromethane, 1,4-dichlorobenzene, di-n-butylphthalate, 4-isopropyltoluene, pentachlorophenol, phenol, toluene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and 1,2-xylene.

Acetone was detected in one sample at a concentration of 0.00731 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of acetone are defined.

Aroclor-1248 was detected in one sample at a concentration of 0.0478 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of Aroclor-1248 are defined.

Aroclor-1254 was detected in eight samples with a maximum concentration of 0.0043. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of Aroclor-1254 are defined.

Aroclor-1260 was detected in eight samples with a maximum concentration of 0.0144. Only one depth was sampled at location 02-600278, concentrations decreased with depth at all other locations, and concentrations decreased laterally. Aroclor-1260 was not detected in deep samples at location 02-612422 approximately 10 ft from location 02-600278 and vertical extent is defined at location 02-600278. Lateral and vertical extent of Aroclor-1260 are defined.

Butylbenzylphthalate was detected in one sample at a concentration of 0.281 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of butylbenzylphthalate are defined.

Chloroform was detected in five samples with a maximum concentration of 0.000273 mg/kg. Concentrations increased with depth at location 02-600266, did not change substantially with depth (0.00032 mg/kg or less) at locations 02-600268 and 02-600271, and decreased laterally. The residential SSL is approximately 21,400 times the maximum concentration. Lateral extent of chloroform is defined and further sampling for vertical extent is not warranted.

Chloromethane was detected in one sample at a concentration of 0.00288 mg/kg. Concentrations increased with depth at location 02-600275 and decreased laterally. The residential SSL is approximately 14,200 times the maximum concentration. Lateral extent of chloromethane is defined and further sampling for vertical extent is not warranted.

Dichlorobenzene[1,4-] was detected in one sample at a concentration of 0.000364 mg/kg. Concentrations increased with depth at location 02-600281 and decreased laterally. The residential SSL is approximately 3,540,000 times the maximum concentration. Lateral extent of 1,4-dichlorobenzene is defined and further sampling for vertical extent is not warranted.

Di-n-butylphthalate was detected in three samples with a maximum concentration of 0.0388 mg/kg. Concentrations did not change substantially with depth (0.0021 mg/kg) at location 02-600275, decreased with depth at location 02-600260, and did not change substantially (0.003 mg/kg) laterally. The residential SSL is approximately 1,590,000 times the maximum concentration. Further sampling for extent of di-n-butylphthalate is not warranted.

Isopropyltoluene[4-] was detected in three samples with a maximum concentration of 0.000519 mg/kg. Concentrations increased with depth at location 02-600260, did not change substantially with depth (0.00174 mg/kg) at location 02-600271, and did not change substantially (0.000195 mg/kg) laterally. The residential SSL is approximately 6,180,000 times the maximum concentration. Further sampling for extent of 4-isopropyltoluene is not warranted.

Pentachlorophenol was detected in one sample at a concentration of 0.257 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of pentachlorophenol are defined.

Phenol was detected in one sample at a concentration of 0.102 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of phenol are defined.

Toluene was detected in 31 samples with a maximum concentration of 0.00143 mg/kg. Concentrations increased with depth at locations 02-600271; did not change substantially with depth (0.000043 mg/kg or less) at locations 02-600261, 02-600264, 02-600265, 02-600267, and 02-600274; decreased with depth at all other locations; and decreased laterally. The residential SSL is approximately 3,650,000 times the maximum concentration. 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 0.000843 mg/kg. Concentrations increased with depth at location 02-600264 and decreased laterally. The residential SSL is approximately 355,000 times the maximum concentration. Lateral extent of 1,2,4-trimethylbenzene is defined and further sampling for vertical extent is not warranted.

Trimethylbenzene[1,3,5-] was detected in one sample at a concentration of 0.000535 mg/kg. Concentrations increased with depth at location 02-600264 and decreased laterally. The residential SSL is approximately 505,000 times the maximum concentration. Lateral extent of 1,3,5-trimethylbenzene is defined and further sampling for vertical extent is not warranted.

Xylene[1,2-] was detected in two samples with a maximum concentration of 0.000648 mg/kg. Concentrations did not change substantially with depth (0.000029 mg/kg) at location 02-600264 and decreased laterally. The residential SSL is approximately 1,230,000 times the maximum concentration. Lateral extent of 1,2-xylene is defined and further sampling for vertical extent is not warranted.

Radionuclides

Radionuclide COPCs at SMWU 02-009(a) include cesium-137, plutonium-238, plutonium-239/240, strontium-90, and tritium.

Cesium-137 was detected above the soil FV in 6 samples and detected below 1 ft bgs in 17 soil samples with a maximum activity of 12.1 pCi/g. Activities increased with depth at locations 02-01263, 02-600268, and 02-600271; decreased with depth at all other locations; and decreased laterally. The residential SAL was approximately 6.4 times the maximum activity, and the industrial SAL was approximately 22 times the maximum activity where vertical extent is not defined (1.88 pCi/g at location 02-600268). Lateral extent of cesium-137 is defined and further sampling for vertical extent is not warranted.

Plutonium-238 was detected below 1 ft bgs in one Qal sample at an activity of 0.047 pCi/g. Activities increased with depth at location 02-600279 and increased laterally. The residential SAL was approximately 1790 times the maximum activity. Further sampling for extent of plutonium-238 is not warranted.

Plutonium-239/240 was detected above the soil FV in seven samples and detected below 1 ft bgs in four Qal samples with a maximum activity of 4.17 pCi/g. Activities increased with depth at location 02-600279, decreased with depth at all other locations, and increased laterally. The residential SAL was approximately 19 times the maximum activity, and the industrial SAL was approximately 288 times the maximum activity. Further sampling for extent of plutonium-239/240 is not warranted.

Strontium-90 was detected below 1 ft bgs in four soil and Qal samples with a maximum activity of 0.483 pCi/g. Activities increased with depth at location 02-01264, decreased with depth at all other locations, and decreased laterally. The residential SAL was approximately 31 times the maximum activity. Lateral extent of strontium-90 is defined and further sampling for vertical extent is not warranted.

Tritium was detected in 27 samples with a maximum activity of 0.106 pCi/g. Activities increased with depth at locations 02-01260, 02-600259, 02-600260, 02-600264, 02-600266, 02-600267, 02-600268, 02-600269, 02-600270, 02-600273, 02-600274, 02-600281, and 02-612422; did not change substantially with depth (0.0019 pCi/g or less) at locations 02-01263, 02-01264, and 02-600279; decreased with depth at all other locations; and decreased laterally. The residential SAL was approximately 16,000 times the maximum activity. Lateral extent of tritium is defined and further sampling for vertical extent is not warranted.

Summary of Nature and Extent

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at SWMU 02-009(a).

6.23.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 6×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.02, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 8×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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 5×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.3, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 5 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The residential exposure scenario also demonstrates protection of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, residential, and construction worker scenarios at SWMU 02-009(a).

6.23.6 Summary of Ecological Risk Screening

SWMU 02-009(a) is within the TA-02 core area. Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and results of site-specific ecological risk studies, no potential ecological risks exist for the TA-02 core area.

6.24 SWMU 02-009(b), Soil Contamination

6.24.1 Site Description and Operational History

SWMU 02-009(b) is an area of radioactive soil contamination located north of the former stack-gas valve house (structure 02-19) and the east bridge at TA-02 (Figure 6.20-1).

Detectable beta/gamma radioactivity was identified in 1986 when the area of SWMU 02-009(b) was used for truck staging during D&D of the WBR (Elder and Knoell 1986, 006670, p. 40). A limited amount of soil was removed from the site and disposed of (Elder and Knoell 1986, 006670, pp. 26–41).

6.24.2 Relationship to Other SWMUs and AOCs

The gaseous effluent vent line (line 117) was adjacent to the area identified as SWMU 02-009(a), but it is not known whether the line was the source of the soil contamination.

6.24.3 Summary of Previous Investigations

6.24.3.1 1985 WBR Decommissioning Project, Phase I

During the 1985 decommissioning project, a radiological walkover survey was conducted across the area. Several contaminated debris items were identified in the shallow subsurface; the most notable was 30 ft of 1-in. stainless-steel piping routed along the north-south fence. The source and destination of the pipe are unknown. Local radionuclide contamination remained in this area but was not addressed at the time. This area was also used as a truck staging area during decontamination operations. Project closeout walkover surveys indicated elevated radionuclide activity, prompting the placement of a 6-in. layer of topsoil cover (Elder and Knoell 1986, 006670, p. 40). All removed material (stainless-steel piping) was transported to TA-54 (Elder and Knoell 1986, 006670, p. 16).

6.24.3.2 1995 Investigation Activities

Samples were collected from two locations within the contamination area. Supporting QA/QC information is not available for these samples, so the sample results are not included in this report.

6.24.3.3 2000 Post–Cerro Grande Recovery Work

As part of the post–Cerro Grande fire recovery work, samples were collected from two boreholes (locations 02-01243 and 02-01244) near the previous screening-level data sampling locations. Field screening of recovered cores indicated no elevated radionuclide levels (LANL 2001, 070352, p. 8).

6.24.3.4 2007 Investigation Activities

Twenty-four samples were collected from nine locations at SWMU 02-009(b) in 2007. Results from the sampling activities in 2007 were presented in the previous investigation report (LANL 2008, 101669.12). Additional sampling was required to define the extent of contamination at the site.

6.24.4 Site Contamination

6.24.4.1 Soil, Rock, and Sediment Sampling

As part of the 2010 investigation, the following characterization activities were conducted at SWMU 02-009(b):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Five samples were collected from location 02-612388 from 5–6 ft, 15–16 ft, 25–26 ft, 35–36 ft, and 47.5–50 ft bgs at SWMU 02-009(b). These samples were analyzed for TAL metals, PCBs, SVOCs, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium.

The 2010 and historical sampling locations at SWMU 02-009(b) are shown in Figure 6.20-1. The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

6.24.4.2 Soil and Rock Sample Field-Screening Results

No organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of the samples. No radiological-screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. No changes to sampling or other activities occurred because of the field-screening results.

6.24.4.3 Soil and Rock Sample Analytical Results

Decision-level data at SWMU 02-009(b) consist of results from 34 samples collected from 12 locations in 2000, 2007, and 2010. The 34 samples include 12 soil, 13 Qal, 2 Qbt 3, and 7 Qbo samples. Table 6.24-1 presents the samples collected and analyses requested for SWMU 02-009(b).

Inorganic Chemicals

A total of 34 samples (12 soil, 13 Qal, 2 Qbt 3, and 7 Qbo) were analyzed for TAL metals, and 24 samples (9 soil, 11 Qal, and 4 Qbo) were analyzed for nitrate, perchlorate, and total cyanide. Table 6.24-2 presents the inorganic chemicals detected or detected above BVs. Plate 30 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV (3560 mg/kg) in one sample at a concentration of 4870 mg/kg. Because there were fewer than eight Qbo samples, statistical tests could not be performed. Aluminum is retained as a COPC.

Antimony was detected above the Qbt 2,3,4 BV (0.5 mg/kg) in one sample at a concentration of 0.57 mg/kg and was not detected above the soil and Qbt 1g, Qct, Qbo BVs (0.83 mg/kg and 0.5 mg/kg) but had DLs (0.979 mg/kg to 1.19 mg/kg) above the BVs in two soil samples and three Qbo samples.

There were too few detections in soil samples and too few tuff samples to perform statistical tests. Antimony is retained as a COPC.

Arsenic was detected above the Qbo BV (0.56 mg/kg) in two samples with a maximum concentration of 1.62 mg/kg and was not detected but had DLs (1.17 mg/kg to 1.74 mg/kg) above the Qbo BV in five samples. There were too few Qbo samples to perform statistical tests. Arsenic is retained as a COPC.

Cadmium was detected above the soil BV (0.4 mg/kg) in one sample at a concentration of 0.49 mg/kg and it was not detected but had DLs (0.495 mg/kg to 0.596 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs in six soil samples and seven tuff samples. There were too few detections in the soil background data set and too few tuff samples to perform statistical tests. Cadmium is retained as a COPC.

Calcium was detected above the soil BV (6120 mg/kg) in two samples with a maximum concentration of 7020 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in soil are not statistically different from background (Figure G-185 and Table G-29). Calcium is not a COPC.

Chromium was detected above the soil and Qbt 1g, Qct, Qbo BVs (19.3 mg/kg and 2.6 mg/kg) in one soil sample and five tuff samples with a maximum concentration of 32.3 mg/kg and was not detected but had a DL (5.7 mg/kg) above the Qbt 1g, Qct, Qbo BV in one sample. The Gehan and quantile tests indicated site concentrations of chromium in soil are not statistically different from background (Figure G-186 and Table G-29). There were too few Qbo samples to perform statistical tests and the maximum Qbo concentration (17.4 mg/kg) is substantially above the maximum Qbt 1g, Qct, Qbo background concentration (2.3 mg/kg). Chromium is retained as a COPC.

Cyanide was detected above the soil BV (0.5 mg/kg) in one sample at a concentration of 1.08 mg/kg and was not detected but had a DL (3.82 mg/kg) above the soil BV in one sample. Cyanide is retained as a COPC.

Iron was detected above the Qbt 1g, Qct, Qbo BV (3700 mg/kg) in seven samples with a maximum concentration of 7330 mg/kg. There were too few Qbo samples to perform statistical tests. Iron is retained as a COPC.

Lead was detected above the Qbt 1g, Qct, Qbo BV (13.5 mg/kg) in 1 sample at a concentration of 13.6 mg/kg. This concentration is equivalent to the BV and is below the highest concentration in the Qbt 1g, Qct, Qbo background data set (20 mg/kg). Lead was detected below BV in 33 other samples. Lead is not a COPC.

Manganese was detected above the Qbt 1g, Qct, Qbo BV (189 mg/kg) in five samples with a maximum concentration of 312 mg/kg. Because there were fewer than eight Qbo samples, statistical tests could not be performed. Manganese is retained as a COPC.

Mercury was detected above the soil BV (0.1 mg/kg) in six samples with a maximum concentration of 1.27 mg/kg. Because there are too few detections in the background data set, statistical tests could not be performed. Mercury is retained as a COPC.

Nickel was detected above the Qbt 1g, Qct, Qbo BV (2 mg/kg) in three samples with a maximum concentration of 4.66 mg/kg and was not detected but had a DL (4.73 mg/kg) above the BV in one sample. Because there were fewer than eight Qbo samples, statistical tests could not be performed. Nickel is retained as a COPC.

Nitrate was detected in 16 samples with a maximum concentration of 6.18 mg/kg. Nitrate is naturally occurring, and the concentrations likely reflect naturally occurring levels. In addition, SWMU 02-009(b) consists of radioactive soil contamination and is not a source of nitrate. Nitrate is not a COPC.

Perchlorate was detected in four samples with a maximum concentration of 0.0017 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs (1.52 mg/kg and 0.3 mg/kg) in one soil sample and three tuff samples with a maximum concentration of 2.11 mg/kg and was not detected but had DLs (1.17 mg/kg to 1.69 mg/kg) above BVs in one soil sample and four tuff samples The Gehan test indicated site concentrations of selenium in soil are statistically different from background (Table G-29). However, the Gehan and quantile tests indicated site concentrations of selenium in soil are not statistically different from background (Figure G-187 and Table G-29). Because there were fewer than eight Qbo samples, statistical tests could not be performed. Selenium is retained as a COPC.

Uranium was detected above the Qbt 2,3,4 BV (2.4 mg/kg) in one sample at a concentration of 2.44 mg/kg. This concentration is equivalent to the BV and is below or equivalent to the two highest concentrations in the Qbt 2,3,4 background data set (5 mg/kg and 2.4 mg/kg). Uranium was detected below BV in four other samples. Uranium is not a COPC.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV (4.59 mg/kg) in one sample at a concentration of 7.92 mg/kg. Because there were fewer than eight Qbo samples, statistical tests could not be performed. Vanadium is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in six samples with a maximum concentration of 70.5 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are statistically different from background (Figure G-188 and Table G-29). Zinc is retained as a COPC.

Organic Chemicals

A total of 29 samples (9 soil, 13 Qal, and 7 Qbo) were analyzed for PCBs and SVOCs, and 15 samples (11 Qal and 4 Qbo) were analyzed for VOCs. Table 6.24-3 presents the detected organic chemicals. Plate 31 shows the spatial distribution of detected organic chemicals.

Polycyclic Aromatic Hydrocarbons

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

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

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

Site Activities

SWMU 02-009(b) is an area of radioactive soil contamination and was identified as a SWMU because it was the location of an apparent release of radioactive materials. SWMU 02-009(b) is located adjacent to former asphalt paving east of the OWR. Samples with detectable PAHs at this site were surface and shallow subsurface samples located adjacent to the former paved area. PAHs were not known to be associated with the radioactive materials released at this site. Based on the above, the PAHs detected in samples used to characterize this site [acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; phenanthrene; and pyrene] are associated with the former paved area, are not related to historical Laboratory site operations, and are not COPCs.

Organic COPCs

Other organic chemicals detected at SWMU 02-009(b) include acetone, Aroclor-1248, Aroclor-1254, Aroclor-1260, bis(2-ethylhexyl)phthalate, di-n-butylphthalate, isopropylbenzene, 4-isopropyltoluene, and toluene. The detected organic chemicals listed are retained as COPCs.

Radionuclides

A total of 29 samples (9 soil, 13 Qal, and 7 Qbo) were analyzed for americium-241, and 34 samples (12 soil, 13 Qal, 2 Qbt 3, and 7 Qbo) were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium. Table 6.24-4 presents the radionuclides detected or detected above BVs/FVs. Plate 32 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Cesium-137 was detected above the soil FV (1.65 pCi/g) in 3 samples and detected below 1 ft bgs in 14 soil and Qal samples with a maximum activity of 8.62 pCi/g. Cesium-137 is retained as a COPC.

Plutonium-239/240 was detected above the soil FV (0.054 pCi/g) in five samples and detected below 1 ft bgs in nine soil and Qal samples with a maximum activity of 0.432 pCi/g. Plutonium-239/240 is retained as a COPC.

Strontium-90 was detected above the soil FV (1.31 pCi/g) in one sample and detected below 1 ft bgs in seven soil and Qal samples with a maximum activity of 4.02 pCi/g. Strontium-90 is retained as a COPC.

Tritium was detected in 17 samples with a maximum activity of 0.173 pCi/g. Tritium is retained as a COPC.

Uranium-234 was detected above the soil BV (2.59 pCi/g) in 1 sample at an activity of 2.87 pCi/g. The activity was only 0.28 pCi/g above BV and uranium-234 was detected below BV in 33 other samples. Uranium-234 is not a COPC.

Uranium-235/236 was detected above the Qbt 3 BV (0.09 pCi/g) in 1 sample at an activity of 0.236 pCi/g. The activity was only 0.146 pCi/g above BV and uranium-235/236 was not detected or detected above BV in 33 other samples (detected below BV in 31 samples). Uranium-235/236 is not a COPC.

6.24.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 02-009(b) are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 02-009(b) include aluminum, antimony, arsenic, cadmium, chromium, cyanide, iron, manganese, mercury, nickel, perchlorate, selenium, vanadium, and zinc.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 4870 mg/kg. Concentrations increased with depth at location 02-600607 and decreased laterally. The residential SSL is approximately 16 times the maximum concentration, and the industrial SSL is approximately 265 times the maximum concentration. Lateral extent of aluminum is defined and further sampling for lateral extent is not warranted.

Antimony was detected above the Qbt 2,3,4 BV in one sample at a concentration of 0.57 mg/kg and was not detected above the soil and Qbt 1g, Qct, Qbo BVs but had DLs (0.979 mg/kg to 1.19 mg/kg) above the BVs in two soil samples and three Qbo samples. Concentrations increased with depth at location 02-01243 and decreased laterally. The residential SSL is approximately 55 times the maximum concentration and 910 times the maximum DL. Lateral extent of antimony is defined and further sampling for lateral extent is not warranted.

Arsenic was detected above the Qbo BV in two samples with a maximum concentration of 1.62 mg/kg and was not detected but had DLs (1.17 mg/kg to 1.74 mg/kg) above the Qbt 1g, Qct, Qbo BV in five samples. Concentrations increased with depth at location 02-600606, decreased with depth at location 02-600610, and increased laterally (the concentration in a shallow sample at location 02-600610 was 1.41 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 4.4 times the maximum concentration, and the industrial SSL is approximately 22 times the maximum concentration. The residential SSL is approximately 4.1 times the maximum DL, and the industrial SSL is approximately 21 times the maximum DL. Further sampling for extent of arsenic is not warranted.

Cadmium was detected above the soil BV in one sample at a concentration of 0.49 mg/kg and it was not detected but had DLs (0.495 mg/kg to 0.596 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs in six soil samples and seven tuff samples. Concentrations decreased with depth at location 02-600607 and increased laterally. The residential SSL is approximately 144 times the maximum concentration and 118 times the maximum DL. Further sampling for extent of cadmium is not warranted.

Chromium was detected above the soil and Qbt 1g, Qct, Qbo BVs in one soil sample and five tuff samples with a maximum concentration of 32.3 mg/kg and was not detected but had a DL (5.7 mg/kg) above the Qbt 1g, Qct, Qbo BV in one sample. Concentrations increased with depth at locations 02-600606 and 02-600607, decreased with depth at all other locations, and increased laterally. As described in section 4.2, SWMU 02-009(b) is not a potential source of hexavalent chromium and use of the SSL for trivalent chromium to determine whether additional sampling is warranted is appropriate. The residential SSL for trivalent chromium (117,000 mg/kg) was approximately 3620 times the maximum concentration. Further sampling for extent of chromium is not warranted.

Cyanide was detected above the soil BV in one sample at a concentration of 1.08 mg/kg and was not detected but had a DL (3.82 mg/kg) above the soil BV in one sample. Concentrations decreased with depth at location 02-600607 and increased laterally. The residential SSL is approximately 10 times the maximum concentration, and the industrial SSL is approximately 58 times the maximum concentration. The residential SSL is approximately 2.9 times the maximum DL, and the industrial SSL is approximately 16 times the maximum DL. Further sampling for extent of cyanide is not warranted.

Iron was detected above the Qbt 1g, Qct, Qbo BV in seven samples with a maximum concentration of 7330 mg/kg. Concentrations decreased with depth at all locations and increased laterally (concentrations in shallow samples at locations 02-600606, 02-600607, 02-600609, 02-600610, and 02-612388 were

7800 mg/kg, 8600 mg/kg, 8190 mg/kg, 8640 mg/kg, and 8180 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 7.5 times the maximum concentration, and the industrial SSL is approximately 124 times the maximum concentration. Vertical extent of iron is defined and further sampling for lateral extent is not warranted.

Manganese was detected above the Qbt 1g, Qct, Qbo BV in five samples with a maximum concentration of 312 mg/kg. Concentrations did not change substantially with depth (19 mg/kg) at location 02-600606, decreased with depth at all other locations, and increased laterally (concentrations in shallow samples at locations 02-600606, 02-600607, 02-600609, and 02-600610 were 309 mg/kg, 331 mg/kg, 279 mg/kg, and 316 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 34 times the maximum concentration. Further sampling for extent of manganese is not warranted.

Mercury was detected above the soil BV in six samples with a maximum concentration of 1.27 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of mercury are defined.

Nickel was detected above the Qbt 1g, Qct, Qbo BV in three samples with a maximum concentration of 4.66 mg/kg and was not detected but had a DL (4.73 mg/kg) above the BV in one sample. Concentrations increased with depth at location 02-600607, did not change substantially with depth (0.00 mg/kg or less) at locations 02-600606 and 02-600610, and did not change substantially laterally (0.85 mg/kg) (concentrations in shallow samples at locations 02-600606 and 02-600610 were 3.71 mg/kg and 4.99 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 335 times the maximum concentration. Further sampling for extent of nickel is not warranted.

Perchlorate was detected in four samples with a maximum concentration of 0.0017 mg/kg. Concentrations increased with depth at location 02-600611, only one depth was sampled at location 02-600612, concentrations decreased with depth at all other locations, and concentrations decreased laterally. The residential SSL is approximately 32,200 times the maximum concentration. Lateral extent of perchlorate is defined and further sampling for vertical extent is not warranted.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs in one soil sample and three tuff samples with a maximum concentration of 2.11 mg/kg and was not detected but had DLs (1.17 mg/kg to 1.69 mg/kg) above BVs in one soil sample and four tuff samples. Concentrations increased with depth at locations 02-600608 and 02-600609, did not change substantially with depth (0.133 mg/kg) at location 02-600610, decreased with depth at location 02-600606, and decreased laterally (concentrations in shallow samples at locations 02-600606 and 02-600610 were 1.05 mg/k and 0.835 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 185 times the maximum concentration. Lateral extent of selenium is defined and further sampling for vertical extent is not warranted.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 7.92 mg/kg. Concentrations decreased with depth at location 02-600606 and increased laterally. The residential SSL is approximately 50 times the maximum concentration. Vertical extent of vanadium is defined and further sampling for lateral extent is not warranted.

Zinc was detected above the soil BV in six samples with a maximum concentration of 70.5 mg/kg. Concentrations decreased with depth at all locations and increased laterally. The residential SSL is approximately 333 times the maximum concentration. Vertical extent of zinc is defined and further sampling for lateral extent is not warranted.

Organic Chemicals

Organic COPCs at SWMU 02-009(b) include acetone, Aroclor-1248, Aroclor-1254, Aroclor-1260, bis(2-ethylhexyl)phthalate, di-n-butylphthalate, isopropylbenzene, 4-isopropyltoluene, and toluene.

Acetone was detected in one sample at a concentration of 0.0108 mg/kg. Concentrations decreased with depth and increased laterally. The residential SSL is approximately 6,140,000 times the maximum concentration. Vertical extent of acetone is defined and further sampling for lateral extent is not warranted.

Aroclor-1248 was detected in one sample at a concentration of 0.0438 mg/kg. Concentrations decreased with depth at location 02-600607 and increased laterally. The residential SSL is approximately 55 times the detected concentration. Vertical extent of Aroclor-1248 is defined and further sampling for lateral extent is not warranted.

Aroclor-1254 was detected in 10 samples with a maximum concentration of 0.0711 mg/kg. Concentrations did not change substantially with depth (0.0016 mg/kg) at location 02-600613, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 16 times the maximum concentration. Lateral extent of Aroclor-1254 is defined and further sampling for vertical extent is not warranted.

Aroclor-1260 was detected in 16 samples with a maximum concentration of 0.14 mg/kg. Concentrations did not change substantially with depth (0.0025 mg/kg) at location 02-600613, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 16 times the maximum concentration. Lateral extent of Aroclor-1260 is defined and further sampling for vertical extent is not warranted.

Bis(2-ethylhexyl)phthalate was detected in one sample at a concentration of 0.0684 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

Di-n-butylphthalate was detected in three samples with a maximum concentration of 0.0789 mg/kg. Concentrations decreased with depth at all locations and increased laterally. The residential SSL is approximately 78,100 times the maximum concentration. Vertical extent of di-n-butylphthalate is defined and further sampling for lateral extent is not warranted.

Isopropylbenzene was detected in one sample at a concentration of 0.000342 mg/kg. Concentrations decreased with depth at location 02-600610 and increased laterally. The residential SSL is approximately 6,870,000 times the maximum concentration. Vertical extent of isopropylbenzene is defined and further sampling for lateral extent is not warranted.

Isopropyltoluene[4-] was detected in one sample at a concentration of 0.000986 mg/kg. Concentrations increased with depth at location 02-600610 and increased laterally. The residential SSL is approximately 3,260,000 times the maximum concentration. Further sampling for extent of 4-isopropyltoluene is not warranted.

Toluene was detected in two samples with a maximum concentration of 0.00136 mg/kg. Only one depth was sampled at locations 02-600606 and 02-600607 and concentrations decreased laterally. The residential SSL is approximately 3,840,000 times the maximum concentration. Further sampling for extent of toluene is not warranted.

Radionuclides

Radionuclide COPCs at SMWU 02-009(b) include cesium-137, plutonium-239/240, strontium-90, and tritium.

Cesium-137 was detected above the soil FV in 3 samples and detected below 1 ft bgs in 14 soil and Qal samples with a maximum activity of 8.62 pCi/g. Activities increased with depth at locations 02-600605 and 02-600611, only one depth was sampled at location 02-600612, activities decreased with depth at all other locations, and activities increased laterally to the east at locations 02-600607 and 02-600610. Cesium-137 was not detected to the east of locations 02-600607 and 02-600610 at locations 02-600595 and 02-600596 for SMWU 02-007 (Plate 32). Lateral extent of cesium-137 is defined. The residential SAL is approximately 11 times the maximum activity, and the industrial SAL is approximately 39 times the maximum activity where vertical extent is not defined (1.06 pCi/g at location 02-600611). Lateral extent of cesium-137 is defined and further sampling for vertical extent is not warranted.

Plutonium-239/240 was detected above the soil FV in five samples and detected below 1 ft bgs in nine soil and Qal samples with a maximum activity of 0.432 pCi/g. Activities increased with depth at location 02-600613, decreased with depth at all other locations, and activities increased laterally. The residential SAL is approximately 183 times the maximum activity. Further sampling for extent of plutonium-239/240 is not warranted.

Strontium-90 was detected above the soil FV in one sample and detected below 1 ft bgs in seven soil and Qal samples with a maximum activity of 4.02 pCi/g. Activities increased with depth at locations 02-600611 and 02-600613, only one depth was sampled at location 02-600612, activities decreased with depth at all other locations, and activities decreased laterally. The residential SAL is approximately 32 times the maximum activity where vertical extent is not defined (0.471 pCi/g at location 02-600611). Lateral extent of strontium-90 is defined and further sampling for vertical extent is not warranted.

Tritium was detected in 17 samples with a maximum activity of 0.173 pCi/g. Activities increased with depth at location 02-01244, 02-600605, 02-600607, 02-600608, 02-600609, and 02-600610; decreased with depth at all other locations; and decreased laterally. The residential SAL is approximately 9830 times the maximum activity. Lateral extent of tritium is defined and further sampling for vertical extent is not warranted.

Summary of Nature and Extent

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at SWMU 02-009(b).

6.24.5 Summary of Human Health Risk Screening

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} (NMED 2017, 602273). The industrial HI is 0.006, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 5 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 1×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.01, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.6 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Residential Scenario

The total excess cancer risk for the recreational scenario is 5×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.09, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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.

The residential exposure scenario also demonstrates protection of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, residential, and construction worker scenarios at SWMU 02-009(b).

6.24.6 Summary of Ecological Risk Screening

SWMU 02-009(b) is within the TA-02 core area. Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and results of site-specific ecological risk studies, no potential ecological risks exist for the TA-02 core area.

6.25 SWMU 02-009(c), Soil Contamination

6.25.1 Site Description and Operational History

SWMU 02-009(c) is a leach field and an area of alpha-, beta-, and gamma-emitting radioactively contaminated soil south of the condensate trap [structure 02-48, AOC 02-003(b)] (Figure 6.20-1).

Radioactive soil contamination was identified at SWMU 02-009(c) during 1985–1986 D&D activities associated with the condensate trap (Elder and Knoell 1986, 006670, pp. 36–40). Two sections of contaminated 6-in.-diameter VCP, one 34 ft long and one 20 ft long and lying parallel to the septic tank overflow pipe, were uncovered during D&D activities at the condensate trap. The pipes were approximately 5 ft below and to either side of the septic tank overflow pipe (Elder and Knoell 1986, 006670, pp. 29–40). The purpose of the pipes is unknown. The pipes were present at depths of 3–8 ft bgs (Elder and Knoell 1986, 006670, pp. 26–41). All structures (pipes) and adjacent soils down to the saturated zone were removed and disposed of during the 1985–1986 D&D activities (Elder and Knoell 1986, 006670, pp. 36–40).

6.25.2 Relationship to Other SWMUs and AOCs

The former condensate trap, AOC 02-003(b), was located within the area identified as SWMU 02-009(c). The SWMU 02-009(c) leach field received effluent from the former septic tank, SWMU 02-007.

6.25.3 Summary of Previous Investigations

6.25.3.1 1985 WBR Decommissioning Project, Phase I

During D&D activities in 1985, excavation and removal of the condensate trap (structure 02-48), the septic tank (structure 02-43), and the septic tank VCP overflow drainpipe led to the discovery of the SWMU 02-009(c) leach field (Elder and Knoell 1986, 006670). The leach field was found east of the condensate trap, approximately 2 ft below the route of the septic tank VCP overflow drainpipe that discharged to Los Alamos Creek. The leach field consisted of two sections of 6-in.-diameter VCP laid in a bed of rock and sand. The VCP and contaminated soil, sand, and crushed rock were removed. The VCP within the leach field and at Los Alamos Creek was broken by the backhoe bucket and removed directly with the soil (Elder and Knoell 1986, 006670, pp. 14–15, 29–40). The material was removed, screened, and segregated using field-screening instruments. Material that passed screening was used as backfill (Elder and Knoell 1986, 006670, p. 21). Excavation of the leach field area (an area approximately 22 ft wide × 83 ft long, located approximately 50 ft east of the condensate trap) extended along the former drainline down to Los Alamos Creek. Soil was removed from the surface to the groundwater interface in some areas (Elder and Knoell 1986, 006670, pp. 36–39).

6.25.3.2 1995 Investigation Activities

Sixteen samples were collected from seven boreholes (locations 02-01140 to 02-01143 and 02-01146 to 02-01148) across the leach field in 1995. Samples were collected from various depths to evaluate soil left in place following the 1986 D&D activities. The 1995 investigation results are not decision-level data.

6.25.3.3 2000 Post–Cerro Grande Recovery Work

During the post–Cerro Grande fire recovery work, 51 samples were collected from 11 boreholes (locations 02-01225 to 02-01234 and 02-01236) from various depths throughout the leach field.

6.25.3.4 2007 Investigation Activities

A total of 80 samples were collected from 26 locations at SWMU 02-009(c) in 2007. Results from the sampling activities in 2007 were presented in the previous investigation report (LANL 2008, 101669.12). Additional sampling was required to define the extent of contamination at the site.

6.25.4 Site Contamination

6.25.4.1 Soil, Rock, and Sediment Sampling

As part of the 2010 investigation, the following characterization activities were conducted at SWMU 02-009(c):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Twenty samples were collected from four locations (02-612391, 02-612392, 02-612393, and 02-612420) at the western, central, eastern, and southern portions of SWMU 02-009(c) (depths ranging from 5–50 ft bgs). These samples were analyzed for TAL metals, PCBs, SVOCs, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium.

The 2010 and historical sampling locations at SWMU 02-009(c) are shown in Figure 6.20-1. The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

6.25.4.2 Soil, Rock, and Sediment Sample Field-Screening Results

No organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of the samples. No radiological-screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. No changes to sampling or other activities occurred because of the field-screening results.

6.25.4.3 Soil, Rock, and Sediment Sample Analytical Results

Decision-level data at SWMU 02-009(c) consist of results from 151 samples collected from 41 locations in 2000, 2007, and 2010. The 151 samples include 61 soil, 39 Qal, 10 Qbt 2, 34 Qbo, and 7 sediment samples. Table 6.25-1 presents the samples collected and analyses requested for SWMU 02-009(c).

Inorganic Chemicals

A total of 151 samples (61 soil, 39 Qal, 10 Qbt 2, 34 Qbo, and 7 sediment) were analyzed for TAL metals, and 80 samples (20 soil, 33 Qal, 21 Qbo, and 6 sediment) were analyzed for hexavalent chromium, nitrate, perchlorate, and total cyanide. Table 6.25-2 presents the inorganic chemicals detected or detected above BVs. Plate 30 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 2,3,4 and Qbt 1g, Qct, Qbo BVs (7340 mg/kg and 3560 mg/kg) in 8 Qbt 2 samples and 25 Qbo samples with a maximum concentration of 21,800 mg/kg. The Gehan and quantile tests indicated site concentrations of aluminum in Qbo are statistically different from background (Figure G-189 and Table G-30). Aluminum is retained as a COPC.

Antimony was not detected but had DLs (0.519 mg/kg to 1.39 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs (0.83 mg/kg and 0.5 mg/kg) in 7 soil samples and 20 tuff samples. There were too few detections to perform statistical tests. Antimony is retained as a COPC.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV (0.56 mg/kg) in 13 samples with a maximum concentration of 1.87 mg/kg and was not detected but had DLs (1.1 mg/kg to 2.22 mg/kg) above the BV in 19 samples. The quantile and slippage tests indicated site concentrations of arsenic in tuff are statistically different from background (Figure G-190 and Table G-30). Arsenic is retained as a COPC.

Barium was detected above the soil; Qbt 2,3,4; and Qbt 1g, Qct, Qbo BVs (295 mg/kg, 46.0 mg/kg, and 25.7 mg/kg) in 4 soil samples, 4 Qbt 2 samples, and 10 Qbo samples with a maximum concentration of 636 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in soil are not statistically different from background (Figure G-191 and Table G-31) but site concentrations of barium in Qbo are statistically different from background (Figure G-192 and Table G-30). Barium is retained as a COPC.

Beryllium was detected above the Qbt 1g, Qct, Qbo BV (1.44 mg/kg) in one sample at a concentration of 1.49 mg/kg. The Gehan test indicated site concentrations of beryllium in Qbo are statistically different from background (Table G-30). However, the quantile and slippage tests indicated site concentrations of beryllium in Qbo are not statistically different from background (Figure G-193 and Table G-30). Beryllium is not a COPC.

Cadmium was detected above the sediment BV (0.4 mg/kg) in 2 samples with a maximum concentration of 0.431 mg/kg and was not detected but had DLs (0.474 mg/kg to 0.739 mg/kg) above the sediment BV and soil and Qbt 1g, Qct, and Qbo BVs (0.4 mg/kg for both) in 2 sediment samples, 46 soil samples, and 34 Qbo samples. There were too few detections in background or site data to perform statistical tests. Cadmium is retained as a COPC.

Chromium was detected above the soil; Qbt 2,3,4; and Qbt 1g, Qct, Qbo BVs (19.3 mg/kg, 7.14 mg/kg, and 2.6 mg/kg) in 12 soil samples, 1 Qbt 2 sample, and 7 Qbo samples with a maximum concentration of 52.3 mg/kg. Chromium was not detected but had DLs (3.06 mg/kg to 11.8 mg/kg) above the Qbt 1g, Qct, Qbo BV in 9 samples. The Gehan and quantile tests indicated site concentrations of chromium in soil are not statistically different from background (Figure G-194 and Table G-31). The Gehan and slippage tests indicated site concentrations of chromium in Qbo are statistically different from background (Figure G-195 and Table G-30). Chromium is retained as a COPC.

Copper was detected above the Qbt 1g, Qct, Qbo BV (3.96 mg/kg) in one sample at a concentration of 4.15 mg/kg and was not detected but had DLs (4.44 mg/kg and 8.11 mg/kg) above the BV in two samples. The Gehan and quantile tests indicated site concentrations of copper in tuff are not statistically different from background (Figure G-196 and Table G-30). Copper is not a COPC.

Hexavalent chromium was detected in 31 soil/Qal/tuff/sediment samples with a maximum concentration of 1.33 mg/kg. Hexavalent chromium is retained as a COPC.

Iron was detected above the sediment and Qbt 1g, Qct, Qbo BVs (13,100 mg/kg and 3700 mg/kg) in 1 sediment sample and 34 tuff samples with a maximum concentration of 15,200 mg/kg. The Gehan and quantile tests indicated site concentrations of iron in tuff are statistically different from background (Figure G-197 and Table G-30). Iron is retained as a COPC.

Lead was detected above the soil and sediment BVs (22.3 mg/kg and 19.7 mg/kg) in 2 soil samples and 3 sediment samples with a maximum concentration of 31.2 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil are not statistically different from background (Figure G-198 and Table G-31). The maximum concentration in sediment (21.3 mg/kg) is only 1.6 mg/kg above the BV and is less than the highest concentration in the sediment background data set (25.6 mg/kg). Lead was not detected or detected above BV in 146 other samples (detected below BV in 145 samples). Lead is not a COPC.

Manganese was detected above the soil and Qbt 1g, Qct, Qbo BVs (671 mg/kg and 189 mg/kg) in 1 soil sample and 24 tuff samples with a maximum concentration of 905 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in soil are not statistically different from background (Figure G-199 and Table G-31) but site concentrations of manganese in tuff are statistically different from background (Figure G-200 and Table G-30). Manganese is retained as a COPC.

Mercury was detected above the soil and sediment BVs (0.1 mg/kg for both) in 10 soil samples and 2 sediment samples with a maximum concentration of 1.13 mg/kg and was not detected but had DLs (0.14 mg/kg to 0.32 mg/kg) above the soil BV in 4 samples. Mercury is retained as a COPC.

Nickel was detected above the Qbt 1g, Qct, Qbo BV (2 mg/kg) in five samples with a maximum concentration of 7.15 mg/kg and was not detected but had DLs (2.06 mg/kg to 4.5 mg/kg) above the BV in eight samples. The quantile test indicated site concentrations of nickel in tuff are statistically different from background (Figure G-201 and Table G-30). Nickel is retained as a COPC.

Nitrate was detected in 30 samples with a maximum concentration of 11.4 mg/kg. Nitrate is naturally occurring, and the concentrations likely reflect naturally occurring levels. In addition, SWMU 02-009(c) consists of radioactive soil contamination and is not a source of nitrate. Nitrate is not a COPC.

Perchlorate was detected in 16 samples with a maximum concentration of 0.00901 mg/kg. Perchlorate is identified as a COPC in soil.

Selenium was detected above the soil; sediment; Qbt 2,3,4; and Qbt 1g, Qct, Qbo BV (1.52 mg/kg, 0.3 mg/kg, 0.3 mg/kg, and 0.3 mg/kg) in 10 soil samples, 3 sediment samples, 1 Qbt 2 sample, and 15 Qbo samples with a maximum concentration of 11.4 mg/kg. Selenium was not detected but had DLs (1.1 mg/kg to 2.04 mg/kg) above BVs in 12 soil samples, 4 sediment samples, and 19 Qbo samples. There are too few detections in the sediment and tuff background data sets to perform statistical tests. Selenium is retained as a COPC.

Silver was detected above the soil; sediment; and Qbt 2,3,4 BVs (1 mg/kg each) in 21 soil samples, 1 sediment sample, and 3 tuff samples with a maximum concentration of 2.8 mg/kg. Silver is retained as a COPC.

Uranium was detected above the soil BV (1.82 mg/kg) in three samples with a maximum concentration of 7.1 mg/kg. The Gehan and quantile tests indicated site concentrations of uranium in soil are not statistically different from background (Figure G-202 and Table G-31). Uranium is not a COPC.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV (4.59 mg/kg) in nine samples with a maximum concentration of 8.42 mg/kg. The Gehan and quantile tests indicated site concentrations of vanadium in tuff are statistically different from background (Figure G-203 and Table G-30). Vanadium is retained as a COPC.

Zinc was detected above the soil and sediment BVs (48.8 mg/kg and 60.2 mg/kg) in one soil sample and two sediment samples with a maximum concentration of 77.2 mg/kg. The Gehan and slippage tests indicated site concentrations of zinc in soil are not statistically different from background (Figure G-204 and Table G-31). Because there were fewer than eight sediment samples, statistical tests could not be performed. The maximum concentration in sediment (77.2 mg/kg) is greater than the highest concentration in the sediment background data set (56.2 mg/kg). Zinc is retained as a COPC.

Organic Chemicals

A total of 80 samples (16 soil, 31 Qal, 29 Qbo, and 4 sediment) were analyzed for PCBs, 150 samples (61 soil, 39 Qal, 10 Qbt 2, 34 Qbo, and 6 sediment) were analyzed for SVOCs, and 54 samples (33 Qal and 21 Qbo) were analyzed for VOCs. Table 6.25-3 presents the detected organic chemicals. Plate 31 shows the spatial distribution of detected organic chemicals.

Polycyclic Aromatic Hydrocarbons

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

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

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

Site Activities

SWMU 02-009(c) is a former leach field and area of radioactive soil contamination and was identified as a SWMU because of apparent release of radioactive materials. SWMU 02-009(c) is located adjacent to former asphalt paving east of the OWR and received runoff from the paved area. Samples with detectable

PAHs at this site were surface and shallow subsurface samples located in the area receiving runoff from the paved area. PAHs were not known to be associated with the radioactive materials released at this site. Based on the above, the PAHs detected in samples used to characterize this site [acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenanthrene; and pyrene] are associated with the former paved area, are not related to historical Laboratory site operations, and are not COPCs.

Organic COPCs

Other organic chemicals detected at SWMU 02-009(c) include acetone, Aroclor-1248, Aroclor-1254, Aroclor-1260, bis(2-ethylhexyl)phthalate, chloroform, dibenzofuran, di-n-butylphthalate, 4-isopropyltoluene, methylene chloride, phenol, styrene, and toluene. The detected organic chemicals listed are retained as COPCs.

Radionuclides

A total of 100 samples (21 soil, 39 Qal, 34 Qbo, and 6 sediment) were analyzed for americium-241 and 151 samples (61 soil, 39 Qal, 10 Qbt 2, 34 Qbo, and 7 sediment) were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium. Table 6.25-4 presents the radionuclides detected or detected above BVs/FVs. Plate 32 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Cesium-137 was detected above the soil and sediment FVs (1.65 pCi/g and 0.9 pCi/g) in 3 soil samples and 1 sediment sample, detected below 1 ft bgs in 62 soil and Qal samples, and detected in 7 Qbo samples and 4 Qbt 2 samples with a maximum activity of 232 pCi/g. Cesium-137 is retained as a COPC.

Plutonium-239/240 was detected above the soil and sediment FVs (0.054 pCi/g and 0.068 pCi/g) in 10 soil samples and 7 sediment samples, detected below 1 ft bgs in 39 soil and Qal samples, and detected in 6 Qbo and 2 Qbt 2 samples with a maximum activity of 0.992 pCi/g. Plutonium-239/240 is retained as a COPC.

Strontium-90 was detected above the soil FV (1.31 pCi/g) in 2 samples, detected below 1 ft bgs in 37 soil and Qal samples, and detected in 5 Qbo and 4 Qbt 2 samples with a maximum activity of 11.8 pCi/g. Strontium-90 is retained as a COPC.

Tritium was detected in 45 samples with a maximum activity of 1.18 pCi/g. Tritium is retained as a COPC.

Uranium-234 was detected above the soil and Qbt 2,3,4 BVs (2.59 pCi/g and 1.98 pCi/g) in two soil samples and eight tuff samples with a maximum activity of 4.37 pCi/g. Uranium-234 is retained as a COPC.

Uranium-235/236 was detected above the soil; Qbt 2,3,4; and Qbt 1g, Qct, Qbo BVs (0.2 pCi/g, 0.09 pCi/g, and 0.18 pCi/g), in one soil sample, five Qbt 2 samples, and two Qbo samples with a maximum activity of 0.233 pCi/g. Uranium-235/236 is retained as a COPC.

Uranium-238 was detected above the soil and Qbt 2,3,4 BVs (2.29 pCi/g and 1.93 pCi/g) in three soil samples and seven tuff samples with a maximum activity of 3.92 pCi/g. Uranium-238 is retained as a COPC.

6.25.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 02-009(c) are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 02-009(c) include aluminum, antimony, arsenic, barium, cadmium, chromium, hexavalent chromium, iron, lead, manganese, mercury, nickel, perchlorate, selenium, silver, vanadium, and zinc.

Aluminum was detected above the Qbt 2,3,4 and Qbt 1g, Qct, Qbo BVs in 8 Qbt 2 samples and 25 Qbo samples with a maximum concentration of 21,800 mg/kg. Concentrations increased with depth at most locations. The detections above BV were generally in the deepest samples collected at each location and aluminum was not detected above BV in overlying soil samples. Concentrations decreased laterally. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 3.6 times the maximum concentration, and the industrial SSL is approximately 59 times the maximum concentration. Lateral extent of aluminum is defined and further sampling for vertical extent is not warranted.

Antimony was not detected but had DLs (0.519 mg/kg to 1.39 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs in 7 soil samples and 20 tuff samples. The residential SSL is approximately 22 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV in 13 samples with a maximum concentration of 1.87 mg/kg and was not detected but had DLs (1.1 mg/kg to 2.22 mg/kg) above the BV in 19 samples. The detections above BV were generally in the deepest samples collected at each location and arsenic was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations did not change substantially laterally (0.69 mg/kg). All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 3.4 times the maximum concentration, and the industrial SSL is approximately 21 times the maximum concentration. The residential SSL is approximately 3.2 times the maximum DL, and the industrial SSL is approximately 16 times the maximum DL. Further sampling for extent of arsenic is not warranted.

Barium was detected above the soil; Qbt 2,3,4; and Qbt 1g, Qct, Qbo BVs in 4 soil samples, 4 Qbt 2 samples, and 10 Qbo samples with a maximum concentration of 636 mg/kg. Concentrations decreased with depth at all locations where barium was detected above BV in soil. The detections above BV at all other locations were generally in the deepest samples collected at each location and barium was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations increased laterally to the south. Lateral extent to the south is bounded by SWMU 02-009(a). All detections above BV in tuff were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 24 times the maximum concentration and 133 times the maximum concentration in tuff (117 mg/kg at location 02-600651). Further sampling for extent of barium is not warranted.

Cadmium was detected above the sediment BV in 2 samples with a maximum concentration of 0.431 mg/kg and was not detected but had DLs (0.474 mg/kg to 0.739 mg/kg) above the sediment, soil, and Qbt 1g, Qct, and Qbo BVs in 2 sediment samples, 46 soil samples, and 34 Qbo samples. Only one depth was sampled at location 02-600703, concentrations decreased with depth at location 02-600704, and concentrations decreased laterally. The residential SSL is approximately 164 times the maximum concentration and 95 times the maximum DL. Further sampling for extent of cadmium is not warranted.

Chromium was detected above the soil; Qbt 2,3,4; and Qbt 1g, Qct, Qbo BVs in 12 soil samples, 1 Qbt 2 sample, and 7 Qbo samples with a maximum concentration of 52.3 mg/kg. Chromium was not detected but had DLs above the Qbt 1g, Qct, Qbo BV in 9 samples. Concentrations increased with depth at locations 02-600602, 02-600646, 02-600698, 02-600702, and 02-600704; concentrations decreased with depth at all other locations; and concentrations decreased laterally (the concentration in a shallow sample at location 02-600602 was 5.67 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The maximum concentration was detected at location 02-600652. Hexavalent chromium was not detected in this sample and the total chromium result is representative of trivalent chromium. The residential SSL for trivalent chromium (117,000 mg/kg) is 2240 times the maximum concentration. Lateral extent of chromium is defined and further sampling for vertical extent is not warranted.

Hexavalent chromium was detected in 31 soil/Qal/tuff/sediment samples with a maximum concentration of 1.33 mg/kg. Concentrations increased with depth at locations 02-600643, 02-600646, 02-600647, 02-600698, 02-600699, and 02-600701; only one depth was sampled at locations 02-600603 and 02-600649; concentrations decreased with depth at all other locations; and concentrations decreased laterally. The residential SSL is approximately 2.3 times the maximum concentration, and the industrial SSL is approximately 54 times the maximum concentration. Lateral extent of hexavalent chromium is defined and further sampling for vertical extent is not warranted.

Iron was detected above the sediment and Qbt 1g, Qct, Qbo BVs in 1 sediment sample and 34 tuff samples with a maximum concentration of 15,200 mg/kg. Only one depth was sampled at location 02-600604 where iron was detected above BV in sediment. The detections above BV at all other locations were generally in the deepest samples collected at each location and iron was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations decreased laterally. All detections above BV in tuff were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 3.6 times the maximum concentration, and the industrial SSL is approximately 60 times the maximum concentration. Further sampling for extent of barium is not warranted.

Manganese was detected above the soil and Qbt 1g, Qct, Qbo BVs in 1 soil sample and 24 tuff samples with a maximum concentration of 905 mg/kg. Concentrations decreased with depth at the location where barium was detected above BV in soil (02-600644). The detections above BV at all other locations were generally in the deepest samples collected at each location and manganese was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations increased laterally. All detections above BV in tuff were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 12 times the maximum concentration, and the industrial SSL is approximately 177 times the maximum concentration. Further sampling for extent of manganese is not warranted.

Mercury was detected above the soil and sediment BVs in 10 soil samples and 2 sediment samples with a maximum concentration of 1.13 mg/kg and was not detected but had DLs (0.14 mg/kg to 0.32 mg/kg) above the soil BV in 4 samples. Only one depth was sampled at location 02-600604, concentrations decreased with depth at all other locations, and concentrations increased laterally. The residential SSL is approximately 21 times the maximum concentration, and the industrial SSL is approximately 344 times the maximum concentration. Further sampling for extent of mercury is not warranted.

Nickel was detected above the Qbt 1g, Qct, Qbo BV in five samples with a maximum concentration of 7.15 mg/kg and was not detected but had DLs (2.06 mg/kg to 4.5 mg/kg) above the BV in eight samples. Concentrations increased with depth at location 02-600702; decreased with depth at locations 02-600602, 02-600699, 02-600704, 02-600705; and decreased laterally (concentrations in shallow samples at locations 02-600602, 02-600704, and 02-600705, were 4.98 mg/kg, 3.97 mg/kg, and 3.68 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 218 times the maximum concentration. Lateral extent of nickel is defined and further sampling for vertical extent is not warranted.

Perchlorate was detected in 16 samples with a maximum concentration of 0.00901 mg/kg. Concentrations increased with depth at location 02-600647, decreased with depth at all other locations, and increased laterally. The residential SSL is approximately 6080 times the maximum concentration. Further sampling for extent of perchlorate is not warranted.

Selenium was detected above the soil; sediment; Qbt 2,3,4; and Qbt 1g, Qct, Qbo BV in 10 soil samples, 3 sediment samples, 1 Qbt 2 sample, and 15 Qbo samples with a maximum concentration of 11.4 mg/kg. Selenium was not detected but had DLs (1.1 mg/kg to 2.04 mg/kg) above BV in 12 soil samples, 4 sediment samples, and 19 Qbo samples. Concentrations increased with depth at location 02-600602, only one depth was sampled at location 02-600604, concentrations decreased with depth at locations 02-600644 and 02-600651, concentrations did not change substantially with depth (1.92 mg/kg or less) at all other locations, and concentrations increased laterally (concentrations in shallow samples at all locations where concentrations did not change substantially with depth were similar to concentrations in deeper tuff samples and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 34 times the maximum concentration, and the industrial SSL is approximately 569 times the maximum concentration. Further sampling for extent of selenium is not warranted.

Silver was detected above the soil; sediment; and Qbt 2,3,4 BVs (1 mg/kg each) in 21 soil samples, 1 sediment sample, and 3 tuff samples with a maximum concentration of 2.8 mg/kg. Concentrations did not change substantially with depth (0.7 mg/kg or less) at locations 02-01225, 02-01232, and 02-01233; decreased with depth at all other locations; and increased laterally. The residential SSL is approximately 140 times the maximum concentration. Further sampling for extent of silver is not warranted.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV in nine samples with a maximum concentration of 8.42 mg/kg. The detections above BV were generally in the deepest samples collected at each location and vanadium was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations did not change substantially laterally (3.09 mg/kg). All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 47 times the maximum concentration. Further sampling for extent of vanadium is not warranted.

Zinc was detected above the soil and sediment BVs in one soil sample and two sediment samples with a maximum concentration of 77.2 mg/kg. Only one depth was sampled at locations 02-600604 and 02-600703, concentrations decreased with depth at location 02-600701, and concentrations decreased laterally. The residential SSL is approximately 304 times the maximum concentration. Lateral extent of zinc is defined and further sampling for vertical extent is not warranted.

Organic Chemicals

Organic COPCs at SWMU 02-009(c) include acetone, Aroclor-1248, Aroclor-1254, Aroclor-1260, bis(2-ethylhexyl)phthalate, chloroform, dibenzofuran, di-n-butylphthalate, 4-isopropyltoluene, methylene chloride, phenol, styrene, and toluene.

Acetone was detected in one sample at a concentration of 0.133 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of acetone are defined.

Aroclor-1248 was detected in two samples with a maximum concentration of 0.352 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of Aroclor-1248 are defined.

Aroclor-1254 was detected in 31 samples with a maximum concentration of 0.149 mg/kg. Only one depth was sampled at locations 02-600703 and 02-600703, concentrations decreased with depth at all other locations, and concentrations decreased laterally. The residential SSL is approximately 7.5 times and the industrial SSL is approximately 74 times the maximum concentration. Lateral extent of Aroclor-1254 is defined and further sampling for vertical extent is not warranted.

Aroclor-1260 was detected in 38 samples with a maximum concentration of 0.146 mg/kg. Only one depth was sampled at locations 02-600649, 02-600703, and 02-600703; concentrations decreased with depth at all other locations; and concentrations decreased laterally. The residential SSL is approximately 15 times the maximum concentration, and the industrial SSL is approximately 76 times the maximum concentration. 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 0.2 mg/kg. Concentrations did not change substantially with depth (0.002 mg/kg) at location 02-01225, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 1900 times the maximum concentration. Lateral extent of bis(2-ethylhexyl)phthalate is defined and further sampling for vertical extent is not warranted.

Chloroform was detected in three samples with a maximum concentration of 0.000305 mg/kg. Concentrations increased with depth at location 02-600600, decreased with depth at location 02-600644, and did not change substantially laterally (0.000074 mg/kg). The residential SSL is approximately 19,200 times the maximum concentration. Further sampling for extent of chloroform is not warranted.

Dibenzofuran was detected in one sample at a concentration of 0.061 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of dibenzofuran are defined.

Di-n-butylphthalate was detected in three samples with a maximum concentration of 0.068 mg/kg. Concentrations increased with depth at location 02-01233, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 90,600 times the maximum concentration. Lateral extent of di-n-butylphthalate is defined and further sampling for vertical is not warranted.

Isopropyltoluene[4-] was detected in one sample at a concentration of 0.0505 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of 4-isopropyltoluene are defined.

Methylene chloride was detected in one sample at a concentration of 0.0031 mg/kg. Concentrations increased with depth at location 02-600651 and decreased laterally. The residential SSL is approximately 38,100 times the maximum concentration. Lateral extent of methylene chloride is defined and further sampling for vertical is not warranted.

Phenol was detected in two samples with a maximum concentration of 0.14 mg/kg. Concentrations decreased with depth at location 02-01230 and decreased laterally. Lateral and vertical extent phenol are defined.

Styrene was detected in one sample at a concentration of 0.000239 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of styrene are defined.

Toluene was detected in three samples with a maximum concentration of 0.000552 mg/kg. Concentrations decreased with depth at all locations, and decreased laterally. Lateral and vertical extent of toluene are defined.

Radionuclides

Radionuclide COPCs at SMWU 02-009(c) include cesium-137, plutonium-239/240, strontium-90, tritium, uranium-234, uranium-235/236, and uranium-238.

Cesium-137 was detected above the soil and sediment FVs in 3 soil samples and 1 sediment sample, detected below 1 ft bgs in 62 soil and Qal samples, and detected in 7 Qbo samples and 4 Qbt 2 samples with a maximum activity of 232 pCi/g. Activities increased with depth at locations 02-01234, 02-600650, and 02-600704; decreased with depth at all other locations; and decreased laterally. Activities decreased with depth in deeper samples at location 02-600651 approximately 5 ft from location 02-01234 and vertical extent is defined at these locations. The residential SAL is approximately 24 times the maximum activity, and the industrial SAL is approximately 83 times the maximum activity where vertical extent is not defined (0.495 pCi/g) at location 02-600650. Lateral extent of cesium-137 is defined and further sampling for vertical extent is not warranted.

Plutonium-239/240 was detected above the soil and sediment FVs in 10 soil samples and 7 sediment samples, detected below 1 ft bgs in 39 soil and Qal samples, and detected in 6 Qbo and 2 Qbt 2 samples with a maximum activity of 0.992 pCi/g. Only one depth was sampled at locations 02-600603, 02-600604, 02-600649, 02-600703, and 02-600706; activities decreased with depth at all other locations; and activities decreased laterally. The residential SAL is approximately 80 times the maximum activity. Lateral extent of plutonium-239/240 is defined and further sampling for vertical extent is not warranted.

Strontium-90 was detected above the soil in 2 samples, detected below 1 ft bgs in 37 soil and Qal samples, and detected in 5 Qbo and 4 Qbt 2 samples with a maximum activity of 11.8 pCi/g. Activities increased with depth at location 02-600644, 02-600650, and 02-600705; activities did not change substantially with depth (0.37 pCi/g or less) at locations 02-01228 and 02-01234, only one depth was sampled at locations 02-600603, 02-600604, 02-600649, 02-600703, and 02-600706; activities decreased with depth at all other locations; and decreased laterally. The residential SAL is approximately 4.6 times the maximum activity, and the industrial SAL is approximately 734 times the maximum activity where vertical extent is not defined (3.27 pCi/g) at location 02-01234. Lateral extent of stontium-90 is defined and further sampling for vertical extent is not warranted.

Tritium was detected in 45 samples with a maximum activity of 1.18 pCi/g. Activities increased with depth at locations 02-01227, 02-01233, and 02-612393; did not change substantially with depth (0.013 pCi/g) at locations 02-01225 and 02-01229; decreased with depth at all other locations; and decreased laterally. The residential SAL is approximately 1440 times the maximum activity. Lateral extent of tritium is defined and further sampling for vertical extent is not warranted.

Uranium-234 was detected above the soil and Qbt 2,3,4 BVs in two soil samples and eight tuff samples with a maximum activity of 4.37 pCi/g. Activities increased with depth at locations 02-01225, 02-01226, 02-01228, 02-01230, and 02-01233 and decreased laterally. The residential SAL is approximately 66 times the maximum activity. Lateral extent of uranium-234 is defined and further sampling for vertical extent is not warranted.

Uranium-235/236 was detected above the soil; Qbt 2,3,4; and Qbt 1g, Qct, Qbo BVs in one soil sample, five Qbt 2 samples, and two Qbo samples with a maximum activity of 0.233 pCi/g. Activities increased with depth at locations 02-01225, 02-01226, 02-01228, 02-01229, 02-01233, 02-600598, and 02-600600; decreased with depth at location 02-600644, and decreased laterally. The residential SAL is approximately 180 times the maximum activity. Lateral extent of uranium-235/236 is defined and further sampling for vertical extent is not warranted.

Uranium-238 was detected above the soil and Qbt 2,3,4 BVs in three soil samples and seven tuff samples with a maximum activity of 3.92 pCi/g. Activities increased with depth at locations 02-01225, 02-01226, 02-01227, 02-01228, 02-01230, and 02-01233; decreased with depth at location 02-01229; and increased laterally. The residential SAL is approximately 38 times the maximum activity. Further sampling for extent of uranium-238 is not warranted.

Summary of Nature and Extent

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at SWMU 02-009(c).

6.25.5 Summary of Human Health Risk Screening

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} (NMED 2017, 602273). The industrial HI is 0.02, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 3×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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 5×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.4, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 56 mrem/yr, which is greater than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Construction Worker Scenario

The residential exposure scenario also demonstrates protection of construction workers for carcinogenic and radionuclide COPCs (the construction worker dose is 18 mrem/yr). The construction worker HI is approximately 1 (due to manganese; see Appendix H, section H-4.5.2, Exposure Evaluation), which is equal to the NMED target HI of 1.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, and construction worker scenarios and no potential unacceptable risks exist for the residential scenario at SWMU 02-009(c). A potential unacceptable dose exists for the residential scenario at SWMU 02-009(c).

6.25.6 Summary of Ecological Risk Screening

SWMU 02-009(c) is within the TA-02 core area. Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and results of site-specific ecological risk studies, no potential ecological risks exist for the TA-02 core area.

6.26 AOC 02-009(d), Soil Contamination

6.26.1 Site Description and Operational History

AOC 02-009(d) is an area of radioactive soil contamination located near the east end of the OWR building (02-1) (Figure 6.26-1). Beta and gamma radioactivity were identified during decommissioning and removal of inactive WBR structures at TA-02 during 1985 and 1986. The source of contamination at AOC 02-009(d) is unknown (LANL 1990, 007511).

There is no known historical use of the area included in AOC 02-009(d).

6.26.2 Relationship to Other SWMUs and AOCs

AOC 02-009(d) is located immediately east of the former OWR facility, AOC 02-004(a), and immediately north of the former boiler house and the former chemical waste shack, AOC 02-010. The former drainline of AOC 02-011(a)(x) passed through the area, as did former line 117, AOC 02-003(a). There is no known connection between these AOCs and the soil contamination area.

6.26.3 Summary of Previous Investigations

6.26.3.1 1995 Investigation Activities

Analytical data were obtained from samples collected at locations within the soil contamination area. Supporting QA/QC information is not available for these samples, so the sample results are not included in this report.

6.26.3.2 2000 Post–Cerro Grande Recovery Work

During the post–Cerro Grande fire recovery work, one borehole (location 02-01245) was drilled just north of the former boiler house (building 02-63). Four samples were collected to a depth of 15.5 ft bgs. Field screening of recovered cores indicated no elevated radionuclide levels (LANL 2001, 070352, p. 8).

6.26.3.3 2007 Investigation Activities

Thirty-four samples were collected from eleven locations at AOC 02-009(d) in 2007. Results from the sampling activities in 2007 were presented in the previous investigation report (LANL 2008, 101669.12). Additional sampling was required to define the extent of contamination at the site.

6.26.4 Site Contamination

6.26.4.1 Soil and Rock Sampling

As part of the 2010 investigation, the following characterization activities were conducted at AOC 02-009(d):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Five samples were collected from location 02-612348 at AOC 02-009(d) from 5–7 ft, 15–16 ft, 25–26 ft, 35–36 ft, and 49–50 ft bgs. These samples were analyzed for TAL metals, hexavalent chromium, PCBs, SVOCs, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium.

The 2010 and historical sampling locations at AOC 02-009(d) are shown in Figure 6.26-1. Table 6.26-1 presents the samples collected and analyses requested for AOC 02-009(d). The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

6.26.4.2 Soil and Rock Sample Field-Screening Results

No organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of the samples. No radiological-screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. No changes to sampling or other activities occurred because of the field-screening results.

6.26.4.3 Soil and Rock Sample Analytical Results

Decision-level data at AOC 02-009(d) consist of results from 43 samples collected from 13 locations in 2000, 2007, and 2010. The 43 samples include 14 soil, 23 Qal, 1 Qbt 3, and 5 Qbo samples.

Inorganic Chemicals

A total of 43 samples (14 soil, 23 Qal, 1 Qbt 3, and 5 Qbo) were analyzed for TAL metals, 19 samples (4 soil, 10 Qal, and 5 Qbo) were analyzed for hexavalent chromium, and 34 samples (11 soil, 21 Qal, and 2 Qbo) were analyzed for nitrate, perchlorate, and total cyanide. Table 6.26-2 presents the inorganic chemicals detected or detected above BVs. Figure 6.26-2 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV (3560 mg/kg) in two samples with a maximum concentration of 8540 mg/kg. Because there were fewer than eight Qbo samples, statistical tests could not be performed. Aluminum is retained as a COPC.

Antimony was not detected but had DLs (1.12 mg/kg to 1.32 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs (0.83 mg/kg and 0.5 mg/kg) in two soil samples and three tuff samples. Antimony is retained as a COPC.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV (0.56 mg/kg) in two samples with a maximum concentration of 1.3 mg/kg and was not detected but had DLs (1.18 mg/kg to 1.27 mg/kg) above the BV in three samples. Arsenic is retained as a COPC.

Barium was detected above the Qbt 1g, Qct, Qbo BV (25.7 mg/kg) in two samples with a maximum concentration of 47.4 mg/kg. Because there were fewer than eight Qbo samples, statistical tests could not be performed. Barium is retained as a COPC.

Cadmium was detected above the soil BV (0.4 mg/kg) in 4 samples with a maximum concentration of 0.773 mg/kg and was not detected but had DLs (0.495 mg/kg to 0.662 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs (0.4 mg/kg) in 23 soil samples and 4 tuff samples. There were too few detections in the soil background data set to perform statistical tests and there is no background data set for Qbo. Cadmium is retained as a COPC.

Calcium was detected above the soil BV (6120 mg/kg) in one sample at a concentration of 17,400 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in soil are not statistically different from background (Figure G-205 and Table G-32). Calcium is not a COPC.

Chromium was detected above the soil; Qbt 2,3,4; and Qbt 1g, Qct Qbo BVs (19.3 mg/kg, 7.14 mg/kg, and 2.6 mg/kg) in two soil samples, one Qbt 3 sample, and two Qbo samples with a maximum concentration of 75.5 mg/kg. Chromium was not detected but had a DL (29.1 mg/kg) above the Qbt 1g, Qct, Qbo BV in one sample. The quantile and slippage tests indicated site concentrations of chromium in soil are not statistically different from background (Figure G-206 and Table G-32). Because there were fewer than eight Qbt 3 or Qbo samples, statistical tests could not be performed. Chromium is retained as a COPC.

Cyanide was not detected above the soil BV (0.5 mg/kg) but had a DL (0.502 mg/kg) above the soil BV in 1 sample. The DL was only 0.002 mg/kg above the BV and cyanide was not detected or detected above BV in 33 other samples (detected below BV in 6 samples). Cyanide is not a COPC.

Hexavalent chromium was detected in five samples with a maximum concentration of 0.179 mg/kg. Hexavalent chromium is retained as a COPC.

Iron was detected above the Qbt 1g, Qct, Qbo BV (3700 mg/kg) in five samples with a maximum concentration of 6490 mg/kg. Iron is retained as a COPC.

Lead was detected above the soil BV (22.3 mg/kg) in one sample at a concentration of 53.2 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil are not statistically different from background (Figure G-207 and Table G-32). Lead is not a COPC.

Manganese was detected above the Qbt 1g, Qct, Qbo BV (189 mg/kg) in five samples with a maximum concentration of 567 mg/kg. Manganese is retained as a COPC.

Mercury was detected above the soil BV (0.1 mg/kg) in 14 samples with a maximum concentration of 1.75 mg/kg. Mercury is retained as a COPC.

Nickel was detected above the Qbt 1g, Qct, Qbo BV (2 mg/kg) in one sample at a concentration of 5.06 mg/kg and was not detected but had a DL (6.33 mg/kg) above the BV in one sample. Because there were fewer than eight Qbo samples, statistical tests could not be performed. Nickel is retained as a COPC.

Nitrate was detected in 20 samples with a maximum concentration of 3.55 mg/kg. Nitrate is naturally occurring, and the concentrations likely reflect naturally occurring levels. In addition, AOC 02-009(d) consists of radioactive soil contamination and is not a source of nitrate. Nitrate is not a COPC.

Perchlorate was detected in 17 samples with a maximum concentration of 0.0033 mg/kg. Perchlorate is identified as a COPC in soil.

Selenium was detected above the soil; Qbt 2,3,4; and Qbt 1g, Qct, Qbo BVs (1.52 mg/kg, 0.3 mg/kg, 0.3 mg/kg) in nine soil samples, one Qbt 3 sample, and one Qbo sample with a maximum concentration of 2.86 mg/kg. Selenium was not detected but had DLs (1.18 mg/kg to 1.67 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs in eight soil samples and four Qbo samples. The Gehan and quantile tests indicated site concentrations of selenium in soil are statistically different from background (Figure G-208 and Table G-32). Selenium is retained as a COPC.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV (4.59 mg/kg) in one sample at a concentration of 6.17 mg/kg. Because there were fewer than eight Qbo samples, statistical tests could not be performed. Vanadium is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in one sample at a concentration of 56.1 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are statistically different from background (Figure G-209 and Table G-32). Zinc is retained as a COPC.

Organic Chemicals

A total of 39 samples (11 soil, 23 Qal, and 5 Qbo) were analyzed for PCBs, 43 samples (14 soil, 23 Qal, 1 Qbt 3, and 5 Qbo) were analyzed for SVOCs, and 23 samples (21 Qal and 2 Qbo) were analyzed for VOCs. Table 6.26-3 presents the detected organic chemicals. Figure 6.26-3 shows the spatial distribution of detected organic chemicals.

Polycyclic Aromatic Hydrocarbons

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

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

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

Site Activities

AOC 02-009(d) is an area of radioactive soil contamination and was identified as an AOC because it was the location of an apparent release of radioactive materials. AOC 02-009(d) is located at the east end of the OWR, adjacent to former asphalt paving south of the OWR. Samples with detectable PAHs at this site were surface and shallow subsurface samples located adjacent to the former paved area. PAHs were not known to be associated with the radioactive materials released at this site. Based on the above, the PAHs detected in samples used to characterize this site [acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene;

fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenanthrene; and pyrene] are associated with the former paved area, are not related to historical Laboratory site operations, and are not COPCs.

Organic COPCs

Other organic chemicals detected at AOC 02-009(d) include Aroclor-1248; Aroclor-1254; Aroclor-1260; 1,4-dichlorobenzene; di-n-butylphthalate; 4-isopropyltoluene; styrene; toluene; and 1,3-xylene + 1,4-xylene. The detected organic chemicals listed are retained as COPCs.

Radionuclides

A total of 34 samples (11 soil, 21 Qal, and 2 Qbo) were analyzed for americium-241, and 43 samples (14 soil, 23 Qal, 1 Qbt 3, and 5 Qbo) were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium. Table 6.26-4 presents the radionuclides detected or detected above BVs/FVs. Figure 6.26-4 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Cesium-137 was detected above the soil FV (1.65 pCi/g) in 6 samples, detected below 1 ft bgs in 11 soil and Qal samples, and detected in 1 Qbt 3 sample and 1 Qbo sample, with a maximum activity of 14 pCi/g. Cesium-137 is retained as a COPC.

Cobalt-60 was detected in one sample at an activity of 0.162 pCi/g. Cobalt-60 is retained as a COPC.

Plutonium-239/240 was detected above the soil FV (0.054 pCi/g) in three samples, detected below 1 ft bgs in six samples, and detected in one Qbt 3 sample with a maximum activity of 1.19 pCi/g. Plutonium-239/240 is retained as a COPC.

Strontium-90 was detected above the soil FV (1.31 pCi/g) in 2 samples, detected below 1 ft bgs in 15 soil and Qal samples, and detected in 1 Qbt 3 sample with a maximum activity of 29.3 pCi/g. Strontium-90 is retained as a COPC.

Tritium was detected in 18 samples with a maximum activity of 0.136 pCi/g. Tritium is retained as a COPC.

Uranium-234 was detected above the soil and Qbt 2,3,4 BVs (2.59 pCi/g and 1.98 pCi/g) in three soil samples and one tuff sample with a maximum activity of 12.8 pCi/g. Uranium-234 is retained as a COPC.

Uranium-235/236 was detected above the soil and Qbt 2,3,4 BVs (0.2 pCi/g and 0.09 pCi/g) in three soil samples and one tuff sample with a maximum activity of 0.901 pCi/g. Uranium-235/236 is retained as a COPC.

6.26.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at AOC 02-009(d) are discussed below.

Inorganic Chemicals

Inorganic COPCs at AOC 02-009(d) include aluminum, antimony, arsenic, barium, cadmium, chromium, hexavalent chromium, iron, manganese, mercury, nickel, perchlorate, selenium, vanadium, and zinc.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV in two samples with a maximum concentration of 8540 mg/kg. Concentrations decreased with depth at both locations. The detections above BV were in the deepest samples collected at each location and aluminum was not detected above BV in overlying soil samples. Concentrations increased laterally to the south. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 9.1 times the maximum concentration, and the industrial SSL is approximately 151 times the maximum concentration. Further sampling for extent of aluminum is not warranted.

Antimony was not detected but had DLs (1.12 mg/kg to 1.32 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs in two soil samples and three tuff samples. The residential SSL is approximately 24 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV in two samples with a maximum concentration of 1.3 mg/kg and was not detected but had DLs (1.18 mg/kg to 1.27 mg/kg) above the BV in three samples. Concentrations decreased with depth at all locations and did not change laterally (concentrations in shallow samples at locations 02-600614 and 02-600615 were 2.67mg/kg and 2.6 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 5.4 times the maximum concentration, and the industrial SSL is approximately 28 times the maximum concentration. The residential SSL is approximately 5.6 times the maximum DL, and the industrial SSL is approximately 28 times the maximum DL. Further sampling for extent of arsenic is not warranted.

Barium was detected above the Qbt 1g, Qct, Qbo BV in two samples with a maximum concentration of 47.4 mg/kg. Concentrations decreased with depth at all locations and decreased laterally (concentrations in shallow samples at locations 02-600614 and 02-600615 were 59.7 mg/kg and 59.1 mg/kg and below the soil BV [Appendix F, Pivot Tables]). Lateral and vertical extent of barium are defined.

Cadmium was detected above the soil BV in 4 samples with a maximum concentration of 0.773 mg/kg and was not detected but had DLs (0.495 mg/kg to 0.662 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs in 23 soil samples and 4 tuff samples. Concentrations decreased with depth at all locations and decreased laterally. The residential SSL is approximately 106 times the maximum DL. Further sampling for extent of cadmium is not warranted.

Chromium was detected above the soil; Qbt 2,3,4; and Qbt 1g, Qct Qbo BVs in two soil samples, one Qbt 3 sample, and two Qbo samples with a maximum concentration of 75.5 mg/kg. Chromium was not detected but had a DL (29.1 mg/kg) above the Qbt 1g, Qct, Qbo BV in one sample. Concentrations increased with depth at locations 02-01245 and 02-600623, decreased with depth at all other locations, and increased laterally. The sample with the maximum concentration was also analyzed for hexavalent chromium. The hexavalent chromium concentration was 0.083 mg/kg, indicating a trivalent chromium concentration of approximately 75.4 mg/kg. The residential SSL for trivalent chromium (117,000 mg/kg) is approximately 1550 times this concentration. Further sampling for extent of chromium is not warranted.

Hexavalent chromium was detected in five samples with a maximum concentration of 0.179 mg/kg. Concentrations increased with depth at location 02-600615, did not change substantially with depth (0.0182 mg/kg) at location 02-600614, decreased with depth at location 02-600616, and decreased laterally. The residential SSL is approximately 17 times the maximum concentration, and the industrial SSL is approximately 403 times the maximum concentration. Lateral extent of hexavalent chromium is defined and further sampling for vertical extent is not warranted.

Iron was detected above the Qbt 1g, Qct, Qbo BV in five samples with a maximum concentration of 6490 mg/kg. Concentrations decreased with depth at all locations and decreased laterally (concentrations in shallow samples at locations 02-600614, 02-600615, and 02-612348 were 11,000 mg/kg, 7380 mg/kg, and 7520 mg/kg and below the soil BV [Appendix F, Pivot Tables]). Lateral and vertical extent of iron are defined.

Manganese was detected above the Qbt 1g, Qct, Qbo BV in five samples with a maximum concentration of 567 mg/kg. Concentrations increased with depth at location 02-600615, decreased with depth at all other locations, and decreased laterally (concentrations in shallow samples at locations 02-600614 and 02-612348 were 376 mg/kg and 330 mg/kg and below the soil BV [Appendix F, Pivot Tables]).

Mercury was detected above the soil BV in 14 samples with a maximum concentration of 1.75 mg/kg. Concentrations decreased with depth at all locations and did not change substantially laterally (0.2 mg/kg). The residential SSL is approximately 13 times the maximum concentration, and the industrial SSL is approximately 222 times the maximum concentration. Vertical extent of mercury is defined and further sampling for lateral extent is not warranted.

Nickel was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 5.06 mg/kg and was not detected but had a DL (6.33 mg/kg) above the BV in one sample. Concentrations did not change substantially with depth (0.86 mg/kg) and increased laterally (the concentration in a shallow sample at location 02-600614 was 5.38 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 308 times the maximum concentration. Further sampling for extent of nickel is not warranted.

Perchlorate was detected in 17 samples with a maximum concentration of 0.0033 mg/kg. Concentrations increased with depth at locations 02-600618 and 02-600619; did not change substantially with depth (0.00119 mg/kg or less) at locations, 02-600621 and 02-600622; decreased with depth at all other locations; and decreased laterally. The residential SSL is approximately 16,600 times the maximum concentration. Lateral extent of perchlorate is defined and further sampling for vertical extent is not warranted.

Selenium was detected above the soil; Qbt 2,3,4; and Qbt 1g, Qct, Qbo BVs in nine soil samples, one Qbt 3 sample, and one Qbo sample with a maximum concentration of 2.86 mg/kg. Selenium was not detected but had DLs (1.18 mg/kg to 1.67 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs in eight soil samples and four Qbo samples. Concentrations increased with depth at location 02-01245; did not change substantially with depth (0.46 mg/kg or less) at locations 02-600614, 02-600620, 02-600621, and 02-600622; decreased with depth at location 02-600616; and decreased laterally. The residential SSL is approximately 137 times the maximum concentration and 234 times the maximum DL. Further sampling for extent of selenium is not warranted.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 6.17 mg/kg. Concentrations decreased with depth and decreased laterally (the concentration in a shallow sample at location 02-600615 was 7.72 mg/kg and below the soil BV [Appendix F, Pivot Tables]). Lateral and vertical extent of vanadium are defined.

Zinc was detected above the soil BV in one sample at a concentration of 56.1 mg/kg. Concentrations decreased with depth and increased laterally. The residential SSL is approximately 419 times the maximum concentration. Vertical extent of zinc is defined and further sampling for lateral extent is not warranted.

Organic Chemicals

Organic COPCs at SWMU 02-009(c) include Aroclor-1248, Aroclor-1254, Aroclor-1260, 1,4-dichlorobenzene, di-n-butylphthalate, 4-isopropyltoluene, styrene, toluene, and 1,3-xylene + 1,4-xylene.

Aroclor-1248 was detected in one sample at a concentration of 0.0059 mg/kg. Concentrations decreased with depth and increased laterally. The residential SSL is approximately 376 times the maximum concentration. Vertical extent of Aroclor-1248 is defined and further sampling for lateral extent is not warranted.

Aroclor-1254 was detected in 17 samples with a maximum concentration of 0.0734 mg/kg. Concentrations did not change substantially with depth (0.0017 mg/kg) at location 02-600624, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 15 times the maximum concentration, and the industrial SSL is approximately 150 times the maximum concentration. Lateral extent of Aroclor-1254 is defined and further sampling for vertical extent is not warranted.

Aroclor-1260 was detected in 25 samples with a maximum concentration of 0.118 mg/kg. Concentrations did not change substantially with depth (0.0007 mg/kg) at location 02-600624, decreased with depth at all other locations, and increased laterally. The residential SSL is approximately 19 times the maximum concentration, and the industrial SSL is approximately 94 times the maximum concentration. Lateral extent of Aroclor-1260 is defined and further sampling for vertical extent is not warranted.

Dichlorobenzene[1,4-] was detected in two samples with a maximum concentration of 0.000595 mg/kg. Concentrations decreased with depth at all locations and did not change substantially laterally (0.000382 mg/kg). The residential SSL is approximately 2,170,000 times the maximum concentration. Vertical extent of 1,4-dichlorobenzene is defined and further sampling for lateral extent is not warranted.

Di-n-butylphthalate was detected in three samples with a maximum concentration of 0.0545 mg/kg. Concentrations did not change substantially with depth (0.016 mg/kg) at location 02-600614, decreased with depth at location 02-600618, and did not change substantially laterally (0.0124 mg/kg). The residential SSL is approximately 113,000 times the maximum concentration. Further sampling for extent of di-n-butylphthalate is not warranted.

Isopropyltoluene[4-] was detected in one sample at a concentration of 0.0034 mg/kg. Concentrations decreased with depth and increased laterally. The residential SSL is approximately 944,000 times the maximum concentration. Vertical extent of 4-isopropyltoluene is defined and further sampling for lateral extent is not warranted.

Styrene was detected in one sample at a concentration of 0.00111 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of styrene are defined.

Toluene was detected in two sample with a maximum concentration of 0.000775 mg/kg. Concentrations decreased with depth at all locations and did not change substantially laterally (0.000242 mg/kg). The residential SSL is approximately 7,340,000 times the maximum concentration. Vertical extent of toluene is defined and further sampling for lateral extent is not warranted.

Xylene[1,3-] + xylene[1,4-] was detected in one sample at a concentration of 0.000302 mg/kg. Concentrations decreased with depth and increased laterally. The residential SSL is approximately 2,860,000 times the maximum concentration. Vertical extent of 1,3-xylene + 1,4-xylene is defined and further sampling for lateral extent is not warranted.

Radionuclides

Radionuclide COPCs at SMWU 02-009(d) include cesium-137, cobalt-60, plutonium-239/240, strontium-90, tritium, uranium-234, and uranium-235/236.

Cesium-137 was detected above the soil FV in 6 samples, detected below 1 ft bgs in 16 soil and Qal samples, and detected in 1 Qbt 3 sample and 1 Qbo sample, with a maximum activity of 14 pCi/g. Activities increased with depth at location 02-600624, decreased with depth at all other locations, and decreased laterally. The residential SAL is approximately 61 times the maximum activity where vertical extent is not defined (0.196 pCi/g at location 02-600624). Lateral extent of cesium-137 is defined and further sampling for vertical extent is not warranted.

Cobalt-60 was detected in one sample at an activity of 0.162 pCi/g. Activities decreased with depth and increased laterally. The residential SAL is approximately 16 times the maximum activity, and the industrial SAL is approximately 56 times the maximum activity. Vertical extent of cobalt-60 is defined and further sampling for lateral extent is not warranted.

Plutonium-239/240 was detected above the soil FV in three samples, detected below 1 ft bgs in six samples, and detected in one Qbt 3 sample with a maximum activity of 1.19 pCi/g. Activities decreased with depth at all locations and increased laterally. The residential SAL is approximately 66 times the maximum activity. Vertical extent of plutonium-239/240 is defined and further sampling for lateral extent is not warranted.

Strontium-90 was detected above the soil FV in 2 samples, detected below 1 ft bgs in 15 soil and Qal samples, and detected in 1 Qbt 3 sample with a maximum activity of 29.3 pCi/g. Activities decreased with depth at all locations and decreased laterally. Lateral and vertical extent of strontium-90 are defined.

Tritium was detected in 18 samples with a maximum activity of 0.136 pCi/g. Activities increased with depth at locations 02-600619, 02-600620, 02-600621, 02-600622, 02-600623, and 02-612348; decreased with depth at all other locations; and decreased laterally. The residential SAL is approximately 12,500 times the maximum activity. Lateral extent of tritium is defined and further sampling for vertical extent is not warranted.

Uranium-234 was detected above the soil and Qbt 2,3,4 BVs in three soil samples and one tuff sample with a maximum activity of 12.8 pCi/g. Activities decreased with depth at all locations and decreased laterally. Lateral and vertical extent of uranium-234 are defined.

Uranium-235/236 was detected above the soil and Qbt 2,3,4 BVs in three soil samples and one tuff sample with a maximum activity of 0.901 pCi/g. Activities decreased with depth at all locations and decreased laterally. Lateral and vertical extent of uranium-235/236 are defined.

Summary of Nature and Extent

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at AOC 02-009(d).

6.26.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 9×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.006, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 1×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.01, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.4 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Residential Scenario

The total excess cancer risk for the residential scenario is 8×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.06, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 30 mrem/yr, which is greater than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The residential exposure scenario also demonstrates protection of construction workers (the construction worker dose is 4 mrem/yr).

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, and construction worker scenarios and no potential unacceptable risks exist for the residential scenario at AOC 02-009(d). A potential unacceptable dose exists for the residential scenario at AOC 02-009(d).

6.26.6 Summary of Ecological Risk Screening

AOC 02-009(d) is within the TA-02 core area. Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and results of site-specific ecological risk studies, no potential ecological risks exist for the TA-02 core area.

6.27 AOC 02-009(e), Duplicate of SWMU 02-009(c)

AOC 02-009(e) is a duplicate of SWMU 02-009(c). All activities for AOC 02-009(e) are addressed with respect to SWMU 02-009(c), which is discussed in section 6.25.

6.28 AOC 02-010, Soil Contamination

6.28.1 Site Description and Operational History

AOC 02-010 is residual soil contamination associated with a small chemical handling building (the chemical waste shack, 02-3) that contained a small underground chamber for working with various radioactive and chemical materials (Figure 6.28-1).

The chemical waste shack was built in 1944, according to engineering drawing C-1686 (LASL 1944, 090084), and was decommissioned, removed, and disposed of in 1971 (LASL no date, 034172). It is not known if soil was removed when the AOC 02-010 structures were removed (LASL no date, 034172). A boiler house (building 02-63) was built in the area after the chemical waste shack was removed in 1971.

6.28.2 Relationship to Other SWMUs and AOCs

The former sewer line, AOC 02-006(c), ran from west to east immediately south of the chemical waste shack. A drainline, AOC 02-011(a)(x), ran from north to south immediately west of the chemical waste shack and the boiler house. An area of soil contamination, AOC 02-009(d), is located immediately north of AOC 02-010.

6.28.3 Summary of Previous Investigations

6.28.3.1 1985 WBR Decommissioning Project, Phase I

During the TA-02 WBR decommissioning project, the removal of the underground chamber (structure 02-32) associated with the chemical waste shack (building 02-3) required extensive excavation and backfilling. No radioactivity was detected in the soil beneath the underground structure (Elder and Knoell 1986, 006670, p. 22). No soil samples were collected at the chemical waste shack site during the D&D activities.

6.28.3.2 2000 Post–Cerro Grande Recovery Work

During the post–Cerro Grande fire recovery work, samples were collected from one borehole (location 02-01246) east of the boiler house (building 02-63) and centered on the east wall. The boiler house was situated on the former location of the chemical waste shack (building 02-3). The borehole was drilled at a 45-degree angle and targeted the sediment/tuff contact beneath the building. Field screening of recovered cores indicated no elevated radionuclide levels (LANL 2001, 070352, p. 10).

6.28.3.3 2003 Omega West Decommissioning Project

The piping and remaining structures associated with the boiler house (building 02-63) located at AOC 02-010 were decommissioned and removed in 2003, and the waste was disposed of at an appropriate disposal facility. Site activities included soil excavation, radiological walkover surveys, radiological (structure) screening, soil sampling, sample analysis, and surveying of sample coordinates. Limited soil surveys were conducted, but no formal report of soil survey results is available.

LLW (construction debris and/or soil) was packaged and shipped to Envirocare or TA-54 for disposal. Mixed waste was packaged and transferred to TA-54 for further processing and/or storage at the Laboratory. In total, 9800 ft^3 of material was shipped to Envirocare for disposal; material from AOC 02-010 was included in this total volume (WD-3 2003, 082646, pp. 1–6, 24). The volume of waste material specifically associated with AOC 02-010 was not documented.

Eight samples were collected from four boreholes (locations 02-22350 and 02-22389 to 02-22391) in 2003.

2007 Investigation Activities

Fifty samples were collected from thirteen locations at AOC 02-010 in 2007. Results from the sampling activities in 2007 were presented in the previous investigation report (LANL 2008, 101669.12). Additional sampling was required to define the extent of contamination at the site.

6.28.4 Site Contamination

6.28.4.1 Soil and Rock Sampling

As part of the 2010 investigation, the following characterization activities were conducted at AOC 02-010:

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Locations 02-600636 and 02-600640 were excavated to remove cesium-137 contamination in accordance with the approved work plan (LANL 2009, 105073, p. 9; NMED 2009, 105595). The surface soil at location 02-600636 was excavated to 2–4 ft bgs, and at location 02-600640 was excavated to approximately 2 ft bgs. The remediated area was approximately 96 ft^2 and the volume of excavated material was approximately 10 yd^3 at location 02-600636 (Figure 6.28-2). The remediated area was approximately 64 ft^2 and the volume of excavated material was approximately 5 yd^3 at location 02-600640 (Figure 6.28-2).
- Confirmation samples were collected as follows.
    - ❖ At location 02-600636, confirmation samples were collected below the excavation from 2–2.2 ft and 4–4.2 ft bgs at location 02-612423, which is 1 ft away from location 02-600636 where excavation was conducted, and from five step-out locations: 4 ft to the north (2–2.2 ft and 4–4.2 ft bgs from location 02-612426), 4 ft to the south (2–2.4 ft and 4–4.2 ft bgs from location 02-612424), 4 ft to the east (2–2.2 ft and 4–4.2 ft bgs from location 02-612425), and 4 ft and 8 ft to the west (4–4.2 ft bgs from location 02-612427, and 2–2.2 ft bgs from location 02-613240, respectively).
    - ❖ At location 02-600640, confirmation samples were collected below the excavation from 2–2.2 ft and 4–4.2 ft bgs and from four step-out locations: 4 ft to the north (2–2.2 ft and 4–4.2 ft bgs from location 02-612429), 4 ft to the south (2–2.2 ft and 4–4.2 ft bgs from location 02-612432), 4 ft to the east (2–2.2 ft and 4–4.2 ft bgs from location 02-612430), and 4 ft to the west (2–2.2 ft and 4–4.2 ft bgs from location 02-612431).

All confirmation samples were analyzed for gamma-emitting radionuclides only.

- Five samples were collected from location 02-612463 (depths ranging from 5–50 ft bgs). All five samples were analyzed for TAL metals, hexavalent chromium, PCBs, americium-241, gamma-emitting radionuclides, isotopic uranium, strontium-90, and tritium.

The 2010 and historical sampling locations at AOC 02-010 are shown in Figure 6.28-1. Table 6.28-1 presents the samples collected and analyses requested for AOC 02-010. The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

6.28.4.2 Soil and Rock Sample Field-Screening Results

No organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of the samples. Radiological-screening results exceeded the daily site background levels at location 02-600636. As a result, respirators were used while collecting samples at this location. Field-screening results are presented in Table 3.2-2. No changes were made to sampling depths because of the field-screening results.

6.28.4.3 Soil and Rock Sample Analytical Results

Decision-level data at AOC 02-010 consist of results from 88 samples collected from 30 locations in 2000, 2003, 2007, and 2010. The 88 samples include 45 soil, 18 Qal, 1 Qbt 3, and 24 Qbo samples.

Inorganic Chemicals

A total of 68 samples (25 soil, 18 Qal, 1 Qbt 3, and 24 Qbo) were analyzed for TAL metals, 13 samples (9 soil and 4 Qbo) were analyzed for hexavalent chromium, 63 samples (24 soil, 18 Qal, 1 Qbt 3, and 20 Qbo) were analyzed for nitrate, and 50 samples (12 soil, 18 Qal, and 20 Qbo) were analyzed for perchlorate and total cyanide. Table 6.28-2 presents the inorganic chemicals detected or detected above BVs. Plate 33 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 2,3,4 and Qbt 1g, Qct, Qbo BVs (7340 mg/kg and 3560 mg/kg) in 1 Qbt 3 sample and 23 Qbo samples with a maximum concentration of 25,800 mg/kg. The Gehan and quantile tests indicated site concentrations of aluminum in Qbo are statistically different from background (Figure G-210 and Table G-33). Aluminum is retained as a COPC.

Antimony was not detected above the soil and Qbt 1g, Qct, Qbo BVs (0.83 mg/kg and 0.5 mg/kg) but had DLs (0.507 mg/kg to 5.73 mg/kg) above BVs in 1 soil sample and 10 tuff samples. The quantile and slippage tests indicated site concentrations of antimony in soil are not statistically different from background (Figure G-211 and Table G-34). There were too few detections of antimony in Qbo to perform statistical tests. Antimony is retained as a COPC.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV (0.56 mg/kg) in 11 samples with a maximum concentration of 2.18 mg/kg and it was not detected but had DLs (1.21 mg/kg to 2.04 mg/kg) above the Qbo BV in 13 samples. The quantile and slippage tests indicated site concentrations of antimony in tuff are statistically different from background (Figure G-212 and Table G-33). Arsenic is retained as a COPC.

Barium was detected above the soil; Qbt 2,3,4; and Qbt 1g, Qct, Qbo BVs (295 mg/kg, 46.0 mg/kg, and 25.7 mg/kg) in 3 soil samples, 1 Qbt 3 sample, and 11 Qbo samples with a maximum concentration of 447 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in soil are not statistically different from background (Figure G-213 and Table G-34) but site concentrations of barium in Qbo are statistically different from background (Figure G-214 and Table G-33). Barium is retained as a COPC.

Cadmium was detected above the soil BV (0.4 mg/kg) in 8 samples with a maximum concentration of 5.6 mg/kg and was not detected but had DLs (0.51 mg/kg to 0.764 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs (0.4 mg/kg) in 18 soil samples and 20 tuff samples. There were too few detections in the background data sets to perform statistical tests. Cadmium is retained as a COPC.

Calcium was detected above the soil BV (6120 mg/kg) in two samples with a maximum concentration of 21,680 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in soil are not statistically different from background (Figure G-215 and Table G-34). Calcium is not a COPC.

Chromium was detected above the soil and Qbt 1g, Qct, Qbo BVs (19.3 mg/kg and 2.6 mg/kg) in 2 soil samples and 22 tuff samples with a maximum concentration of 404 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in soil are not statistically different from background (Figure G-216 and Table G-34) but site concentrations of chromium in Qbo are statistically different from background (Figure G-217 and Table G-33). Chromium is retained as a COPC.

Copper was detected above the soil and Qbt 1g, Qct, Qbo BVs (14.7 mg/kg and 2.6 mg/kg) in two soil samples and four tuff samples with a maximum concentration of 32.6 mg/kg and was not detected but had DLs (4.05 mg/kg and 20.5 mg/kg) above BVs in one soil sample and one tuff sample. The Gehan and quantile tests indicated site concentrations of copper in soil and tuff are not statistically different from background (Figure G-218 and Table G-34, and Figure G-219 and Table G-33, respectively). Copper is not a COPC.

Cyanide was detected above the soil and Qbt 1g, Qct, Qbo BVs (0.5 mg/kg for both) in two soil samples and one tuff sample with a maximum concentration of 14.4 mg/kg. Cyanide is retained as a COPC.

Hexavalent chromium was detected in six samples with a maximum concentration of 0.337 mg/kg. Hexavalent chromium is retained as a COPC.

Iron was detected above the Qbt 1g, Qct, Qbo BV (3700 mg/kg) in 24 Qbo samples with a maximum concentration of 10,700 mg/kg. The Gehan and quantile tests indicated site concentrations of iron in tuff are statistically different from background (Figure G-220 and Table G-33). Iron is retained as a COPC.

Lead was detected above the soil BV (22.3 mg/kg) in five samples with a maximum concentration of 134 mg/kg. The maximum concentration is substantially greater than the highest concentration in the background data set (28 mg/kg). Lead is retained as a COPC.

Manganese was detected above the Qbo BV (189 mg/kg) in 21 samples with a maximum concentration of 838 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in tuff are statistically different from background (Figure G-222 and Table G-33). Manganese is retained as a COPC.

Mercury was detected above the soil BV (0.1 mg/kg) in 11 samples with a maximum concentration of 0.556 mg/kg. Mercury is retained as a COPC.

Nickel was detected above the Qbt 1g, Qct, Qbo BV (2 mg/kg) in 15 samples with a maximum concentration of 15.1 mg/kg. The quantile and slippage tests indicated site concentrations of nickel in tuff are statistically different from background (Figure G-223 and Table G-33). Nickel is retained as a COPC.

Nitrate was detected in 23 samples with a maximum concentration of 9.77 mg/kg. Although nitrate is naturally occurring, AOC 02-010 was used to store chemical wastes, which could have included nitrate. As a result, the concentrations detected might be site related rather than reflecting only naturally occurring levels. Nitrate is retained as a COPC.

Perchlorate was detected in six samples with a maximum concentration of 0.117 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs (1.52 mg/kg and 0.3 mg/kg) in 6 soil samples and 12 Qbo samples with a maximum concentration of 9.31 mg/kg and was not detected but had DLs (0.34 mg/kg to 1.93 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs and Qbt 2,3,4 BV (0.3 mg/kg) in 10 soil samples, 12 Qbo samples, and 1 Qbt 3 sample. The Gehan and slippage tests indicated site concentrations of selenium in soil are statistically different from background (Figure G-224 and Table G-34). Selenium is retained as a COPC.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV (4.59 mg/kg) in nine samples with a maximum concentration of 15.1 mg/kg. The Gehan and quantile tests indicated site concentrations of vanadium in tuff are statistically different from background (Figure G-225 and Table G-33). Vanadium is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in nine samples with a maximum concentration of 152 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are statistically different from background (Figure G-226 and Table G-34). Zinc is retained as a COPC.

Organic Chemicals

A total of 55 samples (13 soil, 18 Qal, and 24 Qbo) were analyzed for PCBs, 63 samples (24 soil, 18 Qal, 1 Qbt 3, and 20 Qbo) were analyzed for SVOCs, and 38 samples (18 Qal and 20 Qbo) were analyzed for VOCs. Table 6.28-3 presents the detected organic chemicals. Plate 34 shows the spatial distribution of detected organic chemicals.

Polycyclic Aromatic Hydrocarbons

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

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

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

Site Activities

AOC 02-010 is an area of soil contamination associated with a former chemical handling building and was identified as an AOC because of the potential for past releases from the building. AOC 02-010 is located at the east end of the OWR, adjacent to former asphalt paving south of the OWR. Samples with detectable PAHs at this site were in surface samples and one shallow subsurface sample located adjacent to the former paved area. PAHs were not known to be associated with the chemicals stored and potentially released from this site. Based on the above, the PAHs detected in samples used to characterize this site [acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenanthrene; and pyrene] are associated with the former paved area, are not related to historical Laboratory site operations, and are not COPCs.

Organic COPCs

Other organic chemicals detected at AOC 02-010 include acetone, Aroclor-1248, Aroclor-1254, Aroclor-1260, bis(2-ethylhexyl)phthalate, chloroform, di-n-butylphthalate, isopropylbenzene, 4-isopropyltoluene, methylene chloride, and toluene. The detected organic chemicals listed are retained as COPCs.

Radionuclides

A total of 55 samples (13 soil, 18 Qal, and 24 Qbo) were analyzed for americium-241; 88 samples (45 soil, 18 Qal, 1 Qbt 3, and 24 Qbo) were analyzed for gamma-emitting radionuclides; 63 samples (24 soil, 18 Qal, 1 Qbt 3, and 20 Qbo) were analyzed for isotopic plutonium; 68 samples (25 soil, 18 Qal, 1 Qbt 3, and 24 Qbo) were analyzed for isotopic uranium, strontium-90, and tritium; and 8 soil samples were analyzed for technetium-99. Table 6.28-4 presents the radionuclides detected or detected above BVs/FVs. Figure 6.28-3 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Cesium-137 was detected above the soil FV (1.65 pCi/g) in 4 samples, detected below 1 ft bgs in 27 soil and Qal samples, and detected in 1 Qbo sample, with a maximum activity of 18.2 pCi/g. Cesium-137 is retained as a COPC.

Plutonium-239/240 was detected above the soil FV (0.054 pCi/g) in six samples and detected below 1 ft bgs in nine soil and Qal samples with a maximum activity of 2.93 pCi/g. Plutonium-239/240 is retained as a COPC.

Strontium-90 was detected above the soil FV (1.31 pCi/g) in three samples and detected below 1 ft bgs in eight soil and Qal samples with a maximum activity of 7.22 pCi/g. Strontium-90 is retained as a COPC.

Tritium was detected in 23 samples with a maximum activity of 0.261 pCi/g. Tritium is retained as a COPC.

Uranium-234 was detected above the soil and Qbt 2,3,4 BVs (2.59 pCi/g and 1.98 pCi/g) in 1 soil sample and 1 tuff sample with a maximum activity of 3.26 pCi/g. The maximum activity was only 0.67 pCi/g above BV and uranium-234 was detected below BV in 66 other samples. Uranium-234 is not a COPC.

Uranium-235/236 was detected above the soil; Qbt 2,3,4; and Qbt 1g, Qct, Qbo BVs (0.2 pCi/g, 0.09 pCi/g, and 0.18 pCi/g) in 1 soil sample, 1 Qbt 3 sample, and 1 Qbo sample with a maximum activity of 0.355 pCi/g. Uranium-235/236 was not detected or detected above BV in 65 other samples (detected below BV in 49 samples). Uranium-235/236 is not a COPC.

Uranium-238 was detected above the soil and Qbt 2,3,4 BVs (2.29 pCi/g and 1.93 pCi/g) in 1 soil sample and 1 Qbt 3 sample with a maximum activity of 2.62 pCi/g. The maximum activity was only 0.69 pCi/g above the Qbt 2,3,4 BV and uranium-238 was detected below BV in 66 other samples. Uranium-238 is not a COPC.

6.28.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at AOC 02-010 are discussed below.

Inorganic Chemicals

Inorganic COPCs at AOC 02-010 include aluminum, antimony, arsenic, barium, cadmium, chromium, cyanide, hexavalent chromium, iron, lead, manganese, mercury, nickel, nitrate, perchlorate, selenium, vanadium, and zinc.

Aluminum was detected above the Qbt 2,3,4 and Qbt 1g, Qct, Qbo BVs in 1 Qbt 3 sample and 23 Qbo samples with a maximum concentration of 25,800 mg/kg. Concentrations increased with depth at most locations. The detections above BV were in the deepest samples collected at each location and aluminum was not detected above BV in overlying soil samples. Concentrations increased laterally. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 3.0 times the maximum concentration, and the industrial SSL is approximately 50 times the maximum concentration. Lateral extent of aluminum is defined and further sampling for vertical extent is not warranted.

Antimony was not detected above the soil and Qbt 1g, Qct, Qbo BVs but had DLs (0.507 mg/kg to 5.73 mg/kg) above BVs in 1 soil sample and 10 tuff samples. The residential SSL is approximately 5.5 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV in 11 samples with a maximum concentration of 2.18 mg/kg and it was not detected but had DLs (1.21 mg/kg to 2.04 mg/kg) above the Qbo BV in 13 samples. The detections above BV were generally in the deepest samples collected at each location and arsenic was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations increased laterally. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 3.2 times the maximum concentration, and the industrial SSL is approximately 16 times the maximum concentration. The residential SSL is approximately 3.5 times the maximum DL, and the industrial SSL is approximately 18 times the maximum DL. Further sampling for extent of arsenic is not warranted.

Barium was detected above the soil; Qbt 2,3,4; and Qbt 1g, Qct, Qbo BVs in 3 soil samples, 1 Qbt 3 sample, and 11 Qbo samples with a maximum concentration of 447 mg/kg. Concentrations decreased with depth at all locations where barium was detected above BV in soil. The detections above BV at all other locations were generally in the deepest samples collected at each location and barium was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations decreased laterally. All detections above BV in tuff were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 35 times the maximum concentration, and 61 times the maximum concentration in tuff (254 mg/kg at location 02-600628). Further sampling for extent of barium is not warranted.

Cadmium was detected above the soil BV in 8 samples with a maximum concentration of 5.6 mg/kg and was not detected but had DLs (0.51 mg/kg to 0.764 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs (0.4 mg/kg) in 18 soil samples and 20 tuff samples. Concentrations decreased with depth at all locations and decreased laterally. The residential SSL is approximately 92 times the maximum DL. Further sampling for extent of cadmium is not warranted.

Chromium was detected above the soil and Qbt 1g, Qct, Qbo BVs in 2 soil samples and 22 tuff samples with a maximum concentration of 404 mg/kg. Concentrations decreased with depth at all locations where chromium was detected above BV in soil. The detections above BV at all other locations were generally in the deepest samples collected at each location and chromium was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations decreased laterally. All detections above BV in tuff were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The sample with the maximum concentration was also analyzed for hexavalent chromium. The hexavalent chromium concentration was 0.377 mg/kg, indicating a trivalent chromium concentration of approximately 404 mg/kg. The residential SSL for trivalent chromium (117,000 mg/kg) is approximately 290 times this concentration. Further sampling for extent of chromium is not warranted.

Cyanide was detected above the soil and Qbt 1g, Qct, Qbo BVs in two soil samples and one tuff sample with a maximum concentration of 14.4 mg/kg. Concentrations increased with depth at location 02-600629, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 13 times the maximum concentration where vertical extent is not defined (0.847 mg/kg at location 02-600629). Lateral extent of cyanide is defined and further sampling for vertical extent is not warranted.

Hexavalent chromium was detected in six samples with a maximum concentration of 0.337 mg/kg. Concentrations did not change substantially with depth (0.0458 mg/kg) at location 02-22350, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 9.0 times the maximum concentration, and the industrial SSL is approximately 214 times the maximum concentration. Lateral extent of hexavalent chromium is defined and further sampling for vertical extent is not warranted.

Iron was detected above the Qbt 1g, Qct, Qbo BV in 24 Qbo samples with a maximum concentration of 10,700 mg/kg. The detections above BV were generally in the deepest samples collected at each location and iron was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations increased laterally. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 5.1 times the maximum concentration, and the industrial SSL is approximately 85 times the maximum concentration. Further sampling for extent of iron is not warranted.

Lead was detected above the soil BV in five samples with a maximum concentration of 134 mg/kg. Only one depth was sampled at location 02-600641, concentrations decreased with depth at all locations, and concentrations decreased laterally. The residential SSL is approximately 17 time and the industrial SSL is approximately 35 times the maximum concentration where vertical extent is not defined (22.9 mg/kg at location 02-600641). Lateral extent of lead is defined and further sampling for vertical extent is not warranted.

Manganese was detected above the Qbt 1g, Qct, Qbo BV in 21 samples with a maximum concentration of 838 mg/kg. Only one depth was sampled at location 02-600641. The detections above BV at all other locations were generally in the deepest samples collected at each location and manganese was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations decreased laterally. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 12 times the maximum concentration, and the industrial SSL is approximately 191 times the maximum concentration. Further sampling for extent of manganese is not warranted.

Mercury was detected above the soil BV in 11 samples with a maximum concentration of 0.556 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of mercury are defined.

Nickel was detected above the Qbt 1g, Qct, Qbo BV in 15 samples with a maximum concentration of 15.1 mg/kg. The detections above BV were generally in the deepest samples collected at each location and nickel was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations decreased laterally. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 103 times the maximum concentration. Further sampling for extent of nickel is not warranted.

Nitrate was detected in 23 samples with a maximum concentration of 9.77 mg/kg. Only one depth was sampled at location 02-600641, concentrations did not change substantially with depth (0.23 mg/kg or less) at locations 02-600634 and 02-600639, concentrations decreased with depth at all other locations, and concentrations decreased laterally. The residential SSL is approximately 12,800 times the maximum concentration. Lateral extent of nitrate is defined and further sampling for vertical extent is not warranted.

Perchlorate was detected in six samples with a maximum concentration of 0.117 mg/kg. Concentrations increased with depth at location 02-22391, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 468 times the maximum concentration. Lateral extent of perchlorate is defined and further sampling for vertical extent is not warranted.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs in 6 soil samples and 12 Qbo samples with a maximum concentration of 9.31 mg/kg and was not detected but had DLs (0.34 mg/kg to 1.93 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs and Qbt 2,3,4 BV in 10 soil samples; 12 Qbo samples, and 1 Qbt 3 sample. Concentrations increased with depth at locations 02-600630, 02-600634, 02-600635, and 02-600638; did not change substantially with depth (0.181 mg/kg) at location 02-600639; decreased with depth at all other locations; and increased laterally. The residential SSL is approximately 42 times the maximum concentration and 202 times the maximum DL. Further sampling for extent of selenium is not warranted.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV in nine samples with a maximum concentration of 15.1 mg/kg. Concentrations did not change substantially with depth (1.15 mg/kg or less) at locations 02-600629 and 02-600635, decreased with depth at all other locations, and decreased laterally (concentrations in shallow soil samples at all locations were similar to or greater than the maximum concentrations in Qbo samples [Appendix F, Pivot Tables]). The SSL is approximately 26 times the maximum concentration. Lateral extent of vanadium is defined and further sampling for vertical extent is not warranted.

Zinc was detected above the soil BV in nine samples with a maximum concentration of 152 mg/kg. Only one depth was sampled at location 02-600641, concentrations decreased with depth at all locations, and concentrations decreased laterally. The residential SSL is approximately 155 times the maximum concentration. Lateral extent of zinc is defined and further sampling for vertical extent is not warranted.

Organic Chemicals

Organic COPCs at AOC 02-010 include acetone, Aroclor-1248, Aroclor-1254, Aroclor-1260, bis(2-ethylhexyl)phthalate, chloroform, di-n-butylphthalate, isopropylbenzene, 4-isopropyltoluene, methylene chloride, and toluene.

Acetone was detected in two samples with a maximum concentration of 0.00815 mg/kg. Concentrations decreased with depth at all locations decreased laterally. Lateral and vertical extent of acetone are defined.

Aroclor-1248 was detected in one sample at a concentration of 0.0066 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of Aroclor-1248 are defined.

Aroclor-1254 was detected in five samples with a maximum concentration of 0.199 mg/kg. Only one depth was sampled at location 02-600641, concentrations decreased with depth at all other locations, and concentrations increased laterally. The residential SSL is approximately 5.6 times the maximum concentration, and the industrial SSL is approximately 55 times the maximum concentration. Further sampling for extent of Aroclor-1254 is not warranted.

Aroclor-1260 was detected in 19 samples with a maximum concentration of 0.329 mg/kg. Only one depth was sampled at location 02-600641, concentrations decreased with depth at all other locations, and concentrations increased laterally. The residential SSL is approximately 6.8 times the maximum concentration, and the industrial SSL is approximately 34 times the maximum concentration. Further sampling for extent of Aroclor-1260 is not warranted.

Bis(2-ethylhexyl)phthalate was detected in six samples with a maximum concentration of 0.33 mg/kg. Concentrations did not change substantially with depth (0.0024 mg/kg) at location 02-22350, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 1150 times the maximum concentration. Lateral extent of bis(2-ethylhexyl)phthalate is defined and further sampling for vertical extent is not warranted.

Chloroform was detected in one sample at a concentration of 0.000219 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of chloroform are defined.

Di-n-butylphthalate was detected in two samples with a maximum concentration of 0.983 mg/kg. Only one depth was sampled at location 02-600641, concentrations decreased with depth at location 02-600632, and concentrations decreased laterally. The residential SSL is approximately 6270 times the maximum concentration. Lateral extent of di-n-butylphthalate is defined and further sampling for vertical extent is not warranted.

Isopropylbenzene was detected in one sample at a concentration of 0.000499 mg/kg. Concentrations increased with depth at location 02-600629 and increased laterally. The detected concentration was below the EQL. The residential SSL is approximately 4,710,000 times the maximum concentration. Lateral extent of isopropylbenzene is defined and further sampling for vertical extent is not warranted.

Isopropyltoluene[4-] was detected in one sample at a concentration of 0.000763 mg/kg. Concentrations increased with depth at location 02-600629 and decreased laterally. The residential SSL is approximately 3,080,000 times the maximum concentration. Further sampling for extent of 4-isopropyltoluene is not warranted.

Methylene chloride was detected in five samples with a maximum concentration of 0.00415 mg/kg. Concentrations increased with depth at locations 02-600628, 02-600629, 02-600631, and 02-600637 and decreased laterally. The residential SSL is approximately 28,400 times the maximum concentration. Lateral extent of methylene chloride is defined and further sampling for vertical extent is not warranted.

Toluene was detected in four samples with a maximum concentration of 0.000593 mg/kg. Concentrations decreased with depth at all locations and did not change substantially laterally (0.000221 mg/kg). The residential SSL is approximately 8,800,000 times the maximum concentration. Vertical extent of toluene is defined and further sampling for vertical extent is not warranted.

Radionuclides

Radionuclide COPCs at AOC 02-010 include cesium-137, plutonium-239/240, strontium-90, and tritium.

Cesium-137 was detected above the soil FV in 4 samples, detected below 1 ft bgs in 27 soil and Qal samples, and detected in 1 Qbo sample, with a maximum activity of 18.2 pCi/g. Activities increased with depth at location 02-22389, 02-612429, 02-612430, and 02-612431; only one depth was sampled at location 02-613240; activities decreased with depth at all other locations; and activities decreased laterally. The residential SAL is approximately 39 times the maximum activity where vertical extent is not defined (0.309 pCi/g at location 02-600640). Lateral extent of cesium-137 is defined and further sampling for vertical extent is not warranted.

Plutonium-239/240 was detected above the soil FV in six samples and detected below 1 ft bgs in nine soil and Qal samples with a maximum activity of 2.93 pCi/g. Activities did not change substantially with depth (0.0152 pCi/g) at location 02-22391, activities decreased with depth at all other locations, and activities decreased laterally. The residential SAL is approximately 27 times the maximum activity. Lateral extent of plutonium-239/240 is defined and further sampling for vertical extent is not warranted.

Strontium-90 was detected above the soil FV in three samples and detected below 1 ft bgs in eight soil and Qal samples with a maximum activity of 7.22 pCi/g. Activities increased with depth at location 02-22389, decreased with depth at all other locations, and decreased laterally. The residential SAL is approximately 17 times the maximum activity, and the industrial SAL is approximately 2700 times the maximum activity where vertical extent is not defined (0.887 pCi/g at location 02-22389). Lateral extent of strontium-90 is defined and further sampling for vertical extent is not warranted.

Tritium was detected in 23 samples with a maximum activity of 0.261 pCi/g. Activities increased with depth at locations 02-600632, 02-600634, 02-600636, 02-600638, 02-600639, and 02-612463; decreased with depth at all other locations; and increased laterally. The residential SAL is approximately 6510 times the maximum activity. Further sampling for extent of tritium is not warranted.

Summary of Nature and Extent at AOC 02-010

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at AOC 02-010.

6.28.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 4×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.3, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 5 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 5×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.5 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Residential Scenario

The total excess cancer risk for the residential scenario is 9×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 1, which is equivalent to the NMED target HI of 1 (NMED 2017, 602273). The total dose is 12 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The residential exposure scenario also demonstrates protection of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, residential, and construction worker scenarios at AOC 02-010.

6.28.6 Summary of Ecological Risk Screening

AOC 02-010 is within the TA-02 core area. Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and results of site-specific ecological risk studies, no potential ecological risks exist for the TA-02 core area.

6.29 AOC 02-011(a), Storm Drains and Outfalls

6.29.1 Site Description and Operational History

AOC 02-011(a) consists of 11 drain segments and associated outfalls across TA-02. These individual segments drain either directly or indirectly to Los Alamos Creek (Figure 6.29-1).

The following drains are associated with this AOC and are divided into the following subunits:

(i) An approximately 50-ft-long concrete storm drain (also described as a concrete flume), located northwest of the OWR building that drains into a drop inlet/catch basin (structure 02-36), as shown on engineering drawing R-5102, sheet 2 of 2 (LANL 1990, 090086). There is no information indicating that the drain handled anything but storm water.

(ii) A 24-in.-diameter, 8-ft-long underground corrugated metal pipe (CMP) between catch basin 02-36 and catch basin 02-27, as shown on engineering drawing R-5102, sheet 2 of 2 (LANL 1990, 090086). There is no information that the drain handled anything but storm water.

(iii) An 85 ft-long concrete storm drain (e.g., concrete flume) located northwest of the OWR building (02-1) that drains into catch basin 02-27, as shown on engineering drawing R-5102, sheet 2 of 2 (LANL 1983, 090086). The drain was reportedly used periodically for discharge of water from the fuel transfer pit (DOE 1987, 008663).

(iv) A 15-in.-diameter, 15-ft-long concrete storm drain west of the OWR building that drains into catch basin 02-28, as shown on engineering drawing R-5102, sheet 2 of 2 (LANL 1983, 090086). There is no information that the drain handled anything but storm water.

(v) A 24-in.-diameter, 30-ft-long concrete storm drain between catch basins 02-27 and 02-28, as shown on engineering drawing R-5102, sheet 2 of 2 (LANL 1983, 090086). This drain may have handled the fuel transfer pit water coming from the concrete flume, with associated contaminated aluminum shards.

(vi) A 30-in.-diameter, 75-ft-long CMP between a catch basin (structure 02-28) and Los Alamos Creek, as shown on engineering drawing R-5102, sheet 2 of 2 (LANL 1983, 090086). This drain may have handled the fuel transfer pit water coming from the concrete flume, with associated contaminated aluminum shards.

(vii) A 6-in.-diameter, 18-ft-long pipe between the OWR building and the salvage basin (structure 02-26) and Los Alamos Creek. AOC 02-011(a)(vii) is a duplicate of AOC 02-006(e), as noted in the 1990 SWMU report (LANL 1990, 007511). This drain is addressed as AOC 02-006(e) throughout this report and discussed in section 6.19.

(viii) An 18-in.-diameter, 75-ft-long CMP between the OWR building catch basin (unnumbered structure within building 02-1) and Los Alamos Creek, as shown on engineering drawing C-1699 (LASL 1947, 090070). There is no information that this drain handled anything but storm water runoff.

(ix) A 3-in.-diameter, 75-ft-long pipe between the OWR building and the outfall to Los Alamos Creek. Wastewater system design memoranda (e.g., Heineman 1990, 089739) indicate that floor drains from the eastern side of the WBR area drained to this outfall before 1990.

(x) A 12-in.-diameter, 30-ft-long storm drain northeast of the OWR building that discharged to Los Alamos Creek through a series of concrete ditches and a CMP along the east side of the OWR building, as shown on engineering drawing C-1718 (LASL 1947, 089677). The total length of the drain and ditches to Los Alamos Creek is approximately 130 ft. The drains and concrete ditches remained in place until they were removed during D&D activities in 2003 (WD-3 2003, 082646, pp. 26–31). There is no information that this drain handled anything but storm water.

(xi) A 4-in.-diameter, 95-ft-long pipe between the OWR building and Los Alamos Creek. AOC 02-011(a)(xi) is a duplicate of the OWR acid waste line [SWMU 02-006(b)]. AOC 02-011(a)(xi) is addressed as SWMU 02-006(b) throughout this report and discussed in section 6.16.

The drains in AOC 02-011(a) date from approximately the time of construction of the reactor building in 1944. Drains from operational areas of the facility may have received effluent until the 2003 D&D of the OWR facility, although the reactor was inactive from 1993 to 2003. Several of the drains were removed in either the 2000 or 2003 D&D activities, but five of the drains, or some portion of them, remained in place (WD-3 2003, 082646, pp. 26–31).

6.29.2 Relationship to Other SWMUs and AOCs

The drains in AOC 02-011(a) were at multiple locations across TA-02 and were connected to, or in proximity to, the reactor building [02-1, AOC 02-004(a)], the OWR equipment building [02-44, AOC 02-004(f)], the boiler house (building 02-63, AOC 02-010), and the chemical waste shack (building 02-3, AOC 02-010).

6.29.3 Summary of Previous Investigations

Because no previous investigations were conducted at AOC 02-011(a)(ii,v), and because AOC 02-011(a)(vii) is a duplicate of AOC 02-006(e), and AOC 02-011(a)(xi) is a duplicate of SWMU 02-006(b), these subunits are not included in this section.

6.29.3.1 AOC 02-011(a)(i)

1995 Investigation Activities

One soil sample was collected from the catch basin (structure 02-36) in 1995. The 1995 investigation results are not decision-level data.

6.29.3.2 AOC 02-011(a)(iii)

1995 Investigation Activities

One soil sample was collected from the catch basin (structure 02-27) in 1995. The 1995 investigation results are not decision-level data.

6.29.3.3 AOC 02-011(a)(iv)

1995 Investigation Activities

One soil sample was collected from the catch basin (structure 02-28) in 1995. The 1995 investigation results are not decision-level data.

6.29.3.4 AOC 02-011(a)(vi)

1995 Investigation Activities

One soil sample was collected from Los Alamos Creek at the AOC 02-011(a)(vi) outfall in 1995. The 1995 investigation results are not decision-level data.

6.29.3.5 AOC 02-011(a)(viii)

1995 Investigation Activities

One sediment sample was collected from Los Alamos Creek at the AOC 02-011(a)(viii) outfall (location 02-01152) in 1995.

2000 Post–Cerro Grande Recovery Work

One sediment sample was collected from Los Alamos Creek at the AOC 02-011(a)(viii) outfall (location 02-01152) in 2000. The sampling location was the same as that sampled in 1995; however, the sampling interval differed.

2003 Omega West Decommissioning Project

AOC 02-011(a)(viii) piping was decommissioned and removed, and the waste was disposed of at an approved disposal facility. Limited soil surveys were conducted, but no formal report of soil survey results is available.

LLW (construction debris and/or soil) was packaged and shipped to Envirocare or TA-54 for disposal. Mixed waste was packaged and transferred to TA-54 for further processing and/or storage at the Laboratory. In total, 360 yd^3 of material was shipped to Envirocare for disposal; material from the AOC 02-011(a)(viii) storm drain was included in this total volume (WD-3 2003, 082646, pp. 1–6), but the specific volume of material associated with this drain was not documented.

Ten samples were collected from five boreholes at AOC 02-011(a)(viii) (locations 02-22351, 02-22352, 02-22372, 02-22373, and 02-22374) in 2003.

6.29.3.6 AOC 02-011(a)(ix)

1995 Investigation Activities

One sediment sample was collected from Los Alamos Creek at the AOC 02-011(a)(ix) outfall (location 02-01150) in 1995.

2003 Omega West Decommissioning Project

AOC 02-011(a)(ix) piping was removed, and the waste was disposed of at an approved facility. Limited soil surveys were conducted, but no formal report of soil survey results is available.

LLW (construction debris and/or soil) was packaged and shipped to Envirocare or TA-54 for disposal. Mixed waste was packaged and transferred to TA-54 for further processing and/or storage at the Laboratory. In total, 360 yd^3 of material was shipped to Envirocare for disposal; material from the AOC 02-011(a)(ix) storm drain was included in this total volume (WD-3 2003, 082646, pp. 1–6), but the specific volume of material associated with this drain was not documented.

Four samples were collected from two boreholes at AOC 02-011(a)(ix) (locations 02-22349 and 02-22367) in 2003.

6.29.3.7 AOC 02-011(a)(x)

1995 Investigation Activities

One sediment sample was collected from Los Alamos Creek at the AOC 02-011(a)(x) outfall (location 02-01153) in 1995. Four samples were collected from one borehole (location 02-01162) in 1995.

2000 Post–Cerro Grande Recovery Work

During the post–Cerro Grande fire recovery work, two samples were collected from location 02-01153. The sampling location was the same as that sampled in 1995; however, the sampling intervals differed.

2003 Omega West Decommissioning Project

AOC 02-011(a)(x) piping and concrete was decommissioned and removed, and the waste was disposed of at an approved facility. Limited soil radiological surveys were conducted; however, no formal report of soil survey results is available.

LLW (construction debris and/or soil) was packaged and shipped to Envirocare or TA-54 for disposal. Mixed waste was packaged and transferred to TA-54 for further processing and/or storage at the Laboratory. In total, 360 yd^3 of material was shipped to Envirocare for disposal; material from the AOC 02-011(a)(x) storm drain was included in this total volume (WD-3 2003, 082646, pp. 1–6), but the specific volume of material associated with this drain was not documented.

Ten samples were collected from five boreholes at AOC 02-011(a)(x) (locations 02-22346, 02-22347, 02-22348, 02-22368, and 02-22380) in 2003.

6.29.3.8 2007 Investigation Activities at AOC 02-011(a)

A total of 113 samples were collected from 38 locations at AOC 02-011(a) in 2007. Results from the sampling activities in 2007 were presented in the previous investigation report (LANL 2008, 101669.12). Additional sampling was required to define the extent of contamination at the site.

6.29.4 Site Contamination

AOC 02-011(a)(vii) is a duplicate of AOC 02-006(e) and has been addressed in section 6.19. AOC 02-011(a)(xi) is a duplicate of SWMU 02-006(b) and has been addressed in section 6.16. The remaining nine subunits of AOC 02-011(a) are presented as follows.

6.29.4.1 Soil, Rock, and Sediment Sampling

AOC 02-011(a)(i)

As part of the 2010 investigation, the following characterization activities were conducted at AOC 02-011(a)(i):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Locations 02-600385 and 02-600386 were excavated to remove PCB contamination in accordance with the approved work plan (LANL 2009, 105073, p. 9; NMED 2009, 105595). The surface soil at location 02-600385 was excavated to approximately 4 ft bgs, and the surface soil at location 02-600386 was excavated to approximately 7 ft bgs. The remediated area was approximately 64 ft^2 and the volume of excavated material was approximately 10 yd^3 at location 02-600385 (Figure 6.29-2). The remediated area was approximately 64 ft^2 and the volume of excavated material was approximately 17 yd^3 at location 02-600386 (Figure 6.29-2).
- Confirmation samples were collected as follows.
  - ❖ At location 02-600385, confirmation samples were collected below the excavation from 4–4.2 ft and 6–6.2 ft bgs at location 02-600385 and from four step-out locations: 12 ft to the north (4–4.2 ft and 6–6.2 ft bgs from location 02-613289), 4 ft to the south (4–4.2 ft and 5–5.5 ft bgs from location 02-612446), 4 ft to the east (4–4.2 ft and 6–6.2 ft bgs from location 02-612445), and 4 ft to the west (4–4.2 ft and 6–6.2 ft bgs from location 02-612448).
  - ❖ At location 02-600386, confirmation samples were collected below the excavation from 7–7.2 ft, 9–9.2 ft, and 11–11.2 ft bgs at location 02-600386, and from three step-out locations: 12 ft to the north (4–4.2 ft bgs from location 02-613292), 4 ft to the south (3.5–4 ft bgs from location 02-612444), and 4 ft to the east (3–3.2 ft bgs from location 02-612447). No step-out sample was collected to the west because a concrete slab prevented sampling.

All confirmation samples were analyzed for PCBs only.

- Five samples were collected from location 02-613571 (depths ranging from 5–50 ft bgs). All five samples were analyzed for TAL metals, hexavalent chromium, PCBs, SVOCs, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium.

AOC 02-011(a)(ii)

As part of the 2010 investigation, the following characterization activities were conducted at AOC 02-011(a)(ii):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- The approved work plan proposed excavation at 02-600449 to remove PCB contamination (LANL 2009, 105073, p. 9; NMED 2009, 105595). However, elevated concentrations of PCBs were detected in an extensive area that exceeded the scope of the work plan during preexcavation step-out sampling from location 02-600449. No excavation was conducted at AOC 02-011(a)(ii); however, decision-level PCB results obtained during preexcavation sampling are included in this report and presented in section 6.29.4.4.

- Five samples were collected from location 02-613571 (depths ranging from 5–50 ft bgs). All five samples were analyzed for TAL metals, hexavalent chromium, PCBs, SVOCs, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium.

AOC 02-011(a)(iii)

As part of the 2010 investigation, the following characterization activities were conducted at AOC 02-011(a)(iii):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Location 02-600406 was excavated to remove PCB contamination in accordance with the approved work plan (LANL 2009, 105073, p. 9; NMED 2009, 105595). Excavations at locations 02-600406 and 02-600450 (about 15 ft apart) ranged from 2–4 ft bgs and resulted in a combined remediated area of approximately 756 ft^2. The total volume of excavated material was approximately 87 yd^3.
- Confirmation samples were collected from four step-out locations: 8 ft to the north (2–2.5 ft and 4–4.5 ft bgs from location 02-613003), 4 ft to the south (2–2.2 ft and 4–4.4 ft bgs from location 02-612439), 4 ft to the east (2–2.2 ft and 4–4.2 ft bgs from location 02-612438), and 4 ft to the west (4–4.4 ft bgs from location 02-612440). Confirmatory sampling below the excavation was not necessary because two 2007 samples were collected from below the depth of the excavation (4.5–13 ft and 15–19.5 ft bgs) at location 02-600406. All confirmation samples were analyzed for PCBs only.
- Five samples were collected from location 02-613571 (depths ranging from 5–50 ft bgs). All five samples were analyzed for TAL metals, hexavalent chromium, PCBs, SVOCs, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium.

AOC 02-011(a)(iv)

As part of the 2010 investigation, the following characterization activities were conducted at AOC 02-011(a)(iv):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Five samples were collected from location 02-612346 (depths ranging from 5–50 ft bgs). All five samples were analyzed for TAL metals, hexavalent chromium, PCBs, SVOCs, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium.

AOC 02-011(a)(v)

As part of the 2010 investigation, the following characterization activities were conducted at AOC 02-011(a)(v):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.

- Location 02-600450 was excavated to remove PCB contamination in accordance with the approved work plan (LANL 2009, 105073, p. 9; NMED 2009, 105595). Excavations at locations 02-600406 and 02-600450 (about 15 ft apart) ranged from 2–4 ft bgs and resulted in a combined remediated area of approximately 756 ft^2. The total volume of excavated material was approximately 87 yd^3 (Figure 6.29-2).
- Confirmation samples were collected below the excavation from 4–4.2 ft bgs at location 02-600450, and from seven step-out locations: 4 ft to the north (4–4.2 ft bgs from location 02-612435), 4 ft and 8 ft to the south (4–4.4 ft bgs from location 02-612434, and 2–2.2 ft bgs from location 02-613121, respectively), 4 ft to the east (4–4.4 ft bgs from location 02-612437), 4 ft and 8 ft to the west (4–4.2 ft bgs from location 02-612436, and 2–2.2 ft bgs from location 02-613118, respectively), and 4 ft to the southwest (2–2.2 ft bgs from location 02-613120). All confirmation samples were analyzed for PCBs only.
- Five samples were collected from location 02-613571 (depths ranging from 5–50 ft bgs). All five samples were analyzed for TAL metals, hexavalent chromium, PCBs, SVOCs, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium.

AOC 02-011(a)(vi)

As part of the 2010 investigation, the following characterization activities were conducted at AOC 02-011(a)(vi):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Location 02-600532 was excavated to remove benzo(a)pyrene contamination in accordance with the approved work plan (LANL 2009, 105073, p. 9; NMED 2009, 105595). The surface soil at location 02-600532 was excavated to approximately 2 ft bgs. The remediated area was approximately 64 ft^2. The total volume of excavated material was approximately 5 yd^3.
- Confirmation samples were collected below the excavation from 2–2.2 ft and 4–4.2 ft bgs at location 02-600532 and from four step-out locations: 4 ft to the north (2–2.2 ft and 4–4.2 ft bgs from location 02-612468), 4 ft to the south (2–2.2 ft and 4–4.4 ft bgs from location 02-612467), 4 ft to the east (2–2.2 ft and 4–4.4 ft bgs from location 02-612466), and 4 ft to the west (2–2.2 ft and 4–4.2 ft bgs from location 02-612465). All confirmation samples were analyzed for PCBs and SVOCs.

AOC 02-011(a)(viii)

As part of the 2010 investigation, the following characterization activities were conducted at AOC 02-011(a)(viii):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Five samples were collected from location 02-612292 (depths ranging from 5–50 ft bgs). All five samples were analyzed for TAL metals, hexavalent chromium, PCBs, SVOCs, gamma-emitting radionuclides, isotopic plutonium, and tritium.

AOC 02-011(a)(ix)

As part of the 2010 investigation, the following characterization activities were conducted at AOC 02-011(a)(ix):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Five samples were collected from location 02-612345 (depths ranging from 5–50 ft bgs). All five samples were analyzed for TAL metals, hexavalent chromium, PCBs, SVOCs, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium.

AOC 02-011(a)(x)

As part of the 2010 investigation, the following characterization activities were conducted at AOC 02-011(a)(x):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Location 02-600664 was excavated to remove PCB contamination in accordance with the approved work plan (LANL 2008, 105073, p. 9; NMED 2009, 105595). The surface soil at location 02-600664 was excavated to 2–4 ft bgs. The remediated area was approximately 192 ft^2. The total volume of excavated material was approximately 24 yd^3 (Figure 6.29-2).
- Confirmation samples were collected below the excavation from 2–2.2 ft and 4–4.2 ft bgs at location 02-600664 and from six step-out locations: 4 ft and 8 ft to the north (4–4.2 ft bgs from location 02-612460 and 0–0.5 ft and 2–2.2 ft bgs from location 02-612999, respectively), 4 ft and 8 ft to the south (4–4.4 ft bgs from location 02-612462 and 0–0.5 ft and 2–2.2 ft bgs from location 02-613000, respectively), 4 ft to the east (4–4.2 ft bgs from location 02-612459), and 4 ft to the west (4–4.4 ft bgs from location 02-612461). All confirmation samples were analyzed for PCBs only.
- Ten samples were collected from locations 02-612348 and 02-612983 (depths ranging from 5–50 ft bgs), located at the north portion of AOC 02-011(a)(x) and at the outfall of AOC 02-011(a)(x), respectively. Samples from location 02-612348 were analyzed for TAL metals, hexavalent chromium, PCBs, SVOCs, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium. Samples from location 02-612983 were analyzed for TAL metals, hexavalent chromium, PCBs, SVOCs, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium.

The 2010 and historical sampling locations at AOC 02-011(a) are shown in Figure 6.29-1. The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

6.29.4.2 Soil, Rock, and Sediment Sample Field-Screening Results

Organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of one sample at location 02-612345. As a result, the samples collected at this location were analyzed for TPH-DRO, in addition to the planned suites. No radiological-screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. No changes to sampling or other activities occurred because of the field-screening results.

6.29.4.3 Soil, Rock, and Sediment Sample Analytical Results

AOC 02-011(a)(i,ii,iii,iv,v,vi)

AOC 02-011(a)(i,ii,iii,iv,v,vi) is located near the west end of the former OWR. Because each segment of the AOC 02-011(a) storm drain system was interconnected (Figure 6.29-1), the investigation data for the six segments were combined for evaluations.

Decision-level data at AOC 02-011(a)(i,ii,iii,iv,v,vi) consist of results from 137 samples collected from 57 locations in 2007 and 2010. The 137 samples include 82 soil, 23 Qal, 6 Qbt 3, and 26 Qbo samples. Table 6.29-1 presents the samples collected and analyses requested for AOC 02-011(a)(i,ii,iii,iv,v,vi).

Inorganic Chemicals

A total of 54 samples (8 soil, 20 Qal, and 26 Qbo) were analyzed for TAL metals, 34 samples (3 soil, 12 Qal, and 19 Qbo) were analyzed for hexavalent chromium, and 29 samples (8 soil, 14 Qal, and 7 Qbo) were analyzed for nitrate, perchlorate, and total cyanide. Table 6.29-2 presents the inorganic chemicals detected or detected above BVs. Plate 35 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV (3560 mg/kg) in 11 samples with a maximum concentration of 11,300 mg/kg. The Gehan and quantile tests indicated site concentrations of aluminum in tuff are statistically different from background (Table G-35 and Figure G-227). Aluminum is retained as a COPC.

Antimony was not detected but had DLs (0.513 mg/kg to 5.14 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs (0.83 mg/kg and 0.5 mg/kg) in 6 soil samples and 21 tuff samples. Antimony is retained as a COPC.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV (0.56 mg/kg) in 4 samples with a maximum concentration of 2.36 mg/kg and was not detected but had DLs (1.04 mg/kg to 1.88 mg/kg) above the BV in 22 samples. Arsenic is retained as a COPC.

Barium was detected above the Qbt 1g, Qct, Qbo BV (25.7 mg/kg) in four samples with a maximum concentration of 97.1 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in tuff are not statistically different from background (Table G-35 and Figure G-228). Barium is not a COPC.

Cadmium was not detected but had DLs (0.497 mg/kg to 0.654 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs (0.4 mg/kg for both) in 22 soil samples and 25 tuff samples. Cadmium is retained as a COPC.

Chromium was detected above the soil and Qbt 1g, Qct, Qbo BVs (19.3 mg/kg and 2.6 mg/kg) in three soil samples and seven tuff samples with a maximum concentration of 27 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in soil are not statistically different from background (Table G-36 and Figure G-229) but site concentrations of chromium in tuff are statistically different from background (Table G-35 and Figure G-230). Chromium is retained as a COPC.

Copper was detected above the Qbt 1g, Qct, Qbo BV (3.96 mg/kg) in three samples with a maximum concentration of 4.53 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in tuff are not statistically different from background (Table G-35 and Figure G-231). Copper is not a COPC.

Hexavalent chromium was detected in one sample at a concentration of 0.448 mg/kg. Hexavalent chromium is retained as a COPC.

Iron was detected above the Qbt 1g, Qct, Qbo BV (3700 mg/kg) in 26 samples with a maximum concentration of 7450 mg/kg. The Gehan and quantile tests indicated site concentrations of iron in tuff are statistically different from background (Table G-35 and Figure G-232). Iron is retained as a COPC.

Manganese was detected above the Qbt 1g, Qct, Qbo BV (189 mg/kg) in 17 samples with a maximum concentration of 298 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in tuff are statistically different from background (Table G-35 and Figure G-233). Manganese is retained as a COPC.

Mercury was detected above the soil and Qbt 1g, Qct, Qbo BVs (0.1 mg/kg for both) in 11 soil samples and 3 tuff samples with a maximum concentration of 40.6 mg/kg. Mercury is retained as a COPC.

Nickel was detected above the Qbt 1g, Qct, Qbo BV (2 mg/kg) in five samples with a maximum concentration of 4.64 mg/kg. The quantile and slippage tests indicated site concentrations of nickel in tuff are not statistically different from background (Table G-35 and Figure G-234). Nickel is not a COPC.

Nitrate was detected in 14 samples with a maximum concentration of 11mg/kg. Nitrate is naturally occurring, and the concentrations likely reflect naturally occurring levels. In addition, the AOC consists of a storm drain and is not a source of nitrate. Nitrate is not a COPC.

Perchlorate was detected in three samples with a maximum concentration of 0.00131 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs (1.52 mg/kg and 0.3 mg/kg) in 1 soil sample and 3 tuff samples with a maximum concentration of 2.41 mg/kg, and was not detected but had DLs (1.04 mg/kg to 1.96 mg/kg) above the BVs in 8 soil samples and 23 tuff samples. Selenium is retained as a COPC.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV (4.59 mg/kg) in three samples with a maximum concentration of 7.56 mg/kg. The quantile and slippage tests indicated site concentrations of vanadium in tuff are not statistically different from background (Table G-35 and Figure G-235). Vanadium is not a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in six samples with a maximum concentration of 78.2 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are statistically different from background (Table G-36 and Figure G-236). Zinc is retained as a COPC.

Organic Chemicals

A total of 28 samples (7 soil, 14 Qal, and 7 Qbo) were analyzed for dioxins and furans, 137 samples (82 soil, 23 Qal, 6 Qbt 3, and 26 Qbo) were analyzed for PCBs, 64 samples (18 soil, 20 Qal, and 26 Qbo) were analyzed for SVOCs, 21 samples (14 Qal and 7 Qbo) were analyzed for SVOCs, and 6 samples (2 soil, 2 Qal, and 2 Qbo) were analyzed for TPH-DRO. Table 6.29-3 presents the detected organic chemicals. Plates 36 and 37 show the spatial distribution of detected organic chemicals.

Dioxins and Furans

Dioxins and furans are frequently detected as a result of environmental sampling but generally are not associated with industrial activities conducted at the Laboratory or released from SWMUs or AOCs being investigated at the Laboratory. The investigation work plan for Middle Los Alamos Canyon Aggregate Area (LANL 2006, 092571.12) notes the potential for presence of dioxins and furans in the OWR fuel pit recirculation pump system, and a small percentage of the investigation samples collected around the

OWR were analyzed for dioxins and furans to determine whether a release may have occurred. If the results were indicative of a release, additional sampling for dioxins and furans would be proposed.

Dioxins and furans are known to be widely distributed in the environment from a number of sources, both natural, such as forest fires, and anthropogenic, such as industrial sources and burning of municipal trash and other waste materials. Industrial sources of dioxins and furans are primarily associated with impurities in the production of chlorinated chemical products (e.g., pentachlorophenol, chlorinated herbicides) and the wastes associated with production of those materials. Another industrial source is the pulp and paper industry and processes that bleach wood pulp (EPA 2006, 600913). None of these common industrial process-related source activities have occurred at the Laboratory. Other anthropogenic sources of dioxins and furans include the combustion of materials containing chlorine, such as the incineration of municipal trash containing chlorinated plastics, and other waste materials (EPA 2006, 600913). Forest fires have occurred in the Los Alamos area, including upgradient of TA-02 in the Los Alamos Canyon watershed, and are a potential source of dioxins and furans.

Polycyclic Aromatic Hydrocarbons

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

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

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

Site Activities

AOC 02-011(a)(i,ii,iii,iv,v,vi) consists of components of a storm water collection system including concrete flumes, concrete storm drains, and CMPs used to convey storm water and was identified as an AOC because of the potential for the storm water to have contained radioactivity. There are no known site-related sources of dioxins and furans or PAHs in the storm water collected by these components.

The dioxin and furan congeners detected at AOC 02-011(a)(i,ii,iii,iv,v,vi) were detected at concentrations ranging from 0.0000000642 mg/kg to 0.00123 mg/kg, with hepta- and hexa-chlorinated congeners being the most frequently detected. These results likely reflect natural and/or anthropogenic background rather than a site-related release. The dioxin and furan congeners detected in samples used to characterize this site [1,2,3,4,6,7,8-heptachlorodibenzodioxin; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 1,2,3,7,8,9-hexachlorodibenzofuran; 2,3,6,7,8,9-hexachlorodibenzofuran;

1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; and 2,3,7,8-tetrachlorodibenzofuran] are not related to historical Laboratory site operations and are not COPCs.

AOC 02-011(a)(i,ii,iii,iv,v,vi) is located at the northwest corner and west side of the former OWR facility. Samples were collected in areas formerly paved with asphalt or adjacent to formerly paved areas. PAHs were generally detected in surface and shallow subsurface samples. PAH concentrations ranged from 0.00185 mg/kg to 3.84 mg/kg, with 60% of the results less than 0.1 mg/kg and only 6 of 233 detected concentrations greater than 1 mg/kg (all in 1 sample). Samples collected during the 2007 sampling at AOC 02-011(a)(iii) were analyzed, and TPH-DRO was detected. The investigation work plan (LANL 2006, 092571), however, called for these samples to be analyzed for TPH-DRO because of the proximity of the site to AOC 02-012, which is a potential source of petroleum contamination. The TPH-DRO and associated PAHs, therefore, are not related to AOC 02-011(a)(iii). The PAHs detected in samples used to characterize these sites [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, 2-methylnaphthalene, naphthalene, phenanthrene; and pyrene] appear to be associated with asphalt paving, are not related to historical Laboratory site operations, and are not COPCs. TPH-DRO is associated with AOC 02-012 and is not a COPC for AOC 02-011(a)(i,ii,iii,iv,v,vi).

Other organic chemicals detected at AOC 02-011(a)(i,ii,iii,iv,v,vi) include Aroclor-1242, Aroclor-1254, Aroclor-1260, chloroform, di-n-butylphthalate, methylene chloride, and toluene. The detected organic chemicals listed are retained as COPCs.

Radionuclides

A total of 29 samples (8 soil, 14 Qal, and 7 Qbo) were analyzed for americium-241 and strontium-90 and 54 samples (8 soil, 20 Qal, and 26 Qbo) were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium. Table 6.29-4 presents the radionuclides detected or detected above BVs/FVs. Plate 38 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Americium-241 was detected above the soil FV (0.013 pCi/g) in one sample with a maximum activity of 0.0924 pCi/g. Americium-241 is retained as a COPC.

Cesium-137 was detected in one sample with a maximum activity of 0.303 pCi/g. Cesium-137 is retained as a COPC.

Cobalt-60 was detected in one sample with a maximum activity of 0.762 pCi/g. Cobalt-60 is retained as a COPC.

Plutonium-239/240 was detected above the soil FV (0.054 pCi/g) in three samples and detected below 1 ft bgs in two Qal samples with a maximum activity of 0.182 pCi/g. Plutonium-239/240 is retained as a COPC.

Tritium was detected in 16 samples with a maximum activity of 0.097 pCi/g. Tritium is retained as a COPC.

Uranium-235/236 was detected above the Qbt 1g, Qct, Qbo BV (0.18 pCi/g) in 5 samples with a maximum activity of 0.208 pCi/g. Uranium-235/236 was not detected or detected above BV in 50 other samples (detected below BV in 38 samples). Uranium-235/236 is not a COPC.

AOC 02-011(a)(viii)

Decision-level data at AOC 02-011(a)(viii) consist of results from 24 samples collected from 9 locations in 2000, 2003, 2007, and 2010. The 24 samples include 12 soil, 4 Qal, 6 Qbo, and 2 sediment samples. Table 6.29-5 presents the samples collected and analyses requested for AOC 02-011(a)(viii).

Inorganic Chemicals

A total of 24 samples (12 soil, 4 Qal, 6 Qbo, and 2 sediment) were analyzed for TAL metals, 22 samples (12 soil, 4 Qal, and 6 Qbo) were analyzed for hexavalent chromium, and 7 samples (2 soil, 3 Qal, and 2 Qbo) were analyzed for nitrate, perchlorate, and total cyanide. Table 6.29-6 presents the inorganic chemicals detected or detected above BVs. Plate 39 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV (3560 mg/kg) in five samples with a maximum concentration of 22,000 mg/kg. Aluminum is retained as a COPC.

Antimony was not detected but had DLs (0.501 mg/kg to 1.3 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs (0.83 mg/kg and 0.5 mg/kg) in one soil sample and six tuff samples. Antimony is retained as a COPC.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV (0.56 mg/kg) in two samples with a maximum concentration of 1.41 mg/kg and was not detected but had DLs (1.28 mg/kg and 1.29 mg/kg) above the BV in three samples. Arsenic is retained as a COPC.

Barium was detected above the Qbt 1g, Qct, Qbo BV (25.7 mg/kg) in two samples with a maximum concentration of 221 mg/kg. Barium is retained as a COPC.

Cadmium was detected above the soil and sediment BVs (0.4 mg/kg for both) in 1 soil sample and 1 sediment sample with a maximum concentration of 0.63 mg/kg and was not detected but had DLs (0.513 mg/kg to 0.664 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs (0.4 mg/kg) in 10 soil samples and 6 tuff samples. The detected concentration in sediment (0.63 mg/kg) was greater than the highest concentration in the sediment data set (0.18 mg/kg). Cadmium is retained as a COPC.

Calcium was detected above the soil BV (6120 mg/kg) in two samples with a maximum concentration of 22,930 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in soil are not statistically different from background (Figure G-237 and Table G-37). Calcium is not a COPC.

Chromium was detected above the soil and Qbt 1g, Qct, Qbo BVs (19.3 mg/kg and 2.6 mg/kg) in two soil samples and three tuff samples with a maximum concentration of 33.4 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in soil are not statistically different from background (Figure G-238 and Table G-37). The maximum concentration in Qbo (21.3 mg/kg) is substantially greater than the highest concentration in the Qbt 1g, Qct, Qbo background data set (2.3 mg/kg). Chromium is retained as a COPC.

Copper was detected above the soil and sediment BVs (14.7 mg/kg and 3.96 mg/kg) in one soil sample and one sediment sample with a maximum concentration of 17 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in soil are not statistically different from background (Figure G-239 and Table G-37). The detected concentration in sediment (15.1 mg/kg) was greater than the highest concentration in the sediment data set (12 mg/kg). Copper is retained as a COPC.

Hexavalent chromium was detected in 11 samples with a maximum concentration of 2.12 mg/kg. Hexavalent chromium is retained as a COPC.

Iron was detected above the Qbt 1g, Qct, Qbo BV (3700 mg/kg) in six samples with a maximum concentration of 7550 mg/kg. Iron is retained as a COPC.

Lead was detected above the soil and sediment BVs (22.3 mg/kg and 19.7 mg/kg) in one soil sample and one sediment sample with a maximum concentration of 40 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil are not statistically different from background (Figure G-240 and Table G-37). There were too few sediment samples to perform statistical tests and the concentration in sediment (40 mg/kg) was above the highest concentration in the sediment background data set (25.6 mg/kg). Lead is retained as a COPC.

Manganese was detected above the Qbt 1g, Qct, Qbo BV (189 mg/kg) in six samples with a maximum concentration of 267 mg/kg. Manganese is retained as a COPC.

Mercury was detected above the soil and sediment BVs (0.1 mg/kg for both) in 14 soil samples and 1 sediment sample with a maximum concentration of 5.26 mg/kg. Mercury is retained as a COPC.

Nitrate was detected in four samples with a maximum concentration of 4.09 mg/kg. Nitrate is naturally occurring, and the concentrations likely reflect naturally occurring levels. In addition, AOC 02-011(a)(viii) consists of a storm drain and is not a source of nitrate. Nitrate is not a COPC.

Selenium was detected above the Qbt 1g, Qct, Qbo BV (0.3 mg/kg) in one sample at a concentration of 0.801 mg/kg and was not detected but had DLs (1.28 mg/kg to 1.9 mg/kg) above the soil BV (1.52 mg/kg) and Qbt 1g, Qct, Qbo BV in one soil sample and five tuff samples. The Gehan and quantile tests indicated site concentrations of selenium in soil are not statistically different from background (Figure G-241 and Table G-37). Three is no Qbt 1g, Qct, Qbo background data set for selenium. Selenium is retained as a COPC.

Zinc was detected above the soil and sediment BVs (48.8 mg/kg and 60.2 mg/kg) in one soil sample and one sediment sample with a maximum concentration of 390 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are not statistically different from background (Figure G-242 and Table G-37). There were too few sediment samples to perform statistical tests and the concentration in sediment (390 mg/kg) was above the highest concentration in the sediment background data set (56.2 mg/kg). Zinc is retained as a COPC.

Organic Chemicals

A total of 7 samples (2 soil, 3 Qal, 2 Qbo) were analyzed for dioxins and furans, 12 samples (2 soil, 4 Qal, and 6 Qbo) were analyzed for PCBs and SVOCs, and 5 tuff samples (3 Qal and 2 Qbo) were analyzed for VOCs. Table 6.29-7 presents the detected organic chemicals. Plates 40 and 41 show the spatial distribution of detected organic chemicals.

Dioxins and Furans

Dioxins and furans are frequently detected as a result of environmental sampling but generally are not associated with industrial activities conducted at the Laboratory or released from SWMUs or AOCs being investigated at the Laboratory. The investigation work plan for Middle Los Alamos Canyon Aggregate Area (LANL 2006, 092571.12) notes the potential for presence of dioxins and furans in the OWR fuel pit recirculation pump system, and a small percentage of the investigation samples collected around the OWR were analyzed for dioxins and furans to determine whether a release may have occurred. If the results were indicative of a release, additional sampling for dioxins and furans would be proposed.

Dioxins and furans are known to be widely distributed in the environment from a number of sources, both natural, such as forest fires, and anthropogenic, such as industrial sources and burning of municipal trash and other waste materials. Industrial sources of dioxins and furans are primarily associated with impurities in the production of chlorinated chemical products (e.g., pentachlorophenol, chlorinated herbicides) and the wastes associated with production of those materials. Another industrial source is the pulp and paper industry and processes that bleach wood pulp (EPA 2006, 600913). None of these common industrial process-related source activities have occurred at the Laboratory. Other anthropogenic sources of dioxins and furans include the combustion of materials containing chlorine, such as the incineration of municipal trash containing chlorinated plastics, and other waste materials (EPA 2006, 600913). Forest fires have occurred in the Los Alamos area, including upgradient of TA-02 in the Los Alamos Canyon watershed, and are a potential source of dioxins and furans.

Polycyclic Aromatic Hydrocarbons

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

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

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

Site Activities

AOC 02-011(a)(viii) is a CMP used to convey storm water and was identified as an AOC because of the potential for the storm water to have contained radioactivity. There are no known site-related sources of dioxins and furans or PAHs in the storm water collected by AOC 02-011(a)(viii).

The dioxin and furan congeners detected at AOC 02-011(a)(viii) were detected at concentrations ranging from 0.000000156 mg/kg to 0.000388 mg/kg, with most detections being hepta-, hexa-, and octa-chlorinated congeners. These results likely reflect natural and/or anthropogenic background rather than a site-related release. The dioxin and furan congeners detected in samples used to characterize this site [1,2,3,4,6,7,8-heptachlorodibenzodioxin; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; 1,2,3,4,7,8-hexachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; and 2,3,7,8-tetrachlorodibenzofuran] are not related to historical Laboratory site operations and are not COPCs.

AOC 02-011(a)(viii) is located to the south of the OWR, in an area that was formerly covered with asphalt paving. PAHs were analyzed only in samples from two locations and were detected only in samples from location 02-600449. PAHs were detected in surface and shallow subsurface samples and were not detected in the deepest samples at each location. The PAHs detected in samples used to characterize this site [acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene, naphthalene, phenanthrene; and pyrene] appear to be associated with asphalt paving, are not related to historical Laboratory site operations, and are not COPCs.

Organic COPCs

Other organic chemicals detected at AOC 02-011(a)(viii) include Aroclor-1254, Aroclor-1260, bis(2-ethylhexyl)phthalate, chloroform, and methylene chloride. The detected organic chemicals listed are retained as COPCs.

Radionuclides

A total of 7 samples (2 soil, 3 Qal, and 2 Qbo) were analyzed for americium-241; 23 samples (12 soil, 4 Qal, 6 Qbo, and 1 sediment) were analyzed for gamma-emitting radionuclides, isotopic plutonium, and tritium; 18 samples (12 soil, 3 Qal, 2 Qbo, and 1 sediment) were analyzed for isotopic uranium and strontium-90; and 10 soil samples were analyzed for technetium-99. Table 6.29-8 presents the radionuclides detected or detected above BVs/FVs. Plate 38 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Cesium-137 was detected below 1 ft bgs in two soil samples with a maximum activity of 0.432 pCi/g. Cesium-137 is retained as a COPC.

Cobalt-60 was detected in three samples with a maximum activity of 0.598 pCi/g. Cobalt-60 is retained as a COPC.

Plutonium-239/240 was detected above the sediment FV (0.068 pCi/g) in two samples and was detected below 1 ft bgs in one soil sample with a maximum activity of 1.87 pCi/g. Plutonium-239/240 is retained as a COPC.

Tritium was detected in 17 samples with a maximum activity of 0.773 pCi/g. Tritium is retained as a COPC.

Uranium-235/236 was detected above the Qbt 1g, Qct, Qbo BV (0.18 pCi/g) in 1 Qbo sample at an activity of 0.195 pCi/g. The activity was only 0.015 pCi/g above the BV and uranium-235/236 was not detected or detected above BV in 18 other samples (detected below BV in 16 samples). The sample where uranium-235/236 was detected above BV was a deep subsurface sample and uranium-235/236 was not detected above BV in shallower samples at that location. The results appear indicative of variations in natural background rather than a release. Uranium-235/236 is not a COPC.

AOC 02-011(a)(ix)

Decision-level data at AOC 02-011(a)(ix) consist of results from 67 samples collected from 22 locations in 2000, 2003, 2007, and 2010. The 67 samples include 22 soil, 21 Qal, 22 Qbo, and 2 sediment samples. Table 6.29-9 presents the samples collected and analyses requested for AOC 02-011(a)(ix).

Inorganic Chemicals

A total of 67 samples (22 soil, 21 Qal, 22 Qbo, and 2 sediment) were analyzed for TAL metals, 65 samples (22 soil, 21 Qal, and 22 Qbo) were analyzed for hexavalent chromium, and 56 samples (18 soil, 19 Qal, and 19 Qbo) were analyzed for nitrate, perchlorate, and total cyanide. Table 6.29-10 presents the inorganic chemicals detected or detected above BVs. Plate 39 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV (3560 mg/kg) in 19 samples with a maximum concentration of 13,800 mg/kg. The Gehan and quantile tests indicated site concentrations of aluminum in tuff are statistically different from background (Figure G-243 and Table G-38). Aluminum is retained as a COPC.

Antimony was not detected but had DLs (0.509 mg/kg to 1.4 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs (0.83 mg/kg and 0.5 mg/kg) in two soil samples and six tuff samples. There were too few detections to perform statistical tests. Antimony is retained as a COPC.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV (0.56 mg/kg) in 16 samples with a maximum concentration of 3.43 mg/kg and was not detected but had DLs (0.992 mg/kg to 1.9 mg/kg) above the BV in 5 samples. The quantile and slippage tests indicated site concentrations of arsenic in tuff are statistically different from background (Figure G-244 and Table G-38). Arsenic is retained as a COPC.

Barium was detected above the Qbt 1g, Qct, Qbo BV (25.7 mg/kg) in 11 samples with a maximum concentration of 2120 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in tuff are statistically different from background (Figure G-245 and Table G-38). Barium is retained as a COPC.

Cadmium was detected above the soil BV (0.4 mg/kg) in 2 samples with a maximum concentration of 0.536 mg/kg and was not detected but had DLs (0.5 mg/kg to 0.699 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs (0.4 mg/kg) in 25 soil samples and 22 tuff samples. There were too few detections in the soil background data set to perform statistical tests and there is no Qbo background data set. Cadmium is retained as a COPC.

Calcium was detected above the soil and Qbt 1g, Qct, Qbo BVs (6120 mg/kg and 1900 mg/kg) in three soil samples and one tuff sample with a maximum concentration of 31,200 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in soil and tuff are not statistically different from background (Figure G-246 and Table G-39, and Figure G-247 and Table G-38, respectively). Calcium is not a COPC.

Chromium was detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs (19.3 mg/kg, 10.5 mg/kg, and 2.6 mg/kg) in 6 soil samples, 1 sediment sample, and 15 tuff samples with a maximum concentration of 45.1 mg/kg and was not detected but had DLs (8.59 mg/kg to 27.7 mg/kg) above the Qbt 1g, Qct, Qbo BV in 7 samples. The Gehan and quantile tests indicated site concentrations of chromium in soil are not statistically different from background (Figure G-248 and Table G-39), but site concentrations of chromium in tuff are statistically different from background (Figure G-249 and Table G-38). Chromium is retained as a COPC.

Copper was detected above the Qbt 1g, Qct, Qbo BV (3.96 mg/kg) in two samples with a maximum concentration of 11.8 mg/kg and was not detected but had DLs (4.47 mg/kg to 16.7 mg/kg) above the Qbt 1g, Qct, Qbo BV and soil BV (14.7 mg/kg) in one soil sample and three tuff samples. The Gehan and quantile tests indicated site concentrations of copper in soil are not statistically different from background (Figure G-250 and Table G-39) but site concentrations of copper in tuff are statistically different from background (Figure G-251 and Table G-38). Copper is retained as a COPC.

Cyanide was detected above the soil BV (0.5 mg/kg) in 1 sample at a concentration of 0.579 mg/kg. The concentration was only 0.079 mg/kg above the BV and cyanide was not detected or detected above BV in 55 other samples (detected below BV in 11 samples). Cyanide is not a COPC.

Hexavalent chromium was detected in 21 samples with a maximum concentration of 1.14 mg/kg. Hexavalent chromium is retained as a COPC.

Iron was detected above the Qbt 1g, Qct, Qbo BV (3700 mg/kg) in 22 samples with a maximum concentration of 12,400 mg/kg. The Gehan and quantile tests indicated site concentrations of iron in tuff are statistically different from background (Figure G-252 and Table G-38). Iron is retained as a COPC.

Lead was detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs (22.3 mg/kg, 19.7 mg/kg, and 13.5 mg/kg) in four soil samples, one sediment sample, and one tuff sample with a maximum concentration of 2370 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil are not statistically different from background (Figure G-253 and Table G-39), and the quantile and slippage tests indicated site concentrations of lead in tuff are not statistically different from background (Figure G-254 and Table G-38). However, the maximum concentration is substantially greater than the highest concentration in the soil background data set (28 mg/kg). Lead is retained as a COPC.

Magnesium was detected above the Qbt 1g, Qct, Qbo BV (739 mg/kg) in two samples with a maximum concentration of 4800 mg/kg. The Gehan test indicated site concentrations of magnesium in tuff are statistically different from background (Table G-38). However, the quantile and slippage tests indicated site concentrations of magnesium in tuff are not statistically different from background (Figure G-255 and Table G-38). Magnesium is not a COPC.

Manganese was detected above the Qbt 1g, Qct, Qbo BV (189 mg/kg) in 22 samples with a maximum concentration of 816 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in tuff are statistically different from background (Figure G-256 and Table G-38). Manganese is retained as a COPC.

Mercury was detected above the soil and sediment BVs (0.1 mg/kg for both) in 17 soil samples and 2 sediment samples with a maximum concentration of 6.45 mg/kg. Mercury is retained as a COPC.

Nickel was detected above the Qbt 1g, Qct, Qbo BV (2 mg/kg) in six samples with a maximum concentration of 3.09 mg/kg and was not detected but had DLs (2.18 mg/kg to 6.52 mg/kg) above the BV in seven samples. The quantile and slippage tests indicated site concentrations of nickel in tuff are statistically different from background (Figure G-257 and Table G-38). Nickel is retained as a COPC.

Nitrate was detected in 27 samples with a maximum concentration of 9.68 mg/kg. Nitrate is naturally occurring, and the concentrations likely reflect naturally occurring levels. In addition, AOC 02-011(a)(ix) consists of a storm drain and is not a source of nitrate. Nitrate is not a COPC.

Perchlorate was detected in four samples with a maximum concentration of 0.0008 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs (1.52 mg/kg and 0.3 mg/kg) in 9 soil samples and 13 tuff samples with a maximum concentration of 5.63 mg/kg and was not detected but had DLs (1.27 mg/kg to 1.84 mg/kg) above BVs in 7 soil samples and 8 tuff samples. The quantile test indicated site concentrations of selenium in soil are statistically different from background (Figure G-258 and Table G-39). Selenium is retained as a COPC.

Silver was detected above the sediment BV (1 mg/kg) in 1 sediment sample at a concentration of 1.1 mg/kg. The concentration was only 0.1 mg/kg above the BV and silver was not detected or detected above BV in 66 other samples (detected below BV in 52 samples). Silver is not a COPC.

Vanadium was detected above the soil and Qbt 1g, Qct, Qbo BVs (39.6 mg/kg and 4.59 mg/kg) in 1 soil sample and 11 samples with a maximum concentration of 69.5 mg/kg. The Gehan and quantile tests indicated site concentrations of vanadium in soil are not statistically different from background (Figure G-259 and Table G-39) but site concentrations of vanadium in tuff are statistically different from background (Figure G-260 and Table G-38). Vanadium is retained as a COPC.

Zinc was detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs (48.8 mg/kg, 60.2 mg/kg, and 40 mg/kg) in 11 soil samples, 1 sediment sample, and 1 tuff sample with a maximum concentration of 296 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are statistically different from background (Figure G-261 and Table G-39), and the quantile and slippage tests indicated site concentrations of zinc in tuff are not statistically different from background (Figure G-262 and Table G-38). Zinc is retained as a COPC.

Organic Chemicals

A total of 61 samples (18 soil, 21 Qal, and 22 Qbo) were analyzed for PCBs and SVOCs, 18 samples (3 soil, 7 Qal, and 8 Qbo) were analyzed for TPH-DRO, and 38 tuff samples (19 Qal and 19 Qbo) were analyzed for VOCs. Table 6.29-11 presents the detected organic chemicals. Plates 40 and 41 show the spatial distribution of detected organic chemicals.

Organic chemicals detected at AOC 02-011(a)(ix) include acenaphthene; anthracene; Aroclor-1242; Aroclor-1248; 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; chloroform; chrysene; di-n-butylphthalate; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; isopropylbenzene; 4-isopropyltoluene; methylene chloride; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; toluene; TPH-DRO; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; and 1,2-xylene. The detected organic chemicals are retained as COPCs.

Radionuclides

A total of 56 samples (18 soil, 19 Qal, and 19 Qbo) were analyzed for americium-241; 67 samples (22 soil, 21 Qal, 22 Qbo, and 2 sediment) were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium; 62 samples (22 soil, 19 Qal, 19 Qbo, and 2 sediment) were analyzed for strontium-90; and 4 soil samples were analyzed for technetium-99. Table 6.29-12 presents the radionuclides detected or detected above BVs/FVs. Plate 38 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Cesium-134 was detected in one Qbo sample with a maximum activity of 0.235 pCi/g. Cesium-134 is retained as a COPC.

Cesium-137 was detected below 1 ft bgs in five soil and Qal samples with a maximum activity of 0.202 pCi/g. Cesium-137 is retained as a COPC.

Plutonium-239/240 was detected above the sediment FV (0.068 pCi/g) in three samples and detected below 1 ft bgs in three soil and Qal samples with a maximum activity of 1.66 pCi/g. Plutonium-239/240 is retained as a COPC.

Tritium was detected in 21 samples with a maximum activity of 0.168 pCi/g. Tritium is retained as a COPC.

Uranium-234 was detected above the sediment BV (2.59 pCi/g) in one sample at an activity of 2.66 pCi/g. The activity is above the maximum sediment background activity (2.5 pCi/g). Uranium-234 is retained as a COPC.

Uranium-235/236 was detected above the soil and Qbt 1g, Qct, Qbo BVs (0.2 pCi/g and 0.18 pCi/g) in 1 soil sample and 3 Qbo samples with a maximum activity of 0.261 pCi/g. The maximum activity was only 0.061 pCi/g above the Qbt 1g, Qct, Qbo BV, and uranium-235/236 was not detected or detected above background in 64 other samples (detected below BV in 52 samples). Uranium-235/236 is not a COPC.

AOC 02-011(a)(x)

Decision-level data at AOC 02-011(a)(x) consist of results from 53 samples collected from 21 locations in 2000, 2003, 2007, and 2010. The 53 samples include 26 soil, 11 Qal, 14 Qbo, and 2 sediment samples. Table 6.29-13 presents the samples collected and analyses requested for AOC 02-011(a)(x).

Inorganic Chemicals

A total of 43 samples (16 soil, 11 Qal, 14 Qbo, and 2 sediment) were analyzed for TAL metals, 39 samples (16 soil, 11 Qal, and 12 Qbo) were analyzed for hexavalent chromium, and 21 samples (6 soil, 7 Qal, and 8 Qbo) were analyzed for nitrate, perchlorate, and total cyanide. Table 6.29-14 presents the inorganic chemicals detected or detected above BVs. Plate 39 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV (3560 mg/kg) in 10 samples with a maximum concentration of 23,800 mg/kg. The Gehan and quantile tests indicated site concentrations of aluminum in tuff are statistically different from background (Figure G-263 and Table G-40). Aluminum is retained as a COPC.

Antimony was not detected but had DLs (0.531 mg/kg to 5.05 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs (0.83 mg/kg and 0.5 mg/kg) in four soil samples and eight tuff samples. There were too few detections to perform statistical tests. Antimony is retained as a COPC.

Arsenic was detected above the soil and Qbt 1g, Qct, Qbo BVs (8.17 mg/kg and 0.56 mg/kg) in one soil sample and four tuff samples with a maximum concentration of 16.9 mg/kg and was not detected but had DLs (1.07 mg/kg to 2.04 mg/kg) above the Qbt 1g, Qct, Qbo BV in seven samples. The Gehan and quantile tests indicated site concentrations of arsenic in soil are not statistically different from background (Figure G-264 and Table G-41), but the quantile and slippage tests indicated site concentrations of arsenic in tuff are statistically different from background (Figure G-265 and Table G-40). Arsenic is retained as a COPC.

Barium was detected above the soil and Qbt 1g, Qct, Qbo BVs (295 mg/kg and 25.7 mg/kg) in two soil samples and five tuff samples with a maximum concentration of 968 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in soil are not statistically different from background (Figure G-266 and Table G-41), but the Gehan and slippage tests indicated site concentrations of barium in tuff are statistically different from background (Figure G-267 and Table G-40). Barium is retained as a COPC.

Cadmium was not detected but had DLs (0.493 mg/kg to 2.54 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs (0.4 mg/kg for both) in 16 soil samples and 12 tuff samples. There were too few detections in the soil background data set to perform statistical tests and there is no Qbo background data set. Cadmium is retained as a COPC.

Calcium was detected above the soil BV (6120 mg/kg) in four samples with a maximum concentration of 16,660 mg/kg. The Gehan and slippage tests indicated site concentrations of calcium in soil are not statistically different from background (Figure G-268 and Table G-41). Calcium is not a COPC.

Chromium was detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs (19.3 mg/kg, 10.5 mg/kg, and 2.6 mg/kg) in three soil samples, two sediment samples, and eight tuff samples with a maximum concentration of 64.8 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in soil are not statistically different from background (Figure G-269 and Table G-41) but site concentrations of chromium in tuff are statistically different from background (Figure G-270 and Table G-40). Chromium is retained as a COPC.

Cobalt was detected above the soil BV (8.64 mg/kg) in one sample at a concentration of 9.67 mg/kg. The Gehan and quantile tests indicated site concentrations of cobalt in soil are not statistically different from background (Figure G-271 and Table G-41). Cobalt is not a COPC.

Copper was detected above the soil and sediment BVs (14.7 mg/kg and 11.2 mg/kg) in one soil sample and one sediment sample with a maximum concentration of 52 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in soil are not statistically different from background (Figure G-272 and Table G-41). There were too few sediment samples to perform statistical tests. Copper is retained as a COPC.

Cyanide was detected above the soil BV (0.5 mg/kg) in 1 sample at a concentration of 0.579 mg/kg. The concentration was only 0.079 mg/kg above the BV and cyanide was not detected or detected above BV in 55 other samples (detected below BV in 11 samples). Cyanide is not a COPC.

Hexavalent chromium was detected in 15 samples with a maximum concentration of 0.693 mg/kg. Hexavalent chromium is retained as a COPC.

Iron was detected above the soil and Qbt 1g, Qct, Qbo BVs (21,500 mg/kg and 3700 mg/kg) in 1 soil sample and 14 tuff samples with a maximum concentration of 66,400 mg/kg. The Gehan and quantile tests indicated site concentrations of iron in soil are not statistically different from background (Figure G-273 and Table G-41) but site concentrations of iron in tuff are statistically different from background (Figure G-274 and Table G-40). Iron is retained as a COPC.

Lead was detected above the soil and sediment BVs (22.3 mg/kg and 19.7 mg/kg) in one soil sample and one sediment sample with a maximum concentration of 45 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil are not statistically different from background (Figure G-275 and Table G-41). There were too few sediment samples to perform statistical tests. Lead is retained as a COPC.

Magnesium was detected above the Qbt 1g, Qct, Qbo BV (739 mg/kg) in one sample at a concentration of 832 mg/kg. The Gehan and quantile tests indicated site concentrations of magnesium in tuff are not statistically different from background (Figure G-276 and Table G-40). Magnesium is not a COPC.

Manganese was detected above the Qbt 1g, Qct, Qbo BV (189 mg/kg) in 10 samples with a maximum concentration of 566 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in tuff are statistically different from background (Figure G-277 and Table G-40). Manganese is retained as a COPC.

Mercury was detected above the soil and sediment BVs (0.1 mg/kg for both) in four soil samples and two sediment samples with a maximum concentration of 0.656 mg/kg. Mercury is retained as a COPC.

Nickel was detected above the Qbt 1g, Qct, Qbo BV (2 mg/kg) in two samples with a maximum concentration of 3.52 mg/kg and was not detected but had a DL (3.76 mg/kg) above the BV in one sample. The quantile and slippage tests indicated site concentrations of nickel in tuff are not statistically different from background (Figure G-278 and Table G-40). Nickel is not a COPC.

Nitrate was detected in six samples with a maximum concentration of 2.35 mg/kg. Nitrate is naturally occurring, and the concentrations likely reflect naturally occurring levels. In addition, AOC 02-011(a)(x) consists of a storm drain and is not a source of nitrate. Nitrate is not a COPC.

Perchlorate was detected in five samples with a maximum concentration of 0.00114 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the sediment and Qbt 1g, Qct, Qbo BVs (0.3 mg/kg for both) in 2 sediment samples and 4 tuff samples with a maximum concentration of 6.17 mg/kg and was not detected but had DLs (1.21 mg/kg to 5.71 mg/kg) above the soil BV (1.52 mg/kg) and Qbt 1g, Qct, Qbo BV in 7 soil samples and 10 tuff samples. There were too few sediment samples to perform statistical tests. Selenium is retained as a COPC.

Silver was detected above the sediment BV (1 mg/kg) in 2 sediment samples with a maximum concentration of 1.1 mg/kg. The maximum concentration was only 0.1 mg/kg above the BV and silver was not detected or detected above BV in 41 other samples (detected below BV in 27 samples). Silver is not a COPC.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV (4.59 mg/kg) in four samples with a maximum concentration of 8.09 mg/kg. The Gehan and quantile tests indicated site concentrations of vanadium in tuff are statistically different from background (Figure G-279 and Table G-40). Vanadium is retained as a COPC.

Zinc was detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs (48.8 mg/kg, 60.2 mg/kg, and 40 mg/kg) in six soil samples, two sediment samples, and one tuff sample with a maximum concentration of 914 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are not statistically different from background (Figure G-280 and Table G-41), and the quantile and slippage tests indicated site concentrations of zinc in tuff are not statistically different from background (Figure G-281 and Table G-40). However, the maximum concentration is substantially greater than the highest concentration in the soil background data set (75.5 mg/kg). Zinc is retained as a COPC.

Organic Chemicals

A total of 41 samples (16 soil, 11 Qal, and 14 Qbo) were analyzed for PCBs, 31 samples (6 soil, 11 Qal, and 14 Qbo) were analyzed for SVOCs, 4 samples (1 soil, 1 Qal, and 2 Qbo) were analyzed for TPH-DRO, and 15 tuff samples (7 Qal and 8 Qbo) were analyzed for VOCs. Table 6.29-15 presents the detected organic chemicals. Plates 40 and 41 show the spatial distribution of detected organic chemicals.

Polycyclic Aromatic Hydrocarbons

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

PAHs are known to be widely distributed in the environment from a number of sources, both natural, such as forest fires, and anthropogenic, such as combustion of fossil fuels, oil drips off motor vehicles, vehicle tires, coal tar pitch, and weathering or eroding of asphalt pavement (Kose et al. 2008, 219977; Teaf 2008, 219976). PAHs from these sources generally occur as complex mixtures, not as single compounds.

Individual PAH compounds can be manufactured for research purposes, and some PAHs (e.g., anthracene, fluorene, naphthalene, and pyrene) are used in dye production, the manufacture of synthetic fibers, and in plastics and pesticides.

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

Site Activities

AOC 02-011(a)(x) is a series concrete ditches and a CMP used to convey storm water and was identified as an AOC because of the potential for the storm water to have contained radioactivity. There are no known site-related sources of PAHs in the storm water collected by AOC 02-011(a)(x). Because of the potential for petroleum use at OWR, samples at two locations were analyzed for TPH-DRO. TPH-DRO was detected in only two of eight samples and the sample with the highest TPH-DRO concentration did not have any detectable PAHs. Therefore, the source of TPH-DRO does not appear to also be a source of PAHs.

AOC 02-011(a)(x) is located east and south of the OWR in areas formerly covered with asphalt paving or adjacent to formerly paved areas. PAHs were detected only in surface samples and not in deeper samples. The PAHs detected in samples used to characterize this site [acenaphthene, anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene, naphthalene, phenanthrene; and pyrene] appear to be associated with asphalt paving, are not related to historical Laboratory site operations, and are not COPCs.

Organic COPCs

Other organic chemicals detected at AOC 02-011(a)(x) include Aroclor-1254, Aroclor-1260, di-n-butylphthalate, methylene chloride, toluene, and TPH-DRO. The detected organic chemicals listed are retained as COPCs.

Radionuclides

A total of 21 samples (6 soil, 7 Qal, and 8 Qbo) were analyzed for americium-241; 43 samples (16 soil, 11 Qal, 14 Qbo, and 2 sediment) were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium; 38 samples (16 soil, 9 Qal, 11 Qbo, and 2 sediment) were analyzed for strontium-90; and 10 soil samples were analyzed for technetium-99. Table 6.29-16 presents the radionuclides detected or detected above BVs/FVs. Plate 38 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Cesium-137 was detected below 1 ft bgs in two soil samples with a maximum activity of 0.121 pCi/g. Cesium-137 is retained as a COPC.

Plutonium-239/240 was detected above the soil and sediment FVs (0.054 pCi/g and 0.068 pCi/g) in three soil samples and three sediment samples with a maximum activity of 1.67 pCi/g. Plutonium-239/240 is retained as a COPC.

Tritium was detected in 21 samples with a maximum activity of 0.148 pCi/g. Tritium is retained as a COPC.

Uranium-235/236 was detected above the Qbt 1g, Qct, Qbo BV (0.18 pCi/g) in 1 Qbo sample with a maximum activity of 0.194 pCi/g. The maximum activity was only 0.014 pCi/g above BV and uranium-235/236 was not detected or detected above background in 43 other samples (detected below BV in 28 samples). Uranium-235/236 is not a COPC.

6.29.4.4 Nature and Extent of Contamination

6.29.4.4.1 AOC 02-011(a)(i,ii,iii,iv,v,vi)

Inorganic Chemicals

Inorganic COPCs at AOC 02-011(a)(i,ii,iii,iv,v,vi) include aluminum, antimony, arsenic, cadmium, chromium, hexavalent chromium, iron, manganese, mercury, perchlorate, selenium, and zinc.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV in 11 samples with a maximum concentration of 11,300 mg/kg. Concentrations increased with depth at most locations. The detections above BV were generally in the deepest samples collected at each location and aluminum was not detected above BV in overlying soil samples. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 6.9 times the maximum concentration, and the industrial SSL is approximately 114 times the maximum concentration. Further sampling for extent of aluminum is not warranted.

Antimony was not detected but had DLs (0.513 mg/kg to 5.14 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs in 6 soil samples and 21 tuff samples. The residential SSL is approximately 6.1 times the maximum DL, and the industrial SSL is approximately 101 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV in 4 samples with a maximum concentration of 2.36 mg/kg and was not detected but had DLs (1.04 mg/kg to 1.88 mg/kg) above the BV in 22 samples. Concentrations did not change substantially with depth (0.14 mg/kg) at location 02-600534, decreased with depth at all other locations, and increased laterally (concentrations in shallow samples at locations 02-600407, 02-600533, and 02-600534 were 2.09 mg/kg, 1.55 mg/kg, and 2.22 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 3 times the maximum concentration, and the industrial SSL is approximately 15 times the maximum concentration. The residential SSL is approximately 3.8 times the maximum DL, and the industrial SSL is approximately 19 times the maximum DL. Further sampling for extent of arsenic is not warranted.

Cadmium was not detected but had DLs (0.497 mg/kg to 0.654 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs in 22 soil samples and 25 tuff samples. The residential SSL is approximately 108 times the maximum DL. Further sampling for extent of cadmium is not warranted.

Chromium was detected above the soil and Qbt 1g, Qct, Qbo BVs in three soil samples and seven tuff samples with a maximum concentration of 27 mg/kg. Concentrations increased with depth at location 02-600407, did not change substantially with depth (2.1 mg/kg) at location 02-600534, decreased with depth at all other locations, and decreased laterally (the concentration in a shallow sample at location 02-600534 was 13.2 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 3.6 times the maximum concentration, and the industrial SSL is approximately 19 times the maximum concentration. Lateral extent of chromium is defined and further sampling for vertical extent is not warranted.

Hexavalent chromium was detected in one sample at a concentration of 0.448 mg/kg. Concentrations decreased with depth at location 02-612436 and decreased laterally. Lateral and vertical extent of hexavalent chromium are defined.

Iron was detected above the Qbt 1g, Qct, Qbo BV in 26 samples with a maximum concentration of 7450 mg/kg. The detections above BV were generally in the deepest samples collected at each location and iron was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations decreased laterally. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 7.4 times the maximum concentration, and the industrial SSL is approximately 122 times the maximum concentration. Lateral extent of iron is defined and further sampling for vertical extent is not warranted.

Manganese was detected above the Qbt 1g, Qct, Qbo BV in 17 samples with a maximum concentration of 298 mg/kg. The detections above BV were generally in the deepest samples collected at each location and manganese was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations decreased laterally. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 35 times the maximum concentration. Lateral extent of manganese is defined and further sampling for vertical extent is not warranted.

Mercury was detected above the soil and Qbt 1g, Qct, Qbo BVs in 11 soil samples and 3 tuff samples with a maximum concentration of 40.6 mg/kg. Concentrations decreased with depth at all locations. The maximum concentration (40.6 mg/kg) was detected at location 02-612346 and concentrations decreased laterally to the south along AOC 02-011(a)(vi). Lateral extent in other directions is defined by lower mercury concentrations in surrounding samples at AOC 02-004(a) locations 02-600415, 02-600546, 02-600547 (Plate 7). Lateral and vertical extent of mercury are defined.

Perchlorate was detected in three samples with a maximum concentration of 0.00131 mg/kg. Concentrations increased with depth at location 02-600534, only one depth was sampled at location 02-600408, concentrations decreased with depth at all other locations, and concentrations increased laterally. The residential SSL is approximately 41,800 times the maximum concentration. Further sampling for extent of perchlorate is not warranted.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs in 1 soil sample and 3 tuff samples with a maximum concentration of 2.41 mg/kg and was not detected but had DLs (1.04 mg/kg to 1.96 mg/kg) above the BVs in 8 soil samples and 23 tuff samples. Concentrations decreased with depth at all locations and increased laterally (the concentration in a shallow sample at location 02-600451 was 1.32 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 162 times the maximum concentration. Vertical extent of selenium is defined and further sampling for lateral extent is not warranted.

Zinc was detected above the soil BV in six samples with a maximum concentration of 78.2 mg/kg. Concentrations decreased with depth at all locations and increased laterally. The residential SSL is approximately 301 times the maximum concentration. Vertical extent of zinc is defined and further sampling for lateral extent is not warranted.

Organic Chemicals

Organic COPCs at AOC 02-011(a)(i,ii,iii,iv,v,vi) include Aroclor-1242, Aroclor-1254, Aroclor-1260, chloroform, di-n-butylphthalate, methylene chloride, and toluene.

Aroclor-1242 was detected in one sample at a concentration of 0.0162 mg/kg. Only one depth was sampled at location 02-612440 and concentrations decreased laterally. The residential SSL is approximately 150 times the maximum concentration. Further sampling for extent of Aroclor-1242 in not warranted.

Aroclor-1254 was detected in 37 samples with a maximum concentration of 14.3 mg/kg. Concentrations increased with depth at locations 02-612446, 02-612466, 02-612468, 02-613122, and 02-613700; only one depth was sampled at locations 02-600408, 02-612435, 02-612440, and 02-612447; concentrations decreased with depth at all other locations; and increased laterally. All detections of Aroclor-1254 concentrations above the residential SSL were at locations 02-613667 and 02-613699, adjacent to SWMU 02-014 and will be addressed as part of future actions at SWMU 02-014 (section 6.35). Further sampling for extent of Arochlor-1254 at AOC 02-011(a)(i,ii,iii,iv,v,vi) is not warranted.

Aroclor-1260 was detected in 96 samples with a maximum concentration of 44.8 mg/kg. Concentrations increased with depth at locations 02-600385, 02-600450, 02-600386, 02-612438, 02-612435, 02-612446, 02-612448, 02-612452, 02-612466, 02-612468, 02-613001, 02-613003, 02-613289, 02-613626, 02-613668, and 02-613700; concentrations did not change substantially with depth (1.3 mg/kg) at location 02-613292; only one depth was sampled at locations 02-612436, 02-612437, 02-612444, 02-612446, 02-612447, 02-6123118, 02-6123120, 02-6123121, 02-613292, and 02-613762; and concentrations increased laterally. Aroclor-1260 concentrations above the residential SSL were at locations 02-600449, 02-612451, 02-613001, 02-613002, 02-613287, 02-613288, 02-613289, 02-613626, 02-613627, 02-613667, 02-613668, 02-613699, 02-613761, and 02-613762 adjacent to SWMU 02-014 and will be addressed as part of future actions at SWMU 02-014 (section 6.35). Further sampling for extent of Arochlor-1260 at AOC 02-011(a)(i,ii,iii,iv,v,vi) is not warranted.

Chloroform was detected in one sample at a concentration of 0.000237 mg/kg. Concentrations decreased with depth and decreased laterally. The lateral and vertical extent of chloroform are defined.

Di-n-butylphthalate was detected in two samples with a maximum concentration of 0.151 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of di-n-butylphthalate is defined.

Methylene chloride was detected in one sample at a concentration of 0.00273 mg/kg. Concentrations increased with depth and decreased laterally. The residential SSL is approximately 150,000 times the maximum concentration. Lateral extent of methylene chloride is defined and further sampling for vertical extent is not warranted.

Toluene was detected in one sample at a concentration of 0.000465 mg/kg. Concentrations increased with depth and decreased laterally. The residential SSL is approximately 11,200,000 times the maximum concentration. Lateral extent of toluene is defined and further sampling for vertical extent is not warranted.

Radionuclides

Radionuclide COPCs at AOC 02-011(a)(i,ii,iii,iv,v,vi) include americium-241, cesium-137, cobalt-60, plutonium-239/240, and tritium.

Americium-241 was detected above the soil FV in one sample at an activity of 0.0924 pCi/g. Activities decreased with depth and decreased laterally. Lateral and vertical extent of americium-241 are defined.

Cesium-137 was detected in one tuff sample at an activity of 0.303 pCi/g. Activities increased with depth and decreased laterally. The residential SAL is approximately 40 times the maximum activity. Lateral extent of cesium-137 is defined and further sampling for vertical extent is not warranted.

Cobalt-60 was detected in one sample at an activity of 0.762 pCi/g. Activities decreased with depth and increased laterally. The residential SAL is approximately 3.4 times and the industrial SAL is approximately 12 times the maximum activity. Vertical extent of cobalt-60 is defined and further sampling for lateral extent is not warranted.

Plutonium-239/240 was detected above the soil FV in three samples and was detected below 1 ft bgs in two soil samples with a maximum activity of 0.182 pCi/g. Activities decreased with depth at all locations and decreased laterally. The residential SAL is approximately 434 times the maximum activity. Lateral extent of plutonium-239/240 is defined and further sampling for vertical extent is not warranted.

Tritium was detected in 16 samples with a maximum activity of 0.097 pCi/g. Activities increased with depth at locations 02-600406, 02-600407, 02-600450, 02-600533, and 02-612346; decreased with depth at all other locations; and increased laterally. The residential SAL is approximately 17,500 times the maximum activity. Further sampling for extent of tritium is not warranted.

Summary of Nature and Extent

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at AOC 02-011(a)(i,ii,iii,iv,v,vi).

6.29.4.4.2 AOC 02-011(a)(viii)

Inorganic Chemicals

Inorganic COPCs at AOC 02-011(a)(viii) include aluminum, antimony, arsenic, barium, cadmium, chromium, copper, hexavalent chromium, iron, lead, manganese, mercury, selenium, and zinc.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV in five samples with a maximum concentration of 22,000 mg/kg. Concentrations increased with depth at locations 02-600542 and 02-600543, decreased with depth at location 02-612292, and increased laterally. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 3.6 times the maximum concentration, and the industrial SSL is approximately 59 times the maximum concentration. Further sampling for extent of aluminum is not warranted.

Antimony was not detected but had DLs above the soil and Qbt 1g, Qct, Qbo BVs in one soil sample and six tuff samples. The residential SSL is approximately 24 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV in two samples with a maximum concentration of 1.41 mg/kg and was not detected but had DLs (1.28 mg/kg and 1.29 mg/kg) above the BV in three samples. Concentrations decreased with depth at locations 02-600542 and 02-600543 (concentrations in shallow samples at locations 02-600542 and 02-600543 were 3.4 mg/kg and 2.89 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 5.0 times the maximum concentration, and the industrial SSL is approximately 25 times the maximum concentration. The residential SSL is approximately 5.5 times the maximum DL, and the industrial SSL is approximately 28 times the maximum DL. Further sampling for extent of arsenic is not warranted.

Barium was detected above the Qbt 1g, Qct, Qbo BV in two samples with a maximum concentration of 221 mg/kg. Concentrations increased with depth at all locations and decreased downgradient. The residential SSL is approximately 68 times the maximum DL, and the industrial SSL is approximately 1150 times the maximum DL. Further sampling for extent of barium is not warranted.

Cadmium was detected above the soil and sediment BVs in one soil sample and 1 sediment sample with a maximum concentration of 0.63 mg/kg and was not detected but had DLs (0.513 mg/kg to 0.664 mg/kg) above the soil Qbt 1g, Qct, Qbo BVs in 10 soil samples and six tuff samples. Concentrations decreased with depth at locations 02-01152 and 02-22351 and increased laterally. The residential SSL is approximately 112 times the maximum concentration and 107 times the maximum DL. Further sampling for extent of cadmium is not warranted.

Chromium was detected above the soil and Qbt 1g, Qct, Qbo BVs in two soil samples and three tuff samples with a maximum concentration of 33.4 mg/kg. Concentrations increased with depth at location and 02-600543, decreased with depth at all other locations, and increased laterally. The sample with the maximum concentration was also analyzed for hexavalent chromium. The hexavalent chromium concentration was 0.25 mg/kg, indicating a trivalent chromium concentration of approximately 33.1 mg/kg. The residential SSL for trivalent chromium (117,000 mg/kg) is approximately 3530 times this concentration. Further sampling for extent of chromium is not warranted.

Copper was detected above the soil and sediment BVs in one soil sample and one sediment sample with a maximum concentration of 17 mg/kg. Concentrations decreased with depth at all locations and increased laterally. The residential SSL is approximately 184 times the maximum concentration. Vertical extent of copper is defined and further sampling for lateral extent is not warranted.

Hexavalent chromium was detected in 11 samples with a maximum concentration of 2.12 mg/kg. Concentrations increased with depth at locations 02-22351 and 02-600542, decreased with depth at all other locations, and increased laterally. The residential SSL is approximately 1.4 times the maximum concentration, and the industrial SSL is approximately 5.2 times the maximum concentration. The maximum concentration was detected at location 02-600542 in a sample collected from below 10 ft bgs beyond the depth intervals evaluated for risk. The residential SSL is approximately 4.5 times the maximum concentration, and the industrial SSL is approximately 16 times the maximum concentration above 10 ft bgs (0.676 mg/kg at location 02-22352). Further sampling for extent of hexavalent chromium is not warranted.

Iron was detected above the Qbt 1g, Qct, Qbo BV in six samples with a maximum concentration of 7550 mg/kg. Concentrations decreased with depth at all locations and increased laterally (concentrations in shallow samples at locations 02-600542 and 02-600543 were 10,100 mg/kg and 7170 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 7.3 times the maximum concentration, and the industrial SSL is approximately 120 times the maximum concentration. Vertical extent of iron is defined and further sampling for lateral extent is not warranted.

Lead was detected above the soil and sediment BVs in one soil sample and one sediment sample with a maximum concentration of 40 mg/kg. Concentrations decreased with depth at all locations and increased laterally. The residential SSL is approximately 10 times the maximum concentration, and the industrial SSL is approximately 20 times the maximum concentration. Vertical extent of lead is defined and further sampling for lateral extent is not warranted.

Manganese was detected above the Qbt 1g, Qct, Qbo BV in six samples with a maximum concentration of 267 mg/kg. Concentrations did not change substantially with depth (24 mg/kg) at location 02-612292, decreased with depth at all other locations, and did not change substantially laterally (4 mg/kg) (the concentration in a shallow sample at location 02-600543 was 257 mg/kg and below the soil BV

[Appendix F, Pivot Tables]. The residential SSL is approximately 39 times the maximum concentration. Further sampling for extent of manganese is not warranted.

Mercury was detected above the soil and sediment BVs (0.1 mg/kg for both) in 14 soil samples and 1 sediment sample with a maximum concentration of 5.26 mg/kg. Concentrations increased with depth at location 02-22374, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 4.5 times the maximum concentration, and the industrial SSL is approximately 74 times the maximum concentration. Lateral extent of mercury is defined and further sampling for vertical extent is not warranted.

Selenium was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 0.801 mg/kg and was not detected but had DLs (1.28 mg/kg to 1.9 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs in one soil sample and five tuff samples. Concentrations decreased with depth at location 02-600543 and decreased laterally (the concentration in a shallow sample at location 02-600543 was 0.846 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 206 times the maximum DL. Further sampling for extent of selenium is not warranted.

Zinc was detected above the soil and sediment BVs in one soil sample and one sediment sample with a maximum concentration of 390 mg/kg. Concentrations decreased with depth at all locations and increased laterally. The residential SSL is approximately 60 times the maximum concentration. Vertical extent of zinc is defined and further sampling for lateral extent is not warranted.

Organic Chemicals

Organic COPCs at AOC 02-011(a)(viii) include Aroclor-1242, Aroclor-1254, Aroclor-1260, bis(2-ethylhexyl)phthalate, chloroform, and methylene chloride.

Aroclor-1242 was detected in one sample at a concentration of 0.213 mg/kg. Concentrations increased with depth and decreased laterally. The residential SSL is approximately 11 times the maximum concentration, and the industrial SSL is approximately 47 times the maximum concentration. Lateral extent of Aroclor-1242 is defined and further sampling for vertical extent is not warranted.

Aroclor-1254 was detected in three samples with a maximum concentration of 0.334 mg/kg. Concentrations increased with depth at location 02-612292, decreased with depth at location 02-600542, and decreased laterally. The residential SSL is approximately 3.4 times the maximum concentration, and the industrial SSL is approximately 33 times the maximum concentration. Lateral extent of Aroclor-1254 is defined and further sampling for vertical extent is not warranted.

Aroclor-1260 was detected in six samples with a maximum concentration of 0.0546 mg/kg. Concentrations increased with depth at location 02-612292, did not change substantially with depth (0.085 mg/kg) at location 600543, decreased with depth at location 02-600542, and did not change substantially laterally (0.0169). The residential SSL is approximately 45 times the maximum concentration. Further sampling for extent of Aroclor-1260 is not warranted.

Bis(2-ethylhexyl)phthalate was detected in one sample at a concentration of 0.231 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

Chloroform was detected in one sample at a concentration of 0.000304 mg/kg. Concentrations increased with depth and decreased laterally. The detected concentration was below the EQL. The residential SSL is approximately 11,800 times the maximum concentration. Lateral extent of chloroform is defined and further sampling for vertical extent is not warranted.

Methylene chloride was detected in one sample at a concentration of 0.00361 mg/kg. Concentrations increased with depth and decreased laterally. The residential SSL is approximately 113,000 times the maximum concentration. Lateral extent of methylene chloride is defined and further sampling for vertical extent is not warranted.

Radionuclides

Radionuclide COPCs at AOC 02-011(a)(viii) include cesium-137, cobalt-60, plutonium-239/240, and tritium.

Cesium-137 was detected below 1 ft bgs in two soil samples with a maximum activity of 0.432 pCi/g. Activities increased with depth at location 02-22351, decreased with depth at location 02-22352, and decreased laterally. The residential SAL is approximately 28 times the maximum activity. Lateral extent of cesium-137 is defined and further sampling for vertical extent is not warranted.

Cobalt-60 was detected in three samples with a maximum activity of 0.598 pCi/g. Activities decreased with depth at all locations and increased laterally. The residential SAL is approximately 4.4 times the maximum activity, and the industrial SAL is approximately 15 times the maximum activity. Vertical extent of cobalt-60 is defined and further sampling for vertical extent is not warranted.

Plutonium-239/240 was detected above the sediment FV in two samples and was detected below 1 ft bgs in one soil sample with a maximum activity of 1.87 pCi/g. Activities increased with depth at location 02-22351, decreased with depth at location 02-01152, and increased laterally. The residential SAL is approximately 42 times the maximum activity. Vertical extent of plutonium-239/240 is defined and further sampling for lateral extent is not warranted.

Tritium was detected in 17 samples with a maximum activity of 0.773 pCi/g. Activities increased with depth at locations 02-22351, 02-22352, and 02-600543; did not change substantially with depth (0.069 pCi/g) at location 02-01152; decreased with depth at all other locations; and decreased laterally. The residential SAL is approximately 2200 times the maximum activity. Lateral extent of tritium is defined and further sampling for vertical extent is not warranted.

Summary of Nature and Extent

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at AOC 02-011(a)(viii).

6.29.4.4.3 AOC 02-011(a)(ix)

Inorganic Chemicals

Inorganic COPCs at AOC 02-011(a)(ix) include aluminum, antimony, arsenic, barium, cadmium, chromium, copper, hexavalent chromium, iron, lead, manganese, mercury, nickel, perchlorate, selenium, vanadium, and zinc.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV in 19 samples with a maximum concentration of 13,800 mg/kg. Concentrations increased with depth at most locations. The detections above BV were generally in the deepest samples collected at each location and aluminum was not detected above BV in overlying soil samples. Concentrations increased laterally. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 5.6 times the maximum concentration, and the industrial SSL is approximately 93 times the maximum concentration. Further sampling for extent of aluminum is not warranted.

Antimony was not detected but had DLs (0.509 mg/kg to 1.4 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs in two soil samples and six tuff samples. The residential SSL is approximately 22 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV in 16 samples with a maximum concentration of 3.43 mg/kg and was not detected but had DLs (0.992 mg/kg to 1.9 mg/kg) above the BV in 5 samples. The detections above BV were generally in the deepest samples collected at each location and arsenic was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations decreased laterally. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 2.1 times the maximum concentration, and the industrial SSL is approximately 10.5 times the maximum concentration. The residential SSL is approximately 3.7 times the maximum DL, and the industrial SSL is approximately 19 times the maximum DL. Further sampling for extent of arsenic is not warranted.

Barium was detected above the Qbt 1g, Qct, Qbo BV in 11 samples with a maximum concentration of 2120 mg/kg. The detections above BV were in the deepest samples collected at each location and barium was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations decreased laterally. All detections above BV in tuff were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 76 times the maximum concentration. Further sampling for extent of barium is not warranted.

Cadmium was detected above the soil BV in 2 samples with a maximum concentration of 0.536 mg/kg and was not detected but had DLs (0.5 mg/kg to 0.699 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs in 25 soil samples and 22 tuff samples. Concentrations decreased with depth and decreased laterally. The residential SSL is approximately 101 times the maximum DL. Further sampling for extent of cadmium is not warranted.

Chromium was detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs in 6 soil samples, 1 sediment sample, and 15 tuff samples with a maximum concentration of 45.1 mg/kg and was not detected but had DLs (8.59 mg/kg to 27.7 mg/kg) above the Qbt 1g, Qct, Qbo BV in 7 samples. Concentrations generally decreased or did not change substantially with depth at all locations where chromium was detected above BV in soil or sediment. The detections above BV at all other locations were generally in the deepest samples collected at each location and chromium was not detected above BV in overlying soil samples. Many of the concentrations in overlying soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations decreased laterally. All detections above BV in tuff were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The sample with the maximum concentration was also analyzed for hexavalent chromium. Hexavalent chromium was not detected in that sample, indicating the total chromium concentration was equivalent to a trivalent chromium concentration of approximately 45 mg/kg. The residential SSL for trivalent chromium (117,000 mg/kg) is approximately 2600 times this concentration. Further sampling for extent of chromium is not warranted.

Copper was detected above the Qbt 1g, Qct, Qbo BV in two samples with a maximum concentration of 11.8 mg/kg and was not detected but had DLs (4.47 mg/kg to 16.7 mg/kg) above the Qbt 1g, Qct, Qbo and soil BVs in one soil sample and three tuff samples. Concentrations increased with depth at locations 02-600434 and 02-600440 and decreased laterally. The residential SSL is approximately 265 times the maximum concentration and 187 times the maximum DL. Further sampling for extent of copper is not warranted.

Hexavalent chromium was detected in 21 samples with a maximum concentration of 1.14 mg/kg. Concentrations increased with depth at locations 02-600433, 02-600444, 02-600445, 02-600446, and 02-600447; did not change substantially with depth (0.0108 mg/kg) at location 02-600431; decreased with depth at all other locations; and decreased laterally. The residential SSL is approximately 2.7 times the maximum concentration, and the industrial SSL is approximately 9.7 times the maximum concentration. Further sampling for extent of hexavalent chromium is not warranted.

Iron was detected above the Qbt 1g, Qct, Qbo BV in 22 samples with a maximum concentration of 12,400 mg/kg. The detections above BV were generally in the deepest samples collected at each location and iron was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations decreased laterally. All detections above BV in tuff were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 4.4 times the maximum concentration, and the industrial SSL is approximately 73 times the maximum concentration. Further sampling for extent of iron is not warranted.

Lead was detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs in four soil samples, one sediment sample, and one tuff sample with a maximum concentration of 2370 mg/kg. Concentrations increased with depth at location 02-600434, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 8.2 times and the industrial SSL is approximately 16 times the maximum concentration where vertical extent is not defined (48.8 mg/kg at location 02-600434). Further sampling for extent of lead is not warranted.

Manganese was detected above the Qbt 1g, Qct, Qbo BV in 22 samples with a maximum concentration of 816 mg/kg. The detections above BV were generally in the deepest samples collected at each location and manganese was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations decreased laterally. All detections above BV in tuff were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 13 times the maximum concentration, and the industrial SSL is approximately 196 times the maximum concentration. Further sampling for extent of manganese is not warranted.

Mercury was detected above the soil and sediment BVs in 17 soil samples and 2 sediment samples with a maximum concentration of 6.45 mg/kg. Concentrations increased with depth at location 02-01150, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 48 times the maximum concentration where vertical extent is not defined (0.49 mg/kg at location 02-01150). Lateral extent of mercury is defined and further sampling for vertical extent is not warranted.

Nickel was detected above the Qbt 1g, Qct, Qbo BV in six samples with a maximum concentration of 3.09 mg/kg and was not detected but had DLs (2.18 mg/kg to 6.52 mg/kg) above the BV in seven samples. Concentrations decreased with depth at all locations and decreased laterally (concentrations in shallow samples at locations 02-600433, 02-600440, 02-600442, 02-600446, and 02-600447 were 2.96 mg/kg, 4.06 mg/kg, 4.53 mg/kg, 3.43 mg/kg, and 4.28 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 239 times the maximum DL. Further sampling for extent of nickel is not warranted.

Perchlorate was detected in four samples with a maximum concentration of 0.0008 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of perchlorate are defined.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs in 9 soil samples and 13 tuff samples with a maximum concentration of 5.63 mg/kg and was not detected but had DLs (1.27 mg/kg to 1.84 mg/kg) above BVs in 7 soil samples and 8 tuff samples. Concentrations increased with depth at locations 02-600431, 02-600432, 02-600433, and 02-600434; did not change substantially with depth (0.2 mg/kg or less) at locations 02-600442, 02-600444, and 02-600445; decreased with depth at all other locations; and decreased laterally. The residential SSL is approximately 69 times the maximum concentration and 212 times the maximum DL. Lateral extent of selenium is defined and further sampling for vertical extent is not warranted.

Vanadium was detected above the soil and Qbt 1g, Qct, Qbo BVs in 1 soil sample and 11 samples with a maximum concentration of 69.5 mg/kg. Concentrations increased with depth at location 02-600434; decreased with depth at locations where vanadium was detected above BV in Qbo samples (concentrations in shallow samples at these locations were greater than the concentrations in Qbo samples and below the soil BV [Appendix F, Pivot Tables]), and decreased laterally. The residential SSL is approximately 82 times the maximum concentration where vertical extent is not defined (5.96 mg/kg at location 02-600434). Lateral extent of vanadium is defined and further sampling for vertical extent is not warranted.

Zinc was detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs in 11 soil samples, 1 sediment sample, and 1 tuff sample with a maximum concentration of 296 mg/kg. Concentrations increased with depth at locations 02-01150, 02-22367, and 02-600434; decreased with depth at all other locations; and decreased laterally. The residential SSL is approximately 79 times the maximum concentration. Lateral extent of zinc is defined and further sampling for vertical extent is not warranted.

Organic Chemicals

Organic COPCs at AOC 02-011(a)(ix) include acenaphthene; anthracene; Aroclor-1242; Aroclor-1248; 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; chloroform; chrysene; di-n-butylphthalate; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; isopropylbenzene; 4-isopropyltoluene; methylene chloride; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; toluene; TPH-DRO; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; and 1,2-xylene.

The PAHs 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 from 5 to 24 samples. PAHs were detected most frequently in the surface sample at each location and were not detected in the deepest sample at any location. The maximum concentration of each PAH was detected in a surface sample. Thus, concentrations decreased with depth in all cases and vertical extent of PAHs is defined. The maximum concentrations of each PAH were detected at locations 02-600432, 02-600433, or 02-600434 and concentrations decreased laterally. Lateral and vertical extent of PAHs are defined.

Aroclor-1242 was detected in one sample at a concentration of 0.0103 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of Aroclor-1242 are defined.

Aroclor-1248 was detected in one sample at a concentration of 0.0103 mg/kg. Concentrations decreased with depth and increased laterally. The residential SSL is approximately 12 times the maximum concentration, and the industrial SSL is approximately 54 times the maximum concentration. Vertical extent of Aroclor-1248 is defined and further sampling for lateral extent is not warranted.

Aroclor-1254 was detected in 24 samples with a maximum concentration of 0.232 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of Aroclor-1254 are defined.

Aroclor-1260 was detected in 25 samples with a maximum concentration of 0.268 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of Aroclor-1260 are defined.

Bis(2-ethylhexyl)phthalate was detected in three samples with a maximum concentration of 0.153 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

Chloroform was detected in one sample at a concentration of 0.000218 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of chloroform are defined.

Di-n-butylphthalate was detected in five samples with a maximum concentration of 0.102 mg/kg. Concentrations did not change substantially with depth (0.012 mg/kg) at location 02-600444, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 60,400 times the maximum concentration. Lateral extent of di-n-butylphthalate is defined and further sampling for vertical extent is not warranted.

Isopropylbenzene was detected in two samples with a maximum concentration of 0.00072 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of isopropylbenzene are defined.

Isopropyltoluene[4-] was detected in one sample at a concentration of 0.000534 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of 4-isopropyltoluene are defined.

Methylene chloride was detected in one sample at a concentration of 0.00322 mg/kg. Concentrations increased with depth and decreased laterally. The residential SSL is approximately 127,000 times the maximum concentration. Lateral extent of methylene chloride is defined and further sampling for vertical extent is not warranted.

Toluene was detected in one sample at a concentration of 0.000362 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of toluene are defined.

TPH-DRO was detected in 12 samples with a maximum concentration of 567 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of TPH-DRO are defined.

Trimethylbenzene[1,2,4-]; 1,3,5-trimethylbenzene; and 1,2-xylene were each detected in one sample at concentrations of 0.00329 mg/kg, 0.00101 mg/kg, and 0.000249 mg/kg, respectively. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; and 1,2-xylene are defined.

Radionuclides

Radionuclide COPCs at AOC 02-011(a)(ix) include cesium-134, cesium-137, plutonium-239/240, tritium, and uranium-234.

Cesium-134 was detected in one Qbo sample with a maximum activity of 0.235 pCi/g. Activities increased with depth at location 02-600444 and decreased laterally. The residential SAL is approximately 22 times the maximum activity. Lateral extent of cesium-134 is defined and further sampling for vertical extent is not warranted.

Cesium-137 was detected below 1 ft bgs in five soil and Qal samples with a maximum activity of 0.202 pCi/g. Activities decreased with depth at all locations and decreased laterally. Lateral and vertical extent of cesium-137 are defined.

Plutonium-239/240 was detected above the sediment FV in three samples and detected below 1 ft bgs in three soil and Qal samples with a maximum activity of 1.66 pCi/g. Activities increased with depth at location 02-22349, decreased with depth at all other locations, and increased laterally. The residential SAL is approximately 48 times the maximum activity. Further sampling for extent of plutonium-239/240 is not warranted.

Tritium was detected in 20 samples with a maximum activity of 0.168 pCi/g. Activities increased with depth at locations 02-22367, 02-600432, 02-600437, 02-600442, and 02-600448; did not change substantially with depth (0.0039 pCi/g) at location 02-612345; decreased with depth at all other locations; and decreased laterally. The residential SAL is approximately 10,100 times the maximum activity. Lateral extent of tritium is defined and further sampling for vertical extent is not warranted.

Uranium-234 was detected above the sediment BV in one sample at an activity of 2.66 pCi/g. Activities increased with depth at location 02-01150 and increased laterally. The residential SAL is approximately 109 times the maximum activity. Further sampling for extent of uranium-234 is not warranted.

Summary of Nature and Extent

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at AOC 02-011(a)(ix).

6.29.4.4.4 AOC 02-011(a)(x)

Inorganic Chemicals

Inorganic COPCs at AOC 02-011(a)(x) include aluminum, antimony, arsenic, barium, cadmium, chromium, copper, hexavalent chromium, iron, lead, manganese, mercury, perchlorate, selenium, vanadium, and zinc.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV in 10 samples with a maximum concentration of 23,800 mg/kg. Concentrations increased with depth at most locations. The detections above BV were generally in the deepest samples collected at each location and aluminum was not detected above BV in overlying soil samples. Concentrations decreased laterally. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 3.3 times the maximum concentration, and the industrial SSL is approximately 54 times the maximum concentration. Lateral extent of aluminum is defined and further sampling for vertical extent is not warranted.

Antimony was not detected but had DLs (0.531 mg/kg to 5.05 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs in four soil samples and eight tuff samples. The residential SSL is approximately 6.2 times the maximum DL, and the industrial SSL is approximately 103 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was detected above the soil and Qbt 1g, Qct, Qbo BVs in one soil sample and four tuff samples with a maximum concentration of 16.9 mg/kg and was not detected but had DLs (1.07 mg/kg to 2.04 mg/kg) above the Qbt 1g, Qct, Qbo BV in seven samples. Concentrations did not change substantially with depth (0.12 mg/kg) at location 02-600662, decreased with depth at all other locations, and decreased laterally to the north and south (the concentration in the shallow sample at location 02-600662 was 1.6 mg/kg and below the soil BV [Appendix F, Pivot Tables]). Lateral extent to the east and west is bounded by AOC 02-009(c). The residential SSL is approximately 4.4 times the maximum concentration, and the industrial SSL is approximately 22 times the maximum concentration where vertical extent is not defined (1.6 mg/kg at location 02-600662). Lateral extent of arsenic is defined and further sampling for vertical extent is not warranted.

Barium was detected above the soil and Qbt 1g, Qct, Qbo BVs in two soil samples and five tuff samples with a maximum concentration of 968 mg/kg. Concentrations increased with depth at locations 02-600660 and 02-600663, did not change substantially with depth (0.5 mg/kg) at location 02-600664, decreased with depth at all other locations, and decreased laterally (concentrations in shallow samples at locations 02-600661, 02-600664, and 02-600665 were 78.2 mg/kg, 48.3 mg/kg, and 144 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 16 times the maximum concentration, and the industrial SSL is approximately 263 times the maximum concentration. Lateral extent of barium is defined and further sampling for vertical extent is not warranted.

Cadmium was not detected but had DLs (0.493 mg/kg to 2.54 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs in 16 soil samples and 12 tuff samples. The residential SSL is approximately 28 times the maximum DL. Further sampling for extent of cadmium is not warranted.

Chromium was detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs in three soil samples, two sediment sample, and eight tuff samples with a maximum concentration of 64.8 mg/kg. Concentrations increased with depth at locations 02-01153, 02-600660, and 02-600662; decreased with depth at all other locations; and decreased laterally. The residential SSL is approximately 4.0 times and the industrial SSL is approximately 21 times the maximum concentration where vertical extent is not defined (24 mg/kg at location 02-01153). Lateral extent of chromium is defined and further sampling for vertical extent is not warranted.

Copper was detected above the soil and sediment BVs in one soil sample and one sediment sample with a maximum concentration of 52 mg/kg. Concentrations increased with depth at location 02-01153, decreased with depth at location 02-600663, and increased laterally. The residential SSL is approximately 60 times the maximum concentration. Further sampling for extent of copper is not warranted.

Hexavalent chromium was detected in 15 samples with a maximum concentration of 0.693 mg/kg. Concentrations increased with depth at location 02-22346 and 02-600664, did not change substantially with depth (0.022 mg/kg) at location 02-22347, decreased with depth at all other locations, and increased laterally. The residential SSL is approximately 4.4 times the maximum concentration, and the industrial SSL is approximately 16 times the maximum concentration. Further sampling for extent of hexavalent chromium is not warranted.

Iron was detected above the soil and Qbt 1g, Qct, Qbo BVs in 1 soil sample and 14 tuff samples with a maximum concentration of 66,400 mg/kg. Concentrations did not change substantially with depth (170 mg/kg) at location 02-600662, decreased with depth at all other locations, and decreased laterally (concentrations in shallow samples at locations 02-600662, 02-612348, and 02-612983 were 8410 mg/kg, 7520 mg/kg, and 9440 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 6.4 times and the industrial SSL is approximately 106 times the maximum concentration where vertical extent is not defined (8580 mg/kg at location 02-600662). Lateral extent of iron is defined and further sampling for vertical extent is not warranted.

Lead was detected above the soil and sediment BVs in one soil sample and one sediment sample with a maximum concentration of 45 mg/kg. Concentrations decreased with depth at both locations and increased laterally. The residential SSL is approximately 8.9 times the maximum concentration, and the industrial SSL is approximately 18 times the maximum concentration. Vertical extent of lead is defined and further sampling for vertical lateral is not warranted.

Manganese was detected above the Qbt 1g, Qct, Qbo BV in 10 samples with a maximum concentration of 566 mg/kg. Concentrations did not change substantially with depth (28 mg/kg or less) at locations 02-600662 and 02-600665, decreased with depth at all other locations, and decreased laterally (concentrations in shallow samples at locations 02-600662, 02-600663, 02-612348, and 02-612983 were 270 mg/kg, 503 mg/kg, 330 mg/kg and 375 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 19 times the maximum concentration, and the industrial SSL is approximately 283 times the maximum concentration. Lateral extent of manganese is defined and further sampling for vertical extent is not warranted.

Mercury was detected above the soil and sediment BVs in four soil samples and two sediment samples with a maximum concentration of 0.656 mg/kg. Concentrations did not change with depth at location 02-01153, decreased with depth at all other locations, and increased laterally. The residential SSL is approximately 36 times the maximum concentration. Further sampling for extent of mercury is not warranted.

Perchlorate was detected in five samples with a maximum concentration of 0.00114 mg/kg. Only one depth was sampled at location 02-600666, concentrations decreased with depth at all other locations, and concentrations increased laterally. The residential SSL is approximately 48,100 times the maximum concentration. Further sampling for extent of perchlorate is not warranted.

Selenium was detected above the sediment and Qbt 1g, Qct, Qbo BVs in 2 sediment samples and 4 tuff samples with a maximum concentration of 6.17 mg/kg and was not detected but had DLs (1.21 mg/kg to 5.71 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs in 7 soil samples and 10 tuff samples. Concentrations increased with depth at locations 02-600664 and 02-600665, decreased with depth at location 02-01153, and increased laterally. The residential SSL is approximately 64 times the maximum concentration and 68 times the maximum DL. Further sampling for extent of selenium is not warranted.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV in four samples with a maximum concentration of 8.09 mg/kg. Concentrations did not change substantially with depth (01.63 mg/kg) at location 02-600662, decreased with depth at all other locations, and decreased laterally (concentrations in shallow samples at locations 02-600662 and 02-600664 were 8.23 mg/kg and 10.9 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 49 times the maximum concentration. Lateral extent of vanadium is defined and further sampling for vertical extent is not warranted.

Zinc was detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs in six soil samples, two sediment samples, and one tuff sample with a maximum concentration of 914 mg/kg. Concentrations increased with depth at location 02-01153, only one depth was sampled at location 02-600666, concentrations decreased with depth at all other locations, and concentrations increased laterally. The residential SSL is approximately 26 times the maximum concentration. Further sampling for extent of zinc is not warranted.

Organic Chemicals

Organic COPCs at AOC 02-011(a)(x) include Aroclor-1254, Aroclor-1260, di-n-butylphthalate, methylene chloride, toluene and TPH-DRO.

Aroclor-1254 was detected in 10 samples with a maximum concentration of 0.0701 mg/kg. Only one depth was sampled at location 02-600666, concentrations decreased with depth at all locations, and increased laterally. The residential SSL is approximately 16 times the maximum concentration, and the industrial SSL is approximately 157 times 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 0.635 mg/kg. Concentrations increased with depth at location 02-612999; only one depth was sampled at locations 02-600666, 02-612459, and 02-612460; concentrations decreased with depth at all locations, and increased laterally. The residential SSL is approximately 3.8 times the maximum concentration, and the industrial SSL is approximately 17 times the maximum concentration. Further sampling for extent of Aroclor-1260 is not warranted.

Di-n-butylphthalate was detected in three samples with a maximum concentration of 0.0467 mg/kg. Concentrations increased with depth at location 02-600661 and decreased laterally. The residential SSL is approximately 132,000 times the maximum concentration. Lateral extent of di-n-butylphthalate is defined and further sampling for vertical extent is not warranted.

Methylene chloride was detected in one sample at a concentration of 0.00295 mg/kg. Concentrations increased with depth and increased laterally. The residential SSL is approximately 139,000 times the maximum concentration. Further sampling for extent of methylene chloride is not warranted.

Toluene was detected in one sample at a concentration of 0.00097 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of toluene are defined.

TPH-DRO was detected in one sample at a concentration of 52.3 mg/kg. Concentrations decreased with depth and increased laterally. The residential SSL is approximately 19 times the maximum concentration, and the industrial SSL is approximately 73 times the maximum concentration. Vertical extent of TPH-DRO is defined and further sampling for lateral extent is not warranted.

Radionuclides

Radionuclide COPCs at AOC 02-011(a)(x) include cesium-137, plutonium-239/240, and tritium.

Cesium-137 was detected below 1 ft bgs in two soil samples with a maximum activity of 0.121 pCi/g. Activities increased with depth at location 02-22347, decreased with depth at location 02-22368, and increased laterally. The residential SAL is approximately 99 times the maximum activity. Further sampling for extent of cesium-137 is not warranted.

Plutonium-239/240 was detected above the soil and sediment FVs in three soil samples and three sediment samples with a maximum activity of 1.67 pCi/g. Activities did not change substantially with depth (0.52 pCi/g) at location 02-01153, only one depth was sampled at location 02-600666, activities decreased with depth at all other locations, and activities increased laterally. The residential SAL is approximately 47 times the maximum activity. Further sampling for extent of plutonium-239/240 is not warranted.

Tritium was detected in 20 samples with a maximum activity of 0.148 pCi/g. Activities increased with depth at locations 02-22348, 02-22368, 02-600664, 02-612348, and 02-612983; did not change substantially with depth (0.0034 pCi/g) at location 02-22346, decreased with depth at all other locations, and increased laterally. The residential SAL is approximately 11,500 times the maximum activity. Further sampling for extent of tritium is not warranted.

Summary of Nature and Extent

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at AOC 02-011(a)(x).

6.29.5 Summary of Human Health Risk Screening

6.29.5.1 AOC 02-011(a)(i,ii,iii,iv,v,vi)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 4×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.02, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 4×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.07, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.05 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 3×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.3, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 7 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The residential exposure scenario also demonstrates protection of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, residential, and construction worker scenarios at AOC 02-011(a)(i,ii,iii,iv,v,vi).

6.29.5.1 AOC 02-011(a)(viii)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 3×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.06, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 5 × 10^{-7}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The recreational HI is 0.06, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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.

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} (NMED 2017, 602273). The residential HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 8 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The residential exposure scenario also demonstrates protection of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, residential, and construction worker scenarios at AOC 02-011(a)(viii).

6.29.5.1 AOC 02-011(a)(ix)

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} (NMED 2017, 602273). The industrial HI is 0.03, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.03 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 8 × 10^{-7}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The recreational HI is 0.05, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.03 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Residential Scenario

The total excess cancer risk for the residential scenario is 6 × 10^{-6}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The residential HI is 1, which is equivalent to the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.8 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The residential exposure scenario also demonstrates protection of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, residential, and construction worker scenarios at AOC 02-011(a)(ix).

6.29.5.1 AOC 02-011(a)(x)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 6×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.03 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 6×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.4, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.03 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

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 2017, 602273). The residential HI is 0.8, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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.

Construction Worker Scenario

The residential exposure scenario also demonstrates protection of construction workers for carcinogenic and radionuclide COPCs. The construction worker HI is approximately 1 (due to manganese; see Appendix H, section H-4.5.2, Exposure Evaluation), which is equal to the NMED target HI of 1.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, residential, and construction worker scenarios at AOC 02-011(a)(x).

6.29.6 Summary of Ecological Risk Screening

AOC 02-011(a) is within the TA-02 core area. Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and results of site-specific ecological risk studies, no potential ecological risks exist for the TA-02 core area.

6.30 AOC 02-011(b), Former Drainlines from Stack-Gas Valve House

6.30.1 Site Description and Operational History

AOC 02-011(b) consists of two drains and outfalls associated with the stack-gas valve house (structure 02-19) (Figure 6.30-1). One drain was a 9-ft-long × 15-in.-diameter CMP between the stack-gas valve house and the catch basin (structure 02-35). The second drain was a 9-ft-long × 24-in.-diameter CMP that drained from the catch basin (structure 02-35) to Los Alamos Creek outside the east fence. The drains and structures are shown on engineering drawing C-1718 (LASL 1947, 089677).

The drains and outfalls were presumably installed at the same time the stack-gas valve house [AOC 02-003(a)] was constructed in 1944. The stack-gas valve house was in use through 1974 when it became inactive and was removed during 1985 D&D activities. The actual purpose of the drainlines and catch basin is not documented. The drains and outfalls remained in place until they were removed and disposed of during 2003 D&D activities (WD-3 2003, 082646).

6.30.2 Relationship to Other SWMUs and AOCs

The drains and outfalls were connected to the stack-gas valve house, AOC 02-003(a), and ran parallel to line 118 [also part of AOC 02-003(a)]. The holding tank, AOC 02-003(e), was located near the upper ends of the drainlines.

6.30.3 Summary of Previous Investigations

6.3.0.3.1 1995 Investigation Activities

Six soil and tuff samples were collected from locations 02-01107 and 02-01110 within the drain and outfall areas. The samples were analyzed for radionuclides only.

6.30.3.2 2000 Post–Cerro Grande Recovery Work

Five samples were collected from one borehole (location 02-01239) drilled in the approximate area of the bend in the outfall pipe. The samples were analyzed for radionuclides and TAL metals. Field screening of recovered core indicated no radioactivity existed above site background (LANL 2001, 070352, p. 7).

Inorganic chemicals and radionuclides were detected above background in samples from 1995 to 2000. Because the nature and extent of contamination were not defined and because no organic chemical analyses were performed, the approved 2006 investigation work plan proposed the collection of additional samples at AOC 02-011(b) (LANL 2006, 092571.12; NMED 2006, 095416).

6.30.3.3 2007 Investigation Activities

Nine samples were collected from five locations at AOC 02-011(b) in 2007. Results from the sampling activities in 2007 were presented in the previous investigation report (LANL 2008, 101669.12). Additional sampling was required to define the extent of contamination at the site.

6.30.4 Site Contamination

6.30.4.1 Soil, Rock, and Sediment Sampling

As part of the 2010 investigation, the following characterization activities were conducted at AOC 02-011(b):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Five samples were collected from location 02-612389 at the former stack house (structure 02-019) from 5–6 ft, 18–19 ft, 25–27 ft, 35–36 ft, and 49–50 ft bgs. Five samples were collected from location 02-612390 near AOC 02-011(b) from 5–6 ft, 15–17 ft, 26–27 ft, 35–36 ft, and 49–50 ft bgs. These samples were analyzed for TAL metals, PCBs, SVOCs, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium.

The 2010 and historical sampling locations at AOC 02-011(b) are shown in Figure 6.30-1. Table 6.30-1 presents the samples collected and analyses requested for AOC 02-011(b). The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

6.30.4.2 Soil, Rock, and Sediment Sample Field-Screening Results

No organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of the samples. Radiological-screening results exceeded the daily site background levels at location 02-612389. As a result, respirators were used while collecting samples at this location. Field-screening results are presented in Table 3.2-2. No changes were made to sampling depths because of the field-screening results.

6.30.4.3 Soil, Rock, and Sediment Sample Analytical Results

Decision-level data at AOC 02-011(b) consist of results from 24 samples collected from 8 locations in 2000, 2007, and 2010. The 24 samples include 4 soil, 6 Qal, 1 Qbt 3, 8 Qbo, and 5 sediment samples.

Inorganic Chemicals

A total of 24 samples (4 soil, 6 Qal, 1 Qbt 3, 8 Qbo, and 5 sediment) were analyzed for TAL metals, and 9 samples (1 soil, 3 Qal, 1 Qbo, and 4 sediment) were analyzed for hexavalent chromium, nitrate, perchlorate, and total cyanide. Table 6.30-2 presents the inorganic chemicals detected or detected above BVs. Figure 6.30-2 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 3 and Qbt 1g, Qct, Qbo BVs (7340 mg/kg and 3560 mg/kg) in one Qbt 3 sample and two Qbo samples with a maximum concentration of 8100 mg/kg. The Gehan and slippage tests indicated site concentrations of aluminum in Qbo are statistically different from background (Figure G-282 and Table G-42). Aluminum is retained as a COPC.

Antimony was not detected but had DLs (0.902 mg/kg to 1.3 mg/kg) above the soil; Qbt 3; and Qbt 1g, Qct, Qbo BVs (0.83 mg/kg, 0.5 mg/kg, and 0.5 mg/kg) in three soil samples and seven tuff samples. Antimony is retained as a COPC.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV (0.56 mg/kg) in one sample at a concentration of 0.64 mg/kg and was not detected but had DLs (1.14 mg/kg to 1.28 mg/kg) above the BV in seven samples. There were too few detections to perform statistical tests. Arsenic is retained as a COPC.

Cadmium was not detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs (0.4 mg/kg for each) but had DLs (0.502 mg/kg to 0.65 mg/kg) above BVs in four soil samples, one sediment sample, and eight tuff samples. There were too few detections in the soil background data set and too few sediment samples to perform statistical tests and there are no Qbo background data. Cadmium is retained as a COPC.

Chromium was detected above the soil BV (19.3 mg/kg) in one sample at a concentration of 37 mg/kg. The Gehan and slippage tests indicated site concentrations of chromium in soil are statistically different from background (Figure G-283 and Table G-43). Chromium is not a COPC.

Hexavalent chromium was detected in seven samples with a maximum concentration of 0.693 mg/kg. Hexavalent chromium is retained as a COPC.

Iron was detected above the Qbt 1g, Qct, Qbo BV (3700 mg/kg) in eight samples with a maximum concentration of 5850 mg/kg. The Gehan and quantile tests indicated site concentrations of iron in tuff are statistically different from background (Figure G-284 and Table G-42). Iron is retained as a COPC.

Lead was detected above the sediment BV (19.7 mg/kg) in three samples with a maximum concentration of 23.2 mg/kg. There were too few sediment samples to perform statistical tests. Lead is retained as a COPC.

Manganese was detected above the soil and Qbt 1g, Qct, Qbo BVs (671 mg/kg and 189 mg/kg) in one soil sample and three tuff samples with a maximum concentration of 980 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in soil are not statistically different from background (Figure G-285 and Table G-43) and site concentrations of manganese in tuff are statistically different from background (Figure G-286 and Table G-42). Manganese is retained as a COPC.

Mercury was detected above the soil and sediment BVs (0.1 mg/kg for both) in one soil sample and three sediment samples with a maximum concentration of 0.461 mg/kg. There were too few detections in the background data sets to perform statistical tests. Mercury is retained as a COPC.

Nickel was detected above the soil and Qbt 1g, Qct, Qbo BVs (15.4 mg/kg and 2 mg/kg) in one soil sample and one tuff sample with a maximum concentration of 20 mg/kg. The Gehan and quantile tests indicated site concentrations of nickel in soil are not statistically different from background (Figure G-287 and Table G-43), and the quantile test indicated site concentrations of nickel in tuff are statistically different from background (Figure G-288 and Table G-42). Nickel retained as a COPC.

Nitrate was detected in six samples with a maximum concentration of 5.02 mg/kg. Nitrate is naturally occurring, and the concentrations likely reflect naturally occurring levels. In addition, AOC 02-011(b) was used to manage reactor stack gas and is not a source of nitrate. Nitrate is not a COPC.

Selenium was detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs (1.52 mg/kg, 0.3 mg/kg, and 0.3 mg/kg) in two soil samples, one sediment sample, and one tuff sample with a maximum concentration of 3.71 mg/kg and was not detected but had DLs (0.32 mg/kg to 1.55 mg/kg) above the soil; sediment; and Qbt 1g, Qct, Qbo BVs and Qbt 2,3,4 BV (0.3 mg/kg) in one soil sample, three sediment samples, seven Qbo samples, and one Qbt 3 sample. Selenium is retained as a COPC.

Uranium was detected above the soil BV (1.82 mg/kg) in one sample at a concentration of 6.83 mg/kg. Because uranium was analyzed in only three soil samples, statistical tests could not be performed. Uranium is retained as a COPC.

Vanadium was detected at the Qbt 1g, Qct, Qbo BV (4.59 mg/kg) in one sample at a concentration of 4.6 mg/kg. The Gehan and slippage tests indicated site concentrations of vanadium in tuff are statistically different from background (Figure G-289 and Table G-42). 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 three soil samples and four sediment samples with a maximum concentration of 70.1 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are statistically different from background (Figure G-290 and Table G-43). Zinc is retained as a COPC.

Organic Chemicals

A total of 19 samples (1 soil, 6 Qal, 8 Qbo, and 4 sediment) were analyzed for PCBs and SVOCs, and 4 samples (3 Qal and 1 Qbo) were analyzed for VOCs. Table 6.30-3 presents the detected organic chemicals. Figure 6.30-3 shows the spatial distribution of detected organic chemicals.

Polycyclic Aromatic Hydrocarbons

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

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

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

Site Activities

AOC 02-011(b) consists of two former drains and outfalls from a reactor stack-gas valve house (structure 02-19) and was identified as an AOC because of the potential release of radionuclides in stack-gas condensate. AOC 02-011(b) is located adjacent to former asphalt paving east of the OWR and received runoff from the paved area. All but three detections of PAHs at this site were in surface samples located in the area adjacent to and receiving runoff from the paved area. PAHs were not known to be associated with the reactor stack gas managed at this site. Based on the above, the PAHs detected in samples used to characterize this site [acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; chrysene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenanthrene; and pyrene] are associated with the former paved area, are not related to historical Laboratory site operations, and are not COPCs.

Organic COPCs

Other organic chemicals detected at AOC 02-011(b) include Aroclor-1254, Aroclor-1260, and bis(2-ethylhexyl)phthalate. The detected organic chemicals listed are retained as COPCs.

Radionuclides

A total of 19 samples (1 soil, 6 Qal, 8 Qbo, and 4 sediment) were analyzed for americium-241, and 24 samples (4 soil, 6 Qal, 1 Qbt 3, 8 Qbo, and 5 sediment) were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium. Table 6.30-4 presents the radionuclides detected or detected above BVs/FVs. Figure 6.30-4 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Cesium-137 was detected above the sediment FV (0.90 pCi/g) in one sample and detected below 1 ft bgs in seven soil and Qal samples with a maximum activity of 274 pCi/g. Cesium-137 is retained as a COPC.

Plutonium-238 was detected below 1 ft bgs in one soil sample at an activity of 0.0255 pCi/g. Plutonium-238 is retained as a COPC.

Plutonium-239/240 was detected above the soil and sediment FVs (0.054 pCi/g and 0.068 pCi/g) in one soil sample and five sediment samples, detected below 1 ft bgs in seven soil and Qal samples, and detected in one Qbo sample with a maximum activity of 4.41 pCi/g. Plutonium-239/240 is retained as a COPC.

Strontium-90 was detected below 1 ft bgs in six soil and Qal samples with a maximum activity of 32.8 pCi/g. Strontium-90 is retained as a COPC.

Tritium was detected in eight samples with a maximum activity of 0.121 pCi/g. Tritium is retained as a COPC.

Uranium-234 was detected above the soil and Qbt 2,3,4 BVs (2.59 pCi/g and 1.98 pCi/g) in two soil samples and one tuff sample with a maximum activity of 6.33 pCi/g. Uranium-234 is retained as a COPC.

Uranium-235/236 was detected above the soil; Qbt 2,3,4; and Qbt 1g, Qct, Qbo BVs (0.2 pCi/g, 0.09 pCi/g, and 0.18 pCi/g) in two soil samples, one Qbt 3 sample, and three Qbo samples with a maximum activity of 0.274 pCi/g. Uranium-235/236 is retained as a COPC.

Uranium-238 was detected above the soil and Qbt 2,3,4 BVs (2.29 pCi/g and 1.93 pCi/g) in two soil samples and one tuff sample with a maximum activity of 6.09 pCi/g. Uranium-238 is retained as a COPC.

6.30.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at AOC 02-011(b) are discussed below.

Inorganic Chemicals

Inorganic COPCs at AOC 02-011(b) include aluminum, antimony, arsenic, cadmium, hexavalent chromium, iron, lead, manganese, mercury, nickel, selenium, uranium, vanadium, and zinc.

Aluminum was detected above the Qbt 3 and Qbt 1g, Qct, Qbo BVs in one Qbt 3 sample and two Qbo samples with a maximum concentration of 8100 mg/kg. Concentrations increased with depth at all locations and increased laterally. The residential SSL is approximately 9.6 times the maximum concentration, and the industrial SSL is approximately 159 times the maximum concentration. Further sampling for extent of aluminum is not warranted.

Antimony was not detected but had DLs (0.902 mg/kg to 1.3 mg/kg) above the soil; Qbt 3; and Qbt 1g, Qct, Qbo BVs in three soil samples and seven tuff samples. The residential SSL is approximately 24 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 0.64 mg/kg and was not detected but had DLs (1.14 mg/kg to 1.28 mg/kg) above the BV in seven samples. Concentrations decreased with depth at location 02-600215 and increased laterally (the concentration in a shallow sample at location 02-600215 was 4.2 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 11 times the maximum concentration, and the industrial SSL is approximately 56 times the maximum DL, the maximum concentration. The residential SSL is approximately 5.5 times and the industrial SSL is approximately 28 times the maximum DL. Further sampling for extent of arsenic is not warranted.

Cadmium was not detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs but had DLs (0.502 mg/kg to 0.65 mg/kg) above BVs in four soil samples, one sediment sample, and eight tuff samples. The residential SSL is approximately 108 times the maximum DL. Further sampling for extent of cadmium is not warranted.

Hexavalent chromium was detected in seven samples with a maximum concentration of 0.693 mg/kg. Concentrations did not change substantially with depth (0.005 mg/kg) at location 02-600215; only one depth was sampled at locations 02-600211, 02-600212, 02-600213, and 02-600214; concentrations decreased with depth at location 02-600215; and concentrations increased laterally. The residential SSL is approximately 4.4 times the maximum concentration, and the industrial SSL is approximately 16 times the maximum concentration. Further sampling for extent of hexavalent chromium is not warranted.

Iron was detected above the Qbt 1g, Qct, Qbo BV in eight samples with a maximum concentration of 5850 mg/kg. Concentrations decreased with depth at all locations and increased laterally (concentrations in shallow samples at locations 02-600215, 02-612389, and 02-612390 were 9620 mg/kg, 9830 mg/kg, and 6980 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 9.4 times the maximum concentration, and the industrial SSL is approximately 155 times the maximum concentration. Vertical extent of iron is defined and further sampling for lateral extent is not warranted.

Lead was detected above the sediment BV in three samples with a maximum concentration of 23.2 mg/kg. Only one depth was sampled at locations 02-600211, 02-600212, and 02-600213 and concentrations did not change substantially laterally (2.4 mg/kg). The residential SSL is approximately 17 times the maximum concentration, and the industrial SSL is approximately 34 times the maximum concentration. Further sampling for extent of lead is not warranted.

Manganese was detected above the soil and Qbt 1g, Qct, Qbo BVs in one soil sample and three tuff samples with a maximum concentration of 980 mg/kg. Concentrations did not change substantially with depth (23 mg/kg) at location 02-612389, decreased with depth at all other locations, and increased laterally (the concentration in a shallow sample at location 02-612389 was 266 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 11 times the maximum concentration, and the industrial SSL is approximately 163 times the maximum concentration. Further sampling for extent of manganese is not warranted.

Mercury was detected above the soil and sediment BVs in one soil sample and three sediment samples with a maximum concentration of 0.461 mg/kg. Only one depth was sampled at locations 02-600211, 02-600212, and 02-600213; concentrations decreased with depth at location 02-600215; and concentrations increased laterally. The residential SSL is approximately 51 times the maximum concentration. Further sampling for extent of mercury is not warranted.

Nickel was detected above the soil and Qbt 1g, Qct, Qbo BVs in one soil sample and one tuff sample with a maximum concentration of 20 mg/kg. Concentrations decreased with depth at all locations and increased laterally (the concentration in a shallow sample at location 02-600215 was 6.73 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 78 times the maximum concentration. Vertical extent of nickel is defined and further sampling for lateral extent is not warranted.

Selenium was detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs in two soil samples, one sediment sample, and one tuff sample with a maximum concentration of 3.71 mg/kg and was not detected but had DLs (0.32mg/kg to 1.55 mg/kg) above the soil; sediment; Qbt 1g, Qct, Qbo; and Qbt 2,3,4 BVs in one soil sample, three sediment samples, seven Qbo samples, and one Qbt 3 sample. Only one depth was sampled at location 02-600211, concentrations decreased with depth at location 02-600215, and concentrations increased laterally. The residential SSL is approximately 106 times the maximum concentration and 252 times the maximum DL. Further sampling for extent of selenium is not warranted.

Uranium was detected above the soil and Qbt 1g, Qct, Qbo BVs in one soil sample and one tuff sample with a maximum concentration of 6.83 mg/kg. Concentrations decreased with depth and increased laterally. The residential SSL is approximately 34 times the maximum concentration. Vertical extent of uranium is defined and further sampling for lateral extent is not warranted.

Vanadium was detected at the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 4.6 mg/kg. Concentrations decreased with depth at location 02-612389 and increased laterally (the concentration in a shallow sample at location 02-612389 was 18 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 86 times the maximum concentration. Vertical extent of vanadium is defined and further sampling for lateral extent is not warranted.

Zinc was detected above the soil and sediment BVs in three soil samples and four sediment samples with a maximum concentration of 70.1 mg/kg. Only one depth was sampled at locations 02-600211, 02-600212, 02-600213, and 02-600214; concentrations decreased with depth at all other locations; and concentrations increased laterally. The residential SSL is approximately 335 times the maximum concentration. Further sampling for extent of zinc is not warranted.

Organic Chemicals

Organic COPCs at AOC 02-011(b) include Aroclor-1254, Aroclor-1260, and bis(2-ethylhexyl)phthalate.

Aroclor-1254 was detected in nine samples with a maximum concentration of 0.298 mg/kg. Only one depth was sampled at locations 02-600211, 02-600212, 02-600213, and 02-600214; concentrations did not change substantially with depth (0.0035 mg/kg) at location 02-600215; concentrations decreased with depth at all other locations, and increased laterally. The residential SSL is approximately 3.8 times the maximum concentration, and the industrial SSL is approximately 37 times the maximum concentration. Further sampling for extent of Aroclor-1254 is not warranted.

Aroclor-1260 was detected in eight samples with a maximum concentration of 0.212 mg/kg. Only one depth was sampled at locations 02-600211, 02-600212, 02-600213, and 02-600214; concentrations did not change substantially with depth (0.0081 mg/kg) at location 02-600215; concentrations decreased with depth at all other locations, and increased laterally. The residential SSL is approximately 11 times the maximum concentration, and the industrial SSL is approximately 52 times the maximum concentration. Further sampling for extent of Aroclor-1260 is not warranted.

Bis(2-ethylhexyl)phthalate was detected in one sample at a concentration of 0.137 mg/kg. Only one depth was sampled at location 02-600213 and concentrations decreased laterally. The residential SSL is approximately 2770 times the maximum concentration. Further sampling for extent of bis(2-ethylhexyl)phthalate is not warranted.

Radionuclides

Radionuclide COPCs at AOC 02-011(b) include cesium-137, plutonium-238, plutonium-239/240, strontium-90, tritium, uranium-234, uranium-235/236, and uranium-238.

Cesium-137 was detected above the sediment FV in one sample and detected below 1 ft bgs in seven soil and Qal samples with a maximum activity of 274 pCi/g. Only one depth was sampled at location 02-600213, activities decreased with depth at all other locations, and activities increased laterally to the west at location 02-612389. Vertical extent of cesium-137 at location 02-600213 is defined by lower activities detected in deeper samples collected at AOC 02-003(a) locations 02-600121 and 02-600124, approximately 20 ft from 02-600213 (Figure 6.2-4). Lateral extent to the west of location 02-612389 is defined by lower activity detected at location 02-600119 at AOC 02-003(a) (Figure 6.2-4). Lateral and vertical extent of cesium-137 are defined.

Plutonium-238 was detected below 1 ft bgs in one soil sample at an activity of 0.0255 pCi/g. Activities decreased with depth and decreased laterally at location 02-01239. Lateral and vertical extent of plutonium-238 are defined.

Plutonium-239/240 was detected above the soil and sediment FVs in one soil sample and five sediment samples, detected below 1 ft bgs in seven soil and Qal samples, and detected in one Qbo sample with a maximum activity of 4.41 pCi/g. Only one depth was sampled at locations 02-01107, 02-600211, 02-600212, 02-600213, and 02-600214; activities decreased with depth at all other locations; and activities decreased laterally. The residential SAL is approximately 18 times the maximum activity, and the industrial SSL is approximately 272 times the maximum activity. Lateral extent of plutonium-239/240 is defined and further sampling for vertical extent is not warranted.

Strontium-90 was detected below 1 ft bgs in six soil and Qal samples with a maximum activity of 32.8 pCi/g. Activities decreased with depth at all locations and increased laterally to the west at location 02-612389. Lateral extent to the west of location 02-612389 is defined by lower activity detected at location 02-600119 at AOC 02-003(a) (Figure 6.2-4). Lateral and vertical extent of strontium-90 are defined.

Tritium was detected in eight samples with a maximum activity of 0.121 pCi/g. Activities increased with depth at location 02-01110, only one depth was sampled at location 02-01107, activities did not change substantially with depth (0.02 pCi/g) at location 02-01239, activities decreased with depth at all other locations, and activities decreased laterally. The residential SAL is approximately 14,000 times the maximum activity. Lateral extent of tritium is defined and further sampling for vertical extent is not warranted.

Uranium-234 was detected above the soil and Qbt 2,3,4 BVs in two soil samples and one tuff sample with a maximum activity of 6.33 pCi/g. Activities decreased with depth at all locations and decreased laterally. Lateral and vertical extent of uranium-234 are defined.

Uranium-235/236 was detected above the soil; Qbt 2,3,4; and Qbt 1g, Qct, Qbo BVs in two soil samples, one Qbt 3 sample, and three Qbo samples with a maximum activity of 0.274 pCi/g. Activities did not change substantially with depth (0.05 pCi/g) at location 02-600215, decreased with depth at all other locations, and decreased laterally. The residential SAL is approximately 153 times the maximum activity. Lateral extent of uranium-234 is defined and further sampling for vertical extent is not warranted.

Uranium-238 was detected above the soil and Qbt 2,3,4 BVs in two soil samples and one tuff sample with a maximum activity of 6.09 pCi/g. Activities decreased with depth at all locations and decreased laterally. Lateral and vertical extent of uranium-238 are defined.

Summary of Nature and Extent

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at AOC 02-011(b).

6.30.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess cancer risk for the industrial scenario is 4×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 5×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.05, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Residential Scenario

The total excess cancer risk for the residential scenario is 4×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.3, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 20 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Construction Worker Scenario

The residential exposure scenario also demonstrates protection of construction workers for carcinogenic and radionuclide COPCs. The construction worker HI is approximately 1 (with manganese, see Appendix H, section H-4.5.2, Exposure Evaluation), which is equal to the NMED target HI of 1.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, residential, and construction worker scenarios at AOCs 02-011(b).

6.30.6 Summary of Ecological Risk Screening

AOC 02-011(b) is within the TA-02 core area. Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and results of site-specific ecological risk studies, no potential ecological risks exist for the TA-02 core area.

6.31 AOC 02-011(c), Storm Drain

6.31.1 Site Description and Operational History

AOC 02-011(c) (Figure 6.31-1) was a storm drain associated with the OWR equipment building [02-44, AOC 02-004(f)]. The drainline was a 4-in.-diameter VCP that was approximately 12 ft long and drained to the surface west of the western fence. The drainline was installed in 1954, as shown on engineering drawing C-14930 (LASL 1954, 090076). The drainline was removed and disposed of in 2003 (WD-3 2003, 082646, pp. 26–31).

The OWR equipment building was in operation from 1954 to 1993. The AOC 02-011(c) storm drain and outfall collected and discharged storm water from the vicinity of the building from 1954 to 2003. The AOC 02-011(c) outfall piping was decommissioned and removed, and the waste was disposed of at an approved facility in 2003 (WD-3 2003, 082646, pp. 1–6). There is no indication AOC 02-011(c) received anything other than storm water (LANL 1990, 007511).

6.31.2 Relationship to Other SWMUs and AOCs

AOC 02-011(c) was associated with the OWR equipment building [02-44, AOC 02-004(f)], although drainlines associated with that building were not directly connected to the storm drainline or outfall. The outfall discharged to the surface approximately 20 ft northeast of AOC 02-004(d), which was a subsurface structure. The path of the storm drainline intersected the path of the drainline from the OWR equipment building [02-44, AOC 02-004(f)] to the OWR acid pit [AOC 02-004(e)].

6.31.3 Summary of Previous Investigations

6.31.3.1 2003 Omega West Decommissioning Project

AOC 02-011(c) outfall piping was decommissioned and removed, and the waste was disposed of at an approved facility in 2003. Site activities included soil excavation, radiological walkover surveys, radiological (structure) screening, soil sampling, sample analysis, and surveying of sample coordinates. Radiological walkover surveys and radiological (structure) screening were conducted to segregate waste, primarily equipment and construction materials. Limited soil surveys were conducted, but no formal report of soil survey results is available.

LLW (construction debris and/or soil) was packaged and shipped to Envirocare or TA-54 for disposal. Mixed waste was packaged and transferred to TA-54 for further processing and/or storage at the Laboratory. In total, 360 yd^3 of material was shipped to Envirocare for disposal; material from the AOC 02-011(c) storm drain was included in this total volume (WD-3 2003, 082646, pp. 1–6).

No soil samples were collected in 2003 at AOC 02-011(c) as part of the Omega West decommissioning project activities.

6.31.3.2 2007 Investigation Activities

Four samples were collected from one location at AOC 02-011(c) in 2007. Results from the sampling activities in 2007 were presented in the previous investigation report (LANL 2008, 101669.12). Additional sampling was required to define the extent of contamination at the site.

6.31.4 Site Contamination

6.31.4.1 Soil and Rock Sampling

As part of the 2010 investigation, the following characterization activities were conducted at AOC 02-011(c):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.

- Five samples were collected from location 02-612347 from 5–6 ft, 15–16 ft, 25–27 ft, 35–36 ft, and 49–50 ft bgs. These samples were analyzed for TAL metals, hexavalent chromium, PCBs, SVOCs, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium.

The 2010 and historical sampling locations at AOC 02-011(c) are shown in Figure 6.31-1. Table 6.31-1 presents the samples collected and analyses requested for AOC 02-011(c). The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

6.31.4.2 Soil and Rock Sample Field-Screening Results

No organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of the samples. No radiological-screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. No changes to sampling or other activities occurred because of the field-screening results.

6.31.4.3 Soil and Rock Sample Analytical Results

Decision-level data at AOC 02-011(c) consist of results from nine samples collected from two locations in 2007 and 2010. The nine samples include one soil, four Qal, and four Qbo samples.

Inorganic Chemicals

A total of nine samples (one soil, four Qal, and four Qbo) were analyzed for TAL metals, five samples (two Qal and three Qbo) were analyzed for hexavalent chromium, and four samples (one soil, two Qal, and one Qbo) were analyzed for nitrate, perchlorate, and total cyanide. Table 6.31-2 presents the inorganic chemicals detected or detected above BVs. Figure 6.31-2 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV (3560 mg/kg) in one sample at a concentration of 9810 mg/kg. Because there were fewer than eight Qbo samples, statistical tests could not be performed. Aluminum is retained as a COPC.

Antimony was not detected but had DLs (0.962 mg/kg to 1.24 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs (0.83 mg/kg and 0.5 mg/kg) in two soil samples and three tuff samples. Antimony is retained as a COPC.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV (0.56 mg/kg) in one sample at a concentration of 0.892 mg/kg and was not detected but had DLs (1.18 mg/kg to 1.22 mg/kg) above the BV in three samples. The concentration and all three DLs are above the maximum Qbo background concentration (0.7 mg/kg). Arsenic is retained as a COPC.

Barium was detected above the Qbt 1g, Qct, Qbo BV (25.7 mg/kg) in one sample at a concentration of 27.7 mg/kg. Because there were fewer than eight Qbo samples, statistical tests could not be performed. Barium is retained as a COPC.

Cadmium was not detected above the soil and Qbt 1g, Qct, Qbo BVs (0.4 mg/kg for both) but had DLs (0.481 mg/kg to 0.622 mg/kg) above the BVs in three soil samples and four tuff samples. Cadmium is retained as a COPC.

Iron was detected above the Qbt 1g, Qct, Qbo BV (3700 mg/kg) in four samples with a maximum concentration of 5850 mg/kg. Iron is retained as a COPC.

Manganese was detected above the Qbt 1g, Qct, Qbo BV (189 mg/kg) in three samples with a maximum concentration of 232 mg/kg. Because there were fewer than eight Qbo samples, statistical tests could not be performed. Manganese is retained as a COPC.

Nitrate was detected in two samples with a maximum concentration of 31.9 mg/kg. Nitrate is naturally occurring, but the maximum concentration likely does not reflect naturally occurring levels. Nitrate is retained as a COPC.

Perchlorate was detected in one sample at a concentration of 0.000559 mg/kg. Perchlorate is retained as a COPC in soil.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs (1.52 mg/kg and 0.3 mg/kg) in one soil sample and one tuff sample with a maximum concentration of 1.7 mg/kg and was not detected but had DLs (1.18 mg/kg to 1.61 mg/kg) above BVs in one soil sample and three tuff samples. Selenium is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in one sample at a concentration of 65.2 mg/kg. Because there were fewer than eight soil samples, statistical tests could not be performed. The maximum concentration was only 16.4 mg/kg above BV and was less than or similar to the two highest concentrations in the soil background data set (75.5 mg/kg and 60 mg/kg). Zinc was not detected or detected above BV in eight other samples (detected below BV in five samples). Zinc is not a COPC.

Organic Chemicals

A total of four samples (one soil, two Qal, and one Qbo) were analyzed for dioxins and furans and explosive compounds, nine samples (one soil, four Qal, and four Qbo) were analyzed for PCBs and SVOCs, and three samples (two Qal and one Qbo) were analyzed for VOCs. Table 6.31-3 presents the detected organic chemicals. Figure 6.31-3 shows the spatial distribution of detected organic chemicals.

Dioxins and Furans

Dioxins and furans are frequently detected as a result of environmental sampling but generally are not associated with industrial activities conducted at the Laboratory or released from SWMUs or AOCs being investigated at the Laboratory. The investigation work plan for Middle Los Alamos Canyon Aggregate Area (LANL 2006, 092571.12) notes the potential for presence of dioxins and furans in the OWR fuel pit recirculation pump system, and a small percentage of the investigation samples collected around the OWR were analyzed for dioxins and furans to determine whether a release may have occurred. If the results were indicative of a release, additional sampling for dioxins and furans would be proposed.

Dioxins and furans are known to be widely distributed in the environment from a number of sources, both natural, such as forest fires, and anthropogenic, such as industrial sources and burning of municipal trash and other waste materials. Industrial sources of dioxins and furans are primarily associated with impurities in the production of chlorinated chemical products (e.g., pentachlorophenol, chlorinated herbicides) and the wastes associated with production of those materials. Another industrial source is the pulp and paper industry and processes that bleach wood pulp (EPA 2006, 600913). None of these common industrial process-related source activities have occurred at the Laboratory. Other anthropogenic sources of dioxins and furans include the combustion of materials containing chlorine, such as the incineration of municipal trash containing chlorinated plastics, and other waste materials (EPA 2006, 600913). Forest fires have occurred in the Los Alamos area, including upgradient of TA-02 in the Los Alamos Canyon watershed, and are a potential source of dioxins and furans.

Polycyclic Aromatic Hydrocarbons

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

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

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

Site Activities

AOC 02-011(c) is drainline used to convey storm water from the OWR equipment building and was identified as an AOC because of the potential for the storm water to have contained radioactivity. There are no known site-related sources of dioxins and furans or PAHs in the storm water collected by AOC 02-011(c).

The dioxin and furan congeners detected at AOC 02-011(c) were detected at concentrations ranging from 0.0000000472 mg/kg to 0.00536 mg/kg, with most detections being hepta- and hexa-chlorinated congeners. These results likely reflect natural and/or anthropogenic background rather than a site-related release. The dioxin and furan congeners detected in samples used to characterize this site [1,2,3,4,6,7,8-heptachlorodibenzodioxin; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; 1,2,3,4,7,8-hexachlorodibenzodioxin; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; 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; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzodioxin; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; 2,3,7,8-tetrachlorodibenzodioxin; and 2,3,7,8-tetrachlorodibenzofuran] are not related to historical Laboratory site operations and are not COPCs.

AOC 02-011(c) is located to the west of the OWR, in an area that was formerly covered with asphalt paving. PAHs were detected only in one surface sample from location 02-600449. The PAHs detected in the sample used to characterize this site [benzo(a)anthracene, fluoranthene, and pyrene] appear to be associated with asphalt paving, are not related to historical Laboratory site operations, and are not COPCs.

Organic COPCs

Other organic chemicals detected at AOC 02-011(c) include Aroclor-1254, Aroclor-1260, di-n-butylphthalate, and toluene. The detected organic chemicals listed are retained as COPCs.

Radionuclides

A total of four samples (one soil and three tuff) were analyzed for americium-241; nine samples (one soil and eight tuff) were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium; and four samples (one soil and three tuff) were analyzed for strontium-90. Table 6.31-4 presents the radionuclides detected or detected above BVs/FVs. Figure 6.31-4 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Strontium-90 was detected below 1 ft bgs in one soil sample at an activity of 0.263 pCi/g. Strontium-90 is retained as a COPC.

Tritium was detected in three samples with a maximum activity of 0.191 pCi/g. Tritium is retained as a COPC.

6.31.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at AOC 02-011(c) are discussed below.

Inorganic Chemicals

Inorganic COPCs at AOC 02-011(c) include aluminum, antimony, arsenic, barium, cadmium, iron, manganese, nitrate, perchlorate, and selenium.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 9810 mg/kg. Concentrations increased with depth at location 02-600573. The residential SSL is approximately 8 times and the industrial SSL is approximately 132 times the maximum concentration. Further sampling for vertical extent of aluminum is not warranted.

Antimony was not detected but had DLs (0.962 mg/kg to 1.24 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs in two soil samples and three tuff samples. The residential SSL is approximately 25 times the maximum DL. Further sampling for vertical extent of antimony is not warranted.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 0.892 mg/kg and was not detected but had DLs (1.18 mg/kg to 1.22 mg/kg) above the BV in three samples. Concentrations decreased with depth at location 02-600573 (the concentration in a shallow sample at location 02-600573 was 2.76 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 7.9 times the maximum concentration, and the industrial SSL is approximately 40 times the maximum concentration. Further sampling for vertical extent of arsenic is not warranted.

Barium was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 27.7 mg/kg. Concentrations decreased with depth at location 02-600573 (the concentration in a shallow sample at location 02-600573 was 42.7 mg/kg and below the soil BV [Appendix F, Pivot Tables]). Vertical extent of barium is defined.

Cadmium was not detected above the soil and Qbt 1g, Qct, Qbo BVs but had DLs (0.481 mg/kg to 0.622 mg/kg) above the BVs in three soil samples and four tuff samples. The residential SSL is approximately 113 times the maximum DL. Further sampling for vertical extent of cadmium is not warranted.

Iron was detected above the Qbt 1g, Qct, Qbo BV in four samples with a maximum concentration of 5850 mg/kg. Concentrations decreased with depth at locations 02-600573 and 02-612347 (concentrations in shallow samples at locations 02-600573 and 02-612347 were 7540 mg/kg and 7340 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). Vertical extent of iron is defined.

Manganese was detected above the Qbt 1g, Qct, Qbo BV in three samples with a maximum concentration of 232 mg/kg. Concentrations decreased with depth at location 02-612347 (the concentration in a shallow sample at location 02-612347 was 329 mg/kg and below the soil BV [Appendix F, Pivot Tables]). Vertical extent of manganese is defined.

Nitrate was detected in two samples with a maximum concentration of 31.9 mg/kg. Concentrations decreased with depth at location 02-600573. Vertical extent of nitrate is defined.

Perchlorate was detected in one sample at a concentration of 0.000559 mg/kg. Concentrations decreased with depth at location 02-600573. Vertical extent of perchlorate is defined.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs in one soil sample and one tuff sample with a maximum concentration of 1.7 mg/kg and was not detected but had a DLs (1.18 mg/kg to 1.61 mg/kg) above BVs in one soil sample and three tuff samples. Concentrations did not change substantially with depth (0.18 mg/kg) at location 02-600573. The residential SSL is approximately 230 times the maximum concentration and 243 times the maximum DL. Further sampling for vertical extent of selenium is not warranted.

Organic Chemicals

Organic COPCs at AOC 02-011(c) include Aroclor-1254, Aroclor-1260, di-n-butylphthalate, and toluene.

Aroclor-1254 was detected in one sample at a concentration of 0.518 mg/kg. Concentrations decreased with depth at location 02-600573. Vertical extent of Aroclor-1254 is defined.

Aroclor-1260 was detected in two samples with a maximum concentration of 0.12 mg/kg. Concentrations decreased with depth at locations 02-600573 and 02-612347. Vertical extent of Aroclor-1254 is defined.

Di-n-butylphthalate was detected in one sample at a concentration of 0.043 mg/kg. Concentrations increased with depth at location 02-600573. The residential SSL is approximately 143,000 times the maximum concentration. Further sampling for vertical extent of di-n-butylphthalate is not warranted.

Toluene was detected in one sample at a concentration of 0.000674 mg/kg. Concentrations decreased with depth at location 02-600573. Vertical extent of toluene is defined.

Radionuclides

Radionuclide COPCs at AOC 02-011(c) include strontium-90 and tritium.

Strontium-90 was detected below 1 ft bgs in one soil sample at an activity of 0.263 pCi/g. Activities decreased with depth at location 02-600573. Vertical extent of strontium-90 is defined.

Tritium was detected in three samples with a maximum activity of 0.191 pCi/g. Activities increased with depth at location 02-600573 and decreased with depth at location 02-612347. The residential SAL is approximately 8900 times the maximum activity. Further sampling for vertical extent of tritium is not warranted.

Summary of Nature and Extent

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at AOC 02-011(c).

6.31.5 Summary of Human Health Risk Screening

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} (NMED 2017, 602273). The industrial HI is 0.003, which is less than the NMED target HI of 1 (NMED 2017, 602273). No radionuclide COPCs were identified in the 0.0–1.0 ft depth interval.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 2×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.009, which is less than the NMED target HI of 1 (NMED 2017, 602273). No radionuclide COPCs were identified in the 0.0–1.0 ft depth interval.

Residential Scenario

The total excess cancer risk for the residential scenario is 7×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.08, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.4 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The residential exposure scenario also demonstrates protection of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, residential, and construction worker scenarios at AOC 02-011(c).

6.31.6 Summary of Ecological Risk Screening

AOC 02-011(c) is within the TA-02 core area. Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and results of site-specific ecological risk studies, no potential ecological risks exist for the TA-02 core area.

6.32 AOC 02-011(d), Outfall from Equipment Building

6.32.1 Site Description and Operational History

AOC 02-011(d) was an NPDES-permitted outfall (Figure 6.32-1) that discharged effluent from the OWR equipment building [02-44, AOC 02-004(f)]. The line ran from the equipment building south-southwest, past the western side of the cooling tower (structure 02-49), to Los Alamos Creek.

The outfall at AOC 02-011(d) became operational in 1949, discharging effluent to Los Alamos Creek. The discharge consisted primarily of regenerant water from the ion-exchange system. Discharge was rerouted through the OWR effluent storage tanks and disposed of through the liquid acid waste line to TA-50 beginning in 1963. The outfall was removed from the NPDES permit in 1995 (NMED 2001, 071256).

6.32.2 Relationship to Other SWMUs and AOCs

The AOC 02-011(d) outfall was associated with the OWR equipment building, AOC 02-004(f), which was the source of effluent discharged from the outfall. The drainline from the equipment building was rerouted in 1963 to the OWR effluent storage tanks, AOCs 02-004(b,c,d).

6.32.3 Summary of Previous Investigations

6.32.3.1 1995 Investigation Activities

Three samples were collected from locations 02-01151 and 02-01155 in 1995.

6.32.3.2 2000 Post–Cerro Grande Recovery Work

During the post–Cerro Grande fire recovery work in July 2000, samples were collected from locations 02-01247 and 02-01248.

6.32.3.3 2003 Omega West Decommissioning Project

AOC 02-011(d) piping was removed, and the waste was disposed of at an approved facility. Site activities included soil excavation, radiological walkover surveys, radiological (structure) screening, soil sampling, sample analysis, and surveying of sample coordinates. Limited soil surveys were conducted, but no formal report of soil survey results is available.

LLW (construction debris and/or soil) was packaged and shipped to Envirocare or TA-54 for disposal. Mixed waste was packaged and transferred to TA-54 for further processing and/or storage at the Laboratory. In total, 9800 ft^3 of material was shipped to Envirocare for disposal; material from the OWR equipment building (building 02-44) outfall was included in this total volume (WD-3 2003, 082646, pp. 1–6). The specific volume of material associated with AOC 02-011(d) was not documented.

No soil samples were collected from AOC 02-011(d) during D&D activities in 2003.

6.32.3.4 2007 Investigation Activities

Two samples were collected from one location at AOC 02-011(d) in 2007. Results from the sampling activities in 2007 were presented in the previous investigation report (LANL 2008, 101669.12). Additional sampling was required to define the extent of contamination at the site.

6.32.4 Site Contamination

6.32.4.1 Soil, Rock, and Sediment Sampling

As part of the 2010 investigation, the following characterization activities were conducted at AOC 02-011(d):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Five samples were collected from location 02-612280 where AOCs 02-004(b,c,d,e) and AOC 02-011(d) are collocated from 5–7 ft, 15–16 ft, 25–27 ft, 35–36 ft, and 49–50 ft bgs. These samples were analyzed for TAL metals, hexavalent chromium, PCBs, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium.

As part of the 2017 investigation, the following characterization activities were conducted at AOC 02-011(d):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Two samples were collected from location 02-600574 from 3–4 ft and 5–5.1 ft to define vertical extent at this location. Three samples were collected at location 02-61413 from 0–1 ft, 2–3 ft, and 4–5 ft. These samples were analyzed for TAL metals, nitrate, perchlorate, hexavalent chromium, PCBs, SVOCs, VOCs, amerium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, strontium-90, and tritium.

The 2010, 2017, and historical sampling locations at AOC 02-011(d) are shown in Figure 6.32-1. Table 6.32-1 presents the samples collected and analyses requested for AOC 02-011(d). The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

6.32.4.2 Soil, Rock, and Sediment Sample Field-Screening Results

No organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of the samples. No radiological-screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. No changes to sampling or other activities occurred because of the field-screening results.

6.32.4.3 Soil, Rock, and Sediment Sample Analytical Results

Decision-level data at AOC 02-011(d) consist of results from 14 samples collected from 5 locations in 2000, 2007, 2010, and 2017. The 14 samples include 6 soil, 2 Qal, 4 Qbo, and 2 sediment samples.

Inorganic Chemicals

A total of 14 samples (6 soil, 2 Qal, 4 Qbo, and 2 sediment) were analyzed for TAL metals, 12 samples (6 soil, 2 Qal, and 4 Qbo) were analyzed for hexavalent chromium, and 7 samples (6 soil and 1 Qal) were analyzed for nitrate, perchlorate, and total cyanide. Table 6.32-2 presents the inorganic chemicals detected or detected above BVs. Figure 6.32-2 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV (3560 mg/kg) in one sample at a concentration of 8240 mg/kg. Because there were fewer than eight Qbo samples, statistical tests could not be performed. Aluminum is retained as a COPC.

Antimony was not detected but had DLs (0.986 mg/kg to 1.26 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs (0.5 mg/kg) in four soil samples and four tuff samples. Antimony is retained as a COPC.

Arsenic was detected above the sediment BV (3.98 mg/kg) in one sample at a concentration of 8.7 mg/kg and was not detected but had DLs (1.25 mg/kg to 1.26 mg/kg) above the Qbt 1g, Qct, Qbo BV (0.56 mg/kg) in three samples. Arsenic is retained as a COPC.

Cadmium was detected above the sediment BV (0.4 mg/kg) in one sample at a concentration of 0.69 mg/kg and was not detected but had DLs (0.589 mg/kg to 0.631 mg/kg) above the Qbt 1g, Qct, Qbo BV (0.4 mg/kg) in four samples. Cadmium is retained as a COPC.

Calcium was detected above the soil and sediment BVs (6610 mg/kg and 4420 mg/kg) in 1 soil sample and 1 sediment sample with a maximum concentration of 19,400 mg/kg. Because there were fewer than 10 sediment samples, statistical tests could not be performed. Calcium is retained as a COPC.

Chromium was detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs (19.3 mg/kg, 10.5 mg/kg, and 2.6 mg/kg) in two soil samples, two sediment samples, and one tuff sample with a maximum concentration of 240 mg/kg. Chromium is retained as a COPC.

Copper was detected above the soil and sediment BVs (14.7 mg/kg and 11.2 mg/kg) in two soil samples and one sediment sample with a maximum concentration of 41 mg/kg. Because there were fewer than eight soil or sediment samples, statistical tests could not be performed. Copper is retained as a COPC.

Hexavalent chromium was detected in three samples with a maximum concentration of 0.775 mg/kg. Hexavalent chromium is retained as a COPC.

Iron was detected above the Qbt 1g, Qct, Qbo BV (3700 mg/kg) in four samples with a maximum concentration of 5400 mg/kg. Because there were fewer than eight Qbo samples, statistical tests could not be performed. Iron is retained as a COPC.

Lead was detected above the soil and sediment BVs (22.3 mg/kg and 19.7 mg/kg) in two soil samples and two sediment samples with a maximum concentration of 44.4 mg/kg. Because there were fewer than eight soil or sediment samples, statistical tests could not be performed. Lead is retained as a COPC.

Manganese was detected above the Qbt 1g, Qct, Qbo BV (189 mg/kg) in three samples with a maximum concentration of 253 mg/kg. Because there were fewer than eight Qbo samples, statistical tests could not be performed. Manganese is retained as a COPC.

Mercury was detected above the soil BV (0.1 mg/kg) in 1 sample at a concentration of 0.151 mg/kg. The concentration was only 0.051 mg/kg above the BV and mercury was not detected or detected above BV in 13 other samples (detected below BV in 9 samples). Mercury is not a COPC.

Nickel was detected above the Qbt 1g, Qct, Qbo BV (2 mg/kg) in one sample at a concentration of 2.49 mg/kg. Because there were fewer than eight Qbo samples, statistical tests could not be performed. Nickel is retained as a COPC.

Nitrate was detected in four samples with a maximum concentration of 3.32 mg/kg. Nitrate is naturally occurring, and the concentrations likely reflect naturally occurring levels. In addition, AOC 02-011(d) discharged ion exchange regenerant and is not a source of nitrate. Nitrate is not a COPC.

Perchlorate was detected in four samples with a maximum concentration of 0.00172 mg/kg. Perchlorate is retained as a COPC.

Selenium was not detected but had DLs (1.19 mg/kg to 1.26 mg/kg) above the Qbt 1g, Qct, Qbo BV (0.3 mg/kg) in four samples. Selenium is retained as a COPC.

Silver was detected above the sediment BV (1 mg/kg) in one sample at a concentration of 1.1 mg/kg. Silver is retained as a COPC.

Zinc was detected above the soil and sediment BVs (48.8 mg/kg and 60.2 mg/kg) in three soil samples and two sediment samples with a maximum concentration of 190 mg/kg. Because there were fewer than eight soil or sediment samples, statistical tests could not be performed. Zinc is retained as a COPC.

Organic Chemicals

A total of twelve samples (6 soil, 2 Qal, and 4 Qbo) were analyzed for PCBs and 7 samples (6 soil and 1 Qal) were analyzed for SVOCs and VOCs. Table 6.32-3 presents the detected organic chemicals. Figure 6.32-3 shows the spatial distribution of detected organic chemicals.

Polycyclic Aromatic Hydrocarbons

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

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

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

Site Activities

AOC 02-011(d) was an NPDES-permitted outfall that discharged effluent from the OWR equipment building, including ion-exchange regenerant, and was identified as an AOC because of the potential for releases of radioactivity. The AOC 02-011(d) outfall was located adjacent to asphalt paving west of the OWR and received runoff from the paved area. Samples with detectable PAHs at this site were collected from a location that received runoff from the paved area, and the highest concentrations of PAHs were detected in the surface sample. PAHs were not known to be associated with the effluent discharged from this outfall. Therefore, the PAHs detected in samples used to characterize this site [acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; dibenz(a,h)anthracene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenanthrene; and pyrene] are associated with the former paved area, are not related to historical Laboratory site operations, and are not COPCs.

Organic COPCs

Other organic chemicals detected at AOC 02-011(d) include acetone, Aroclor-1254, Aroclor-1260, 2-butanone, and isophorone. The detected organic chemicals listed are retained as COPCs.

Radionuclides

A total of 7 samples (6 soil and 1 Qal) were analyzed for americium-241; 14 samples (6 soil, 2 Qal, 4 Qbo, and 2 sediment) were analyzed for gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, and tritium; and 9 samples (6 soil, 1 Qal, and 2 sediment) were analyzed for strontium-90.

Table 6.32-4 presents the radionuclides detected or detected above BVs/FVs. Figure 6.32-4 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Cesium-137 was detected above the soil FV (1.65 pCi/g) in one sample and detected below 1 ft bgs in four soil and Qal samples with a maximum activity of 1.66 pCi/g. Cesium-137 is retained as a COPC.

Cobalt-60 was detected in seven samples with a maximum activity of 2.19 pCi/g. Cobalt-60 is retained as a COPC.

Plutonium-239/240 was detected above the soil and sediment FVs (0.054 pCi/g and 0.068 pCi/g) in one soil sample and two sediment samples and was detected below 1 ft bgs in six soil and Qal samples with a maximum activity of 1.28 pCi/g. Plutonium-239/240 is retained as a COPC.

Tritium was detected in two samples with a maximum activity of 0.217 pCi/g. Tritium is retained as a COPC.

Uranium-234 was detected above the sediment BV (2.59 pCi/g) in one sample at an activity of 2.66 pCi/g. Uranium-234 is retained as a COPC.

6.32.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at AOC 02-011(d) are discussed below.

Inorganic Chemicals

Inorganic COPCs at AOC 02-011(d) include aluminum, antimony, arsenic, cadmium, calcium, chromium, copper, hexavalent chromium, iron, lead, manganese, nickel, perchlorate, selenium, silver, and zinc.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 8240 mg/kg. Concentrations decreased with depth at location 02-612280 and decreased laterally to the south. Lateral and vertical extent of aluminum are defined.

Antimony was not detected but had DLs (0.986 mg/kg to 1.26 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs in four soil samples and four tuff samples. The residential SSL is approximately 25 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 8.7 mg/kg and was not detected but had DLs (1.25 mg/kg to 1.26 mg/kg) above the Qbt 1g, Qct, Qbo BV in three samples. Only one depth was sampled at location 02-01247 and concentrations decreased laterally to the south. Arsenic was not detected above BV in deeper samples collected at location 02-600574 approximately 8 ft from location 02-01247 and vertical extent is defined at location 02-01247. Lateral and vertical extent of arsenic are defined.

Cadmium was detected above the sediment BV in one sample at a concentration of 0.69 mg/kg and was not detected but had DLs (0.589 mg/kg to 0.631 mg/kg) above the Qbt 1g, Qct, Qbo BV in four samples. Only one depth was sampled at location 02-01247 and concentrations decreased laterally to the south. Cadmium was not detected above BV in a deeper sample collected at location 02-600574 approximately 8 ft from location 02-01247 and vertical extent is defined at location 02-01247. The residential SSL is approximately 112 times the maximum DL. Further sampling for extent of cadmium is not warranted.

Calcium was detected above the soil and sediment BVs in one soil sample and one tuff sample with a maximum concentration of 19,400 mg/kg. Only one depth was sampled at location 02-01247, concentrations decreased with depth at location 02-600574, and concentrations decreased laterally to the south. Calcium concentrations decreased with depth at location 02-600574 approximately 8 ft from location 02-01247 and vertical extent is defined at location 02-01247. Lateral and vertical extent of calcium are defined.

Chromium was detected above the soil; sediment; and Qbt 1g, Qct, Qbo BVs in two soil samples, two sediment samples, and one tuff sample with a maximum concentration of 240 mg/kg. Only one depth was sampled at locations 02-01247 and 02-01248, concentrations decreased with depth at locations 02-600574 and 02-612280, and concentrations decreased laterally to the south (the concentration in a shallow sample at location 02-612280 was 15.6 mg/kg and below the soil BV [Appendix F, Pivot Tables]). Chromium concentrations decreased with depth at location 02-600574 approximately 8 ft from location 02-01247 and 15 ft from location 02-01248 and vertical extent is defined at locations 02-01247 and 02-01248. Lateral and vertical extent of chromium are defined.

Copper was detected above the soil and sediment BVs in two soil samples and one sediment sample with a maximum concentration of 41 mg/kg. Only one depth was sampled at location 02-01247, concentrations decreased with depth at location 02-600574, and concentrations decreased laterally to the south. Copper concentrations decreased with depth at location 02-600574 approximately 8 ft from location 02-01247 and vertical extent is defined at location 02-01247. Lateral and vertical extent of chromium are defined.

Hexavalent chromium was detected in three samples with a maximum concentration of 0.775 mg/kg. Concentrations decreased with depth at locations 02-600574 and 02-61413 and increased laterally to the south. The residential SSL is approximately 3.9 times the maximum concentration, and the industrial SSL is approximately 14 times the maximum concentration. Vertical extent of hexavalent chromium is defined and further sampling for lateral extent is not warranted.

Iron was detected above the Qbt 1g, Qct, Qbo BV in four samples with a maximum concentration of 5400 mg/kg. Concentrations decreased with depth at location 02-612280 and decreased laterally to the south (the concentration in a shallow sample at location 02-612280 was 8300 mg/kg and below the soil BV [Appendix F, Pivot Tables]). Lateral and vertical extent of iron are defined.

Lead was detected above the soil and sediment BVs in two soil samples and two sediment samples with a maximum concentration of 44.4 mg/kg. Only one depth was sampled at locations 02-01247 and 02-01248, concentrations decreased with depth at location 02-600574, and concentrations decreased laterally to the south. Lead concentrations decreased with depth at location 02-600574 approximately 8 ft from location 02-01247 and 15 ft from location 02-01248 and vertical extent is defined at locations 02-01247 and 02-01248. Lateral and vertical extent of lead are defined.

Manganese was detected above the Qbt 1g, Qct, Qbo BV in three samples with a maximum concentration of 253 mg/kg. Concentrations decreased with depth at location 02-612280 and decreased laterally to the south. Lateral and vertical extent of manganese are defined.

Nickel was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 2.49 mg/kg. Concentrations decreased with depth at location 02-612280 and decreased laterally to the south. Lateral and vertical extent of nickel are defined.

Perchlorate was detected in four samples with a maximum concentration of 0.00172 mg/kg. Concentrations did not change substantially with depth (0.00061 mg/kg) at location 02-600574 and increased laterally to the south. The residential SSL is approximately 31,900 times the maximum concentration. Further sampling for extent of perchlorate is not warranted.

Selenium was not detected but had DLs (1.19 mg/kg to 1.26 mg/kg) above the Qbt 1g, Qct, Qbo BV in four samples. The residential SSL is approximately 310 times the maximum DL. Further sampling for extent of selenium is not warranted.

Silver was detected above the sediment BV in one sample at a concentration of 1.1 mg/kg. Only one depth was sampled at location 02-01248 and concentrations decreased laterally to the south. Silver was not detected above BV in deeper samples collected at location 02-600574 approximately 15 ft from location 02-01248 and vertical extent is defined at location 02-01248. Lateral and vertical extent of silver are defined.

Zinc was detected above the soil and sediment BVs in three soil samples and two sediment samples with a maximum concentration of 190 mg/kg. Only one depth was sampled at locations 02-01247 and 02-01248, concentrations did not change substantially with depth (4.1 mg/kg) at location 02-61413, concentrations decreased with depth at location 02-600574, and concentrations decreased laterally to the south (the concentration in a shallow sample at location 02-61413 was 46.2 mg/kg and below the soil BV [Appendix F, Pivot Tables]). Zinc concentrations decreased with depth at location 02-600574 approximately 8 ft from location 02-01247 and 15 ft from location 02-01248 and vertical extent is defined at locations 02-01247 and 02-01248. Lateral and vertical extent of zinc are defined.

Organic Chemicals

Organic COPCs at AOC 02-011(d) include acetone, Aroclor-1254, Aroclor-1260, 2-butanone, and isophorone.

Acetone was detected in one sample at a concentration of 0.00917 mg/kg. Concentrations decreased with depth at location 02-600574 and increased laterally to the south. The residential SSL is approximately 7,230,000 times the maximum concentration. Vertical extent of acetone is defined and further sampling for lateral extent is not warranted.

Aroclor-1254 was detected in seven samples with a maximum concentration of 0.12 mg/kg. Concentrations decreased with depth at all locations and increased laterally to the south. The residential SSL is approximately 9.5 times the maximum concentration, and the industrial SSL is approximately 92 times the maximum concentration. Vertical extent of Aroclor-1254 is defined and further sampling for lateral extent is not warranted.

Aroclor-1260 was detected in eight samples with a maximum concentration of 0.182 mg/kg. Concentrations decreased with depth at all locations and decreased laterally to the south. Lateral and vertical extent of Aroclor-1254 are defined.

Butanone[2-] was detected in one sample at a concentration of 0.0024 mg/kg. Concentrations decreased with depth at location 02-600574 and increased laterally to the south. The residential SSL is approximately 15,500,000 times the maximum concentration. Vertical extent of 2-butanone is defined and further sampling for lateral extent is not warranted.

Isophorone was detected in one sample at a concentration of 0.145 mg/kg. Concentrations increased with depth at location 02-600574 and increased laterally to the south. The residential SSL is approximately 38,700 times the maximum concentration. Further sampling for extent of isophorone is not warranted.

Radionuclides

Radionuclide COPCs at AOC 02-011(d) include cesium-137, cobalt-60, plutonium-239/240, tritium, and uranium-234.

Cesium-137 was detected above the soil FV in one sample and detected below 1 ft bgs in six soil and Qal samples with a maximum activity of 1.66 pCi/g. Activities decreased with depth at locations 02-600574, 02-612280, and 02-61413 and increased laterally to the south. The residential SAL is approximately 7.2 times the maximum activity, and the industrial SAL is approximately 25 times the maximum activity. Vertical extent of cesium-137 is defined and further sampling for lateral extent is not warranted.

Cobalt-60 was detected in seven samples with a maximum activity of 2.19 pCi/g. Activities increased with depth at location 02-61413, only one depth was sampled at locations 02-01147 and 02-01148, activities decreased with depth at locations 02-600574 and 02-612280, and activities increased laterally to the south. Cobalt-60 activities decreased with depth at location 02-600574 approximately 8 ft from location 02-01247 and 15 ft from location 02-01248 and vertical extent is defined at locations 02-01247 and 02-01248. Cobalt-60 was not detected to the south at AOC 02-004(g) location 02-600495 (Figure 6.13-2) and lateral extent is defined to the south. The residential SAL is approximately 22 times and the industrial SAL is approximately 76 times the maximum activity where vertical extent is not defined (0.119 pCi/g at location 02-61413). Lateral extent of cobalt-60 is defined and further sampling for vertical extent is not warranted.

Plutonium-239/240 was detected above the soil and sediment FVs in one soil sample and two sediment samples and was detected below 1 ft bgs in six soil and Qal samples with a maximum activity of 1.28 pCi/g. Only one depth was sampled at locations 02-01147 and 02-01148, activities did not change substantially with depth (0.0042 pCi/g) at location 02-61413, activities decreased with depth at locations 02-600574 and 02-612280, and activities increased laterally to the south. Plutonium-239/240 activities decreased with depth at location 02-600574 approximately 8 ft from location 02-01247 and 15 ft from location 02-01248 and vertical extent is defined at locations 02-01247 and 02-01248. Plutonium-239/240 activities decreased to the south at AOC 02-004(g) location 02-600496 (Figure 6.13-2) and lateral extent is defined to the south. The residential SAL is approximately 1120 times the maximum activity where vertical extent is not defined (0.0703 pCi/g at location 02-61413). Lateral extent of plutonium-239/240 is defined and further sampling for vertical extent is not warranted.

Tritium was detected in two samples with a maximum activity of 0.217 pCi/g. Activities decreased with depth at locations 02-600574 and 02-612280 and decreased laterally to the south. Lateral and vertical extent of tritium are defined.

Uranium-234 was detected above the sediment BV in one sample at an activity of 2.66 pCi/g. Only one depth was sampled at location 02-01247 and activities decreased laterally to the south. Uranium-234 was not detected above BV at location 02-600574 approximately 8 ft from location 02-01247 and vertical extent is defined at location 02-01247. Lateral and vertical extent of uranium-234 are defined.

Summary of Nature and Extent

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at AOC 02-011(d).

6.32.5 Summary of Human Health Risk Screening

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} (NMED 2017, 602273). The industrial HI is 0.1, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 7 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 1×10^{-5}, which is equivalent to the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.8 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Residential Scenario

The total excess cancer risk for the residential scenario is 2×10^{-5}, which is greater than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.6, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 12 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The residential exposure scenario also demonstrates protection of construction workers.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, and construction worker scenarios at AOC 02-011(d). A potential for unacceptable cancer risk exists for the residential scenario at AOC 02-011(d).

6.32.6 Summary of Ecological Risk Screening

AOC 02-011(d) is within the TA-02 core area. Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and results of site-specific ecological risk studies, no potential ecological risks exist for the TA-02 core area.

6.33 AOC 02-011(e), Duplicate of SWMU 02-008(a)

AOC 02-011(e) is a duplicate of SWMU 02-008(a). All activities for AOC 02-011(e) are addressed with respect to SWMU 02-008(a), which is discussed in section 6.21.

6.34 AOC 02-012, Soil Contamination

6.34.1 Site Description and Operational History

AOC 02-012 consists of the potential soil contamination associated with two removed fuel underground storage tanks (USTs), structures 02-29 and 02-67 (NMED-registered tank 02-1) (Figure 6.34-1).

AOC 02-003(e) is the former location of an 800-L stainless-steel holding tank (structure 02-62), installed in approximately 1944, which was associated with operation of the WBR. The tank was removed in 1950 (LANL 1996, 055226, p. 5-15). In 1982, a 517-gal. diesel tank [structure 02-67 (NMED-registered tank 02-1)] was installed on the north side of the OWR building (02-1). The diesel tank and associated lines were removed and disposed of in 1998 in accordance with NMED requirements (LANL 2000, 090023).

6.34.2 Relationship to Other SWMUs and AOCs

AOC 02-012 is located immediately adjacent to the south side of a former reactor building [AOC 02-004(a)]. It is also approximately 10 ft west of a former drainline [AOC 02-011(a)(ix)] and is collocated with a portion of the former sewer line [AOC 02-006(c)]. There was no physical connection between the drainline or the sewer line and the two tanks in AOC 02-012.

6.34.3 Summary of Previous Investigations

In 1994, UST tightness tests were performed on the diesel tank and its associated lines. The results indicated that the tank system was competent (LANL 2000, 090023).

6.34.3.1 1998 UST Removal Activities

As part of the 1998 UST removal activities, six samples were collected from five boreholes around the tank excavation. Borehole location survey coordinates were not collected for these locations, and the data cannot be accurately represented. Therefore, the data are not useable and are not presented in this report.

6.34.3.2 2000 Post–Cerro Grande Recovery Work

During the post–Cerro Grande fire recovery work in 2000, six soil samples were collected from three boreholes (locations 02-01257, 02-01258, and 02-01265) along the former fuel line associated with the UST (NMED-registered tank 02-1).

6.34.3.3 2007 Investigation Activities

Thirty-five samples were collected from eleven locations at AOC 02-012 in 2007. Results from the sampling activities in 2007 were presented in the previous investigation report (LANL 2008, 101669.12). Additional sampling was required to define the extent of contamination at the site.

6.34.4 Site Contamination

6.34.4.1 Soil and Rock Sampling

As part of the 2010 investigation, the following characterization activities were conducted at AOC 02-012:

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Five samples were collected from location 02-612374 near AOC 02-012 from 5–6 ft, 15–16 ft, 25–26 ft, 35–36 ft, and 49–50 ft bgs. These samples were analyzed for TAL metals, PCBs, TPH-DRO, SVOCs, isotopic plutonium, isotopic uranium, strontium-90, and tritium.

The 2010 and historical sampling locations at AOC 02-012 are shown in Figure 6.34-1. Table 6.34-1 presents the samples collected and analyses requested for AOC 02-012. The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

6.34.4.2 Soil and Rock Sample Field-Screening Results

No organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of the samples. No radiological-screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. No changes to sampling or other activities occurred because of the field-screening results.

6.34.4.3 Soil and Rock Sample Analytical Results

Decision-level data at AOC 02-012 consist of results from 46 samples collected from 15 locations in 2000, 2007, and 2010. The 46 samples include 18 soil/fill, 12 Qal, and 16 Qbo samples.

Inorganic Chemicals

A total of 46 samples (18 soil, 12 Qal, and 16 Qbo) were analyzed for TAL metals, 35 samples (11 soil, 12 Qal, and 12 tuff) were analyzed for nitrate and perchlorate, and 41 samples (17 soil, 12 Qal, and 12 tuff) were analyzed for total cyanide. Table 6.34-2 presents the inorganic chemicals detected or detected above BVs. Plate 42 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV (3560 mg/kg) in 13 samples with a maximum concentration of 9800 mg/kg. The Gehan and quantile tests indicated site concentrations of aluminum in tuff are statistically different from background (Figure G-291 and Table G-44). Aluminum is retained as a COPC.

Antimony was detected above the Qbt 1g, Qct, Qbo BV (0.5 mg/kg) in one sample at a concentration of 0.539 mg/kg and was not detected but had DLs (0.506 mg/kg to 1.37 mg/kg) above the BV in five samples. There were too few detections to perform statistical tests. Antimony is retained as a COPC.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV (0.56 mg/kg) in 12 samples with a maximum concentration of 2.63 mg/kg and was not detected but had DLs (1.21 mg/kg to 1.94 mg/kg) above the Qbo BV in 4 samples. The quantile and slippage tests indicated site concentrations of arsenic in tuff are statistically different from background (Figure G-292 and Table G-44). Arsenic is retained as a COPC.

Barium was detected above the Qbt 1g, Qct, Qbo BV (25.7 mg/kg) in seven samples with a maximum concentration of 92.7 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in tuff are statistically different from background (Figure G-293 and Table G-44). Barium is retained as a COPC.

Cadmium was detected above the soil BV (0.4 mg/kg) in 1 sample at a concentration of 0.883 mg/kg and was not detected but had DLs (0.493 mg/kg to 0.683 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs (0.4 mg/kg) in 19 soil samples and 16 tuff samples. There were too few detections in the soil background data set to perform statistical tests and there is no Qbo background data set. Cadmium is retained as a COPC.

Chromium was detected above the soil and Qbt 1g, Qct, Qbo BVs (19.3 mg/kg and 2.6 mg/kg) in one soil sample and nine tuff samples with a maximum concentration of 35.5 mg/kg and was not detected but had DLs (3.55 mg/kg to 7.58 mg/kg) above the Qbo BV in four samples. The quantile and slippage tests indicated site concentrations of chromium in soil are not statistically different from background (Figure G-294 and Table G-45), and the Gehan and quantile tests indicated site concentrations of chromium in tuff are statistically different from background (Figure G-295 and Table G-44). Chromium is retained as a COPC.

Copper was detected above the soil and Qbt 1g, Qct, Qbo BVs (14.7 mg/kg and 2.6 mg/kg) in one soil sample and two tuff samples with a maximum concentration of 104 mg/kg and was not detected but had DLs (3.98 mg/kg and 4.28 mg/kg) above the Qbt 1g, Qct, Qbo BV in two samples. The Gehan and quantile tests indicated site concentrations of copper in soil are not statistically different from background (Figure G-296 and Table G-45), and the quantile and slippage tests indicated site concentrations of copper in tuff are statistically different from background (Figure G-297 and Table G-44). Copper is retained as a COPC.

Cyanide was detected above the Qbt 1g, Qct, Qbo BV (0.5 mg/kg) in one sample at a concentration of 0.69 mg/kg. Cyanide is retained as a COPC.

Iron was detected above the Qbt 1g, Qct, Qbo BV (3700 mg/kg) in 16 samples with a maximum concentration of 8890 mg/kg. The Gehan and quantile tests indicated site concentrations of iron in tuff are statistically different from background (Figure G-298 and Table G-44). Iron is retained as a COPC.

Lead was detected above the soil BV (22.3 mg/kg) in one sample at a concentration of 23.4 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil are not statistically different from background (Figure G-299 and Table G-45). Lead is not a COPC.

Manganese was detected above the Qbt 1g, Qct, Qbo BV (189 mg/kg) in 13 samples with a maximum concentration of 688 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in tuff are statistically different from background (Figure G-300 and Table G-44). Manganese is retained as a COPC.

Mercury was detected above the soil BV (0.1 mg/kg) in nine samples with a maximum concentration of 4.65 mg/kg. Mercury is retained as a COPC in soil.

Nickel was detected above the Qbt 1g, Qct, Qbo BV (2 mg/kg) in eight samples with a maximum concentration of 3.38 mg/kg. The quantile and slippage tests indicated site concentrations of nickel in tuff are statistically different from background (Figure G-301 and Table G-44). Nickel is retained as a COPC.

Nitrate was detected in 16 samples with a maximum concentration of 7.39 mg/kg. Nitrate is naturally occurring, and the concentrations likely reflect naturally occurring levels. In addition, AOC 02-012 is associated with underground fuel storage tanks and is not a source of nitrate. Nitrate is not a COPC.

Perchlorate was detected in five samples with a maximum concentration of 0.00174 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs (1.52 mg/kg and 0.3 mg/kg) in 4 soil samples and 10 tuff samples with a maximum concentration of 6.41 mg/kg and it was not detected but had DLs (1.21 mg/kg and 1.86 mg/kg) above the BVs in 3 soil samples and 6 tuff samples. The Gehan and quantile tests indicated site concentrations of selenium in soil are statistically different from background (Figure G-302 and Table G-45). Selenium is retained as a COPC.

Vanadium was detected above the Qbt 1g, Qct, Qbo BV (4.59 mg/kg) in six samples with a maximum concentration of 10.3 mg/kg. The Gehan and quantile tests indicated site concentrations of vanadium in tuff are statistically different from background (Figure G-303 and Table G-44). Vanadium is retained as a COPC.

Zinc was detected above the soil and Qbt 1g, Qct, Qbo BVs (48.8 mg/kg and 40 mg/kg) in six soil samples and one tuff sample with a maximum concentration of 560 mg/kg. The site concentrations are substantially above background. Zinc is identified as a COPC in soil. Zinc was detected above the Qbo BV (40 mg/kg) in one sample at a concentration of 56.8 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are statistically different from background (Figure G-304 and Table G-45), and the quantile and slippage tests indicated site concentrations of zinc in tuff are not statistically different from background (Figure G-305 and Table G-44). Zinc is retained as a COPC.

Organic Chemicals

A total of 5 samples (1 soil and 4 Qbo) were analyzed for PCBs, 40 samples (12 soil, 12 Qal, and 16 Qbo) were analyzed for SVOCs and TPH-DRO, and 24 samples (12 Qal and 12 Qbo) were analyzed for VOCs. Table 6.34-3 presents the detected organic chemicals. Plate 43 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at AOC 02-012 include acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chloroform; chrysene; dibenzofuran; 1,4-dichlorobenzene; di-n-butylphthalate; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; methylene chloride; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; TPH-DRO; and trichloroethene. The detected organic chemicals are retained as COPCs.

Radionuclides

A total of 35 samples (11 soil, 12 Qal, and 12 Qbo) were analyzed for americium-241 and gamma-emitting radionuclides, 40 samples (12 soil, 12 Qal, and 16 Qbo) were analyzed for isotopic plutonium, strontium-90, and tritium, and 27 samples (8 soil, 7 Qal, and 12 Qbo) were analyzed for isotopic uranium. Table 6.34-4 presents the radionuclides detected or detected above BVs/FVs. Figure 6.34-2 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Americium-241 was detected below 1 ft bgs in one Qal sample at an activity of 0.0987 pCi/g. Americium-241 is retained as a COPC.

Plutonium-239/240 was detected below 1 ft bgs in one Qal sample at an activity of 0.228 pCi/g. Plutonium-239/240 is retained as a COPC.

Tritium was detected in 14 samples with a maximum activity of 0.446 pCi/g. Tritium is retained as a COPC.

Uranium-235/236 was detected above the Qbo BV (0.18 pCi/g) in 1 sample at an activity of 0.193 pCi/g. The activity was only 0.013 pCi/g above BV, and uranium-235/236 was not detected or detected above BV in 26 other samples (detected below BV in 23 samples). Uranium-235/236 is not a COPC.

6.34.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at AOC 02-012 are discussed below.

Inorganic Chemicals

Inorganic COPCs at AOC 02-012 include aluminum, antimony, arsenic, barium, cadmium, chromium, copper, cyanide, iron, manganese, mercury, nickel, perchlorate, selenium, vanadium, and zinc.

Aluminum was detected above the Qbt 1g, Qct, Qbo BV in 13 samples with a maximum concentration of 9800 mg/kg. Concentrations increased with depth at most locations. The detections above BV were in the deepest samples collected at each location and aluminum was not detected above BV in overlying soil samples. Concentrations decreased laterally. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 8.0 times the maximum concentration, and the industrial SSL is approximately 132 times the maximum concentration. Lateral extent of aluminum is defined and further sampling for vertical extent is not warranted.

Antimony was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 0.539 mg/kg and was not detected but had DLs (0.506 mg/kg to 1.37 mg/kg) above the BV in five samples. Concentrations increased with depth at location 02-612374 and increased laterally. The residential SSL is approximately 58 times the maximum concentration and 23 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbt 1g, Qct, Qbo BV in 12 samples with a maximum concentration of 2.63 mg/kg and was not detected but had DLs (1.21 mg/kg to 1.94 mg/kg) above the Qbo BV in 4 samples. The detections above BV were generally in the deepest samples collected at each location and arsenic was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations decreased laterally. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 2.7 times the maximum concentration, and the industrial SSL is approximately 14 times the maximum concentration. The residential SSL is approximately 3.6 times the maximum DL, and the industrial SSL is approximately 19 times the maximum DL. Lateral extent of arsenic is defined and further sampling for vertical extent is not warranted.

Barium was detected above the Qbt 1g, Qct, Qbo BV in seven samples with a maximum concentration of 92.7 mg/kg. The detections above BV were generally in the deepest samples collected at each location and barium was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations decreased laterally. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 168 times the maximum DL. Lateral extent of barium is defined and further sampling for vertical extent is not warranted.

Cadmium was detected above the soil BV in 1 sample at a concentration of 0.883 mg/kg and was not detected but had DLs (0.493 mg/kg to 0.683 mg/kg) above the soil and Qbt 1g, Qct, Qbo BVs (0.4 mg/kg) in 19 soil samples and 16 tuff samples. Concentrations decreased with depth at location 02-600418 and increased laterally. The residential SSL is approximately 80 times the maximum concentration and 103 times the maximum DL. Further sampling for extent of cadmium is not warranted.

Chromium was detected above the soil and Qbt 1g, Qct, Qbo BVs in one soil sample and nine tuff samples with a maximum concentration of 35.5 mg/kg and was not detected but had DLs (3.55 mg/kg to 7.58 mg/kg) above the Qbo BV in four samples. Concentrations increased with depth at locations 02-600453, 02-600455, and 02-600487; did not change substantially with depth (1.4 mg/kg or less) at locations 02-600485 and 02-612374; decreased with depth at all other areas; and decreased laterally (concentrations in shallow samples at locations 02-600485, 02-600486, and 02-612374 were 15.3 mg/kg, 13.9 mg/kg, and 6.97 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). As described in section 4.2, AOC 02-012 is not a potential source of hexavalent chromium and use of the SSL for trivalent chromium to determine whether additional sampling is warranted is appropriate. The residential SSL for trivalent chromium (117,000 mg/kg) is approximately 3300 times the maximum concentration. Lateral extent of chromium is defined and further sampling for vertical extent is not warranted.

Copper was detected above the soil and Qbt 1g, Qct, Qbo BVs in one soil sample and two tuff samples with a maximum concentration of 104 mg/kg and was not detected but had DLs (3.98 mg/kg and 4.28 mg/kg) above the Qbt 1g, Qct, Qbo BV in two samples. Concentrations increased with depth at location 02-600453, did not change substantially with depth (1.44 mg/kg) at location 02-600485, and increased laterally (the concentration in a shallow sample at location 02-600485 was 5.49 mg/kg and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 30 times the maximum concentration. Further sampling for extent of copper is not warranted.

Cyanide was detected above the Qbt 1g, Qct, Qbo BV in one sample at a concentration of 0.69 mg/kg. Concentrations increased with depth at location 02-600453 and increased laterally. The residential SSL is approximately 16 times the maximum concentration, and the industrial SSL is approximately 91 times the maximum concentration. Further sampling for extent of cyanide is not warranted.

Iron was detected above the Qbt 1g, Qct, Qbo BV in 16 samples with a maximum concentration of 8890 mg/kg. The detections above BV were generally in the deepest samples collected at each location and iron was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations increased laterally. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 6.2 times the maximum concentration, and the industrial SSL is approximately 102 times the maximum concentration. Further sampling for extent of iron is not warranted.

Manganese was detected above the Qbt 1g, Qct, Qbo BV in 13 samples with a maximum concentration of 688 mg/kg. The detections above BV were generally in the deepest samples collected at each location and manganese was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations decreased laterally. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 15 times the maximum concentration, and the industrial SSL is approximately 233 times the maximum concentration. Further sampling for extent of manganese is not warranted.

Mercury was detected above the soil BV in nine samples with a maximum concentration of 4.65 mg/kg. Concentrations decreased with depth at all locations and increased laterally. The residential SSL is approximately 5.0 times the maximum concentration, and the industrial SSL is approximately 84 times the maximum concentration. Vertical extent of mercury is defined and further sampling for lateral extent is not warranted.

Nickel was detected above the Qbt 1g, Qct, Qbo BV in eight samples with a maximum concentration of 3.38 mg/kg. The detections above BV were generally in the deepest samples collected at each location and nickel was not detected above BV in overlying soil samples. Many of the concentrations in soil samples were equivalent to or greater than the Qbo concentrations, indicating that concentrations decreased or did not change substantially with depth (Appendix F, Pivot Tables). Concentrations decreased laterally. All detections above BV were at or below 10 ft bgs, beyond the depth intervals evaluated for risk. The residential SSL is approximately 402 times the maximum concentration. Lateral extent of nickel is defined and further sampling for vertical extent is not warranted.

Perchlorate was detected in five samples with a maximum concentration of 0.00174 mg/kg. Concentrations decreased with depth at all locations and increased laterally. The residential SSL is approximately 31,500 times the maximum concentration. Vertical extent of perchlorate is defined and further sampling for lateral extent is not warranted.

Selenium was detected above the soil and Qbt 1g, Qct, Qbo BVs in 4 soil samples and 10 tuff samples with a maximum concentration of 6.41 mg/kg and it was not detected but had DLs (1.21 mg/kg and 1.86 mg/kg) above the BVs in 3 soil samples and 6 tuff samples. Concentrations increased with depth at location 02-600420; did not change substantially with depth (0.66 mg/kg or less) at locations 02-600419, 02-600453, and 02-600487; decreased with depth at all other locations; and decreased laterally (concentrations in shallow samples at locations 02-600419, 02-600452, 02-600487, and 02-600488 were 1.29 mg/kg, 1.43 mg/kg, 0.806 mg/kg, and 1.42 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 61 times the maximum concentration and 210 times the maximum DL. Further sampling for extent of selenium is not warranted.

Vanadium was detected above the Qbt 1g, Qct, Qbo in six samples with a maximum concentration of 10.3 mg/kg. Concentrations did not change substantially with depth (1.37 mg/kg) at location 02-600453, decreased with depth at all other locations, and increased laterally (concentrations in shallow samples at locations 02-600452, 02-600453, 02-600455, 02-600487, and 02-600488 were 8.69 mg/kg, 5.47 mg/kg, 10.3 mg/kg, 12.1 mg/kg, and 13.2 mg/kg, respectively, and below the soil BV [Appendix F, Pivot Tables]). The residential SSL is approximately 38 times the maximum concentration. Further sampling for extent of vanadium is not warranted.

Zinc was detected above the soil and Qbt 1g, Qct, Qbo BVs in six soil samples and one tuff sample with a maximum concentration of 560 mg/kg. Concentrations decreased with depth at all locations and increased laterally. The residential SSL is approximately 42 times the maximum concentration. Vertical extent of zinc is defined and further sampling for lateral extent is not warranted.

Organic Chemicals

Organic COPCs at AOC 02-012 include acenaphthene, anthracene, Aroclor-1254, Aroclor-1260, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chloroform, chrysene, dibenzofuran, 1,4-dichlorobenzene, di-n-butylphthalate, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, methylene chloride, 2-methylnaphthalene, naphthalene, phenanthrene, pyrene, TPH-DRO, and trichloroethene.

The PAHs 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 from 7 to 20 samples. PAHs were detected most frequently in the surface sample at each location and were only detected in the deepest sample at one location (02-600453). Concentrations of all PAHs at location 02-600453 decreased with depth. The maximum concentration of each PAH was detected in a surface sample. Thus, concentrations decreased with depth in all cases and vertical extent of PAHs is defined. The maximum concentration of each PAH was detected at location 02-600419 and concentrations increased laterally. The residential SSLs for PAHs were all greater than 10 times the maximum concentrations except for benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene. The residential SSL for benzo(a)anthracene is approximately 3.2 times the maximum concentration (0.477 mg/kg) and the industrial SSL is approximately 68 times the maximum concentration. The residential SSL for benzo(a)pyrene is approximately 2.1 times the maximum concentration (0.537 mg/kg) and the industrial SSL is approximately 44 times the maximum concentration. The residential SSL for benzo(b)fluoranthene is approximately 1.9 times the maximum concentration (0.787 mg/kg) and the industrial SSL is approximately 41 times the maximum concentration. The residential SSL for indeno(1,2,3-cd)pyrene is approximately 8.1 times the maximum concentration (0.189 mg/kg) and the industrial SSL is approximately 171 times the maximum concentration. Vertical extent of PAHs is defined and further sampling for lateral extent is not warranted.

Aroclor-1254 was detected in one sample at a concentration of 0.0027 mg/kg. Concentrations decreased with depth at location 02-612374. The residential SSL is approximately 422 times the maximum concentration. 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 0.0027 mg/kg. Concentrations decreased with depth at location 02-612374. The residential SSL is approximately 900 times the maximum concentration. Vertical extent of Aroclor-1260 is defined and further sampling for lateral extent is not warranted.

Chloroform was detected in one sample at a concentration of 0.000245 mg/kg. Concentrations increased with depth at location 02-600485 and increased laterally. The residential SSL is approximately 23,900 times the maximum concentration. Further sampling for extent of chloroform is not warranted.

Dibenzofuran was detected in two samples with a maximum concentration of 0.109 mg/kg. Concentrations decreased with depth at location 02-600419 and decreased laterally. Lateral and vertical extent of dibenzofuran are defined.

Dichlorobenzene[1,4-] was detected in one sample at a concentration of 0.000252 mg/kg. Concentrations decreased with depth at location 02-600418 and increased laterally. The residential SSL is approximately 5,120,000 times the maximum concentration. Vertical extent of 1,4-dichlorobenzene is defined and further sampling for lateral extent is not warranted.

Di-n-butylphthalate was detected in five samples with a maximum concentration of 0.0678 mg/kg. Concentrations increased with depth at location 02-600487, decreased with depth at all other locations, and increased laterally. The residential SSL is approximately 90,900 times the maximum concentration. Further sampling for extent of di-n-butylphthalate is not warranted.

Methylene chloride was detected in 26 samples with a maximum concentration of 42.4 mg/kg. Concentrations increased with depth at location 02-600419, did not change substantially with depth (0.00034 mg/kg or less) at locations 02-600420 and 02-600455, decreased with depth at all other locations, and increased laterally. The residential SSL is approximately 98,300 times the maximum concentration. Further sampling for extent of methylene chloride is not warranted.

TPH-DRO was detected in 26 samples with a maximum concentration of 74.7 mg/kg. Concentrations decreased with depth at all locations and increased laterally. The residential SSL is approximately 14 times the maximum concentration, and the industrial SSL is approximately 51 times the maximum concentration. Vertical extent of TPH-DRO is defined and further sampling for lateral extent is not warranted.

Trichloroethene was detected in one sample at a concentration of 0.000635 mg/kg. Concentrations decreased with depth at location at location 02-600487 and increased laterally. The residential SSL is approximately 10,600 times the maximum concentration. Vertical extent of trichloroethene is defined and further sampling for lateral extent is not warranted.

Radionuclides

Radionuclide COPCs at AOC 02-012 include americium-241, plutonium-239/240, and tritium.

Americium-241 was detected below 1 ft bgs in one Qal sample at an activity of 0.0987 pCi/g. Activities decreased with depth at location 02-600453 and increased laterally. The residential SAL is approximately 841 times the maximum activity. Vertical extent of americium-241 is defined and further sampling for lateral extent is not warranted.

Plutonium-239/240 was detected below 1 ft bgs in one Qal sample at an activity of 0.228 pCi/g. Activities decreased with depth at location 02-600420 and decreased laterally. Lateral and vertical extent of plutonium-239/240 are defined.

Tritium was detected in 14 samples with a maximum activity of 0.446 pCi/g. Activities decreased with depth at all locations and increased laterally. The residential SAL is approximately 3810 times the maximum activity. Vertical extent of tritium is defined and further sampling for lateral extent is not warranted.

Summary of Nature and Extent

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at AOC 02-012.

6.34.5 Summary of Human Health Risk Screening

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} (NMED 2017, 602273). The industrial HI is 0.009, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.0000001 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 2×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.02, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.00000004 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Residential Scenario

The total excess cancer risk for the residential scenario is 1×10^{-5}, which is equivalent to the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.5, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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.

Construction Worker Scenario

The residential exposure scenario also demonstrates protection of construction workers for carcinogenic and radionuclide COPCs. The construction worker HI is approximately 1 (due to manganese; see Appendix H, section H-4.5.2, Exposure Evaluation), which is equal to the NMED target HI of 1.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the industrial, recreational, residential, and construction worker scenarios at AOC 02-012.

6.34.6 Summary of Ecological Risk Screening

In accordance with the approved work plan (LANL 2009, 105073; NMED 2009, 105595), locations surrounding the core area of TA-02 were sampled to define the lateral extent of contamination for TA-02 as a whole (section 6.32). Although the lateral extent at the TA-02 core area is defined, one site within the core area requires additional remediation and confirmation sampling. The ecological risk-screening assessment will be conducted for the sites within the TA-02 core area as one exposure unit after the investigation at this site has been completed.

6.35 SWMU 02-014, Former Transformers Stations

6.35.1 Site Description and Operational History

SWMU 02-014 consists of three former electrical transformer stations (structures 02-31, 02-45, and 02-51) that served buildings in TA-02 (Figure 6.35-1). This site was not identified as a SWMU or AOC in the 1990 SWMU report. (LANL 1990, 007511). This site was identified during efforts to discover the source of PCB contamination identified during investigation sampling at storm drain AOC 02-011(a)(ii). Historical records, including engineering drawings and photographs, were reviewed and three potential sources of PCBs were identified. Former structure 02-31 was an electrical transformer station located 40 ft behind building 02-1. The transformer station was built in 1944 and was removed in 1950. Former structure 02-45 was built in 1954 to serve building 02-44. The transformer structure consisted of three transformers mounted across two telephone poles approximately 14 ft above the ground. The transformer station was replaced with another transformer station (structure 02-51). Former structure 02-51 was an electrical transformer station located approximately 20 ft southwest of former structure 02-31 and 20 ft southeast of former structure 02-45. Historical records indicated PCB-containing transformer oil had been used at this former transformer station. Structure 02-51 was constructed in 1961 and demolished in 2003.

6.35.2 Relationship to Other SWMUs and AOCs

SMWU 02-014 is adjacent to and northwest of AOC 02-011(a) segments (i), (ii), and (iii). SWMU 02-014 is the source of the PCB contamination previously detected at AOC 02-011(a).

6.35.3 Summary of Previous Investigations

No previous investigations have been performed at SWMU 02-014. The area of SWMU 02-014 was previously sampled as part of the investigations performed for AOC 02-011(a) (section 6.29-3)

6.35.4 Site Contamination

6.35.4.1 Soil and Rock Sampling

SWMU 02-014 was sampled during 2017 to characterize the areas potentially requiring removal of PCB-contaminated soil. Samples were collected around areas where PCB contamination was previously detected during the investigation of AOC 02-011(a). Samples were collected at various depth intervals based on previous results, to a maximum of 20 ft bgs or until refusal. Following evaluation of initial results, additional sampling was performed in early 2018 to better characterize extent of potential excavation areas. Samples were collected at 66 locations and analyzed for PCBs.

6.35.4.2 Soil and Rock Sample Field-Screening Results

No radiological-screening results exceeded twice the daily site background levels.

6.35.4.3 Soil and Rock Sample Analytical Results

Results of the 2017–2018 samples indicate PCBs in excess of residential and industrial SSLs. The 2017–2018 PCB results are presented in Plate 44.

6.35.4.4 Nature and Extent of Contamination

The results of the PCB sampling indicate the need to remove PCB-contaminated soil posing a potential risk. Nature and extent of contamination was not evaluated for SWMU 02-014. Following removal of PCB-contaminated soil, confirmation sampling will be performed and nature and extent will be evaluated using the results of the confirmation samples, along with the results from samples previously associated with AOC 02-011(a) and now within the area impacted by SWMU 02-014.

6.35.5 Summary of Human Health Risk Screening

Because additional cleanup of SWMU 02-014, including removal of PCB-contaminated soil, is expected, human health risk was not evaluated. Human health risk will be evaluated after cleanup is completed to verify that cleanup goals have been met.

6.35.6 Summary of Ecological Risk Screening

AOC 02-012 is within the TA-02 core area. Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and results of site-specific ecological risk studies, no potential ecological risks exist for the TA-02 core area.

7.0 TA-21 BACKGROUND AND FIELD INVESTIGATION RESULTS

The Middle Los Alamos Canyon Aggregate Area contains three sites associated with TA-21 that are addressed in this investigation report (Table 1.1-1). Two seepage pits, SWMU 21-006(e) and AOC 21-006(f), are described in sections 7.2 and 7.3, respectively. AOC 21-028(c), which contains four satellite container storage areas, is described in section 7.4. Each section includes a site description and operational history, relationship to other SWMUs and AOCs, historical and 2010 investigation activities, site contamination results based on qualified data (decision-level data from the current and previous investigations), and a summary of human health and ecological risk-screening assessments.

7.1 Background of TA-21

7.1.1 Operational History

Operations at TA-21 started in 1945 for establishing the chemical and metallurgical properties of the nuclear material necessary to achieve and sustain the required nuclear fission reaction. The primary operation at DP West (western portion of TA-21) was to produce metal and alloys of plutonium from the nitrate solution feedstock provided by other production facilities. A major research objective at DP West was the development of new purification techniques that would increase the efficiency of the separation processes (Christensen and Maraman 1969, 004779). Details of the purification techniques are discussed in the operable unit (OU) work plan for TA-21 (LANL 1991, 007529). Other operations at DP West included nuclear fuel reprocessing. In 1977, a transfer of work to the new plutonium facility at TA-55 began, and much of the DP West complex was vacated. Operations at DP East (eastern portion of TA-21) were to process polonium and actinium and to produce initiators (a nuclear weapons component).

In 1964, building 21-209 was built to house research into high-temperature and actinide chemistry.

Building 21-155 formerly housed the Tritium Systems Test Assembly for developing and demonstrating effective technology for handling and processing deuterium and tritium fuels for use in fusion reactors. Building 21-155 recently underwent D&D.

TA-21 also includes Material Disposal Areas (MDAs) A, B, T, U, and V. Process wastes, transuranic wastes, and liquid wastes were disposed of in the MDAs from the early 1940s to the late 1970s; details of the disposal methods are presented in the TA-21 OU work plan (LANL 1991, 007529).

Three TA-21 sites are addressed in Middle Los Alamos Canyon Aggregate Area:

- Consolidated Unit 21-006(e)-99, which includes SWMU 21-006(e) and AOC 21-006(f), seepage pits; and
- AOC 21-028(c), satellite container storage areas.

7.1.2 Summary of Releases

There were no documented releases from Consolidated Unit 21-006(e)-99, but there were indications that acid waste had been released to the ground beneath room 413 of building 21-4.

There were no specific documented releases from any of the satellite container storage areas in AOC 21-028(c).

7.1.3 Current Site Usage and Status

Buildings 21-3 and 21-4 were present in the vicinity of the TA-21 sites under investigation. These buildings have undergone D&D, as have other TA-21 structures.

7.2 SWMU 21-006(e), Seepage Pit

7.2.1 Site Description and Operational History

SWMU 21-006(e) is a seepage pit that may be located south of former building 21-4 (Figure 7.2-1). The location of this seepage pit is unclear (LANL 1990, 007512), but it may be the same seepage pit as AOC 21-006(f) (LANL 1991, 007680, p. 18-13). AOC 21-006(f) is described as a gravel seepage pit located on the south side of the DP West complex (Tribby 1947, 001404, p. 1).

The seepage pit(s) may have received up to 4000 L per day of hydrogen fluoride wastewater effluent from a hydrofluorination process located in room 413, the southernmost room of building 21-4 (Tribby 1947, 001404, p. 1). The period of operation is not known. During repair work on the drain system under room 413, a hole in the ground was identified under the drainlines. It was evident that acid waste had escaped from the drain system into the ground (Meyer 1978, 000526). This hole may have been SWMU 21-006(e) or AOC 21-006(f).

7.2.2 Relationship to Other SWMUs and AOCs

There is no documented relationship between the seepage pits and any other SWMUs or AOCs.

7.2.3 Summary of Previous Investigations

7.2.3.1 1995 TA-21 Buildings 3 and 4 RCRA Facility Investigation Phase I Project

One sample was collected from each of six locations at SWMU 21-006(e) and AOC 21-006(f) in 1995. As part of the RCRA facility investigation (RFI) Phase I investigation activities, locations were sampled at unknown depths at the bottom of the excavated area in the approximate area of the seepage pits for confirmation of building 21-4 D&D activities. Because depths are not available for the samples, the data are not useable and are not included in this report.

7.2.3.2 2007 Investigation Activities

Forty-six samples were collected from fifteen locations at SWMU 21-006(e) and AOC 21-006(f) in 2007. Results from the sampling activities in 2007 were presented in the previous investigation report (LANL 2008, 101669.12). Additional sampling was required to define the extent of contamination at the site.

7.2.4 Site Contamination

7.2.4.1 Soil, Rock, and Sediment Sampling

As part of the 2010 investigation, the following characterization activities were conducted at SWMU 21-006(e) and AOC 21-006(f):

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- Six samples were collected from locations in the northwest (21-612318) and southeast (21-612319) portions of the area from 5–6 ft, 15–16 ft, and 24–25 ft bgs. These samples were analyzed for TAL metals, PCBs, isotopic plutonium, isotopic uranium, and tritium.
- Fifteen samples were collected from five step-out locations (21-612320 to 21-612324) from 5–6 ft, 15–16 ft, and 24–25 ft bgs. These samples were analyzed for TAL metals, PCBs, americium-241, isotopic plutonium, and isotopic uranium.

The 2010 and historical sampling locations at SWMU 21-006(e) and AOC 21-006(f) are shown in Figure 7.2-1. Table 7.2-1 presents the samples collected and analyses requested for SWMU 21-006(e) and AOC 21-006(f). The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

7.2.4.2 Soil and Rock Sample Field-Screening Results

No organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of the samples. No radiological-screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. No changes to sampling or other activities occurred because of the field-screening results.

7.2.4.3 Soil and Rock Sample Analytical Results

Decision-level data at SWMU 21-006(e) and AOC 21-006(f) consist of results from 67 samples collected from 22 locations in 2007 and 2010. The 67 samples include 4 soil/fill and 63 Qbt 3 samples. Table 7.2-1 presents the samples collected and the analyses requested for SWMU 21-006(e) and AOC 21-006(f).

Inorganic Chemicals

A total of 66 samples (4 soil and 62 Qbt 3) were analyzed for TAL metals, and 45 samples (3 soil and 42 Qbt 3) were analyzed for nitrate, perchlorate, and total cyanide. Table 7.2-2 presents the inorganic chemicals detected or detected above BVs. Figure 7.2-2 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 2,3,4 BV (7340 mg/kg) in one sample at a concentration of 10,400 mg/kg. The Gehan and quantile tests indicated site concentrations of aluminum in tuff are not statistically different from background (Figure G-306 and Table G-46). 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 2 soil samples and 3 tuff samples with a maximum concentration of 2.9 mg/kg and was not detected but had DLs (0.995 mg/kg to 1.16 mg/kg) above the Qbt 2,3,4 BV in 20 samples. The slippage test indicated site concentrations of antimony in tuff are statistically different from background (Figure G-307 and Table G-46). Antimony is retained as a COPC.

Arsenic was detected above the Qbt 2,3,4 BV (2.79 mg/kg) in three samples with a maximum concentration of 5 mg/kg. The Gehan and quantile tests indicated site concentrations of arsenic in tuff are statistically different from background (Figure G-308 and Table G-46). Arsenic is retained as a COPC.

Barium was detected above the Qbt 2,3,4 BV (46 mg/kg) in 20 samples with a maximum concentration of 528 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in tuff are statistically different from background (Figure G-309 and Table G-46). 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 3 soil samples and 35 tuff samples with a maximum concentration of 18,600 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in tuff are statistically different from background (Figure G-310 and Table G-46). Calcium is retained as a COPC.

Chromium was detected above the Qbt 2,3,4 BV (7.14 mg/kg) in two samples with a maximum concentration of 8.7 mg/kg. The Gehan test indicated site concentrations of chromium in tuff are statistically different from background (Table G-46). However, the quantile and slippage tests indicated site concentrations of chromium in tuff are not statistically different from background (Figure G-311 and Table G-46). Chromium is not a COPC.

Cobalt was detected above the Qbt 2,3,4 BV (3.14 mg/kg) in three samples with a maximum concentration of 3.5 mg/kg. The Gehan and quantile tests indicated site concentrations of cobalt in tuff are not statistically different from background (Figure G-312 and Table G-46). Cobalt is not a COPC.

Copper was detected above the Qbt 2,3,4 BV (4.66 mg/kg) in 1 sample at a concentration of 4.9 mg/kg and was not detected but had DLs (4.9 mg/kg to 30.2 mg/kg) above the Qbt 2,3,4 BV in 15 samples. The quantile and slippage tests indicated site concentrations of copper in tuff are statistically different from background (Figure G-313 and Table G-46). Copper is retained as a COPC.

Cyanide was not detected but had DLs (0.52 mg/kg to 0.57 mg/kg) above the soil and Qbt 2,3,4 BVs (0.5 mg/kg for both) in 2 soil samples and 35 tuff samples. 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 2 soil samples and 7 tuff samples with a maximum concentration of 74.2 mg/kg and was not detected but had DLs (11.6 mg/kg to 27.1 mg/kg) above the Qbt 2,3,4 BV in 17 samples. The slippage test indicated site concentrations of lead in tuff are statistically different from background (Figure G-314 and Table G-46). Lead is retained as a COPC.

Magnesium was detected above the Qbt 2,3,4 BV (1690 mg/kg) in three samples with a maximum concentration of 2480 mg/kg. The Gehan test indicated site concentrations of magnesium in tuff are statistically different from background (Table G-46). However, the quantile and slippage tests indicated site concentrations of magnesium in tuff are not statistically different from background (Figure G-315 and Table G-46). Magnesium is not a COPC.

Manganese was detected above the Qbt 2,3,4 BV (482 mg/kg) in three samples with a maximum concentration of 664 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in tuff are not statistically different from background (Figure G-316 and Table G-46). Manganese is not a COPC.

Mercury was detected above the soil and Qbt 2,3,4 BVs (0.1 for both) in two soil samples and one tuff sample with a maximum concentration of 0.151 mg/kg. Mercury is retained as a COPC.

Nickel was detected above the Qbt 2,3,4 BV (6.58 mg/kg) in one sample at a concentration of 68.4 mg/kg and was not detected but had DLs (7.9 mg/kg to 11.1 mg/kg) above the Qbt 2,3,4 BV in four samples. The quantile and slippage tests indicated site concentrations of nickel in tuff are statistically different from background (Figure G-317 and Table G-46). Nickel is retained as a COPC.

Nitrate was detected in 17 samples with a maximum concentration of 4 mg/kg. Nitrate is naturally occurring, and the concentrations likely reflect naturally occurring levels. In addition, SWMU 21-006(e) was used for disposal of hydrogen fluoride waste and is not a source of nitrate. Nitrate is not a COPC.

Selenium was detected above the Qbt 2,3,4 BV (0.3 mg/kg) in 2 samples with a maximum concentration of 0.54 mg/kg and was not detected but had DLs (0.52 mg/kg to 1.13 mg/kg) above the Qbt 2,3,4 BV in 56 samples. There were too few detections to perform statistical tests. Selenium is retained as a COPC.

Zinc was detected above the soil and Qbt 2,3,4 BVs (44.8 mg/kg and 63.5 mg/kg) in two soil samples and one tuff sample with a maximum concentration of 86 mg/kg and was not detected but had DLs (63.3 mg/kg to 87.6 mg/kg) above the Qbt 2,3,4 BV in five samples. The quantile and slippage tests indicated site concentrations of zinc in tuff are not statistically different from background (Figure G-318 and Table G-46). There were too few soil samples to perform statistical tests and the maximum concentration is greater than the highest concentration in the soil background data set (75.5 mg/kg). Zinc is retained as a COPC.

Organic Chemicals

Of 68 total samples, 1 soil sample was analyzed for dioxins and furans and explosive compounds, 22 samples (1 soil and 21 Qbt 3) were analyzed for PCBs, and 45 samples (3 soil and 42 Qbt 3) were analyzed for SVOCs and VOCs. Table 7.2-3 presents the detected organic chemicals. Plate 44 and Figure 7.2-3 show the spatial distribution of detected organic chemicals.

Dioxins and Furans

Dioxins and furans are frequently detected as a result of environmental sampling but generally are not associated with industrial activities conducted at the Laboratory or released from SWMUs or AOCs being investigated at the Laboratory. Because of the limited history of many of the sites in the DP Site Aggregate Area, a full analytical suite including dioxins and furans was required by NMED (NMED 2005, 092099). The Laboratory proposed analysis of dioxins and furans from a limited subset of samples from locations believed to have the highest potential for contamination (LANL 2005, 087836). These samples were to be submitted for quick turnaround analysis, and the results from these analyses were to be used by NMED and the Laboratory to determine whether additional samples should be analyzed for dioxins and furans. This proposed approach was approved by NMED (NMED 2005, 089314) and implemented by the Laboratory. Based on this approach, additional sampling for dioxins and furans was not required at SWMU 21-006(e).

Dioxins and furans are known to be widely distributed in the environment from a number of sources, both natural, such as forest fires, and anthropogenic, such as industrial sources and burning of municipal trash and other waste materials. Industrial sources of dioxins and furans are primarily associated with impurities in the production of chlorinated chemical products (e.g., pentachlorophenol, chlorinated herbicides) and the wastes associated with production of those materials. Another industrial source is the pulp and paper industry and processes that bleach wood pulp (EPA 2006, 600913). None of these common industrial process-related source activities have occurred at the Laboratory. Other anthropogenic sources of dioxins and furans include the combustion of materials containing chlorine, such as the incineration of municipal trash containing chlorinated plastics, and other waste materials (EPA 2006, 600913).

Polycyclic Aromatic Hydrocarbons

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

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

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

Site Activities

SWMU 21-006(e) and AOC 21-006(f) are former seepage pits and were identified as a SWMU and AOC because of possible soil contamination resulting from radioactive liquid waste to the pit. The wastewater included hydrogen fluoride wastewater effluent from a hydrofluorination process. There are no known site-related sources of dioxins and furans or PAHs in the radioactive liquid waste discharged to SWMU 21-006(e) and AOC 21-006(f).

The dioxin and furan congeners detected at SWMU 21-006(e) and AOC 21-006(f) were detected at concentrations ranging from 0.000000379 mg/kg to 0.000104 mg/kg, with hepta- and hexta-chlorinated congeners being the most frequently detected. These results likely reflect natural and/or anthropogenic background rather than a site-related release. The dioxin and furan congeners detected in samples used to characterize this site [1,2,3,4,6,7,8-heptachlorodibenzodioxin; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; 1,2,3,6,7,8-hexachlorodibenzodioxin; 1,2,3,7,8,9-hexachlorodibenzodioxin; 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; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 1,2,3,7,8-pentachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; and 2,3,7,8-tetrachlorodibenzofuran] are not related to historical Laboratory site operations and are not COPCs.

The SWMU 21-006(e) and AOC 21-006(f) seepage pits are located south of former building 21-4, and samples were collected within an asphalt-paved area around the former building or within the footprint of the former building. Although all samples at this site were collected from depth, the concentrations were low and PAHs were detected in only 14 of 45 samples. Most detections of PAHs were in the shallowest samples at each location, and PAHs were detected infrequently in the deepest samples. PAH concentrations ranged from 0.037 mg/kg to 0.28 mg/kg, and most detected PAH results were less than 0.1 mg/kg. The sample locations and the frequency and magnitude of detection suggest the detections of

PAHs may have resulted from cross contamination from augering through surface contamination. Additionally, because PAHs were not associated with wastes discharged to the seepage pit, the PAHs detected in samples used to characterize this site [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 associated with asphalt, are not related to historical Laboratory site operations, and are not COPCs.

Organic COPCs

Other organic chemicals detected at SWMU 21-006(e) and AOC 21-006(f) include acetone; Aroclor-1242; Aroclor-1254; Aroclor-1260; bis(2-ethylhexyl)phthalate; bromobenzene; n-butylbenzene; sec-butylbenzene; 1,2-dichlorobenzene; 1,3-dichlorobenzene; 1,4-dichlorobenzene; di-n-butylphthalate; ethylbenzene; 4-isopropyltoluene; methylene chloride; toluene; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; and xylenes. The detected organic chemicals listed are retained as COPCs.

Radionuclides

A total of 60 samples (4 soil and 56 Qbt 3) were analyzed for americium-241, 45 samples (3 soil and 42 Qbt 3) were analyzed for gamma-emitting radionuclides and strontium-90, 66 samples (4 soil and 62 Qbt 3) were analyzed for isotopic plutonium and isotopic uranium, and 51 samples (3 soil and 48 Qbt 3) were analyzed for tritium. Table 7.2-4 presents the radionuclides detected or detected above BVs/FVs. Plate 45 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Americium-241 was detected below 1 ft bgs in 4 soil samples and detected in 17 tuff samples with a maximum activity of 6.55 pCi/g. Americium-241 is retained as a COPC.

Cesium-134 was detected in one sample at an activity of 0.068 pCi/g. Cesium-134 is retained as a COPC.

Cesium-137 was detected below 1 ft bgs in two soil samples with a maximum activity of 0.269 pCi/g. Cesium-137 is retained as a COPC.

Plutonium-238 was detected below 1 ft bgs in 4 soil samples and detected in 12 tuff samples with a maximum activity of 2.32 pCi/g. Plutonium-238 is retained as a COPC.

Plutonium-239/240 was detected below 1 ft bgs in 4 soil samples and detected in 48 tuff samples with a maximum activity of 66.3 pCi/g. Plutonium-239/240 is retained as a COPC.

Tritium was detected in 10 samples with a maximum activity of 2.39 pCi/g. Tritium is retained as a COPC.

Uranium-234 was detected above the soil and Qbt 2,3,4 BVs (2.59 pCi/g and 1.98 pCi/g) in 3 soil samples and 29 tuff samples with a maximum activity of 91.3 pCi/g. Uranium-234 is retained as a COPC.

Uranium-235/236 was detected above the soil and Qbt 2,3,4 BVs (0.2 pCi/g and 0.09 pCi/g) in 3 soil samples and 27 tuff samples with a maximum activity of 4.28 pCi/g. Uranium-235/236 is retained as a COPC.

Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 21-006(e) and AOC 21-006(f) are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 21-006(e) and AAOC 21-006(f) include antimony, arsenic, barium, calcium, copper, cyanide, lead, mercury, nickel, selenium, and zinc.

Antimony was detected above the soil and Qbt 2,3,4 BVs in 2 soil samples and 3 tuff samples with a maximum concentration of 2.9 mg/kg and was not detected but had DLs (0.995 mg/kg to 1.16 mg/kg) above the Qbt 2,3,4 BV in 20 samples. Concentrations decreased with depth at all locations and decreased laterally. The residential SSL is approximately 27 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbt 2,3,4 BV in three samples with a maximum concentration of 5 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of arsenic are defined.

Barium was detected above the Qbt 2,3,4 BV in 20 samples with a maximum concentration of 528 mg/kg. Concentrations decreased with depth at all locations and decreased laterally (the concentration in a shallow sample at location 21-602919 was 100 mg/kg and below the soil BV) [Appendix F, Pivot Tables]). Lateral and vertical extent of barium are defined.

Calcium was detected above the soil and Qbt 2,3,4 BVs 3 soil samples and 35 tuff samples with a maximum concentration of 18,600 mg/kg. Concentrations increased with depth at locations 21-602931 and 21-602932, decreased with depth at all other locations, and increased laterally. The residential SSL is approximately 699 times the maximum concentration. Further sampling for extent of calcium is not warranted.

Copper was detected above the Qbt 2,3,4 BV in 1 sample at a concentration of 4.9 mg/kg and was not detected but had DLs (4.9 mg/kg to 30.2 mg/kg) above the Qbt 2,3,4 BV in 15 samples. Concentrations decreased with depth at location 21-602919 and decreased laterally (the concentration in a shallow sample at location 21-602919 was 9.1 mg/kg and below the soil BV) [Appendix F, Pivot Tables]). The residential SSL is approximately 103 times the maximum DL. Further sampling for extent of copper is not warranted.

Cyanide was not detected but had DLs (0.52 mg/kg to 0.57 mg/kg) above the soil and Qbt 2,3,4 BVs in 2 soil samples and 35 tuff samples. The residential SSL is approximately 19 times the maximum DL. Further sampling for extent of cyanide is not warranted.

Lead was detected above the soil and Qbt 2,3,4 BVs in 2 soil samples and 7 tuff samples with a maximum concentration of 74.2 mg/kg and was not detected but had DLs (11.6 mg/kg to 27.1 mg/kg) above the Qbt 2,3,4 BV in 17 samples. Concentrations increased with depth at location 21-602925, decreased with depth at all other locations, and increased laterally to the south. The residential SSL is approximately 5.4 times the maximum concentration, and the industrial SSL is approximately 11 times the maximum concentration. Further sampling for extent of lead is not warranted.

Mercury was detected above the soil and Qbt 2,3,4 BVs in two soil samples and one tuff sample with a maximum concentration of 0.151 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of mercury are defined.

Nickel was detected above the Qbt 2,3,4 BV in one sample at a concentration of 68.4 mg/kg and was not detected but had DLs (7.9 mg/kg to 11.1 mg/kg) above the Qbt 2,3,4 BV in four samples. Concentrations decreased with depth and decreased laterally. The residential SSL is approximately 141 times the maximum DL. Further sampling for extent of nickel is not warranted.

Selenium was detected above the Qbt 2,3,4 BV in 2 samples with a maximum concentration of 0.54 mg/kg and was not detected but had DLs (0.52 mg/kg to 1.13 mg/kg) above the Qbt 2,3,4 BV in 56 samples. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of selenium are defined.

Zinc was detected above the soil and Qbt 2,3,4 BVs in two soil samples and one tuff sample with a maximum concentration of 86 mg/kg and was not detected but had DLs (63.3 mg/kg to 87.6 mg/kg) above the Qbt 2,3,4 BV in five samples. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of zinc are defined.

Organic Chemicals

Organic COPCs at SWMU 21-006(e) and AOC 21-006(f) include acetone, Aroclor-1242, Aroclor-1254, Aroclor-1260, bis(2-ethylhexyl)phthalate, bromobenzene; n-butylbenzene, sec-butylbenzene; 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, di-n-butylphthalate, ethylbenzene, 4-isopropyltoluene, methylene chloride, toluene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and xylenes.

Acetone was detected in seven samples with a maximum concentration of 0.033 mg/kg. Concentrations did not change substantially with depth (0.002 mg/kg) at location 21-602927, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 21,400,000 times the maximum concentration. Lateral extent of acetone is defined and further sampling for vertical extent is not warranted.

Aroclor-1242 was detected in one sample at a concentration of 0.0679 mg/kg. Concentrations decreased with depth and increased laterally at location 21-612321. The residential SSL is approximately 36 times the maximum concentration. Vertical extent of Aroclor-1242 is defined and further sampling for lateral extent is not warranted.

Aroclor-1254 was detected in seven samples with a maximum concentration of 0.241 mg/kg. Concentrations increased with depth at locations 21-602919, 21-612319 and 21-612320, decreased with depth at all other locations, and increased laterally. The residential SSL is approximately 4.7 times the maximum concentration, and the industrial SSL is approximately 46 times the maximum concentration. Further sampling for extent of Aroclor-1254 is not warranted.

Aroclor-1260 was detected in five samples with a maximum concentration of 0.185 mg/kg. Concentrations decreased with depth at all locations and increased laterally. The residential SSL is approximately 13 times the maximum concentration, and the industrial SSL is approximately 60 times the maximum concentration. Vertical extent of Aroclor-1260 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 0.22 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

Bromobenzene was detected in one sample at a concentration of 0.00047 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of bromobenzene are defined.

Butylbenzene[n-] was detected in one sample at a concentration of 0.0011 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of n-butylbenzene are defined.

Butylbenzene[sec-] was detected in one sample at a concentration of 0.00041 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of sec-butylbenzene are defined.

Dichlorobenzene[1,2-] was detected in three samples with a maximum concentration of 0.00041 mg/kg. Concentrations decreased with depth at all locations and did not change substantially (0.00017 mg/kg) laterally. The residential SSL is approximately 5,220,000 times the maximum concentration. Vertical extent of 1,2-dichlorobenzene is defined and further sampling for lateral extent is not warranted.

Dichlorobenzene[1,3-] was detected in three samples with a maximum concentration of 0.00038 mg/kg. Concentrations decreased with depth at all locations and did not change substantially (0.00013 mg/kg) laterally. The residential SSL is approximately 5,630,000 times the maximum concentration. Vertical extent of 1,3-dichlorobenzene is defined and further sampling for lateral extent is not warranted.

Dichlorobenzene[1,4-] was detected in four samples with a maximum concentration of 0.00049 mg/kg. Concentrations increased with depth at location 21-602925, decreased with depth at all other locations and did not change substantially (0.0001 mg/kg) laterally. The residential SSL is approximately 2,630,000 times the maximum concentration. Further sampling for extent of 1,4-dichlorobenzene is not warranted.

Di-n-butylphthalate was detected in one sample at a concentration of 0.5 mg/kg. Concentrations increased with depth at location 21-602925 and decreased laterally. The residential SSL is approximately 12,300 times the maximum concentration. Further sampling for extent of di-n-butylphthalate is not warranted.

Ethylbenzene was detected in one sample at a concentration of 0.0016 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of ethylbenzene are defined.

Isopropyltoluene[4-] was detected in two samples with a maximum concentration of 0.0021 mg/kg. Concentrations decreased with depth at location 21-602927 and decreased laterally. Lateral and vertical extent of 4-isopropyltoluene are defined.

Methylene chloride was detected in six samples with a maximum concentration of 0.015 mg/kg. Concentrations did not change substantially with depth (0.002 mg/kg) at locations 21-602928 and 21-602932, decreased with depth at all other locations, and did not change substantially laterally (0.005 mg/kg). The residential SSL is approximately 27,300 times the maximum concentration. Further sampling for extent of methylene chloride is not warranted.

Toluene was detected in 13 samples with a maximum concentration of 0.0023 mg/kg. Concentrations increased at location 21-602933, did not change substantially with decreased with depth (0.0009 mg/kg) at location 21-602919, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 2,270,000 times the maximum concentration. Lateral extent of toluene is defined and further sampling for vertical extent is not warranted.

Trimethylbenzene[1,2,4-] was detected in seven samples with a maximum concentration of 0.0024 mg/kg. Concentrations did not change substantially with depth (0.00001 mg/kg) at location 21-602926, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 125,000 times the maximum concentration. Lateral extent of 1,2,4-trimethylbenzene is defined and further sampling for vertical extent is not warranted.

Trimethylbenzene[1,3,5-] was detected in three samples with a maximum concentration of 0.0024 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of 1,3,5-trimethylbenzene are defined.

Xylenes were detected in one sample at a concentration of 0.0092 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of xylenes are defined.

Radionuclides

Radionuclide COPCs at SWMU 21-006(e) and AOC 21-006(f) include americium-241, cesium-134, cesium-137, plutonium-238, plutonium-239/240, tritium, uranium-234, and uranium-235/236.

Americium-241 was detected below 1 ft bgs in 4 soil samples and detected in 17 tuff samples with a maximum activity of 6.55 pCi/g. Activities did not change substantially with depth (0.0.013 pCi/g) at location 21-602930, decreased with depth at all other locations, and decreased laterally. The residential SAL is approximately 13 times the maximum activity, and the industrial SAL is approximately 153 times the maximum activity. Lateral extent of americium-241 is defined and further sampling for vertical extent is not warranted.

Cesium-134 was detected in one sample at an activity of 0.068 pCi/g. Activities decreased with depth and increased laterally at location 21-602924. The residential SAL is approximately 74 times the maximum activity. Vertical extent of cesium-134 is defined and further sampling for lateral extent is not warranted.

Cesium-137 was detected below 1 ft bgs in two soil samples with a maximum activity of 0.269 pCi/g. Activities decreased with depth and decreased laterally at location 21-602919. Lateral and vertical extent of cesium-137 are defined.

Plutonium-238 was detected below 1 ft bgs in 4 soil samples and detected in 12 tuff samples with a maximum activity of 2.32 pCi/g. Activities increased with depth at location 21-612322, did not change substantially with depth (0.016 pCi/g) at location 21-602923, decreased with depth at all other locations, and increased laterally. The residential SAL is approximately 36 times the maximum activity. Further sampling for extent of plutonium-238 is not warranted.

Plutonium-239/240 was detected below 1 ft bgs in 4 soil samples and detected in 48 tuff samples with a maximum activity of 66.3 pCi/g. Activities increased with depth at locations 21-602930 and 21-602933, did not change substantially with depth (0.3 pCi/g) at location 21-602923, decreased with depth at all other locations, and decreased laterally. The residential SAL is approximately 7.9 times and the industrial SAL is approximately 113 times the maximum activity where vertical extent is not defined (10.6 pCi/g at location 21-602923). Lateral extent of plutonium-239/240 is defined and further sampling for vertical extent is not warranted.

Tritium was detected in 10 samples with a maximum activity of 2.39 pCi/g. Activities increased with depth at locations 21-602921 and 21-612318, decreased with depth at all other locations, and increased laterally. The residential SAL is approximately 711 times the maximum activity. Further sampling for extent of tritium is not warranted.

Uranium-234 was detected above the soil and Qbt 2,3,4 BVs in 3 soil samples and 29 tuff samples with a maximum activity of 91.3 pCi/g. Activities increased with depth at location 21-602930, did not change substantially with depth (0.45 pCi/g or less) at locations 21-602923 and 21-602932, decreased with depth at all other locations, and decreased laterally. The residential SAL is approximately 7.9 times and the industrial SAL is approximately 113 times the maximum activity where vertical extent is not defined (5.95 pCi/g at location 21-602930). Lateral extent of uranium-234 is defined and further sampling for vertical extent is not warranted.

Uranium-235/236 was detected above the soil and Qbt 2,3,4 BVs in 3 soil samples and 27 tuff samples with a maximum activity of 4.28 pCi/g. Activities increased with depth at location 21-602930, did not change substantially with depth (0.003 pCi/g) at location 21-602923, decreased with depth at all other locations, and decreased laterally. The residential SAL is approximately 200 times the maximum activity where vertical extent is not defined (0.21 pCi/g at location 21-602930). Lateral extent of uranium-235/236 is defined and further sampling for vertical extent is not warranted.

Summary of Nature and Extent

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at SWMU 21-006(e) and AOC 21-006(f).

7.2.5 Summary of Human Health Risk Screening

Industrial Scenario

Samples were not collected from the 0.0–1.0 ft depth interval, and the industrial scenario was not evaluated for SWMU 21-006(e) and AOC 21-006(f).

Construction Worker Scenario

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 2017, 602273). The construction worker HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 6 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^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.4, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 15 mrem/yr, which is greater 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 residential and construction worker scenarios at SWMU 21-006(e) and AOC 21-006(f).

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 screening levels to background concentrations, no potential ecological risks exist for SWMU 21-006(e) and AOC 21-006(f).

7.3 AOC 21-006(f), Seepage Pit

AOC 21-006(f) is described as a gravel seepage pit located on the south side of the DP West complex (Tribby 1947, 001404, p. 1). The location of this seepage pit is unclear (LANL 1990, 007512), but it may be the same seepage pit as SWMU 21-006(e) (LANL 1991, 007680, p. 18-13). Because SWMU 21-006(e) and AOC 21-006(f) share the same location, the data for both sites are evaluated together in section 7.2.

7.4 AOC 21-028(c), Storage Areas

7.4.1 Site Description and Operational History

AOC 21-028(c) consists of four satellite container storage areas that were located around building 21-3 (Figure 7.4-1). The four container storage areas were located at the door to room 301 on the north dock, at the outer door to room 360, at the northeast side of the fan room 3N, and inside a chemical safety cabinet in room 362.

The period of operation for the storage areas is not available but probably began in 1945, when the building was constructed (LANL 1991, 007680, p. 18-21). The areas were in use as late as 1990 (LANL 1991, 007680, pp. 18-23–18-24). These areas have stored a wide variety of chemicals including depleted uranium salts, metal salts, organic chemicals, synthetic inorganic chemicals, and other reagents (LANL 1991, 007680, pp. 18-23–18-24).

7.4.2 Relationship to Other SWMUs and AOCs

Room 362, the location of one of the storage areas (chemical safety cabinet), was also the location of a septic tank [structure 21-142, SWMU 21-023(b)] that was removed. The septic tank was addressed in the DP Site Aggregate Area investigation work plan (LANL 2005, 090225) and in the DP Site Aggregate Area investigation report (LANL 2007, 099175).

7.4.3 Summary of Previous Investigations

7.4.3.1 1996 TA-21 Buildings 3 and 4 RFI Phase I Project

As part of Phase I investigation activities, samples were collected from five locations at the bottom of the excavation in the approximate area of the satellite storage areas for confirmation (LANL 1994–1996, 065025). The sampling depths were not recorded. These data are therefore not useable and are not included in this report.

7.4.3.2 2007 Investigation Activities

A total of 52 samples were collected from 17 locations at AOC 21-028(c) in 2007. Results from the sampling activities in 2007 were presented in the previous investigation report (LANL 2008, 101669.12). Additional sampling was required to define the extent of contamination at the site.

7.4.4 Site Contamination

7.4.4.1 Soil and Rock Sampling

As part of the 2010 investigation, the following characterization activities were conducted at three subareas of AOC 21-028(c): the north side, east side, and southeast side.

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.

- *North Side:* Three samples were collected from location 21-612329 near previous location 21-601066 from 5–6 ft, 15–16 ft, and 24–25 ft bgs. These samples were analyzed for TAL metals, PCBs, and isotopic plutonium. Twelve samples were collected from four step-out locations (21-612330, 21-612336, 21-612337, and 21-612342) from 5–6 ft, 15–16 ft, and 24–25 ft bgs. These samples were analyzed for TAL metals, PCBs, americium-241, and isotopic plutonium.
- *East Side:* Fifteen samples were collected from five locations (21-612331, 21-612332, 21-612334, 21-612335, and 21-612339) from 5–6 ft, 15–16 ft, and 24–25 ft bgs. These samples were analyzed for TAL metals, PCBs, americium-241, and isotopic plutonium.
- *Southeast Side:* Three samples were collected from location 21-612333 in the center of this subarea from 5–6 ft, 15–16 ft, and 24–25 ft bgs. Nine samples were collected from three step-out locations (21-612338, 21-612340, and 21-612341) from 5–6 ft, 15–16 ft, and 24–25 ft bgs. These samples were analyzed for TAL metals, PCBs, americium-241, and isotopic plutonium.

The 2010 and historical sampling locations at AOC 21-028(c) are shown in Figure 7.4-1. Table 7.4-1 presents the samples collected and analyses requested for AOC 21-028(c). The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

7.4.4.2 Soil and Rock Sample Field-Screening Results

No organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of the samples. No radiological-screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. No changes to sampling or other activities occurred because of the field-screening results.

7.4.4.3 Soil and Rock Sample Analytical Results

Decision-level data at AOC 21-028(c) consist of results from 94 samples collected from 31 locations in 2007 and 2010. The 94 samples include 14 soil and 80 Qbt 3 samples.

Inorganic Chemicals

A total of 93 samples (13 soil and 80 Qbt 3) were analyzed for TAL metals, and 51 samples (12 soil and 39 Qbt 3) were analyzed for nitrate, perchlorate, and total cyanide. Table 7.4-2 presents the inorganic chemicals detected or detected above BVs. Plate 46 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 2,3,4 BV (7340 mg/kg) in four samples with a maximum concentration of 10,400 mg/kg. The Gehan and quantile tests indicated site concentrations of aluminum in tuff are not statistically different from background (Figure G-319 and Table G-47). 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 6 soil samples and 25 tuff samples with a maximum concentration of 5.28 mg/kg and was not detected but had DLs (0.9545 mg/kg to 1.109 mg/kg) above the Qbt 2,3,4 BV in 35 samples. The quantile and slippage tests indicated site concentrations of antimony in soil and tuff are statistically different from background (Figure G-320 and Table G-48, and Figure G-321 and Table G-47, respectively). Antimony is retained as a COPC.

Arsenic was detected above the Qbt 2,3,4 BV (2.79 mg/kg) in three samples with a maximum concentration of 6.06 mg/kg. The Gehan test indicated site concentrations of arsenic in tuff are statistically different from background (Table G-47). However, the quantile and slippage tests indicated site concentrations of arsenic in tuff are not statistically different from background (Figure G-322 and Table G-47). Arsenic is not a COPC.

Barium was detected above the Qbt 2,3,4 BV (46 mg/kg) in 25 samples with a maximum concentration of 142 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in tuff are statistically different from background (Figure G-323 and Table G-47). Barium is retained as a COPC.

Cadmium was not detected but had a DL (0.599 mg/kg) above the soil BV (0.4 mg/kg) in 1 sample. The DL was only 0.199 mg/kg above BV and was less than the 3 highest concentrations in the soil background data set (1.4 mg/kg, 2 mg/kg, and 2.6 mg/kg) and the 3 highest DLs in the soil background data set (2 mg/kg, 2 mg/kg, and 2 mg/kg). Cadmium was not detected or detected above BV in 92 other samples (detected below BV in 15 samples). 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 11 soil samples and 46 tuff samples with a maximum concentration of 46,200 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in soil and tuff are statistically different from background (Figure G-324 and Table G-48, and Figure G-325 and Table G-47, respectively). Calcium is retained as a COPC.

Chromium was detected above the Qbt 2,3,4 BV (7.14 mg/kg) in 28 samples with a maximum concentration of 17 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in tuff are statistically different from background (Figure G-326 and Table G-47). Chromium is retained as a COPC.

Cobalt was detected above the Qbt 2,3,4 BV (3.14 mg/kg) in three samples with a maximum concentration of 3.9 mg/kg. The Gehan and quantile tests indicated site concentrations of cobalt in tuff are not statistically different from background (Figure G-327 and Table G-47). Cobalt is not a COPC.

Copper was detected above the Qbt 2,3,4 BV (4.66 mg/kg) in 6 samples with a maximum concentration of 62.49 mg/kg and was not detected but had DLs (4.9 mg/kg to 30.2 mg/kg) above the soil BV (14.7 mg/kg) and Qbt 2,3,4 BV in 1 soil sample and 11 tuff samples. The Gehan and slippage tests indicated site concentrations of copper in tuff are statistically different from background (Figure G-328 and Table G-47). Copper is retained as a COPC.

Cyanide was not detected but had DLs (0.53 mg/kg to 0.6 mg/kg) above the soil and Qbt 2,3,4 BVs (0.5 mg/kg for both) in 9 soil samples and 22 tuff samples. Cyanide is retained as a COPC.

Iron was detected above the Qbt 2,3,4 BV (6.58 mg/kg) in one sample at a concentration of 24,700 mg/kg. The Gehan test indicated site concentrations of iron in tuff are statistically different from background (Table G-47). However, the quantile and slippage tests indicated site concentrations of iron in tuff are not statistically different from background (Figure G-329 and Table G-47). 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 7 tuff samples with a maximum concentration of 165 mg/kg and was not detected but had DLs (11.3 mg/kg to 28.4 mg/kg) above the BVs in1 soil sample and 12 tuff samples. There were too few detections in soil to perform statistical tests. The Gehan and quantile tests indicated site concentrations of lead in tuff are not statistically different from background (Figure G-330 and Table G-47). However, the maximum concentration is substantially greater than the highest concentration in the Qbt 2,3,4 background data set (15.5 mg/kg). Lead is retained as a COPC.

Magnesium was detected above the Qbt 2,3,4 BV (1690 mg/kg) in five samples with a maximum concentration of 2340 mg/kg. The Gehan test indicated site concentrations of magnesium in tuff are statistically different from background (Table G-47). However, the quantile and slippage tests indicated site concentrations of magnesium in tuff are not statistically different from background (Figure G-331 and Table G-47). Magnesium is not a COPC.

Manganese was detected above the Qbt 2,3,4 BV (482 mg/kg) in one sample at a concentration of 625 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in tuff are not statistically different from background (Figure G-332 and Table G-47). Manganese is not a COPC.

Mercury was detected above the soil and Qbt 2,3,4 BVs (0.1 for both) in 8 soil samples and 20 tuff samples with a maximum concentration of 1.31 mg/kg. Mercury is retained as a COPC.

Nickel was detected above the Qbt 2,3,4 BV (6.58 mg/kg) in 1 sample at a concentration of 8.22 mg/kg and was not detected but had DLs (7 mg/kg to 8.8 mg/kg) above the Qbt 2,3,4 BV in 11 samples. The slippage test indicated site concentrations of nickel in tuff are statistically different from background (Figure G-333 and Table G-47). Nickel is retained as a COPC.

Nitrate was detected in 37 samples with a maximum concentration of 1.7 mg/kg. Nitrate is naturally occurring, and the concentrations likely reflect naturally occurring levels. In addition, AOC 21-028(c) consists of satellite storage area and is not a source of nitrate. Nitrate is not a COPC.

Perchlorate was detected in 13 samples with a maximum concentration of 0.0096 mg/kg. Perchlorate is retained as a COPC.

Selenium was not detected but had DLs (0.53 mg/kg to 1.09 mg/kg) above the Qbt 2,3,4 BV (0.3 mg/kg) in 77 samples. There were too few detections to perform statistical tests. Selenium is retained as a COPC.

Silver was detected above the Qbt 2,3,4 BV (1 mg/kg) in 1 sample at a concentration of 1.3 mg/kg. The concentration was only 0.3 mg/kg above the BV and was less than the highest concentration in the Qbt 2,3,4 background data set (1.9 mg/kg). Silver was not detected or detected above BV in 92 other samples (detected below BV in 51 samples). Silver is not a COPC.

Vanadium was detected above the soil and Qbt 2,3,4 BVs (39.6 mg/kg and 17 mg/kg) in four soil samples and eight tuff samples with a maximum concentration of 86.3 mg/kg. The Gehan and quantile tests indicated site concentrations of vanadium in soil are not statistically different from background (Figure G-334 and Table G-48) and site concentrations of vanadium in tuff are statistically different from background (Figure G-335 and Table G-47). Vanadium is retained as a COPC.

Zinc was detected above the Qbt 2,3,4 BV (63.5 mg/kg) in two samples with a maximum concentration of 163 mg/kg and was not detected but had DLs (50.9 mg/kg to 137 mg/kg) above the soil BV (48.8 mg/kg) and Qbt 2,3,4 BV in eight soil samples and three tuff samples. The Gehan and quantile tests indicated site concentrations of zinc in tuff are not statistically different from background (Figure G-336 and Table G-47). There were too few detections in soil to perform statistical tests, and the maximum DL was substantially greater than the highest concentration in the background data set (75.5 mg/kg). Zinc is retained as a COPC.

Organic Chemicals

Of 95 total samples, 1 soil sample was analyzed for dioxins and furans and explosive compounds, 43 samples (2 soil and 41 Qbt 3) were analyzed for PCBs, and 51 samples (12 soil and 39 Qbt 3) were analyzed for SVOCs and VOCs. Table 7.4-3 presents the detected organic chemicals. Plate 47 shows the spatial distribution of detected organic chemicals.

Dioxins and Furans

Dioxins and furans are frequently detected as a result of environmental sampling but generally are not associated with industrial activities conducted at the Laboratory or released from SWMUs or AOCs being investigated at the Laboratory. Because of the limited history of many of the sites in DP Site Aggregate Area, a full analytical suite including dioxins and furans was required by NMED (NMED 2005, 092099). The Laboratory proposed analysis of dioxins and furans from a limited subset of samples from locations believed to have the highest potential for contamination (LANL 2005, 087836). These samples were to be submitted for quick turnaround analysis, and the results from these analyses were to be used by NMED and the Laboratory to determine whether additional samples should be analyzed for dioxins and furans. This proposed approach was approved by NMED (NMED 2005, 089314) and implemented by the Laboratory. Based on this approach, additional sampling for dioxins and furans was not required at AOC 21-028(c).

Dioxins and furans are known to be widely distributed in the environment from a number of sources, both natural, such as forest fires, and anthropogenic, such as industrial sources and burning of municipal trash and other waste materials. Industrial sources of dioxins and furans are primarily associated with impurities in the production of chlorinated chemical products (e.g., pentachlorophenol, chlorinated herbicides) and the wastes associated with production of those materials. Another industrial source is the pulp and paper industry and processes that bleach wood pulp (EPA 2006, 600913). None of these common industrial process-related source activities have occurred at the Laboratory. Other anthropogenic sources of dioxins and furans include the combustion of materials containing chlorine, such as the incineration of municipal trash containing chlorinated plastics, and other waste materials (EPA 2006, 600913).

Site Activities

AOC 21-028(c) consists of four satellite accumulation areas at former building 21-3 and was identified as an AOC because of possible releases of the wastes stored at these areas. The areas reportedly stored a wide variety of chemicals including depleted uranium salts, metal salts, organic chemicals, synthetic inorganic chemicals, and other reagents (LANL 1991, 007680, pp. 18-23–18-24). There are, however, no known site-related sources of dioxins and furans at former building 21-3.

As noted above, dioxins and furans were not known to be associated with this site and only one sample was analyzed for dioxins and furans. Only eight congeners were detected and concentrations ranged from 0.000000239 mg/kg to 0.0000852 mg/kg. These results likely reflect natural and/or anthropogenic background rather than a site-related release. The dioxin and furan congeners detected in samples used to characterize this site [1,2,3,4,6,7,8-heptachlorodibenzodioxin; 1,2,3,4,6,7,8-heptachlorodibenzofuran; 1,2,3,4,7,8,9-heptachlorodibenzofuran; 2,3,4,6,7,8-hexachlorodibenzofuran; 1,2,3,4,6,7,8,9-octachlorodibenzodioxin; 1,2,3,4,6,7,8,9-octachlorodibenzofuran; 2,3,4,7,8-pentachlorodibenzofuran; and 2,3,7,8-tetrachlorodibenzofuran] are not related to historical Laboratory site operations and are not COPCs.

Organic COPCs

Other organic chemicals detected at AOC 21-028(c) include acetone; anthracene; Aroclor-1242; Aroclor-1248; 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; bromobenzene; butylbenzylphthalate; chrysene; 1,2-dichlorobenzene; 1,3-dichlorobenzene; ethylbenzene; fluoranthene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; methylene chloride; phenanthrene; pyrene; tetrachloroethene; toluene; 1,2,4-trimethylbenzene; and xylenes. The detected organic chemicals listed are retained as COPCs.

Radionuclides

A total of 90 samples (13 soil and 77 Qbt 3) were analyzed for americium-241; 51 samples (12 soil and 39 Qbt 3) were analyzed for gamma-emitting radionuclides, isotopic uranium, strontium-90, and tritium; and 93 samples (13 soil and 80 Qbt 3) were analyzed for isotopic plutonium. Table 7.4-4 presents the radionuclides detected or detected above BVs/FVs. Plate 48 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Americium-241 was detected below 1 ft bgs in 10 soil samples and was detected in 46 Qbt 3 samples with a maximum activity of 3.68 pCi/g. Americium-241 is retained as a COPC.

Cesium-137 was detected below 1 ft bgs in two soil samples with a maximum activity of 0.225 pCi/g. Cesium-137 is retained as a COPC.

Plutonium-238 was detected below 1 ft bgs in 13 soil samples and was detected in 49 Qbt 3 samples with a maximum activity of 14.4 pCi/g. Plutonium-238 is retained as a COPC.

Plutonium-239/240 was detected below 1 ft bgs in 13 soil samples and was detected in 68 Qbt 3 samples with a maximum activity of 28.4 pCi/g. Plutonium-239/240 is retained as a COPC.

Tritium was detected in four samples with a maximum activity of 0.301 pCi/g. Tritium is retained as a COPC.

Uranium-234 was detected above the soil and Qbt 2,3,4 BVs (2.59 pCi/g and 1.98 pCi/g) in two soil samples and three tuff samples with a maximum activity of 4.91 pCi/g. Uranium-234 is retained as a COPC.

Uranium-235/236 was detected above the Qbt 2,3,4 BV (0.09 pCi/g) in two samples with a maximum activity of 0.128 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 AOC 21-028(c) are discussed below.

Inorganic Chemicals

Inorganic COPCs at AOC 21-028(c) include antimony, barium, calcium, chromium, copper, cyanide, lead, mercury, nickel, perchlorate, selenium, vanadium, and zinc.

Antimony was detected above the soil and Qbt 2,3,4 BVs in 6 soil samples and 25 tuff samples with a maximum concentration of 5.28 mg/kg and was not detected but had DLs (0.9545 mg/kg to 1.109 mg/kg) above the Qbt 2,3,4 BV in 35 samples. Concentrations increased with depth at locations 21-601070 and 21-601079, did not change substantially with depth (0.112 mg/kg) at location 21-612399, decreased with depth at all other locations, and increased laterally. The residential SSL is approximately 5.9 times the maximum concentration, and the industrial SSL is approximately 98 times the maximum concentration. The residential SSL is approximately 28 times the maximum DL, and the industrial SSL is approximately 468 times the maximum DL. Further sampling for extent of antimony is not warranted.

Barium was detected above the Qbt 2,3,4 BV in 25 samples with a maximum concentration of 142 mg/kg. Concentrations decreased with depth at all locations and decreased laterally (concentrations in shallow samples at locations 21-601066, 21-601067, and 21-601068 were 185 mg/kg, 160 mg/kg, and 132 mg/kg, respectively, and below the soil BV). Lateral and vertical extent of barium are defined.

Calcium was detected above the soil and Qbt 2,3,4 BVs in 11 soil samples and 46 tuff samples with a maximum concentration of 46,200 mg/kg. Concentrations decreased with depth at all locations and decreased laterally (the concentration in a shallow sample at location 21-601076 was 3860 mg/kg and below the soil BV). Lateral and vertical extent of calcium are defined.

Chromium was detected above the Qbt 2,3,4 BV in 28 samples with a maximum concentration of 17 mg/kg. Concentrations increased with depth at location 21-601081; did not change substantially with depth (1.1 mg/kg or less) at locations 21-601072, 21-601073, and 21-601079; decreased with depth at all other locations, and decreased laterally. As described in section 4.2, AOC 21-028(c) is not a potential source of hexavalent chromium and use of the SSL for trivalent chromium to determine whether additional sampling is warranted is appropriate. The residential SSL for trivalent chromium (117,000 mg/kg) is approximately 6880 times the maximum concentration. Lateral extent of chromium is defined and further sampling for vertical extent is not warranted.

Copper was detected above the Qbt 2,3,4 BV in 6 samples with a maximum concentration of 62.4 mg/kg and was not detected but had DLs (4.9 mg/kg to 30.2 mg/kg) above the soil BV (14.7 mg/kg) and Qbt 2,3,4 BV in 1 soil sample and 11 tuff samples. Concentrations decreased with depth at all locations and decreased laterally. The residential SSL is approximately 50 times the maximum concentration. Lateral extent of copper is defined and further sampling for vertical extent is not warranted.

Cyanide was not detected but had DLs (0.53 mg/kg to 0.6 mg/kg) above the soil and Qbt 2,3,4 BVs in 9 soil samples and 22 tuff samples. The residential SSL is approximately 18 times the maximum DL, and the industrial SSL is approximately 105 times the maximum DL. Further sampling for extent of cyanide is not warranted.

Lead was detected above the soil and Qbt 2,3,4 BVs in 2 soil samples and 7 tuff samples with a maximum concentration of 165 mg/kg and was not detected but had DLs (11.3 mg/kg to 28.4 mg/kg) above the BVs in1 soil sample and 12 tuff samples. Concentrations increased with depth at locations 21-612329 and 21-612334, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 14 times and the industrial SSL is approximately 28 times the maximum concentration where vertical extent is not defined (28.2 mg/kg at location 21-612329). Lateral extent of lead is defined and further sampling for vertical extent is not warranted

Mercury was detected above the soil and Qbt 2,3,4 BVs in 8 soil samples and 20 tuff samples with a maximum concentration of 1.31 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of mercury are defined.

Nickel was detected above the Qbt 2,3,4 BV in 1 sample at a concentration of 8.22 mg/kg and was not detected but had DLs (7 mg/kg to 8.8 mg/kg) above the Qbt 2,3,4 BV in 11 samples. Concentrations decreased with depth and decreased laterally. The residential SSL is approximately 177 times the maximum DL. Further sampling for extent of nickel is not warranted.

Perchlorate was detected in 13 samples with a maximum concentration of 0.0096 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of perchlorate are defined.

Selenium was not detected but had DLs (0.53 mg/kg to 1.09 mg/kg) above the Qbt 2,3,4 BV in 77 samples. The residential SSL is approximately 28 times the maximum DL. Further sampling for extent of selenium is not warranted.

Vanadium was detected above the soil and Qbt 2,3,4 BVs in four soil samples and eight tuff samples with a maximum concentration of 86.3 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of vanadium are defined.

Zinc was detected above the Qbt 2,3,4 BV in two samples with a maximum concentration of 163 mg/kg and was not detected but had DLs (50.9 mg/kg to 137 mg/kg) above the soil and Qbt 2,3,4 BVs in eight soil samples and three tuff samples. Concentrations decreased with depth at all locations and increased laterally at location 21-612341. The residential SSL is approximately 144 times the maximum concentration and 172 times the maximum DL. Further sampling for extent of zinc is not warranted.

Organic Chemicals

Organic COPCs at AOC 21-028(c) include acetone; anthracene; Aroclor-1242; Aroclor-1248; 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; bromobenzene; butylbenzylphthalate; chrysene; 1,2-dichlorobenzene; 1,3-dichlorobenzene; ethylbenzene; fluoranthene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; methylene chloride; phenanthrene; pyrene; tetrachloroethene; toluene; 1,2,4-trimethylbenzene; and xylenes.

The PAHs anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene were detected in from 1 to 30 samples. The PAHs were detected in a total of 206 samples at 15 locations at concentrations ranging from 0.034 mg/kg to 0.29 mg/kg. Vertically, most of the highest concentrations (i.e., greater than 0.1 mg/kg) were detected in the shallow samples collected from 2 ft to 3 ft bgs and PAH concentrations generally decreased with depth. There were no clear trends for lateral concentration distributions. The residential SSLs for PAHs were all greater than 10 times the maximum concentrations except for benzo(a)pyrene. The residential SSL for benzo(a)pyrene is approximately 9.3 times the maximum concentration (0.12 mg/kg) and the industrial SSL is approximately 197 times the maximum concentration. Further sampling for extent of PAHs is not warranted.

Acetone was detected in 17 samples with a maximum concentration of 0.042 mg/kg. Concentrations did not change substantially with depth (0.004 mg/kg or less) at locations 21-601075 and 21-601079, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 1,580,000 times the maximum concentration. Lateral extent of acetone is defined and further sampling for vertical extent is not warranted.

Aroclor-1242 was detected in one sample at a concentration of 0.0659 mg/kg. Concentrations decreased with depth and increased laterally. The residential SSL is approximately 39 times the maximum concentration. Vertical extent of Aroclor-1242 is defined and further sampling for lateral extent is not warranted.

Aroclor-1248 was detected in two samples with a maximum concentration of 0.01 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of Aroclor-1248 are defined.

Aroclor-1254 was detected in 23 samples with a maximum concentration of 0.273 mg/kg. Concentrations decreased with depth at all locations and increased laterally. The residential SSL is approximately 4.8 times the maximum concentration, and the industrial SSL is approximately 40 times the maximum concentration. Vertical extent of Aroclor-1254 is defined and further sampling for lateral extent is not warranted.

Aroclor-1260 was detected in 13 samples with a maximum concentration of 0.0264 mg/kg. Concentrations decreased with depth at all locations and increased laterally. The residential SSL is approximately 92 times the maximum concentration. Vertical extent of Aroclor-1260 is defined and further sampling for lateral extent is not warranted.

Benzoic acid was detected in one sample at a concentration of 0.4 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of benzoic acid are defined.

Bis(2-ethylhexyl)phthalate was detected in 14 samples with a maximum concentration of 0.27 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

Bromobenzene was detected in one sample at a concentration of 0.00053 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of bromobenzene are defined.

Butylbenzylphthalate was detected in three samples with a maximum concentration of 0.042 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of butylbenzylphthalate are defined.

Dichlorobenzene[1,2-] was detected in two samples with a maximum concentration of 0.00054 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of 1,2-dichlorobenzene are defined.

Dichlorobenzene[1,3-] was detected in one sample at a concentration of 0.00049 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of 1,3-dichlorobenzene are defined.

Ethylbenzene was detected in four samples with a maximum concentration of 0.001 mg/kg. Concentrations increased with depth at locations 21-601071 and 21-601075, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 74,500 times the maximum concentration. Lateral extent of ethylbenzene is defined and further sampling for vertical extent is not warranted.

Isopropyltoluene[4-] was detected in three samples with a maximum concentration of 0.0097 mg/kg. Concentrations increased with depth at locations 21-601070, decreased with depth at location 21-601078, and decreased laterally. The residential SSL is approximately 242,000 times the maximum concentration. Lateral extent of 4-isopropyltoluene is defined and further sampling for vertical extent is not warranted.

Methylene chloride was detected in 11 samples with a maximum concentration of 0.013 mg/kg. Concentrations increased with depth at location 21-601068, did not change substantially with depth (0.012 mg/kg or less) at locations 21-601079 and 21-601082, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 31,500 times the maximum concentration. Lateral extent of methylene chloride is defined and further sampling for vertical extent is not warranted.

Tetrachloroethene was detected in three samples with a maximum concentration of 0.0014 mg/kg. Concentrations increased with depth at location 21-601070, decreased with depth at location 21-601068, and decreased laterally. The residential SSL is approximately 78,600 times the maximum concentration. Lateral extent of tetrachloroethene is defined and further sampling for vertical extent is not warranted.

Toluene was detected in 25 samples with a maximum concentration of 0.00079 mg/kg. Concentrations increased with depth at location 21-601066 and 21-601075; did not change substantially with depth (0.00007 mg/kg or less) at locations 21-601071, 21-601079, and 21-601082; decreased with depth at all other locations; and decreased laterally. The residential SSL is approximately 6,610,000 times the maximum concentration. Lateral extent of toluene is defined and further sampling for vertical extent is not warranted.

Trimethylbenzene[1,2,4-] was detected in 14 samples with a maximum concentration of 0.00068 mg/kg. Concentrations increased with depth at location 21-601066, 21-601070, and 21-601071, and 21-601075; did not change substantially with depth (0.00006 mg/kg or less) at locations 21-601069 and 21-601070; decreased with depth at all other locations; and decreased laterally. The residential SSL is approximately 442,000 times the maximum concentration. Lateral extent of 1,2,4-trimethylbenzene is defined and further sampling for vertical extent is not warranted.

Xylenes were detected in one sample at a concentration of 0.0071 mg/kg. Concentrations increased with depth at location 21-601071 and decreased laterally. The residential SSL is approximately 122,000 times the maximum concentration. Lateral extent of xylenes is defined and further sampling for vertical extent is not warranted.

Radionuclides

Radionuclide COPCs at AOC 21-028(c) include americium-241, cesium-137, plutonium-238, plutonium-239/240, tritium, uranium-234, and uranium-235/236.

Americium-241 was detected below 1 ft bgs in 10 soil samples and was detected in 46 Qbt 3 samples with a maximum activity of 3.68 pCi/g. Activities increased with depth at locations 21-601079, 21-612331, 21-612332, and 21-612342; activities increased with depth at all other locations; and decreased laterally.

Cesium-137 was detected below 1 ft bgs in two soil samples with a maximum activity of 0.225 pCi/g. Activities decreased with depth at all locations and decreased laterally. Lateral and vertical extent of cesium-137 are defined.

Plutonium-238 was detected below 1 ft bgs in 13 soil samples and was detected in 49 Qbt 3 samples with a maximum activity of 14.4 pCi/g. Activities increased with depth at locations 21-601066, 21-601079, and 21-612342; decreased with depth at all other locations; and decreased laterally. The residential SAL is approximately 33 times the maximum activity where vertical extent is not defined (2.58 pCi/g at location 21-601079. Lateral extent of plutonium-238 is defined and further sampling for vertical extent is not warranted.

Plutonium-239/240 was detected below 1 ft bgs in 13 soil samples and was detected in 68 Qbt 3 samples with a maximum activity of 28.4 pCi/g. Activities increased with depth at locations 21-601066, 21-601073, 21-601079, 21-612231, and 21-612232; did not change substantially with depth (0.12 pCi/g) at location 21-601078; decreased with depth at all other locations, and decreased laterally. The residential SAL is approximately 5.6 times and the industrial SSL is approximately 88 times the maximum activity where vertical extent is not defined (13.7 pCi/g at location 21-601079). Lateral extent of plutonium-239/240 is defined and further sampling for vertical extent is not warranted.

Tritium was detected in four samples with a maximum activity of 0.301 pCi/g. Activities increased with depth at location 21-601082, decreased with depth at all other locations, and increased laterally. The residential SAL is approximately 5650 times the maximum activity. Lateral extent of tritium is defined and further sampling for vertical extent is not warranted.

Uranium-234 was detected above the soil and Qbt 2,3,4 BVs in two soil samples and three tuff samples with a maximum activity of 4.91 pCi/g. Activities increased with depth at location 21-601079, decreased with depth at all other locations, and decreased laterally. The residential SAL is approximately 59 times the maximum activity. Lateral extent of uranium-234 is defined and further sampling for vertical extent is not warranted.

Uranium-235/236 was detected above the Qbt 2,3,4 BV in two samples with a maximum activity of 0.128 pCi/g. Activities did not change substantially with depth (0.001 pCi/g) at location 21-601082, decreased with depth at location 21-601070, and decreased laterally. The residential SAL is approximately 328 times the maximum activity. Lateral extent of uranium-235/236 is defined and further sampling for vertical extent is not warranted.

Summary of Nature and Extent

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at AOC 21-028(c).

7.4.5 Summary of Human Health Risk Screening

Industrial Scenario

Samples were not collected from the 0.0–1.0 ft depth interval, and the industrial scenario was not evaluated for AOC 21-028(c).

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} (NMED 2017, 602273). The construction worker HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Residential Scenario

The total excess cancer risk for the residential scenario is 4×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.3, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 4 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 residential and construction worker scenarios at and AOC 21-028(c).

7.4.6 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 screening levels to background concentrations, no potential ecological risks exist for AOC 21-028(c).

8.0 TA-26 BACKGROUND AND FIELD INVESTIGATION RESULTS

The Middle Los Alamos Canyon Aggregate Area contains four sites associated with TA-26 that are addressed in this investigation report (Table 1.1-1). Each site is described separately in sections 8.2 through 8.5; sections include site description and operational history, relationship to other SWMUs and AOCs, historical and 2010 investigation activities, 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-26

8.1.1 Operational History

TA-26 is a former TA located south of NM 502, east and south of the Los Alamos County airport, and west of the East Gate Industrial Park (Figure 8.2-1). The area is restricted to D-Site, which contained the East Gate vault. D-Site was established for Los Alamos Scientific Laboratory's Chemistry and Metallurgical Research division for the purpose of storing radioactive materials (LASL 1947, 000664).

The area consisted of several structures, including the East Gate vault (building 26-1), Guard Tower A (structure 26-2), Guard Tower B (structure 26-3), a guard building (26-4), east room septic system (structure 26-5), and a sump system (structure 26-6). Construction at D-Site began on April 1, 1946. The concrete storage vault, Guard Tower A, the guard building, and the sump system were completed in October 1946.

Guard Tower B was moved from TA-21 to TA-26 in March 1948. The septic system was installed in August 1948. The guard building was removed in December 1948, and the two guard towers were removed in May 1955 (LASL no date, 000675). The storage vault was later used by the Zia Company for storing high explosives (Lojek 1991, 001904). The vault operated from approximately 1946 to 1965. D-Site was demolished in 1965 and 1966.

8.1.2 Summary of Releases

Releases at TA-26 may have occurred from routine operations through the sump outfall [SWMU 26-002(a)], the drainline [SWMU 26-002(b)], and the septic tank (SWMU 26-003).

8.1.3 Current Site Usage and Status

The only existing surface structure at the TA-26 site is a concrete retaining wall near the south edge of the mesa top. The wall is 10 in. thick, set into the ground to an unknown depth, and runs east-west for approximately 50 ft. TA-26 could be used occasionally for recreational purposes (e.g., hiking) because the mesa top portion is accessible to the public.

8.2 SWMU 26-001, Surface Disposal Site

8.2.1 Site Description and Operational History

SWMU 26-001 is a surface disposal area on the south-facing slope of Los Alamos Canyon that contains debris from a five-room concrete storage vault (Figure 8.2-1).

The vault was constructed in 1946 (LASL 1949, 000696) and was decommissioned and dismantled in 1966 (Blackwell 1973, 000619). Although the vault was constructed for storing radioactive materials, documentation describing the specific type and quantity of radioactive materials is not available. One document states that the vault "stored friable containers which now contain, or have contained radioactive material" (Maddy 1957, 006349). The vault was later used for storing high explosives (Lojek 1991, 001904). Before the vault was dismantled, the contaminated contents that could be removed, including shelving, drainlines, the sump, and duct work, were disposed of at MDA C (Blackwell 1973, 000619). The remains of the vault were bulldozed onto the south-facing slope of Los Alamos Canyon. In the 1970s, most of the vault debris rested on the bench below the mesa top; however, some debris may have fallen as far as the canyon floor (Buckland 1978, 000496). The debris on the ledge was covered with approximately 3 ft of soil (Blackwell 1973, 000619).

8.2.2 Relationship to Other SWMUs and AOCs

The debris in the disposal area of SWMU 26-001 originated as the building 26-1 storage vault. Components of the storage vault included a sump system, SWMU 26-002(a), a drainage system, SWMU 26-002(b), and a septic system, SWMU 26-003. There are no other SWMUs or AOCs related to SWMU 26-001.

8.2.3 Summary of Previous Investigations

8.2.3.1 1965 Radiological Survey

A survey of radioactive contaminants at the D-Site vault area was conducted in 1965 before the vault was decommissioned. The radiation survey covered the grounds area, five vault doors, five vault rooms, and the north side concrete ramp to the vault area (Buckland 1965, 000628).

The grounds and five vault doors were found to be free of contamination. Alpha radiation was elevated in all five of the vault rooms. Contamination was detected on floors, light fixtures, ventilation ducts, and the concrete ramp. The contaminants were suspected to be enriched uranium-234 and uranium-235 (Buckland 1965, 000628).

Documentation of the decommissioning of the D-Site vault area is incomplete. A Laboratory memorandum from the General Monitoring Section (H-1) staff in 1973 indicates that paint applied to cover the contamination on the floors was removed to enable a survey of the exposed concrete. The floor was damp-mopped to remove loose contamination (Blackwell 1973, 000619). Before the vault was dismantled, the contaminated contents that were removable, including shelving, drainlines, the sump, and duct work, were disposed of at MDA C (Blackwell 1973, 000619). The remains of the vault were broken up, and the rubble was pushed over the cliff side to a bench on the south-facing slope of Los Alamos Canyon. When all rubble had been pushed over the side, additional soil was pushed over the side to cover the rubble to a minimum depth of 3 ft (Blackwell 1973, 000619).

8.2.3.2 1985 Phoswich Radioactivity Survey

A Phoswich radioactivity survey was conducted on the mesa at the location of the former D-Site storage vault area in 1985. The survey revealed beta-gamma radiation levels 20% to 25% higher than background levels on the west side of the vault area site (LANL 1992, 007667, p. 5-160). The source of the contamination was unclear, and the extent of contamination beyond the vault site on the ledge and in the canyon was not known.

8.2.3.3 1986 Comprehensive Environmental Assessment and Response Program Field Survey

The Comprehensive Environmental Assessment and Response Program field survey team observed pipe and other materials projecting from the debris on the bench below where the D-Site storage vault material had been bulldozed in 1965 (DOE 1987, 008663).

8.2.3.4 2007 Investigation Activities

At the time of the 2007 investigation, a small amount of reinforced-concrete debris was visible on the bench below the mesa top.

Ninety-five samples were collected from 39 locations at TA-26 in 2007. Results from the sampling activities in 2007 were presented in the previous investigation report (LANL 2008, 101669.12). Additional sampling was required to define the extent of contamination at TA-26.

8.2.4 Site Contamination

8.2.4.1 Soil and Rock Sampling

As part of the 2010 investigation, the following characterization activities were conducted at the mesa top and the canyon slope of TA-26:

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- *Mesa Top:* Three samples were collected from location 26-612303 in the central area of previous sampling locations, and nine samples were collected from three step-out locations (26-612304 to 26-612306). All mesa-top samples were collected from 0–0.5 ft, 5–6 ft, 15–16 ft, and 24–25 ft bgs and were analyzed for TAL metals only.
- *Canyon Slope:* Twenty-four samples were collected from eight step-out locations (26-612294 to 26-612297 and 26-612299 to 26-612302) downgradient of previous sampling locations (depths ranging from 0–10 ft bgs). Three samples were collected from location 26-612298, downgradient of previous locations 26-600777 and 26-600778, from 0–0.5 ft, 5–6 ft, and 9–10 ft bgs. All canyon-slope samples were analyzed for TAL metals, nitrate, and gamma-emitting radionuclides.

The 2010 and historical sampling locations at TA-26 are shown in Figure 8.2-1. Table 8.2-1 presents the samples collected and analyses requested for SWMU 26-001. The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

8.2.4.2 Soil and Rock Field Screening Results

No organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of the samples. No radiological-screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. No changes to sampling or other activities occurred because of the field-screening results.

8.2.4.3 Soil and Rock Sampling Analytical Results

Decision-level data at SWMU 26-001 consist of results from 52 samples collected from 21 locations in 2007 and 2010. The 52 samples include 8 soil and 44 tuff samples.

Inorganic Chemicals

A total of 52 samples (8 soil and 44 tuff) were analyzed for TAL metals and nitrate and 31 tuff samples were analyzed for perchlorate and cyanide. Table 8.2-2 presents the inorganic chemicals detected or detected above BVs. Plate 50 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 7570 mg/kg. The Gehan and quantile tests indicated site concentrations of aluminum in tuff are not statistically different from background (Figure G-337 and Table G-49). 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 two soil samples and one tuff sample with a maximum concentration of 15.5 mg/kg. Antimony is retained as a COPC.

Arsenic was detected above the Qbt 2,3,4 BV (2.79 mg/kg) in six samples with a maximum concentration of 3.85 mg/kg. The Gehan and quantile tests indicated site concentrations of arsenic in tuff are statistically different from background (Figure G-338 and Table G-49). Arsenic is retained as a COPC.

Barium was detected above the Qbt 2,3,4 BV (46 mg/kg) in nine samples with a maximum concentration of 137 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in tuff are not statistically different from background (Figure G-339 and Table G-49). Barium 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 1.3 mg/kg. The Gehan and quantile tests indicated site concentrations of beryllium in tuff are not statistically different from background (Figure G-340 and Table G-49). Beryllium is not a COPC.

Calcium was detected above the soil and Qbt 2,3,4 BVs (6120 mg/kg and 2200 mg/kg) in 6 soil samples and 26 tuff samples with a maximum concentration of 20,900 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in soil and tuff are statistically different from background (Figure G-341 and Table G-50, and Figure G-342 and Table G-49, respectively). Calcium is retained as a COPC.

Chromium was detected above the Qbt 2,3,4 BV (7.14 mg/kg) in eight samples with a maximum concentration of 16.8 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in tuff are statistically different from background (Figure G-343 and Table G-49). Chromium is retained as a COPC.

Cobalt was detected above the Qbt 2,3,4 BV (3.14 mg/kg) in three samples with a maximum concentration of 3.74 mg/kg. The Gehan and quantile tests indicated site concentrations of cobalt in tuff are not statistically different from background (Figure G-344 and Table G-49). Cobalt is not a COPC.

Copper was detected above the Qbt 2,3,4 BV (4.66 mg/kg) in seven samples with a maximum concentration of 12 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in tuff are statistically different from background (Figure G-345 and Table G-49). Copper is retained as a COPC.

Cyanide was detected above the Qbt 2,3,4 BV (0.5 mg/kg) in two samples with a maximum concentration of 0.74 mg/kg. Cyanide is retained as a COPC.

Lead was detected above the Qbt 2,3,4 BV (11.2 mg/kg) in one sample at a concentration of 13.7 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in tuff are not statistically different from background (Figure G-346 and Table G-49). Lead is not a COPC.

Magnesium was detected above the Qbt 2,3,4 BV (482 mg/kg) in three samples with a maximum concentration of 2980 mg/kg. The Gehan test indicated site concentrations of magnesium in tuff are statistically different from background (Table G-49). However, the quantile and slippage tests indicated site concentrations of magnesium in tuff are not statistically different from background (Figure G-347 and Table G-49). Magnesium is not a COPC.

Nickel was detected above the Qbt 2,3,4 BV (6.58 mg/kg) in five samples with a maximum concentration of 10.7 mg/kg. The quantile test indicated site concentrations of nickel in tuff are statistically different from background (Figure G-348 and Table G-49). Nickel is retained as a COPC.

Nitrate was detected in 48 samples with a maximum concentration of 50.6 mg/kg. Nitrate is naturally occurring but the maximum concentration likely exceeds naturally occurring levels. Nitrate is retained as a COPC.

Perchlorate was detected in eight samples with a maximum concentration of 0.0019 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the soil and Qbt 2,3,4 BVs (1.52 mg/kg and 0.3 mg/kg) in 4 soil samples and 44 tuff samples with a maximum concentration of 11.4 mg/kg. Selenium is retained as a COPC.

Organic Chemicals

A total of 31 tuff samples were analyzed for PCBs, SVOCs, and explosive compounds and 29 tuff samples were analyzed for VOCs. Table 8.2-3 presents the organic chemicals detected. Plate 51 shows the spatial distribution of organic chemicals detected.

Polycyclic Aromatic Hydrocarbons

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

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

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

Site Activities

SWMU 26-001 is a surface disposal site for demolition debris. The site was associated with the former TA-26 radioactive material storage vault and was identified as a SWMU because of the potential for radioactive contamination. The vault was constructed of concrete and was used to store radioactive materials. PAHs were detected in low concentrations (0.0104 mg/kg to 0.0114 mg/kg), were only detected at 1 of 14 locations sampled, and were only detected in shallow subsurface samples. PAHs are not known to have been used in the storage vault or associated with the materials stored there. PAHs may be related to the access road and parking area for the former vault, or to runoff from the highway to the north of the site. Therefore, the PAHs detected in samples used to characterize this site [benzo(a)anthracene, chrysene, fluoranthene, and pyrene] are associated with roadways or parking areas, are not related to historical Laboratory site operations, and are not COPCs.

Organic COPCs

Other organic chemicals detected at SWMU 26-001 include Aroclor-1248, 4-isopropyltoluene, and toluene. The detected organic chemicals listed are retained as COPCs.

Radionuclides

A total of 52 samples (8 soil and 44 tuff) were analyzed for gamma-emitting radionuclides and 31 tuff samples were analyzed for americium-241, isotopic plutonium, isotopic uranium, strontium-90, and tritium. Table 8.2-4 presents the radionuclides detected or detected above BVs/FVs. Plate 52 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Cesium-137 was detected in five tuff samples with a maximum activity of 0.36 pCi/g. Cesium-137 is retained as a COPC.

Plutonium-238 was detected in one tuff sample at an activity of 1.43 pCi/g. Plutonium-238 is retained as a COPC.

Plutonium-239/240 was detected in one tuff sample at an activity of 0.154 pCi/g. Plutonium-239/240 is retained as a COPC.

Strontium-90 was detected in one tuff sample at an activity of 0.164 pCi/g. Strontium-90 is retained as a COPC.

Tritium was detected in 12 samples with a maximum activity of 0.443 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 six samples with a maximum activity of 0.173 pCi/g. Uranium-235/236 is retained as a COPC.

8.2.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 26-001 are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 26-001 include antimony, arsenic, calcium, chromium, copper, cyanide, nickel, nitrate, perchlorate, and selenium.

Antimony was detected above the soil and Qbt 2,3,4 BVs in two soil samples and one tuff sample with a maximum concentration of 15.5 mg/kg. Concentrations increased with depth at location 26-612297, decreased with depth at location 26-612302, and increased laterally. The residential SSL is approximately 2.0 times the maximum concentration, and the industrial SSL is approximately 33 times the maximum concentration. Further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbt 2,3,4 BV in six samples with a maximum concentration of 3.85 mg/kg. Concentrations did not change substantially with depth (0.14 mg/kg) at location 26-600777, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 2.1 times and the industrial SSL is approximately 10.4 times the maximum concentration where vertical extent is not defined (3.45 mg/kg at location 26-600777). Lateral extent of arsenic is defined and further sampling for vertical extent is not warranted.

Calcium was detected above the soil and Qbt 2,3,4 BVs in 6 soil samples and 26 tuff samples with a maximum concentration of 20,900 mg/kg. Concentrations increased with depth at location 26-612302, only one depth was sampled at location 26-600778, concentrations did not change substantially with depth (400 mg/kg) at location 26-600777, concentrations decreased with depth at all other locations, and concentrations increased laterally. The residential SSL is approximately 622 times the maximum concentration. Further sampling for extent of calcium is not warranted.

Chromium was detected above the Qbt 2,3,4 BV in eight samples with a maximum concentration of 16.8 mg/kg. Concentrations increased with depth at locations 26-600779, 26-600790, 26-612296, and 26-612300; decreased with depth at all other locations; and increased laterally. As described in section 4.2, SWMU 26-001 is not a potential source of hexavalent chromium and use of the SSL for trivalent chromium to determine whether additional sampling is warranted is appropriate. The residential SSL for trivalent chromium (117,000 mg/kg) is approximately 6960 times the maximum concentration. Further sampling for extent of chromium is not warranted.

Copper was detected above the Qbt 2,3,4 BV in seven samples with a maximum concentration of 12 mg/kg. Concentrations increased with depth at locations 26-612297 and 26-612300, did not change substantially with depth (1.3 mg/kg or less) at locations 26-612301 and 26-612302, decreased with depth at all other locations, and increased laterally. The residential SSL is approximately 261 times the maximum concentration. Further sampling for extent of copper is not warranted.

Cyanide was detected above the Qbt 2,3,4 BV in two samples with a maximum concentration of 0.74 mg/kg. Concentrations decreased with depth at all locations and increased laterally. The residential SSL is approximately 15 times the maximum concentration, and the industrial SSL is approximately 85 times the maximum concentration. Vertical extent of cyanide is defined and further sampling for lateral extent is not warranted.

Nickel was detected above the Qbt 2,3,4 BV in five samples with a maximum concentration of 10.7 mg/kg. Concentrations increased with depth at locations 26-612297 and 26-612300, decreased with depth at location 26-612301, and increased laterally. The residential SSL is approximately 146 times the maximum concentration. Further sampling for extent of nickel is not warranted.

Nitrate was detected in 48 samples with a maximum concentration of 50.6 mg/kg. Concentrations increased with depth at locations 26-600777 and 26-612297, only one depth was sampled at locations 26-600778 and 26-600786, concentrations decreased with depth at all other locations, and concentrations decreased laterally. The residential SSL is approximately 2470 times the maximum concentration. Lateral extent of nitrate is defined and further sampling for vertical extent is not warranted.

Perchlorate was detected in eight samples with a maximum concentration of 0.0019 mg/kg. Concentrations increased with depth at location 26-600777, only one depth was sampled at location 26-600778, concentrations did not change substantially with depth (0.00068 mg/kg or less) at locations 26-600781 and 26-600790, concentrations decreased with depth at all other locations, and concentrations decreased laterally. The residential SSL is approximately 28,800 times the maximum concentration. Lateral extent of perchlorate is defined and further sampling for vertical extent is not warranted.

Selenium was detected above the soil and Qbt 2,3,4 BVs in 4 soil samples and 44 tuff samples with a maximum concentration of 11.4 mg/kg. Concentrations increased with depth at locations 26-612299, 26-612300, and 26-612302; only one depth was sampled at locations 26-600778 and 26-600786; concentrations did not change substantially with depth (0.5 mg/kg or less) at locations 26-612296, 26-612297, and 26-612298; concentrations decreased with depth at all other locations; and concentrations decreased laterally. The residential SSL is approximately 34 times the maximum concentration. Lateral extent of selenium is defined and further sampling for vertical extent is not warranted.

Organic Chemicals

Organic COPCs at SWMU 26-001 include Aroclor-1248, 4-isopropyltoluene, and toluene.

Aroclor-1248 was detected in one sample at a concentration of 0.073 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of Aroclor-1248 are defined.

Isopropyltoluene[4-] was detected in one sample at a concentration of 0.00237 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of 4-isopropyltoluene are defined.

Toluene was detected in 14 samples with a maximum concentration of 0.00123 mg/kg. Concentrations increased with depth at location 26-600788, only one depth was sampled at location 26-600778, concentrations decreased with depth at all other locations, and concentrations increased laterally. The residential SSL is approximately 4,240,000 times the maximum concentration. Further sampling for extent of toluene is not warranted.

Radionuclides

Radionuclide COPCs at SWMU 26-001 include cesium-137, plutonium-238, plutonium-239/240, strontium-90, tritium, and uranium-235/236.

Cesium-137 was detected in five tuff samples with a maximum activity of 0.36 pCi/g. Activities decreased with depth at all locations and increased laterally. The residential SAL is approximately 32 times the maximum activity. Vertical extent of cesium-137 is defined and further sampling for lateral extent is not warranted.

Plutonium-238 was detected in one tuff sample at an activity of 1.43 pCi/g. Activities decreased with depth and decreased laterally. Lateral and vertical extent of plutonium-238 are defined.

Plutonium-239/240 was detected in one tuff sample at an activity of 0.154 pCi/g. Activities decreased with depth and decreased laterally. Lateral and vertical extent of plutonium-239/240 are defined.

Strontium-90 was detected in one tuff sample at an activity of 0.164 pCi/g. Activities decreased with depth and decreased laterally. Lateral and vertical extent of strontium-90 are defined.

Tritium was detected in 12 samples with a maximum activity of 0.443 pCi/g. Only one depth was sampled at locations 26-600778 and 26-6007786, concentrations decreased with depth at all other locations, and concentrations decreased laterally. The residential SAL is approximately 3840 times the maximum activity. 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 six samples with a maximum activity of 0.173 pCi/g. Activities increased with depth at location 26-600784, only one depth was sampled at location 26-600786, activities decreased with depth at all other locations, and activities decreased laterally. The residential SAL is approximately 302 times the maximum activity. Lateral extent of uranium-235/236 is defined and further sampling for vertical extent is not warranted.

Summary of Nature and Extent

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at SWMU 26-001.

8.2.5 Summary of Human Health Risk Screening

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} (NMED 2017, 602273). The industrial HI is 0.06, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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 2×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The construction worker HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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.

Residential Scenario

The total excess cancer risk for the residential scenario is 4×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.7, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.9 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the residential and construction worker scenarios at and SWMU 26-001.

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 screening levels to background concentrations, no potential ecological risks exist for SWMU 26-001.

8.3 SWMU 26-002(a), Soil Contamination

8.3.1 Site Description and Operational History

SWMU 26-002(a) is the acid sump system that served the concrete storage vault at TA-26 from 1946 to 1965 (Figure 8.2-1). Engineering records note the sump as having an internal diameter of 4 ft and a depth of 10 ft (LANL 1990, 007513). The collection sump was located outside the vault.

The vault and its associated structures were constructed in 1946 (LASL 1949, 000696) and decommissioned and dismantled in 1966 (Blackwell 1973, 000619). The sump system consisted of a 6-in.-diameter VCP floor drain in the south center room of the vault. The drain connected to a collection sump and outfall that discharged to Los Alamos Canyon. The vault was decommissioned and dismantled in 1966 (LASL 1949, 000696). The sump and its drainlines were removed before demolition of the vault and disposed of at MDA C (Blackwell 1973, 000619).

8.3.2 Relationship to Other SWMUs and AOCs

The sump system was connected to the building 26-1 storage vault and the drainage system within the vault [SWMU 26-002(b)]. The sump outfall may have discharged liquids to the vicinity of the disposal area identified as SWMU 26-001.

8.3.3 Summary of Previous Investigations

The sump system was not investigated separately from the surveys discussed in association with SWMU 26-001 (section 8.2.3).

8.3.4 Site Contamination

8.3.4.1 Soil and Rock Sampling

As part of the 2010 investigation, the following characterization activities were conducted at the mesa top and the canyon slope of TA-26:

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- *Mesa Top:* Three samples were collected from location 26-612303 in the central area of previous sampling locations, and nine samples were collected from three step-out locations (26-612304 to 26-612306). All mesa-top samples were collected from 0–0.5 ft, 5–6 ft, 15–16 ft, and 24–25 ft bgs and were analyzed for TAL metals only.
- *Canyon Slope:* Twenty-four samples were collected from eight step-out locations (26-612294 to 26-612297 and 26-612299 to 26-612302) downgradient of previous sampling locations (depths ranging from 0–10 ft bgs). Three samples were collected from location 26-612298, downgradient of previous locations 26-600777 and 26-600778, from 0–0.5 ft, 5–6 ft, and 9–10 ft bgs. All canyon-slope samples were analyzed for TAL metals, nitrate, and gamma-emitting radionuclides.

The 2010 and historical sampling locations at TA-26 are shown in Figure 8.2-1. Table 8.3-1 presents the samples collected and analyses requested for SWMU 26-002(a). The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

8.3.4.2 Soil and Rock Field Screening Results

No organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of the samples. No radiological-screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. No changes to sampling or other activities occurred because of the field-screening results.

8.3.4.3 Soil and Rock Sampling Analytical Results

Decision-level data at SWMU 26-002(a) consist of results from 51 samples collected from 17 locations in 2007 and 2010. The 51 samples include 4 soil and 47 tuff samples.

Inorganic Chemicals

A total of 51 samples (4 soil and 47 tuff) were analyzed for TAL metals, 39 samples (1 soil and 38 tuff) were analyzed for nitrate, and 36 tuff samples were analyzed for perchlorate and cyanide. Table 8.3-2 presents the inorganic chemicals detected or detected above BVs. Plate 50 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was detected above the Qbt 2,3,4 BV (0.5 mg/kg) in one sample at a concentration of 0.627 mg/kg and was not detected but had DLs (0.993 mg/kg to 1.04 mg/kg) above the Qbt 2,3,4 BV in nine samples. Antimony is retained as a COPC.

Arsenic was detected above the Qbt 2,3,4 BV (2.79 mg/kg) in 22 samples with a maximum concentration of 8.34 mg/kg. The Gehan and quantile tests indicated site concentrations of arsenic in tuff are statistically different from background (Figure G-349 and Table G-51). Arsenic is retained as a COPC.

Barium was detected above the Qbt 2,3,4 BV (46 mg/kg) in 13 samples with a maximum concentration of 148 mg/kg. The quantile and slippage tests indicated site concentrations of barium in tuff are statistically different from background (Figure G-350 and Table G-51). Barium is retained as a COPC.

Cadmium was detected above the Qbt 2,3,4 BV (1.63 mg/kg) in one sample at a concentration of 1.71 mg/kg and was not detected but had DLs (0.503 mg/kg and 0.513 mg/kg) above the soil BV (0.4 mg/kg) in two samples. The quantile and slippage tests indicated site concentrations of cadmium in tuff are not statistically different from background (Figure G-351 and Table G-51). The DLs are only 0.103 mg/kg and 0.113 mg/kg above BV; the maximum DL (0.513 mg/kg) is below or equivalent to the three highest concentrations (0.6 mg/kg, 1.4 mg/kg, and 2.6 mg/kg) and three highest DLs (2 mg/kg, 2 mg/kg, and 2 mg/kg) in the soil background data set. 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 20 tuff samples with a maximum concentration of 30,400 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in tuff are statistically different from background (Figure G-352 and Table G-51). 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 10 tuff samples with a maximum concentration of 48.9 mg/kg and was not detected but had DLs (8.03 mg/kg and 7.49 mg/kg) above the Qbt 2,3,4 BV in 2 samples. The Gehan and quantile tests indicated site concentrations of chromium in tuff are statistically different from background (Figure G-353 and Table G-51). Chromium is retained as a COPC.

Cobalt was detected above the Qbt 2,3,4 BV (3.14 mg/kg) in one sample at a concentration of 3.8 mg/kg. The Gehan and quantile tests indicated site concentrations of cobalt in tuff are not statistically different from background (Figure G-354 and Table G-51). Cobalt is not a COPC.

Copper was detected above the Qbt 2,3,4 BV (4.66 mg/kg) in seven samples with a maximum concentration of 9.74 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in tuff are statistically different from background (Figure G-355 and Table G-51). Copper is retained as a COPC.

Magnesium was detected above the soil and Qbt 2,3,4 BVs (4610 mg/kg and 1690 mg/kg) in one soil sample and five tuff samples with a maximum concentration of 5420 mg/kg. The Gehan test indicated site concentrations of magnesium in tuff are statistically different from background (Table G-51). However, the quantile and slippage tests indicated site concentrations of magnesium in tuff are not statistically different from background (Figure G-356 and Table G-51). Magnesium is not a COPC.

Manganese was detected above the Qbt 2,3,4 BV (482 mg/kg) in two samples with a maximum concentration of 881 mg/kg. The Gehan test indicated site concentrations of manganese in tuff are statistically different from background (Table G-51). However, the quantile and slippage tests indicated site concentrations of manganese in tuff are not statistically different from background (Figure G-357 and Table G-51). Manganese is not a COPC.

Nickel was detected above the Qbt 2,3,4 BV (6.58 mg/kg) in seven samples with a maximum concentration of 22.6 mg/kg and was not detected but had DLs (7.44 mg/kg to 12.1 mg/kg) above the Qbt 2,3,4 BV in three samples. The quantile test indicated site concentrations of nickel in tuff are statistically different from background (Figure G-358 and Table G-51). Nickel is retained as a COPC.

Nitrate was detected in 15 samples with a maximum concentration of 7.43 mg/kg. Nitrate is naturally occurring, and the concentrations likely reflect naturally occurring levels. In addition, SWMU 26-002(a) is associated with a storage vault and is not a source of nitrate. Nitrate is not a COPC.

Perchlorate was detected in six samples with a maximum concentration of 0.00191 mg/kg. Perchlorate is retained as a COPC.

Potassium was detected above the soil BV (3460 mg/kg) in one sample at a concentration of 3490 mg/kg. The concentration is only 30 mg/kg above BV and is below the seven highest concentrations (3700 mg/kg to 6850 mg/kg) in the soil background data set. Potassium is not a COPC.

Selenium was detected above the Qbt 2,3,4 BV (0.3 mg/kg) in 41 samples with a maximum concentration of 16.3 mg/kg and was not detected but had DLs (1.01 mg/kg to 1.04 mg/kg) above the BV in 6 samples. Selenium is retained as a COPC.

Thallium was not detected but had a DL (1.066 mg/kg) above the soil BV (0.73 mg/kg) in one sample. Thallium is retained as a COPC.

Vanadium was detected above the Qbt 2,3,4 BV (17 mg/kg) in two samples with a maximum concentration of 22.4 mg/kg. The Gehan and quantile tests indicated site concentrations of vanadium in tuff are not statistically different from background (Figure G-359 and Table G-51). Vanadium is not a COPC.

Zinc was detected above the Qbt 2,3,4 BV (63.5 mg/kg) in one sample at a concentration of 72.5 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in tuff are not statistically different from background (Figure G-360 and Table G-51). Zinc is not a COPC.

Organic Chemicals

A total of 36 tuff samples were analyzed for PCBs, SVOCs, VOCs, and explosive compounds. Table 8.3-3 presents the organic chemicals detected. Plate 51 shows the spatial distribution of organic chemicals detected.

Polycyclic Aromatic Hydrocarbons

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

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

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

Site Activities

SWMU 26-002(a) is an acid sump system. The site was associated with the former TA-26 radioactive material storage vault and was identified as a SWMU because of the potential for radioactive contamination. The vault was constructed of concrete and was used to store radioactive materials. PAHs were detected in low concentrations (0.0128 mg/kg to 0.0647 mg/kg), were only detected at 2 of 13 locations sampled, and were only detected in shallow subsurface samples. PAHs are not known to have been used in the storage vault or associated with the materials stored there. PAHs may be related to the access road and parking area for the former vault, or to runoff from the highway to the north of the site. Therefore, the PAHs detected in samples used to characterize this site [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, fluoranthene, phenanthrene, and pyrene] are associated with roadways or parking areas, are not related to historical Laboratory site operations, and are not COPCs.

Organic COPCs

Other organic chemicals detected at SWMU 26-002(a) include Aroclor-1260, 2-hexanone, and toluene. The detected organic chemicals listed are retained as COPCs.

Radionuclides

A total of 39 samples (1 soil and 38 tuff) were analyzed for gamma-emitting radionuclides and 36 tuff samples were analyzed for americium-241, isotopic plutonium, isotopic uranium, strontium-90, and tritium. Table 8.3-4 presents the radionuclides detected or detected above BVs/FVs. Plate 52 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Cesium-137 was detected in three tuff samples with a maximum activity of 0.415 pCi/g. Cesium-137 is retained as a COPC.

Plutonium-239/240 was detected in one tuff sample at an activity of 0.0769 pCi/g. Plutonium-239/240 is retained as a COPC.

Strontium-90 was detected in one tuff sample an activity of 0.13 pCi/g. Strontium-90 is retained as a COPC.

Tritium was detected in 24 samples with a maximum activity of 0.507 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 nine samples with a maximum activity of 0.128 pCi/g. Uranium-235/236 is retained as a COPC.

8.3.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 26-002(a) are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 26-002(a) include antimony, arsenic, barium, calcium, chromium, copper, nickel, perchlorate, selenium, and thallium.

Antimony was detected above the Qbt 2,3,4 BV in one sample at a concentration of 0.627 mg/kg and was not detected but had DLs (0.993 mg/kg to 1.03 mg/kg) above the Qbt 2,3,4 BV in nine samples. Concentrations decreased with depth and decreased laterally. The residential SSL is approximately 32 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbt 2,3,4 BV in 22 samples with a maximum concentration of 8.34 mg/kg. Concentrations did not change substantially with depth (0.07 mg/kg or less) at locations 26-600914 and 26-600921, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 1.6 times and the industrial SSL is approximately 8.0 times the maximum concentration where vertical extent is not defined (4.47 mg/kg at location 26-600921). All concentrations are below or equivalent to the soil BV (8.17 mg/kg). Lateral extent of arsenic is defined and further sampling for vertical extent is not warranted.

Barium was detected above the Qbt 2,3,4 BV in 13 samples with a maximum concentration of 148 mg/kg. Concentrations did not change substantially with depth (0.5 mg/kg) at location 26-600921, only one depth was sampled at location 26-600922, concentrations decreased with depth at all other locations, and concentrations increased laterally. The residential SSL is approximately 105 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 1 soil sample and 20 tuff samples with a maximum concentration of 30,400 mg/kg. Concentrations did not change substantially with depth (900 mg/kg) at location 26-600921, only one depth was sampled at location 26-600922, concentrations decreased with depth at all other locations, and concentrations increased laterally. The residential SSL is approximately 439 times the maximum concentration. Further sampling for extent of calcium is not warranted.

Chromium was detected above the soil and Qbt 2,3,4 BVs in 1 soil sample and 10 tuff samples with a maximum concentration of 48.9 mg/kg and was not detected but had DLs (8.03 mg/kg and 7.49 mg/kg) above the Qbt 2,3,4 BV in 2 samples. Concentrations increased with depth at locations 26-600914, 26-600921, 26-600924; only one depth was sampled at location 26-600922; concentrations decreased with depth at all other locations; and concentrations increased laterally. As described in section 4.2, SWMU 26-002(a) is not a potential source of hexavalent chromium and use of the SSL for trivalent chromium to determine whether additional sampling is warranted is appropriate. The residential SSL for trivalent chromium (117,000 mg/kg) is approximately 2390 times the maximum concentration and 15,600 times the maximum DL. Further sampling for extent of chromium is not warranted.

Copper was detected above the Qbt 2,3,4 BV in seven samples with a maximum concentration of 9.74 mg/kg. Concentrations increased with depth at location 26-600921, did not change substantially with depth (0.01 mg/kg) at location 26-600916, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 321 times the maximum concentration. Lateral extent of copper is defined and further sampling for vertical extent is not warranted.

Nickel was detected above the Qbt 2,3,4 BV in seven samples with a maximum concentration of 22.6 mg/kg and was not detected but had DLs (7.44 mg/kg to 12.1 mg/kg) above the Qbt 2,3,4 BV in three samples. Concentrations increased with depth at location 26-612294, decreased with depth at all other locations, and increased laterally. The residential SSL is approximately 69 times the maximum concentration and 129 times the maximum DL. Further sampling for extent of nickel is not warranted.

Perchlorate was detected in six samples with a maximum concentration of 0.00191 mg/kg. Concentrations increased with depth at location 26-600913, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 28,700 times the maximum concentration. Lateral extent of perchlorate is defined and further sampling for vertical extent is not warranted.

Selenium was detected above the Qbt 2,3,4 BV in 41 samples with a maximum concentration of 16.3 mg/kg and was not detected but had DLs (1.01 mg/kg to 1.04 mg/kg) above the BV in 6 samples. Concentrations increased with depth at location 26-612294, did not change substantially with depth (0.4 mg/kg) at location 26-612305, decreased with depth at all other locations, and decreased laterally. The residential SSL is approximately 24 times the maximum concentration and 376 times the maximum DL. Further sampling for extent of selenium is not warranted.

Thallium was not detected but had a DL above the soil BV (0.73 mg/kg) in one sample. The industrial SSL is approximately 12 times the maximum DL. Further sampling for extent of thallium is not warranted.

Organic Chemicals

Organic COPCs at SWMU 26-002(a) include Aroclor-1260, 2-hexanone, and toluene.

Aroclor-1260 was detected in one sample at a concentration of 0.0041 mg/kg. Concentrations decreased with depth and increased laterally. The residential SSL is approximately 593 times the maximum concentration. Vertical extent of Aroclor-1260 is defined and further sampling for lateral extent is not warranted.

Hexanone[2-] was detected in two samples with a maximum concentration of 0.00218 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of 2-hexanone are defined.

Toluene was detected in seven samples with a maximum concentration of 0.00524 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. Lateral and vertical extent of toluene are defined.

Radionuclides

Radionuclide COPCs at SWMU 26-002(a) include cesium-137, plutonium-239/240, strontium-90, tritium, and uranium-235/236.

Cesium-137 was detected in three tuff samples with a maximum activity of 0.415 pCi/g. Only one depth was sampled at location 26-600922, activities decreased with depth at all locations, and activities increased laterally. The residential SAL is approximately 29 times the maximum activity. Further sampling for extent of cesium-137 is not warranted.

Plutonium-239/240 was detected in one tuff sample at an activity of 0.0769 pCi/g. Only one depth was sampled at location 26-600922 and activities increased laterally. The residential SAL is approximately 1027 times the maximum activity. Further sampling for extent of plutonium-239/240 is not warranted.

Strontium-90 was detected in one tuff sample an activity of 0.13 pCi/g. Activities decreased with depth at location 26-600918 and decreased laterally. The residential SAL is approximately 115 times the maximum activity. The lateral and vertical extent of strontium-90 are defined.

Tritium was detected in 24 samples with a maximum activity of 0.507 pCi/g. Activities increased with depth at locations 26-600910, 26-600913, 26-600915, 26-600916, 26-600918, and 26-6009121; did not change substantially with depth (0.0012 pCi/g) at location 26-600917; decreased with depth at all other locations; and decreased laterally. The residential SAL is approximately 3350 times the maximum activity. 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 nine samples with a maximum activity of 0.128 pCi/g. Activities did not change substantially with depth (0.0101 pCi/g) at location 26-600913, decreased with depth at all other locations, and decreased laterally. The residential SAL is approximately 328 times the maximum activity. Lateral extent of uranium-235/236 is defined and further sampling for vertical extent is not warranted.

Summary of Nature and Extent

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at SWMU 26-002(a).

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} (NMED 2017, 602273). The industrial HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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 4×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The construction worker HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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 6×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.5, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the residential and construction worker scenarios at and SWMU 26-002(a).

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), LOAEL analyses, and the relationship of detected concentrations and screening levels to background concentrations, no potential ecological risks exist for SWMU 21-002(a).

8.4 SWMU 26-002(b), Drainline

8.4.1 Site Description and Operational History

SWMU 26-002(b) was the equipment room drainage system constructed in 1946 for the concrete storage vault at TA-26 (Figure 8.2-1).

The drainage system was installed during construction of the storage vault in 1946. It carried effluent through a 4-in.-diameter VCP floor drain that discharged directly to the south-facing slope. Specific uses of the drain system are not documented. The drainlines were removed before demolition of the vault structure in 1966 (Blackwell 1973, 000619). All removable material, including the drainlines, was disposed of at MDA C (Blackwell 1973, 000619).

8.4.2 Relationship to Other SWMUs and AOCs

The equipment room drainage system was apparently not connected to either the sump system, SWMU 26-002(a), or the septic system, SWMU 26-003. The drainline ran south from the storage vault, parallel to the septic system lines, and discharged at a point near the septic system outfall. The discharge point was directly above the area that became SWMU 26-001.

8.4.3 Summary of Previous Investigations

The equipment room drainage system was not investigated separately from the surveys discussed in association with SWMU 26-001 (section 8.2.3).

8.4.4 Site Contamination

8.4.4.1 Soil and Rock Sampling

As part of the 2010 investigation, the following characterization activities were conducted at the mesa top and the canyon slope of TA-26:

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.
- *Mesa Top:* Three samples were collected from location 26-612303 in the central area of previous sampling locations, and nine samples were collected from three step-out locations (26-612304 to 26-612306). All mesa-top samples were collected from 0–0.5 ft, 5–6 ft, 15–16 ft, and 24–25 ft bgs and were analyzed for TAL metals only.
- *Canyon Slope:* Twenty-four samples were collected from eight step-out locations (26-612294 to 26-612297 and 26-612299 to 26-612302) downgradient of previous sampling locations (depths ranging from 0–10 ft bgs). Three samples were collected from location 26-612298, downgradient of previous locations 26-600777 and 26-600778, from 0–0.5 ft, 5–6 ft, and 9–10 ft bgs. All canyon-slope samples were analyzed for TAL metals, nitrate, and gamma-emitting radionuclides.

The 2010 and historical sampling locations at TA-26 are shown in Figure 8.2-1. Table 8.4-1 presents the samples collected and analyses requested for SWMU 26-002(b). The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

8.4.4.2 Soil and Rock Field Screening Results

No organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of the samples. No radiological-screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. No changes to sampling or other activities occurred because of the field-screening results.

8.4.4.3 Soil and Rock Sampling Analytical Results

Decision-level data at SWMU 26-002(b) consist of results from 11 samples collected from 4 locations in 2007 and 2010. The 11 samples include 1 soil and 10 tuff samples.

Inorganic Chemicals

A total of 11 samples (1 soil and 10 tuff) were analyzed for TAL metals and 7 tuff samples were analyzed for nitrate, perchlorate, and cyanide. Table 8.4-2 presents the inorganic chemicals detected or detected above BVs. Plate 50 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Arsenic was detected above the Qbt 2,3,4 BV (2.79 mg/kg) in two samples with a maximum concentration of 4.27 mg/kg. The Gehan and quantile tests indicated site concentrations of arsenic in tuff are statistically different from background (Figure G-361 and Table G-52). Arsenic is retained as a COPC.

Barium was detected above the Qbt 2,3,4 BV (46 mg/kg) in three samples with a maximum concentration of 95 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in tuff are not statistically different from background (Figure G-362 and Table G-52). Barium is not a COPC.

Calcium was detected above the Qbt 2,3,4 BV (2200 mg/kg) in six samples with a maximum concentration of 28,100 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in tuff are statistically different from background (Figure G-363 and Table G-52). Calcium is retained as a COPC.

Chromium was detected above the Qbt 2,3,4 BV (7.14 mg/kg) in three samples with a maximum concentration of 12.9 mg/kg and was not detected but had a DL (16.7mg/kg) above the BV in one sample. The Gehan and quantile tests indicated site concentrations of chromium in tuff are statistically different from background (Figure G-364 and Table G-52). Chromium 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 0.531 mg/kg. The DL was only 0.031 mg/kg above BV and cyanide was not detected in six other samples. Cyanide is not a COPC.

Lead was detected above the Qbt 2,3,4 BV (11.2 mg/kg) in three samples with a maximum concentration of 94.1 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in tuff are not statistically different from background (Figure G-365 and Table G-52). 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 1840 mg/kg. The Gehan test indicated site concentrations of magnesium in tuff are statistically different from background (Table G-52). However, the quantile and slippage tests indicated site concentrations of magnesium in tuff are not statistically different from background (Figure G-366 and Table G-52). Magnesium is not a COPC.

Manganese was detected above the Qbt 2,3,4 BV (482 mg/kg) in one sample at a concentration of 533 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in tuff are not statistically different from background (Figure G-367 and Table G-52). Manganese is not a COPC.

Nickel was detected above the Qbt 2,3,4 BV (6.58 mg/kg) in one sample at a concentration of 7.62 mg/kg. The quantile tests indicated site concentrations of nickel in tuff are statistically different from background (Figure G-368 and Table G-52). Nickel is retained a COPC.

Nitrate was detected in two samples with a maximum concentration of 4.14 mg/kg. Nitrate is naturally occurring, and the concentrations likely reflect naturally occurring levels. In addition, SWMU 26-002(b) is associated with a storage vault and is not a source of nitrate. Nitrate is not a COPC.

Perchlorate was detected in two samples with a maximum concentration of 0.0014 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the Qbt 2,3,4 BV (0.3 mg/kg) in eight samples with a maximum concentration of 17 mg/kg and was not detected but had DLs (1.49 mg/kg and 1.59 mg/kg) above the BV in two samples. Selenium is retained as a COPC.

Thallium was not detected but had a DL (1.27 mg/kg) above the Qbt 2,3,4 BV (1.1 mg/kg) in one sample. Thallium is retained as a COPC.

Organic Chemicals

A total of seven tuff samples were analyzed for PCBs, SVOCs, VOCs, and explosive compounds. Table 8.4-3 presents the organic chemicals detected. Plate 51 shows the spatial distribution of organic chemicals detected.

Organic chemicals detected at SWMU 26-002(b) include acetone, Aroclor-1260, and toluene. The detected organic chemicals are retained as COPCs.

Radionuclides

A total of seven tuff samples were analyzed for gamma-emitting radionuclides, americium-241, isotopic plutonium, isotopic uranium, strontium-90, and tritium. Table 8.4-4 presents the radionuclides detected or detected above BVs/FVs. Plate 52 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Cesium-137 was detected in one tuff sample at an activity of 0.2 pCi/g. Cesium-137 is retained as a COPC.

Tritium was detected in five samples with a maximum activity of 0.0233 pCi/g. Tritium is retained as a COPC.

Uranium-234 was detected above the Qbt 2,3,4 BV (1.98 pCi/g) in one sample at an activity of 2.65 pCi/g. The activity was only 0.67 pCi/g above BV and uranium-234 was detected below BV in six other samples. Uranium-234 is not a COPC.

Uranium-235/236 was detected above the Qbt 2,3,4 BV (0.09 pCi/g) in two samples with a maximum activity of 0.187 pCi/g. Uranium-235/236 is retained as a COPC.

Uranium-238 was detected above the Qbt 2,3,4 BV (1.93 pCi/g) in one sample at an activity of 2.61 pCi/g. The maximum activity was only 0.68 pCi/g above BV and uranium-238 was detected below BV in six other samples. Uranium-238 is not a COPC.

8.4.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 26-002(b) are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 26-002(b) include arsenic, calcium, chromium, nickel, perchlorate, selenium, and thallium.

Arsenic was detected above the Qbt 2,3,4 BV in two samples with a maximum concentration of 4.27 mg/kg. Only one depth was sampled at location 26-600923, concentrations decreased with depth at location 26-600924, and concentrations decreased laterally. The residential SSL is approximately 2.1 times and the industrial SSL is approximately 11 times the maximum concentration where vertical extent is not defined (3.39 mg/kg at location 26-600923). Lateral extent of arsenic is defined and further sampling for vertical extent is not warranted.

Calcium was detected above the Qbt 2,3,4 BV (2200 mg/kg) in six samples with a maximum concentration of 28,100 mg/kg. Only one depth was sampled at location 26-600923, concentrations decreased with depth at all other locations, and concentrations decreased laterally. The residential SSL is approximately 463 times the maximum concentration. Lateral extent of calcium is defined and further sampling for vertical extent is not warranted.

Chromium was detected above the Qbt 2,3,4 BV in three samples with a maximum concentration of 12.9 mg/kg and was not detected but had a DL (16.7mg/kg) above the BV in one sample. Concentrations increased with depth at location 26-612306, only one depth was sampled at location 26-600923, concentrations decreased with depth at location 26-600924, and concentrations increased laterally. As described in section 4.2, SWMU 26-002(b) is not a potential source of hexavalent chromium and use of the SSL for trivalent chromium to determine whether additional sampling is warranted is appropriate. The residential SSL for trivalent chromium (117,000 mg/kg) is approximately 9070 times the maximum concentration and 7000 times the maximum DL. Further sampling for extent of chromium is not warranted.

Nickel was detected above the Qbt 2,3,4 BV in one sample at a concentration of 7.62 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of nickel are defined.

Perchlorate was detected in two samples with a maximum concentration of 0.0014 mg/kg. Only one depth was sampled at location 26-600923, concentrations decreased with depth at location 26-600925, and concentrations increased laterally. The residential SSL is approximately 39,100 times the maximum concentration. Lateral extent of perchlorate is defined and further sampling for vertical extent is not warranted.

Selenium was detected above the Qbt 2,3,4 BV in eight samples with a maximum concentration of 17 mg/kg and was not detected but had DLs (1.49 mg/kg and 1.59 mg/kg) above the BV in two samples. Concentrations increased with depth at locations 26-600925 and 26-612306, only one depth was sampled at location 26-600923, concentrations decreased with depth at location 26-600924, and concentrations decreased laterally. The residential SSL is approximately 23 times the maximum concentration and 34 times the maximum DL. Further sampling for extent of selenium is not warranted.

Thallium was not detected but had a DL (1.27 mg/kg) above the Qbt 2,3,4 BV in one sample. The DL is approximately 1.6 times the residential SSL and the industrial SSL is approximately 10 times the DL. Further sampling for extent of thallium is not warranted.

Organic COPCs

Organic COPCs at SWMU 26-002(b) include acetone, Aroclor-1260, and toluene.

Acetone, Aroclor-1260, and toluene were each detected in one sample at concentrations of 0.00331 mg/kg, 0.0073 mg/kg, and 0.000579 mg/kg, respectively. Only one depth was sampled at location 26-600923 and concentrations increased laterally. The residential SSLs were approximately 20,000,000 times; 333 times; and 9,020,000 times the maximum concentrations, respectively. Further sampling for extent of acetone, Aroclor-1260, and toluene is not warranted.

Radionuclides

Radionuclide COPCs at SMWU 26-002(b) include cesium-137, tritium, and uranium-235/236.

Cesium-137 was detected in one tuff sample at an activity of 0.2 pCi/g. Only one depth was sampled at location 26-600923 and activities increased laterally. The residential SAL was approximately 60 times the maximum activity. Further sampling for extent of cesium-137 is not warranted.

Tritium was detected in five samples with a maximum activity of 0.0233 pCi/g. Activities increased with depth at location 26-600925, only one depth was sampled at location 26-600923, activities decreased with depth at location 26-600924, and activities decreased laterally. The residential SAL is approximately 73,000 times the maximum activity. 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 two samples with a maximum activity of 0.187 pCi/g. Activities decreased with depth at location 26-600925 and decreased laterally. Lateral and vertical extent of uranium-235/236 are defined.

Summary of Nature and Extent

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at SWMU 26-002(b).

8.4.5 Summary of Human Health Risk Screening

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} (NMED 2017, 602273). The industrial HI is 0.02, which is less than the NMED target HI of 1 (NMED 2017, 602273). No radionuclide COPCs were identified in the 0.0-1.0 ft depth interval. The total dose is 0.03 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

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} (NMED 2017, 602273). The construction worker HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Residential Scenario

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 2017, 602273). The residential HI is 0.4, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.4 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the residential and construction worker scenarios at and SWMU 26-002(b).

8.4.6 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 screening levels to background concentrations, no potential ecological risks exist for SWMU 21-002(b).

8.5 SWMU 26-003, Septic Tank

8.5.1 Site Description and Operational History

SWMU 26-003 is the septic system that served sanitary facilities in the east room of the concrete storage vault at TA-26 (Figure 8.2-1). The septic system consisted of a 4-in.-diameter VCP drainline connected to a 250-gal. steel septic tank.

The septic system was installed in August 1948 (LASL no date, 000675). Overflow from the system was discharged to the slope below the mesa top. It was assumed that the septic tank was free from radioactive contamination because the tank served the toilet and sink in the least contaminated room of the storage vault (Buckland 1965, 000628). The septic tank was thought to have handled only sanitary waste; however, because radioactive contamination was found in the vault, it is possible that contaminants were introduced into the system. The septic tank system may have been removed at the same time as the sump system [SWMU 26-002(a)] and other removable material in 1966, but no clear documentation is available (Blackwell 1973, 000619).

8.5.2 Relationship to Other SWMUs and AOCs

The septic system was not known to be directly connected to anything except sanitary facilities in the storage vault. The equipment room drainage system, SWMU 26-002(b), was located in the east end of the vault, and its lines ran approximately parallel to the septic system lines south of the vault. The septic system discharge point may have been in the vicinity of the area that became SWMU 26-001.

8.5.3 Summary of Previous Investigations

The septic system was not investigated separately from the surveys discussed in association with SWMU 26-001 (section 8.2.3).

8.5.4 Site Contamination

8.5.4.1 Soil and Rock Sampling

As part of the 2010 investigation, the following characterization activities were conducted at the mesa top and the canyon slope of TA-26:

- All samples were field screened for organic vapors and gross-alpha, -beta, and -gamma radioactivity. Field-screening results were recorded on the SCLs (Appendix F) and are presented in Table 3.2-2.

- *Mesa Top:* Three samples were collected from location 26-612303 in the central area of previous sampling locations, and nine samples were collected from three step-out locations (26-612304 to 26-612306). All mesa-top samples were collected from 0–0.5 ft, 5–6 ft, 15–16 ft, and 24–25 ft bgs and were analyzed for TAL metals only.
- *Canyon Slope:* Twenty-four samples were collected from eight step-out locations (26-612294 to 26-612297 and 26-612299 to 26-612302) downgradient of previous sampling locations (depths ranging from 0–10 ft bgs). Three samples were collected from location 26-612298, downgradient of previous locations 26-600777 and 26-600778, from 0–0.5 ft, 5–6 ft, and 9–10 ft bgs. All canyon-slope samples were analyzed for TAL metals, nitrate, and gamma-emitting radionuclides.

The 2010 and historical sampling locations at TA-26 are shown in Figure 8.2-1. Table 8.5-1 presents the samples collected and analyses requested for SWMU 26-003. The geodetic coordinates of the 2010 sampling locations are presented in Table 3.2-1.

8.5.4.2 Soil and Rock Field Screening Results

No organic vapors were detected at more than 10 ppm above ambient air levels during headspace screening of the samples. No radiological-screening results exceeded twice the daily site background levels. Field-screening results are presented in Table 3.2-2. No changes to sampling or other activities occurred because of the field-screening results.

8.5.4.3 Soil and Rock Sampling Analytical Results

Decision-level data at SWMU 26-003 consist of results from 24 samples collected from 10 locations in 2007 and 2010. The 24 samples include 1 soil and 23 tuff samples.

Inorganic Chemicals

A total of 24 samples (1 soil and 23 tuff) were analyzed for TAL metals and nitrate and 21 tuff samples were analyzed for perchlorate and cyanide. Table 8.5-2 presents the inorganic chemicals detected or detected above BVs. Plate 50 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Arsenic was detected above the Qbt 2,3,4 BV (2.79 mg/kg) in 12 samples with a maximum concentration of 6.48 mg/kg. The Gehan and quantile tests indicated site concentrations of arsenic in tuff are statistically different from background (Figure G-369 and Table G-53). Arsenic is retained as a COPC.

Barium was detected above the Qbt 2,3,4 BV (46 mg/kg) in seven samples with a maximum concentration of 194 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in tuff are statistically different from background (Figure G-370 and Table G-53). Barium is retained as a COPC.

Calcium was detected above the Qbt 2,3,4 BV (2200 mg/kg) in 15 samples with a maximum concentration of 23,900 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in tuff are statistically different from background (Figure G-371 and Table G-53). Calcium is retained as a COPC.

Chromium was detected above the Qbt 2,3,4 BV (7.14 mg/kg) in three samples with a maximum concentration of 34.4 mg/kg and was not detected but had DLs (10.7 mg/kg to 12.9 mg/kg) above the BV in three samples. The slippage test indicated site concentrations of chromium in tuff are statistically different from background (Figure G-372 and Table G-53). Chromium is retained as a COPC.

Copper was detected above the Qbt 2,3,4 BV (4.66 mg/kg) in five samples with a maximum concentration of 6.84 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in tuff are statistically different from background (Figure G-373 and Table G-53). 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 1.86 mg/kg. Cyanide is retained a COPC.

Lead was detected above the soil and Qbt 2,3,4 BVs (22.3 mg/kg and 11.2 mg/kg) in one soil sample and two tuff samples with a maximum concentration of 27.8 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in tuff are not statistically different from background (Figure G-374 and Table G-53). The concentration in soil (27.8 mg/kg) is only 5.3 mg/kg above BV and is below or equivalent to the two highest concentrations (27 mg/kg and 28 mg/kg) in the soil background data set. Lead is not a COPC.

Magnesium was detected above the Qbt 2,3,4 BV (1690 mg/kg) in two samples with a maximum concentration of 1950 mg/kg. The Gehan test indicated site concentrations of magnesium in tuff are statistically different from background (Table G-X). However, the quantile and slippage tests indicated site concentrations of magnesium in tuff are not statistically different from background (Figure G-375 and Table G-53). Magnesium is not a COPC.

Nitrate was detected in 25 samples with a maximum concentration of 25.2 mg/kg. Nitrate is naturally occurring but the maximum concentration likely exceeds naturally occurring levels. Nitrate is retained as a COPC.

Perchlorate was detected in eight samples with a maximum concentration of 0.0038 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the soil and Qbt 2,3,4 BVs (1.52 mg/kg and 0.3 mg/kg) in 1 soil sample and 21 tuff samples with a maximum concentration of 15.7 mg/kg and was not detected but had DLs (1.48 mg/kg and 1.52 mg/kg) above the BV in two samples. Selenium is retained as a COPC.

Vanadium was detected above the Qbt 2,3,4 BV (17 mg/kg) in one sample at a concentration of 22.8 mg/kg. The Gehan and quantile tests indicated site concentrations of vanadium in tuff are not statistically different from background (Figure G-376 and Table G-53). Vanadium is not a COPC.

Organic Chemicals

A total of 21 tuff samples were analyzed for PCBs, SVOCs, VOCs, and explosive compounds. Table 8.5-3 presents the organic chemicals detected. Plate 51 shows the spatial distribution of organic chemicals detected.

Polycyclic Aromatic Hydrocarbons

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

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

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

Site Activities

SWMU 26-003 was a septic system. The site was associated with the former TA-26 radioactive material storage vault and was identified as SWMU because of the potential for radioactive contamination. The vault was constructed of concrete and was used to store radioactive materials. PAHs were detected in low concentrations (0.0123 mg/kg to 0.013 mg/kg), were only detected at one of nine locations sampled, and were only detected in shallow subsurface samples. PAHs are not known to have been used in the storage vault or associated with the materials stored there. PAHs may be related to the access road and parking area for the former vault, or to runoff from the highway to the north of the site. Therefore, the PAHs detected in samples used to characterize this site [benzo(b)fluoranthene and fluoranthene] are associated with roadways or parking areas, are not related to historical Laboratory site operations, and are not COPCs.

Organic COPCs

Other organic chemicals detected at SWMU 26-003 include acetone, Aroclor-1248, Aroclor-1260, 4-isopropyltoluene, and toluene. The detected organic chemicals listed are retained as COPCs.

Radionuclides

A total of 21 tuff samples were analyzed for gamma-emitting radionuclides, americium-241, isotopic plutonium, isotopic uranium, strontium-90, and tritium. Table 8.5-4 presents the radionuclides detected or detected above BVs/FVs. Plate 52 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Cesium-137 was detected in two tuff samples with a maximum activity of 0.514 pCi/g. Cesium-137 is retained as a COPC.

Plutonium-239/240 was detected in one tuff sample at an activity of 0.0269 pCi/g. Plutonium-239/240 is retained as a COPC.

Tritium was detected in 11 samples with a maximum activity of 0.273 pCi/g. Tritium is retained as a COPC.

Uranium-234 was detected above the Qbt 2,3,4 BV (1.98 pCi/g) in 1 sample at an activity of 2.51 pCi/g. The activity was only 0.53 pCi/g above BV and uranium-234 was detected below BV in 20 other samples. Uranium-234 is not a COPC.

Uranium-235/236 was detected above the Qbt 2,3,4 BV (0.09 pCi/g) in five samples with a maximum activity of 0.125 pCi/g. Uranium-235/236 is retained as a COPC.

Uranium-238 was detected above the Qbt 2,3,4 BV (1.93 pCi/g) in 1 sample at an activity of 2.54 pCi/g. The activity was only 0.61 pCi/g above BV and uranium-238 was detected below BV in 20 other samples. Uranium-238 is not a COPC.

8.5.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 26-003 are discussed below.

Inorganic Chemicals

Inorganic COPCs at SWMU 26-003 include arsenic, barium, calcium, chromium, copper, cyanide, nitrate, perchlorate, and selenium.

Arsenic was detected above the Qbt 2,3,4 BV in 12 samples with a maximum concentration of 6.48 mg/kg. Concentrations did not change substantially with depth (0.37 mg/kg or less) at locations 26-600775 and 26-600776, only one depth was sampled at location 26-600927, concentrations decreased with depth at all other locations, and concentrations decreased laterally. The residential SSL is approximately 1.5 times and the industrial SSL is approximately 7.5 times the maximum concentration where vertical extent is not defined (4.8 mg/kg at location 26-600776). All concentrations are below the soil BV (8.17 mg/kg). Lateral extent of arsenic is defined and further sampling for vertical extent is not warranted.

Barium was detected above the Qbt 2,3,4 BV in seven samples with a maximum concentration of 194 mg/kg. Only one depth was sampled at location 26-600927, concentrations decreased with depth at all locations, and concentrations decreased laterally. The residential SSL is approximately 80 times the maximum concentration. Lateral extent of barium is defined and further sampling for vertical extent is not warranted.

Calcium was detected above the Qbt 2,3,4 in 15 samples with a maximum concentration of 23,900 mg/kg. Concentrations increased with depth at location 26-600776, decreased with depth at all other locations, and decreased laterally. The residential essential nutrient SSL is approximately 544 times the maximum concentration. Lateral extent of calcium is defined and further sampling for vertical extent is not warranted.

Chromium was detected above the Qbt 2,3,4 BV in three samples with a maximum concentration of 34.4 mg/kg and was not detected but had DLs (10.7 mg/kg to 12.9 mg/kg) above the BV in three samples. Concentrations increased with depth at locations 26-600773 and 26-600926, decreased with depth at location 26-600928, and decreased laterally. As described in section 4.2, SWMU 26-003 is not a potential source of hexavalent chromium and use of the SSL for trivalent chromium to determine whether additional sampling is warranted is appropriate. The residential SSL for trivalent chromium (117,000 mg/kg) is approximately 3400 times the maximum concentration and 9070 times the maximum DL. Further sampling for extent of chromium is not warranted.

Copper was detected above the Qbt 2,3,4 BV in five samples with a maximum concentration of 6.84 mg/kg. Concentrations increased with depth at location 26-600773, only one depth was sampled at location 26-600927, concentrations decreased with depth at all other locations, and concentrations decreased laterally. The residential SSL is approximately 458 times the maximum concentration. Lateral extent of copper is defined and further sampling for vertical extent is not warranted.

Cyanide was detected above the Qbt 2,3,4 BV in one sample at a concentration of 1.86 mg/kg. Concentrations increased with depth at location 26-600929 and decreased laterally. The residential SSL is approximately 6.0 times the maximum concentration, and the industrial SSL is approximately 34 times the maximum concentration. Lateral extent of cyanide is defined and further sampling for vertical extent is not warranted.

Nitrate was detected in 25 samples with a maximum concentration of 25.2 mg/kg. Concentrations increased with depth at location 26-600780, only one depth was sampled at location 26-600927, concentrations decreased with depth at all other locations, and concentrations increased laterally. The residential SSL is approximately 4960 times the maximum concentration. Further sampling for extent of nitrate is not warranted.

Perchlorate was detected in eight samples with a maximum concentration of 0.0038 mg/kg. Concentrations increased with depth at location 26-600780, only one depth was sampled at location 26-600927, concentrations decreased with depth at all other locations, and concentrations increased laterally. The residential SSL is approximately 14,400 times the maximum concentration. Further sampling for extent of perchlorate is not warranted.

Selenium was detected above the soil and Qbt 2,3,4 BVs in 1 soil sample and 21 tuff samples with a maximum concentration of 15.7 mg/kg and was not detected but had DLs (1.48 mg/kg and 1.52 mg/kg) above the BV in two samples. Concentrations increased with depth at locations 26-600773, 26-600780, and 26-600928; only one depth was sampled at location 26-600927; concentrations decreased with depth at all other locations; and concentrations decreased laterally. The residential SSL is approximately 25 times the maximum concentration and 257 times the maximum DL. Further sampling for extent of selenium is not warranted.

Organic Chemicals

Organic COPCs at SWMU 26-003 include acetone, Aroclor-1248, Aroclor-1260, 4-isopropyltoluene, and toluene.

Acetone was detected in two samples with a maximum concentration of 0.00596 mg/kg. Concentrations increased with depth at location 26-600776, decreased with depth at location 26-600775, and increased laterally. The residential SSL is approximately 11,100,000 times the maximum concentration. Further sampling for extent of acetone is not warranted.

Aroclor-1248 was detected in one sample at a concentration of 0.0301 mg/kg. Concentrations increased with depth at location 26-600774 and increased laterally. The residential SSL is approximately 80 times the detected concentration. Further sampling for extent of acetone is not warranted.

Aroclor-1260 was detected in three samples with a maximum concentration of 0.0513 mg/kg. Only one depth was sampled at location 26-600927, concentrations decreased with depth at location 26-600926, and concentrations decreased laterally. The residential SSL is approximately 47 times the maximum concentration. Lateral extent of Aroclor-1260 is defined and further sampling for vertical extent is not warranted.

Isopropyltoluene[4-] was detected in one sample at a concentration of 0.000896 mg/kg. Concentrations decreased with depth and decreased laterally. Lateral and vertical extent of 4-isopropyltoluene are defined.

Toluene was detected in four samples with a maximum concentration of 0.000915 mg/kg. Concentrations increased with depth at locations 26-600776 and 26-600780 and increased laterally. The residential SSL is approximately 5,700,000 times the maximum concentration. Further sampling for extent of toluene is not warranted.

Radionuclides

Radionuclide COPCs at SMWU 26-003 include cesium-137, plutonium-239/240, tritium, and uranium-235/236.

Cesium-137 was detected in two tuff samples with a maximum activity of 0.514 pCi/g. Only one depth was sampled at location 26-600927, activities decreased with depth at location 26-600776, and activities increased laterally. The residential SAL is approximately 23 times the maximum activity. Further sampling for extent of cesium-137 is not warranted.

Plutonium-239/240 was detected in one tuff sample at an activity of 0.0269 pCi/g. Activities decreased with depth at location 26-600776 and increased laterally. The residential SAL is approximately 2940 times the maximum activity. Vertical extent of plutonium-239/240 is defined and further sampling for lateral extent is not warranted.

Tritium was detected in 11 samples with a maximum activity of 0.273 pCi/g. Activities increased with depth at locations 26-600776 and 26-600928, only one depth was sampled at location 26-600927, activities decreased with depth at all other locations, and activities decreased laterally. The residential SAL is approximately 6230 times the maximum activity. 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 five samples with a maximum activity of 0.125 pCi/g. Activities increased with depth at locations 26-600773, 26-600926, 26-600928, and 26-600929; decreased with depth at location 26-600774; and decreased laterally. The residential SAL is approximately 336 times the maximum activity. Lateral extent of uranium-235/236 is defined and further sampling for vertical extent is not warranted.

Summary of Nature and Extent

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs is defined or no further sampling for extent is warranted at SWMU 26-003.

8.5.5 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} (NMED 2017, 602273). The industrial HI is 0.03, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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.

Construction Worker Scenario

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 2017, 602273). The construction worker HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.4 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

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} (NMED 2017, 602273). The residential HI is 0.4, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Based on the risk-screening assessment results, no potential unacceptable risks or doses exist for the residential and construction worker scenarios at and SWMU 26-003.

8.5.6 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 screening levels to background concentrations, no potential ecological risks exist for SWMU 21-003.

9.0 CONCLUSIONS

9.1 Nature and Extent of Contamination

Based on the evaluation of the sampling data, the nature and extent of contamination have been defined, and/or no further sampling for extent is warranted for 40 sites investigated during the 2007 and 2010 Middle Los Alamos Canyon Aggregate Area investigations. The nature and extent of contamination has not been defined, and further sampling is warranted for one new site identified after the 2010 investigation. Summaries of the nature and extent of contamination and remaining characterization requirements for the sites at TA-02, TA-21, and TA-26 are presented below.

9.1.1 TA-02

The nature and extent of contamination have been defined, and/or no further sampling for extent is warranted for the following sites at TA-02:

- AOC 02-003(a), Soil Contamination from Stack-Gas Valve House and Gaseous Effluent Line
- AOC 02-003(b), Soil Contamination at Condensate Trap and Line 119
- AOC 02-003(c), Soil Contamination at Gaseous Effluent Delay Tanks
- AOC 02-003(d), Soil Contamination at Site of Upper Part of Line 119 and Temporary Vent Line
- AOC 02-003(e), Soil Contamination
- AOC 02-004(a), Former Reactor Facility
- AOC 02-004(b), Former Storage Tank for Effluent from OWR and Equipment Building
- AOC 02-004(c), Former Storage Tank for Effluent from OWR and Equipment Building
- AOC 02-004(d), Former Storage Tank for Effluent from OWR and Equipment Building
- AOC 02-004(e), Former Acid Pit/Transfer Sump
- AOC 02-004(f), Former Equipment Building and Acid Waste Line to TA-50
- AOC 02-004(g), Soil Contamination
- SWMU 02-005, Soil Contamination

- SWMU 02-006(a), Former French Drain
- SWMU 02-006(b), Former Acid Waste Line, Laboratory Effluent
- AOC 02-006(c), Former Drainline from Offices, Restrooms, Control Room
- AOC 02-006(d), Duplicate of AOC 02-006(c)
- AOC 02-006(e), Former Sump for Reactor Room Floor Drains and Mezzanine
- SWMU 02-007, Septic System for Floor Drains in OWR Building and Chemical Shack
- SWMU 02-008(a), Outfall
- AOC 02-008(c), Outfall for Seepage into Basement of OWR Building
- SWMU 02-009(a), Soil Contamination
- SWMU 02-009(b), Soil Contamination
- SWMU 02-009(c), Soil Contamination
- AOC 02-009(d), Soil Contamination
- AOC 02-009(e), Duplicate of SWMU 02-009(c)
- AOC 02-010, Soil Contamination
- AOC 02-011(a), Storm Drains and Outfalls
- AOC 02-011(b), Former Drainlines from Stack-Gas Valve House
- AOC 02-011(c), Storm Drain
- AOC 02-011(d), Outfall from Equipment Building
- AOC 02-011(e), Duplicate of SWMU 02-008(a)
- AOC 02-012, Soil contamination

The nature and extent of contamination have not been defined, and further sampling is warranted for one site at TA-02. Additional sampling following cleanup of PCB-contaminated soil is needed to confirm cleanup goals have been met at the following site:

- SWMU 02-014, Former Transformer Stations

9.1.2 TA-21

The nature and extent of contamination have been defined, and/or no further sampling for extent is warranted for the following sites at TA-21:

- SWMU 21-006(e), Seepage Pit
- AOC 21-006(f), Seepage Pit
- AOC 21-028(c), Storage Areas

9.1.3 TA-26

The nature and extent of contamination have been defined, and/or no further sampling for extent is warranted for the following sites at TA-26:

- SWMU 26-001, Surface Disposal Site
- SWMU 26-002(a), Soil Contamination

- SWMU 26-002(b), Drainline
- SWMU 26-003, Septic Tank

9.2 Summary of Risk-Screening Assessments

A total of 40 SWMUs/AOCs were evaluated for potential risk by human health and ecological risk-screening assessments.

9.2.1 Human Health Risk-Screening Assessment

There were no potential unacceptable risks for any of the sites evaluated under the industrial scenario. The total excess cancer risks were less than the target risk level of 1×10^{-5}, HIs were less than the target level of 1, and doses were less than the target dose limit of 25 mrem/yr at all sites. SWMU 21-006(e) and AOC 21-006(f) were not evaluated under the industrial scenario because no samples were collected in the 0.0–1.0 ft bgs depth interval.

The recreational scenario was applicable at sites within TA-02. There were no potential unacceptable risks for any of the sites evaluated under the recreational scenario. The total excess cancer risks were less than 1×10^{-5}, HIs were less than 1, and doses were less than 25 mrem/yr.

Thirty-three SWMUs/AOCs had total excess cancer risks and HIs below or equivalent to the target risk levels and doses below target dose limits under the residential scenario. Two sites had cancer risks above 1×10^{-5} [SWMU 02-006(b) (PAHs) and AOC 02-011(d) (chromium)], three sites had HIs greater than 1 [AOC 02-003(c) (thallium), AOC 02-003(e) (lead), and SWMU 02-006(b) (lead)], and four sites had doses greater than 25 mrem/yr [AOC 02-003(a) (cesium-137), AOC 02-003(e) (cesium-137), SWMU 02-009(c) (cesium-137), and AOC 02-009(e) (cesium-137 and strontium-90)].

The residential scenario demonstrated protection of construction workers at most sites and construction worker risk was evaluated for sites where the residential scenario might not be protective. All sites had a construction worker HI equivalent to or less than 1.

Sites at TA-02, TA-21, and TA-26 are not accessible by the public. Therefore, an as low as reasonably achievable (ALARA) evaluation for radiological exposure to the public is not currently required. An ALARA evaluation will be conducted should DOE plan to release these areas.

9.2.2 Ecological Risk-Screening Assessment

Ecological risk was evaluated on a site-specific basis for sites outside the TA-02 core area and collectively for sites within the TA-02 core area. Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and results of site-specific ecological risk studies conducted within the TA-02 core area, no potential ecological risks exist for the Middle Los Alamos Canyon Aggregate Area 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 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 Middle Los Alamos Canyon Aggregate Area is industrial and possibly recreational for TA-02.

10.1 Additional Field Characterization and Remediation Activities

SWMU 02-014 was identified following the 2010 investigation based on elevated PCB concentrations detected at AOC 02-011(a). Results of sampling conducted during 2017 and 2018 identified areas with elevated PCB concentrations requiring removal. PCB-contaminated soil will be removed from SWMU 02-014 in the future and post-cleanup confirmation sampling will be conducted at that time to verify cleanup goals have been met.

10.2 Recommendations for Corrective Actions Complete

A total of 33 sites have been found to pose no potential unacceptable risks or doses to human health under the industrial, construction worker, and residential scenarios (also under the recreational scenario for 24 sites) and to ecological receptors and are appropriate for corrective actions complete without controls (Table 10.1-1). They include the following:

- AOC 02-003(b), Soil Contamination at Condensate Trap and Line 119
- AOC 02-003(d), Soil Contamination at Site of Upper Part of Line 119 and Temporary Vent Line
- AOC 02-004(a), Former Reactor Facility
- AOC 02-004(b), Former Storage Tank for Effluent OWR and Equipment Building
- AOC 02-004(c), Former Storage Tank for Effluent OWR and Equipment Building
- AOC 02-004(d), Former Storage Tank for Effluent OWR and Equipment Building
- AOC 02-004(e), Former Acid Pit/Transfer Sump
- AOC 02-004(f), Former Equipment Building and Acid Waste Line to TA-50
- AOC 02-004(g), Soil Contamination
- SWMU 02-005, Soil Contamination
- SWMU 02-006(a), Former French Drain
- AOC 02-006(c), Former Drainline from Offices, Restrooms, Control Room
- AOC 02-006(d), Duplicate of AOC 02-006(c)
- AOC 02-006(e), Former Sump for Reactor Room Floor Drains and Mezzanine
- SWMU 02-007, Septic System for Floor Drains in OWR Building and Chemical Shack
- SWMU 02-008(a), Outfall
- AOC 02-008(c), Outfall for Seepage into Basement of OWR Building
- SWMU 02-009(a), Soil Contamination
- SWMU 02-009(b), Soil Contamination
- AOC 02-009(e), Duplicate of SWMU 02-009(c)
- AOC 02-010, Soil Contamination

- AOC 02-011(a), Storm Drains and Outfalls
- AOC 02-011(b), Former Drainlines from Stack-Gas Valve House
- AOC 02-011(c), Storm Drain
- AOC 02-011(e), Duplicate of SWMU 02-008(a)
- AOC 02-012, Soil contamination
- SWMU 21-006(e), Seepage Pit
- AOC 21-006(f), Seepage Pit
- AOC 21-028(c), Storage Areas
- SWMU 26-001, Surface Disposal Site
- SWMU 26-002(a), Soil Contamination
- SWMU 26-002(b), Drainline
- SWMU 26-003, Septic Tank

Three sites have been found to pose no potential unacceptable risks to human health under the industrial, construction worker and recreational scenarios and to ecological receptors, but may pose unacceptable doses under the residential scenario. Although DOE may require controls for radioactive contamination, these sites are appropriate for corrective actions complete without controls under the Consent Order (Table 10.1-1). They include the following:

- AOC 02-003(a), Soil Contamination from Stack-Gas Valve House and Gaseous Effluent Line
- SWMU 02-009(c), Soil Contamination
- AOC 02-009(d), Soil Contamination

Four sites have been found to pose no potential unacceptable risks to human health under the industrial, recreational, and construction worker scenarios and to ecological receptors but may pose unacceptable risks under the residential scenario. These sites are appropriate for corrective actions complete with controls (Table 10.1-1). They include the following:

- AOC 02-003(c), Soil Contamination at Gaseous Effluent Delay Tanks
- AOC 02-003(e), Soil Contamination
- AOC 02-011(d), Outfall from Equipment Building
- SWMU 02-006(b), Former Acid Waste Line, Laboratory Effluent

10.3 Schedule for Recommended Activities

Soil removal and confirmatory sampling at SWMU 02-014 will be implemented and a report will be submitted to NMED in fiscal year 2019.

11.0 REFERENCES AND MAP DATA SOURCES

11.1 References

The following reference list includes documents cited in this report. Parenthetical information following each reference provides the author(s), publication date, and ERID, ESHID, or EMID. This information is also included in text citations. ERIDs were assigned by the Laboratory's Associate Directorate for Environmental Management (IDs through 599999); ESHIDs were assigned by the Laboratory's Associate Directorate for Environment, Safety, and Health (IDs 600000 through 699999); and EMIDs are assigned by N3B (IDs 700000 and above). IDs are used to locate documents in N3B's Records Management System and in the Master Reference Set. The NMED Hazardous Waste Bureau and N3B maintain copies of the Master Reference Set. The set ensures that NMED has the references to review documents. The set is updated when new references are cited in documents.

Blackwell, C.D., December 12, 1973. "Removal of Structures at TA-26 (D-Site Vault)," Los Alamos Scientific Laboratory memorandum to A. Valentine (H-1) from C.D. Blackwell (H-1), Los Alamos, New Mexico. (Blackwell 1973, 000619)

Broxton, D.E., G.H. Heiken, S.J. Chipera, and F.M. Byers, Jr., June 1995. "Stratigraphy, Petrography, and Mineralogy of Bandelier Tuff and Cerro Toledo Deposits," in *Earth Science Investigation for Environmental Restoration—Los Alamos National Laboratory, Technical Area 21*, Los Alamos National Laboratory report LA-12934-MS, Los Alamos, New Mexico, pp. 33-63. (Broxton et al. 1995, 050121)

Broxton, D.E., P.A. Longmire, P.G. Eller, and D. Flores, June 1995. "Preliminary Drilling Results for Boreholes LADP-3 and LADP-4," in *Earth Science Investigation for Environmental Restoration—Los Alamos National Laboratory, Technical Area 21*, Los Alamos National Laboratory report LA-12934-MS, Los Alamos, New Mexico, pp. 93-109. (Broxton et al. 1995, 050119)

Buckland, C., March 21, 1978. "I. Recollection of 1945 Contaminated Dump Fire, II: Additional Waste Disposal Areas," Los Alamos Scientific Laboratory memorandum to M.A. Rogers (H-12) from C. Buckland (H-1), Los Alamos, New Mexico. (Buckland 1978, 000496)

Buckland, C.D., April 20, 1965. "Radioactive Contamination Survey Results at D-Site Vault Area, TA-26-1, 5, 6," Los Alamos Scientific Laboratory memorandum to S.E. Russo (ENG-3) from C.D. Buckland (H-1), Los Alamos, New Mexico. (Buckland 1965, 000628)

Bunker, M., November 1985. "Personal Notes on TA-2," Los Alamos National Laboratory Personal Notes to file by M. Bunker (INC-5), Los Alamos, New Mexico. (Bunker 1985, 036231)

Christensen, E.L., and W.J. Maraman, April 1969. "Plutonium Processing at the Los Alamos Scientific Laboratory," Los Alamos Scientific Laboratory report LA-3542, Los Alamos, New Mexico. (Christensen and Maraman 1969, 004779)

Collins, K.A., A.M. Simmons, B.A. Robinson, and C.I. Nylander (Eds.), December 2005. "Los Alamos National Laboratory's Hydrogeologic Studies of the Pajarito Plateau: A Synthesis of Hydrogeologic Workplan Activities (1998–2004)," Los Alamos National Laboratory report LA-14263-MS, Los Alamos, New Mexico. (Collins et al. 2005, 092028)

DOE (U.S. Department of Energy), October 1987. "Phase I: Installation Assessment, Los Alamos National Laboratory," draft, Volume 1 of 2, Comprehensive Environmental Assessment and Response Program, Environment and Health Division, Environmental Programs Branch, Albuquerque Operations Office, Albuquerque, New Mexico. (DOE 1987, 008663)

Elder, J.C., and C.L. Knoell, December 1986. "TA-2 Water Boiler Reactor Decommissioning (Phase I)," Los Alamos National Laboratory report LA-10890-MS, Los Alamos, New Mexico. (Elder and Knoell 1986, 006670)

EPA (U.S. Environmental Protection Agency), November 2006. "An Inventory of Sources and Environmental Releases of Dioxin-Like Compounds in the United States for the Years 1987, 1995, and 2000," EPA/600/P-03/002F, National Center for Environmental Assessment, Office of Research and Development, Washington, D.C. (EPA 2006, 600913)

EPA (U.S. Environmental Protection Agency), December 2007. "EPA Region 6 Human Health Medium-Specific Screening Levels," U.S. EPA Region 6, Dallas, Texas. (EPA 2007, 099314)

Gehan, E.A., June 1965. "A Generalized Wilcoxon Test for Comparing Arbitrarily Singly-Censored Samples," *Biometrika,* Vol. 52, No. 1 and 2, pp. 203–223. (Gehan 1965, 055611)

Gilbert, R.O., and J.C. Simpson, November 1990. "Statistical Sampling and Analysis Issues and Needs for Testing Attainment of Background-Based Cleanup Standards at Superfund Sites," Proceedings of The Workshop on Superfund Hazardous Waste: Statistical Issues in Characterizing a Site: Protocols, Tools, and Research Needs, U.S. Environmental Protection Agency, Arlington, Virginia. (Gilbert and Simpson 1990, 055612)

Gilbert, R.O., and J.C. Simpson, December 1992. "Statistical Methods for Evaluating the Attainment of Cleanup Standards, Volume 3: Reference-Based Standards for Soils and Solid Media," document prepared for the U.S. Environmental Protection Agency, Pacific Northwest Laboratory, Richland, Washington. (Gilbert and Simpson 1992, 054952)

Goff, F., June 1995. "Geologic Map of Technical Area 21," in *Earth Science Investigations for Environmental Restoration—Los Alamos National Laboratory, Technical Area 21*, Los Alamos National Laboratory report LA-12934-MS, Los Alamos, New Mexico, pp. 7–18. (Goff 1995, 049682)

Heineman, D., March 19, 1990. "Design Wast Water Collect System, Bldg. 1, 44, 53," Los Alamos National Laboratory memorandum to G. Ramsey (INO-5) from D. Heineman (HSE-3), Los Alamos, New Mexico. (Heineman 1990, 089739)

Hollis, D., E. Vold, R. Shuman, K.H. Birdsell, K. Bower, W.R. Hansen, D. Krier, P.A. Longmire, B. Newman, D.B. Rogers, and E.P. Springer, March 27, 1997. "Performance Assessment and Composite Analysis for Los Alamos National Laboratory Material Disposal Area G," Rev. 2.1, Los Alamos National Laboratory document LA-UR-97-85, Los Alamos, New Mexico. (Hollis et al. 1997, 063131)

Kearl, P.M., J.J. Dexter, and M. Kautsky, December 1986. "Vadose Zone Characterization of Technical Area 54, Waste Disposal Areas G and L, Los Alamos National Laboratory, New Mexico, Report 4: Preliminary Assessment of the Hydrologic System through Fiscal Year 1986," UNC Technical Services report GJ-54, Grand Junction, Colorado. (Kearl et al. 1986, 015368)

Kose, T., T. Yamamoto, A. Anegawa, S. Mohri, and Y. Ono, June 25, 2008. "Source Analysis for Polycyclic Aromatic Hydrocarbon in Road Dust and Urban Runoff Using Marker Compounds," *Desalination,* Vol. 226, No. 1–3, pp. 151–159. (Kose et al. 2008, 219977)

LANL (Los Alamos National Laboratory), June 22, 1990. "Structure Location Plan, TA-2, Omega Site, Revision 1," Engineering Drawing ENG-R-5102, sheet number 2 of 2, Los Alamos, New Mexico. (LANL 1990, 090086)

LANL (Los Alamos National Laboratory), August 31, 1990. "Design Waste Water Collection System, Civil: Site Plan, Bldg. 1, 8, 44, TA-2," Engineering Drawing ENG-C-45924, sheet number 1 of 8, Los Alamos, New Mexico. (LANL 1990, 089679)

LANL (Los Alamos National Laboratory), November 1990. "Solid Waste Management Units Report," Vol. I of IV (TA-0 through TA-9), Los Alamos National Laboratory document LA-UR-90-3400, Los Alamos, New Mexico. (LANL 1990, 007511)

LANL (Los Alamos National Laboratory), November 1990. "Solid Waste Management Units Report," Vol. II of IV (TA-10 through TA-25), Los Alamos National Laboratory document LA-UR-90-3400, Los Alamos, New Mexico. (LANL 1990, 007512)

LANL (Los Alamos National Laboratory), November 1990. "Solid Waste Management Units Report," Vol. III of IV (TA-26 through TA-50), Los Alamos National Laboratory document LA-UR-90-3400, Los Alamos, New Mexico. (LANL 1990, 007513)

LANL (Los Alamos National Laboratory), May 1991. "TA-21 Operable Unit RFI Work Plan for Environmental Restoration," Vol. III (Chapters 17 to Appendix G), Los Alamos National Laboratory document LA-UR-91-962, Los Alamos, New Mexico. (LANL 1991, 007680)

LANL (Los Alamos National Laboratory), May 1991. "TA-21 Operable Unit RFI Work Plan for Environmental Restoration," Vol. II (Chapters 14 to 16), Los Alamos National Laboratory document LA-UR-91-962, Los Alamos, New Mexico. (LANL 1991, 007529)

LANL (Los Alamos National Laboratory), May 1992. "RFI Work Plan for Operable Unit 1071," Los Alamos National Laboratory document LA-UR-92-810, Los Alamos, New Mexico. (LANL 1992, 007667)

LANL (Los Alamos National Laboratory), February 10, 1993. "Automatic Sprinkler System (FY-64), Cooling Tower - Omega-49, TA-2, Utility Plan - Water and Alarm," Engineering Drawing ENG-C-48768, sheet number 4 of 79, Los Alamos, New Mexico. (LANL 1993, 090056)

LANL (Los Alamos National Laboratory), June 1993. "RFI Work Plan for Operable Unit 1098," Los Alamos National Laboratory document LA-UR-92-3825, Los Alamos, New Mexico. (LANL 1993, 015314)

LANL (Los Alamos National Laboratory), August 1993. "Environmental Surveillance at Los Alamos During 1991," Los Alamos National Laboratory report LA-12572-ENV, Los Alamos, New Mexico. (LANL 1993, 023249)

LANL (Los Alamos National Laboratory), July 1994. "Environmental Surveillance at Los Alamos during 1992," Los Alamos National Laboratory report LA-12764-ENV, Los Alamos, New Mexico. (LANL 1994, 052951.71)

LANL (Los Alamos National Laboratory), 1994–1996. "Sample Collection Logs for PRSs 21-013(f), 21-024(h), 21-024(d), 21-018(a), and 21-011(k) and Buildings 21-3 and 21-4," Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 1994–1996, 065025)

LANL (Los Alamos National Laboratory), September 1996. "RFI Report for Potential Release Sites 2-004(a through f), 2-008(b), and 2-012," Los Alamos National Laboratory document LA-UR-96-3155, Los Alamos, New Mexico. (LANL 1996, 055226)

LANL (Los Alamos National Laboratory), April 1997. "Core Document for Canyons Investigations," Los Alamos National Laboratory document LA-UR-96-2083, Los Alamos, New Mexico. (LANL 1997, 055622)

LANL (Los Alamos National Laboratory), June 1998. "RFI Work Plan and SAP for Potential Release Sites 53-002(a), 53-002(b), and Associated Piping and Drainages at TA-53," Los Alamos National Laboratory document LA-UR-98-2547, Los Alamos, New Mexico. (LANL 1998, 058841)

LANL (Los Alamos National Laboratory), September 22, 1998. "Inorganic and Radionuclide Background Data for Soils, Canyon Sediments, and Bandelier Tuff at Los Alamos National Laboratory," Los Alamos National Laboratory document LA-UR-98-4847, Los Alamos, New Mexico. (LANL 1998, 059730)

LANL (Los Alamos National Laboratory), January 25, 2000. "Deferral of Additional Site Investigation for UST# TA-2-1," Los Alamos National Laboratory letter (ESH-19:00-007) to L. Georger (NMED USTB) from A. Jackson (LANL), Los Alamos, New Mexico. (LANL 2000, 090023)

LANL (Los Alamos National Laboratory), March 2000. "Installation Work Plan for Environmental Restoration Project, Revision 8," Los Alamos National Laboratory document LA-UR-00-1336, Los Alamos, New Mexico. (LANL 2000, 066802)

LANL (Los Alamos National Laboratory), July 2000. "Decommissioning Completion Report for Buildings 4, 46, 49, 50, 53, 54, 55, 56, 57, 69, and 88 at TA-02, Omega Site, Flood Control Project," draft, Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2000, 090087)

LANL (Los Alamos National Laboratory), March 2001. "TA-2 Sampling and Soil Removal, Final Closeout Report," Los Alamos National Laboratory document LA-UR-01-1243, Los Alamos, New Mexico. (LANL 2001, 070352)

LANL (Los Alamos National Laboratory), August 2003. "Field Summary Report for Removal of Omega West Reactor French Drain, TA-61, Potential Release Site 2-006(a)," Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2003, 090089)

LANL (Los Alamos National Laboratory), April 2004. "Los Alamos and Pueblo Canyons Investigation Report," Los Alamos National Laboratory document LA-UR-04-2714, Los Alamos, New Mexico. (LANL 2004, 087390)

LANL (Los Alamos National Laboratory), March 11, 2005. "Response to the Notice of Disapproval for the Investigation Work Plan for Delta Prime Site Aggregate Area, at Technical Area 21," Los Alamos National Laboratory document LA-UR-05-1696, Los Alamos, New Mexico. (LANL 2005, 087836)

LANL (Los Alamos National Laboratory), September 30, 2005. “Submittal of Revisions to the 'Investigation Work Plan for Delta Prime Site Aggregate Area, at Technical Area 21',” Los Alamos National Laboratory letter (ER2005-0475) to J.P. Bearzi (NMED HWB) from D. McInroy (ERS Deputy Program Director) and D. Gregory (DOE-LASO), Los Alamos, New Mexico. (LANL 2005, 090225)

LANL (Los Alamos National Laboratory), May 2006. “Investigation Work Plan for Middle Los Alamos Canyon Aggregate Area, Revision 1,” Los Alamos National Laboratory document LA-UR-06-3015, Los Alamos, New Mexico. (LANL 2006, 092571.12)

LANL (Los Alamos National Laboratory), November 2007. “Delta Prime Site Aggregate Area Investigation Report,” Los Alamos National Laboratory document LA-UR-07-5459, Los Alamos, New Mexico. (LANL 2007, 099175)

LANL (Los Alamos National Laboratory), May 2008. “Investigation Report for Middle Los Alamos Canyon Aggregate Area, Revision 1,” Los Alamos National Laboratory document LA-UR-08-2725, Los Alamos, New Mexico. (LANL 2008, 101669.12)

LANL (Los Alamos National Laboratory), February 2009. “Phase II Investigation Work Plan for Middle Los Alamos Canyon Aggregate Area, Revision 1,” Los Alamos National Laboratory document LA-UR-09-1206, Los Alamos, New Mexico. (LANL 2009, 105073)

LANL (Los Alamos National Laboratory), February 2010. “Technical Approach for Calculating Recreational Soil Screening Levels for Chemicals, Revision 1,” Los Alamos National Laboratory document LA-UR-09-07510, Los Alamos, New Mexico. (LANL 2010, 108613)

LANL (Los Alamos National Laboratory), March 2010. “2010 General Facility Information,” Los Alamos National Laboratory document LA-UR-10-1363, Los Alamos, New Mexico. (LANL 2010, 109084)

LANL (Los Alamos National Laboratory), June 2010. “2010 Interim Facility-Wide Groundwater Monitoring Plan,” Los Alamos National Laboratory document LA-UR-10-1777, Los Alamos, New Mexico. (LANL 2010, 109830)

LANL (Los Alamos National Laboratory), September 2015. “Derivation and Use of Radionuclide Screening Action Levels, Revision 4,” Los Alamos National Laboratory document LA-UR-15-24859, Los Alamos, New Mexico. (LANL 2015, 600929)

LANL (Los Alamos National Laboratory), September 2017. “Technical Approach for Calculating Recreational Soil Screening Levels for Chemicals, Revision 5,” Los Alamos National Laboratory document LA-UR-17-27660, Los Alamos, New Mexico. (LANL 2017, 602581)

LANL (Los Alamos National Laboratory), September 2017. “Chromium Background Study Report,” Los Alamos National Laboratory document LA-UR-17-28239, Los Alamos, New Mexico. (LANL 2017, 602650)

LANL (Los Alamos National Laboratory), September 2017. “Screening-Level Ecological Risk Assessment Methods, Revision 5,” Los Alamos National Laboratory document LA-UR-17-28553, Los Alamos, New Mexico. (LANL 2017, 602649)

LANL (Los Alamos National Laboratory), October 2017. "ECORISK Database (Release 4.1)," on CD, LA-UR-17-26376, Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2017, 602538)

LASL (Los Alamos Scientific Laboratory), September 22, 1944. "Plot Plan and Piping Details, Omega Building/Annex," Engineering Drawing ENG-C-1686, sheet number 0, Los Alamos, New Mexico. (LASL 1944, 090084)

LASL (Los Alamos Scientific Laboratory), 1944. "Laboratory Bldg 3, Heating - Plumbing, Omega Site," Engineering Drawing ENG-C-1683, sheet number 4, Los Alamos, New Mexico. (LASL 1944, 090081)

LASL (Los Alamos Scientific Laboratory), 1946. "Omega Site - Fast Reactor Building Structural Foundation Plan, Revised," Engineering Drawing ENG-C-1703, sheet number 5 of 16, Los Alamos, New Mexico. (LASL 1946, 089678)

LASL (Los Alamos Scientific Laboratory), January 23, 1947. "Nomenclature; Technical Areas Assigned to the Laboratory," Los Alamos Scientific Laboratory, Los Alamos, New Mexico. (LASL 1947, 000664)

LASL (Los Alamos Scientific Laboratory), February 24, 1947. "Fast Reactor Building, Omega Site Bldg. T, Plot Plan, Revised," Engineering Drawing ENG-C-1699, Los Alamos, New Mexico. (LASL 1947, 090070)

LASL (Los Alamos Scientific Laboratory), June 30, 1947. "Blower House - Drain Trap - Misc. Details, 150 ft. Mast, TA-2," Engineering Drawing ENG-C-1718, sheet number 3 of 4, Los Alamos, New Mexico. (LASL 1947, 089677)

LASL (Los Alamos Scientific Laboratory), July 30, 1948. "General Layout, 150 ft. Mast, TA-2," Engineering Drawing ENG-C-1716, sheet number 1 of 4, Los Alamos, New Mexico. (LASL 1948, 090083)

LASL (Los Alamos Scientific Laboratory), June 30, 1949. "Structure Descriptions from Laboratory Pan Am History Book, TA-26," Los Alamos Scientific Laboratory, Los Alamos, New Mexico. (LASL 1949, 000696)

LASL (Los Alamos Scientific Laboratory), October 10, 1949. "Plumbing Layout, Waste and Drain Piping, Alterations and Additions to Bldg. 1, TA-2," Engineering Drawing ENG-C-1750, sheet number 30 of 34, Los Alamos, New Mexico. (LASL 1949, 089680)

LASL (Los Alamos Scientific Laboratory), April 3, 1954. "West Reactor, Civil Plot Plan, Omega-1 and Omega-44, TA-2," Engineering Drawing ENG-C-14930, sheet number 1 of 33, Los Alamos, New Mexico. (LASL 1954, 090076)

LASL (Los Alamos Scientific Laboratory), October 11, 1957. "O.W.R. Exhaust Line, Plan, Profiles, Details, Bldg. Omega-1, TA-2, Revision 1," Engineering Drawing ENG-C-10473, sheet number 1 of 1, Los Alamos, New Mexico. (LASL 1957, 090082)

LASL (Los Alamos Scientific Laboratory), November 13, 1957. "OWR Cooling Tower Installation, Civil Plans, Sections and Details, Omega-49, TA-2," Engineering Drawing ENG-C-21327, sheet number 1 of 7, Los Alamos, New Mexico. (LASL 1957, 090058)

LASL (Los Alamos Scientific Laboratory), July 9, 1958. "Utility Location Plan, TA-2, Omega-Site, Sewer and Storm Drainage System, Revision 2," Engineering Drawing ENG-R-391, sheet number 1 of 3, Los Alamos, New Mexico. (LASL 1958, 090085)

LASL (Los Alamos Scientific Laboratory), May 25, 1962. "Omega West Reactor Cooling Water Modifications, Mech. Piping Plot Plan, Elevations and Sect., Bldg. Omega 44," Engineering Drawing ENG-C-29861, sheet number 4 of 13, Los Alamos, New Mexico. (LASL 1962, 090055)

LASL (Los Alamos Scientific Laboratory), January 26, 1971. "Boiler Room and Equipment Relocation, Design Criteria, Bldg. Omega-63, TA-2," Engineering Drawing ENG-C-39551, sheet number 2 of 4, Los Alamos, New Mexico. (LASL 1971, 089682)

LASL (Los Alamos Scientific Laboratory), no date. "Chemical Shack Waste Units," handwritten status report concerning TA-2 (period of use, 1940s to 1971), Los Alamos, New Mexico. (LASL no date, 034172)

LASL (Los Alamos Scientific Laboratory), no date. "Status of Structures TA-26-1 through TA-26-6," Los Alamos Scientific Laboratory, Los Alamos, New Mexico. (LASL no date, 000675)

Lojek, C.A., May 13, 1991. "Record of Bob Drake Interview for OU 1071 Work Plan," IT Corporation letter to M.J. Aldrich (EES-1 Project Leader) from C.A. Lojek (IT Corp.), Los Alamos, New Mexico. (Lojek 1991, 001904)

Longmire, P.A., S. Kung, J.M. Boak, A.I. Adams, F. Caporuscio, and R.N. Gray, 1996. "Aqueous Geochemistry of Upper Los Alamos Canyon, Los Alamos, New Mexico," New Mexico Geological Society Guidebook: 47th Field Conference, Jemez Mountains Region, New Mexico, pp. 473-480. (Longmire et al. 1996, 054168)

Maddy, J.R., March 29, 1957. "Use of East Gate Pass Office Building," Los Alamos National Laboratory memorandum to T.L. Shipman (Director/H Division) from Maddy (Chief/Project Services Branch/AEC), Los Alamos, New Mexico. (Maddy 1957, 006349)

Meyer, D., March 7, 1978. "Review of LA-6848-MS [document]," Los Alamos Scientific Laboratory letter to M.A. Rogers (H-12) from D. Meyer (Consultant to H-12), Los Alamos, New Mexico. (Meyer 1978, 000526)

Millard, W.P., and S.J. Deverel, December 1988. "Nonparametric Statistical Methods for Comparing Two Sites Based on Data with Multiple Nondetect Limits," *Water Resources Research,* Vol. 24, No. 12, pp. 2087–2098. (Millard and Deverel 1988, 054953)

Montoya, G., June 1991. "Final Project Report, TA-2 Water Boiler Reactor Decommissioning Project," Los Alamos National Laboratory report LA-12049, Los Alamos, New Mexico. (Montoya 1991, 006997)

Montoya, G.M., June 1, 1991. "Post-Remedial Action Report for the Water Boiler Reactor Site," Los Alamos National Laboratory report LA-12012, Los Alamos, New Mexico. (Montoya 1991, 006996)

NMED (New Mexico Environment Department), October 10, 2001. "Approval of Class III Permit Modification to Remove Seven (7) Solid Waste Management Units from the Department of Energy / Los Alamos National Laboratory RCRA Permit NM 0890010515," New Mexico Environment Department letter to D.A. Gurulé (Program Manager/LAAO) and J.C. Browne (LANL Director) from G.J. Lewis (NMED WWMD Director), Santa Fe, New Mexico. (NMED 2001, 071256)

NMED (New Mexico Environment Department), February 8, 2005. "Notice of Disapproval for the Investigation Work Plan for Delta Prime Site Aggregate Area at Technical Area 21," New Mexico Environment Department letter to D. Gregory (DOE-LASO) and G.P. Nanos (LANL Director) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2005, 092099)

NMED (New Mexico Environment Department), April 13, 2005. "Approval with Modifications for the Investigation Work Plan for Delta Prime Site Aggregate Area at Technical Area 21," New Mexico Environment Department letter to D. Gregory (DOE LASO) and G.P. Nanos (LANL Director) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2005, 089314)

NMED (New Mexico Environment Department), May 30, 2006. "Approval with Modifications, Investigation Work Plan for the Middle Los Alamos Canyon Aggregate Area," 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 2006, 095416)

NMED (New Mexico Environment Department), October 2006. "New Mexico Environment Department TPH Screening Guidelines," Santa Fe, New Mexico. (NMED 2006, 094614)

NMED (New Mexico Environment Department), March 25, 2009. "Approval, Middle Los Alamos Canyon Aggregate Area Phase II Work Plan, Revision 1," New Mexico Environment Department letter to D. Gregory (DOE LASO) and D. McInroy (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2009, 105595)

NMED (New Mexico Environment Department), March 2017. "Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Soil Screening Guidance for Human Health Risk Assessments," Hazardous Waste Bureau and Ground Water Quality Bureau, Santa Fe, New Mexico. (NMED 2017, 602273)

NMED (New Mexico Environment Department), October 12, 2017. "Approval, Chromium Background Study Report," New Mexico Environment Department letter to D. Hintze (DOE-NA-LA) and B. Robinson (LANL) from J.E. Kieling (NMED-HWB), Santa Fe, New Mexico. (NMED 2017, 602678)

Nyhan, J.W., L.W. Hacker, T.E. Calhoun, and D.L. Young, June 1978. "Soil Survey of Los Alamos County, New Mexico," Los Alamos Scientific Laboratory report LA-6779-MS, Los Alamos, New Mexico. (Nyhan et al. 1978, 005702)

Purtymun, W.D., January 1984. “Hydrologic Characteristics of the Main Aquifer in the Los Alamos Area: Development of Ground Water Supplies,” Los Alamos National Laboratory report LA-9957-MS, Los Alamos, New Mexico. (Purtymun 1984, 006513)

Purtymun, W.D., January 1995. “Geologic and Hydrologic Records of Observation Wells, Test Holes, Test Wells, Supply Wells, Springs, and Surface Water Stations in the Los Alamos Area,” Los Alamos National Laboratory report LA-12883-MS, Los Alamos, New Mexico. (Purtymun 1995, 045344)

Purtymun, W.D., J.R. Buchholz, and T.E. Hakonson, 1977. “Chemical Quality of Effluents and Their Influence on Water Quality in a Shallow Aquifer,” *Journal of Environmental Quality,* Vol. 6, No. 1, pp. 29-32. (Purtymun et al. 1977, 011846)

Purtymun, W.D., and A.K. Stoker, August 1988. “Water Supply at Los Alamos: Current Status of Wells and Future Water Supply,” Los Alamos National Laboratory report LA-11332-MS, Los Alamos, New Mexico. (Purtymun and Stoker 1988, 006879)

Purtymun, W.D., and A.K. Stoker, September 1990. “Perched Zone Monitoring Well Installation,” Los Alamos National Laboratory document LA-UR-90-3230, Los Alamos, New Mexico. (Purtymun and Stoker 1990, 007508)

Teaf, C.M., December 16, 2008. “Polycyclic Aromatic Hydrocarbons (PAHs) in Urban Soil: A Florida Risk Assessment Perspective,” *International Journal of Soil, Sediment and Water,* Vol. 1, No. 2, Article 2. (Teaf 2008, 219976)

Tribby, J.F., May 8, 1947. “Fluid Waste Disposal at D.P. West,” Los Alamos Scientific Laboratory memorandum to F.R. Jette from J.F. Tribby, Los Alamos, New Mexico. (Tribby 1947, 001404)

WD-3 (Washington-Framatome ANP Decontamination and Decommissioning, LLC), August 2003. “Omega West Decommissioning, Final Project Report, Volume 1,” report prepared for Los Alamos National Laboratory, Los Alamos, New Mexico. (WD-3 2003, 082646)

11.2 Data Map Sources

Aggregate Areas, er_agg_areas_ply; Los Alamos National Laboratory, ENV Environmental Remediation & Surveillance Program, ER2005-0496; 1:2,500 Scale Data; 22 September 2005.

Canyon Reaches, er_reaches_ply; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program, ER2002-0592; 1:24,000 Scale Data; Unknown publication date.

Communication Lines, ksl_comm_arc; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 08 August 2002; as published 28 May 2009.

Drainage: WQH Drainage_arc; Los Alamos National Laboratory, ENV Water Quality and Hydrology Group; 1:24,000 Scale Data; 03 June 2003.

Existing sampling locations: Point Feature Locations of the Environmental Restoration Project Database, er_location_ids_pnt; Los Alamos National Laboratory, Waste and Environmental Services Division, EP2010-0035; 21 January 2010.

Former fences: Phase II Investigation Work Plan for Middle Los Alamos Canyon Aggregate Area, Revision 1; Los Alamos National Laboratory, Environmental Programs; Report LA-UR-09-1206, EP2009-0080; February 2009.

Former structures: Former Structures of the Los Alamos Site, frmr_structures_ply; Los Alamos National Laboratory, Waste and Environmental Services Division, EP2008-0441; 1:2,500 Scale Data; 08 August 2008. Phase II Investigation Work Plan for Middle Los Alamos Canyon Aggregate Area, Revision 1; Los Alamos National Laboratory, Environmental Programs; Report LA-UR-09-1206, EP2009-0080; February 2009.

Hypsography, 2, 10, 20, and 100 Foot Contour Intervals; Los Alamos National Laboratory, ENV Environmental Remediation and Surveillance Program; 1991.

LANL Areas Used and Occupied, plan_lanlarea_ply; Los Alamos National Laboratory, Site Planning & Project Initiation Group, Infrastructure Planning Office; 19 September 2007; as published 04 December 2008.

Locations of Springs, er_springs_pnt; Los Alamos National Laboratory, Waste and Environmental Services Division in cooperation with the New Mexico Environment Department, Department of Energy Oversight Bureau, EP2008-0138; 1:2,500 Scale Data; 17 March 2008.

Potential release sites: Phase II Investigation Work Plan for Middle Los Alamos Canyon Aggregate Area, Revision 1; Los Alamos National Laboratory, Environmental Programs; Report LA-UR-09-1206, EP2009-0080; February 2009.

Primary Electric Grid, ksl_electric_arc; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.

Primary Gas Distribution Lines, ksl_gas_arc; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.

Primary Industrial Waste Lines, wfm_indstrl_waste_arc; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.

Primary Landscape Features, ksl_landscape_arc; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.

Roads: Paved Road Arcs, ksl_paved_rds_arc; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009. Paved Parking, ksl_paved_prking_arc; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 12 August 2002; as published 28 May 2009. Dirt Road Arcs, ksl_dirt_rds_arc; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009. Road Centerlines for the County of Los Alamos, lac_centerlin_arc; County of Los Alamos, Information Services; as published 04 March 2009.

Structures, ksl_structures_ply; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.

Security and Industrial Fences and Gates, ksl_fences_arc; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.

Sewer Line System, ksl_sewer_arc; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.

SMA Monitoring Locations, sma_monitoring_pnt; Los Alamos National Laboratory, ESH&Q Waste and Environmental Services Division; 1:2,500 Scale Data; published 14 February 2011.

Steam Line Distribution System, ksl_steam_arc; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.

Storm Drain Line Distribution System, ksl_stormdrn_arc; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.

Technical area boundaries, plan_tecareas_ply; Los Alamos National Laboratory, Site Planning & Project Initiation Group, Infrastructure Planning Office; September 2007; as published 04 December 2008.

Water Lines, ksl_water_arc; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 28 May 2009.

Watershed Monitoring - Environmental Surveillance at Los Alamos during 2008 - On-Site and Perimeter Monitoring Locations, Edition 2009-0A, ESR_surfwatermonsta_pnt; Los Alamos National Laboratory, Waste and Environmental Services Division, Water Stewardship Program, Corrective Actions Program, Environmental Protection Division, Ecology and Air Quality Group, and Water Quality and RCRA Group; September 2009.

Well Locations: Locations of Monitoring and Supply Wells at Los Alamos National Laboratory, 2009_GFI_TBL_A2_WELLS_pnt; Los Alamos National Laboratory, General Facility Information; Table A-2, LANL Report LA-UR-09-1341; March 2009. Environmental Surveillance at Los Alamos During 2006, Groundwater monitoring; LANL Report LA-14341-ENV, September 2007.

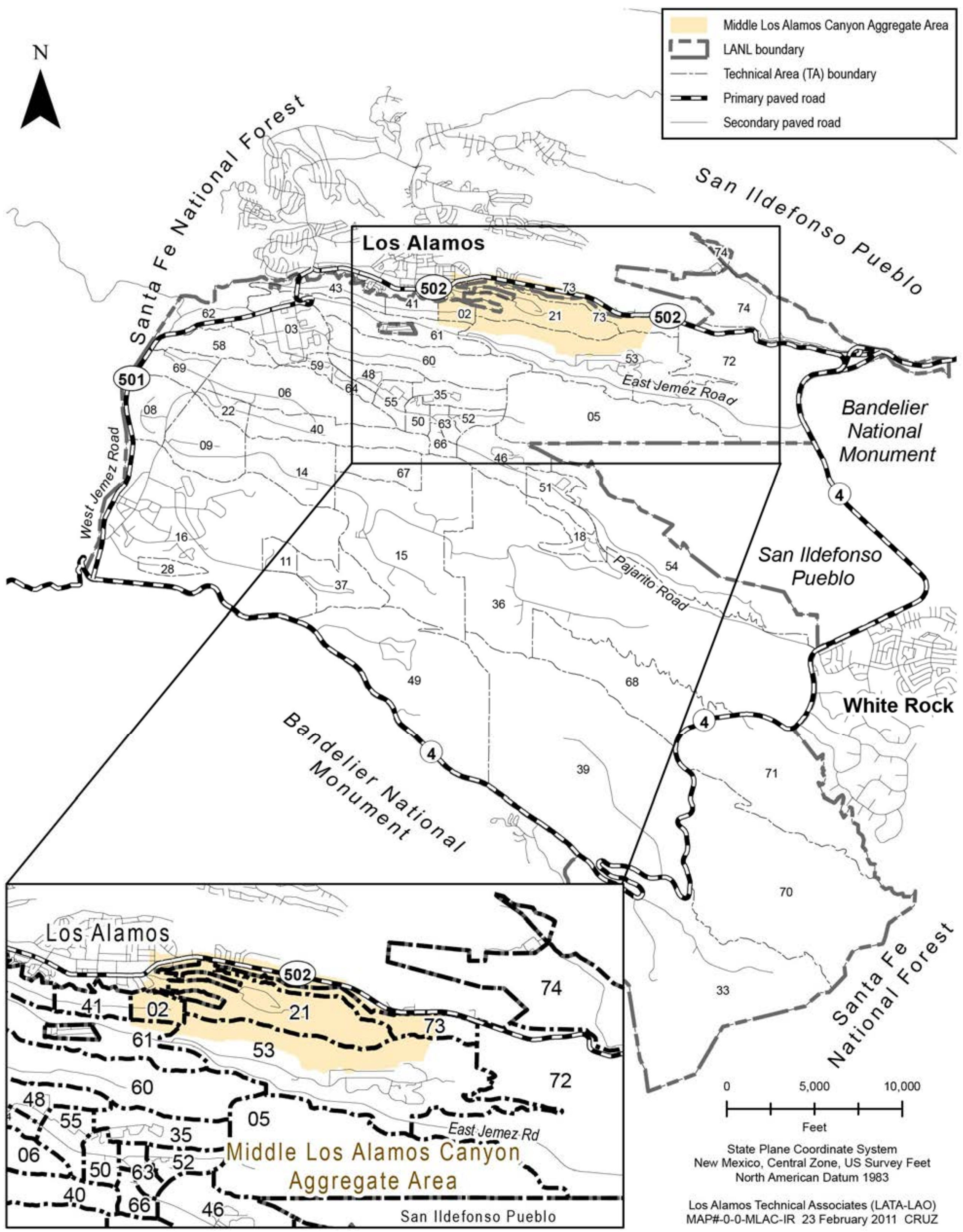

Figure 1.0-1 Location of Middle Los Alamos Canyon Aggregate Area with respect to Laboratory technical areas

Bandelier Tuff	Tshirege Member	Qbt 4	Ash-flow units
		Qbt 3	
		Qbt 2	
		Qbt 1v	
		Qbt 1g	
		Tsankawi Pumice Bed	
Cerro Toledo interval		Volcaniclastic sediments and ash-falls	
Bandelier Tuff	Otowi Member	Ash-flow units	
		Guaje Pumice Bed	
Puye Formation and intercalated volcanic rocks	Fanglomerate	Fanglomerate facies includes sand, gravel, conglomerate, and tuffaceous sediments	
	Volcanic rocks	Cerros del Rio basalts intercalated within the Puye Formation, includes up to four interlayered basaltic flows. Andesites of the Tschicoma Formation present in western part of plateau	
	Fanglomerate	Fanglomerate facies includes sand, gravel, conglomerate, and tuffaceous sediments; includes "old alluvium"	
	Axial facies deposits of the ancestral Rio Grande	Totavi Lentil	
Santa Fe Group	Coarse sediments	Coarse-grained upper facies (called the "Chaquehui Formation" by Purtymun 1995, 45344)	
	Basalt		
	Coarse sediments		
	Basalt		
	Coarse sediments		
	Basalt		
	Coarse sediments		
	Basalt		
	Coarse sediments		
	Arkosic clastic sedimentary deposits	Undivided Santa Fe Group (includes Chamita[?] and Tesuque Formations)	

Figure 2.2-1 Generalized stratigraphy of bedrock geologic units of the Pajarito Plateau

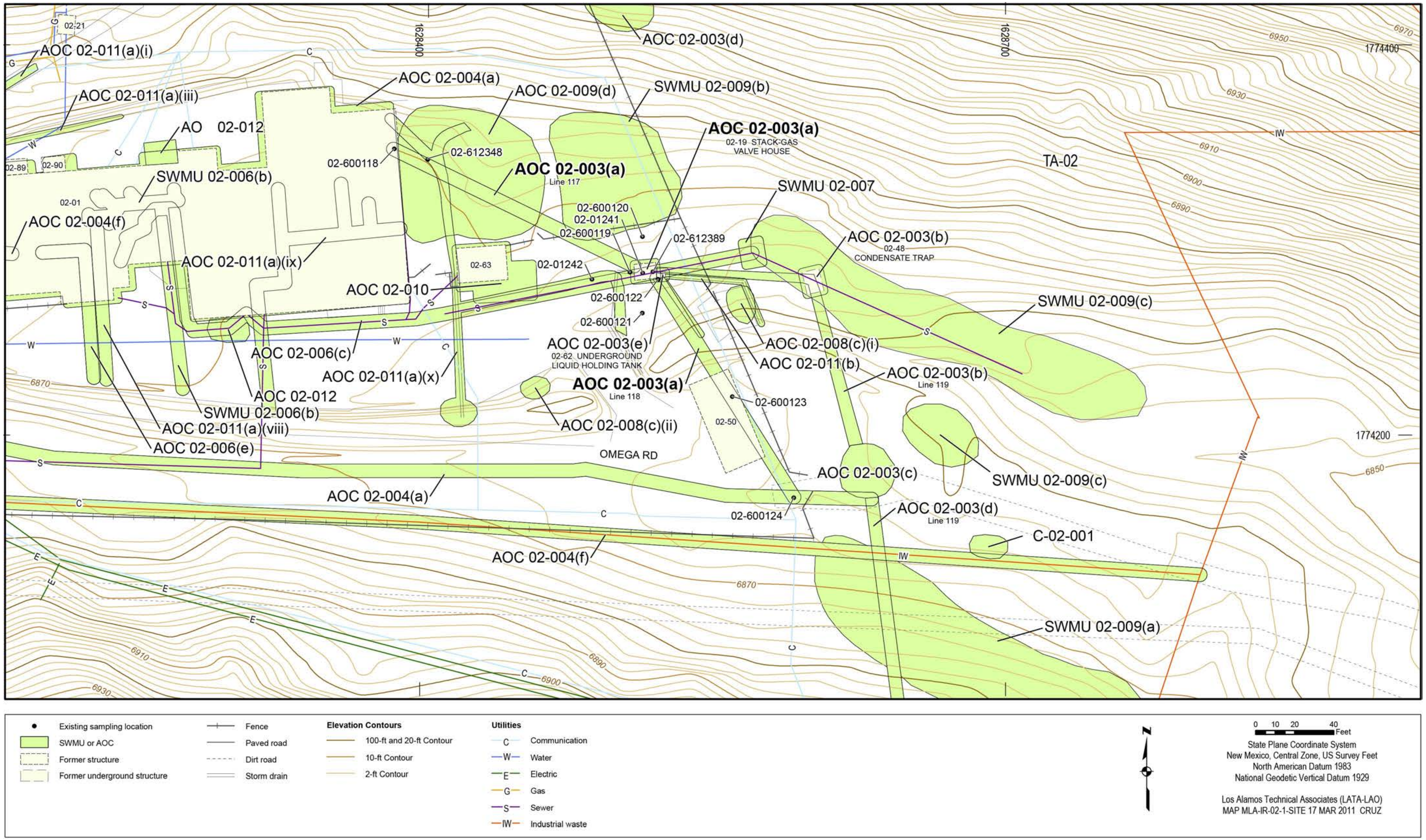

Figure 6.2-1 Site map of AOC 02-003(a)

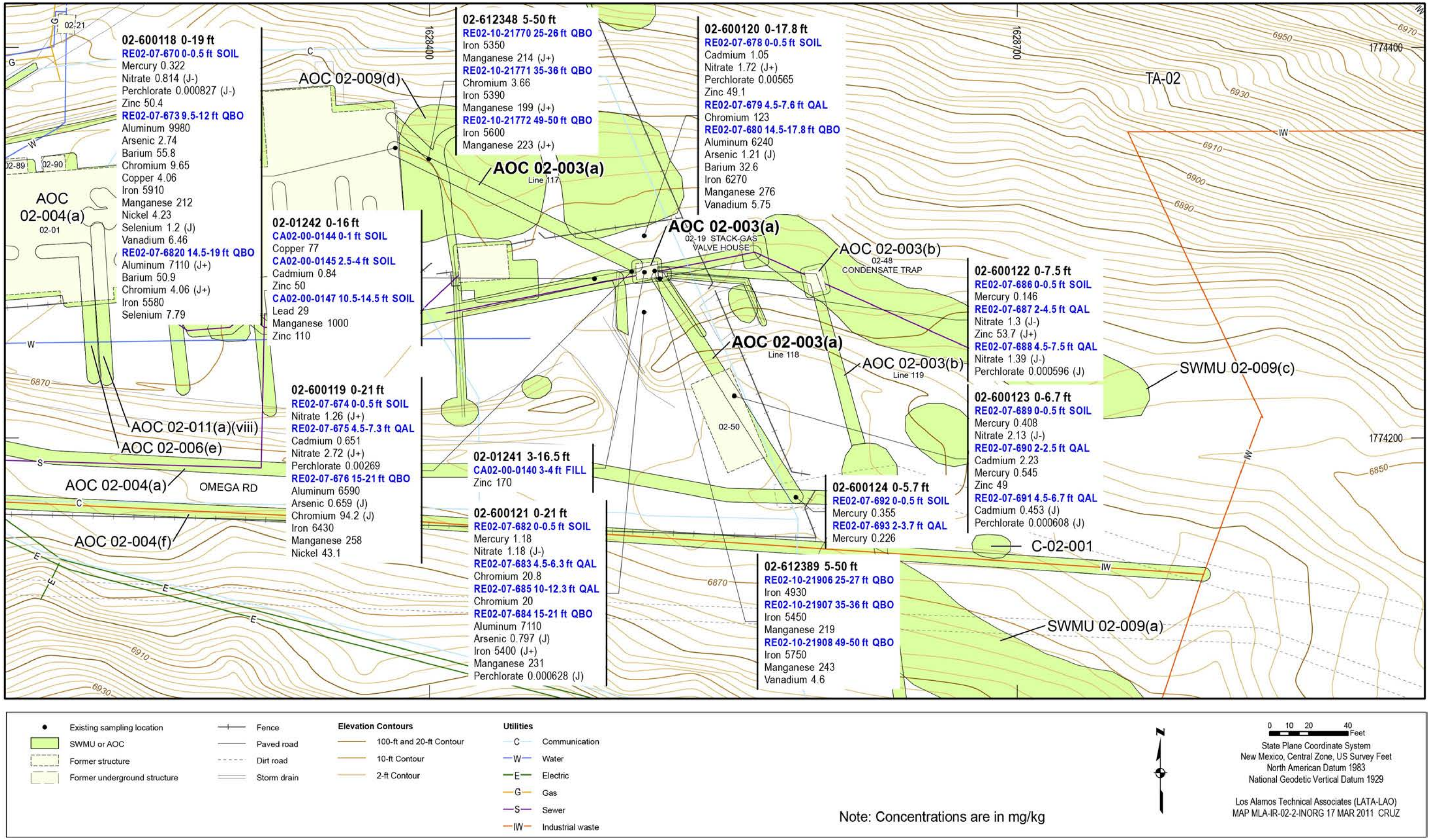

Figure 6.2-2 Inorganic chemicals detected or detected above BVs at AOC 02-003(a)

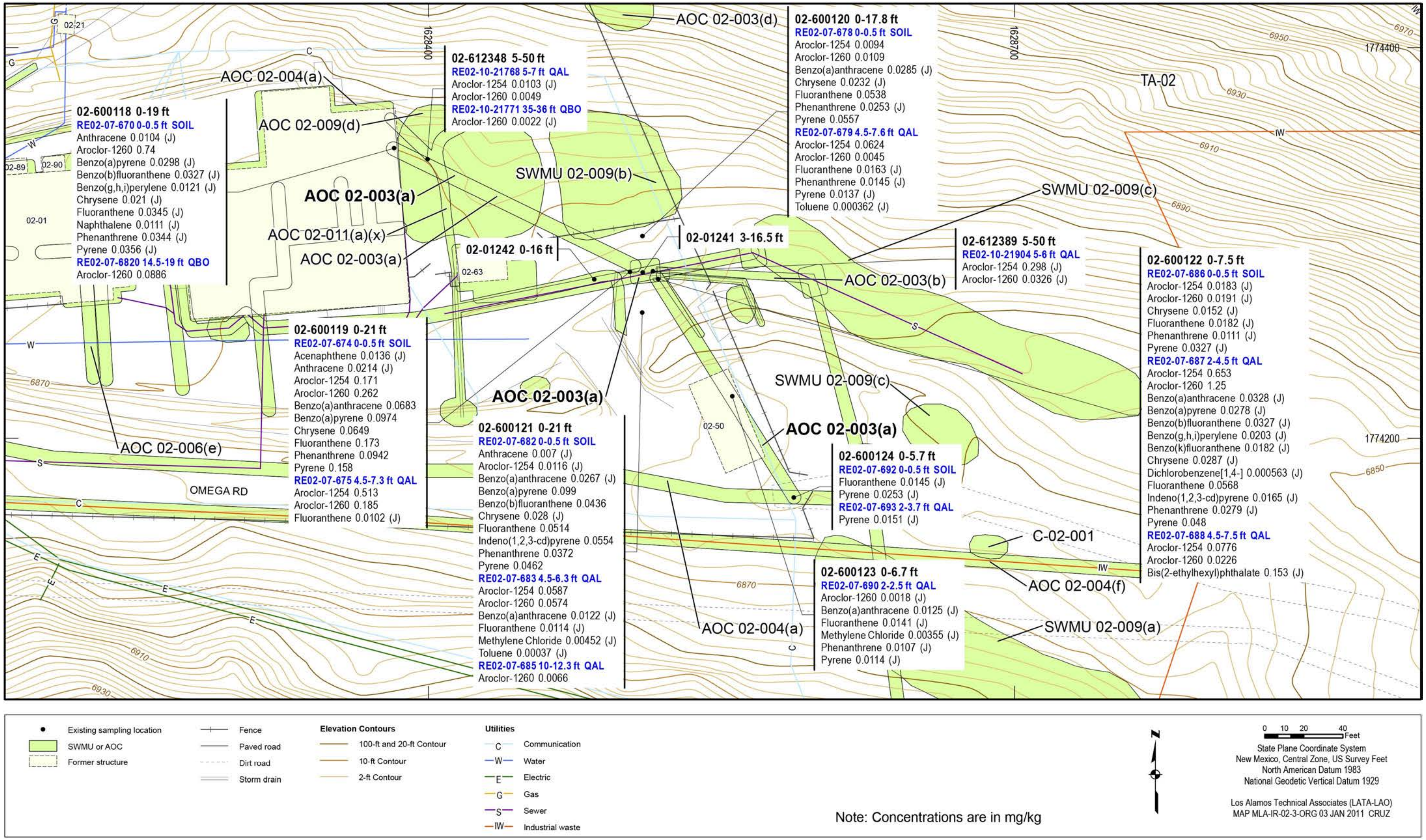

Figure 6.2-3 Organic chemicals detected at AOC 02-003(a)

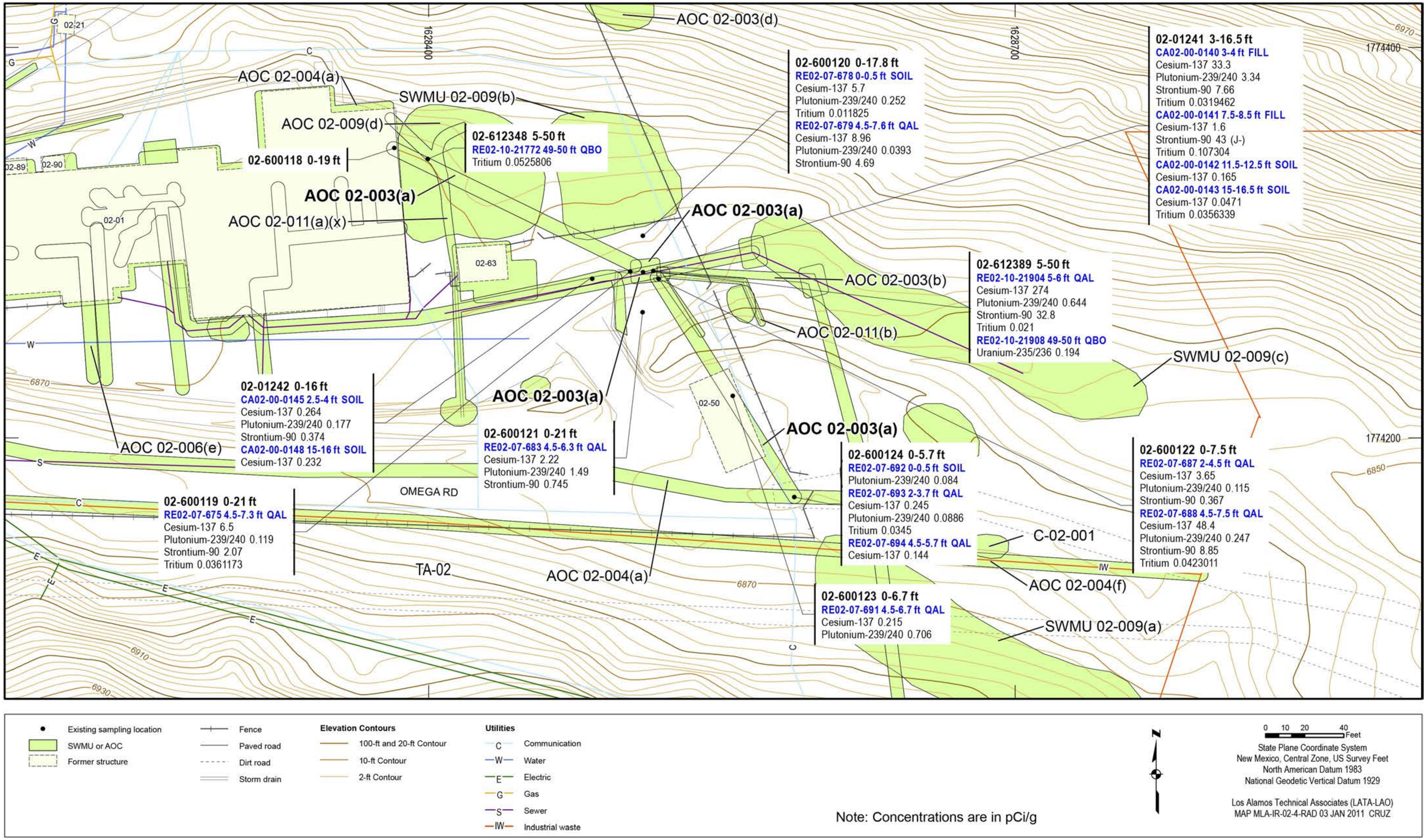

Figure 6.2-4 Radionuclides detected or detected above BVs/FVs at AOC 02-003(a)

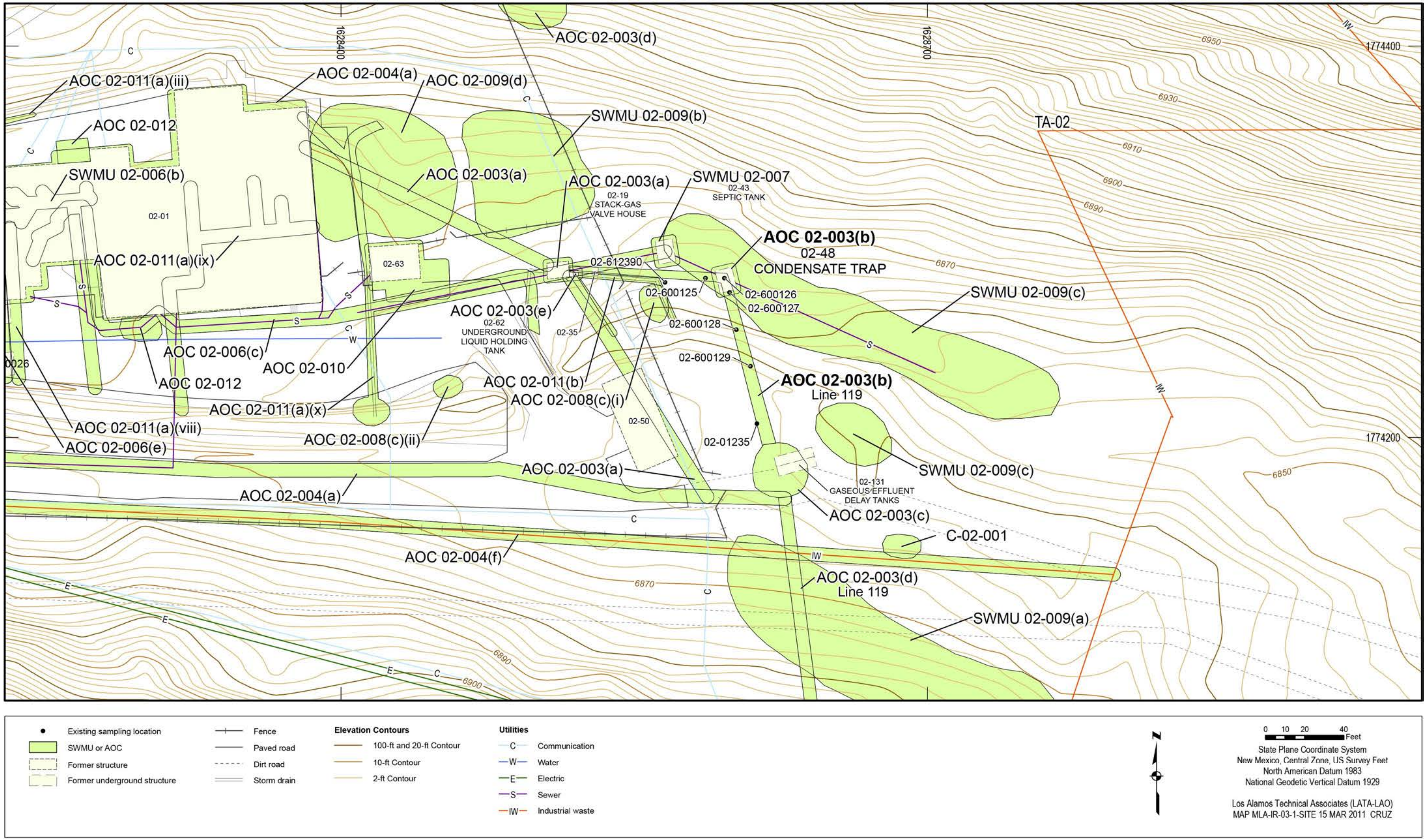

Figure 6.3-1 Site map of AOC 02-003(b)

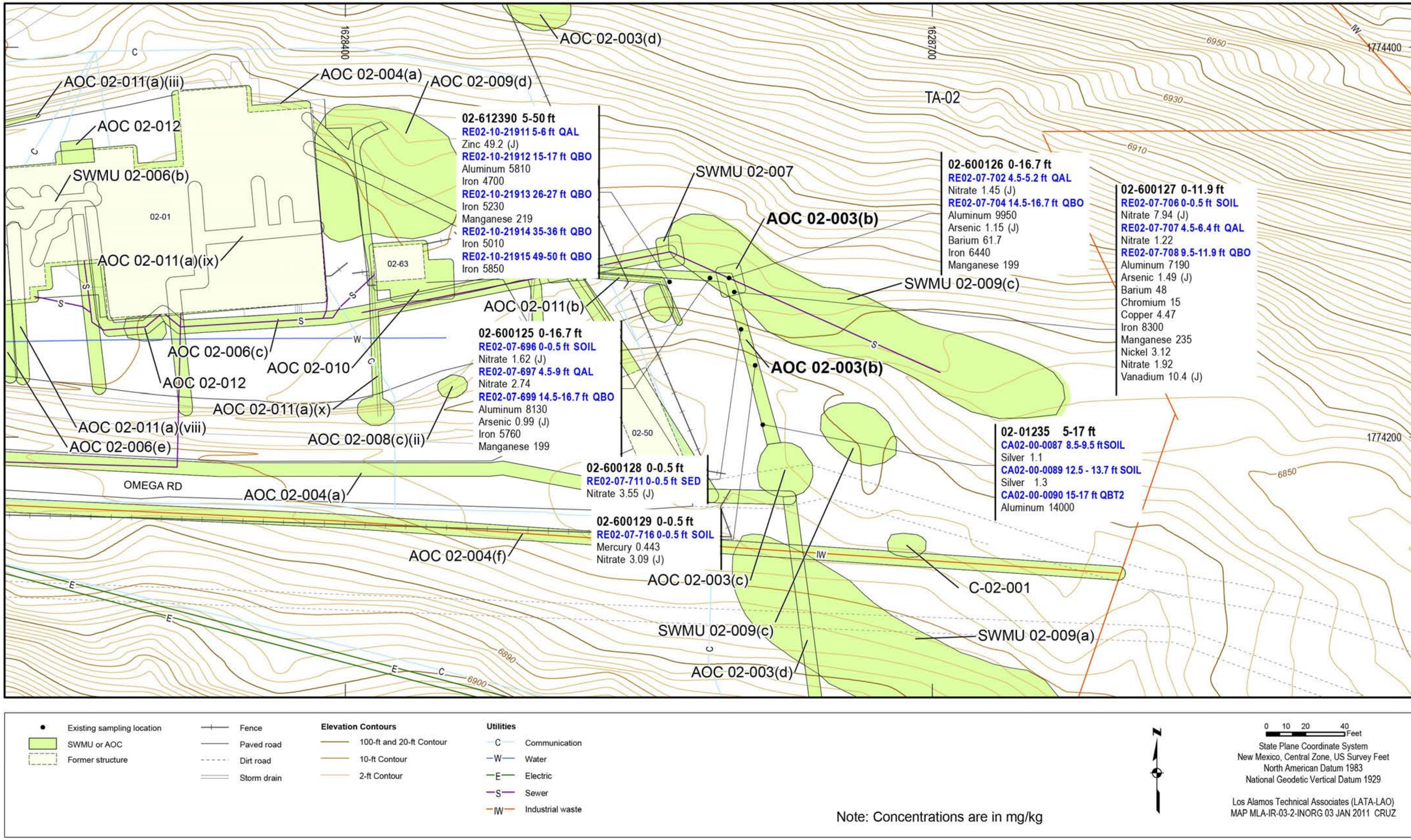

Figure 6.3-2 Inorganic chemicals detected or detected above BVs at AOC 02-003(b)

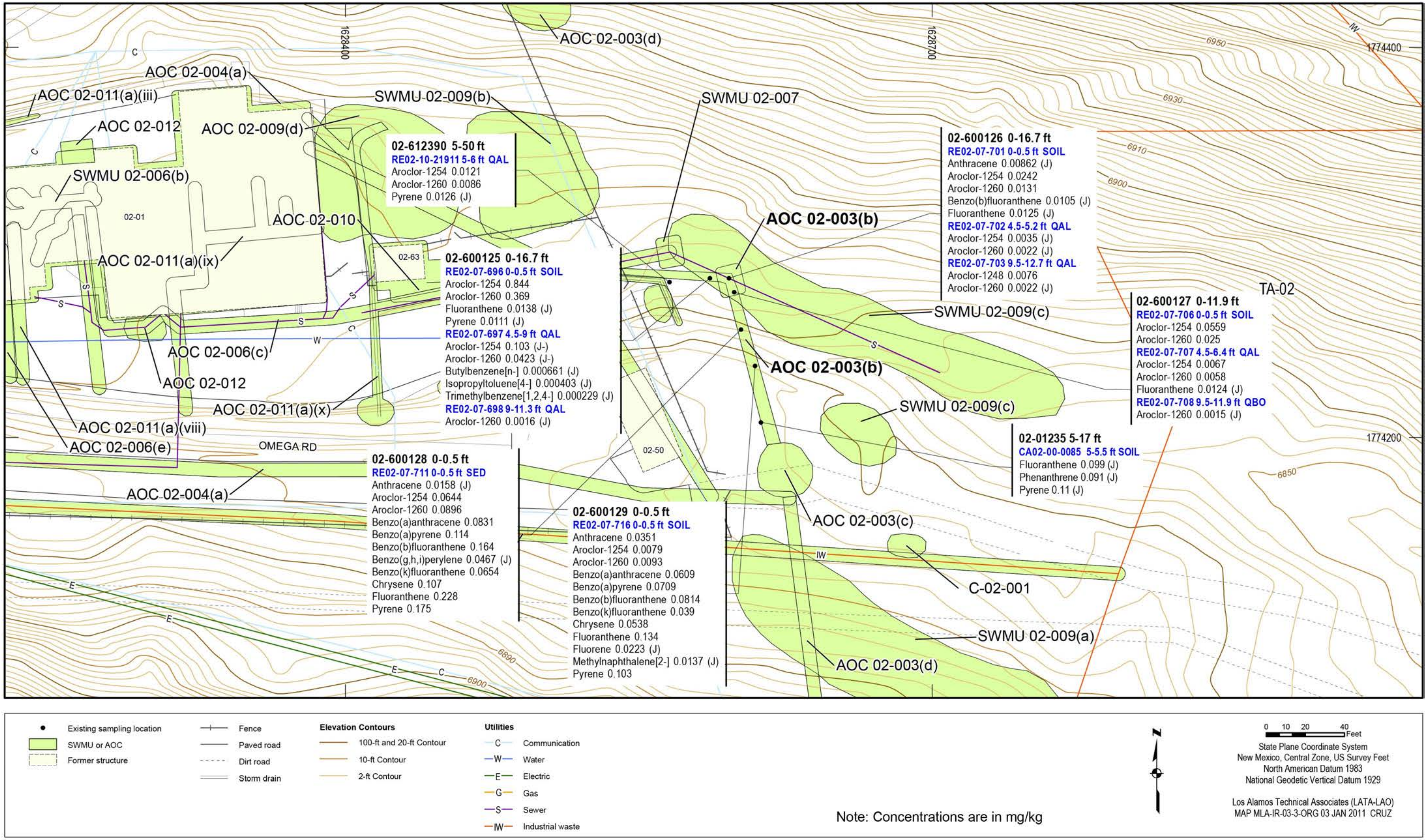

Figure 6.3-3 Organic chemicals detected at AOC 02-003(b)

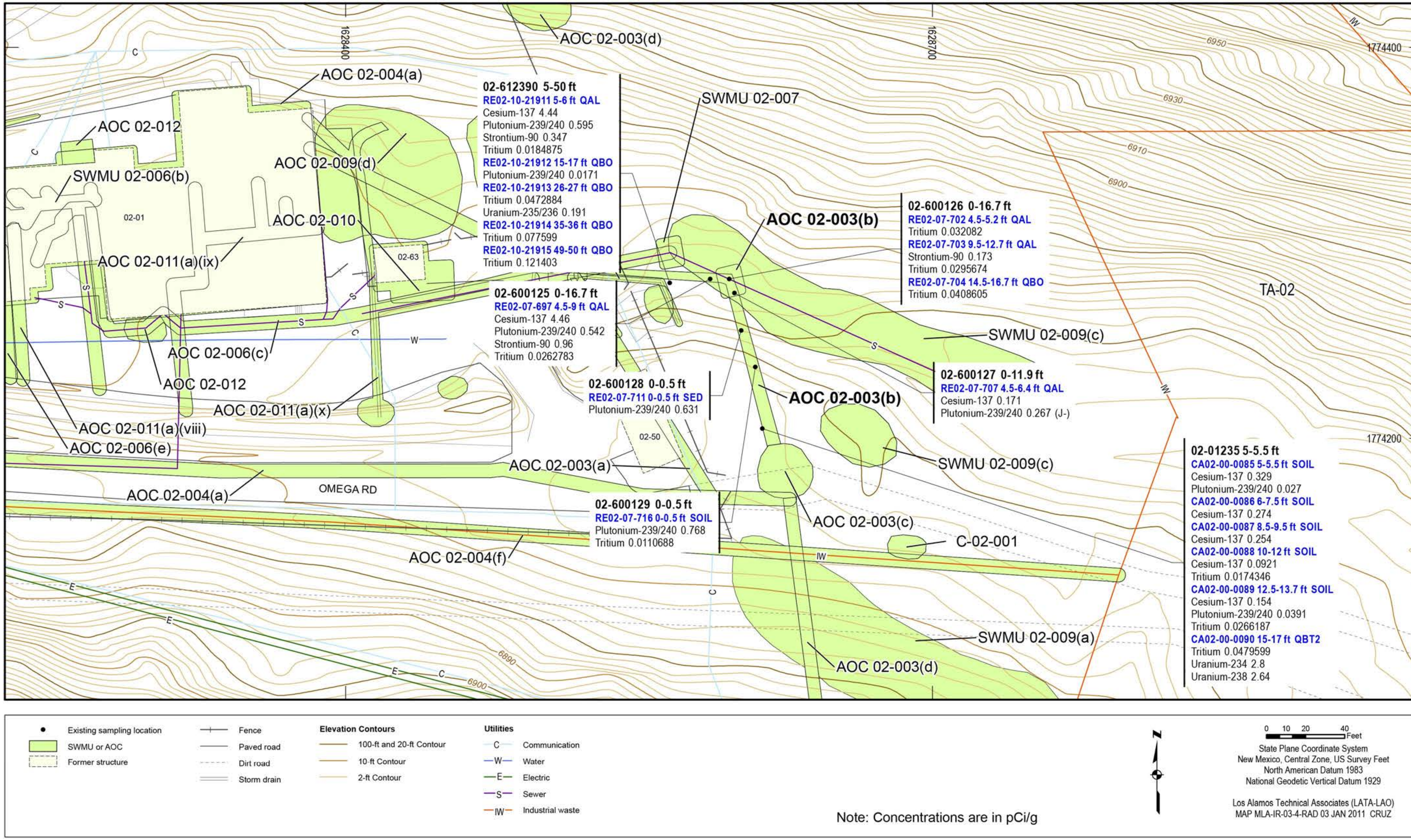

Figure 6.3-4 Radionuclides detected or detected above BVs/FVs at AOC 02-003(b)

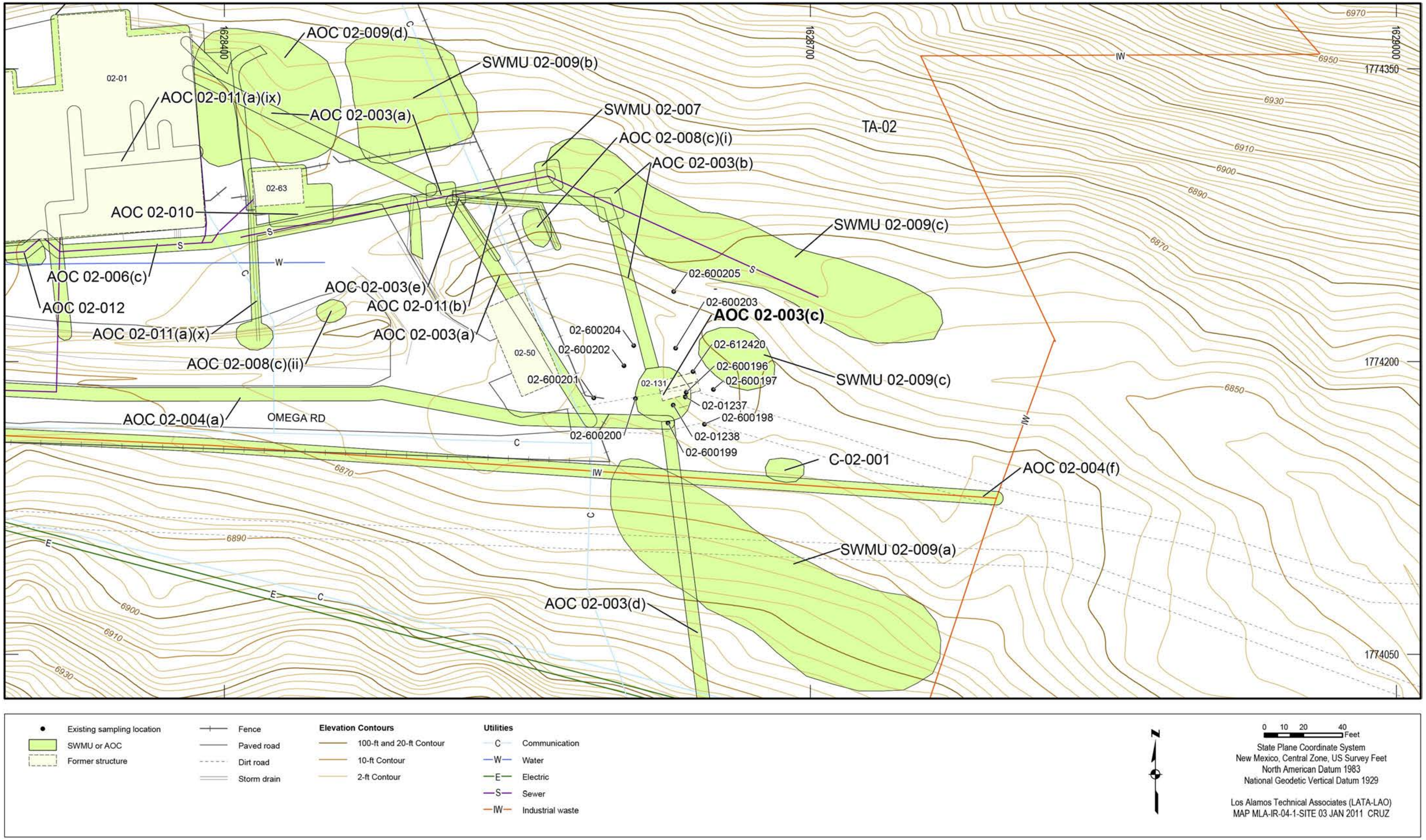

Figure 6.4-1 Site map of AOC 02-003(c)

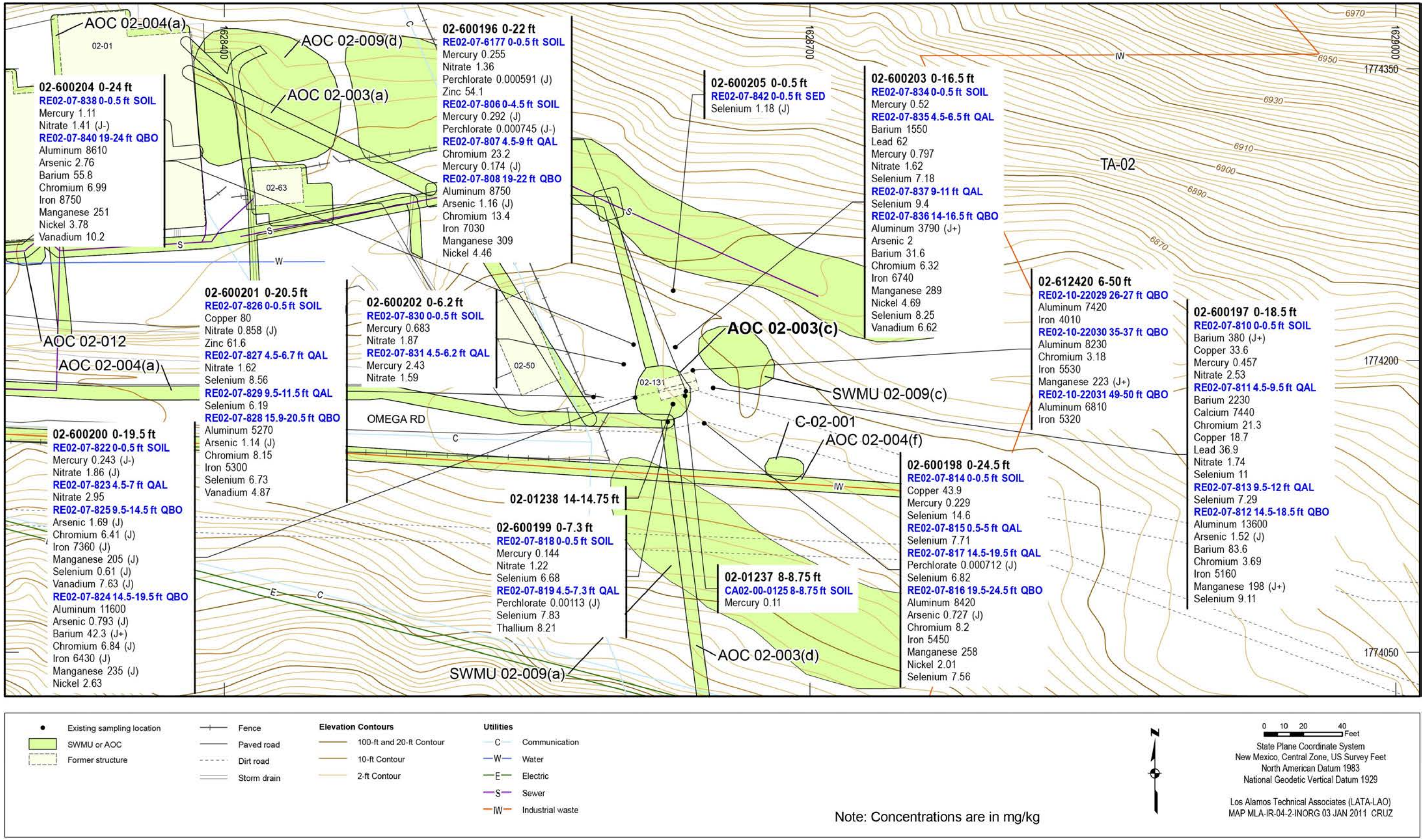

Figure 6.4-2 Inorganic chemicals detected or detected above BVs at AOC 02-003(c)

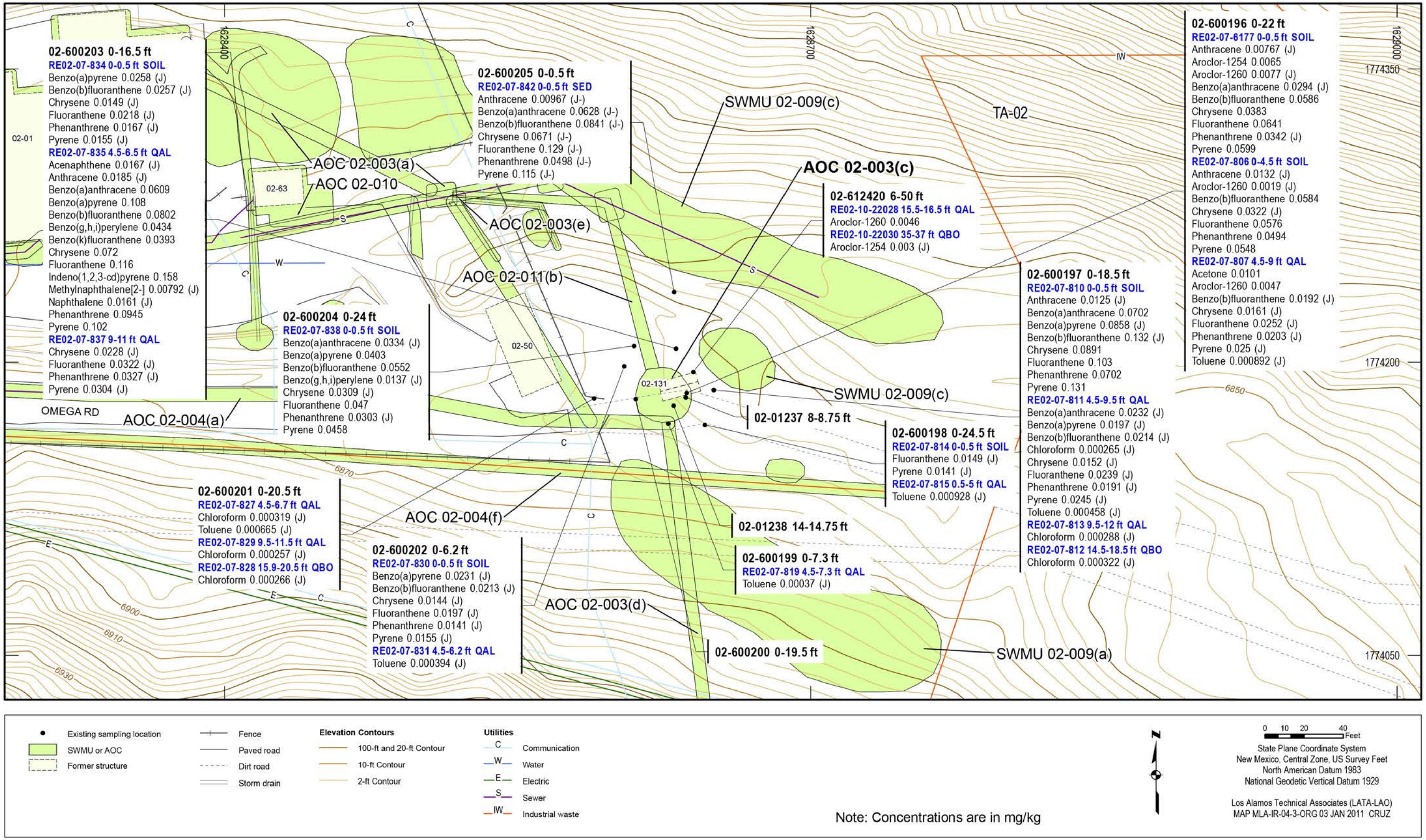

Figure 6.4-3 Organic chemicals detected at AOC 02-003(c)

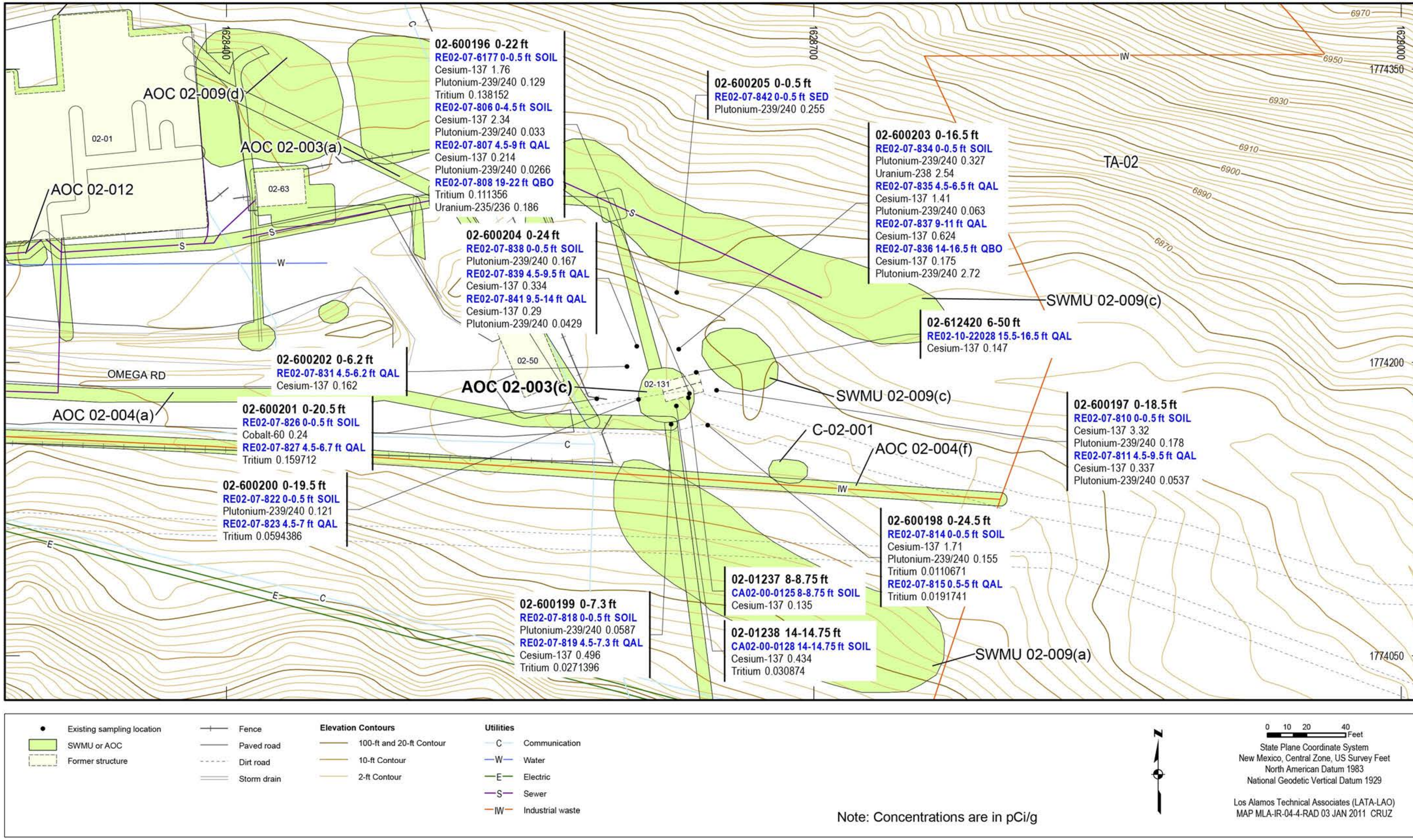

Figure 6.4-4 Radionuclides detected or detected above BVs/FVs at AOC 02-003(c)

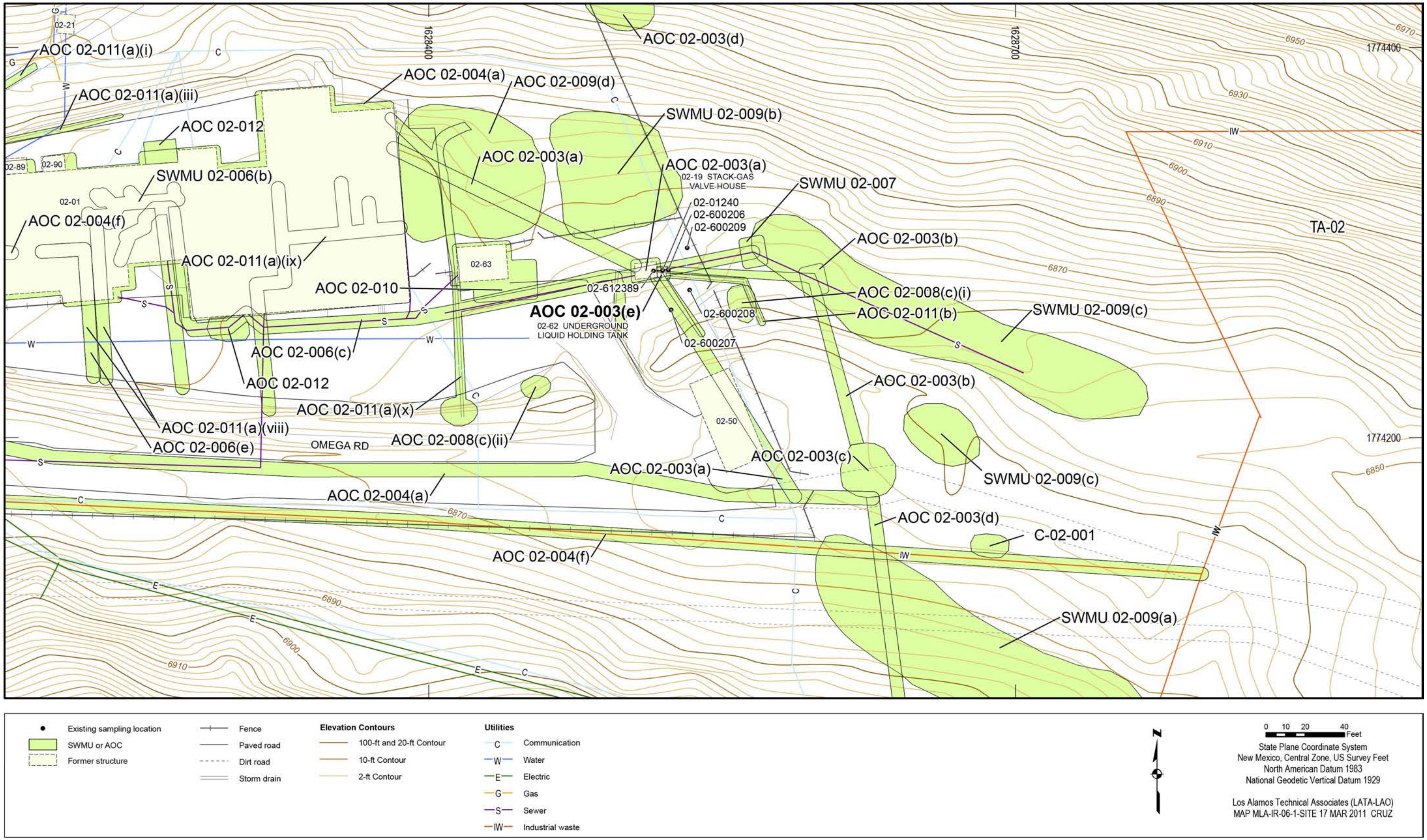

Figure 6.6-1 Site map of AOC 02-003(e)

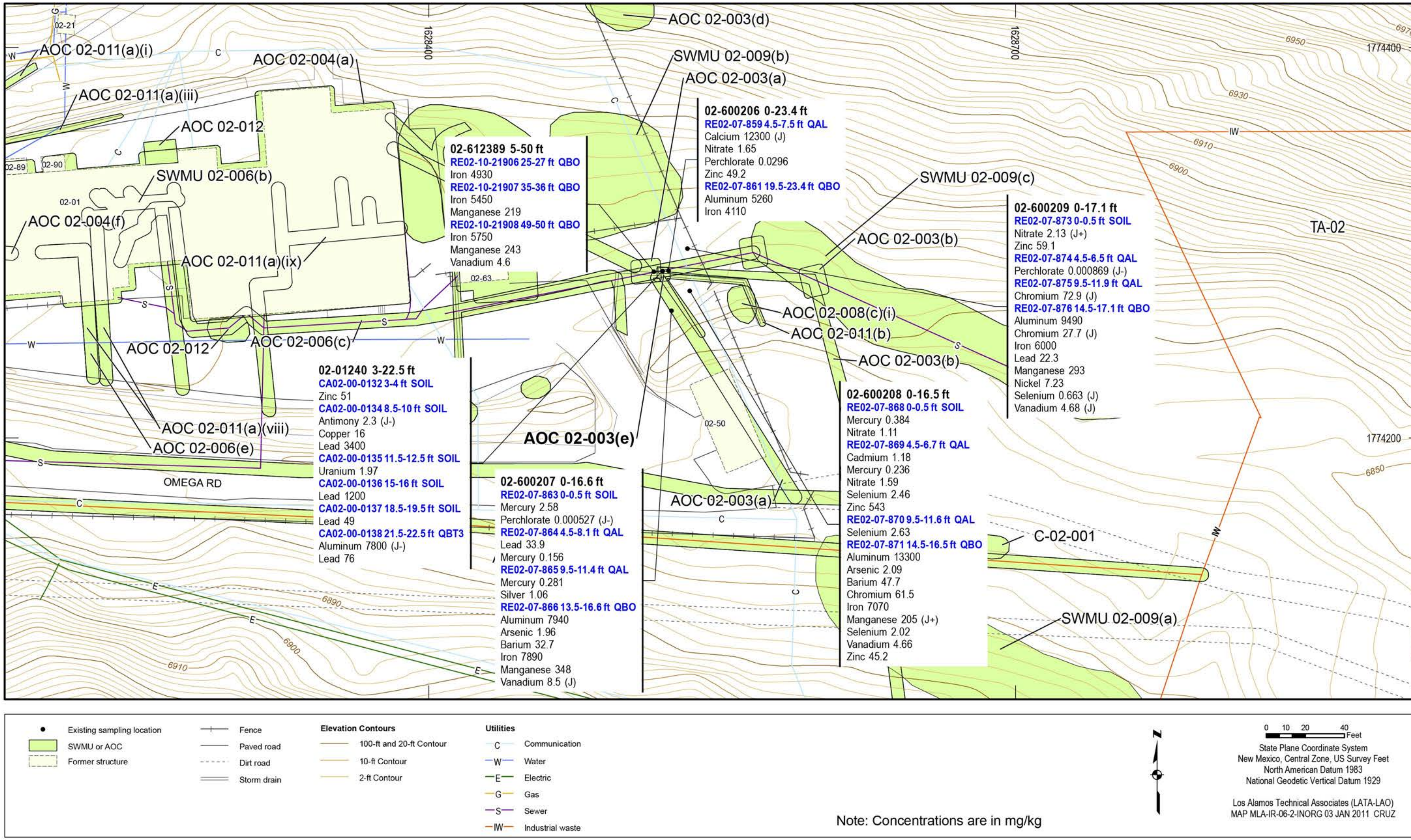

Figure 6.6-2 Inorganic chemicals detected or detected above BVs at AOC 02-003(e)

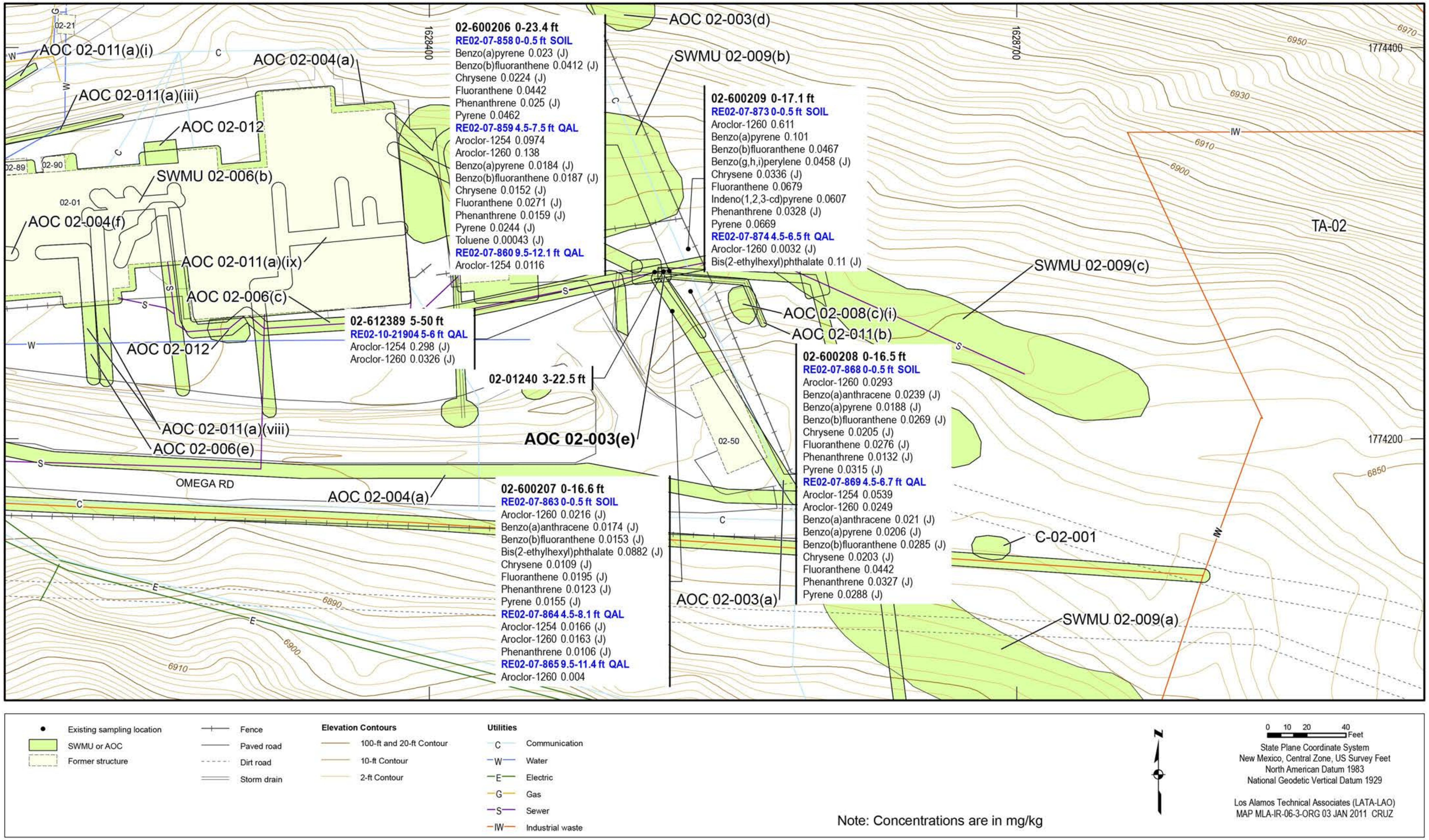

Figure 6.6-3 Organic chemicals detected at AOC 02-003(e)

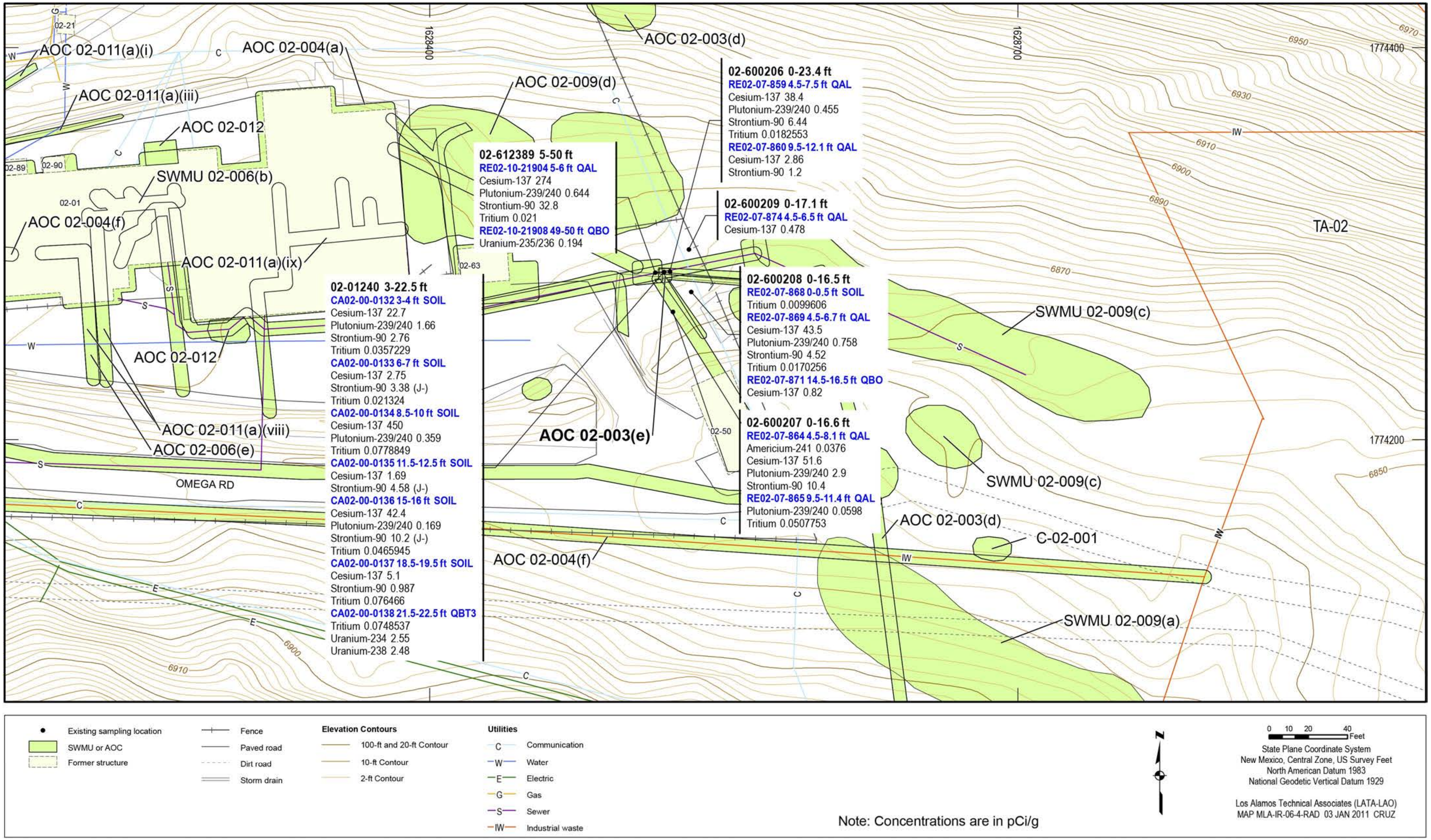

Figure 6.6-4 Radionuclides detected or detected above BVs/FVs at AOC 02-003(e)

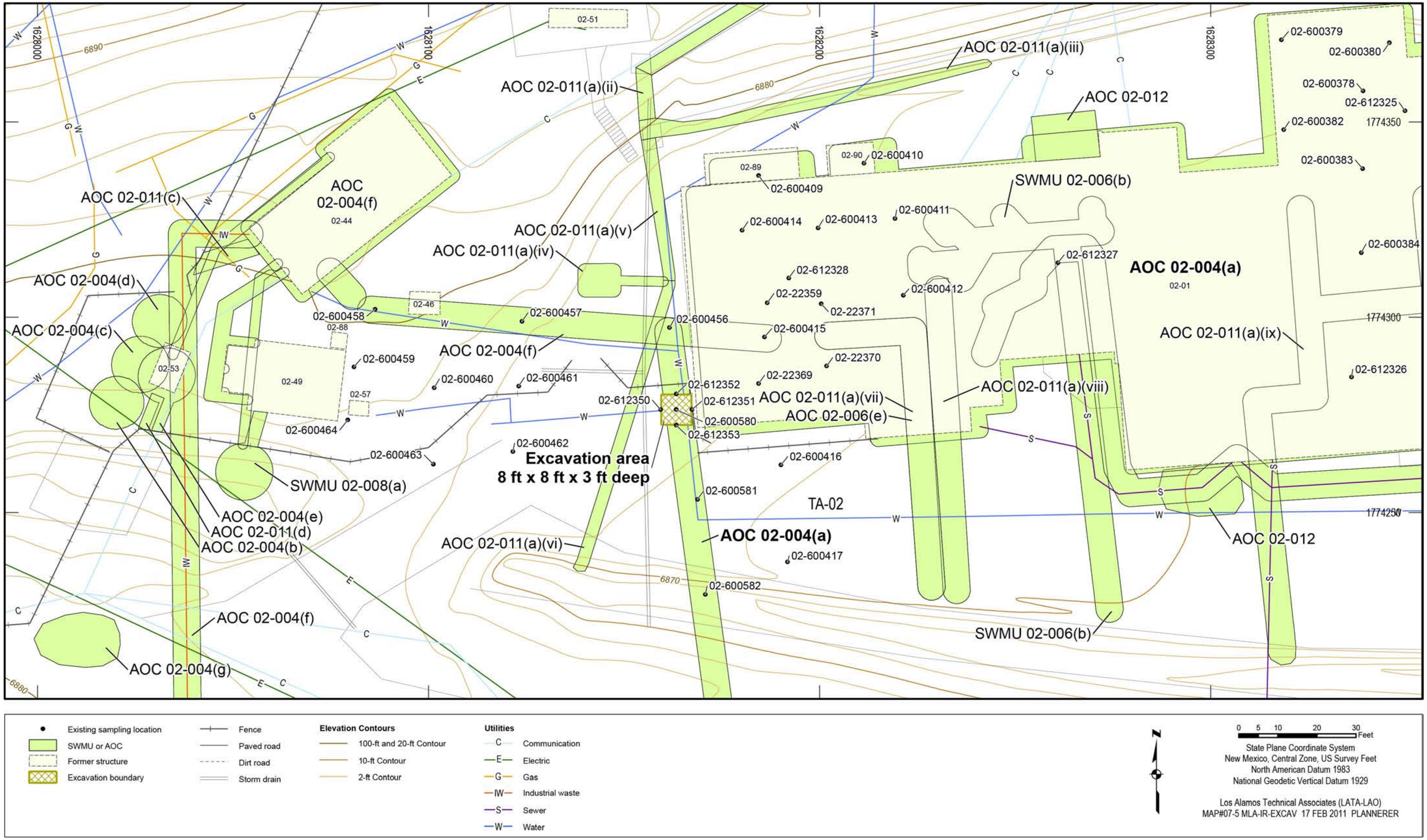

Figure 6.7-1 Excavation at AOC 02-004(a)

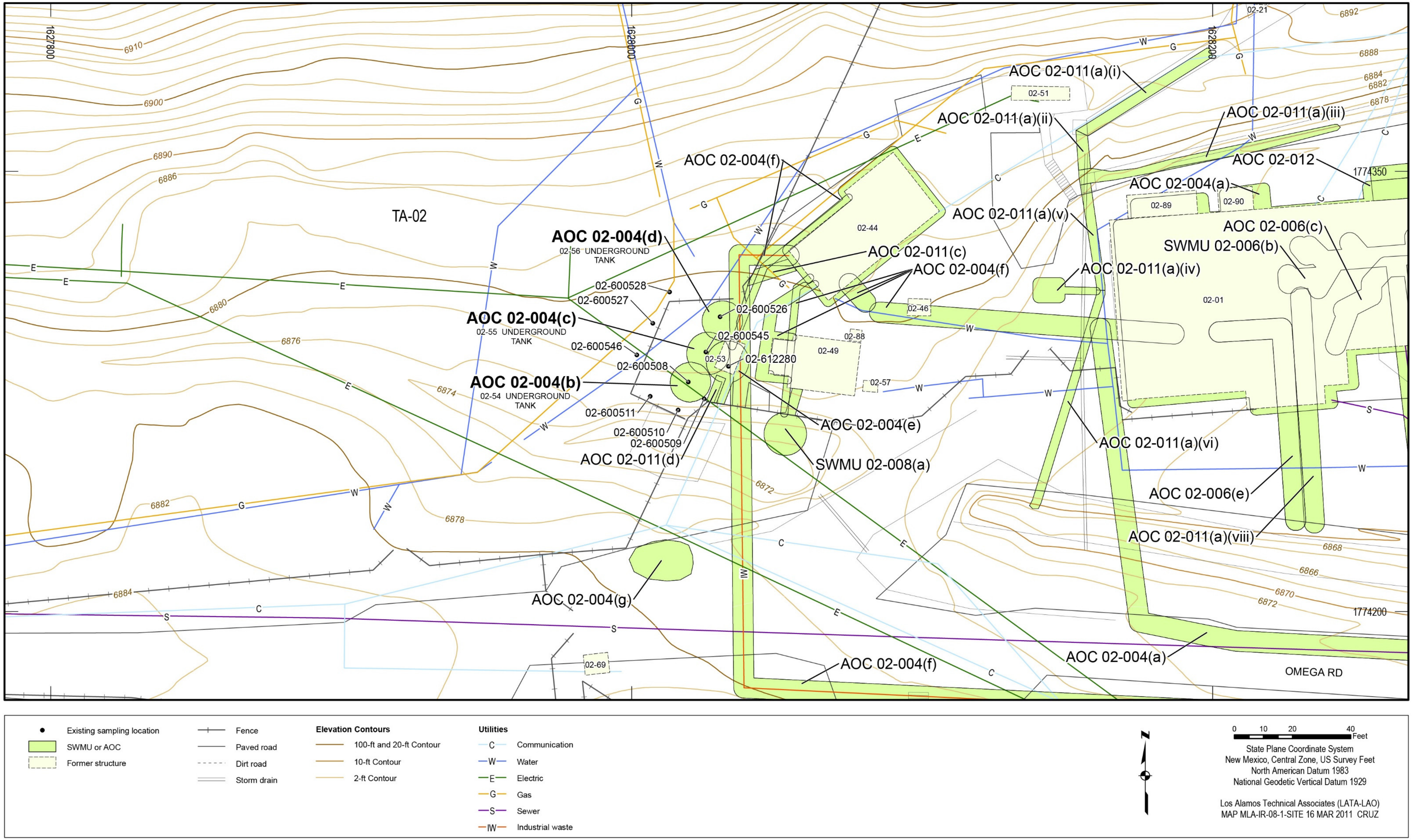

Figure 6.8-1 Site map of AOCs 02-004(b,c,d)

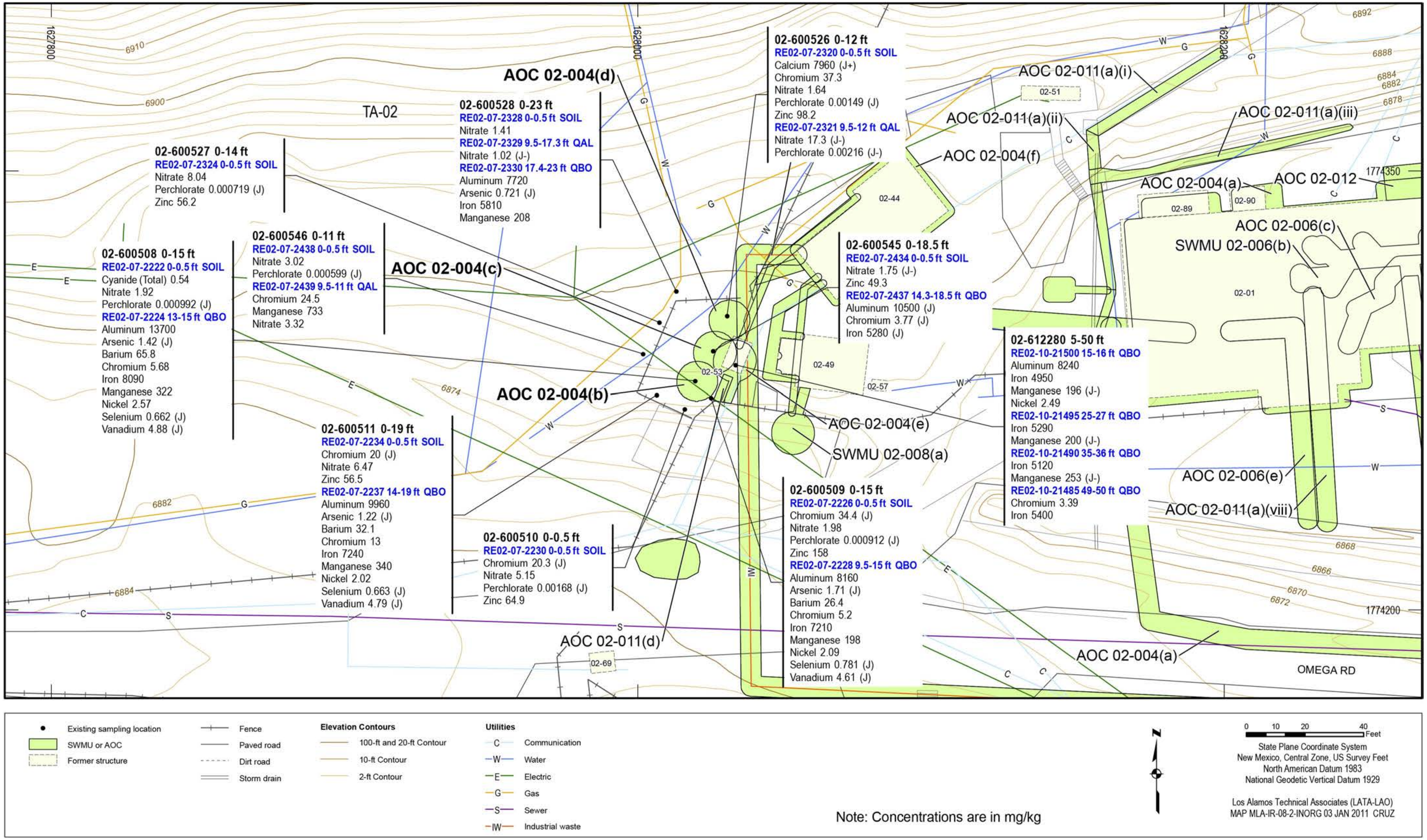

Figure 6.8-2 Inorganic chemicals detected or detected above BVs at AOCs 02-004(b,c,d)

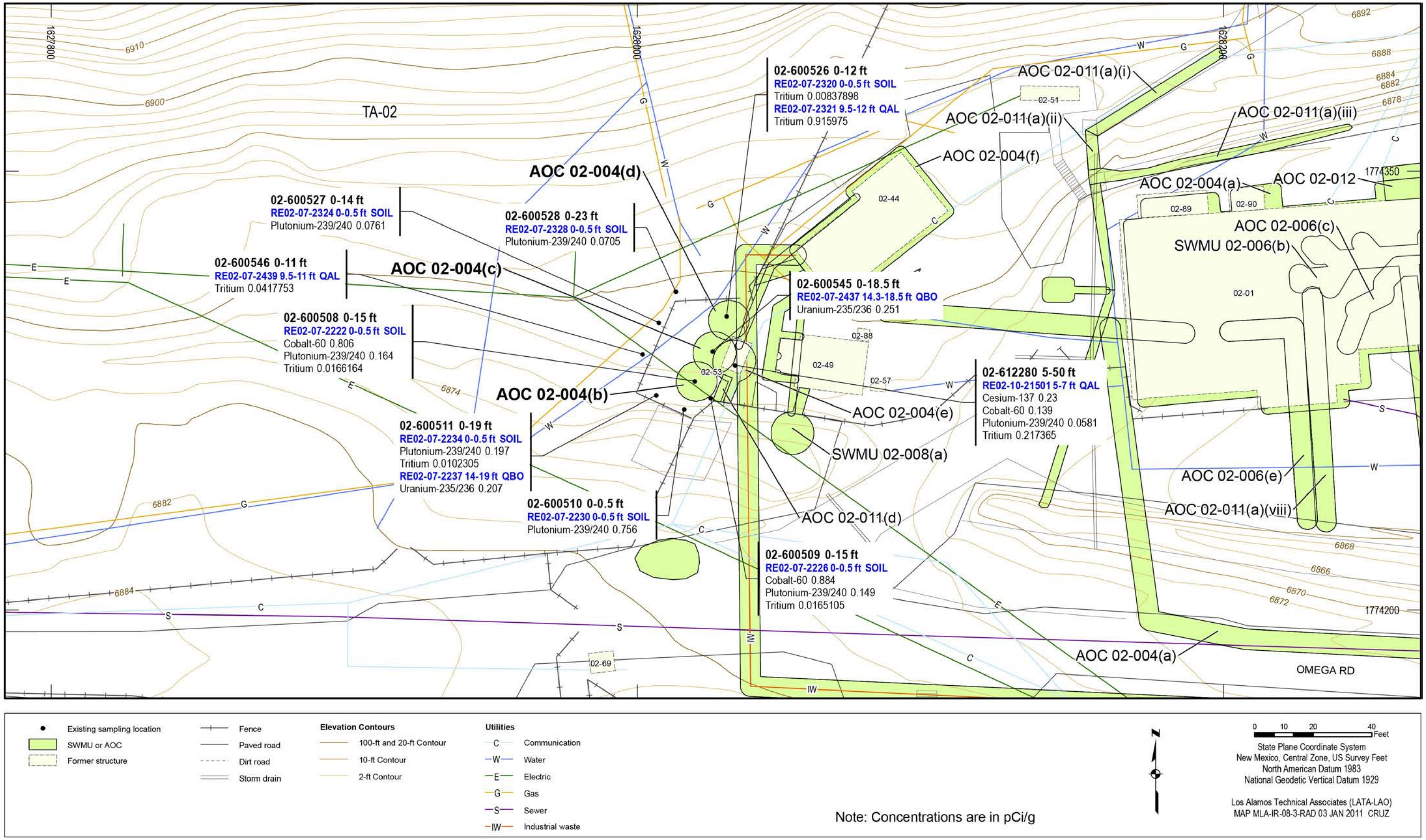

Figure 6.8-3 Radionuclides detected or detected above BVs/FVs at AOCs 02-004(b,c,d)

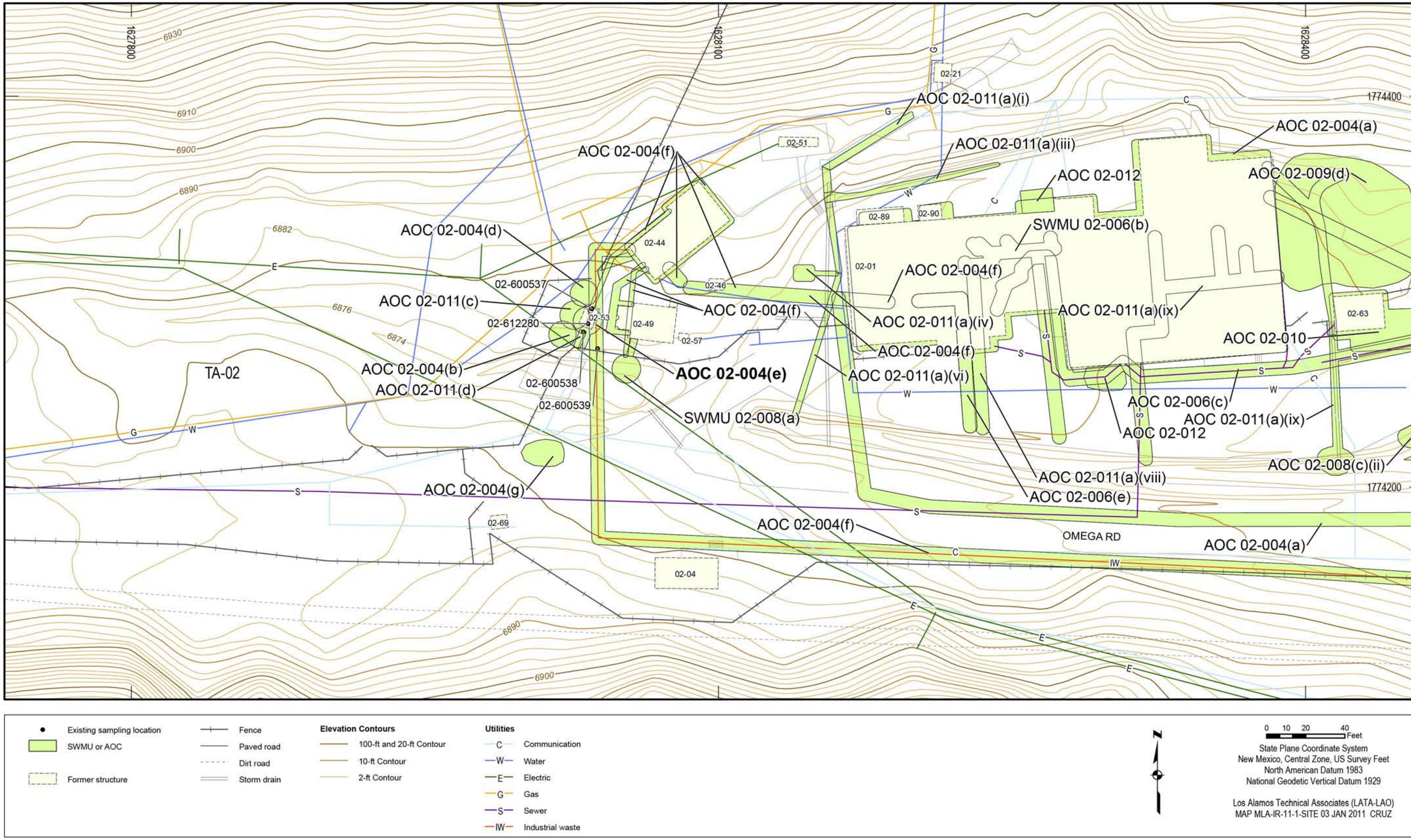

Figure 6.11-1 Site map of AOC 02-004(e)

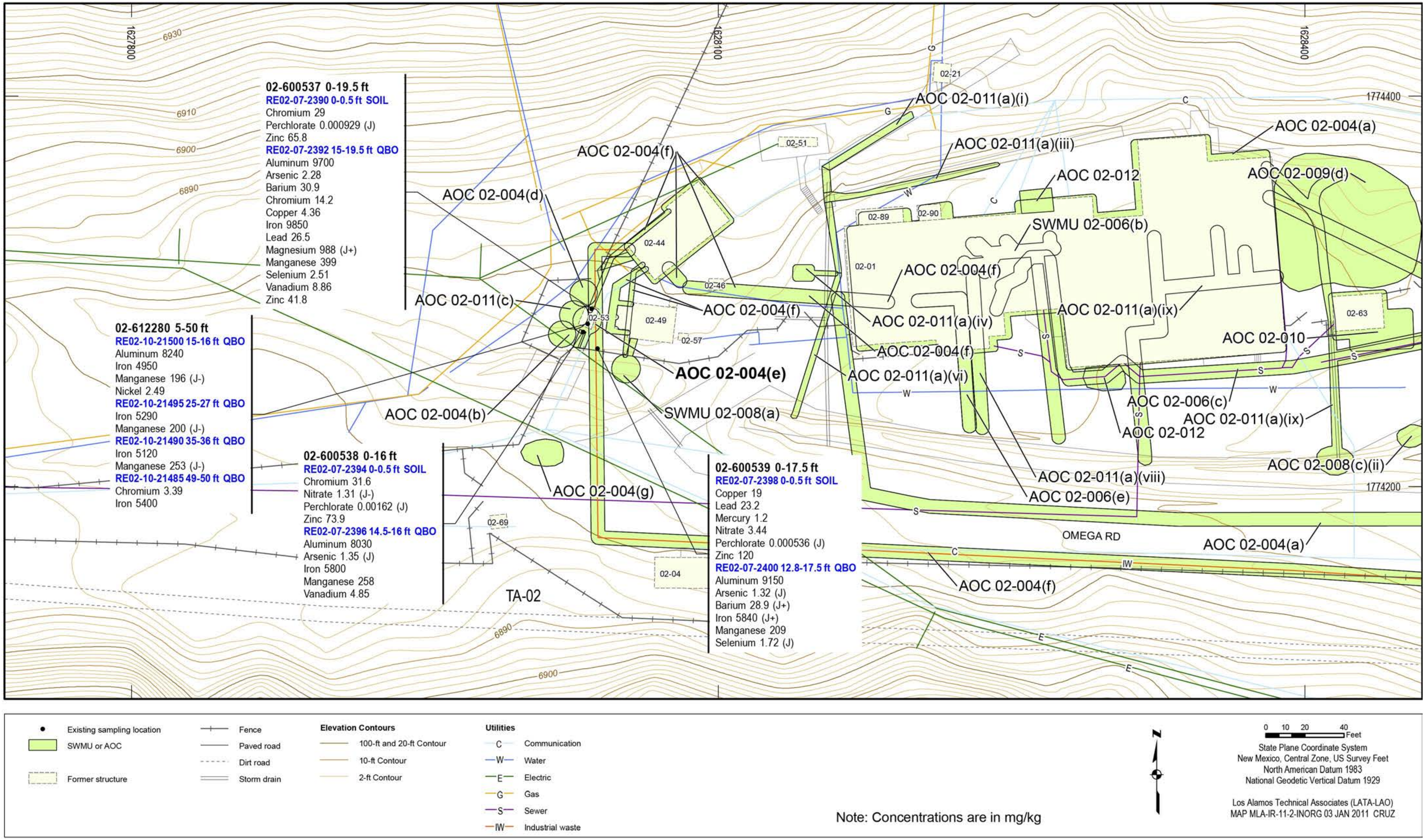

Figure 6.11-2 Inorganic chemicals detected or detected above BVs at AOC 02-004(e)

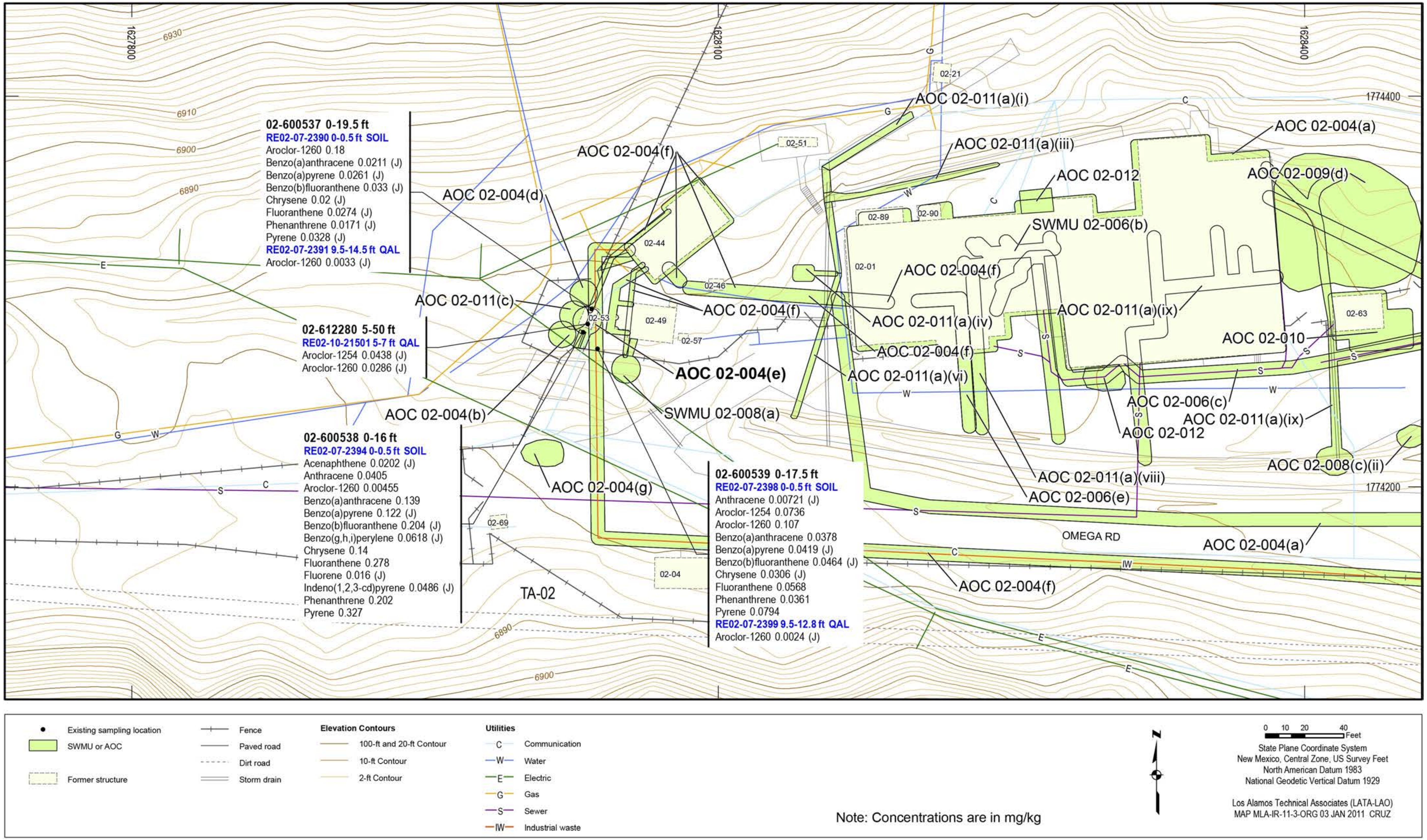

Figure 6.11-3 Organic chemicals detected at AOC 02-004(e)

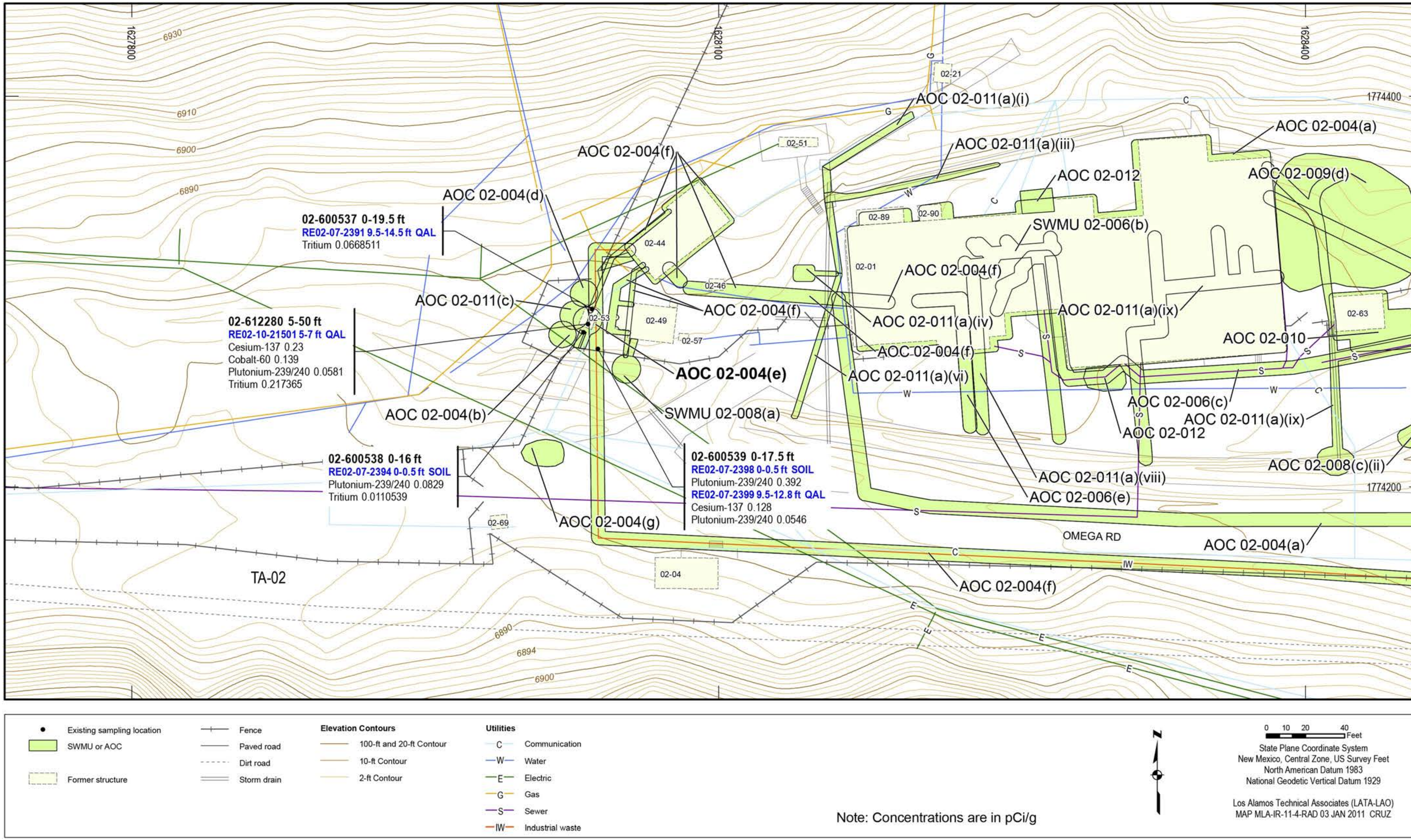

Figure 6.11-4 Radionuclides detected or detected above BVs/FVs at AOC 02-004(e)

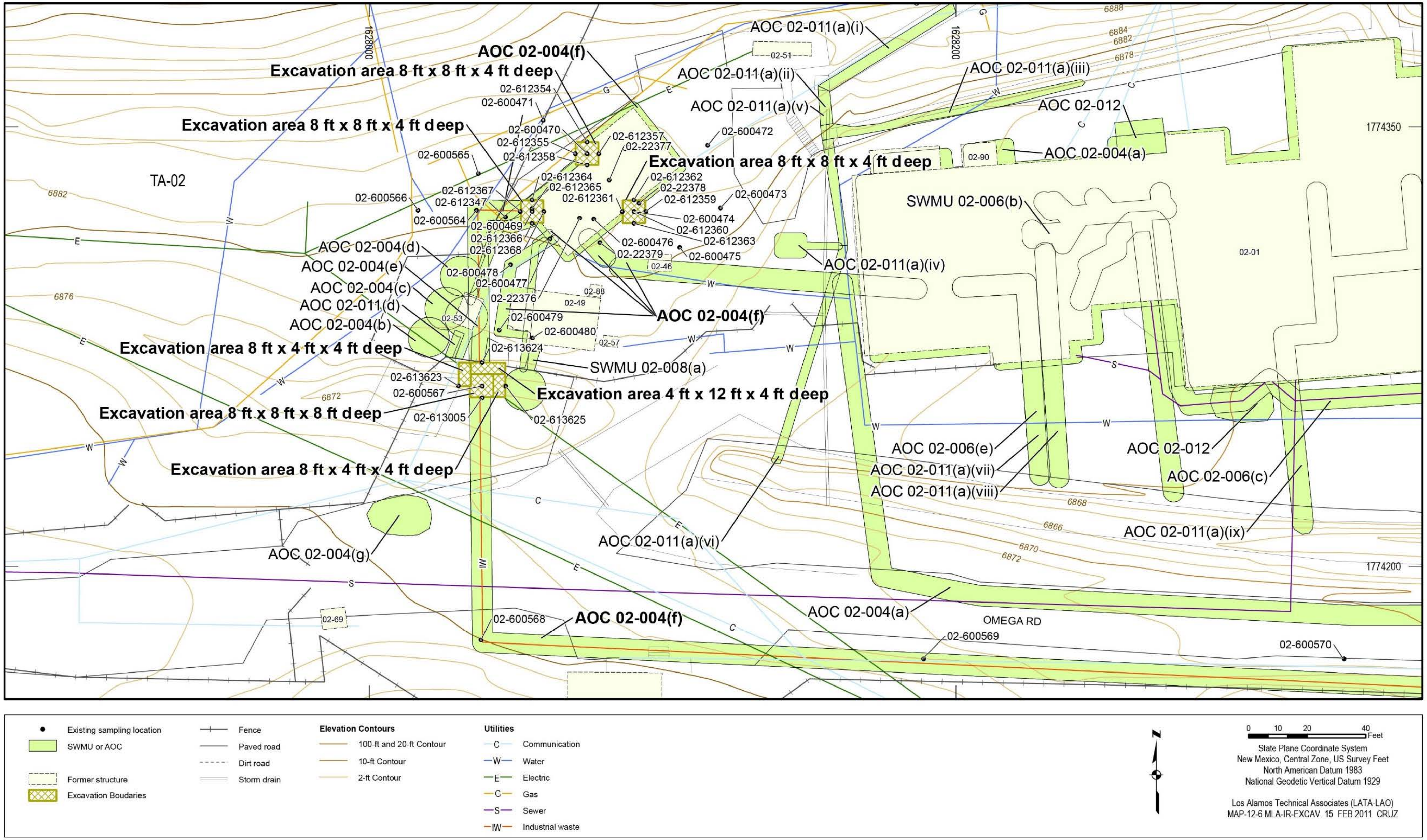

Figure 6.12-1 Excavations at AOC 02-004(f)

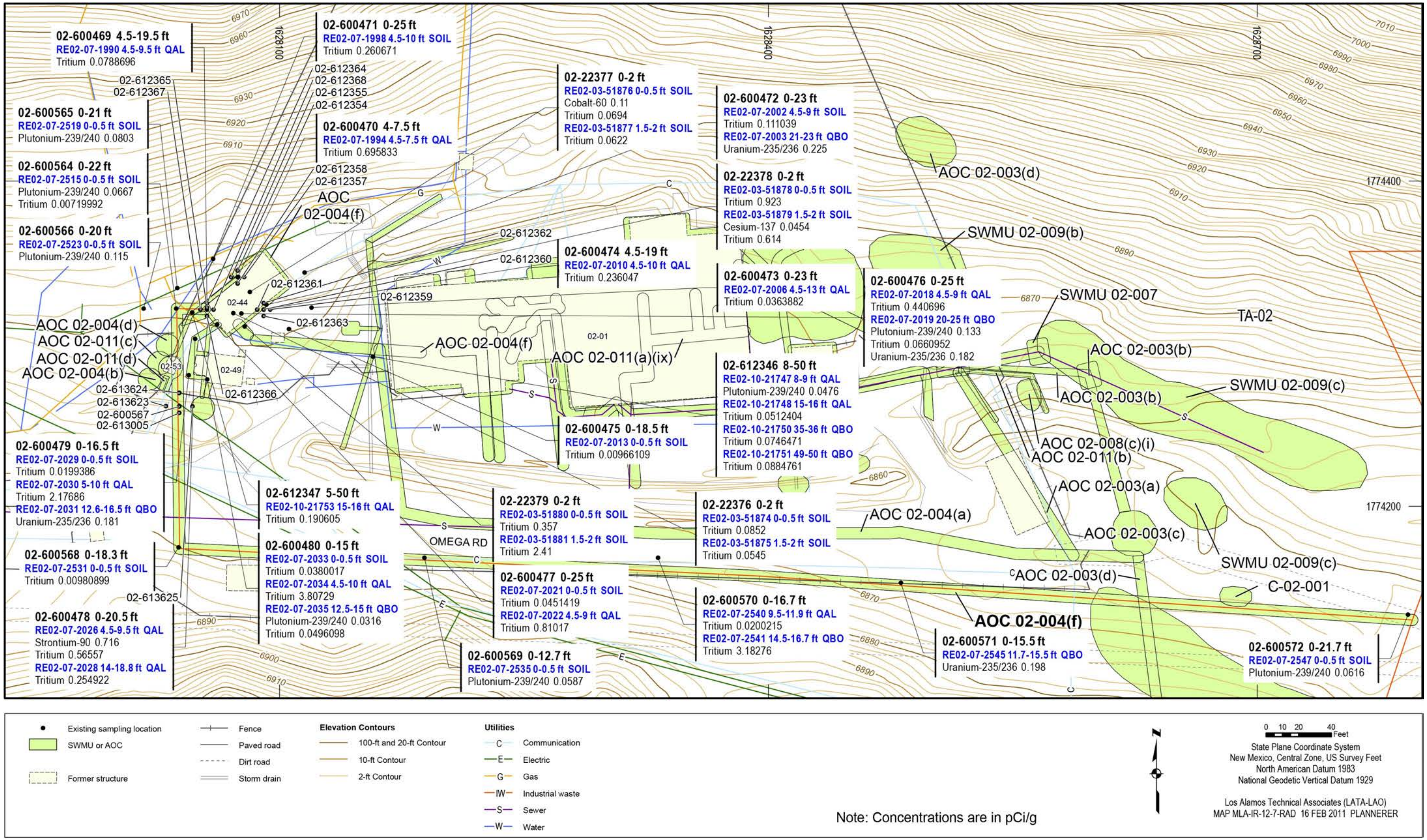

Figure 6.12-2 Radionuclides detected or detected above BVs/FVs at AOC 02-004(f)

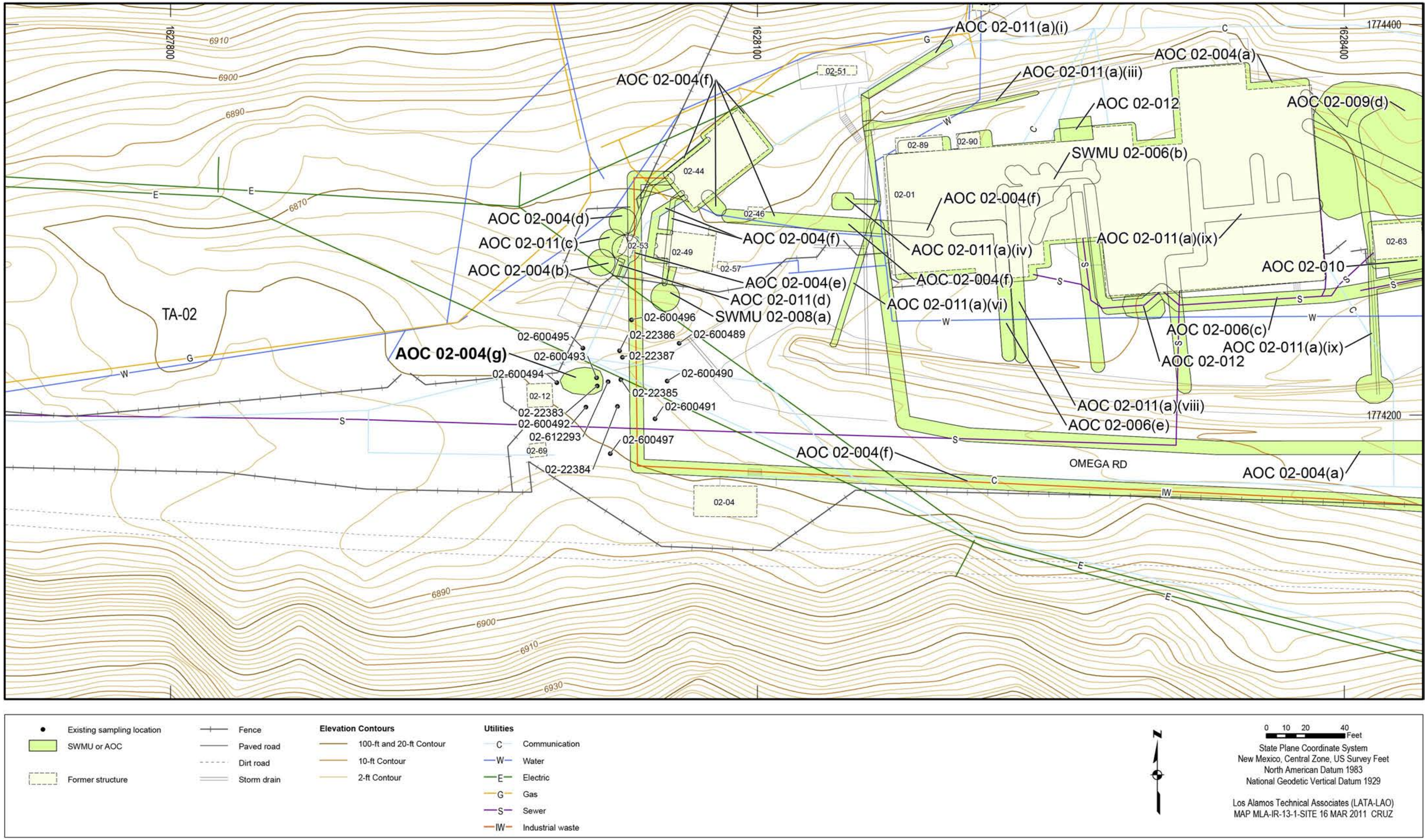

Figure 6.13-1 Site map of AOC 02-004(g)

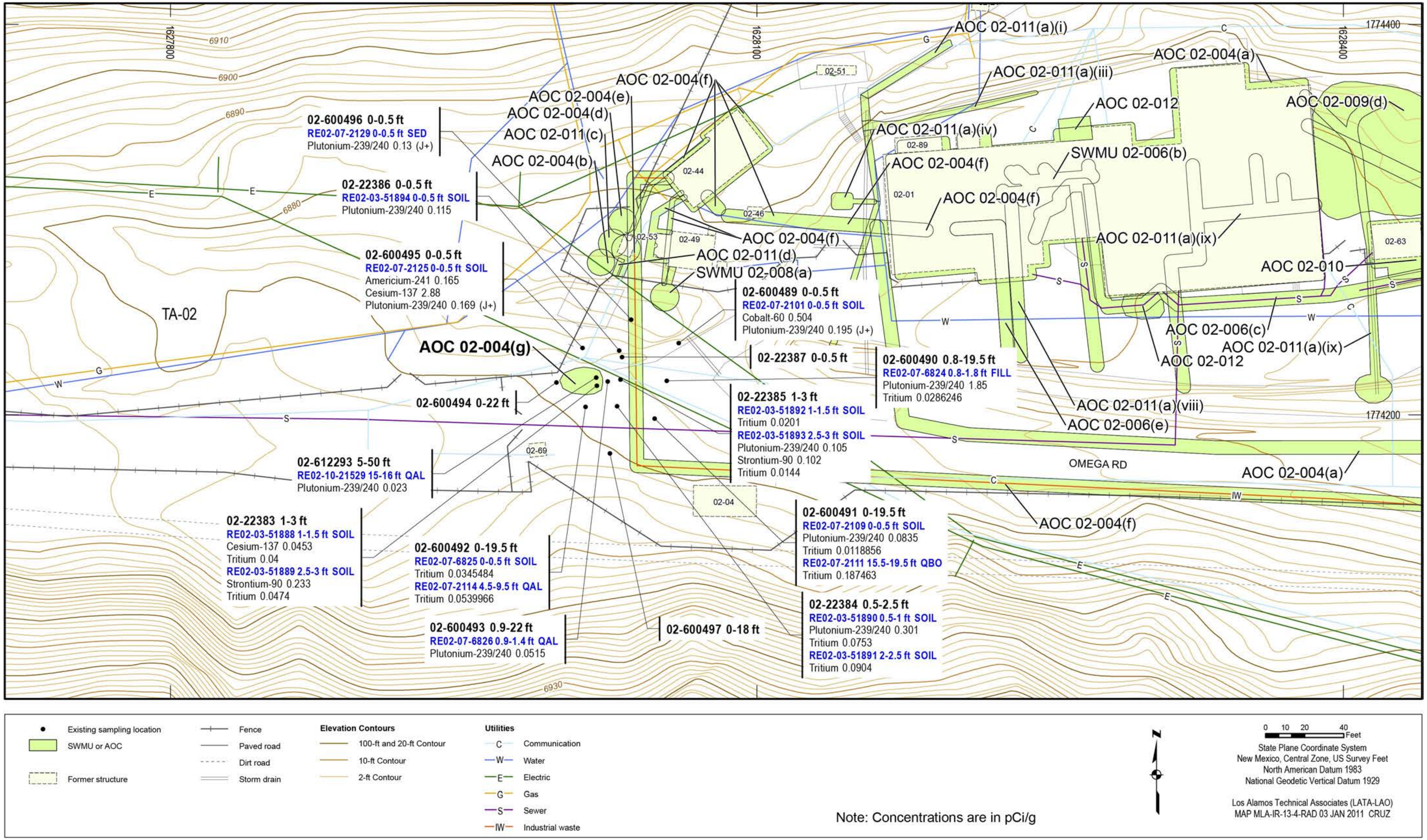

Figure 6.13-2 Radionuclides detected or detected above BVs/FVs at AOC 02-004(g)

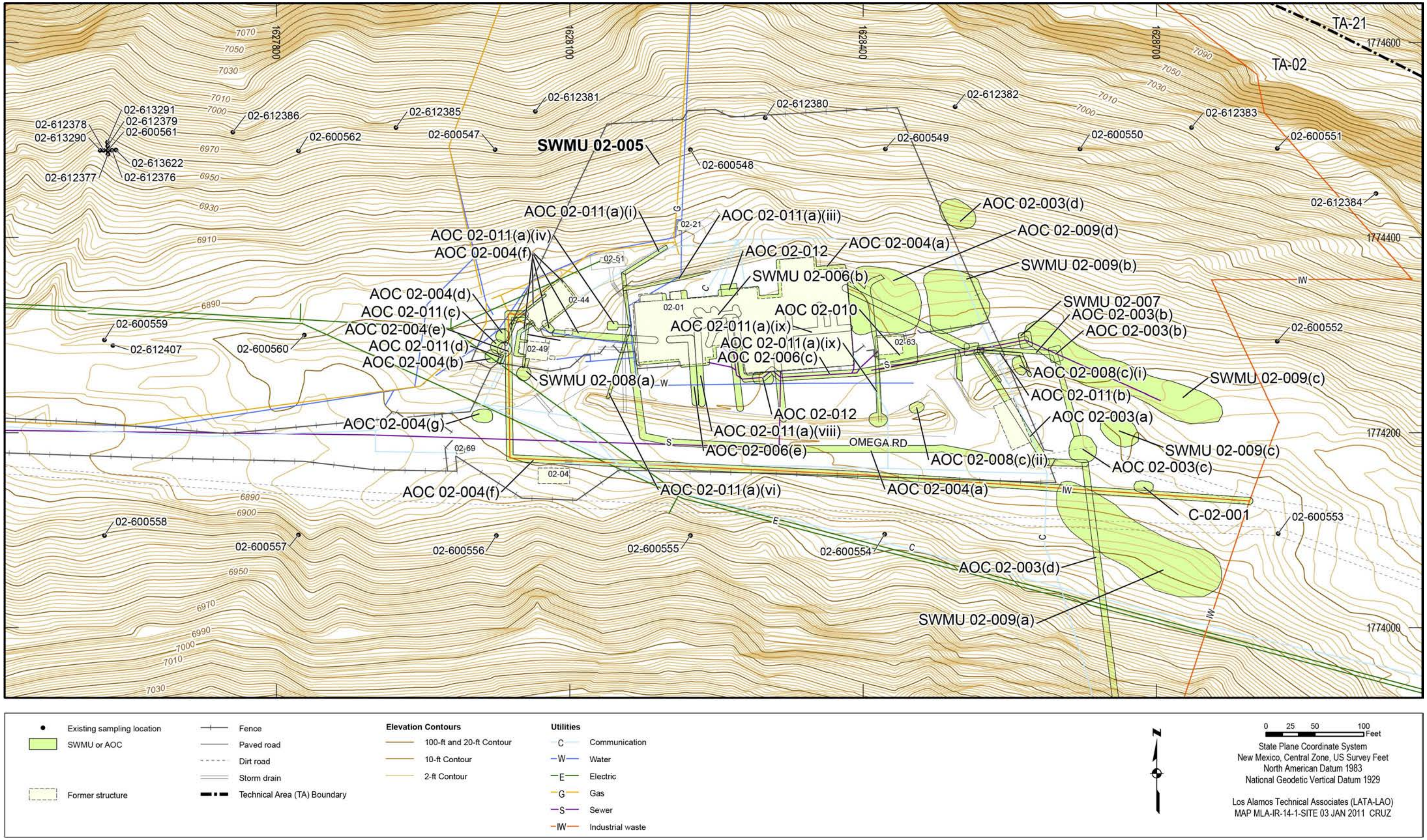

Figure 6.14-1 Site map of SWMU 02-005

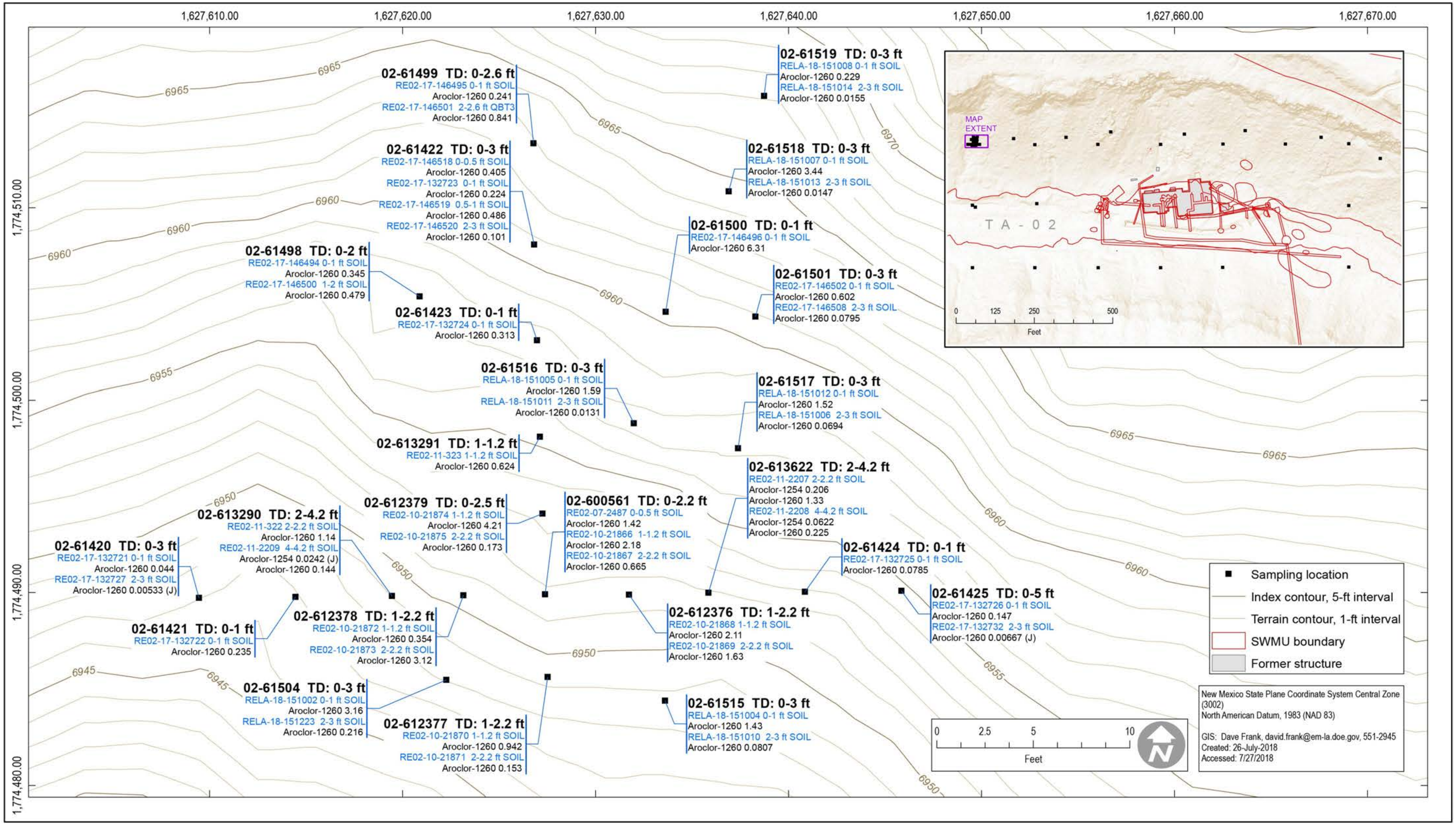

Figure 6.14-2 PCBs detected west of SWMU 02-005

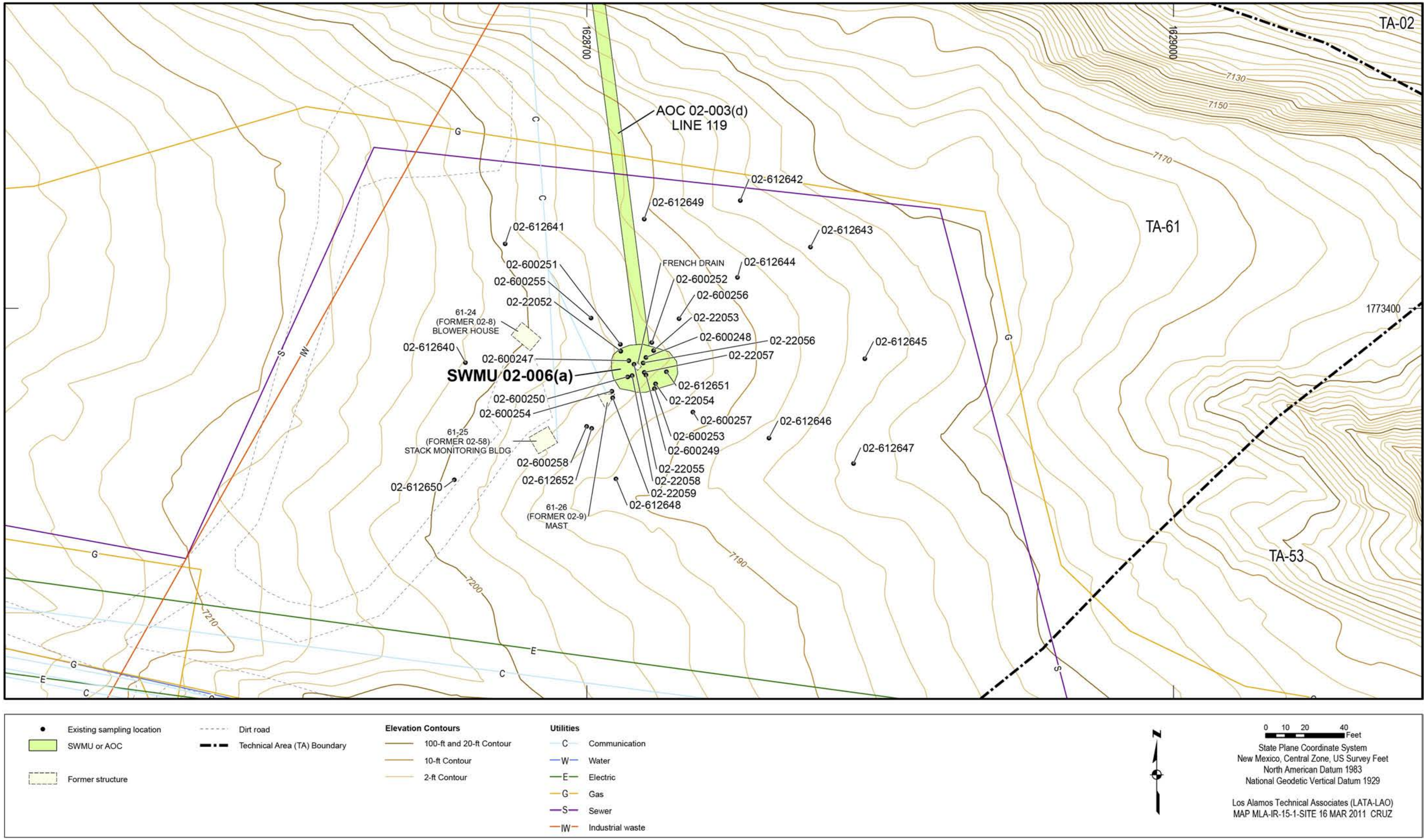

Figure 6.15-1 Site map of SWMU 02-006(a)

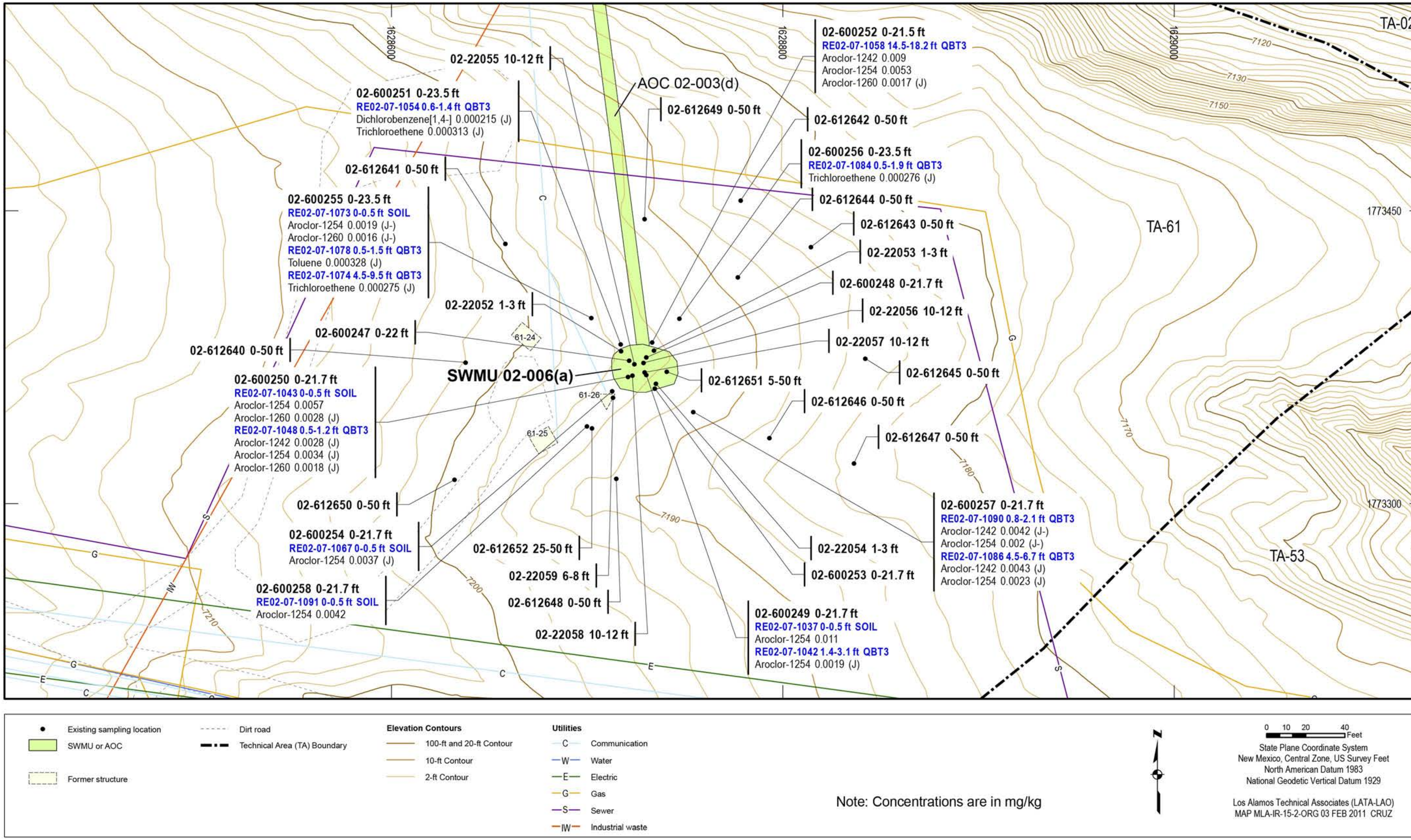

Figure 6.15-2 Organic chemicals detected at SWMU 02-006(a)

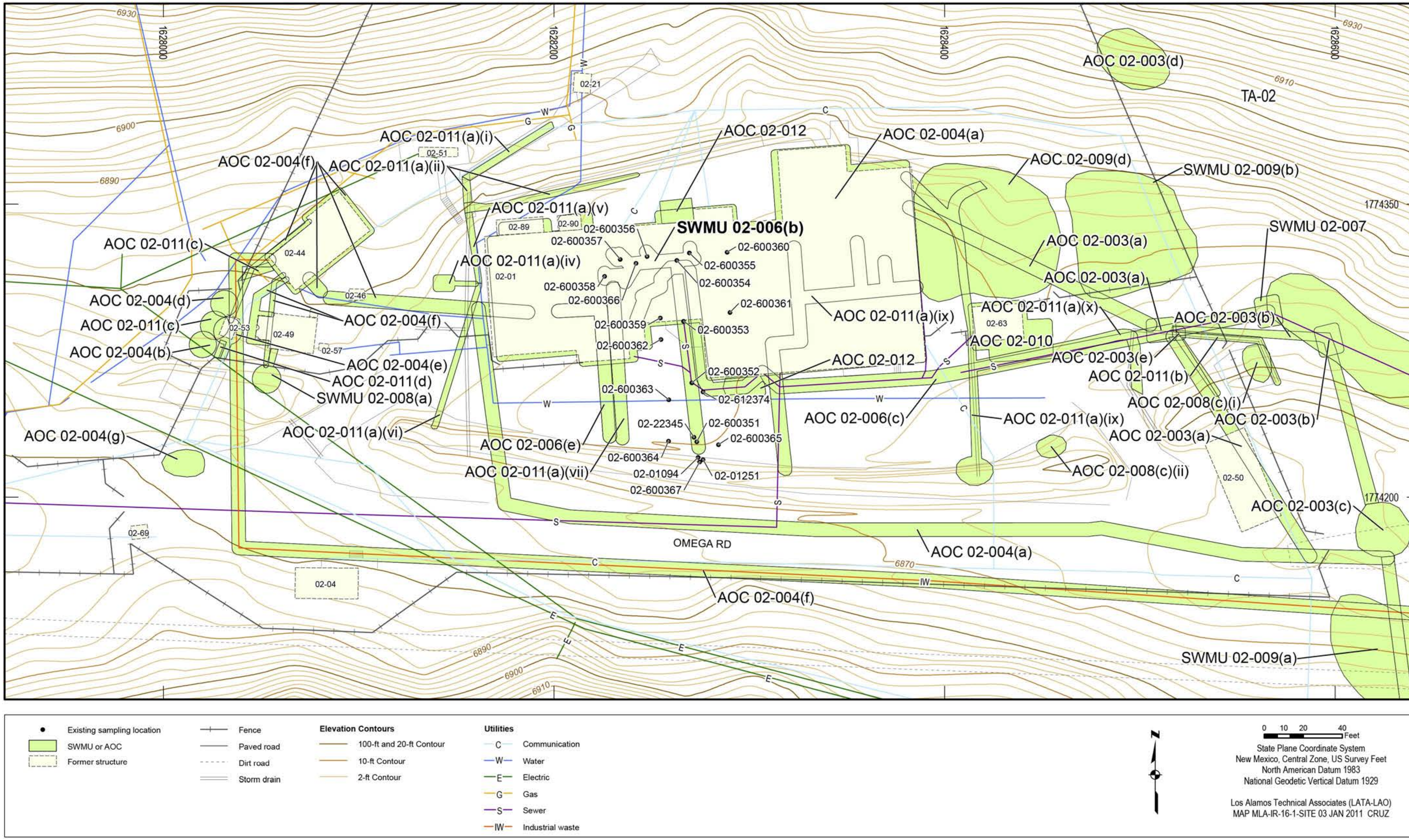

Figure 6.16-1 Site map of SWMU 02-006(b)

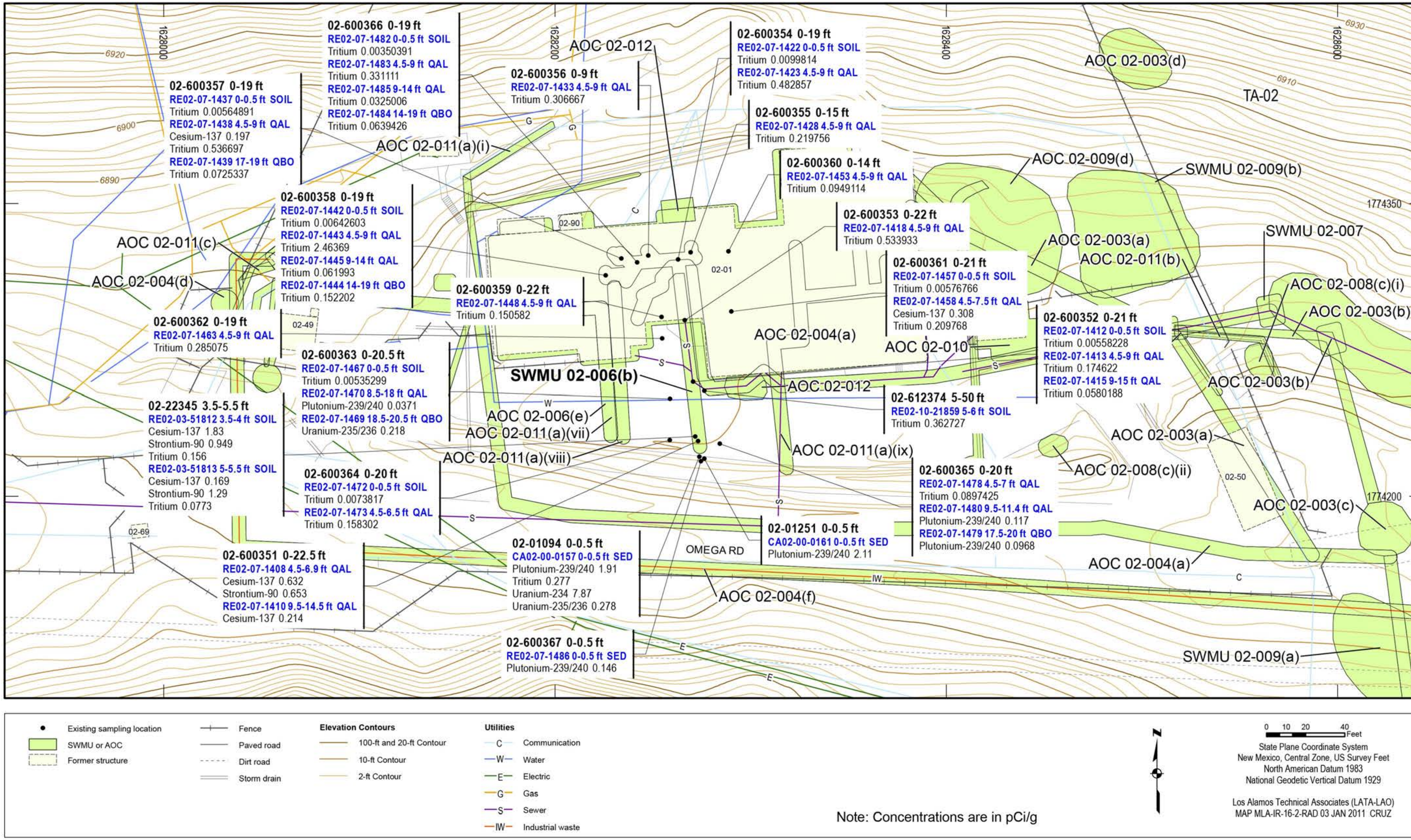

Figure 6.16-2 Radionuclides detected or detected above BVs/FVs at SWMU 02-006(b)

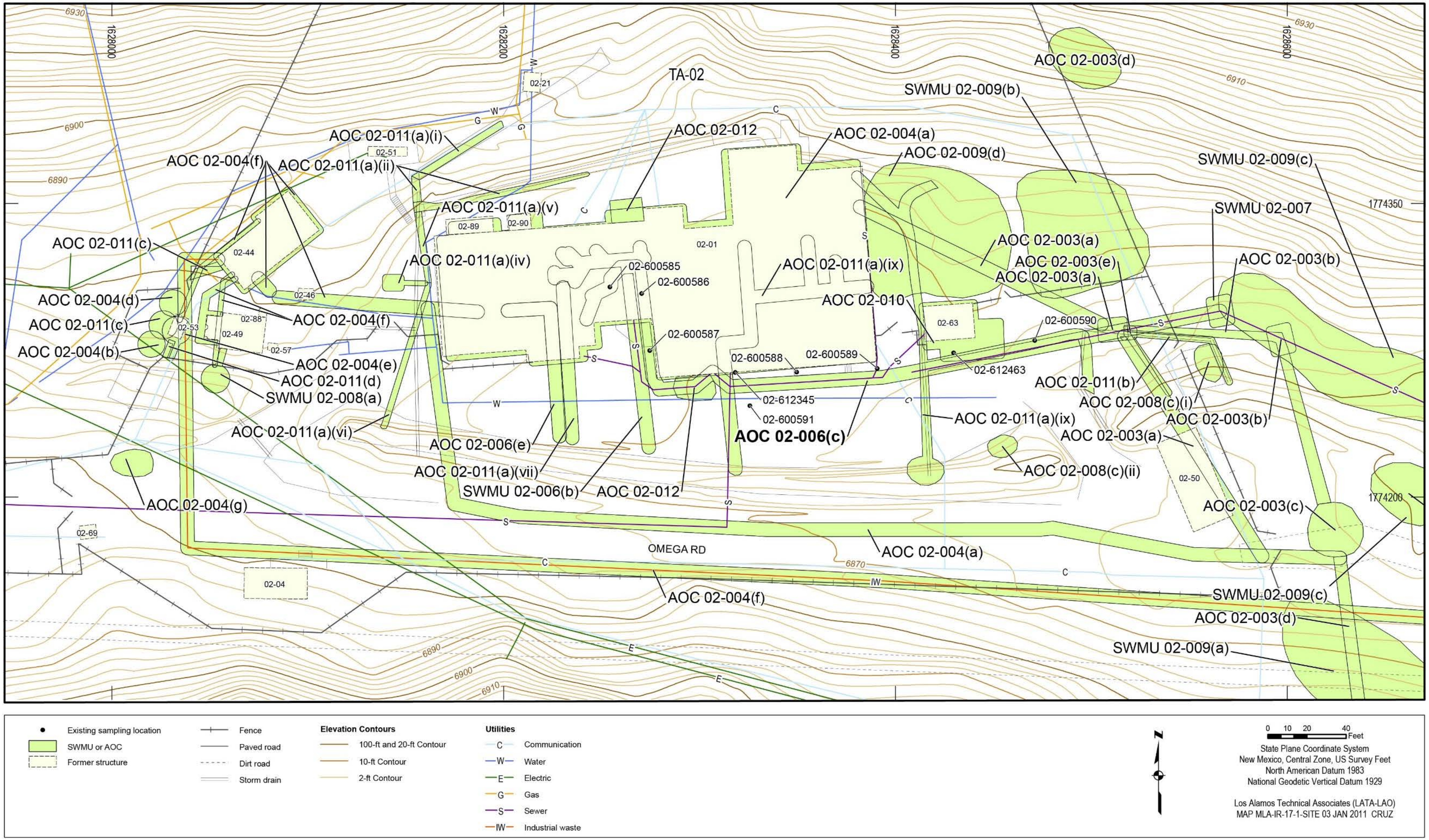

Figure 6.17-1 Site map of AOC 02-006(c)

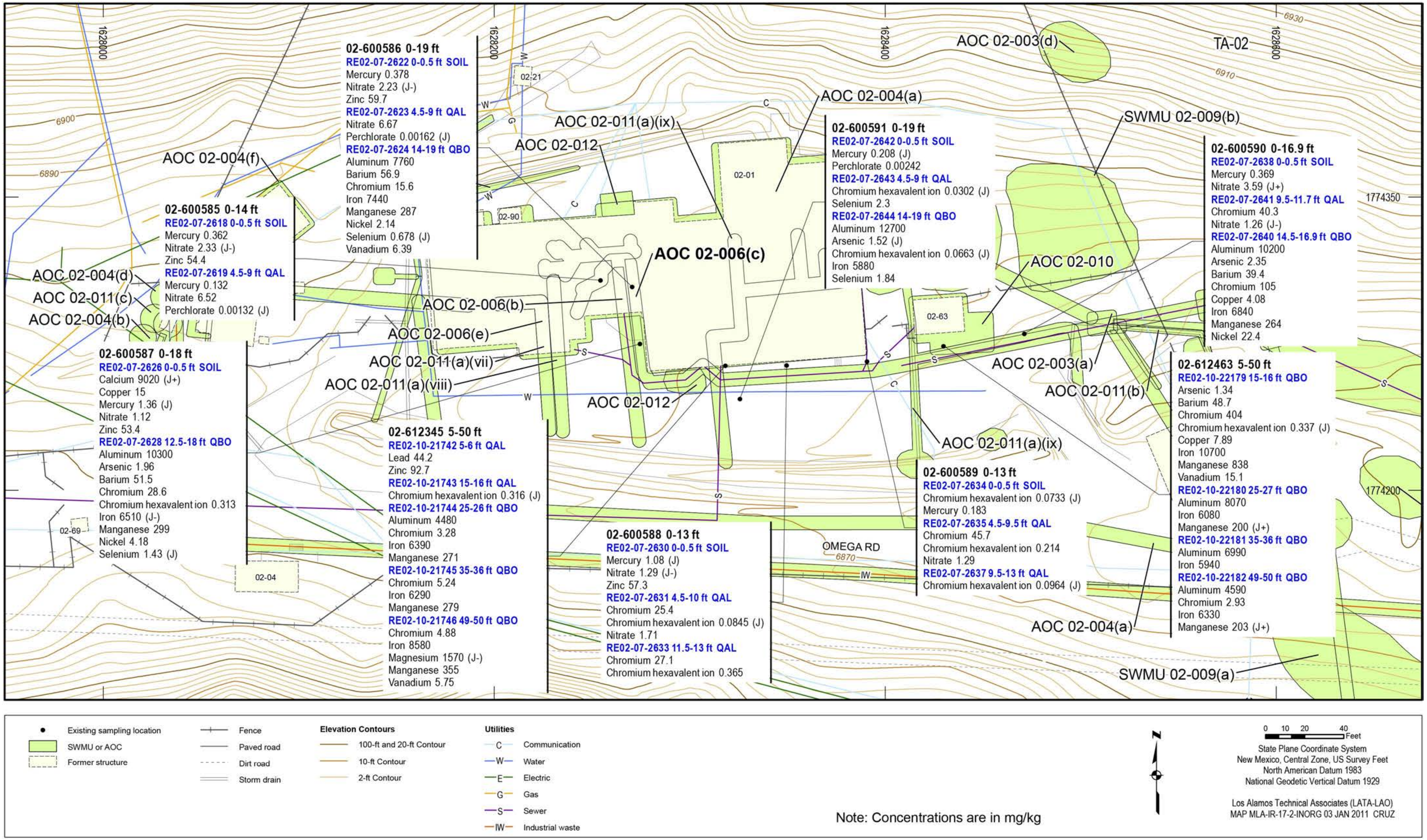

Figure 6.17-2 Inorganic chemicals detected or detected above BVs at AOC 02-006(c)

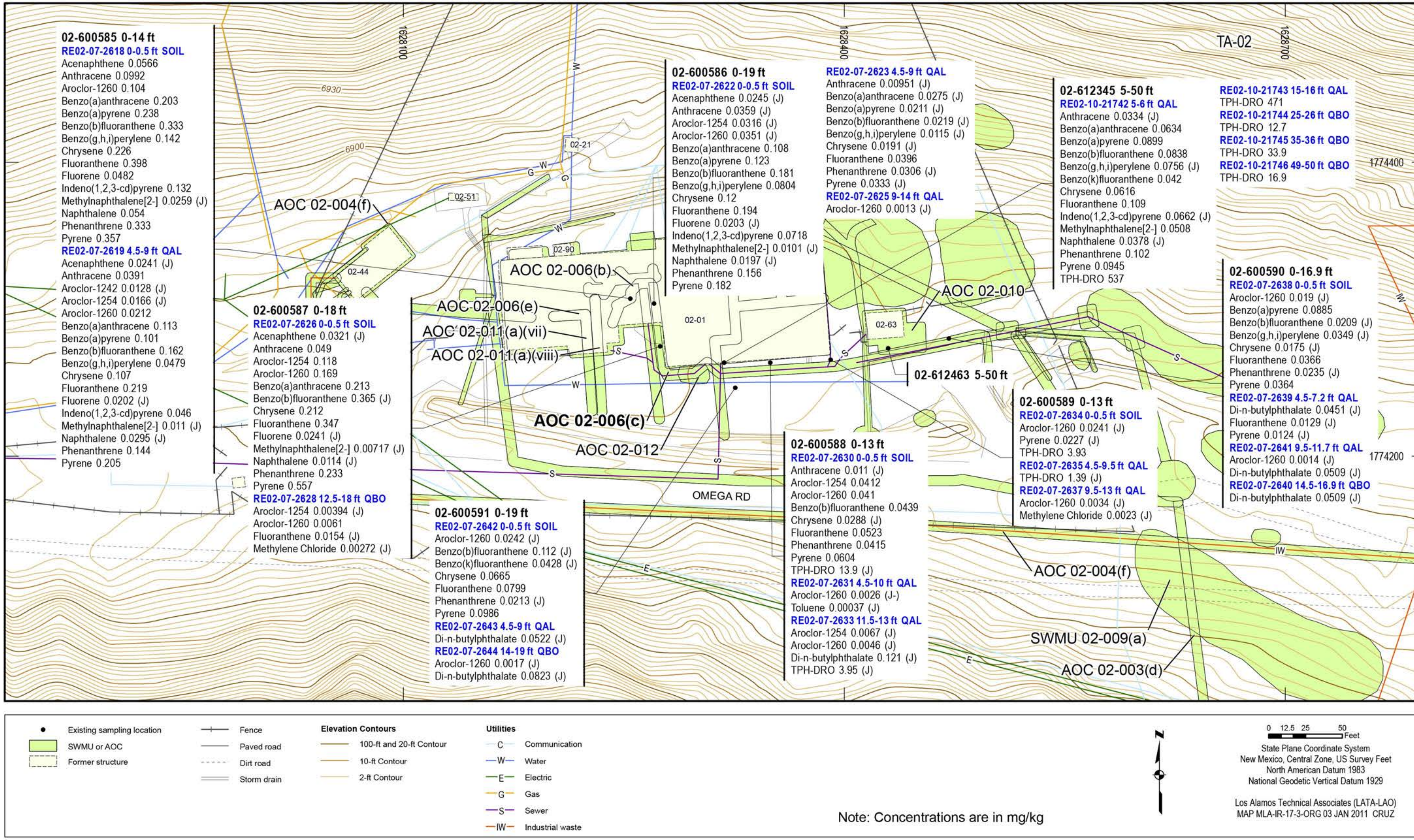

Figure 6.17-3 Organic chemicals detected at AOC 02-006(c)

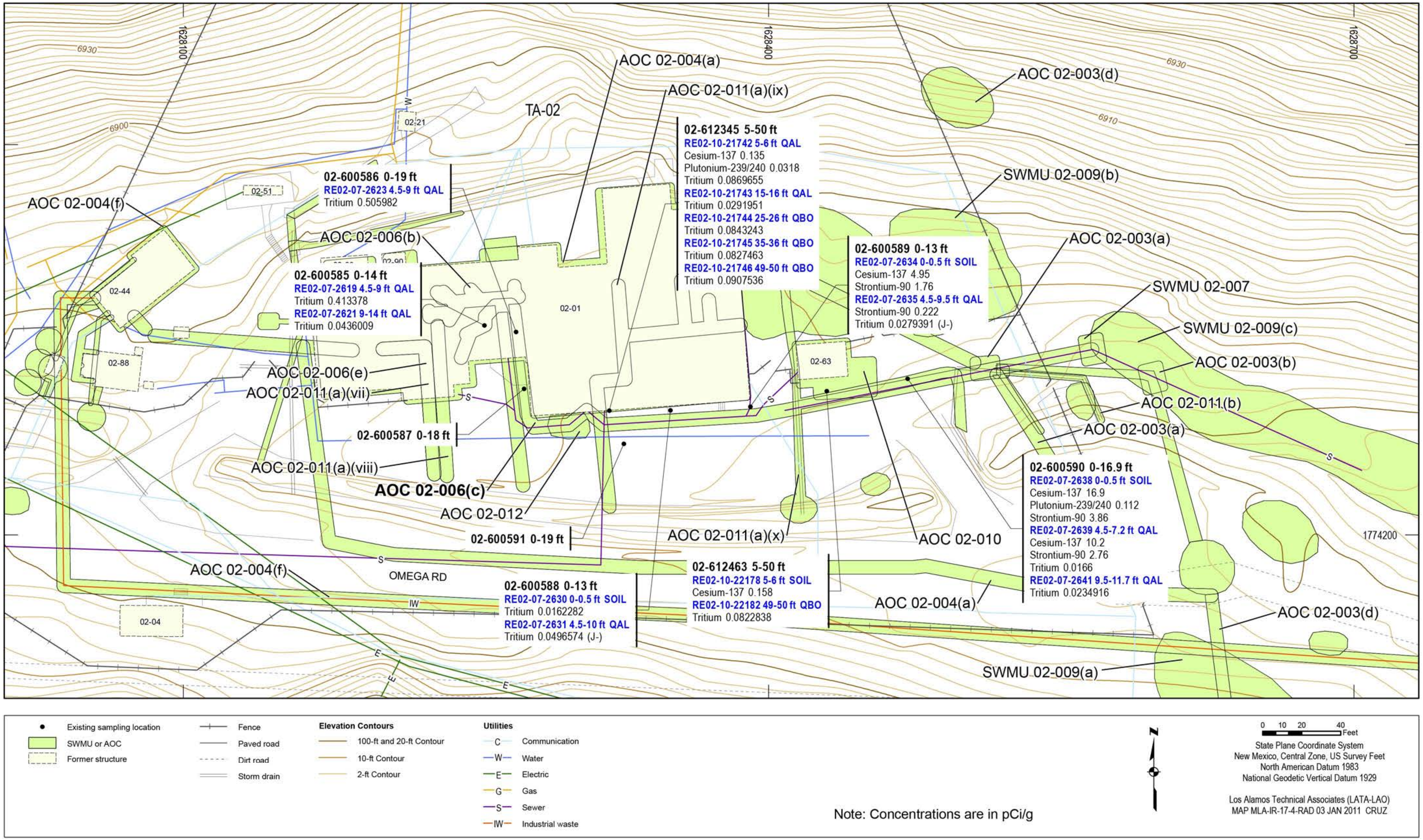

Figure 6.17-4 Radionuclides detected or detected above BVs/FVs at AOC 02-006(c)

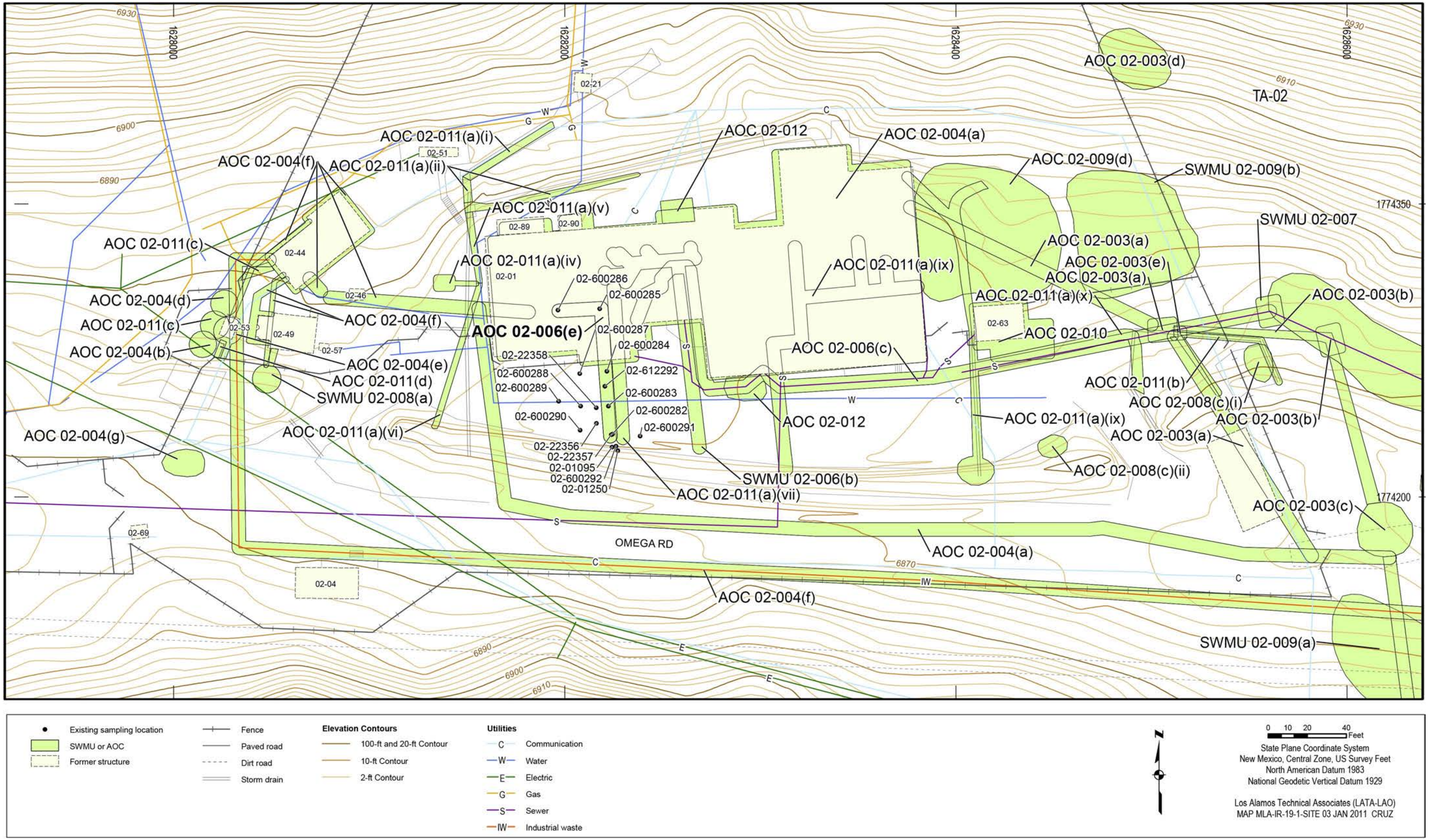

Figure 6.19-1 Site map of AOC 02-006(e)

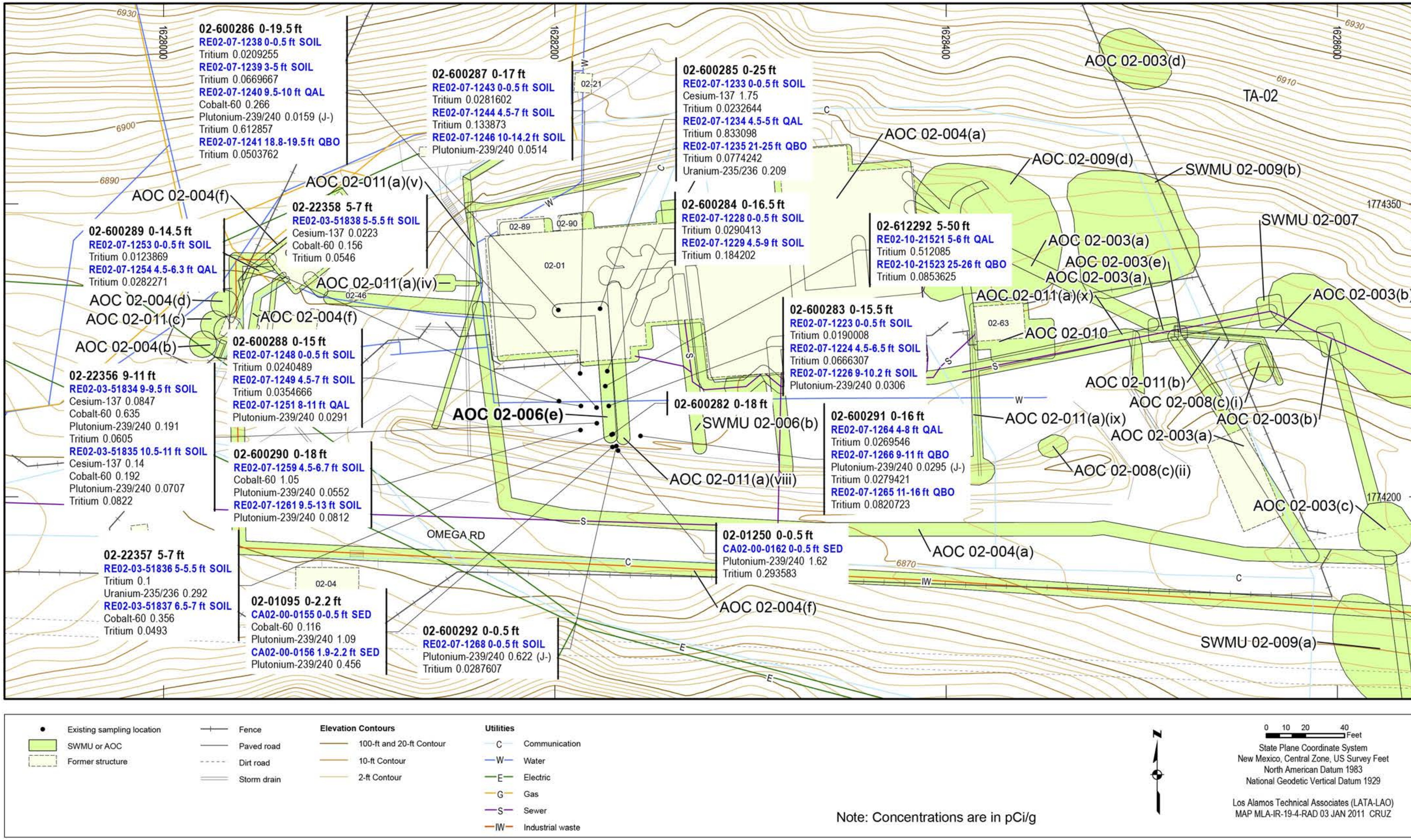

Figure 6.19-2 Radionuclides detected or detected above BVs/FVs at AOC 02-006(e)

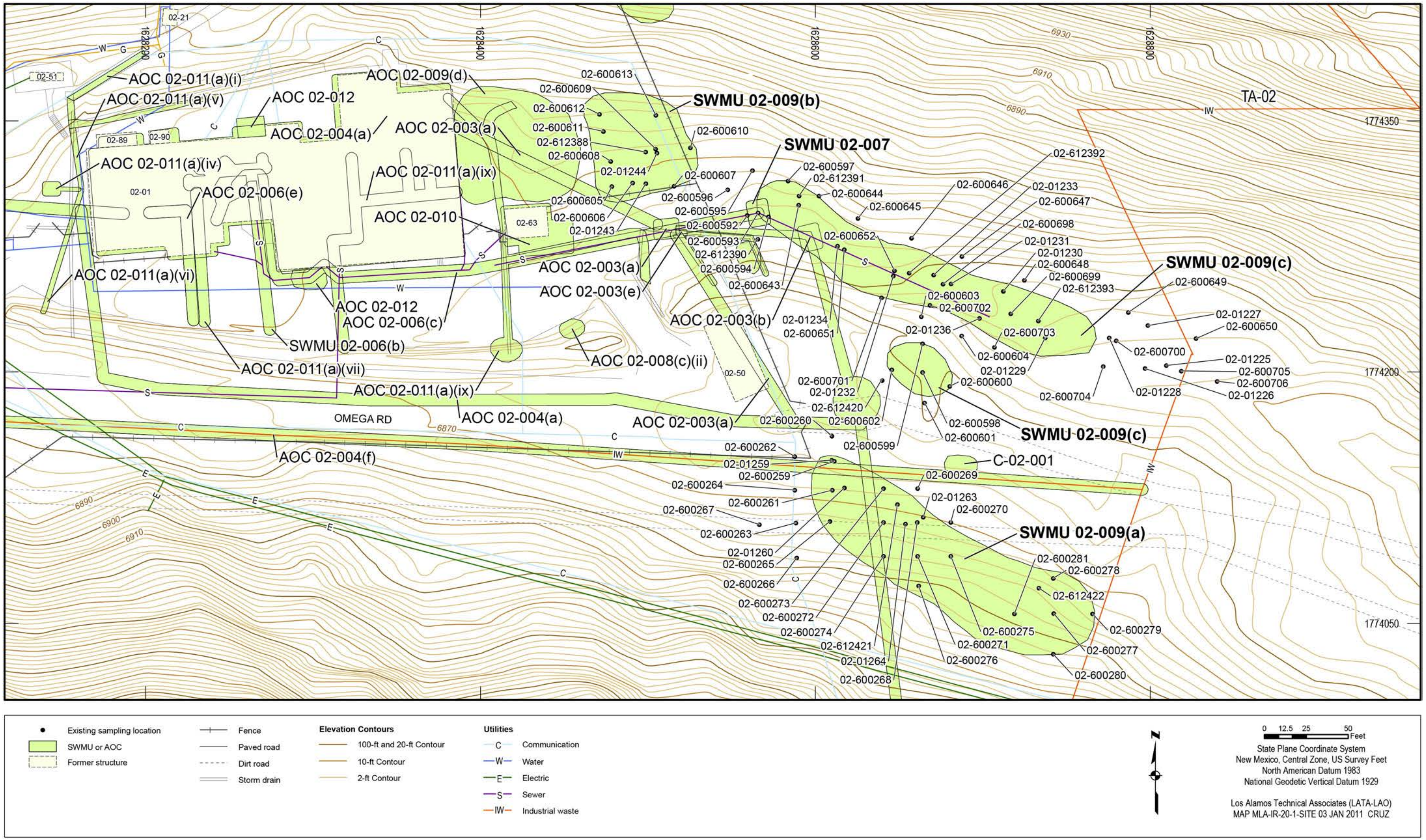

Figure 6.20-1 Site map of SWMUs 02-007 and 02-009(a,b,c)

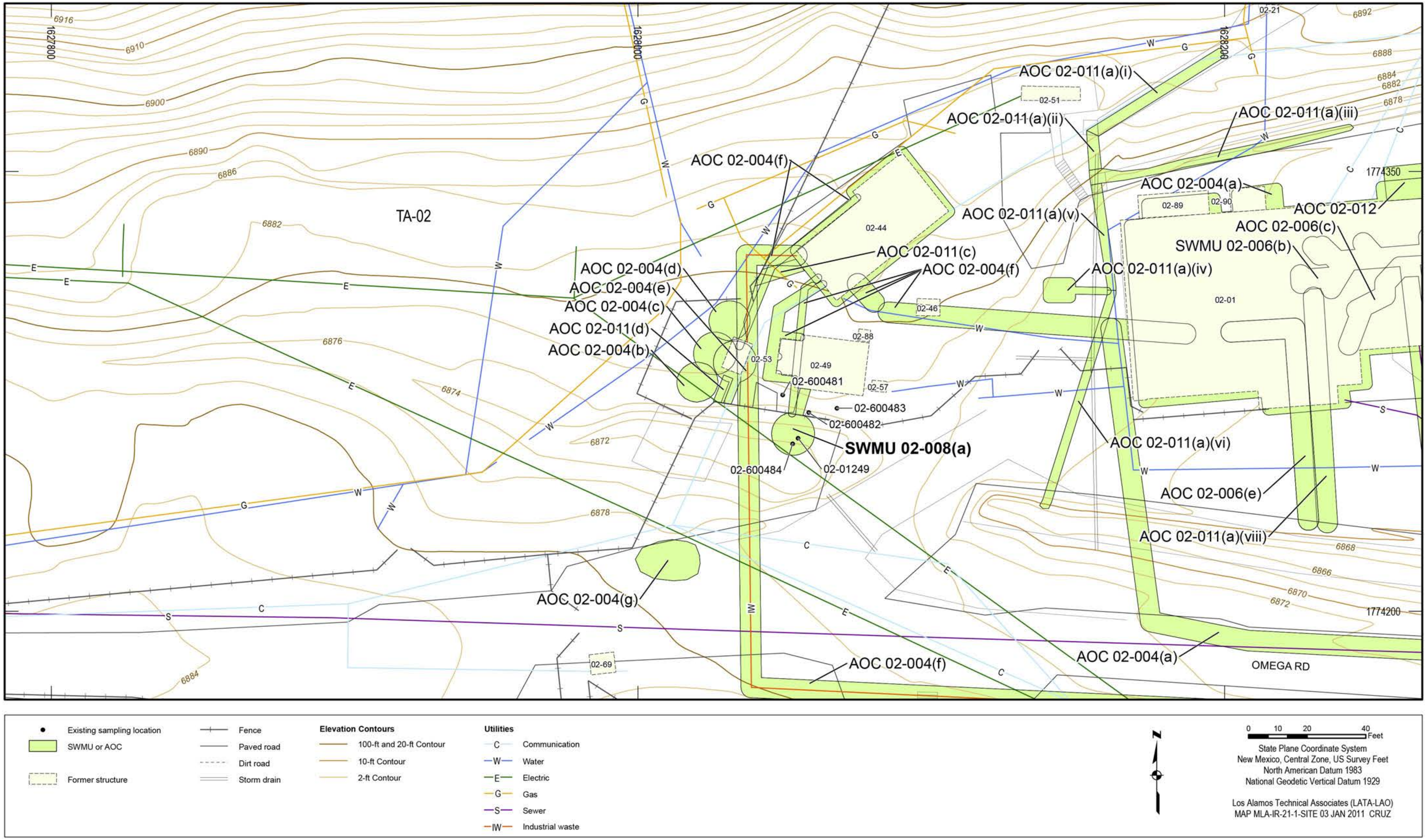

Figure 6.21-1 Site map of SWMU 02-008(a)

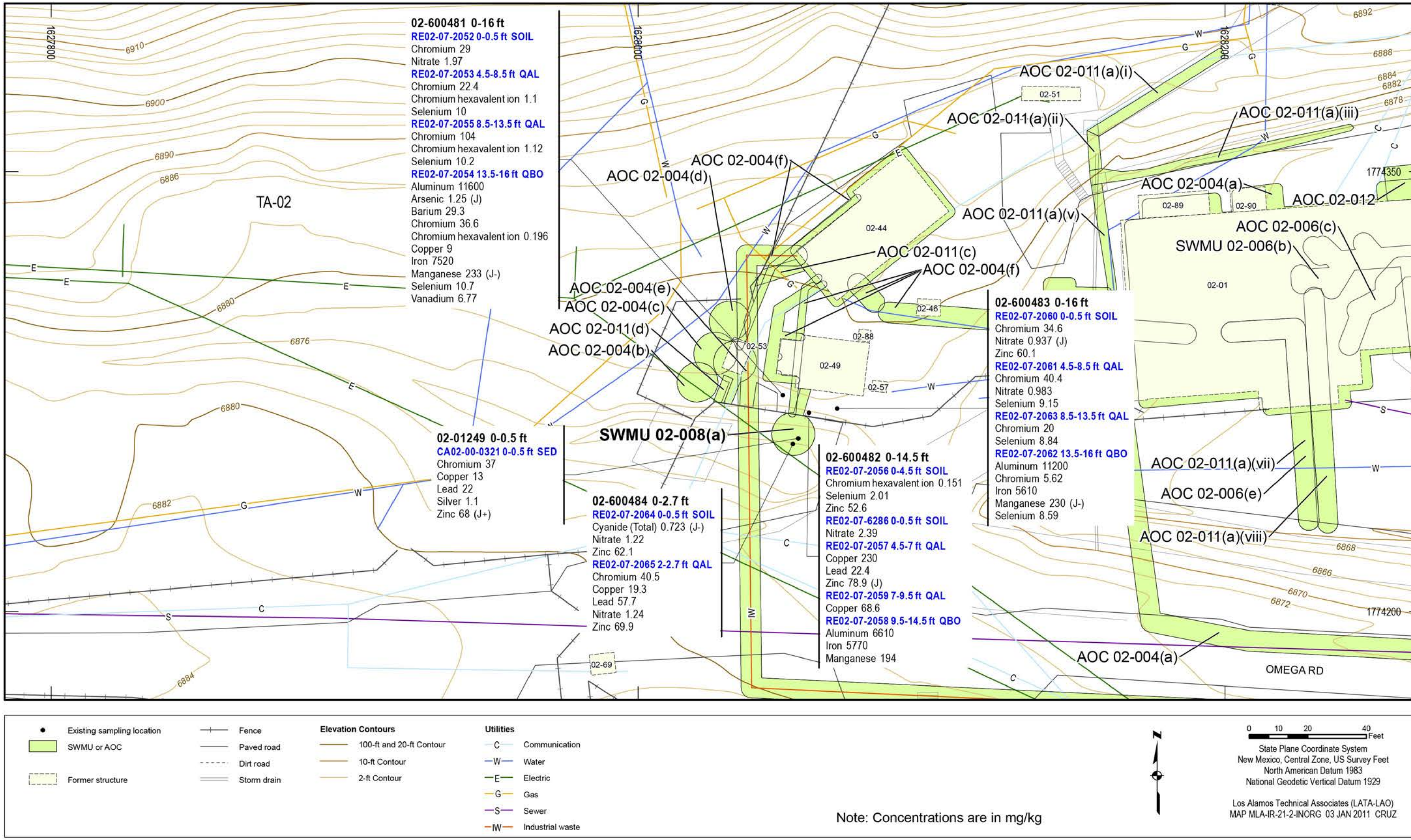

Figure 6.21-2 Inorganic chemicals detected or detected above BVs at SWMU 02-008(a)

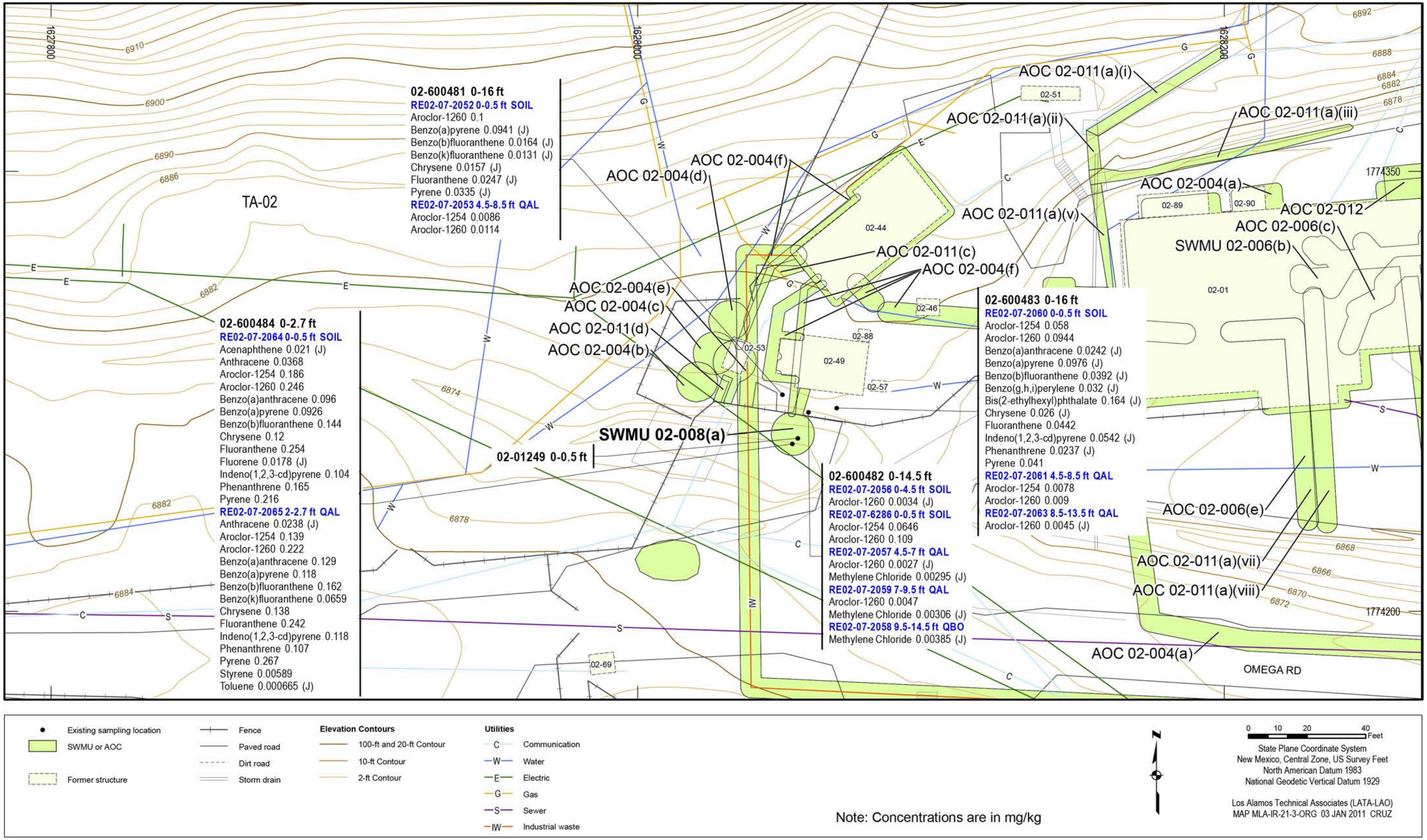

Figure 6.21-3 Organic chemicals detected at SWMU 02-008(a)

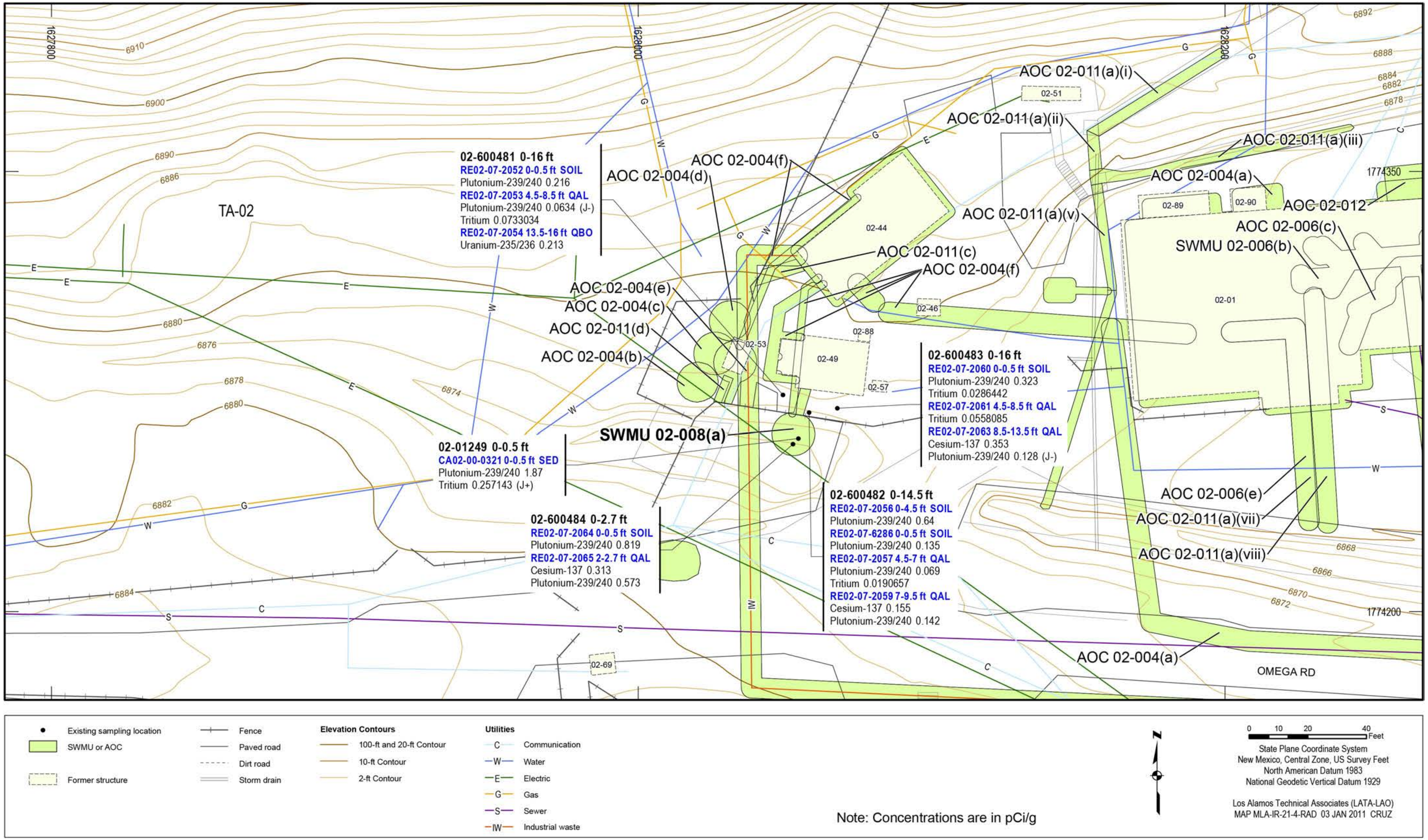

Figure 6.21-4 Radionuclides detected or detected above BVs/FVs at SWMU 02-008(a)

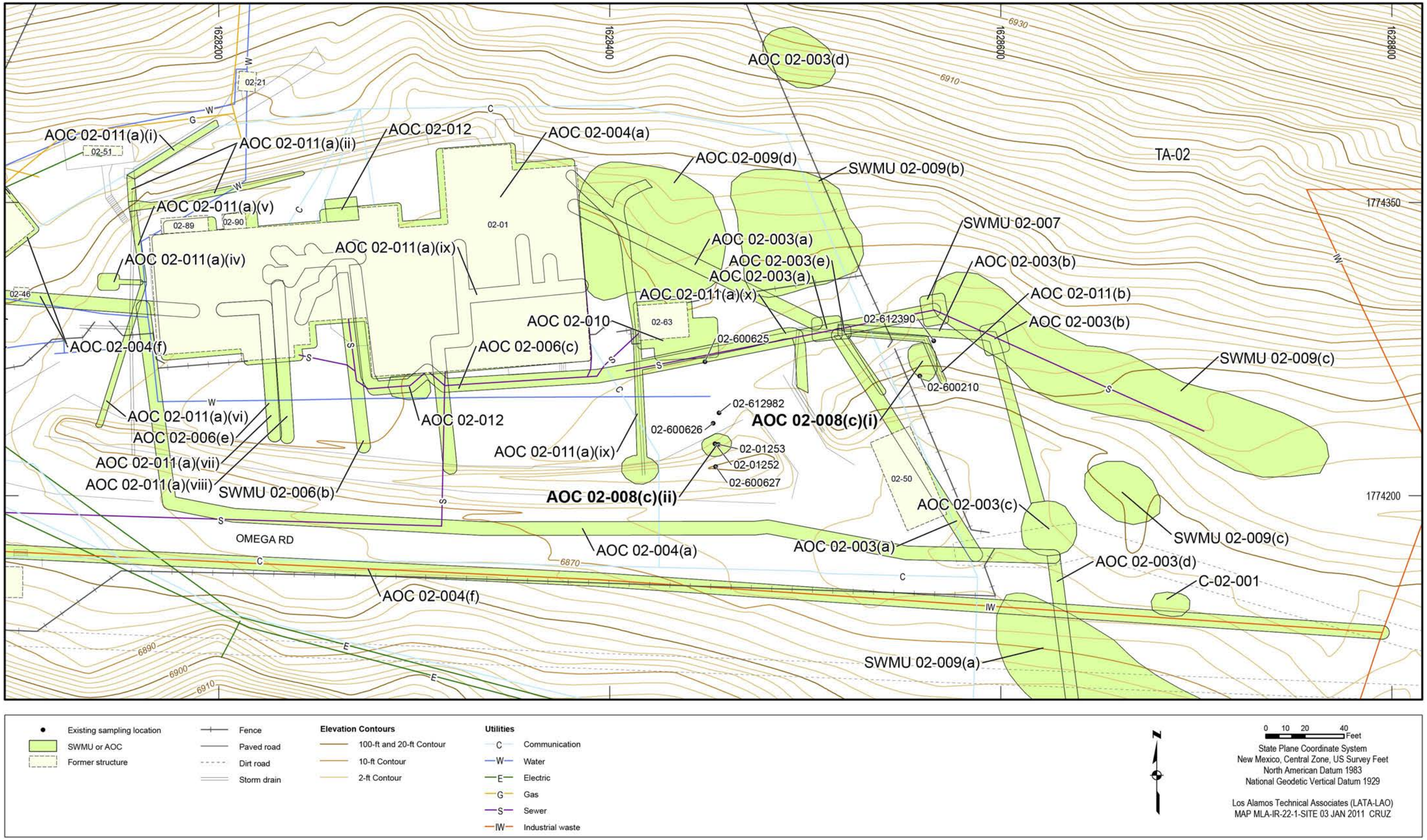

Figure 6.22-1 Site map of AOC 02-008(c)

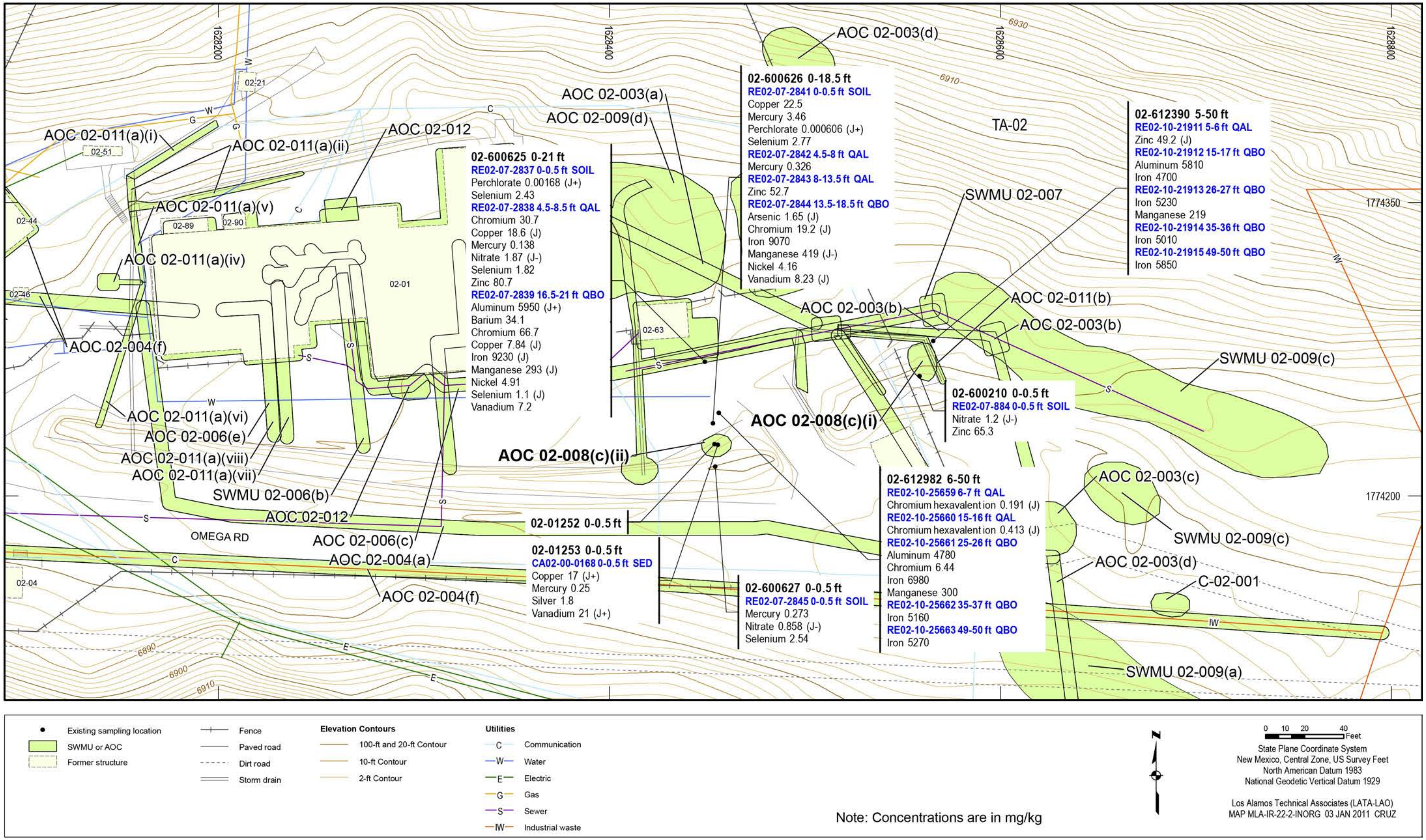

Figure 6.22-2 Inorganic chemicals detected or detected above BVs at AOC 02-008(c)

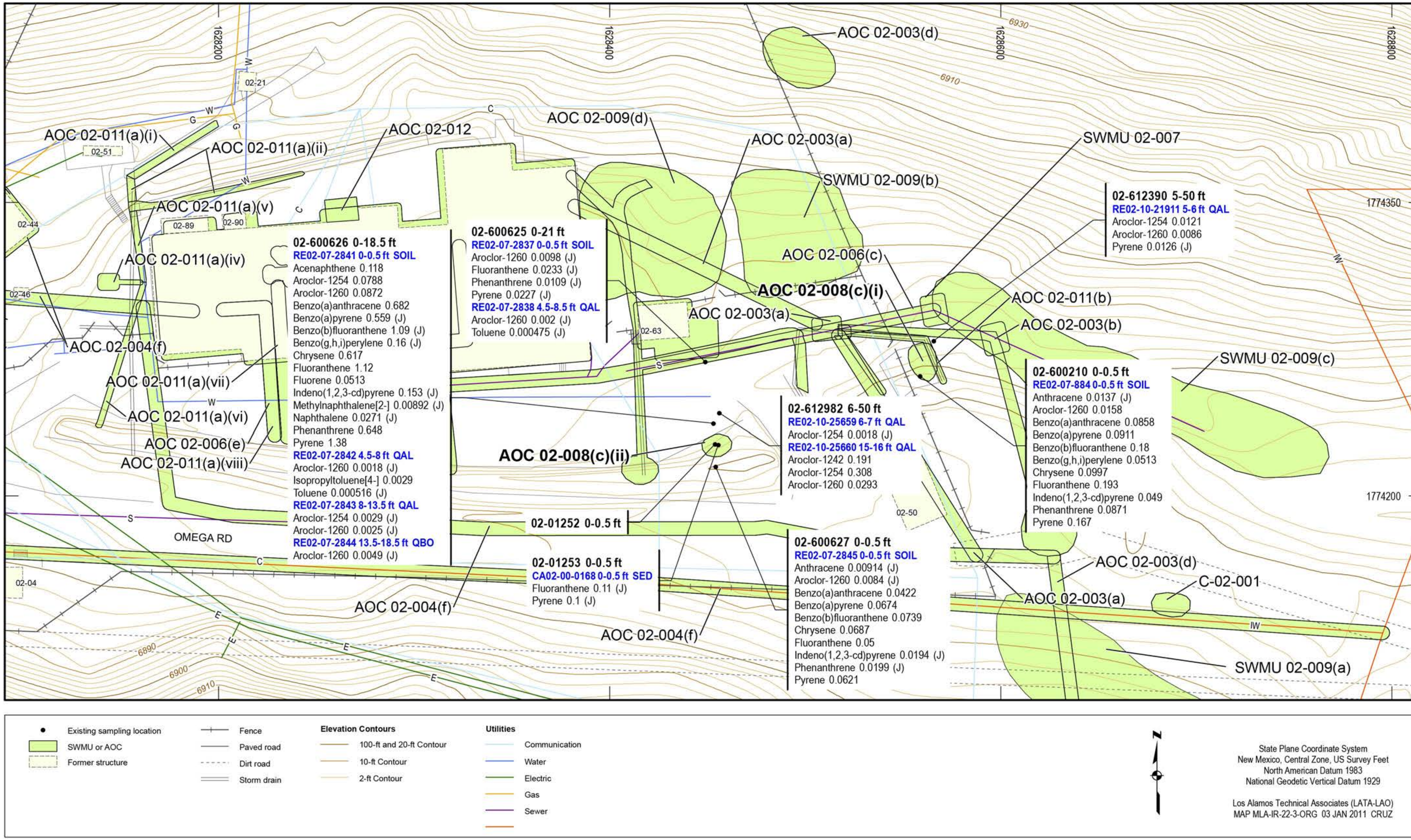

Figure 6.22-3 Organic chemicals detected at AOC 02-008(c)

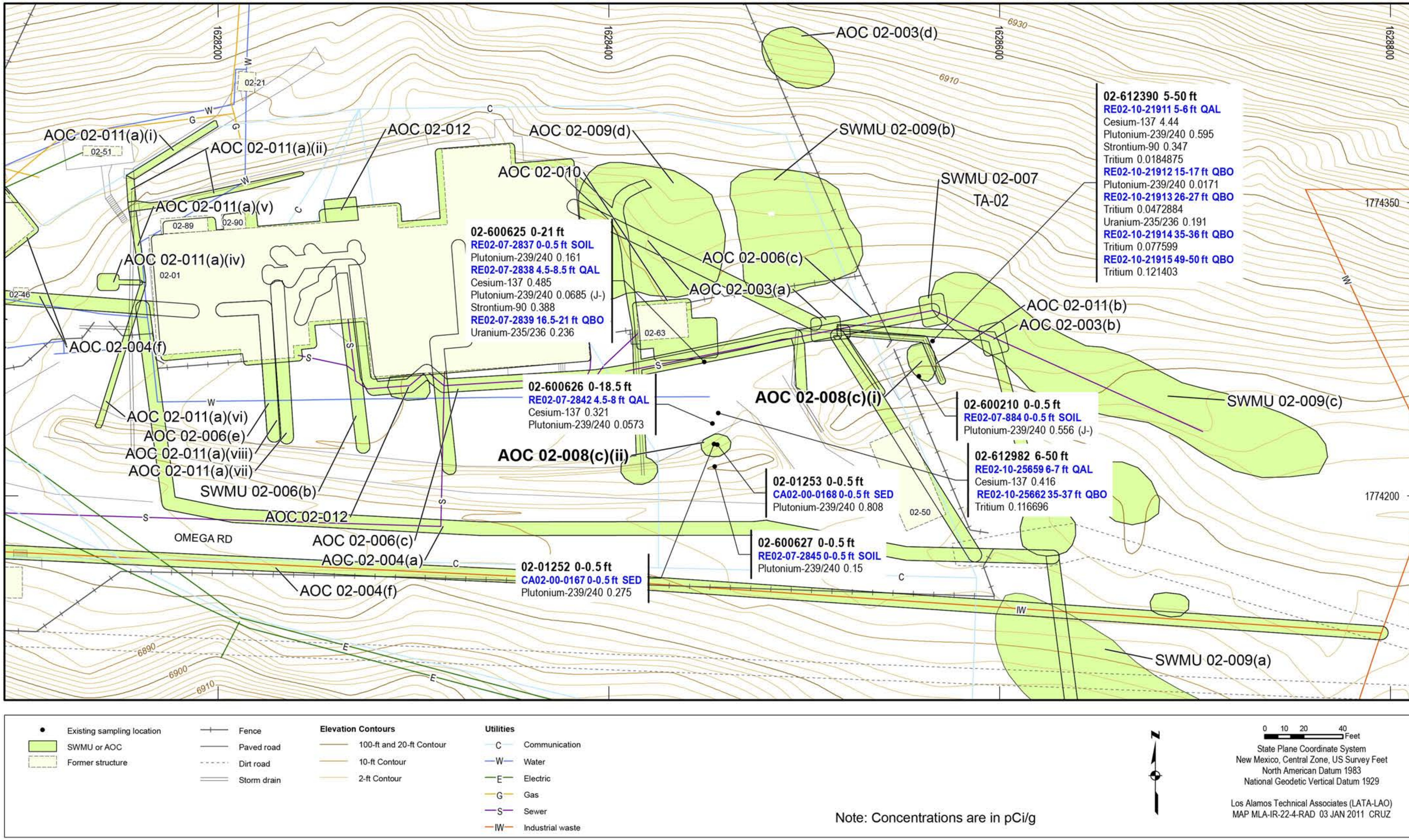

Figure 6.22-4 Radionuclides detected or detected above BVs/FVs at AOC 02-008(c)

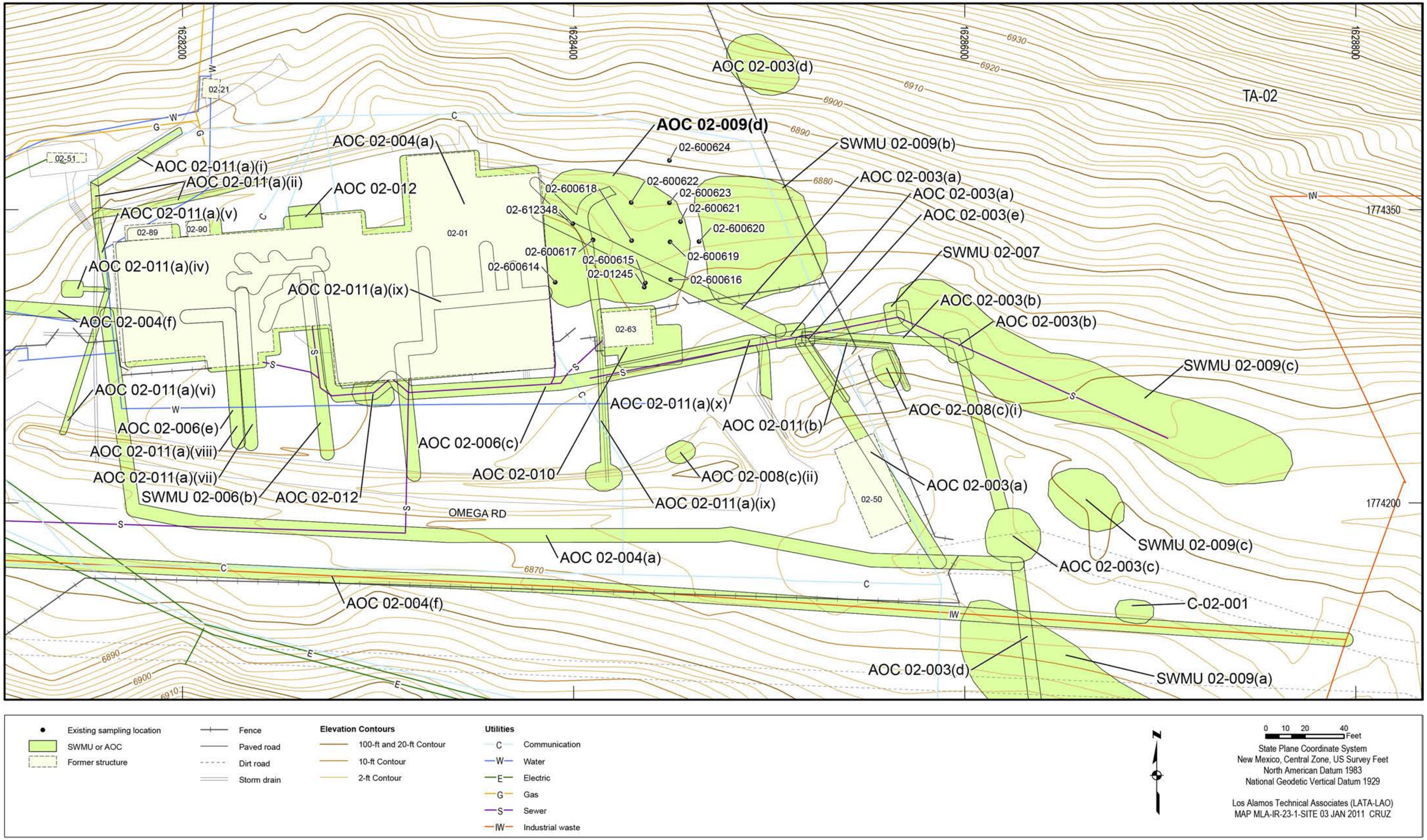

Figure 6.26-1 Site map of AOC 02-009(d)

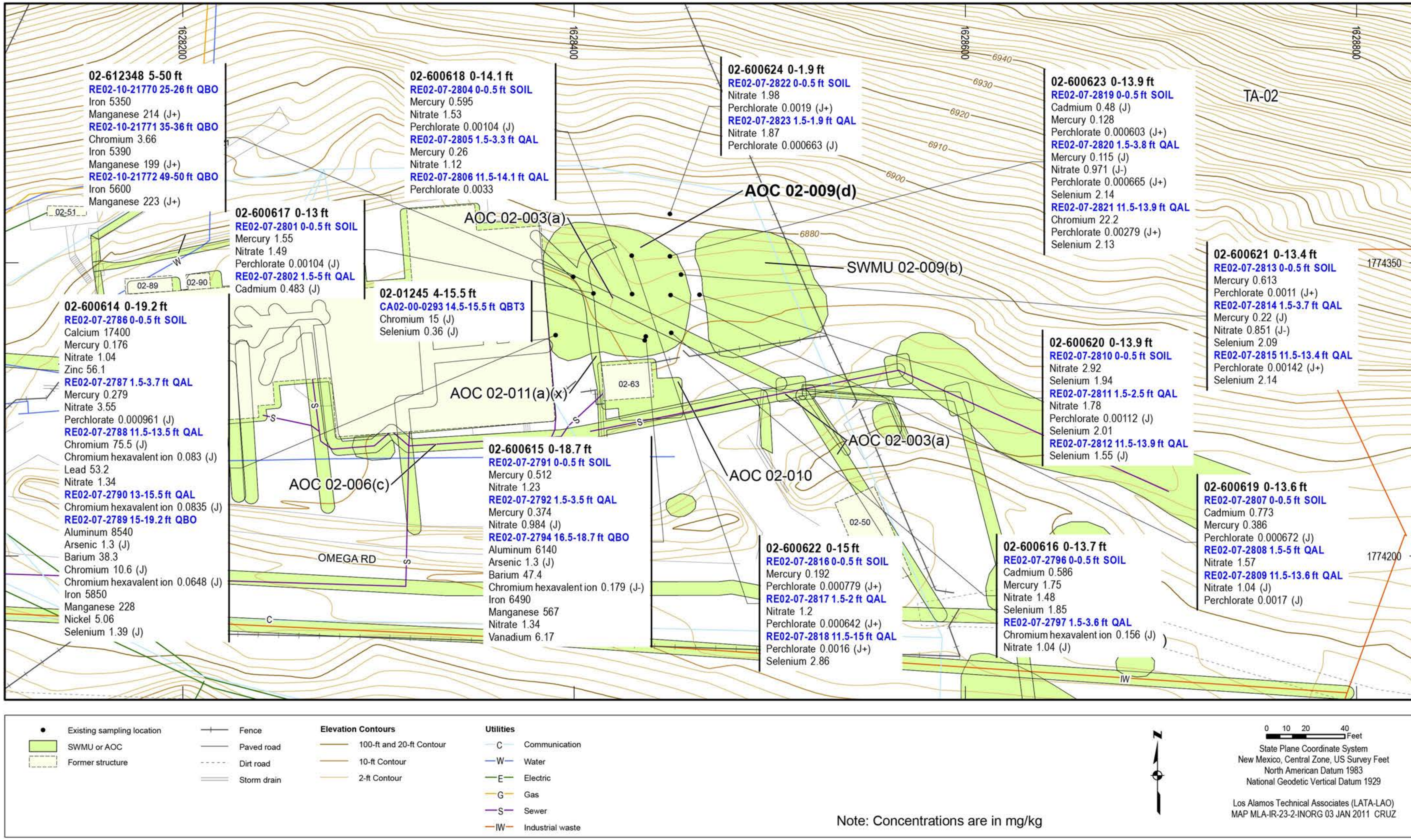

Figure 6.26-2 Inorganic chemicals detected or detected above BVs at AOC 02-009(d)

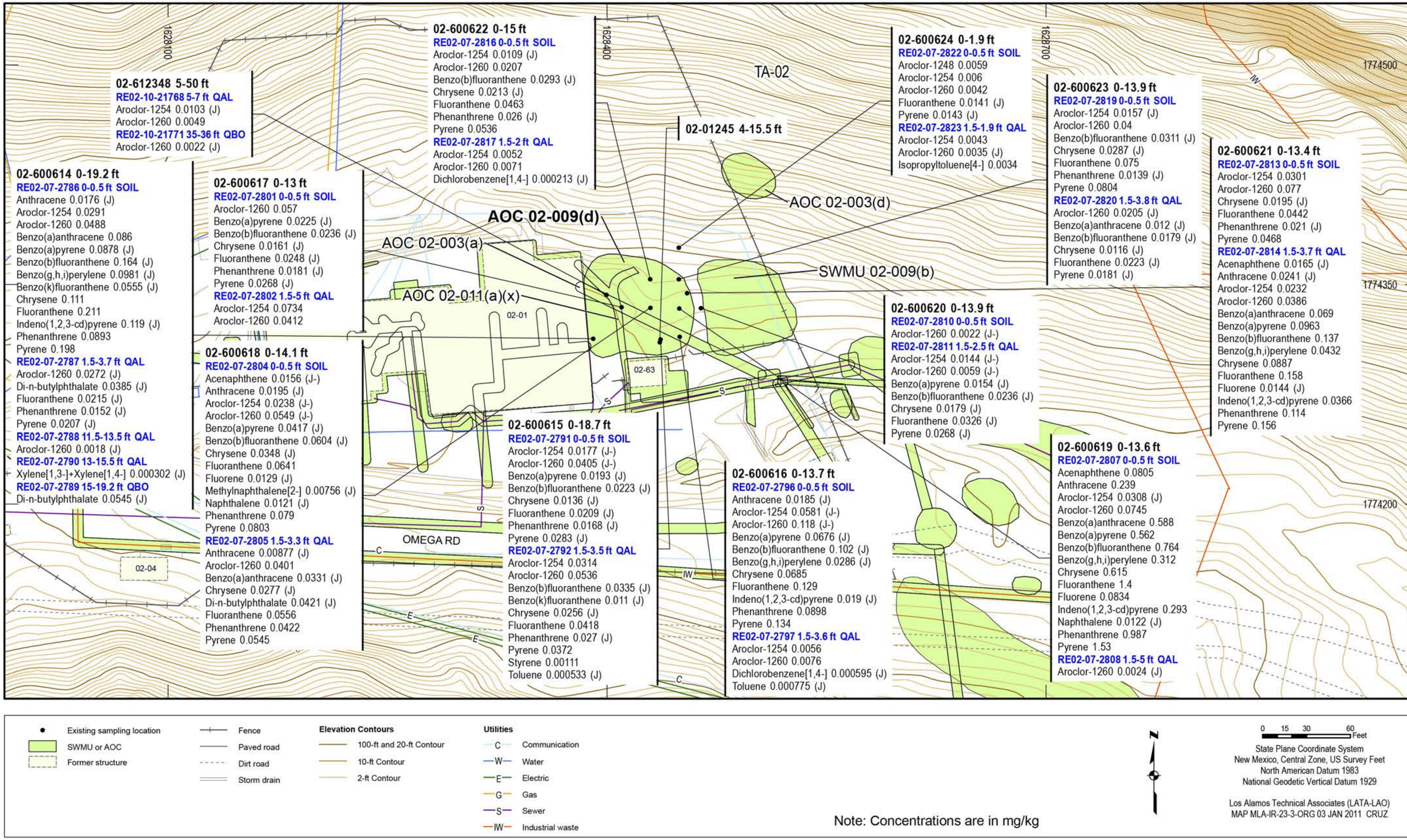

Figure 6.26-3 Organic chemicals detected at AOC 02-009(d)

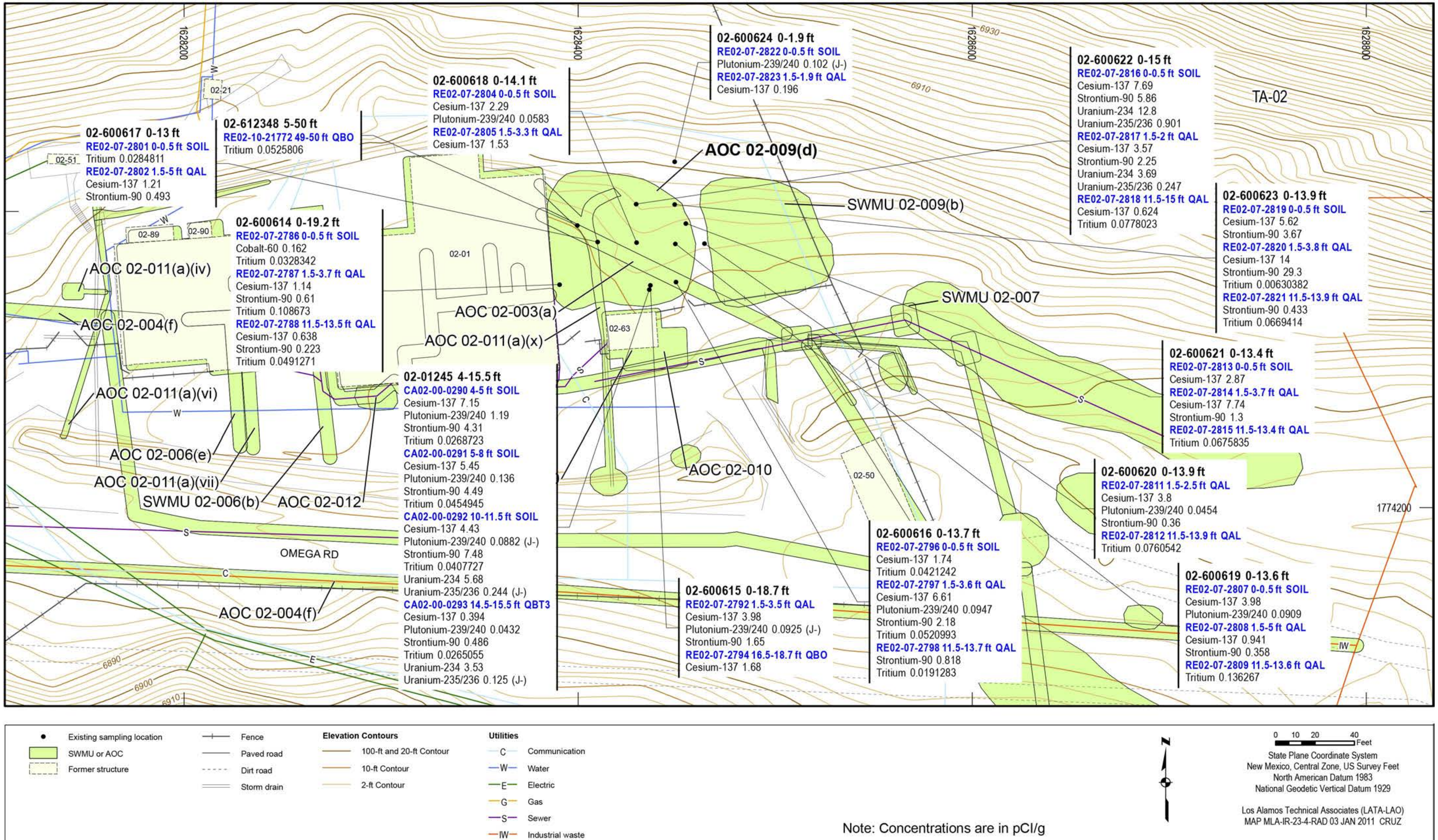

Figure 6.26-4 Radionuclides detected or detected above BVs/FVs at AOC 02-009(d)

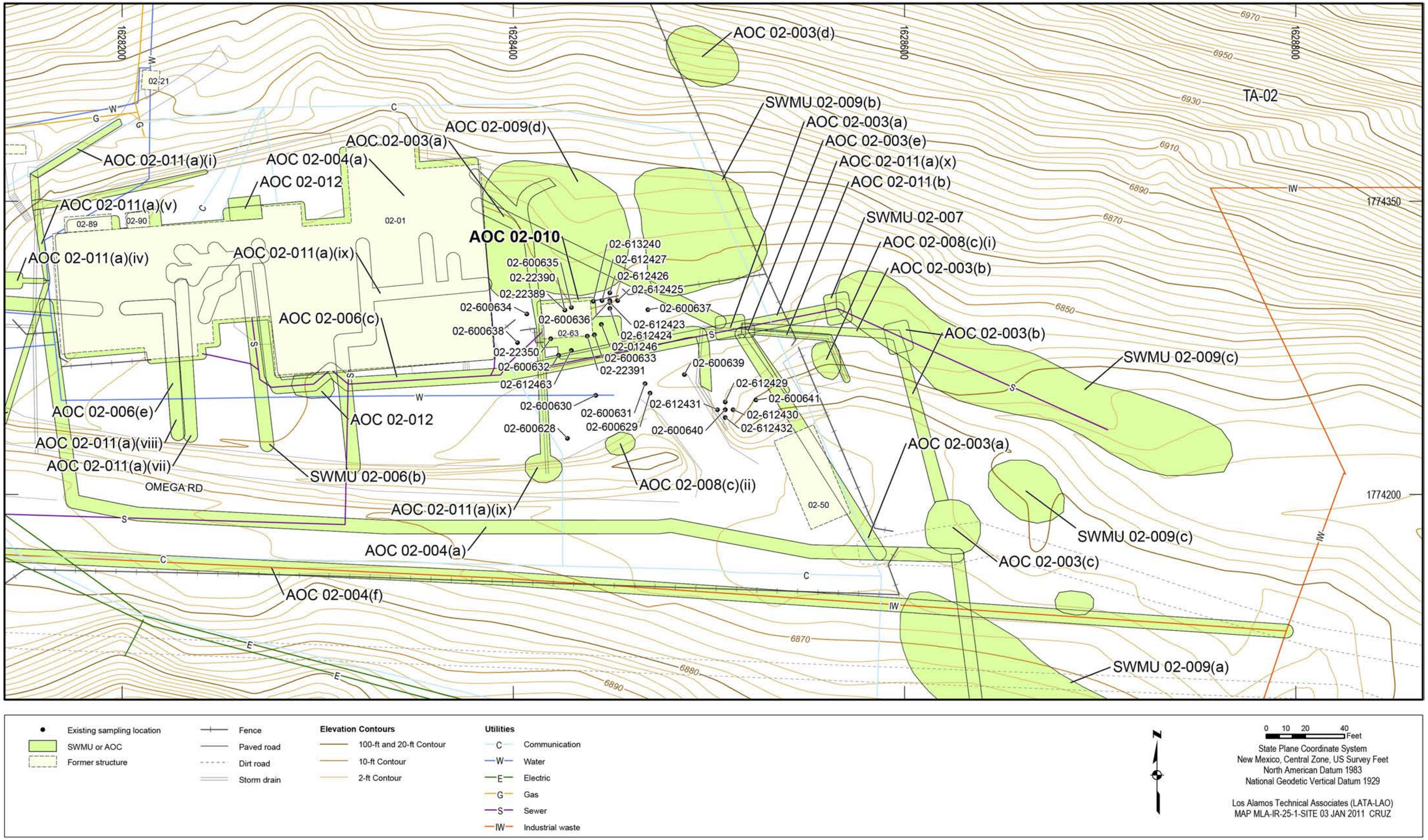

Figure 6.28-1 Site map of AOC 02-010

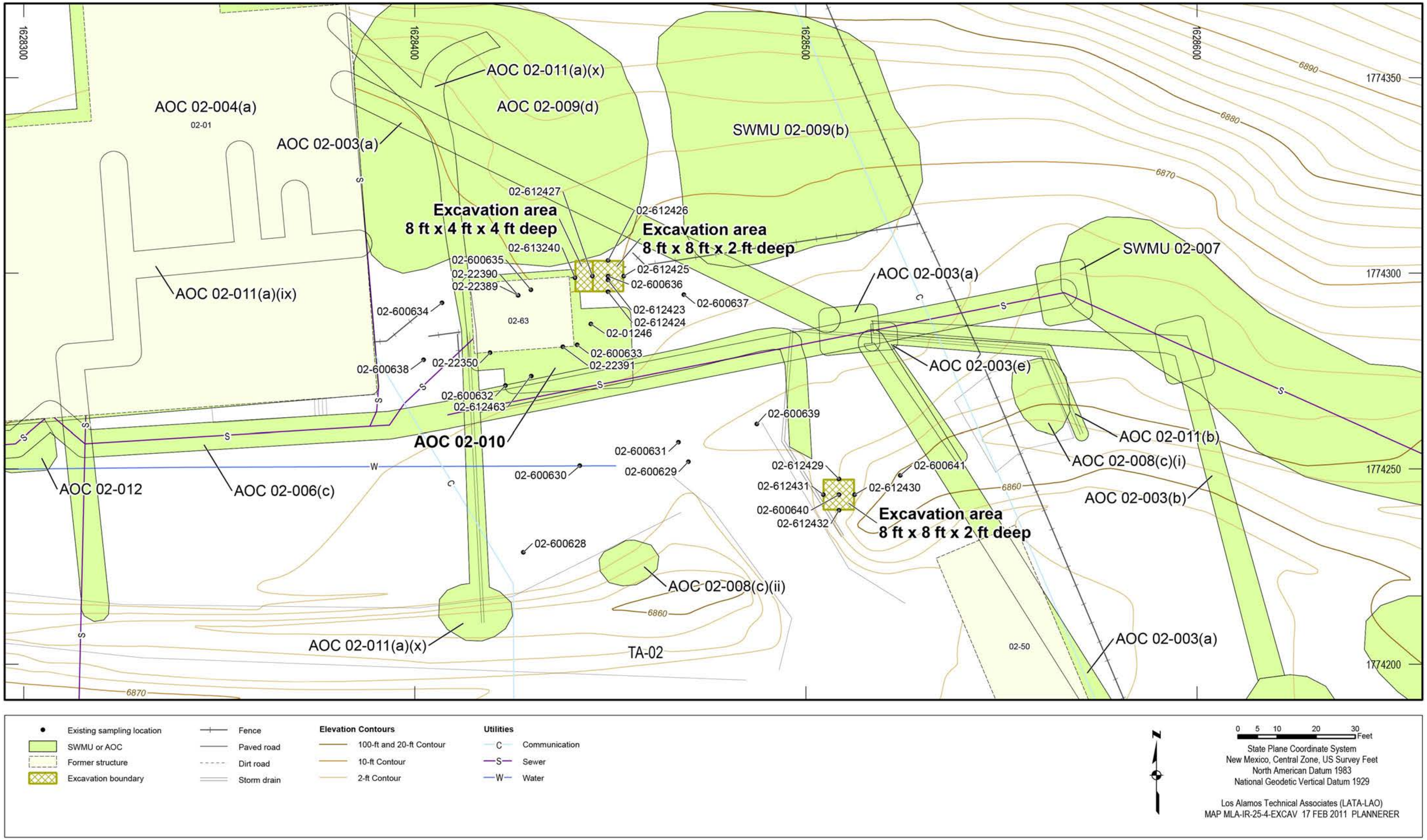

Figure 6.28-2 Excavations at AOC 02-010

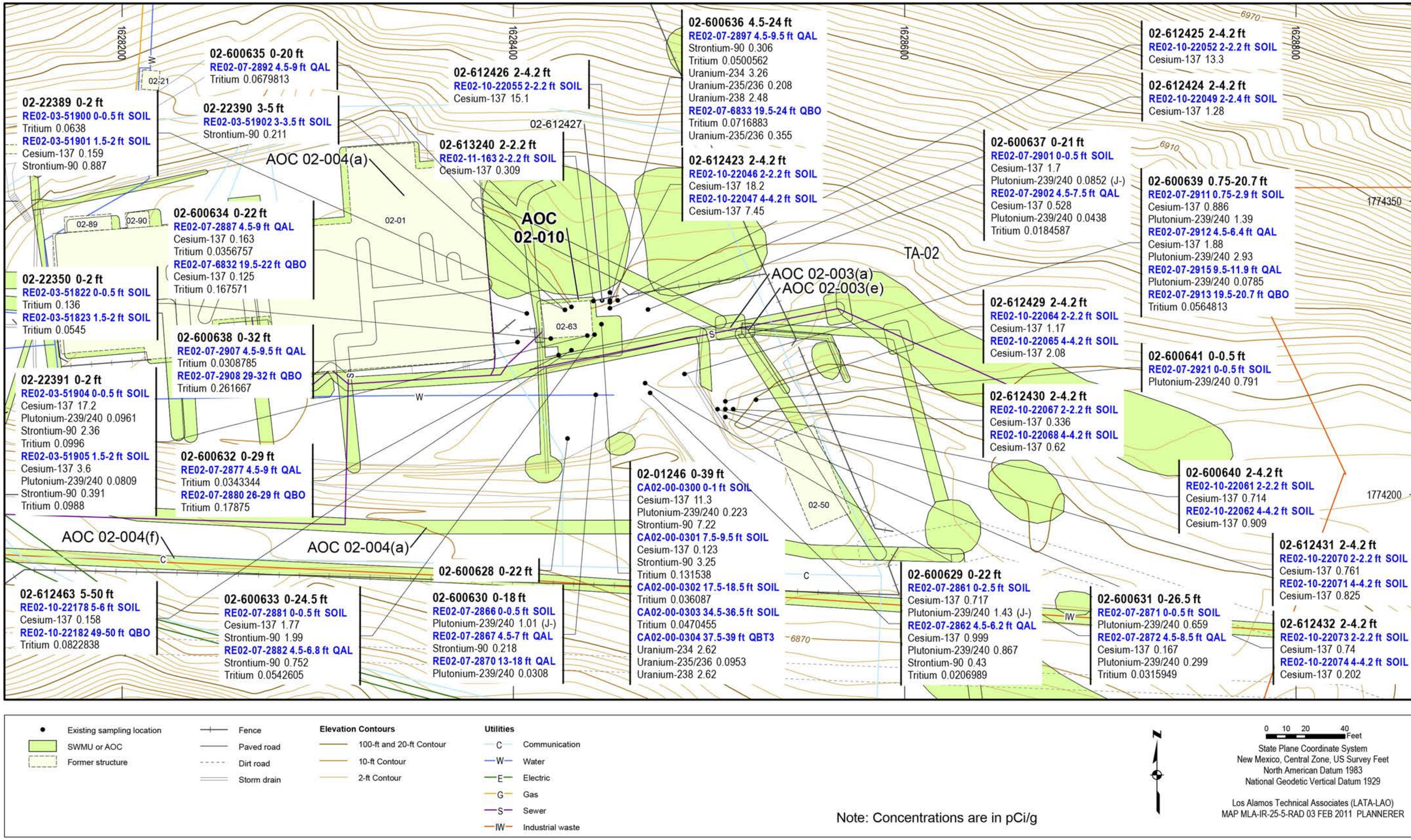

Figure 6.28-3 Radionuclides detected or detected above BVs/FVs at AOC 02-010

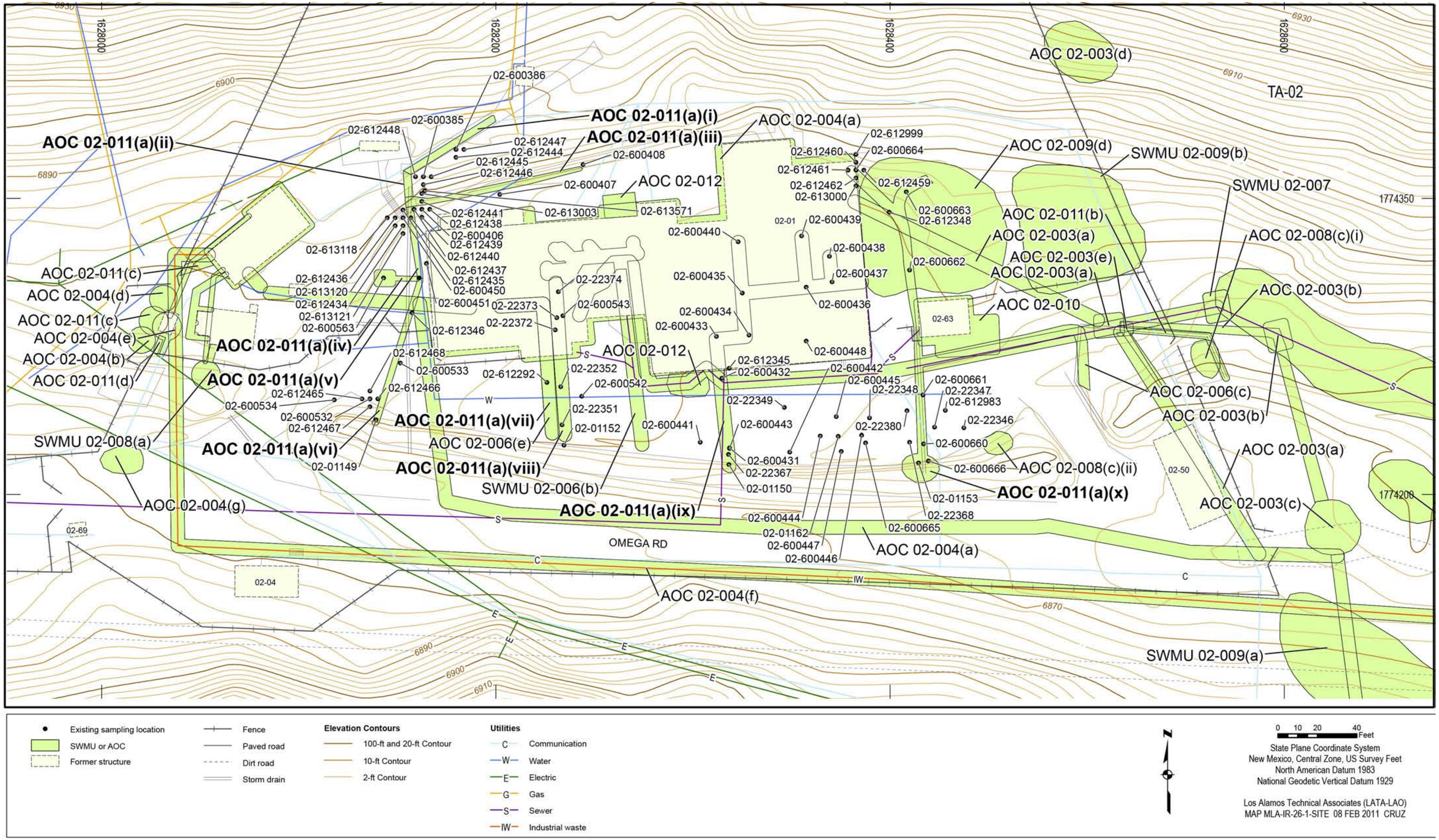

Figure 6.29-1 Site map of AOC 02-011(a)

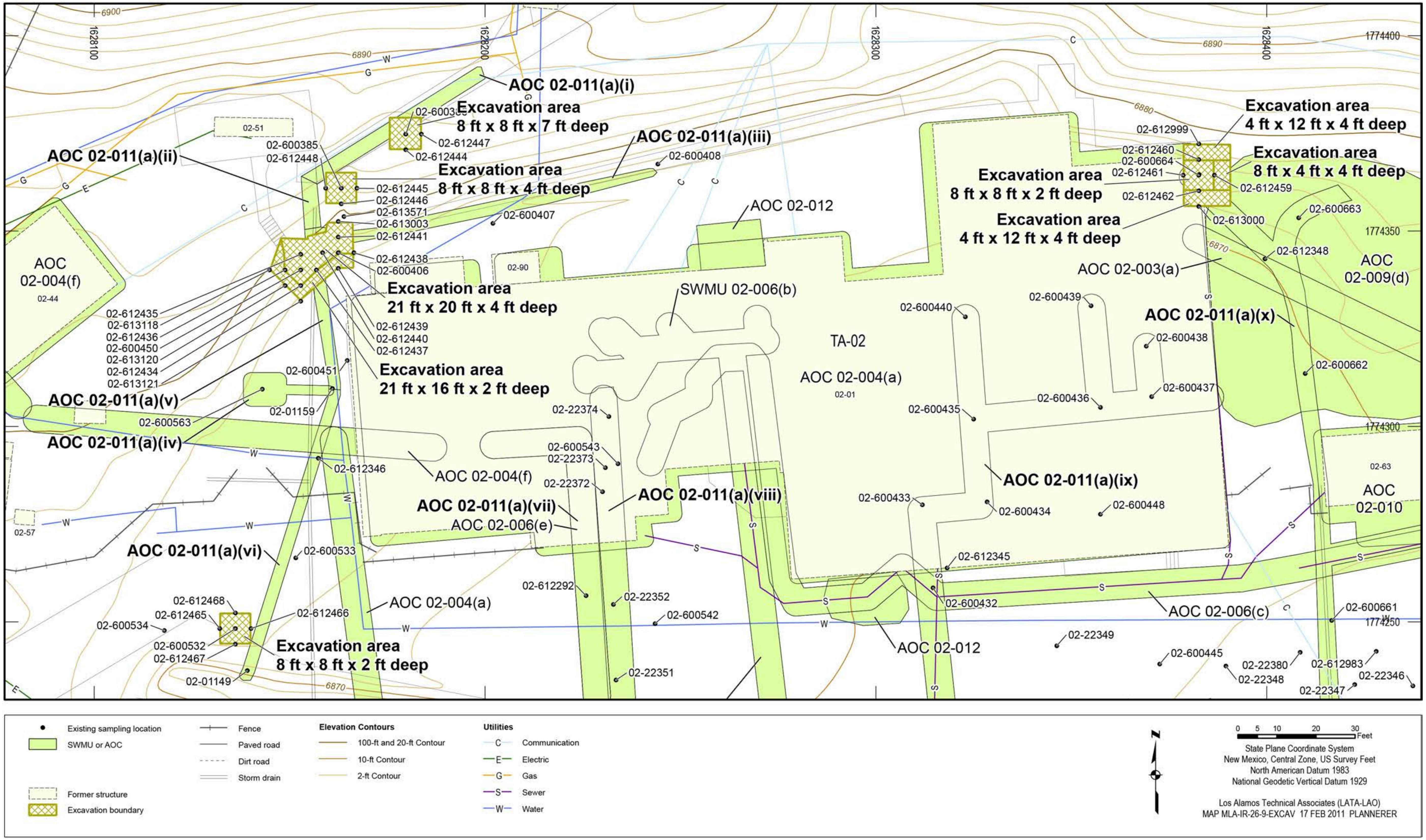

Figure 6.29-2 Excavations at AOC 02-011(a)

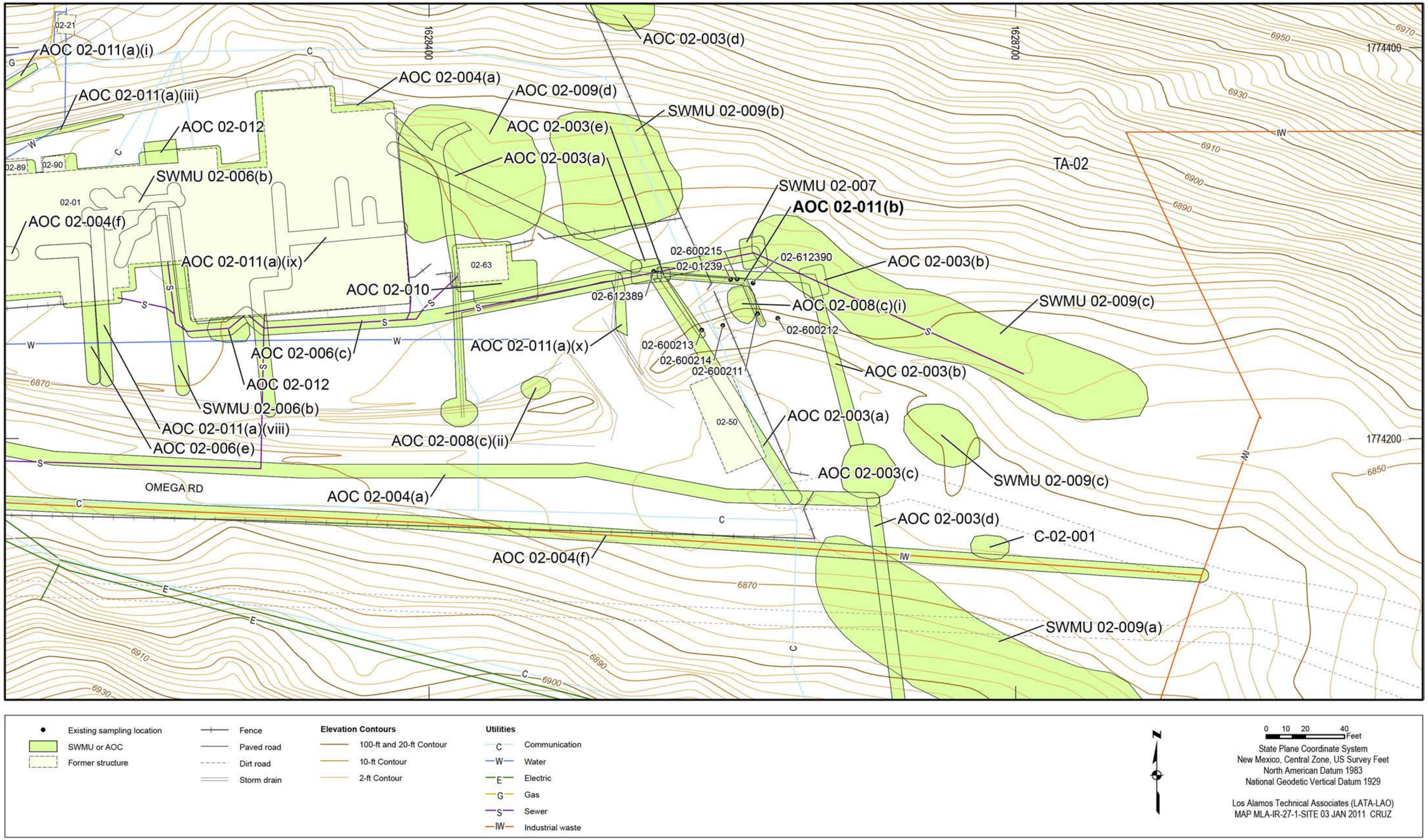

Figure 6.30-1 Site map of AOC 02-011(b)

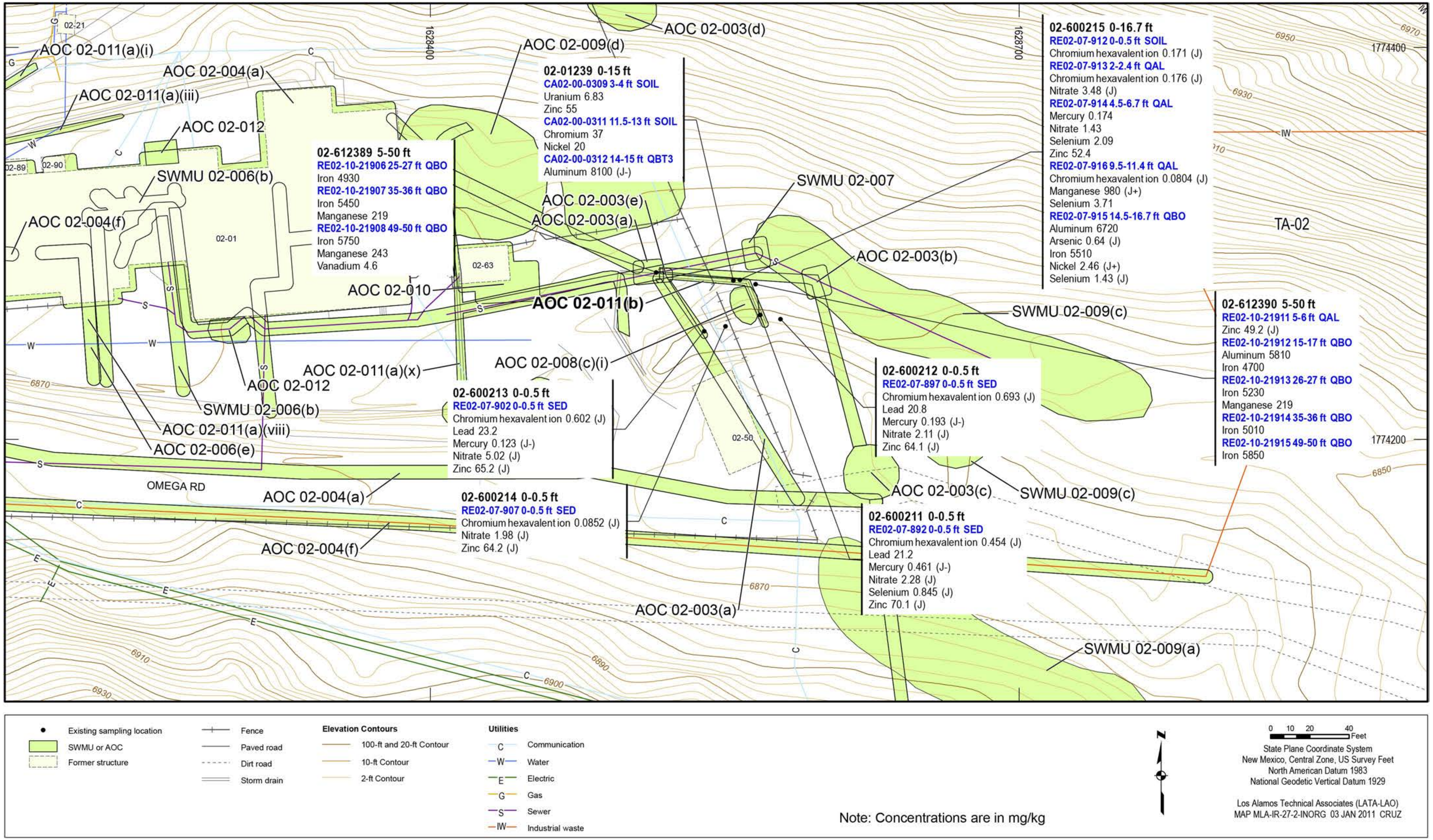

Figure 6.30-2 Inorganic chemicals detected or detected above BVs at AOC 02-011(b)

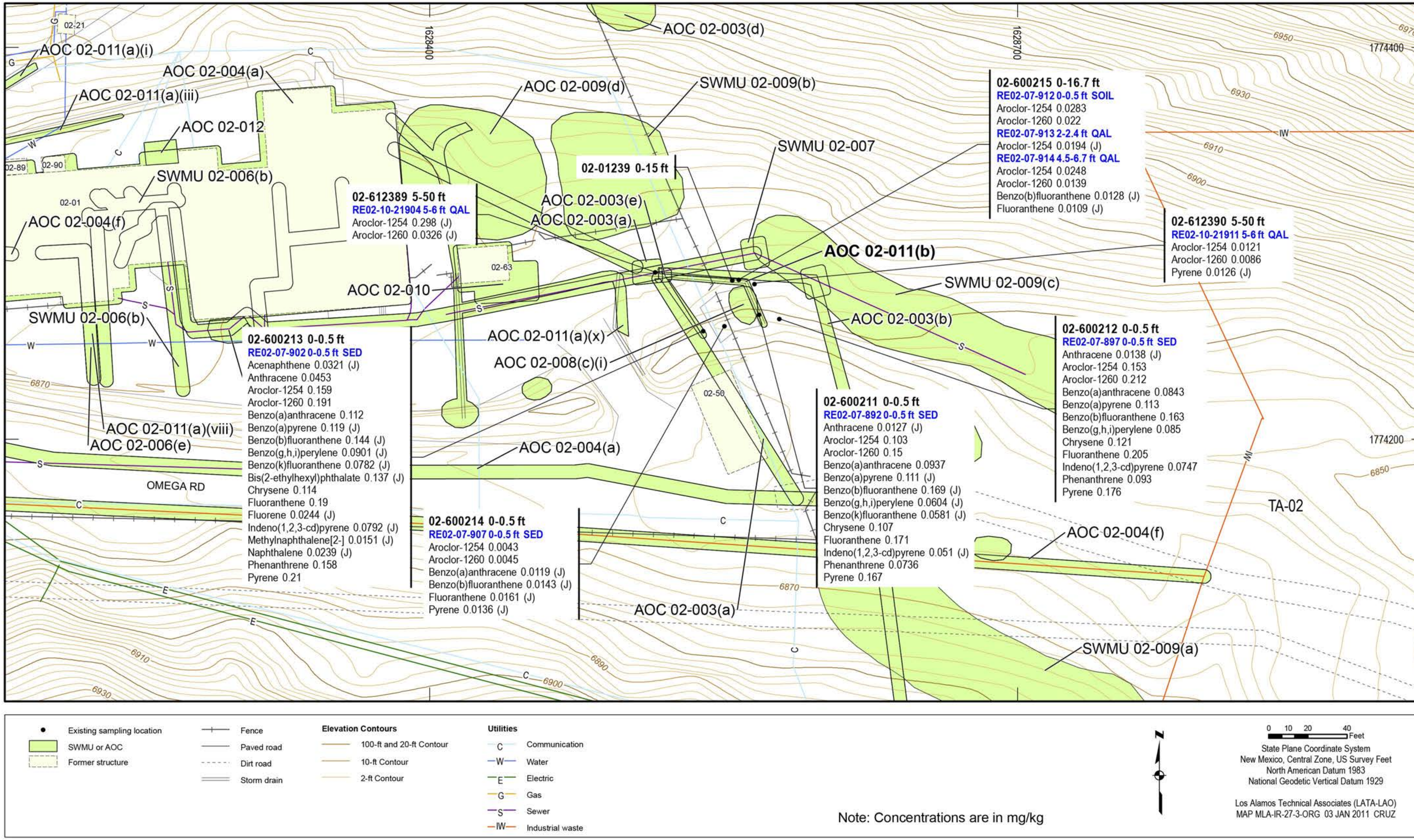

Figure 6.30-3 Organic chemicals detected at AOC 02-011(b)

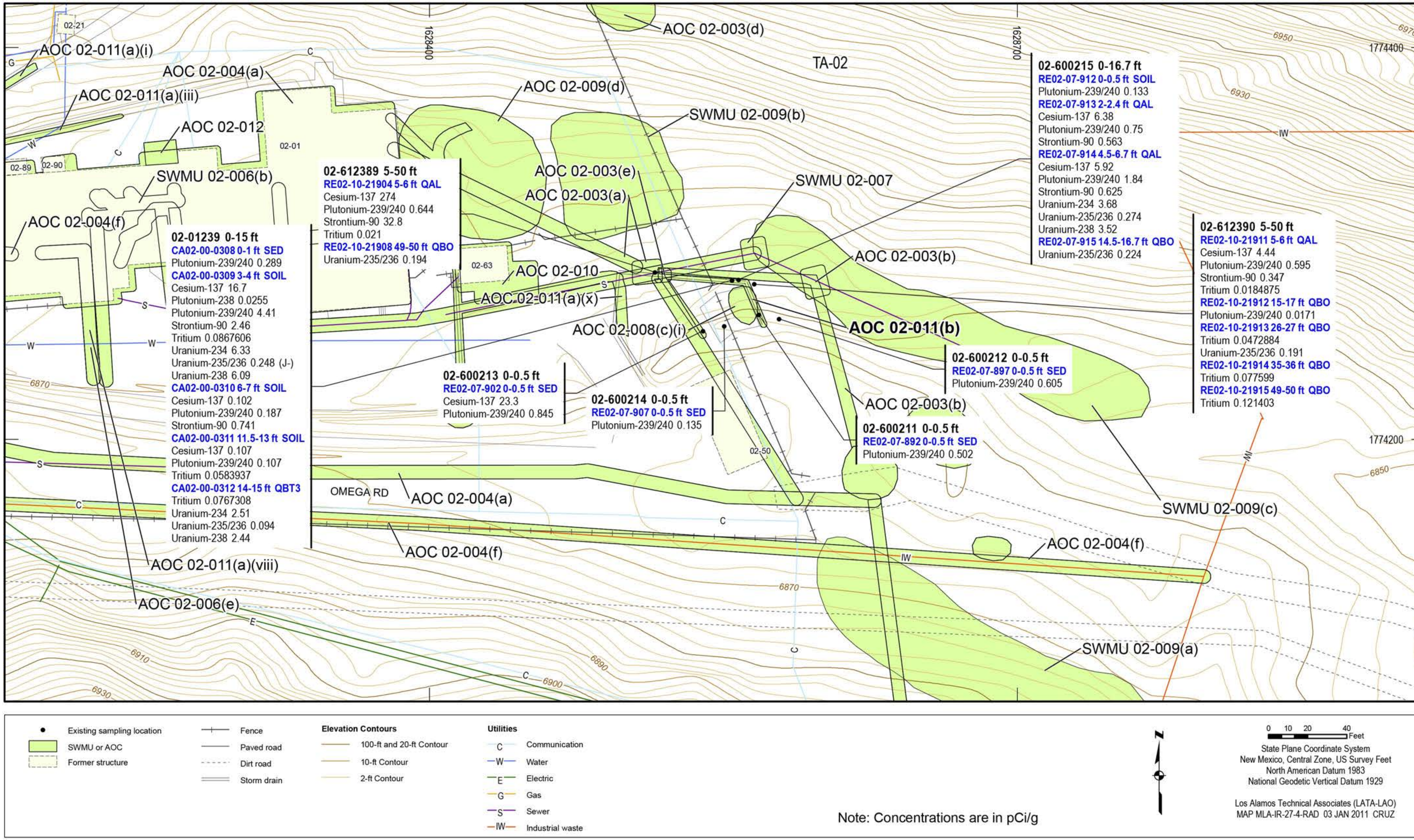

Figure 6.30-4 Radionuclides detected or detected above BVs/FVs at AOC 02-011(b)

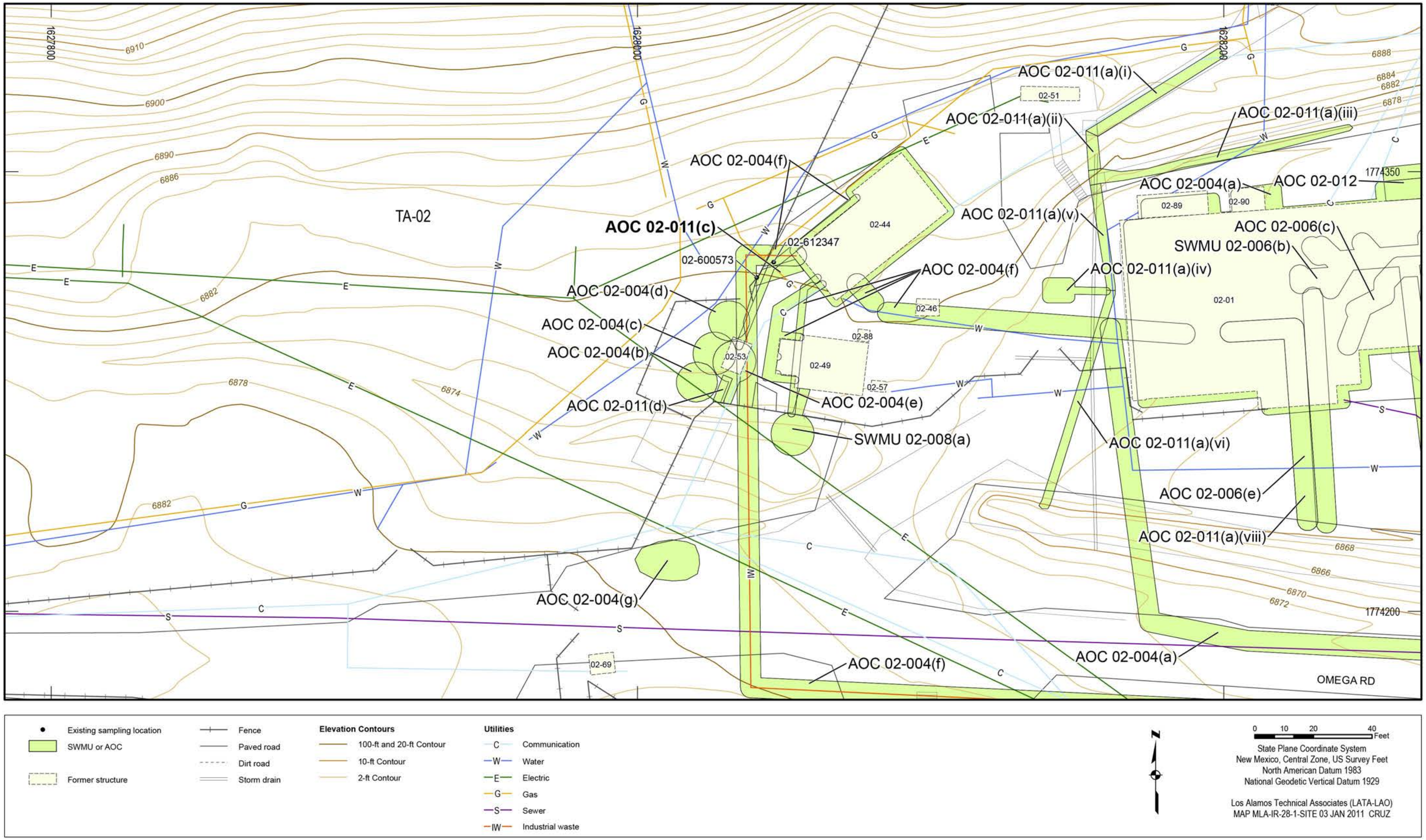

Figure 6.31-1 Site map of AOC 02-011(c)

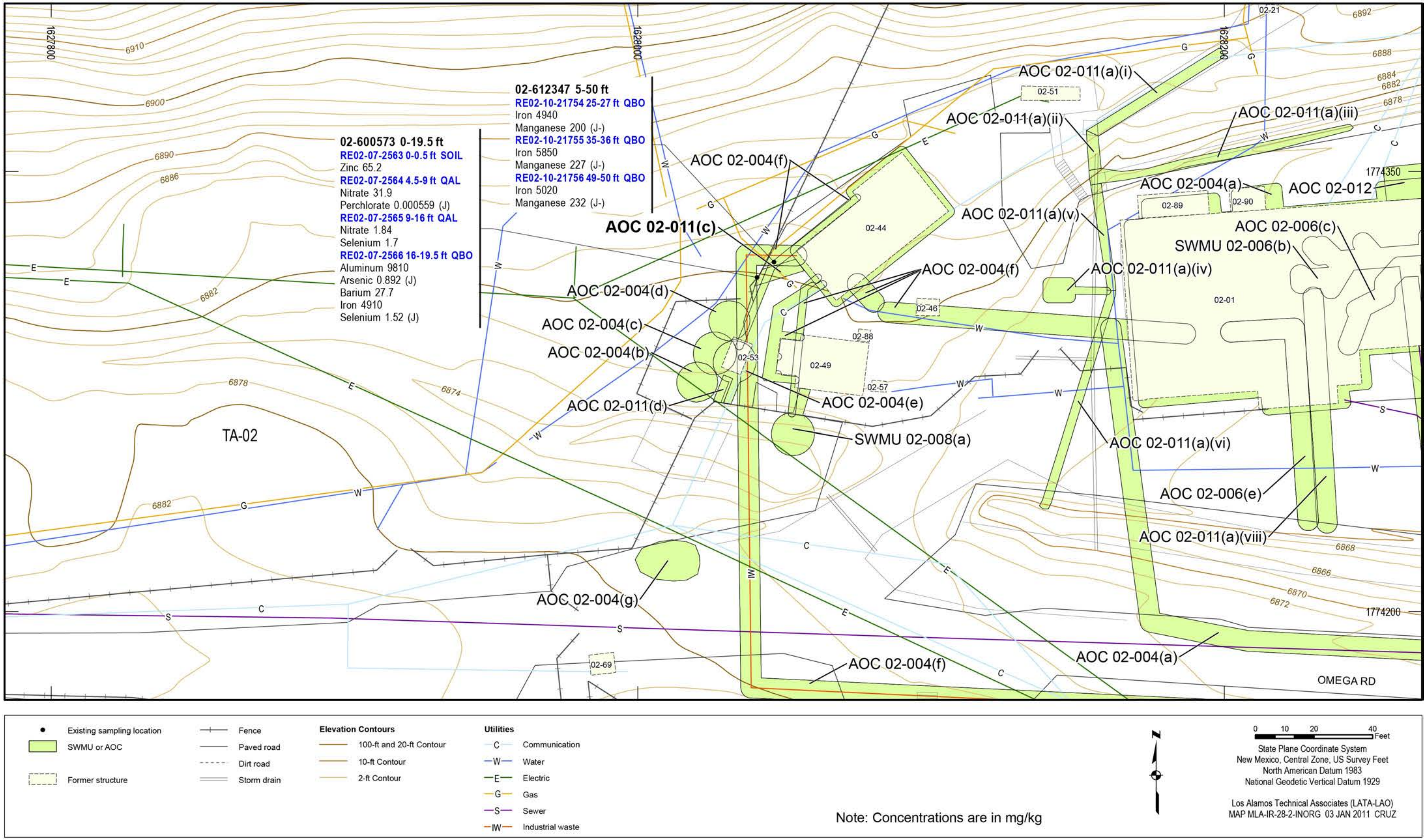

Figure 6.31-2 Inorganic chemicals detected or detected above BVs at AOC 02-011(c)

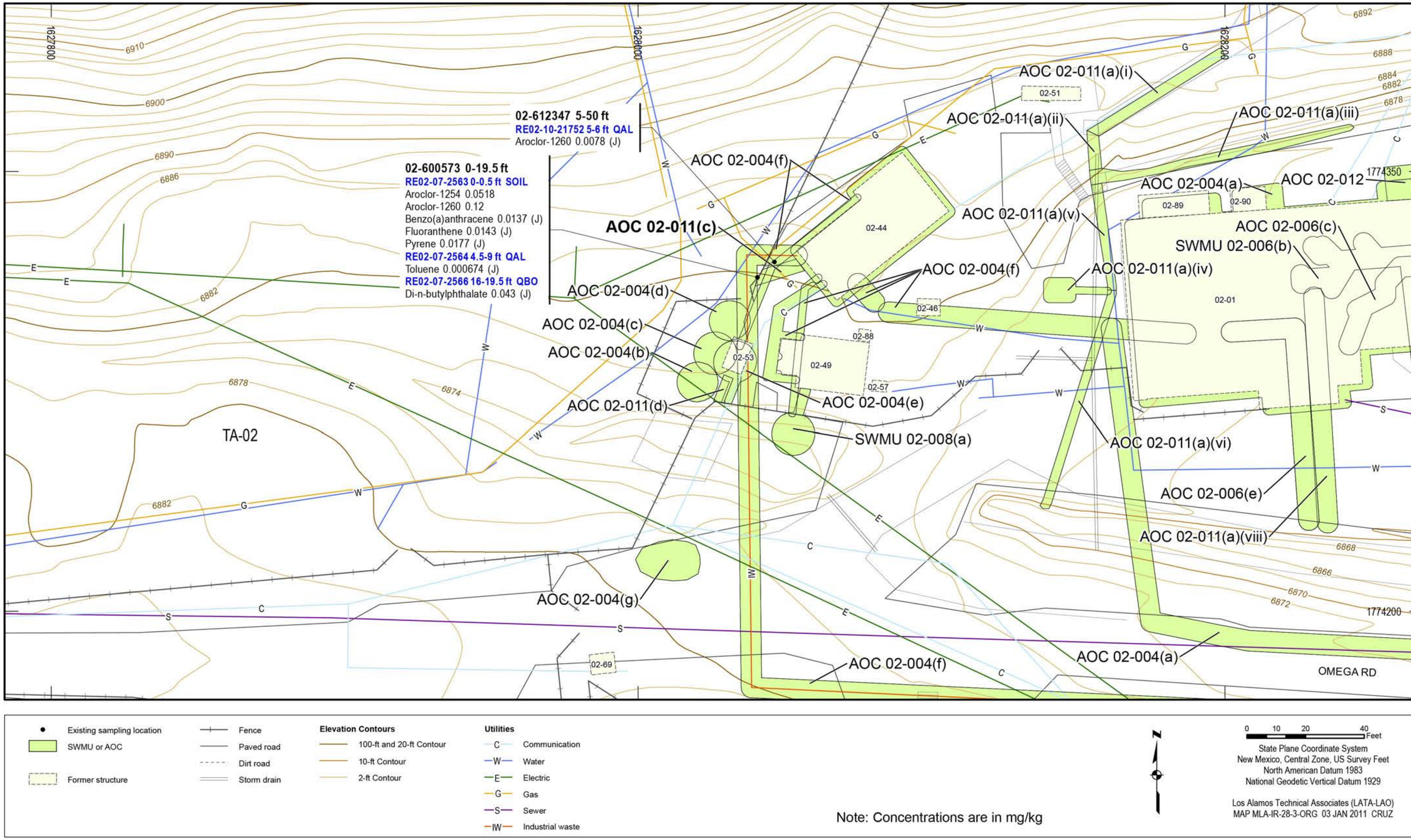

Figure 6.31-3 Organic chemicals detected at AOC 02-011(c)

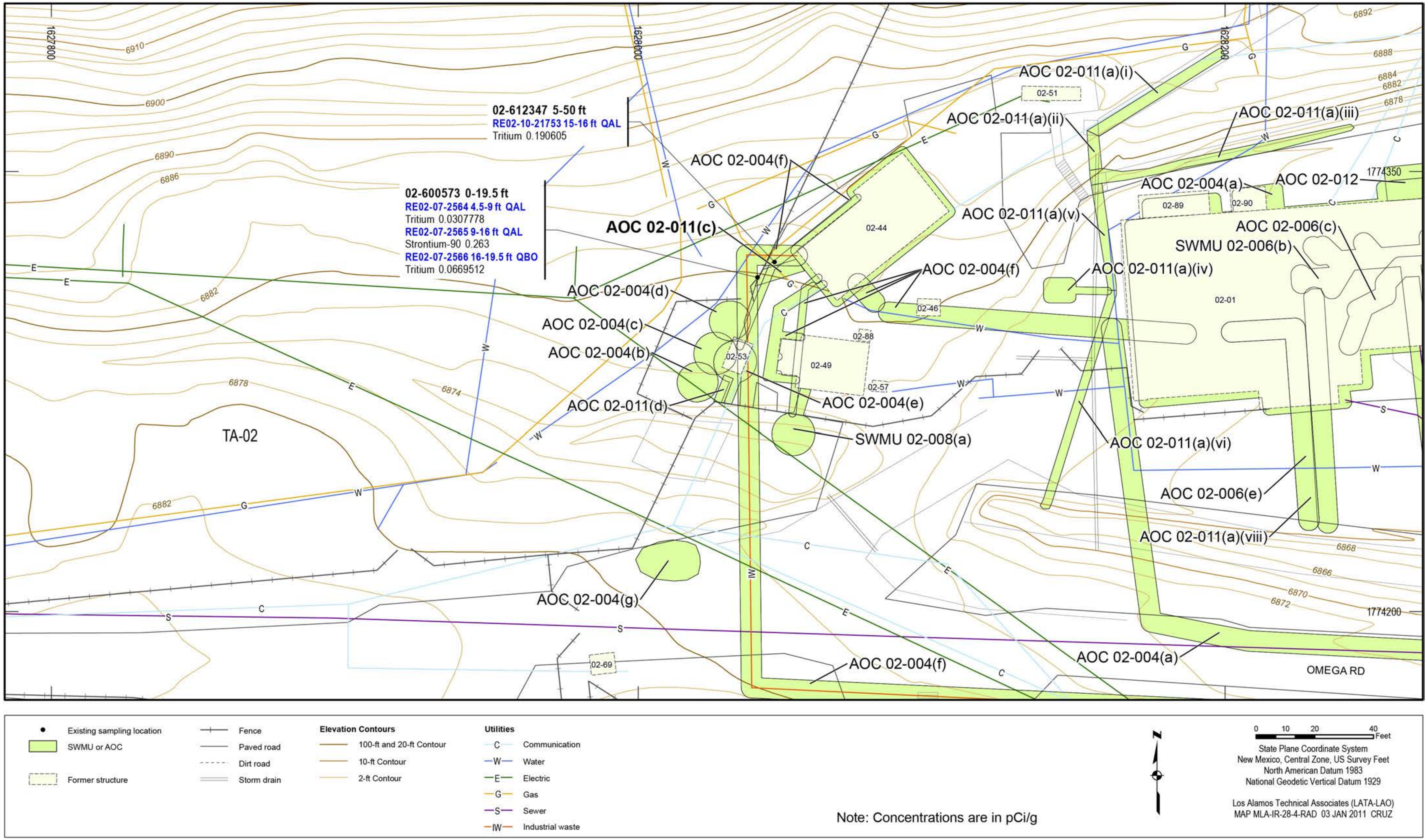

Figure 6.31-4 Radionuclides detected or detected above BVs/FVs at AOC 02-011(c)

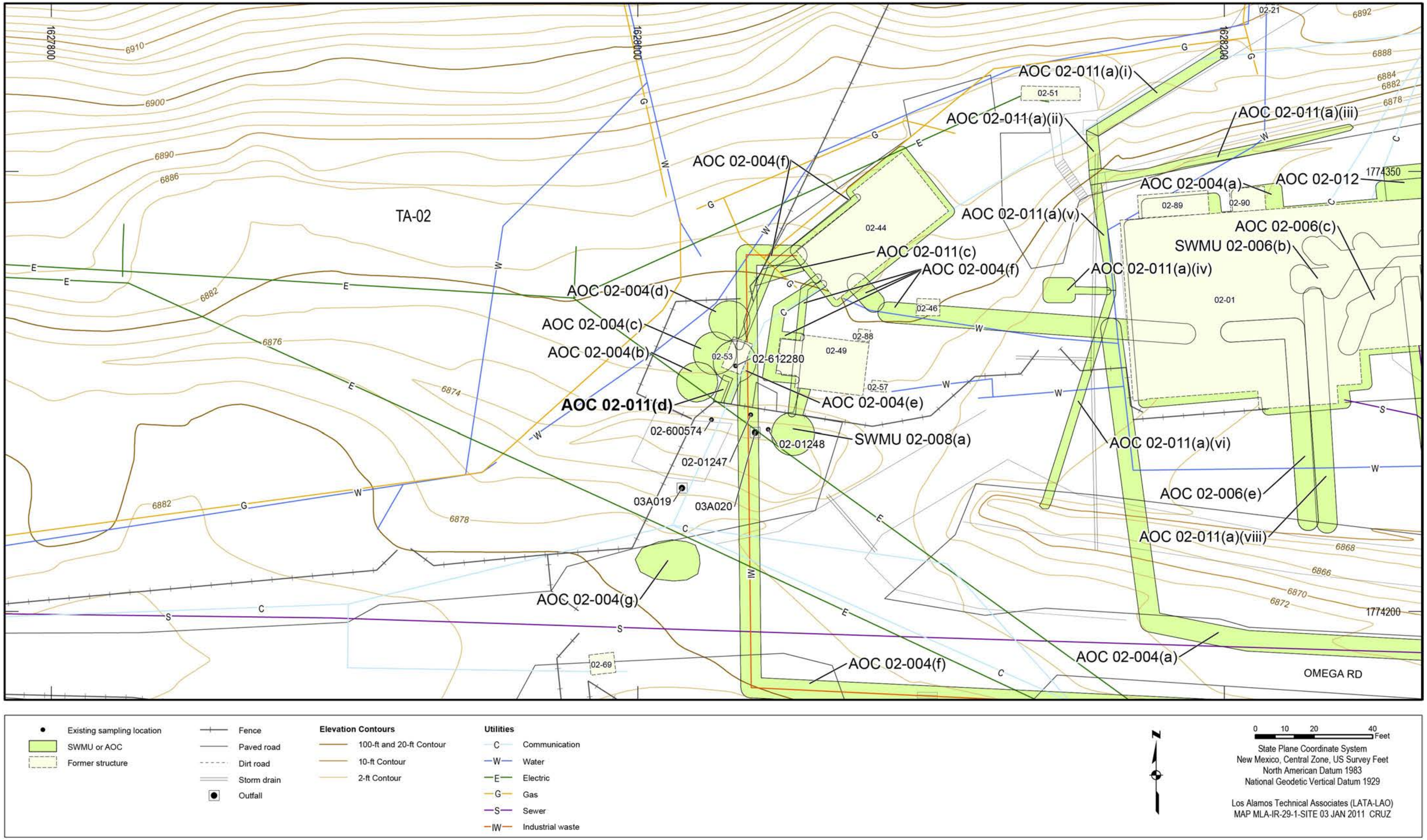

Figure 6.32-1 Site map of AOC 02-011(d)

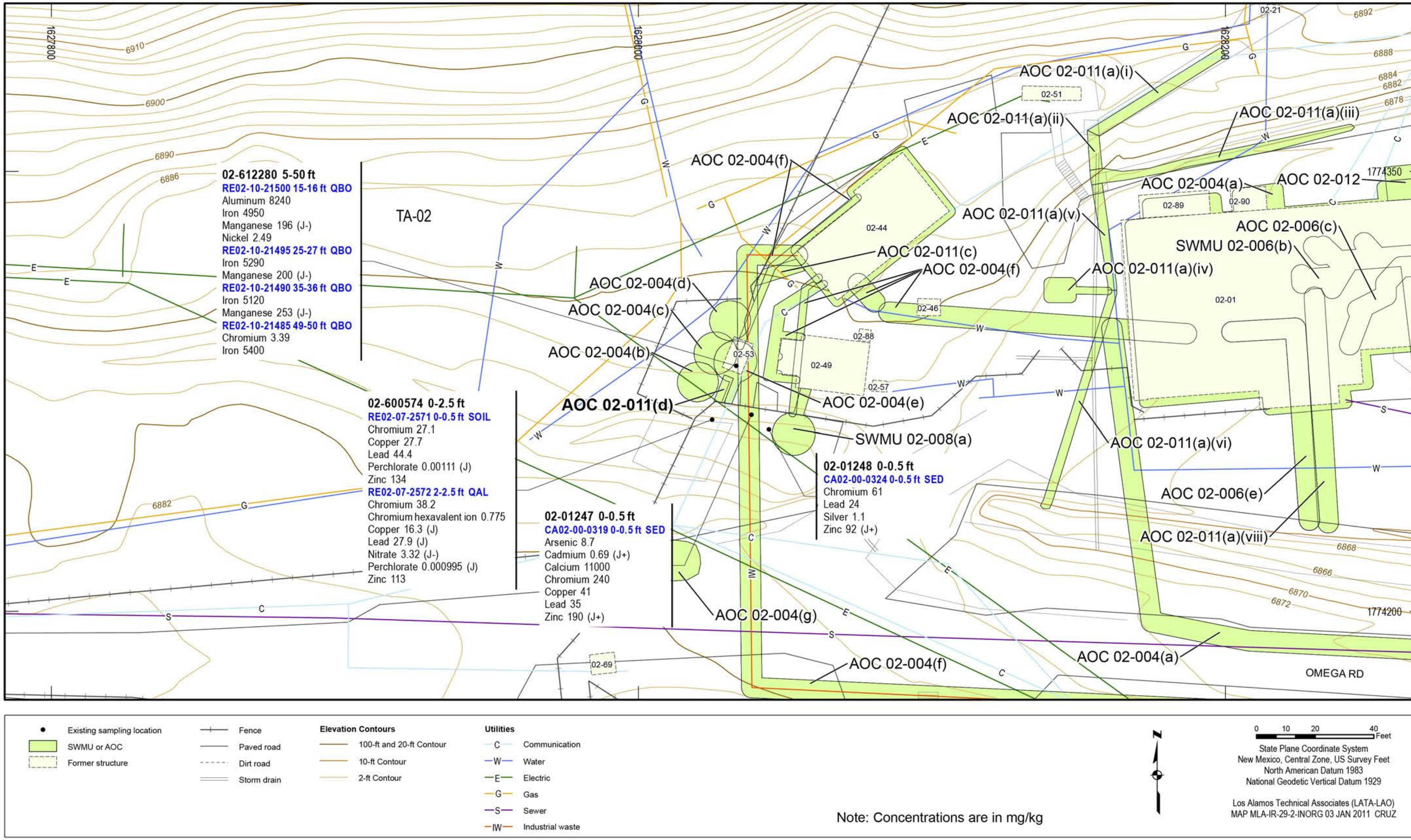

Figure 6.32-2 Inorganic chemicals detected or detected above BVs at AOC 02-011(d)

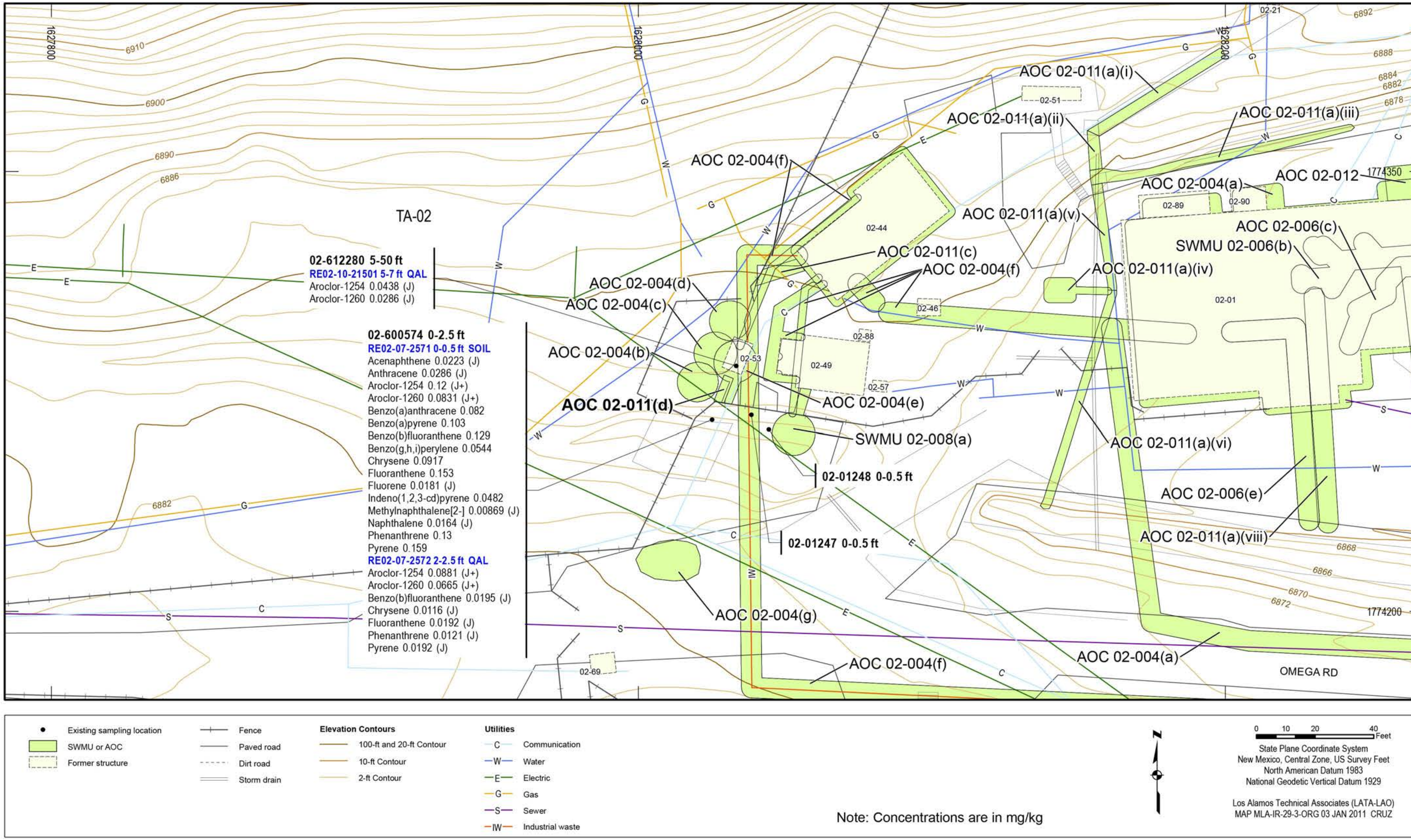

Figure 6.32-3 Organic chemicals detected at AOC 02-011(d)

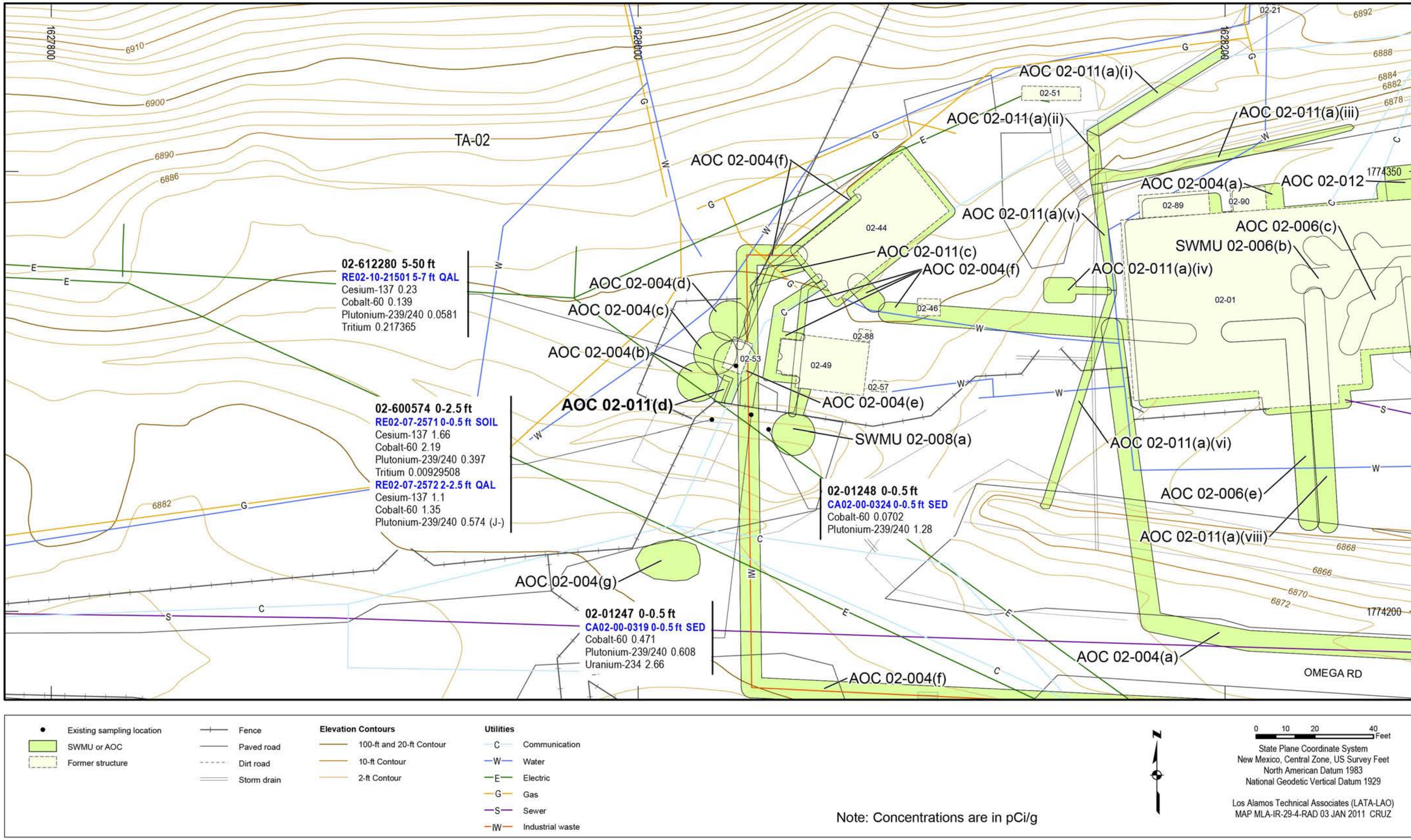

Figure 6.32-4 Radionuclides detected or detected above BVs/FVs at AOC 02-011(d)

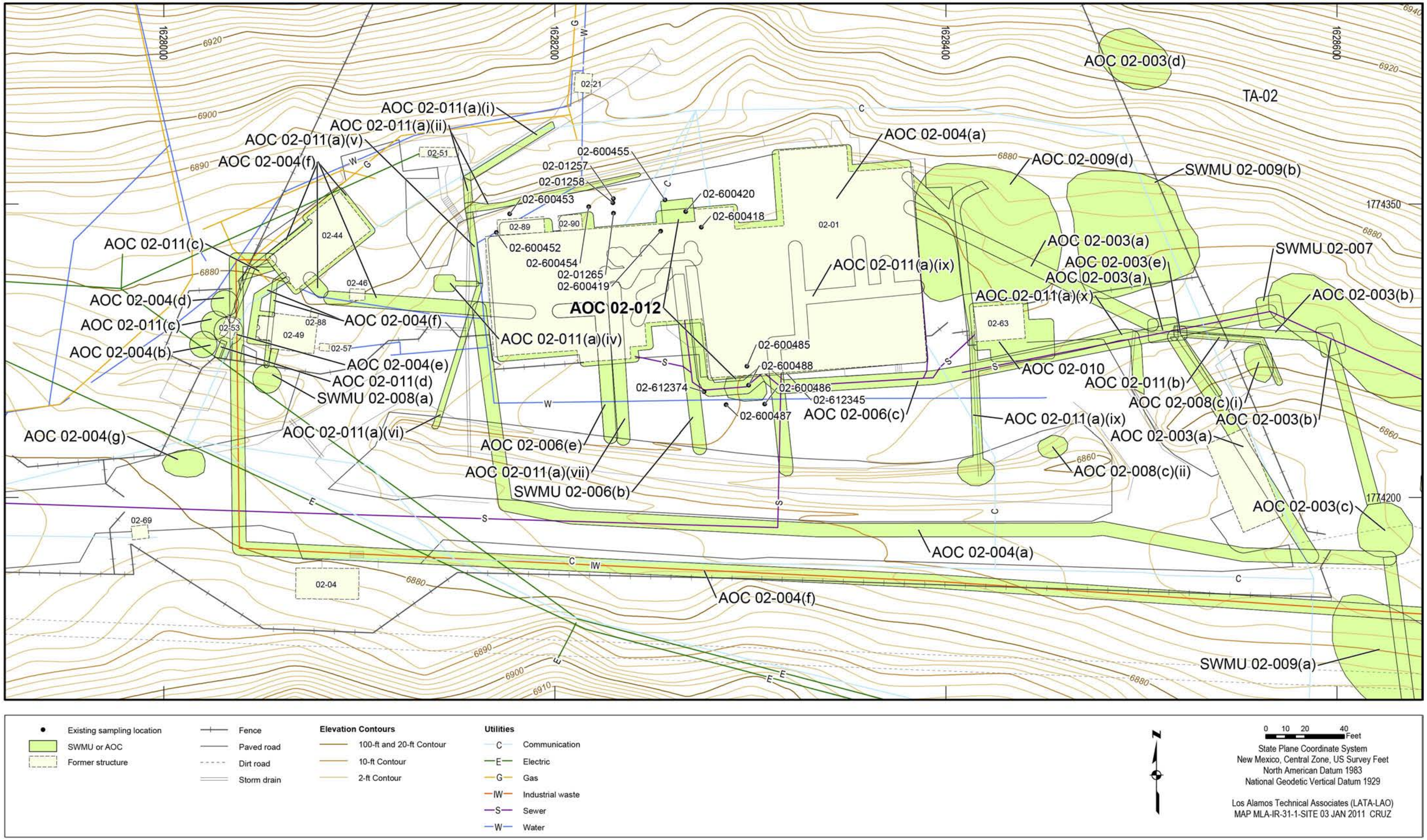

Figure 6.34-1 Site map of AOC 02-012

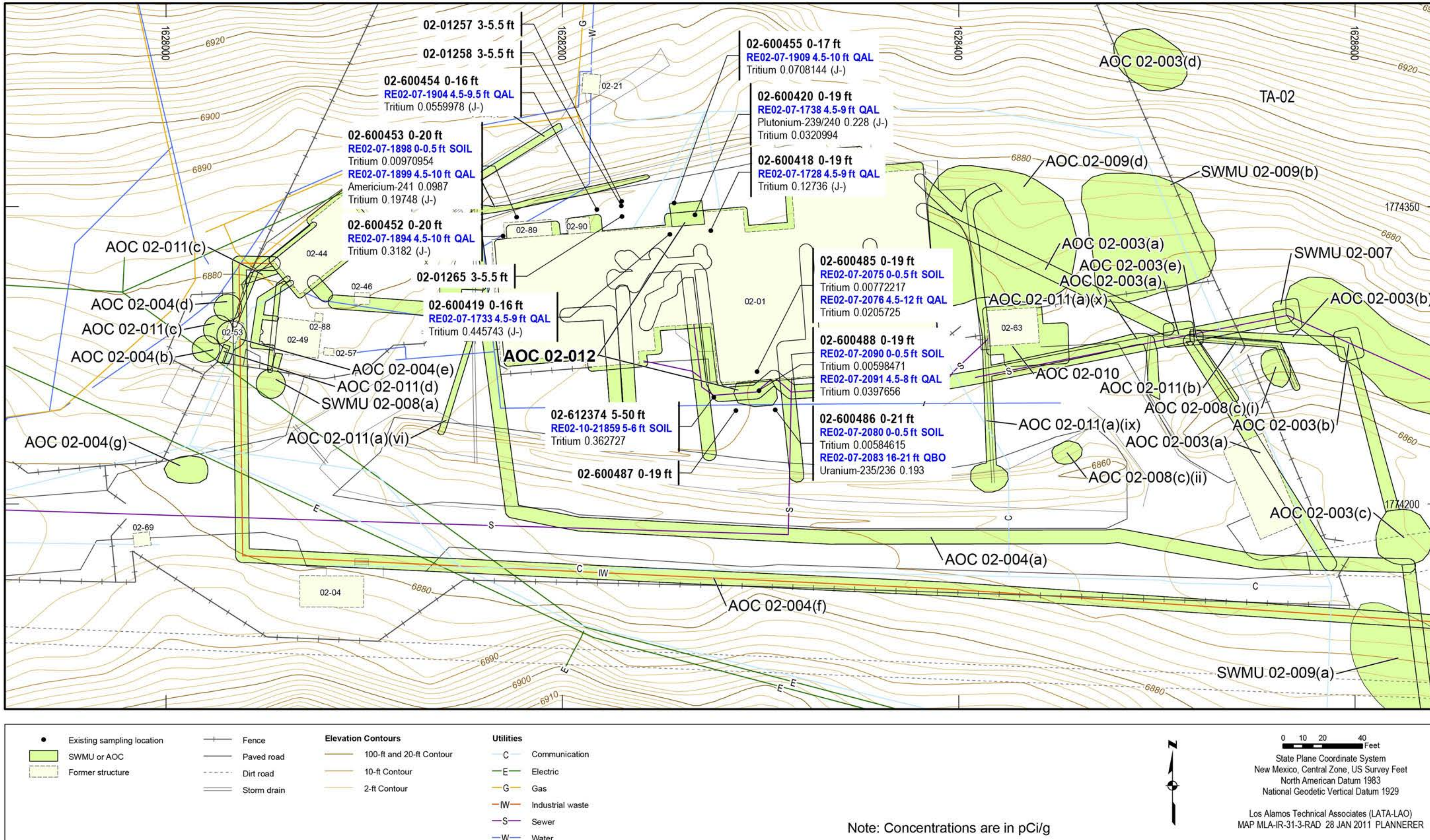

Figure 6.34-2 Radionuclides detected or detected above BVs/FVs at AOC 02-012

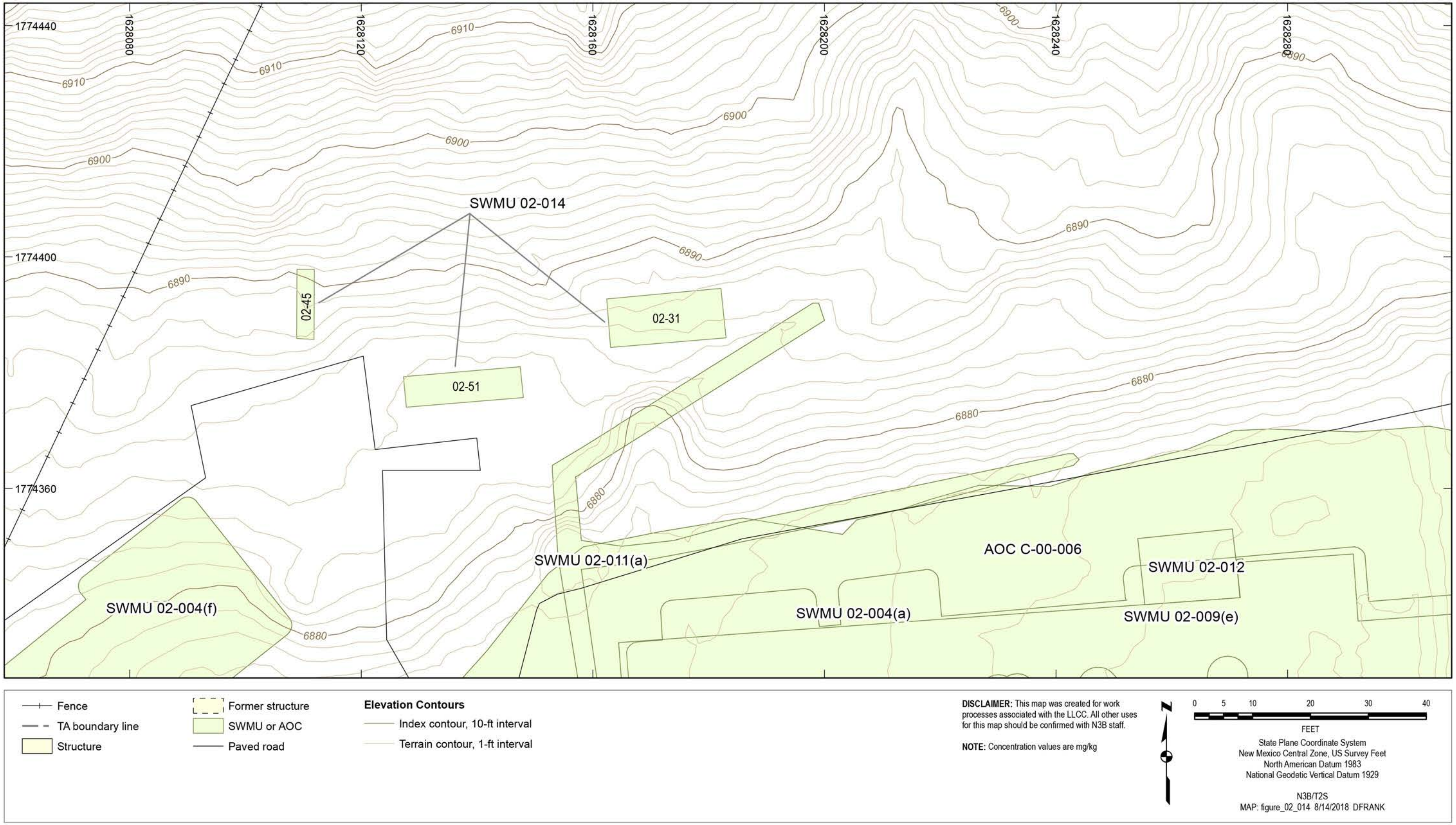

Figure 6.35-1 Site map of SWMU 02-014

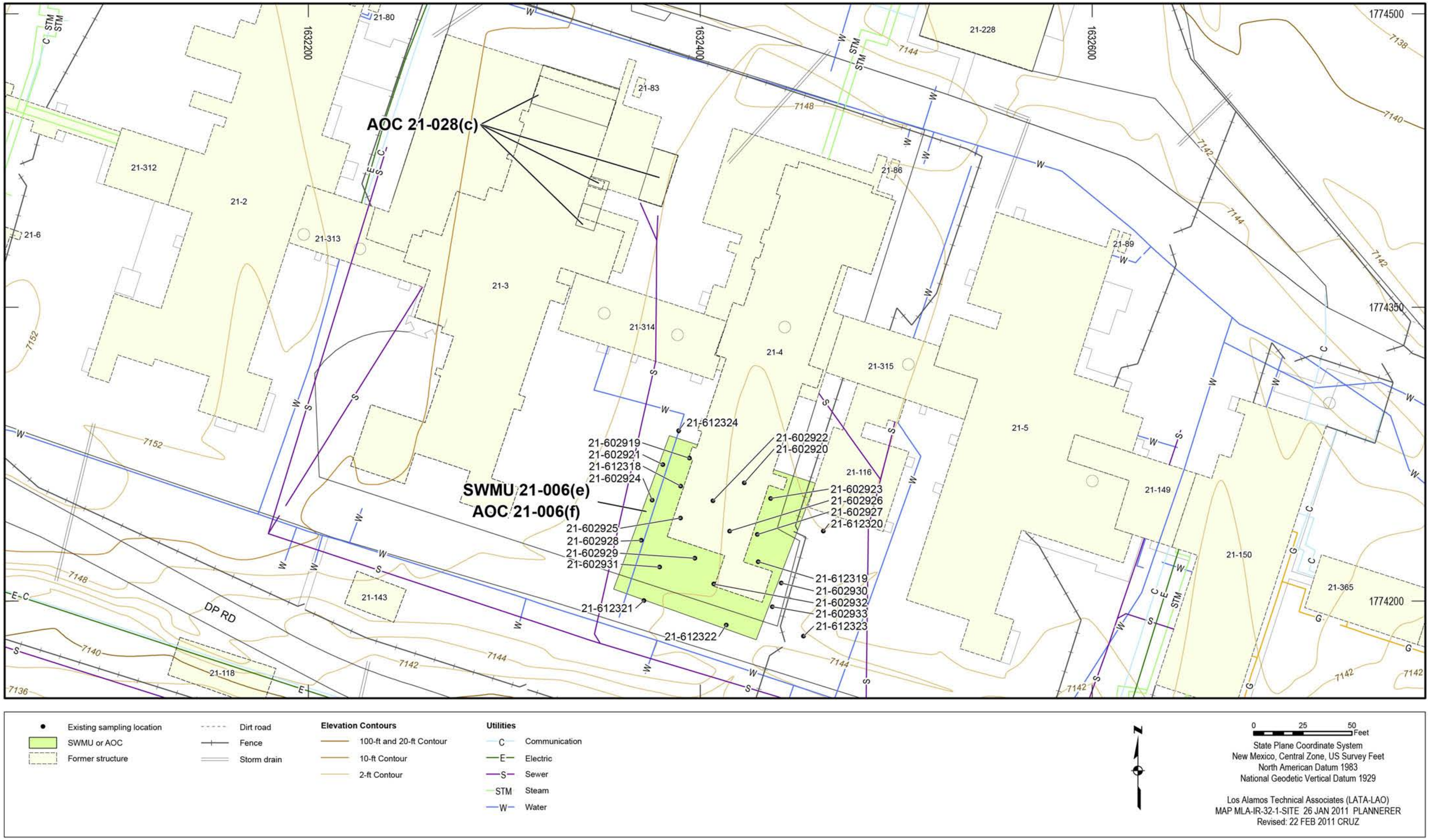

Figure 7.2-1 Site map of SWMU 21-006(e) and AOC 21-006(f)

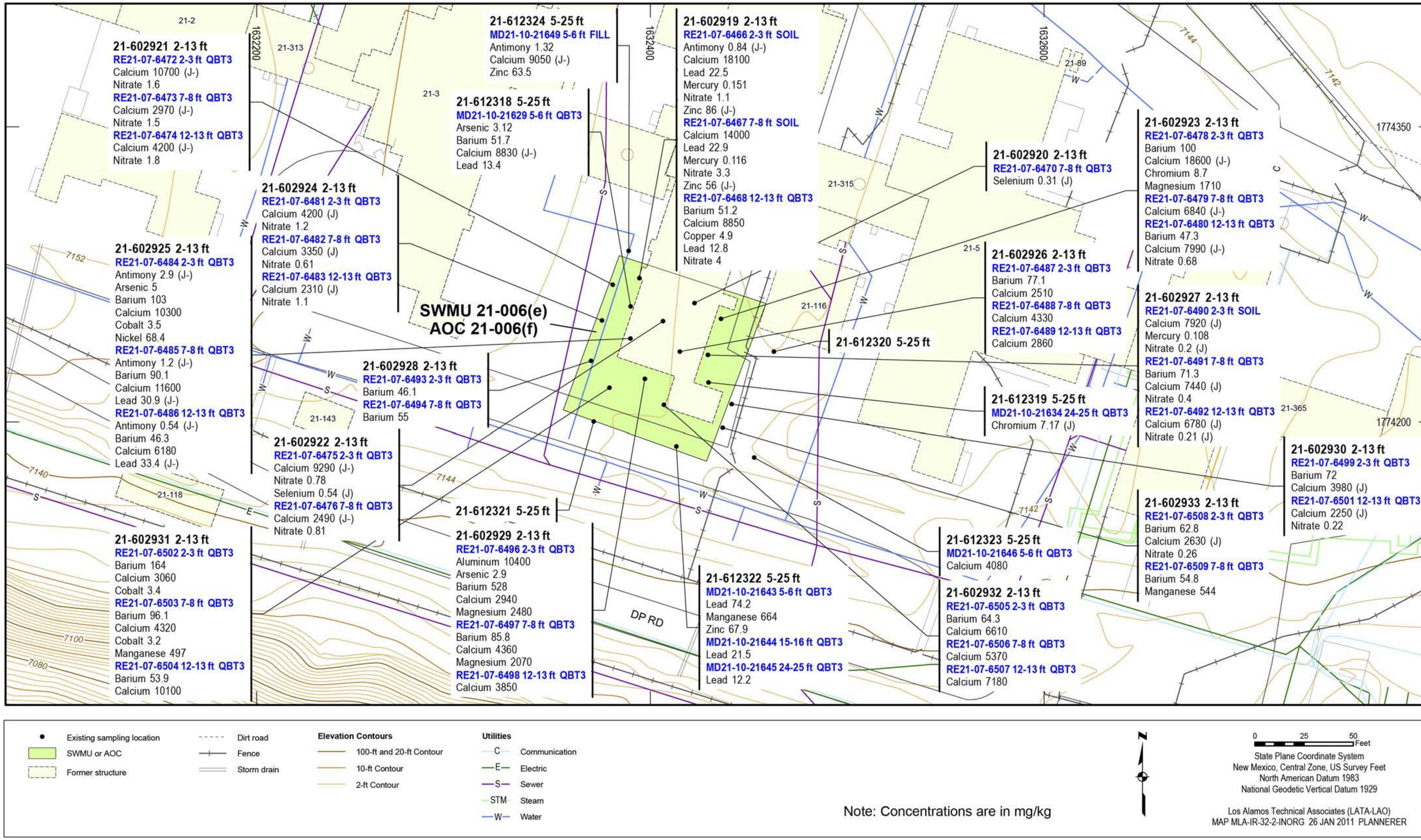

Figure 7.2-2 Inorganic chemicals detected or detected above BVs at SWMU 21-006(e) and AOC 21-006(f)

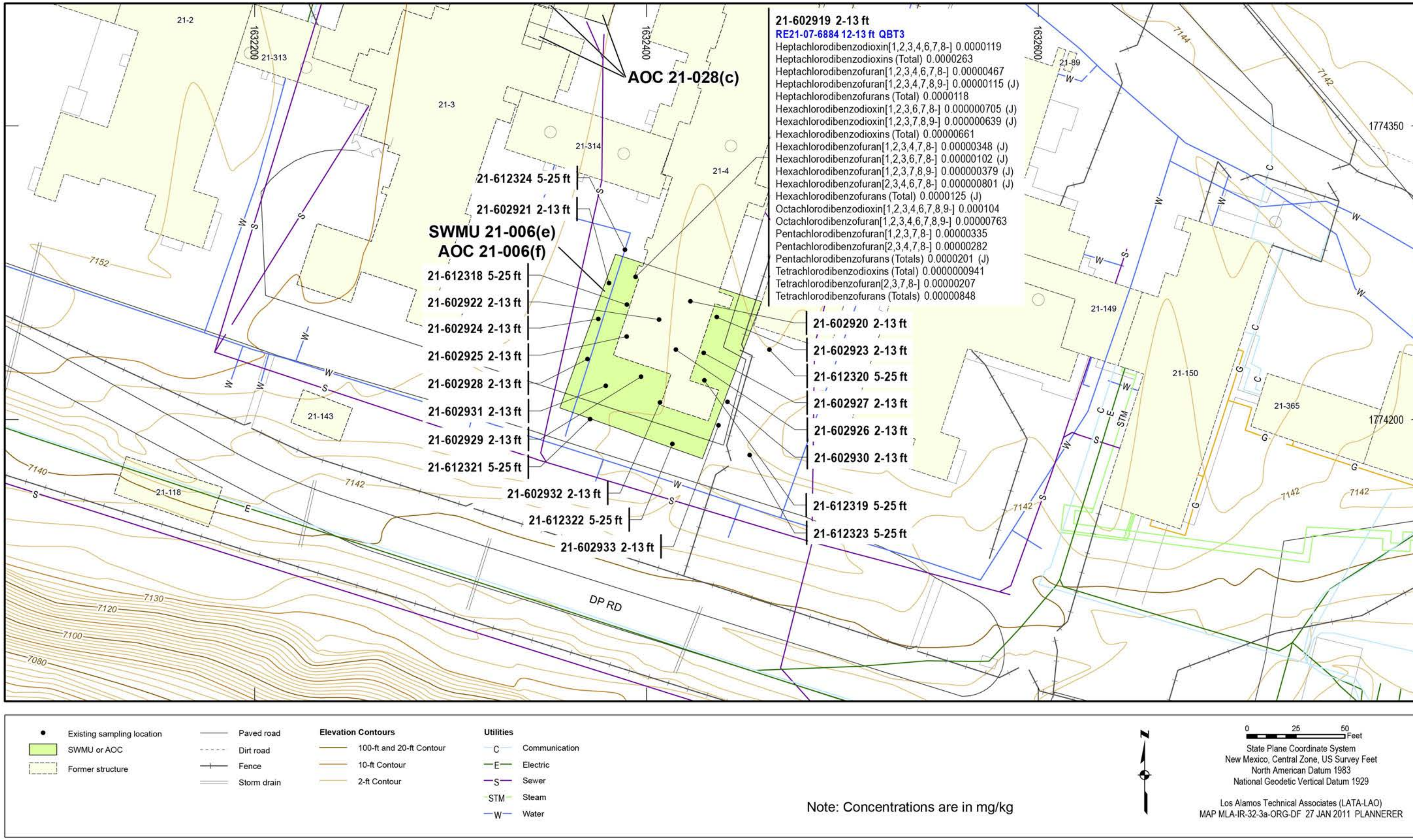

Figure 7.2-3 Dioxins and furans detected at SWMU 21-006(e) and AOC 21-006(f)

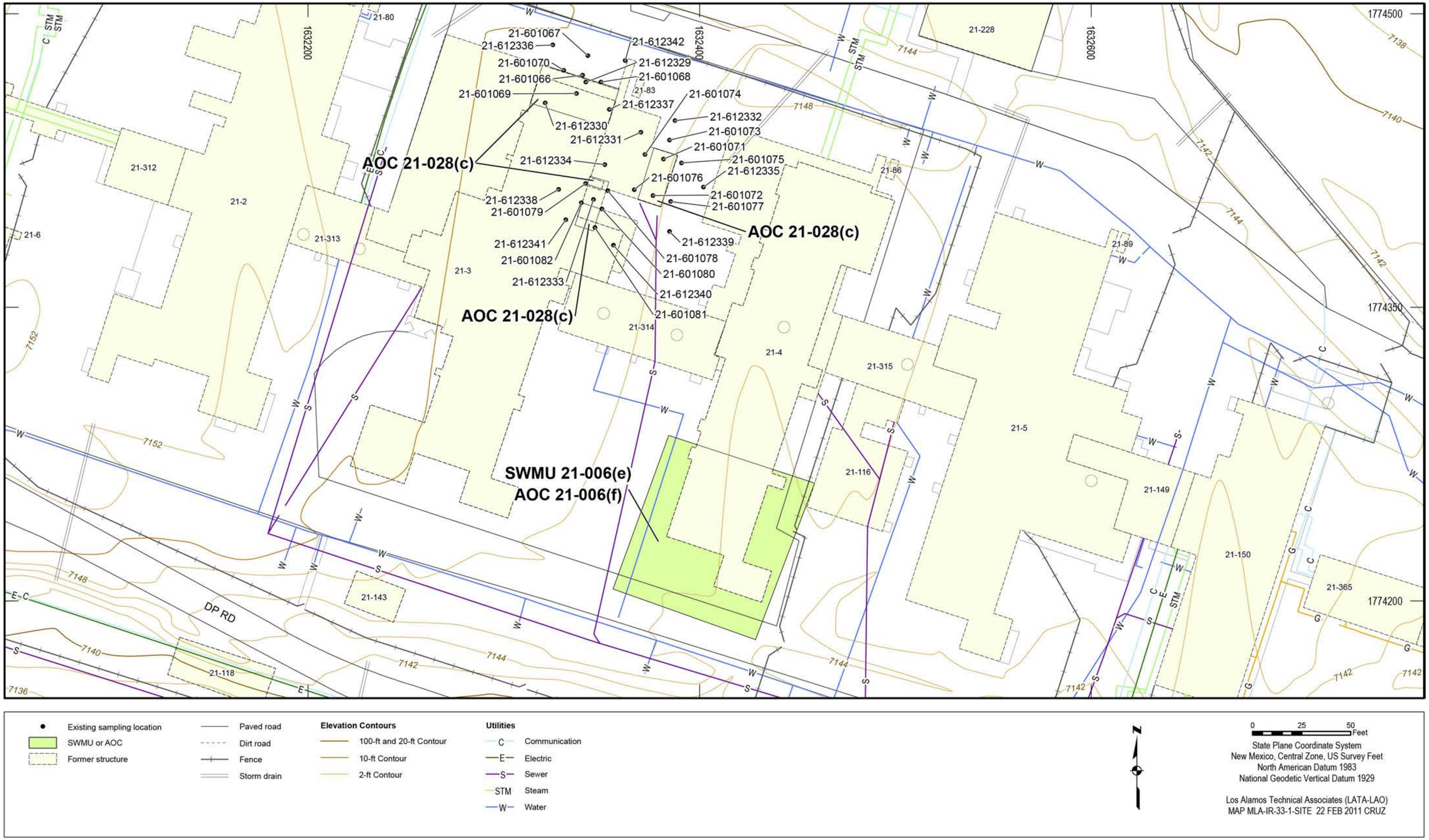

Figure 7.4-1 Site map of AOC 21-028(c)

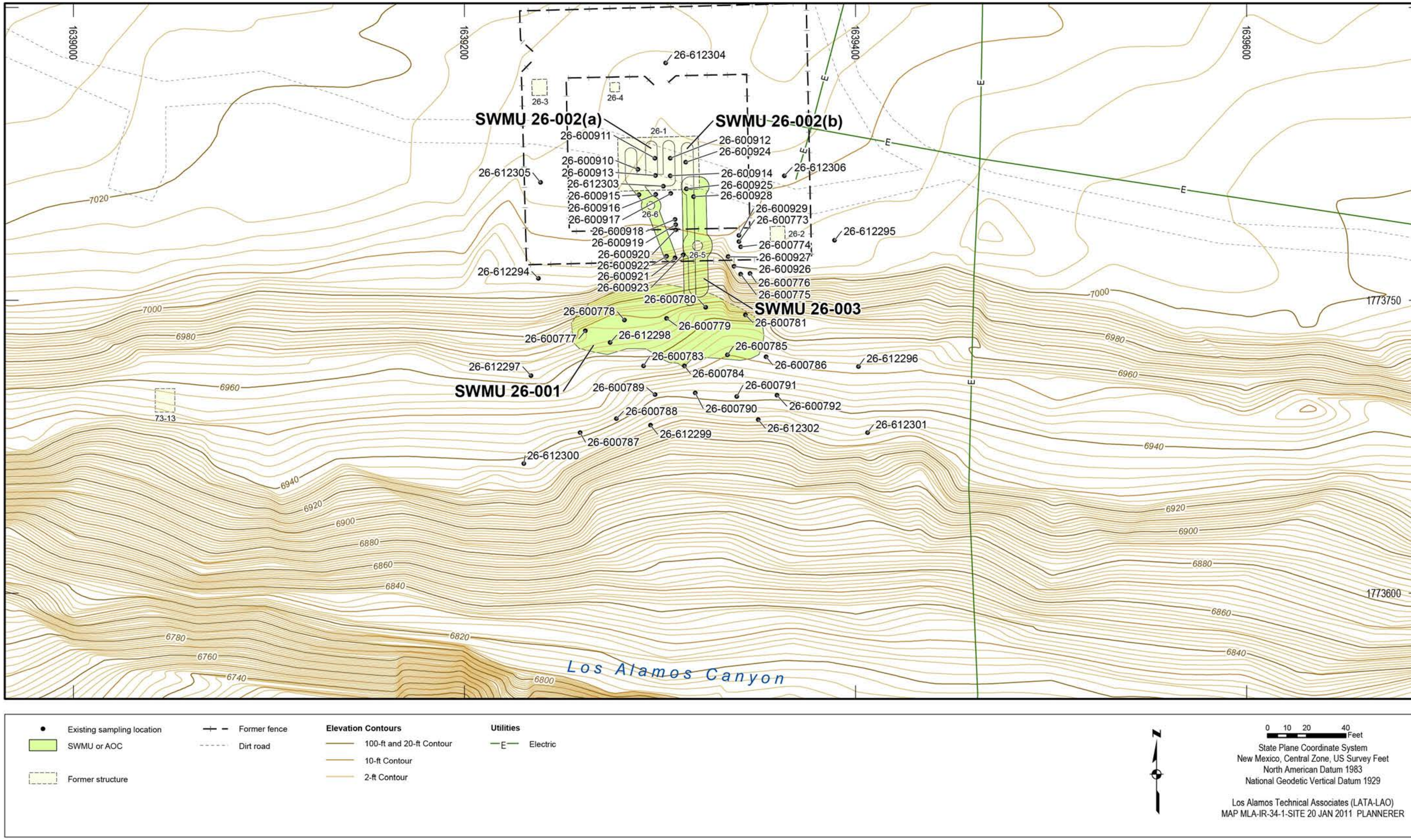

Figure 8.2-1 Site map of SWMUs 26-001, 26-002(a), 26-002(b), and 26-003

Table 1.1-1
Sites under Phase II Investigation in Middle Los Alamos Canyon Aggregate Area

SWMU/AOC	Site Description	Associated Structure or Facility	Previous Investigation	Phase II Investigation Activities
TA-02				
AOC 02-003(a)	Soil contamination from stack-gas valve house and gaseous effluent line	WBR, stack-gas valve house 02-19	1985 WBR Decommissioning Project 1995 RFI 2000 Post-Cerro Grande Fire Recovery Work 2007 Sampling	Sampled
AOC 02-003(b)	Soil contamination at condensate trap and line 119	WBR, condensate trap 02-48, line 119	1985 WBR Decommissioning Project 1995 RFI 2007 Sampling	Sampled
AOC 02-003(c)	Soil contamination at gaseous effluent delay tanks	WBR	1985 WBR Decommissioning Project 1995 RFI 2000 Post-Cerro Grande Fire Recovery Work 2007 Sampling	Sampled
AOC 02-003(d)	Soil contamination at site of upper part of line 119 and temporary vent line	WBR	1995 RFI 2000 Post-Cerro Grande Fire Recovery Work 2007 Sampling	Sampled
AOC 02-003(e)	Soil contamination	WBR, holding tank 02-62	1985 WBR Decommissioning Project 2000 Post-Cerro Grande Fire Recovery Work 2007 Sampling	Sampled
AOC 02-004(a)	Former reactor facility	OWR building 02-1	2000 Post-Cerro Grande Fire Recovery Work 2003 Omega West Decommissioning Project 2007 Sampling	Sampled; excavated PAH contamination
AOC 02-004(b) AOC 02-004(c) AOC 02-004(d)	Former storage tanks for effluent from OWR and equipment building	OWR 02-1, equipment building 02-44	1995 RFI 2000 Post-Cerro Grande Fire Recovery Work 2003 Omega West Decommissioning Project 2007 Sampling	Sampled

Table 1.1-1 (continued)

SWMU/AOC	Site Description	Associated Structure or Facility	Previous Investigation	Phase II Investigation Activities
AOC 02-004(e)	Former acid pit/ transfer sump	OWR building 02-1	1995 RFI 2000 Post-Cerro Grande Fire Recovery Work 2003 Omega West Decommissioning Project 2007 Sampling	Sampled
AOC 02-004(f)	Former equipment building and acid waste line to TA-50	Equipment building 02-44	2003 Omega West Decommissioning Project 2007 Sampling	Sampled; excavated PCB contamination
AOC 02-004(g)	Soil contamination	Portable aboveground tank	2003 Omega West Decommissioning Project 2007 Sampling	Sampled
SWMU 02-005	Soil contamination	Cooling tower 02-49	1995 RFI 2007 Sampling	Sampled
SWMU 02-006(a)	Former French drain	WBR	2003 Omega West Decommissioning Project 2007 Sampling	Sampled
SWMU 02-006(b)	Former acid waste line, laboratory effluent	OWR building 02-1	1995 RFI 2000 Post-Cerro Grande Fire Recovery Work 2003 Omega West Decommissioning Project 2007 Sampling	Sampled
AOC 02-006(c)	Former drainline from offices, restrooms, control room	OWR building 02-1	2003 Omega West Decommissioning Project 2007 Sampling	Sampled
AOC 02-006(d)	Duplicate of AOC 02-006(c)	OWR building 02-1	Same as AOC 02-006(c) (LANL 2006, 092571.12, p. 11)	Same as AOC 02-006(c)
AOC 02-006(e)	Former sump for reactor room floor drains and mezzanine	OWR building 02-1	1995 RFI 2000 Post-Cerro Grande Fire Recovery Work 2003 Omega West Decommissioning Project 2007 Sampling	Sampled

Table 1.1-1 (continued)

SWMU/AOC	Site Description	Associated Structure or Facility	Previous Investigation	Phase II Investigation Activities
SWMU 02-007	Septic system for floor drains in OWR building and chemical shack	OWR building 02-1	1985 WBR Decommissioning Project 2007 Sampling	Sampled
SWMU 02-008(a)	Outfall	Cooling tower 02-49	2000 Post-Cerro Grande Fire Recovery Work 2003 Omega West Decommissioning Project 2007 Sampling	Sampled under AOCs 02-004(b,c,d)
AOC 02-008(c)	Outfall for seepage into basement of OWR building	OWR building 02-1	1995 RFI 2000 Post-Cerro Grande Fire Recovery Work 2003 Omega West Decommissioning Project 2007 Sampling	Sampled
SWMU 02-009(a)	Soil contamination	Storage building 02-50	1985 WBR Decommissioning Project 1995 RFI 2000 Post-Cerro Grande Fire Recovery Work 2007 Sampling	Sampled
SWMU 02-009(b)	Soil contamination	Stack-gas valve house 02-19	2000 Post-Cerro Grande Fire Recovery Work 2007 Sampling	Sampled
SWMU 02-009(c)	Soil contamination	Leach field, Condensate trap 02-48	2000 Post-Cerro Grande Fire Recovery Work 2007 Sampling	Sampled
AOC 02-009(d)	Soil contamination	OWR building 02-1	1995 RFI 2000 Post-Cerro Grande Fire Recovery Work 2007 Sampling	Sampled
AOC 02-009(e)	Duplicate of SWMU 02-009(c)	Leach field, Condensate trap 02-48	Same as SWMU 02-009(c) (LANL 2006, 092571.12, p. 14)	Same as SWMU 02-009(c)
AOC 02-010	Soil contamination	Chemical shack 02-3, underground chamber 02-32	2000 Post-Cerro Grande Fire Recovery Work 2003 Omega West Decommissioning Project 2007 Sampling	Sampled; excavated cesium-137 contamination
AOC 02-011(a)	Storm drains, outfalls	OWR building 02-1, equipment building 02-44, chemical shack 02-3	1995 RFI 2000 Post-Cerro Grande Fire Recovery Work 2003 Omega West Decommissioning Project 2007 Sampling	Sampled; excavated PAH and PCB contaminations

Table 1.1-1 (continued)

SWMU/AOC	Site Description	Associated Structure or Facility	Previous Investigation	Phase II Investigation Activities
AOC 02-011(b)	Former drainlines from stack-gas valve house	WBR, stack-gas valve house 02-19	1995 RFI 2000 Post-Cerro Grande Fire Recovery Work 2007 Sampling	Sampled
AOC 02-011(c)	Storm drain	Equipment building 02-44	2003 Omega West Decommissioning Project 2007 Sampling	Sampled
AOC 02-011(d)	Outfall from equipment building	Equipment building 02-44	1995 RFI 2000 Post-Cerro Grande Fire Recovery Work 2003 Omega West Decommissioning Project 2007 Sampling	Sampled
AOC 02-011(e)	Duplicate of SWMU 02-008(a)	Cooling tower 02-49	Same as SWMU 02-008(a) (LANL 2006, 092571.12, p. 16)	Same as SWMU 02-008(a)
AOC 02-012	Soil contamination	UST 02-29 and 02-67, OWR building 02-1	1998 UST Removal 2000 Post-Cerro Grande Fire Recovery Work 2007 Sampling	Sampled
SWMU 02-014	Former transformer stations	Structures 02-31, 02-45, and 02-51	2007 Sampling for AOC 02-011(a)	Sampled
TA-21				
SWMU 21-006(e)	Seepage pit	Building 21-4	1995 Buildings 21-3 & -4 RFI Phase I Project 2007 Sampling	Sampled
AOC 21-006(f)	Seepage pit	Building 21-4		
AOC 21-028(c)	Storage areas	Building 21-3	1996 Buildings 21-3 & -4 RFI Phase I Project 2007 Sampling	Sampled
TA-26				
SWMU 26-001	Surface disposal site	East Gate vault 26-1	1965 Radiological Survey 1985 Phoswich Radioactivity Survey 1986 Comprehensive Environmental Assessment and Response Program Field survey 2007 Sampling	Sampled
SWMU 26-002(a)	Soil contamination	Sump 26-6		
SWMU 26-002(b)	Drainline	East Gate vault 26-1		
SWMU 26-003	Septic tank	Septic tank 26-5		

Table 3.2-1
Crosswalk of Proposed and Sampled Locations (Phase II) with Surveyed Coordinates

SWMU/AOC	Objective Addressed	Proposed #	Location ID	Easting (ft)	Northing (ft)
TA-02					
AOC 02-003(a)	Vertical extent for AOCs 02-003(a), 02-009(d), and 02-011(a)(x)	27	02-612348	1628399.576	1774342.889
AOC 02-003(a)	Vertical extent for AOCs 02-003(a,e) and 02-011(b)	31	02-612389	1628514.925	1774285.392
AOC 02-003(b)	Vertical extent for AOCs 02-003(b), 02-008(c)(i) and 02-011(b) and SWMU 02-007	32	02-612390	1628565.678	1774279.358
AOC 02-003(c)	Vertical extent for AOCs 02-003(b,c) and south part of SWMU 02-009(c)	36	02-612420	1628639.951	1774195.027
AOC 02-003(d)	Lateral extent near previous location 02-600218	46	02-612412	1628533.864	1774420.456
AOC 02-003(e)	Vertical extent for AOCs 02-003(a,e) and 02-011(b)	31	02-612389	1628514.925	1774285.392
AOC 02-004(a)	Vertical extent of PAHs	1	02-600580	1628163.36	1774276.324
AOC 02-004(a)	Vertical extent for AOC 02-004(a)	25	02-612325	1628349.71	1774352.826
AOC 02-004(a)	Vertical extent for AOC 02-004(a)	26	02-612326	1628336.046	1774284.682
AOC 02-004(a)	Vertical extent for AOC 02-004(a)	24	02-612327	1628260.981	1774313.963
AOC 02-004(a)	Vertical extent for AOC 02-004(a)	23	02-612328	1628192.127	1774310.059
AOC 02-004(a)	Vertical extent for AOCs 02-011(a)(iv) and 02-004(a,f)	19	02-612346	1628157.374	1774291.844
AOC 02-004(a)	Lateral extent from location 1	1 Step-out	02-612350	1628159.36	1774276.324
AOC 02-004(a)	Lateral extent from location 1	1 Step-out	02-612351	1628167.36	1774276.324
AOC 02-004(a)	Lateral extent from location 1	1 Step-out	02-612352	1628163.36	1774280.324
AOC 02-004(a)	Lateral extent from location 1	1 Step-out	02-612353	1628163.36	1774272.324
AOCs 02-004(b,c,d)	Vertical extent for AOCs 02-004(b–e) and 02-011(d)	16	02-612280	1628033.301	1774283.617
AOC 02-004(f)	Vertical extent of PCBs	3	02-600470	1628074.235	1774340.811
AOC 02-004(f)	Vertical extent of PCBs	5	02-600567	1628038.445	1774261.469
AOC 02-004(f)	Vertical extent for AOCs 02-011(a)(iv) and 02-004(a,f)	19	02-612346	1628157.374	1774291.844
AOC 02-004(f)	Vertical extent for AOCs 02-004(f) and 02-011(c)	15	02-612347	1628046.433	1774319.109
AOC 02-004(f)	Lateral extent from location 3	3 Step-out	02-612354	1628074.235	1774344.811
AOC 02-004(f)	Lateral extent from location 3	3 Step-out	02-612355	1628070.235	1774340.811
AOC 02-004(f)	Lateral extent from location 3	3 Step-out	02-612357	1628078.235	1774340.811

Table 3.2-1 (continued)

SWMU/AOC	Objective Addressed	Proposed #	Location ID	Easting (ft)	Northing (ft)
AOC 02-004(f)	Lateral extent from location 3	3 Step-out	02-612358	1628074.235	1774336.881
AOC 02-004(f)	Lateral extent from location 4	4 Step-out	02-612359	1628094.25	1774320.982
AOC 02-004(f)	Vertical extent of PCBs	4	02-612360	1628090.25	1774319.982
AOC 02-004(f)	Lateral extent from location 4	4 Step-out	02-612361	1628086.25	1774320.982
AOC 02-004(f)	Lateral extent from location 4	4 Step-out	02-612362	1628090.25	1774324.982
AOC 02-004(f)	Lateral extent from location 4	4 Step-out	02-612363	1628090.25	1774316.982
AOC 02-004(f)	Lateral extent from location 2	2 Step-out	02-612364	1628055.473	1774324.982
AOC 02-004(f)	Vertical extent of PCBs	2	02-612365	1628055.473	1774321.982
AOC 02-004(f)	Lateral extent from location 2	2 Step-out	02-612366	1628055.473	1774316.982
AOC 02-004(f)	Lateral extent from location 2	2 Step-out	02-612367	1628051.473	1774320.982
AOC 02-004(f)	Lateral extent from location 2	2 Step-out	02-612368	1628059.473	1774320.982
AOC 02-004(f)	Lateral extent from location 5	5 Step-out	02-613005	1628038.445	1774257.47
AOC 02-004(f)	Lateral extent from location 5	5 Step-out	02-613623	1628030.346	1774261.541
AOC 02-004(f)	Lateral extent from location 5	5 Step-out	02-613624	1628038.461	1774269.547
AOC 02-004(f)	Lateral extent from location 5	5 Step-out	02-613625	1628046.495	1774261.46
AOC 02-004(g)	Vertical extent of contamination for AOC 02-004(g)	17	02-612293	1628023.718	1774217.07
SWMU 02-005	Vertical extent of PCBs	60	02-600561	1627623.186	1774489.018
SWMU 02-005	Lateral extent from location 60	60 Step-out	02-612376	1627631.727	1774489.885
SWMU 02-005	Lateral extent from location 60	60 Step-out	02-612377	1627627.378	1774494.103
SWMU 02-005	Lateral extent from location 60	60 Step-out	02-612378	1627623.16	1774489.885
SWMU 02-005	Lateral extent from location 60	60 Step-out	02-612379	1627627.508	1774485.601
SWMU 02-005	Lateral extent of radionuclides on slope NE of previous location 02-600548	64	02-612380	1628299.847	1774522.936
SWMU 02-005	Lateral extent of radionuclides on slope NE of previous location 02-600547	63	02-612381	1628064.659	1774529.592
SWMU 02-005	Lateral extent of radionuclides on slope NE of previous location 02-600549	65	02-612382	1628493.988	1774534.584
SWMU 02-005	Lateral extent of radionuclides on slope NE of previous location 02-600550	66	02-612383	1628735.832	1774512.951
SWMU 02-005	Lateral extent of radionuclides on slope SE of previous location 02-600551	67	02-612384	1628924.427	1774445.279
SWMU 02-005	Lateral extent of radionuclides on slope NW of previous location 02-600562	62	02-612385	1627922.13	1774513.116

Table 3.2-1 (continued)

SWMU/AOC	Objective Addressed	Proposed #	Location ID	Easting (ft)	Northing (ft)
SWMU 02-005	Lateral extent of radionuclides on slope NW of previous location 02-600562	61	02-612386	1627755.273	1774508.328
SWMU 02-005	Lateral extent of contamination, vertical extent of PCBs and plutonium-239/240	40	02-612407	1627632.567	1774289.47
SWMU 02-005	Lateral extent from location 60	60 Step-out	02-613290	1627619.446	1774489.824
SWMU 02-005	Lateral extent from location 60	60 Step-out	02-613291	1627627.118	1774498.099
SWMU 02-005	Lateral extent from location 60	60 Step-out	02-613622	1627635.842	1774489.99
SWMU 02-006(a)	Lateral extent of metals and tritium, 80 ft W of location 1	6(6a)	02-612640	1628637.882	1773372.307
SWMU 02-006(a)	Lateral extent of metals and tritium, 60 ft NW of previous location 02-600255	7(6a)	02-612641	1628658.15	1773433.114
SWMU 02-006(a)	Lateral extent of metals and tritium, 40 ft N of location 4	9(6a)	02-612642	1628778.436	1773455.277
SWMU 02-006(a)	Lateral extent of metals and tritium, 40 ft NE of location 4	10(6a)	02-612643	1628814.349	1773431.44
SWMU 02-006(a)	Lateral extent of metals and tritium, 40 ft NE of previous location 02-600256	3(6a)	02-612644	1628776.973	1773415.82
SWMU 02-006(a)	Lateral extent of metals and tritium, 120 ft W of location 1	11(6a)	02-612645	1628842.056	1773374.353
SWMU 02-006(a)	Lateral extent of metals and tritium, 40 ft SE of previous location 02-600257	4(6a)	02-612646	1628793.151	1773333.63
SWMU 02-006(a)	Lateral extent of metals and tritium, 50 ft S of location 11	12(6a)	02-612647	1628836.292	1773320.613
SWMU 02-006(a)	Lateral extent of metals and tritium, 40 ft SE of location 2	13(6a)	02-612648	1628714.853	1773312.698
SWMU 02-006(a)	Lateral extent of metals and tritium, 70 ft N of location 1	8(6a)	02-612649	1628729.347	1773445.74
SWMU 02-006(a)	Lateral extent of metals and tritium, 60 ft SW of previous location 02-600258	5(6a)	02-612650	1628632.169	1773312.209
SWMU 02-006(a)	Vertical extent of tritium	1(6a)	02-612651	1628740.64	1773367.484
SWMU 02-006(a)	Vertical extent of cyanide (total), hexavalent chromium, and tritium	2(6a)	02-612652	1628702.407	1773338.464
SWMU 02-006(b)	Vertical extent for AOCs 02-006(b) and 02-012	21	02-612374	1628276.42	1774253.804
AOC 02-006(c)	Vertical extent for AOCs 02-006(c) and 02-011(a)(ix)	22	02-612345	1628318.272	1774263.737
AOC 02-006(c)	Vertical extent for AOCs-02-006(c) and 02-010	28	02-612463	1628429.744	1774273.68

Table 3.2-1 (continued)

SWMU/AOC	Objective Addressed	Proposed #	Location ID	Easting (ft)	Northing (ft)
AOC 02-006(e)	Vertical extent for AOCs 02-006(e) and 02-011(a)(vii,viii)	20	02-612292	1628225.844	1774256.643
SWMU 02-007	Vertical extent for AOCs 02-003(b), 02-008(c)(i) and 02-011(b) and SWMU 02-007	32	02-612390	1628565.678	1774279.358
SWMU 02-009(a)	Vertical extent for SWMU 02-009(a)	37	02-612421	1628649.001	1774121.092
SWMU 02-009(a)	Vertical extent for SWMU 02-009(a)	38	02-612422	1628734.442	1774061.793
SWMU 02-009(b)	Vertical extent for SWMU 02-009(b)	30	02-612388	1628498.68	1774331.531
SWMU 02-009(c)	Vertical extent for SWMU 02-009(c)	33	02-612391	1628590.345	1774305.267
SWMU 02-009(c)	Vertical extent for SWMU 02-009(c)	34	02-612392	1628656.005	1774259.128
SWMU 02-009(c)	Vertical extent for SWMU 02-009(c)	35	02-612393	1628733.199	1774230.557
SWMU 02-009(c)	Vertical extent for AOCs 02-003(b,c) and south part of SWMU 02-009(c)	36	02-612420	1628639.951	1774195.027
AOC 02-008(c)(i)	Vertical extent for AOCs 02-003(b), 02-008(c)(i) and 02-011(b) and SWMU 02-007	32	02-612390	1628565.678	1774279.358
AOC 02-008(c)(ii)	Vertical extent for AOCs 02-008(c)(ii) and 02-011(a)(x)	Was 29	02-612982	1628455.936	1774242.473
AOC 02-009(d)	Vertical extent for AOCs 02-003(a), 02-009(d), and 02-011(a)(x)	27	02-612348	1628399.576	1774342.889
AOC 02-010	Vertical extent of cesium-137	7	02-600640	1628508.411	1774243.406
AOC 02-010	Vertical extent of cesium-137	6	02-612423	1628449.396	1774298.251
AOC 02-010	Lateral extent from location 6	6 Step-out	02-612424	1628449.396	1774295.251
AOC 02-010	Lateral extent from location 6	6 Step-out	02-612425	1628453.369	1774299.251
AOC 02-010	Lateral extent from location 6	6 Step-out	02-612426	1628449.396	1774303.251
AOC 02-010	Lateral extent from location 6	6 Step-out	02-612427	1628445.396	1774299.251
AOC 02-010	Lateral extent from location 7	7 Step-out	02-612429	1628508.412	1774247.406
AOC 02-010	Lateral extent from location 7	7 Step-out	02-612430	1628512.412	1774243.406
AOC 02-010	Lateral extent from location 7	7 Step-out	02-612431	1628504.412	1774243.406
AOC 02-010	Lateral extent from location 7	7 Step-out	02-612432	1628508.412	1774239.406
AOC 02-010	Vertical extent for AOCs 02-006(c) and 02-010	28	02-612463	1628429.744	1774273.68
AOC 02-010	Lateral extent from location 6	6 Step-out	02-613240	1628440.943	1774298.833
AOC 02-011(a)(i)	Vertical extent of PCBs	8	02-600385	1628163.211	1774360.936
AOC 02-011(a)(i)	Vertical extent of PCBs	9	02-600386	1628179.751	1774374.776
AOC 02-011(a)(i)	Lateral extent from location 9	9 Step-out	02-612444	1628179.751	1774370.776
AOC 02-011(a)(i)	Lateral extent from location 8	8 Step-out	02-612445	1628167.211	1774360.936
AOC 02-011(a)(i)	Lateral extent from location 8	8 Step-out	02-612446	1628163.211	1774356.936
AOC 02-011(a)(i)	Lateral extent from location 9	9 Step-out	02-612447	1628183.751	1774374.776

Table 3.2-1 (continued)

SWMU/AOC	Objective Addressed	Proposed #	Location ID	Easting (ft)	Northing (ft)
AOC 02-011(a)(i)	Lateral extent from location 8	8 Step-out	02-612448	1628159.211	1774360.936
AOC 02-011(a)(i)	Lateral extent from location 8	8 Step-out	02-613289	1628162.844	1774373.205
AOC 02-011(a)(i)	Lateral extent from location 9	9 Step-out	02-613292	1628179.766	1774384.078
AOC 02-011(a)(i)	Vertical extent for AOCs 02-011(a)(i,ii,iii,v)	18	02-613571	1628163.911	1774353.714
AOC 02-011(a)(ii)	Vertical extent of PCBs	11	02-600449	1628151.784	1774356.131
AOC 02-011(a)(ii)	Lateral extent from location 11	11 Step-out	02-612451	1628151.784	1774360.131
AOC 02-011(a)(ii)	Lateral extent from location 11	11 Step-out	02-612452	1628151.784	1774352.131
AOC 02-011(a)(ii)	Lateral extent from location 11	11 Step-out	02-612453	1628147.784	1774356.131
AOC 02-011(a)(ii)	Lateral extent from location 11	11 Step-out	02-613001	1628151.784	1774348.131
AOC 02-011(a)(ii)	Lateral extent from location 11	11 Step-out	02-613002	1628151.784	1774364.131
AOC 02-011(a)(ii)	Lateral extent from location 11	11 Step-out	02-613122	1628147.784	1774348.131
AOC 02-011(a)(ii)	Lateral extent from location 11	11 Step-out	02-613124	1628147.784	1774352.131
AOC 02-011(a)(ii)	Lateral extent from location 11	11 Step-out	02-613287	1628143.823	1774352.113
AOC 02-011(a)(ii)	Lateral extent from location 11	11 Step-out	02-613288	1628144.477	1774365.629
AOC 02-011(a)(ii)	Vertical extent for AOCs 02-011(a)(i,ii,iii,v)	18	02-613571	1628163.911	1774353.714
AOC 02-011(a)(ii)	Lateral extent from location 11	11 Step-out	02-613626	1628139.681	1774352.222
AOC 02-011(a)(ii)	Lateral extent from location 11	11 Step-out	02-613627	1628139.245	1774371.952
AOC 02-011(a)(ii)	Lateral extent from location 11	11 Step-out	02-613667	1628133.555	1774377.775
AOC 02-011(a)(ii)	Lateral extent from location 11	11 Step-out	02-613668	1628135.577	1774352.376
AOC 02-011(a)(ii)	Lateral extent from location 11	11 Step-out	02-613699	1628127.915	1774383.699
AOC 02-011(a)(ii)	Lateral extent from location 11	11 Step-out	02-613700	1628131.604	1774352.376
AOC 02-011(a)(ii)	Lateral extent from location 11	11 Step-out	02-613761	1628116.067	1774386.04
AOC 02-011(a)(ii)	Lateral extent from location 11	11 Step-out	02-613762	1628115.854	1774395.866
AOC 02-011(a)(iii)	Lateral extent from location 10	10 Step-out	02-612438	1628166.46	1774344.403
AOC 02-011(a)(iii)	Lateral extent from location 10	10 Step-out	02-612439	1628162.46	1774340.403
AOC 02-011(a)(iii)	Lateral extent from location 10	10 Step-out	02-612440	1628158.46	1774344.403
AOC 02-011(a)(iii)	Lateral extent from location 10	10 Step-out	02-613003	1628162.46	1774352.403
AOC 02-011(a)(iii)	Vertical extent for AOCs 02-011(a)(i,ii,iii,v)	18	02-613571	1628163.911	1774353.714
AOC 02-011(a)(iv)	Vertical extent for AOCs 02-011(a)(iv) and 02-004(a,f)	19	02-612346	1628157.374	1774291.844
AOC 02-011(a)(v)	Vertical extent of PCBs	12	02-600450	1628152.836	1774340.042
AOC 02-011(a)(v)	Lateral extent from location 12	12 Step-out	02-612434	1628152.836	1774336.042
AOC 02-011(a)(v)	Lateral extent from location 12	12 Step-out	02-612435	1628152.836	1774344.042
AOC 02-011(a)(v)	Lateral extent from location 12	12 Step-out	02-612436	1628148.836	1774340.042
AOC 02-011(a)(v)	Lateral extent from location 12	12 Step-out	02-612437	1628156.836	1774340.042
AOC 02-011(a)(v)	Lateral extent from location 12	12 Step-out	02-613118	1628144.836	1774340.042

Table 3.2-1 (continued)

SWMU/AOC	Objective Addressed	Proposed #	Location ID	Easting (ft)	Northing (ft)
AOC 02-011(a)(v)	Lateral extent from location 12	12 Step-out	02-613120	1628148.836	1774336.042
AOC 02-011(a)(v)	Lateral extent from location 12	12 Step-out	02-613121	1628152.836	1774332.042
AOC 02-011(a)(v)	Vertical extent for AOCs 02-011(a)(i,ii,iii,v)	18	02-613571	1628163.911	1774353.714
AOC 02-011(a)(vi)	Vertical extent of PAHs	14	02-600532	1628136.121	1774248.262
AOC 02-011(a)(vi)	Lateral extent from location 14	14 Step-out	02-612465	1628132.121	1774248.262
AOC 02-011(a)(vi)	Lateral extent from location 14	14 Step-out	02-612466	1628140.121	1774248.262
AOC 02-011(a)(vi)	Lateral extent from location 14	14 Step-out	02-612467	1628136.121	1774244.262
AOC 02-011(a)(vi)	Lateral extent from location 14	14 Step-out	02-612468	1628136.121	1774252.262
AOC 02-011(a)(viii)	Vertical extent for AOCs 02-006(e) and 02-011(a)(vii,viii)	20	02-612292	1628225.844	1774256.643
AOC 02-011(a)(ix)	Vertical extent for AOCs 02-006(c) and 02-011(a)(ix)	22	02-612345	1628318.272	1774263.737
AOC 02-011(a)(x)	Vertical extent of PCBs	13	02-600664	1628382.63	1774364.255
AOC 02-011(a)(x)	Vertical extent for AOCs 02-003(a), 02-009(d), and 02-011(a)(x)	27	02-612348	1628399.576	1774342.889
AOC 02-011(a)(x)	Lateral extent from location 13	13 Step-out	02-612459	1628386.63	1774364.255
AOC 02-011(a)(x)	Lateral extent from location 13	13 Step-out	02-612460	1628382.63	1774368.255
AOC 02-011(a)(x)	Lateral extent from location 13	13 Step-out	02-612461	1628378.63	1774364.255
AOC 02-011(a)(x)	Lateral extent from location 13	13 Step-out	02-612462	1628382.63	1774360.255
AOC 02-011(a)(x)	Vertical extent for AOCs 02-008(c)(ii) and 02-011(a)(x)	29	02-612983	1628428.023	1774242.395
AOC 02-011(a)(x)	Lateral extent from location 13	13 Step-out	02-612999	1628382.63	1774372.255
AOC 02-011(a)(x)	Lateral extent from location 13	13 Step-out	02-613000	1628382.63	1774356.255
AOC 02-011(b)	Vertical extent for AOCs 02-003(a,e) and 02-011(b)	31	02-612389	1628514.925	1774285.392
AOC 02-011(b)	Vertical extent for AOCs 02-003(b), 02-008(c)(i) and 02-011(b) and SWMU 02-007	32	02-612390	1628565.678	1774279.358
AOC 02-011(c)	Vertical extent for AOCs 02-004(f) and 02-011(c)	15	02-612347	1628046.433	1774319.109
AOC 02-011(d)	Vertical extent for AOCs 02-004(b–e) and 02-011(d)	16	02-612280	1628033.301	1774283.617
AOC 02-012	Vertical extent for AOCs 02-006(b) and 02-012	21	02-612374	1628276.42	1774253.804

Table 3.2-1 (continued)

SWMU/AOC	Objective Addressed	Proposed #	Location ID	Easting (ft)	Northing (ft)
TA-21					
SWMU 21-006(e), AOC 21-006(f)	Vertical extent in NW area of previous sample locations	1	21-612318	1632390.006	1774258.732
SWMU 21-006(e), AOC 21-006(f)	Vertical extent in SW area of previous sample locations	2	21-612319	1632429.486	1774220.065
SWMU 21-006(e), AOC 21-006(f)	Vertical and lateral extent 40 ft E of previous locations 21-602923 and 21-602927	3	21-612320	1632462.726	1774235.733
SWMU 21-006(e), AOC 21-006(f)	Vertical and lateral extent 25 ft SW of previous location 21-602931	4	21-612321	1632371.169	1774200.25
SWMU 21-006(e), AOC 21-006(f)	Vertical and lateral extent 25 ft S of previous location 21-602932	5	21-612322	1632413.224	1774187.765
SWMU 21-006(e), AOC 21-006(f)	Vertical and lateral extent 25 ft SE of previous location 21-602933	6	21-612323	1632452.687	1774182.033
SWMU 21-006(e), AOC 21-006(f)	Vertical and lateral extent 15 ft N of previous location 21-602919	7	21-612324	1632388.956	1774286.86
AOC 21-028(c)	Vertical extent of contamination	1	21-612329	1632341.88	1774464.983
AOC 21-028(c)	Vertical and lateral extent 25 ft SW of location 1	4	21-612330	1632321.028	1774454.454
AOC 21-028(c)	Vertical and lateral extent 5 ft S of previous location 21-601120	14	21-612331	1632369.958	1774439.459
AOC 21-028(c)	Vertical and lateral extent 10 ft N of previous location 21-601073	6	21-612332	1632387.401	1774445.35
AOC 21-028(c)	Vertical extent in center of previous sampling locations	10	21-612333	1632345.698	1774404.969
AOC 21-028(c)	Vertical and lateral extent 15 ft W of previous locations 21-601074 and 21-601076	7	21-612334	1632351.574	1774422.863
AOC 21-028(c)	Vertical and lateral extent 15 ft E of previous locations 21-601075 and 21-601077	9	21-612335	1632401.938	1774411.43
AOC 21-028(c)	Vertical and lateral extent 25 ft NW of location 1	2	21-612336	1632322.282	1774478.255
AOC 21-028(c)	Vertical and lateral extent 25 ft SE of location 1	5	21-612337	1632350.136	1774453.063
AOC 21-028(c)	Vertical and lateral extent 15 ft W of previous locations 21-601079 and 21-601082	11	21-612338	1632327.93	1774410.255
AOC 21-028(c)	Vertical and lateral extent 20 ft SE of previous location 21-601072	8	21-612339	1632384.611	1774388.669
AOC 21-028(c)	Vertical and lateral extent 15 ft SE of previous location 21-601081	13	21-612340	1632355.977	1774381.621
AOC 21-028(c)	Vertical and lateral extent 20 ft SW of location 10	12	21-612341	1632331.601	1774394.69
AOC 21-028(c)	Vertical and lateral extent 25 ft NE of location 1	3	21-612342	1632363.85	1774464.882

Table 3.2-1 (continued)

SWMU/AOC	Objective Addressed	Proposed #	Location ID	Easting (ft)	Northing (ft)
TA-26					
TA-26	Vertical and lateral extent on slope, 70 ft W of previous location 26-600922	5	26-612294	1639237.844	1773761.16
TA-26	Vertical and lateral extent on slope, 40 ft E of previous location 26-600776	6	26-612295	1639389.192	1773780.609
TA-26	Vertical and lateral extent on slope, 50 ft E of previous location 26-600786	8	26-612296	1639401.45	1773716.057
TA-26	Vertical and lateral extent on slope, 60 ft W of previous location 26-600783	7	26-612297	1639234.014	1773711.376
TA-26	Vertical and lateral extent on slope, 15 SE of location 26-600777 and 15 ft SW of location 26-600778	11	26-612298	1639274.451	1773728.293
TA-26	Vertical and lateral extent on slope, 15 ft S of previous location 26-600789	12	26-612299	1639295.108	1773685.926
TA-26	Vertical and lateral extent on slope, 40 ft downgradient of location 7 and 35 ft SW of previous location 26-600787	9	26-612300	1639230.397	1773666.273
TA-26	Vertical and lateral extent on slope, 30 ft downgradient of location 8 and 50 ft SW of previous location 26-600792	10	26-612301	1639406.13	1773682.229
TA-26	Vertical and lateral extent on slope, 15 ft SE of previous location 26-600791	13	26-612302	1639350.199	1773688.868
TA-26	Vertical extent in center of previous sampling locations	1	26-612303	1639301.669	1773808.391
TA-26	Vertical and lateral extent of metals on mesa top, 60 ft N of location 1	2	26-612304	1639302.946	1773871.578
TA-26	Vertical and lateral extent of metals on mesa top, 60 ft W of location 1	3	26-612305	1639238.907	1773810.306
TA-26	Vertical and lateral extent of metals on mesa top, 60 ft E of location 1	4	26-612306	1639363.58	1773813.71

Table 3.2-2
Field-Screening Results for Phase II Samples Collected at Middle Los Alamos Canyon Aggregate

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID, Ambient (ppm)	PID, Head Space (ppm)	Alpha (dpm)	Beta/ Gamma (dpm)
TA-02							
AOC 02-003(a)	02-612348	5–7	RE02-10-21768	0.0	0.0	25	605
AOC 02-003(a)	02-612348	15–16	RE02-10-21769	0.0	0.0	0	598
AOC 02-003(a)	02-612348	25–26	RE02-10-21770	0.0	0.0	15	701
AOC 02-003(a)	02-612348	35–36	RE02-10-21771	0.0	0.0	0	886
AOC 02-003(a)	02-612348	49–50	RE02-10-21772	0.0	0.0	9	1000
AOC 02-003(a)	02-612389	5–6	RE02-10-21904	0.0	0.0	20	4800
AOC 02-003(a)	02-612389	18–19	RE02-10-21905	0.0	0.0	11	1214
AOC 02-003(a)	02-612389	25–27	RE02-10-21906	0.0	0.0	8	1628
AOC 02-003(a)	02-612389	35–36	RE02-10-21907	0.0	0.0	30	1835
AOC 02-003(a)	02-612389	49–50	RE02-10-21908	0.0	0.0	25	1391
AOC 02-003(b)	02-612390	5–6	RE02-10-21911	0.0	0.0	26	1765
AOC 02-003(b)	02-612390	15–17	RE02-10-21912	0.0	0.0	26	1543
AOC 02-003(b)	02-612390	26–27	RE02-10-21913	0.0	0.0	53	1225
AOC 02-003(b)	02-612390	35–36	RE02-10-21914	0.0	0.0	48	1373
AOC 02-003(b)	02-612390	49–50	RE02-10-21915	0.0	0.0	26	1269
AOC 02-003(c)	02-612420	6–7	RE02-10-22027	0.0	0.0	16	1011
AOC 02-003(c)	02-612420	15.5–16.5	RE02-10-22028	0.0	0.0	25	986
AOC 02-003(c)	02-612420	26–27	RE02-10-22029	0.0	0.0	31	860
AOC 02-003(c)	02-612420	35–37	RE02-10-22030	0.0	0.0	20	797
AOC 02-003(c)	02-612420	49–50	RE02-10-22031	0.0	0.0	9	879
AOC 02-003(d)	02-612412	0–0.5	RE02-10-21991	0.2	0.2	63	1370
AOC 02-003(d)	02-612412	4–5	RE02-10-21992	0.2	0.2	31	1784
AOC 02-003(d)	02-612412	9–10	RE02-10-21993	0.3	0.3	58	1858
AOC 02-003(e)	02-612389	5–6	RE02-10-21904	0.0	0.0	20	4800
AOC 02-003(e)	02-612389	18–19	RE02-10-21905	0.0	0.0	11	1214
AOC 02-003(e)	02-612389	25–27	RE02-10-21906	0.0	0.0	8	1628
AOC 02-003(e)	02-612389	35–36	RE02-10-21907	0.0	0.0	30	1835
AOC 02-003(e)	02-612389	49–50	RE02-10-21908	0.0	0.0	25	1391
AOC 02-004(a)	02-600580	3–3.2	RE02-10-21775	0.0	0.0	13	2260
AOC 02-004(a)	02-600580	5–5.2	RE02-10-21777	0.0	0.0	14	1260
AOC 02-004(a)	02-600580	7–7.2	RE02-10-21776	0.0	0.0	0	2010
AOC 02-004(a)	02-612325	5–6	RE02-10-21656	0.0	0.0	33	2050
AOC 02-004(a)	02-612325	15–16	RE02-10-21657	0.0	0.0	22	1937
AOC 02-004(a)	02-612325	25–26	RE02-10-21658	0.0	0.0	14	665
AOC 02-004(a)	02-612325	35–37	RE02-10-21659	0.0	0.0	14	1183

Table 3.2-2 (continued)

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID, Ambient (ppm)	PID, Head Space (ppm)	Alpha (dpm)	Beta/ Gamma (dpm)
AOC 02-004(a)	02-612325	49–50	RE02-10-21660	0.0	0.0	8	1390
AOC 02-004(a)	02-612326	5–6	RE02-10-21661	0.0	0.0	38	1265
AOC 02-004(a)	02-612326	15–16	RE02-10-21662	0.0	0.0	0	991
AOC 02-004(a)	02-612326	25–26	RE02-10-21663	0.0	0.0	20	1420
AOC 02-004(a)	02-612326	35–37	RE02-10-21664	0.0	0.0	25	1805
AOC 02-004(a)	02-612326	49–50	RE02-10-21665	0.0	0.0	0	1331
AOC 02-004(a)	02-612327	5–6	RE02-10-21666	0.0	0.0	15	1316
AOC 02-004(a)	02-612327	15–16	RE02-10-21667	0.0	0.0	10	1198
AOC 02-004(a)	02-612327	25–26	RE02-10-21668	0.0	0.0	23	1413
AOC 02-004(a)	02-612327	35–36	RE02-10-21669	0.0	0.0	23	1265
AOC 02-004(a)	02-612327	49–50	RE02-10-21670	0.0	0.0	29	1384
AOC 02-004(a)	02-612328	5–6	RE02-10-21671	0.0	0.0	0	1084
AOC 02-004(a)	02-612328	15–16	RE02-10-21672	0.0	0.0	0	1240
AOC 02-004(a)	02-612328	25–26	RE02-10-21673	0.0	0.0	15	1373
AOC 02-004(a)	02-612328	35–36	RE02-10-21674	0.0	0.0	0	1107
AOC 02-004(a)	02-612328	49–50	RE02-10-21675	0.0	0.0	11	1043
AOC 02-004(a)	02-612346	8–9	RE02-10-21747	0.0	0.0	11	1176
AOC 02-004(a)	02-612346	15–16	RE02-10-21748	0.0	0.0	31	996
AOC 02-004(a)	02-612346	25–26	RE02-10-21749	0.0	0.0	15	1306
AOC 02-004(a)	02-612346	35–36	RE02-10-21750	0.0	0.0	4	1055
AOC 02-004(a)	02-612346	49–50	RE02-10-21751	0.0	0.0	25	1159
AOC 02-004(a)	02-612350	3–3.2	RE02-10-21778	0.0	0.0	48	3090
AOC 02-004(a)	02-612350	5–5.2	RE02-10-21779	0.0	0.1	27	1535
AOC 02-004(a)	02-612350	7–7.2	RE02-10-21780	0.0	0.0	22	1742
AOC 02-004(a)	02-612351	3–3.2	RE02-10-21781	0.0	0.0	22	1098
AOC 02-004(a)	02-612351	5–5.2	RE02-10-21782	0.0	0.0	16	832
AOC 02-004(a)	02-612351	7–7.2	RE02-10-21783	0.0	0.0	19	1019
AOC 02-004(a)	02-612352	3–3.2	RE02-10-21784	0.0	0.0	11	1121
AOC 02-004(a)	02-612352	5–5.2	RE02-10-21785	0.0	0.0	16	1343
AOC 02-004(a)	02-612353	3–3.4	RE02-10-21787	0.0	0.0	5	1291
AOC 02-004(a)	02-612353	5–5.2	RE02-10-21788	0.0	0.0	5	995
AOCs 02-004(b,c,d)	02-612280	5–7	RE02-10-21501	0.0	0.0	0	1810
AOCs 02-004(b,c,d)	02-612280	15–16	RE02-10-21500	0.0	0.0	19	1574
AOCs 02-004(b,c,d)	02-612280	25–27	RE02-10-21495	0.0	0.0	3	1670
AOCs 02-004(b,c,d)	02-612280	35–36	RE02-10-21490	0.0	0.0	3	1729
AOCs 02-004(b,c,d)	02-612280	49–50	RE02-10-21485	0.0	0.0	0	1581
AOC 02-004(e)	02-612280	5–7	RE02-10-21501	0.0	0.0	0	1810

Table 3.2-2 (continued)

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID, Ambient (ppm)	PID, Head Space (ppm)	Alpha (dpm)	Beta/ Gamma (dpm)
AOC 02-004(e)	02-612280	15–16	RE02-10-21500	0.0	0.0	19	1574
AOC 02-004(e)	02-612280	25–27	RE02-10-21495	0.0	0.0	3	1670
AOC 02-004(e)	02-612280	35–36	RE02-10-21490	0.0	0.0	3	1729
AOC 02-004(e)	02-612280	49–50	RE02-10-21485	0.0	0.0	0	1581
AOC 02-004(f)	02-600470	4–4.2	RE02-10-21798	0.0	0.0	2	820
AOC 02-004(f)	02-600470	6–6.2	RE02-10-21799	0.0	0.0	13	812
AOC 02-004(f)	02-600567	3–3.2	RE02-10-21846	0.0	0.0	27	2500
AOC 02-004(f)	02-600567	4–4.2	RE02-10-21847	0.0	0.0	27	2410
AOC 02-004(f)	02-600567	6–6.2	RE02-10-26121	0.0	0.0	48	1269
AOC 02-004(f)	02-600567	8–8.2	RE02-10-26122	0.0	0.0	6	1294
AOC 02-004(f)	02-612346	8–9	RE02-10-21747	0.0	0.0	11	1176
AOC 02-004(f)	02-612346	15–16	RE02-10-21748	0.0	0.0	31	996
AOC 02-004(f)	02-612346	25–26	RE02-10-21749	0.0	0.0	15	1306
AOC 02-004(f)	02-612346	35–36	RE02-10-21750	0.0	0.0	4	1055
AOC 02-004(f)	02-612346	49–50	RE02-10-21751	0.0	0.0	25	1159
AOC 02-004(f)	02-612347	5–6	RE02-10-21752	0.0	0.0	4	886
AOC 02-004(f)	02-612347	15–16	RE02-10-21753	0.0	0.0	8	1240
AOC 02-004(f)	02-612347	25–27	RE02-10-21754	0.0	0.0	19	1573
AOC 02-004(f)	02-612347	35–36	RE02-10-21755	0.0	0.0	19	1758
AOC 02-004(f)	02-612347	49–50	RE02-10-21756	0.0	0.0	8	1536
AOC 02-004(f)	02-612354	4–4.2	RE02-10-21792	0.0	0.1	7	805
AOC 02-004(f)	02-612354	6–6.2	RE02-10-21793	0.0	0.0	45	864
AOC 02-004(f)	02-612355	4–4.4	RE02-10-21795	0.0	0.0	13	945
AOC 02-004(f)	02-612355	6–6.2	RE02-10-21796	0.1	0.3	13	568
AOC 02-004(f)	02-612357	4–4.2	RE02-10-21801	0.0	0.0	7	908
AOC 02-004(f)	02-612357	6–6.2	RE02-10-21802	0.0	0.0	29	746
AOC 02-004(f)	02-612358	4–4.2	RE02-10-21804	0.0	0.0	45	916
AOC 02-004(f)	02-612358	6–6.4	RE02-10-21805	0.0	0.0	29	753
AOC 02-004(f)	02-612359	4–4.2	RE02-10-21807	0.0	0.0	0	838
AOC 02-004(f)	02-612359	6–6.2	RE02-10-21808	0.0	0.0	8	1230
AOC 02-004(f)	02-612360	4–4.2	RE02-10-21810	0.0	0.0	19	1163
AOC 02-004(f)	02-612360	6–6.2	RE02-10-21811	0.2	0.1	3	986
AOC 02-004(f)	02-612361	4–4.4	RE02-10-21813	0.3	0.3	3	1008
AOC 02-004(f)	02-612361	6–6.2	RE02-10-21814	0.3	0.3	8	890
AOC 02-004(f)	02-612362	4–4.2	RE02-10-21816	0.4	0.4	0	1326
AOC 02-004(f)	02-612362	6–6.2	RE02-10-21817	0.5	0.5	0	1111
AOC 02-004(f)	02-612363	4–4.2	RE02-10-21819	0.6	0.6	8	1319

Table 3.2-2 (continued)

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID, Ambient (ppm)	PID, Head Space (ppm)	Alpha (dpm)	Beta/ Gamma (dpm)
AOC 02-004(f)	02-612363	6–6.2	RE02-10-21820	0.6	0.6	24	2010
AOC 02-004(f)	02-612364	4–4.4	RE02-10-21822	0.0	0.0	38	866
AOC 02-004(f)	02-612364	6–6.4	RE02-10-21823	0.0	0.0	22	1332
AOC 02-004(f)	02-612365	4–4.2	RE02-10-21825	0.0	0.0	16	1124
AOC 02-004(f)	02-612365	6–6.2	RE02-10-21826	0.0	0.0	33	1154
AOC 02-004(f)	02-612366	4–4.2	RE02-10-21828	0.0	0.0	27	1265
AOC 02-004(f)	02-612366	6–6.2	RE02-10-21829	0.0	0.0	64.5	2490
AOC 02-004(f)	02-612367	4–4.2	RE02-10-21831	0.0	0.0	26	2440
AOC 02-004(f)	02-612367	6–6.2	RE02-10-21832	0.0	0.0	26	2490
AOC 02-004(f)	02-612368	4–4.2	RE02-10-21834	0.0	0.0	26	2320
AOC 02-004(f)	02-612368	6–6.2	RE02-10-21835	0.0	0.1	21	2340
AOC 02-004(f)	02-612368	3–3.2	RE02-10-21839	0.0	0.0	43	2810
AOC 02-004(f)	02-612368	4–4.2	RE02-10-21840	0.0	0.0	59	2520
AOC 02-004(f)	02-613005	2–2.2	RE02-10-26115	0.0	0.0	64	1062
AOC 02-004(f)	02-613005	4–4.2	RE02-10-26116	0.0	0.0	5	1218
AOC 02-004(f)	02-613005	6–6.2	RE02-10-26126	0.0	0.0	20	895
AOC 02-004(f)	02-613623	2–3	RE02-11-2210	0.0	0.0	83	649
AOC 02-004(f)	02-613623	4–5	RE02-11-2211	0.0	0.0	83	649
AOC 02-004(f)	02-613624	2–3	RE02-11-2213	0.0	0.0	11	82
AOC 02-004(f)	02-613624	4–5	RE02-11-2214	0.0	0.0	11	82
AOC 02-004(f)	02-613624	6–7	RE02-11-2215	0.0	0.0	11	82
AOC 02-004(f)	02-613625	2–3	RE02-11-2216	0.0	0.0	11	82
AOC 02-004(f)	02-613625	4–5	RE02-11-2217	0.0	0.0	83	649
AOC 02-004(g)	02-612293	5–6	RE02-10-21528	0.0	0.0	21	1353
AOC 02-004(g)	02-612293	15–16	RE02-10-21529	0.0	0.0	5	1191
AOC 02-004(g)	02-612293	25–26	RE02-10-21530	0.0	0.1	1	1251
AOC 02-004(g)	02-612293	35–36	RE02-10-21531	0.0	0.0	8	1359
AOC 02-004(g)	02-612293	49–50	RE02-10-21532	0.0	0.0	25	1258
SWMU 02-005	02-600561	1–1.2	RE02-10-21866	0.2	0.2	19	790
SWMU 02-005	02-600561	2–2.2	RE02-10-21867	0.4	0.6	51	1145
SWMU 02-005	02-612376	1–1.2	RE02-10-21868	0.3	0.3	51	1182
SWMU 02-005	02-612376	2–2.2	RE02-10-21869	0.3	0.3	56	901
SWMU 02-005	02-612377	1–1.2	RE02-10-21870	0.2	0.2	45	1108
SWMU 02-005	02-612377	2–2.2	RE02-10-21871	0.2	0.2	51	1026
SWMU 02-005	02-612378	1–1.2	RE02-10-21872	0.3	0.3	40	1086
SWMU 02-005	02-612378	2–2.2	RE02-10-21873	0.3	0.3	35	886
SWMU 02-005	02-612379	0–0.5	RE02-10-21891	0.3	0.3	13	745

Table 3.2-2 (continued)

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID, Ambient (ppm)	PID, Head Space (ppm)	Alpha (dpm)	Beta/ Gamma (dpm)
SWMU 02-005	02-612379	1.5–2.5	RE02-10-21892	0.3	0.3	19	1115
SWMU 02-005	02-612379	1–1.2	RE02-10-21874	0.3	0.3	45	790
SWMU 02-005	02-612379	2–2.2	RE02-10-21875	0.3	0.3	24	1071
SWMU 02-005	02-612380	0–0.5	RE02-10-21877	0.0	0.0	70	2500
SWMU 02-005	02-612380	1.5–2.5	RE02-10-21878	0.0	0.0	75	2370
SWMU 02-005	02-612381	0–0.5	RE02-10-21879	0.0	0.0	21	2890
SWMU 02-005	02-612381	1.5–2.5	RE02-10-21880	0.0	0.0	53	2820
SWMU 02-005	02-612382	0–0.5	RE02-10-21881	0.0	0.0	64	949
SWMU 02-005	02-612382	1.5–2.5	RE02-10-21882	0.0	0.0	80	1053
SWMU 02-005	02-612383	0–0.5	RE02-10-21883	0.0	0.0	48	831
SWMU 02-005	02-612383	1.5–2.5	RE02-10-21884	0.0	0.0	86	1075
SWMU 02-005	02-612384	0–0.5	RE02-10-21885	0.0	0.0	43	1253
SWMU 02-005	02-612384	1.5–2.5	RE02-10-21886	0.0	0.0	53	861
SWMU 02-005	02-612385	0–0.5	RE02-10-21887	0.2	0.2	81	1039
SWMU 02-005	02-612385	1.5–2.5	RE02-10-21888	0.3	0.3	48	1128
SWMU 02-005	02-612386	0–0.5	RE02-10-21889	0.2	0.2	51	1529
SWMU 02-005	02-612386	1.5–2.5	RE02-10-21890	0.2	0.2	19	1197
SWMU 02-005	02-612407	0–0.5	RE02-10-21976	0.0	0.0	59	2330
SWMU 02-005	02-612407	4–5	RE02-10-21977	0.0	0.0	37	2470
SWMU 02-005	02-612407	9–10	RE02-10-21978	0.0	0.0	26	2580
SWMU 02-005	02-613290	2–2.2	RE02-11-322	0.0	0.0	15	920
SWMU 02-005	02-613290	4–4.2	RE02-11-2209	0.0	0.0	36	588
SWMU 02-005	02-613291	1–1.2	RE02-11-323	0.0	0.0	22	1350
SWMU 02-005	02-613622	2–2.2	RE02-11-2207	0.0	0.0	32	591
SWMU 02-005	02-613622	4–4.2	RE02-11-2208	0.0	0.0	36	588
SWMU 02-006(a)	02-612640	0–0.5	RE02-10-23289	0.0	0.0	12	1255
SWMU 02-006(a)	02-612640	5–6	RE02-10-23290	0.0	0.0	12	1255
SWMU 02-006(a)	02-612640	15–16	RE02-10-23291	0.0	0.0	12	1255
SWMU 02-006(a)	02-612640	25–26	RE02-10-23292	0.0	0.0	12	1255
SWMU 02-006(a)	02-612640	35–36	RE02-10-23293	0.0	0.0	12	1255
SWMU 02-006(a)	02-612640	49–50	RE02-10-23294	0.0	0.0	12	1255
SWMU 02-006(a)	02-612641	0–0.5	RE02-10-23295	0.0	0.0	12	1255
SWMU 02-006(a)	02-612641	5–6	RE02-10-23296	0.0	0.0	22	2080
SWMU 02-006(a)	02-612641	15–16	RE02-10-23297	0.0	0.0	22	2080
SWMU 02-006(a)	02-612641	25–26	RE02-10-23298	0.0	0.0	22	2080
SWMU 02-006(a)	02-612641	35–36	RE02-10-23299	0.0	0.0	22	2080
SWMU 02-006(a)	02-612641	49–50	RE02-10-23300	0.0	0.0	22	2080

Table 3.2-2 (continued)

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID, Ambient (ppm)	PID, Head Space (ppm)	Alpha (dpm)	Beta/ Gamma (dpm)
SWMU 02-006(a)	02-612642	0–0.5	RE02-10-23301	0.0	0.0	22	2080
SWMU 02-006(a)	02-612642	5–6	RE02-10-23302	0.0	0.0	22	2080
SWMU 02-006(a)	02-612642	15–16	RE02-10-23303	0.0	0.0	22	2080
SWMU 02-006(a)	02-612642	25–26	RE02-10-23304	0.0	0.0	22	2080
SWMU 02-006(a)	02-612642	35–36	RE02-10-23305	0.0	0.0	22	2080
SWMU 02-006(a)	02-612642	49–50	RE02-10-23306	0.0	0.0	22	2080
SWMU 02-006(a)	02-612643	0–0.5	RE02-10-23307	0.0	0.0	0	198
SWMU 02-006(a)	02-612643	5–6	RE02-10-23308	0.0	0.0	0	198
SWMU 02-006(a)	02-612643	15–16	RE02-10-23309	0.0	0.0	0	198
SWMU 02-006(a)	02-612643	25–26	RE02-10-23310	0.0	0.0	0	198
SWMU 02-006(a)	02-612643	35–36	RE02-10-23311	0.0	0.0	0	198
SWMU 02-006(a)	02-612643	49–50	RE02-10-23312	0.0	0.0	0	198
SWMU 02-006(a)	02-612644	0–0.5	RE02-10-23313	0.0	0.0	0	198
SWMU 02-006(a)	02-612644	5–6	RE02-10-23314	0.0	0.0	0	198
SWMU 02-006(a)	02-612644	15–16	RE02-10-23315	0.0	0.0	0	198
SWMU 02-006(a)	02-612644	25–26	RE02-10-23316	0.0	0.0	0	198
SWMU 02-006(a)	02-612644	35–36	RE02-10-23317	0.0	0.0	0	198
SWMU 02-006(a)	02-612644	49–50	RE02-10-23318	0.0	0.0	0	198
SWMU 02-006(a)	02-612645	0–0.5	RE02-10-23319	0.0	0.0	2	631
SWMU 02-006(a)	02-612645	5–6	RE02-10-23320	0.0	0.0	2	631
SWMU 02-006(a)	02-612645	15–16	RE02-10-23321	0.0	0.0	2	631
SWMU 02-006(a)	02-612645	25–26	RE02-10-23322	0.0	0.0	2	631
SWMU 02-006(a)	02-612645	35–36	RE02-10-23323	0.0	0.0	2	631
SWMU 02-006(a)	02-612645	49–50	RE02-10-23324	0.0	0.0	2	631
SWMU 02-006(a)	02-612646	0–0.5	RE02-10-23325	0.0	0.0	20	294
SWMU 02-006(a)	02-612646	5–6	RE02-10-23326	0.0	0.0	20	294
SWMU 02-006(a)	02-612646	15–16	RE02-10-23327	0.0	0.0	20	294
SWMU 02-006(a)	02-612646	25–26	RE02-10-23328	0.0	0.0	20	294
SWMU 02-006(a)	02-612646	35–36	RE02-10-23329	0.0	0.0	20	294
SWMU 02-006(a)	02-612646	49–50	RE02-10-23330	0.0	0.0	20	294
SWMU 02-006(a)	02-612647	0–0.5	RE02-10-23331	0.0	0.0	20	294
SWMU 02-006(a)	02-612647	5–6	RE02-10-23332	0.0	0.0	20	294
SWMU 02-006(a)	02-612647	15–16	RE02-10-23333	0.0	0.0	20	294
SWMU 02-006(a)	02-612647	25–26	RE02-10-23334	0.0	0.0	20	294
SWMU 02-006(a)	02-612647	35–36	RE02-10-23335	0.0	0.0	20	294
SWMU 02-006(a)	02-612647	49–50	RE02-10-23336	0.0	0.0	20	294
SWMU 02-006(a)	02-612648	0–0.5	RE02-10-23337	0.0	0.0	1	430

Table 3.2-2 (continued)

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID, Ambient (ppm)	PID, Head Space (ppm)	Alpha (dpm)	Beta/ Gamma (dpm)
SWMU 02-006(a)	02-612648	5–6	RE02-10-23338	0.0	0.0	1	430
SWMU 02-006(a)	02-612648	15–16	RE02-10-23339	0.0	0.0	1	430
SWMU 02-006(a)	02-612648	25–26	RE02-10-23340	0.0	0.0	1	430
SWMU 02-006(a)	02-612648	35–36	RE02-10-23341	0.0	0.0	1	430
SWMU 02-006(a)	02-612648	49–50	RE02-10-23342	0.0	0.0	1	430
SWMU 02-006(a)	02-612649	0–0.5	RE02-10-23343	0.0	0.0	26	367
SWMU 02-006(a)	02-612649	5–6	RE02-10-23344	0.0	0.0	26	367
SWMU 02-006(a)	02-612649	15–16	RE02-10-23345	0.0	0.0	26	367
SWMU 02-006(a)	02-612649	25–26	RE02-10-23346	0.0	0.0	26	367
SWMU 02-006(a)	02-612649	35–36	RE02-10-23347	0.0	0.0	26	367
SWMU 02-006(a)	02-612649	49–50	RE02-10-23348	0.0	0.0	26	367
SWMU 02-006(a)	02-612650	0–0.5	RE02-10-23349	0.0	0.0	39	1583
SWMU 02-006(a)	02-612650	5–6	RE02-10-23350	0.0	0.0	39	1583
SWMU 02-006(a)	02-612650	15–16	RE02-10-23351	0.0	0.0	39	1583
SWMU 02-006(a)	02-612650	25–26	RE02-10-23352	0.0	0.0	39	1583
SWMU 02-006(a)	02-612650	35–36	RE02-10-23353	0.0	0.0	39	1583
SWMU 02-006(a)	02-612650	49–50	RE02-10-23354	0.0	0.0	39	1583
SWMU 02-006(a)	02-612651	5–6	RE02-10-23370	0.0	0.0	26	367
SWMU 02-006(a)	02-612651	15–16	RE02-10-23371	0.0	0.0	26	367
SWMU 02-006(a)	02-612651	25–26	RE02-10-23372	0.0	0.0	26	367
SWMU 02-006(a)	02-612651	35–36	RE02-10-23373	0.0	0.0	26	367
SWMU 02-006(a)	02-612651	49–50	RE02-10-23374	0.0	0.0	26	367
SWMU 02-006(a)	02-612652	25–26	RE02-10-23377	0.0	0.0	2	631
SWMU 02-006(a)	02-612652	35–36	RE02-10-23378	0.0	0.0	2	631
SWMU 02-006(a)	02-612652	49–50	RE02-10-23379	0.0	0.0	2	631
SWMU 02-006(b)	02-612374	5–6	RE02-10-21859	0.0	0.1	0	1225
SWMU 02-006(b)	02-612374	15–16	RE02-10-21860	0.0	0.0	8	833
SWMU 02-006(b)	02-612374	25–26	RE02-10-21861	0.0	0.1	8	1344
SWMU 02-006(b)	02-612374	35–36	RE02-10-21862	0.0	0.1	8	1559
SWMU 02-006(b)	02-612374	49–50	RE02-10-21863	0.0	0.1	14	1721
AOC 02-006(c)	02-612345	5–6	RE02-10-21742	0.0	0.0	8	643
AOC 02-006(c)	02-612345	15–16	RE02-10-21743	0.2	2.2	19	857
AOC 02-006(c)	02-612345	25–26	RE02-10-21744	0.2	3.8	25	1136
AOC 02-006(c)	02-612345	35–36	RE02-10-21745	0.5	32.7	8	1035
AOC 02-006(c)	02-612345	49–50	RE02-10-21746	0.2	0.8	3	872
AOC 02-006(e)	02-612292	5–6	RE02-10-21521	0.0	0.0	0	1086
AOC 02-006(e)	02-612292	15–16.5	RE02-10-21522	0.0	0.0	0	1175

Table 3.2-2 (continued)

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID, Ambient (ppm)	PID, Head Space (ppm)	Alpha (dpm)	Beta/ Gamma (dpm)
AOC 02-006(e)	02-612292	25–26	RE02-10-21523	0.0	0.0	25	1450
AOC 02-006(e)	02-612292	35–36	RE02-10-21524	0.0	0.0	57	1302
AOC 02-006(e)	02-612292	49–50	RE02-10-21525	0.0	0.0	0	1273
SWMU 02-007	02-612390	5–6	RE02-10-21911	0.0	0.0	26	1765
SWMU 02-007	02-612390	15–17	RE02-10-21912	0.0	0.0	26	1543
SWMU 02-007	02-612390	26–27	RE02-10-21913	0.0	0.0	53	1225
SWMU 02-007	02-612390	35–36	RE02-10-21914	0.0	0.0	48	1373
SWMU 02-007	02-612390	49–50	RE02-10-21915	0.0	0.0	26	1269
SWMU 02-009(a)	02-612421	5–6	RE02-10-22034	0.0	0.0	17	1494
SWMU 02-009(a)	02-612421	15–16	RE02-10-22035	0.0	0.0	11	1279
SWMU 02-009(a)	02-612421	28–29	RE02-10-22036	0.0	0.0	15	1188
SWMU 02-009(a)	02-612421	35–36	RE02-10-22037	0.0	0.0	4	966
SWMU 02-009(a)	02-612421	48–50	RE02-10-22038	0.0	0.0	0	1011
SWMU 02-009(a)	02-612422	5–6	RE02-10-22039	0.0	0.0	14	1110
SWMU 02-009(a)	02-612422	15–16	RE02-10-22040	0.0	0.0	4	1065
SWMU 02-009(a)	02-612422	25–26	RE02-10-22041	0.0	0.0	14	1250
SWMU 02-009(a)	02-612422	35–36	RE02-10-22042	0.0	0.0	9	1376
SWMU 02-009(a)	02-612422	49–50	RE02-10-22043	0.0	0.0	4	1642
SWMU 02-009(b)	02-612388	5–6	RE02-10-21895	0.0	0.0	15	1423
SWMU 02-009(b)	02-612388	15–16	RE02-10-21896	0.0	0.0	37	1217
SWMU 02-009(b)	02-612388	25–26	RE02-10-21897	0.0	0.0	21	1305
SWMU 02-009(b)	02-612388	35–36	RE02-10-21898	0.0	0.0	4	1291
SWMU 02-009(b)	02-612388	47.5–50	RE02-10-21899	0.0	0.0	26	1416
SWMU 02-009(c)	02-612391	5–6	RE02-10-21918	0.0	0.0	10	4010
SWMU 02-009(c)	02-612391	15–16	RE02-10-21919	0.0	0.0	26	973
SWMU 02-009(c)	02-612391	25–26	RE02-10-21920	0.0	0.0	0	1409
SWMU 02-009(c)	02-612391	35–37	RE02-10-21921	0.0	0.0	15	1409
SWMU 02-009(c)	02-612391	49–50	RE02-10-21922	0.0	0.0	21	1313
SWMU 02-009(c)	02-612392	5–6	RE02-10-21923	0.0	0.0	11	1014
SWMU 02-009(c)	02-612392	19–20	RE02-10-21924	0.0	0.0	4	1250
SWMU 02-009(c)	02-612392	25–26	RE02-10-21925	0.0	0.0	9	1346
SWMU 02-009(c)	02-612392	35–37	RE02-10-21926	0.0	0.0	25	1701
SWMU 02-009(c)	02-612392	49–50	RE02-10-21927	0.0	0.0	0	1242
SWMU 02-009(c)	02-612393	5–6	RE02-10-21928	0.0	0.0	31	1339
SWMU 02-009(c)	02-612393	15.5–16.5	RE02-10-21929	0.0	0.0	15	1368
SWMU 02-009(c)	02-612393	25–26	RE02-10-21930	0.0	0.0	0	1080
SWMU 02-009(c)	02-612393	35–36	RE02-10-21931	0.0	0.0	9	1106

Table 3.2-2 (continued)

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID, Ambient (ppm)	PID, Head Space (ppm)	Alpha (dpm)	Beta/ Gamma (dpm)
SWMU 02-009(c)	02-612393	49–50	RE02-10-21932	0.0	0.0	9	1219
SWMU 02-009(c)	02-612420	6–7	RE02-10-22027	0.0	0.0	16	1011
SWMU 02-009(c)	02-612420	15.5–16.5	RE02-10-22028	0.0	0.0	25	986
SWMU 02-009(c)	02-612420	26–27	RE02-10-22029	0.0	0.0	31	860
SWMU 02-009(c)	02-612420	35–37	RE02-10-22030	0.0	0.0	20	797
SWMU 02-009(c)	02-612420	49–50	RE02-10-22031	0.0	0.0	9	879
AOC 02-008(c)(i)	02-612390	5–6	RE02-10-21911	0.0	0.0	26	1765
AOC 02-008(c)(i)	02-612390	15–17	RE02-10-21912	0.0	0.0	26	1543
AOC 02-008(c)(i)	02-612390	26–27	RE02-10-21913	0.0	0.0	53	1225
AOC 02-008(c)(i)	02-612390	35–36	RE02-10-21914	0.0	0.0	48	1373
AOC 02-008(c)(i)	02-612390	49–50	RE02-10-21915	0.0	0.0	26	1269
AOC 02-008(c)(ii)	02-612982	6–7	RE02-10-25659	0.1	0.1	28	1695
AOC 02-008(c)(ii)	02-612982	15–16	RE02-10-25660	0.1	0.1	0	874
AOC 02-008(c)(ii)	02-612982	25–26	RE02-10-25661	0.0	0.0	50	1414
AOC 02-008(c)(ii)	02-612982	35–37	RE02-10-25662	0.1	0.1	7	1451
AOC 02-008(c)(ii)	02-612982	49–50	RE02-10-25663	0.1	0.1	7	1481
AOC 02-009(d)	02-612348	5–7	RE02-10-21768	0.0	0.0	25	605
AOC 02-009(d)	02-612348	15–16	RE02-10-21769	0.0	0.0	0	598
AOC 02-009(d)	02-612348	25–26	RE02-10-21770	0.0	0.0	15	701
AOC 02-009(d)	02-612348	35–36	RE02-10-21771	0.0	0.0	0	886
AOC 02-009(d)	02-612348	49–50	RE02-10-21772	0.0	0.0	9	1000
AOC 02-010	02-600640	2–2.2	RE02-10-22061	0.0	0.0	75	2480
AOC 02-010	02-600640	4–4.2	RE02-10-22062	0.0	0.0	53	2260
AOC 02-010	02-612423	2–2.2	RE02-10-22046	0.0	0.0	37	5190
AOC 02-010	02-612423	4–4.2	RE02-10-22047	0.0	0.0	37	3310
AOC 02-010	02-612424	2–2.4	RE02-10-22049	0.0	0.0	53	5200
AOC 02-010	02-612424	4–4.2	RE02-10-22050	0.0	0.0	26	2680
AOC 02-010	02-612425	2–2.2	RE02-10-22052	0.0	0.0	21	3550
AOC 02-010	02-612425	4–4.2	RE02-10-22053	0.0	0.0	10	2550
AOC 02-010	02-612426	2–2.2	RE02-10-22055	0.0	0.0	37	2400
AOC 02-010	02-612426	4–4.2	RE02-10-22056	0.0	0.0	43	2440
AOC 02-010	02-612427	2–2.2	RE02-10-22058	0.0	0.0	53	2790
AOC 02-010	02-612427	4–4.2	RE02-10-22059	0.0	0.0	32	2590
AOC 02-010	02-612429	2–2.2	RE02-10-22064	0.0	0.0	21	2040
AOC 02-010	02-612429	4–4.2	RE02-10-22065	0.0	0.0	43	2480
AOC 02-010	02-612430	2–2.2	RE02-10-22067	0.0	0.0	21	2590
AOC 02-010	02-612430	4–4.2	RE02-10-22068	0.0	0.0	48	2580

Table 3.2-2 (continued)

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID, Ambient (ppm)	PID, Head Space (ppm)	Alpha (dpm)	Beta/ Gamma (dpm)
AOC 02-010	02-612431	2–2.2	RE02-10-22070	0.0	0.0	37	2650
AOC 02-010	02-612431	4–4.2	RE02-10-22071	0.0	0.0	59	2360
AOC 02-010	02-612432	2–2.2	RE02-10-22073	0.0	0.0	32	2560
AOC 02-010	02-612432	4–4.2	RE02-10-22074	0.0	0.0	10	2680
AOC 02-010	02-612463	5–6	RE02-10-22178	0.0	0.0	27	905
AOC 02-010	02-612463	15–16	RE02-10-22179	0.0	0.0	0	794
AOC 02-010	02-612463	25–27	RE02-10-22180	0.0	0.0	0	880
AOC 02-010	02-612463	35–36	RE02-10-22181	0.0	0.0	27	1110
AOC 02-010	02-612463	49–50	RE02-10-22182	0.0	0.0	0	969
AOC 02-010	02-613240	2–2.2	RE02-11-163	0.0	0.0	17	1276
AOC 02-011(a)(i)	02-600385	4–4.2	RE02-10-22127	0.0	0.0	44	2160
AOC 02-011(a)(i)	02-600385	6–6.2	RE02-10-22128	0.0	0.0	27	2020
AOC 02-011(a)(i)	02-600386	7–7.2	RE02-10-22109	0.0	0.0	43	2220
AOC 02-011(a)(i)	02-600386	9–9.2	RE02-10-22110	0.0	0.0	0	957
AOC 02-011(a)(i)	02-600386	11–11.2	RE02-10-22111	0.0	0.0	21	720
AOC 02-011(a)(i)	02-612444	3.5–4	RE02-10-22112	0.0	0.0	27	2450
AOC 02-011(a)(i)	02-612445	4–4.2	RE02-10-22115	0.0	0.0	33	2300
AOC 02-011(a)(i)	02-612445	6–6.2	RE02-10-22116	0.0	0.0	16	2640
AOC 02-011(a)(i)	02-612446	4–4.2	RE02-10-22118	0.0	0.0	15	2390
AOC 02-011(a)(i)	02-612446	5–5.5	RE02-10-22119	0.0	0.0	22	2400
AOC 02-011(a)(i)	02-612447	3–3.2	RE02-10-22121	0.0	0.0	44	2470
AOC 02-011(a)(i)	02-612448	4–4.2	RE02-10-22124	0.0	0.0	49	1956
AOC 02-011(a)(i)	02-612448	6–6.2	RE02-10-22125	0.0	0.0	33	2030
AOC 02-011(a)(i)	02-613289	4–4.2	RE02-11-319	0.0	0.1	0	1019
AOC 02-011(a)(i)	02-613289	6–6.2	RE02-11-320	0.0	0.0	28	1258
AOC 02-011(a)(i)	02-613292	4–4.2	RE02-11-325	0.0	0.0	10	1581
AOC 02-011(a)(i)	02-613571	5–6	RE02-11-1525	0.0	0.0	28	1485
AOC 02-011(a)(i)	02-613571	15–16	RE02-11-1526	0.0	0.0	0	1618
AOC 02-011(a)(i)	02-613571	25–26	RE02-11-1527	0.0	0.0	12	1492
AOC 02-011(a)(i)	02-613571	35–37	RE02-11-1528	0.0	0.0	1	1300
AOC 02-011(a)(i)	02-613571	49–50	RE02-11-1529	0.0	0.0	0	1655
AOC 02-011(a)(ii)	02-600449	6–6.2	RE02-10-22130	0.0	0.0	22	1912
AOC 02-011(a)(ii)	02-612451	6–6.2	RE02-10-22133	0.0	0.0	22	1962
AOC 02-011(a)(ii)	02-612452	6–6.2	RE02-10-22136	0.0	0.0	49	2180
AOC 02-011(a)(ii)	02-612452	8–8.2	RE02-10-22137	0.0	0.0	27	2080
AOC 02-011(a)(ii)	02-612453	6–6.2	RE02-10-22139	0.0	0.0	22	1691
AOC 02-011(a)(ii)	02-612453	8–8.2	RE02-10-22140	0.0	0.0	33	2240

Table 3.2-2 (continued)

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID, Ambient (ppm)	PID, Head Space (ppm)	Alpha (dpm)	Beta/ Gamma (dpm)
AOC 02-011(a)(ii)	02-613001	6–6.5	RE02-10-26105	0.0	0.0	65	1276
AOC 02-011(a)(ii)	02-613001	7–7.5	RE02-10-26106	0.0	0.0	49	1216
AOC 02-011(a)(ii)	02-613002	6–6.5	RE02-10-26107	0.0	0.0	55	1608
AOC 02-011(a)(ii)	02-613002	8–8.5	RE02-10-26108	0.0	0.0	49	1335
AOC 02-011(a)(ii)	02-613122	2–2.2	RE02-10-26638	0.0	0.0	68	1537
AOC 02-011(a)(ii)	02-613122	4–4.2	RE02-10-26639	0.0	0.0	52	1123
AOC 02-011(a)(ii)	02-613124	6–6.2	RE02-10-26640	0.0	0.0	31	1567
AOC 02-011(a)(ii)	02-613124	8–8.2	RE02-10-26641	0.0	0.0	36	1426
AOC 02-011(a)(ii)	02-613287	6–6.2	RE02-11-315	0.0	0.0	≥15	≥1157
AOC 02-011(a)(ii)	02-613287	8–8.2	RE02-11-316	0.0	0.0	≥32	≥1126
AOC 02-011(a)(ii)	02-613288	6–6.2	RE02-11-317	0.0	0.0	≥26	≥918
AOC 02-011(a)(ii)	02-613288	8–8.2	RE02-11-318	0.0	0.0	≥32	≥843
AOC 02-011(a)(ii)	02-613571	5–6	RE02-11-1525	0.0	0.0	28	1485
AOC 02-011(a)(ii)	02-613571	15–16	RE02-11-1526	0.0	0.0	0	1618
AOC 02-011(a)(ii)	02-613571	25–26	RE02-11-1527	0.0	0.0	12	1492
AOC 02-011(a)(ii)	02-613571	35–37	RE02-11-1528	0.0	0.0	1	1300
AOC 02-011(a)(ii)	02-613571	49–50	RE02-11-1529	0.0	0.0	0	1655
AOC 02-011(a)(ii)	02-613626	8–9	RE02-11-2218	0.0	0.0	11	82
AOC 02-011(a)(ii)	02-613626	10–11	RE02-11-2219	0.0	0.0	11	82
AOC 02-011(a)(ii)	02-613627	6–7	RE02-11-2220	0.0	0.0	11	82
AOC 02-011(a)(ii)	02-613627	8–9	RE02-11-2221	0.0	0.0	11	82
AOC 02-011(a)(ii)	02-613627	10–11	RE02-11-2222	0.0	0.0	11	82
AOC 02-011(a)(ii)	02-613667	6–6.2	RE02-11-2523	0.0	0.0	67	580
AOC 02-011(a)(ii)	02-613667	8–8.2	RE02-11-2524	0.0	0.0	67	580
AOC 02-011(a)(ii)	02-613667	10–10.2	RE02-11-2525	0.0	0.0	67	580
AOC 02-011(a)(ii)	02-613668	8–8.2	RE02-11-2526	0.0	0.0	0	1900
AOC 02-011(a)(ii)	02-613668	10–10.2	RE02-11-2527	0.0	0.0	0	1900
AOC 02-011(a)(ii)	02-613699	6–6.2	RE02-11-2795	0.0	0.0	48	787
AOC 02-011(a)(ii)	02-613699	8–8.2	RE02-11-2796	0.0	0.0	36	592
AOC 02-011(a)(ii)	02-613699	10–10.2	RE02-11-2797	0.0	0.0	4	657
AOC 02-011(a)(ii)	02-613699	12–12.2	RE02-11-2798	0.0	0.0	29	929
AOC 02-011(a)(ii)	02-613700	8–8.2	RE02-11-2799	0.0	0.0	55	941
AOC 02-011(a)(ii)	02-613700	10–10.5	RE02-11-2800	0.0	0.0	55	787
AOC 02-011(a)(ii)	02-613700	12–12.2	RE02-11-2801	0.0	0.0	42	1196
AOC 02-011(a)(ii)	02-613700	14–14.2	RE02-11-3145	0.0	0.0	44	313
AOC 02-011(a)(ii)	02-613761	6–6.2	RE02-11-3146	0.0	0.0	19	1475
AOC 02-011(a)(ii)	02-613761	8–8.2	RE02-11-3147	0.0	0.0	44	1157

Table 3.2-2 (continued)

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID, Ambient (ppm)	PID, Head Space (ppm)	Alpha (dpm)	Beta/ Gamma (dpm)
AOC 02-011(a)(ii)	02-613761	10–10.2	RE02-11-3148	0.0	0.0	34	960
AOC 02-011(a)(ii)	02-613761	12–12.2	RE02-11-3149	0.0	0.0	10	1238
AOC 02-011(a)(ii)	02-613761	14–14.2	RE02-11-3150	0.0	0.0	0	1089
AOC 02-011(a)(ii)	02-613762	0–0.5	RE02-11-3177	0.0	0.0	26	295
AOC 02-011(a)(iii)	02-612438	2–2.2	RE02-10-22094	0.1	0.1	21	2070
AOC 02-011(a)(iii)	02-612438	4–4.2	RE02-10-22095	0.1	0.1	21	2070
AOC 02-011(a)(iii)	02-612439	2–2.2	RE02-10-22097	0.0	0.0	48	2210
AOC 02-011(a)(iii)	02-612439	4–4.4	RE02-10-22098	0.0	0.0	48	2210
AOC 02-011(a)(iii)	02-612440	2–2.4	RE02-10-22102	0.2	0.2	21	2410
AOC 02-011(a)(iii)	02-612440	4–4.4	RE02-10-22101	0.2	0.2	21	2270
AOC 02-011(a)(iii)	02-613003	2–2.5	RE02-10-26109	0.0	0.0	33	935
AOC 02-011(a)(iii)	02-613003	4–4.5	RE02-10-26110	0.0	0.0	60	1239
AOC 02-011(a)(iii)	02-613571	5–6	RE02-11-1525	0.0	0.0	28	1485
AOC 02-011(a)(iii)	02-613571	15–16	RE02-11-1526	0.0	0.0	0	1618
AOC 02-011(a)(iii)	02-613571	25–26	RE02-11-1527	0.0	0.0	12	1492
AOC 02-011(a)(iii)	02-613571	35–37	RE02-11-1528	0.0	0.0	1	1300
AOC 02-011(a)(iii)	02-613571	49–50	RE02-11-1529	0.0	0.0	0	1655
AOC 02-011(a)(iv)	02-612346	8–9	RE02-10-21747	0.0	0.0	11	1176
AOC 02-011(a)(iv)	02-612346	15–16	RE02-10-21748	0.0	0.0	31	996
AOC 02-011(a)(iv)	02-612346	25–26	RE02-10-21749	0.0	0.0	15	1306
AOC 02-011(a)(iv)	02-612346	35–36	RE02-10-21750	0.0	0.0	4	1055
AOC 02-011(a)(iv)	02-612346	49–50	RE02-10-21751	0.0	0.0	25	1159
AOC 02-011(a)(v)	02-600450	2–2.2	RE02-10-22079	0.0	0.0	21	2470
AOC 02-011(a)(v)	02-600450	4–4.2	RE02-10-22080	0.0	0.0	10	2260
AOC 02-011(a)(v)	02-612434	2–2.2	RE02-10-22082	0.0	0.0	16	2530
AOC 02-011(a)(v)	02-612434	4–4.4	RE02-10-22083	0.0	0.0	18	2490
AOC 02-011(a)(v)	02-612435	2–2.2	RE02-10-22085	0.1	0.1	43	2390
AOC 02-011(a)(v)	02-612435	4–4.2	RE02-10-22086	0.1	0.1	40	2210
AOC 02-011(a)(v)	02-612436	2–2.2	RE02-10-22088	0.0	0.0	21	2320
AOC 02-011(a)(v)	02-612436	4–4.2	RE02-10-22089	0.0	0.0	20	2370
AOC 02-011(a)(v)	02-612437	2–2.2	RE02-10-22091	0.1	0.1	37	2630
AOC 02-011(a)(v)	02-612437	4–4.4	RE02-10-22092	0.1	0.1	37	2630
AOC 02-011(a)(v)	02-613118	2–2.2	RE02-10-26634	0.0	0.0	36	1685
AOC 02-011(a)(v)	02-613120	2–2.2	RE02-10-26636	0.0	0.0	47	1693
AOC 02-011(a)(v)	02-613121	2–2.2	RE02-10-26637	0.0	0.0	41	1108
AOC 02-011(a)(v)	02-613571	5–6	RE02-11-1525	0.0	0.0	28	1485
AOC 02-011(a)(v)	02-613571	15–16	RE02-11-1526	0.0	0.0	0	1618

Table 3.2-2 (continued)

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID, Ambient (ppm)	PID, Head Space (ppm)	Alpha (dpm)	Beta/ Gamma (dpm)
AOC 02-011(a)(v)	02-613571	25–26	RE02-11-1527	0.0	0.0	12	1492
AOC 02-011(a)(v)	02-613571	35–37	RE02-11-1528	0.0	0.0	1	1300
AOC 02-011(a)(v)	02-613571	49–50	RE02-11-1529	0.0	0.0	0	1655
AOC 02-011(a)(vi)	02-600532	2–2.2	RE02-10-22185	0.0	0.0	39	932
AOC 02-011(a)(vi)	02-600532	4–4.2	RE02-10-22186	0.0	0.0	25	796
AOC 02-011(a)(vi)	02-612465	2–2.2	RE02-10-22188	0.0	0.0	23	1310
AOC 02-011(a)(vi)	02-612465	4–4.2	RE02-10-22198	0.0	0.0	36	1010
AOC 02-011(a)(vi)	02-612466	2–2.2	RE02-10-22191	0.0	0.0	34	940
AOC 02-011(a)(vi)	02-612466	4–4.2	RE02-10-22195	0.0	0.0	25	648
AOC 02-011(a)(vi)	02-612467	2–2.2	RE02-10-22194	0.0	0.0	45	1117
AOC 02-011(a)(vi)	02-612467	4–4.2	RE02-10-22192	0.0	0.0	31	937
AOC 02-011(a)(vi)	02-612468	2–2.2	RE02-10-22197	0.0	0.0	50	1088
AOC 02-011(a)(vi)	02-612468	4–4.2	RE02-10-22189	0.0	0.0	9	1129
AOC 02-011(a)(viii)	02-612292	5–6	RE02-10-21521	0.0	0.0	0	1086
AOC 02-011(a)(viii)	02-612292	15–16.5	RE02-10-21522	0.0	0.0	0	1175
AOC 02-011(a)(viii)	02-612292	25–26	RE02-10-21523	0.0	0.0	25	1450
AOC 02-011(a)(viii)	02-612292	35–36	RE02-10-21524	0.0	0.0	57	1302
AOC 02-011(a)(viii)	02-612292	49–50	RE02-10-21525	0.0	0.0	0	1273
AOC 02-011(a)(ix)	02-612345	5–6	RE02-10-21742	0.0	0.0	8	643
AOC 02-011(a)(ix)	02-612345	15–16	RE02-10-21743	0.2	2.2	19	857
AOC 02-011(a)(ix)	02-612345	25–26	RE02-10-21744	0.2	3.8	25	1136
AOC 02-011(a)(ix)	02-612345	35–36	RE02-10-21745	0.5	32.7	8	1035
AOC 02-011(a)(ix)	02-612345	49–50	RE02-10-21746	0.2	0.8	3	872
AOC 02-011(a)(x)	02-600664	2–2.2	RE02-10-22154	0.0	0.0	64	2300
AOC 02-011(a)(x)	02-600664	4–4.2	RE02-10-22155	0.0	0.0	21	2500
AOC 02-011(a)(x)	02-612348	5–7	RE02-10-21768	0.0	0.0	25	605
AOC 02-011(a)(x)	02-612348	15–16	RE02-10-21769	0.0	0.0	0	598
AOC 02-011(a)(x)	02-612348	25–26	RE02-10-21770	0.0	0.0	15	701
AOC 02-011(a)(x)	02-612348	35–36	RE02-10-21771	0.0	0.0	0	886
AOC 02-011(a)(x)	02-612348	49–50	RE02-10-21772	0.0	0.0	9	1000
AOC 02-011(a)(x)	02-612459	2–2.2	RE02-10-22157	0.0	0.0	26	2370
AOC 02-011(a)(x)	02-612459	4–4.2	RE02-10-22158	0.0	0.0	48	2550
AOC 02-011(a)(x)	02-612460	2–2.2	RE02-10-22160	0.0	0.0	53	2490
AOC 02-011(a)(x)	02-612460	4–4.2	RE02-10-22161	0.0	0.0	59	2520
AOC 02-011(a)(x)	02-612461	2–2.2	RE02-10-22163	0.0	0.0	53	2600
AOC 02-011(a)(x)	02-612461	4–4.4	RE02-10-22164	0.0	0.0	16	2590
AOC 02-011(a)(x)	02-612462	2–2.4	RE02-10-22166	0.0	0.0	10	2230

Table 3.2-2 (continued)

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID, Ambient (ppm)	PID, Head Space (ppm)	Alpha (dpm)	Beta/ Gamma (dpm)
AOC 02-011(a)(x)	02-612462	4–4.2	RE02-10-22167	0.0	0.0	16	2470
AOC 02-011(a)(x)	02-612983	7–8	RE02-10-25664	0.0	0.0	28	769
AOC 02-011(a)(x)	02-612983	15–16	RE02-10-25665	0.0	0.0	36	1379
AOC 02-011(a)(x)	02-612983	26–27	RE02-10-25666	0.0	0.0	9	972
AOC 02-011(a)(x)	02-612983	35–36	RE02-10-25667	0.0	0.0	13	1216
AOC 02-011(a)(x)	02-612983	49–50	RE02-10-25668	0.0	0.0	34	1793
AOC 02-011(a)(x)	02-612999	0–0.5	RE02-10-26101	0.0	0.0	76	1416
AOC 02-011(a)(x)	02-612999	2–2.2	RE02-10-26102	0.0	0.0	28	1379
AOC 02-011(a)(x)	02-613000	0–0.5	RE02-10-26103	0.0	0.0	22	1179
AOC 02-011(a)(x)	02-613000	2–2.2	RE02-10-26104	0.0	0.0	60	1357
AOC 02-011(b)	02-612389	5–6	RE02-10-21904	0.0	0.0	20	4800
AOC 02-011(b)	02-612389	18–19	RE02-10-21905	0.0	0.0	11	1214
AOC 02-011(b)	02-612389	25–27	RE02-10-21906	0.0	0.0	8	1628
AOC 02-011(b)	02-612389	35–36	RE02-10-21907	0.0	0.0	30	1835
AOC 02-011(b)	02-612389	49–50	RE02-10-21908	0.0	0.0	25	1391
AOC 02-011(b)	02-612390	5–6	RE02-10-21911	0.0	0.0	26	1765
AOC 02-011(b)	02-612390	15–17	RE02-10-21912	0.0	0.0	26	1543
AOC 02-011(b)	02-612390	26–27	RE02-10-21913	0.0	0.0	53	1225
AOC 02-011(b)	02-612390	35–36	RE02-10-21914	0.0	0.0	48	1373
AOC 02-011(b)	02-612390	49–50	RE02-10-21915	0.0	0.0	26	1269
AOC 02-011(c)	02-612347	5–6	RE02-10-21752	0.0	0.0	4	886
AOC 02-011(c)	02-612347	15–16	RE02-10-21753	0.0	0.0	8	1240
AOC 02-011(c)	02-612347	25–27	RE02-10-21754	0.0	0.0	19	1573
AOC 02-011(c)	02-612347	35–36	RE02-10-21755	0.0	0.0	19	1758
AOC 02-011(c)	02-612347	49–50	RE02-10-21756	0.0	0.0	8	1536
AOC 02-011(d)	02-612280	5–7	RE02-10-21501	0.0	0.0	0	1810
AOC 02-011(d)	02-612280	15–16	RE02-10-21500	0.0	0.0	19	1574
AOC 02-011(d)	02-612280	25–27	RE02-10-21495	0.0	0.0	3	1670
AOC 02-011(d)	02-612280	35–36	RE02-10-21490	0.0	0.0	3	1729
AOC 02-011(d)	02-612280	49–50	RE02-10-21485	0.0	0.0	0	1581
AOC 02-012	02-612374	5–6	RE02-10-21859	0.0	0.1	0	1225
AOC 02-012	02-612374	15–16	RE02-10-21860	0.0	0.0	8	833
AOC 02-012	02-612374	25–26	RE02-10-21861	0.0	0.1	8	1344
AOC 02-012	02-612374	35–36	RE02-10-21862	0.0	0.1	8	1559
AOC 02-012	02-612374	49–50	RE02-10-21863	0.0	0.1	14	1721
SWMU 21-006(e), AOC 21-006(f)	21-612318	5–6	MD21-10-21629	0.0	0.0	0	414

Table 3.2-2 (continued)

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID, Ambient (ppm)	PID, Head Space (ppm)	Alpha (dpm)	Beta/ Gamma (dpm)
SWMU 21-006(e), AOC 21-006(f)	21-612318	15–16	MD21-10-21630	0.0	0.0	0	401
SWMU 21-006(e), AOC 21-006(f)	21-612318	24–25	MD21-10-21631	0.0	0.0	28	217
SWMU 21-006(e), AOC 21-006(f)	21-612319	5–6	MD21-10-21632	0.0	0.0	13	257
SWMU 21-006(e), AOC 21-006(f)	21-612319	15–16	MD21-10-21633	0.0	0.0	28	488
SWMU 21-006(e), AOC 21-006(f)	21-612319	24–25	MD21-10-21634	0.0	0.0	18	457
SWMU 21-006(e), AOC 21-006(f)	21-612320	5–6	MD21-10-21637	0.0	0.0	14	528
SWMU 21-006(e), AOC 21-006(f)	21-612320	15–16	MD21-10-21638	0.0	0.0	2	543
SWMU 21-006(e), AOC 21-006(f)	21-612320	24–25	MD21-10-21639	0.0	0.0	0	295
SWMU 21-006(e), AOC 21-006(f)	21-612321	5–6	MD21-10-21640	0.0	0.0	38	241
SWMU 21-006(e), AOC 21-006(f)	21-612321	15–16	MD21-10-21641	0.0	0.0	15	205
SWMU 21-006(e), AOC 21-006(f)	21-612321	24–25	MD21-10-21642	0.0	0.0	12	626
SWMU 21-006(e), AOC 21-006(f)	21-612322	5–6	MD21-10-21643	0.0	0.0	18	702
SWMU 21-006(e), AOC 21-006(f)	21-612322	15–16	MD21-10-21644	0.0	0.0	45	629
SWMU 21-006(e), AOC 21-006(f)	21-612322	24–25	MD21-10-21645	0.0	0.0	15	475
SWMU 21-006(e), AO 21-006(f)	21-612323	5–6	MD21-10-21646	0.0	0.0	2	460
SWMU 21-006(e), AOC 21-006(f)	21-612323	15–16	MD21-10-21647	0.0	0.0	25	543
SWMU 21-006(e), AOC 21-006(f)	21-612323	24–25	MD21-10-21648	0.0	0.0	18	410
SWMU 21-006(e), AOC 21-006(f)	21-612324	5–6	MD21-10-21649	0.0	0.0	10	256
SWMU 21-006(e), AOC 21-006(f)	21-612324	15–16	MD21-10-21650	0.0	0.0	0	223
SWMU 21-006(e), AOC 21-006(f)	21-612324	24–25	MD21-10-21651	0.0	0.0	2	288
AOC 21-028(c)	21-612329	5–6	MD21-10-21680	0.0	0.0	7	968
AOC 21-028(c)	21-612329	15–16	MD21-10-21681	0.0	0.0	18	658
AOC 21-028(c)	21-612329	24–25	MD21-10-21682	0.0	0.0	23	924

Table 3.2-2 (continued)

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID, Ambient (ppm)	PID, Head Space (ppm)	Alpha (dpm)	Beta/ Gamma (dpm)
AOC 21-028(c)	21-612330	5–6	MD21-10-21685	0.0	0.0	13	820
AOC 21-028(c)	21-612330	15–16	MD21-10-21686	0.0	0.0	18	1138
AOC 21-028(c)	21-612330	24–25	MD21-10-21687	0.0	0.0	13	1101
AOC 21-028(c)	21-612331	5–6	MD21-10-21688	0.0	0.0	23	806
AOC 21-028(c)	21-612331	15–16	MD21-10-21689	0.0	0.0	18	946
AOC 21-028(c)	21-612331	24–25	MD21-10-21690	0.0	0.0	18	798
AOC 21-028(c)	21-612332	5–6	MD21-10-21691	0.0	0.0	5	573
AOC 21-028(c)	21-612332	15–16	MD21-10-21692	0.0	0.0	16	573
AOC 21-028(c)	21-612332	24–25	MD21-10-21693	0.0	0.0	27	618
AOC 21-028(c)	21-612333	5–6	MD21-10-21694	0.0	0.0	22	344
AOC 21-028(c)	21-612333	15–16	MD21-10-21695	0.0	0.0	5	625
AOC 21-028(c)	21-612333	24–25	MD21-10-21696	0.0	0.0	0	507
AOC 21-028(c)	21-612334	5–6	MD21-10-21697	0.0	0.0	0	662
AOC 21-028(c)	21-612334	15–16	MD21-10-21698	0.0	0.0	0	558
AOC 21-028(c)	21-612334	24–25	MD21-10-21699	0.0	0.0	10	1078
AOC 21-028(c)	21-612335	5–6	MD21-10-21700	0.0	0.0	32	878
AOC 21-028(c)	21-612335	15–16	MD21-10-21701	0.0	0.0	10	1078
AOC 21-028(c)	21-612335	24–25	MD21-10-21702	0.0	0.0	26	893
AOC 21-028(c)	21-612336	5–6	MD21-10-21703	0.0	0.0	12	794
AOC 21-028(c)	21-612336	15–16	MD21-10-21704	0.0	0.0	28	1082
AOC 21-028(c)	21-612336	24–25	MD21-10-21705	0.0	0.0	28	1274
AOC 21-028(c)	21-612337	5–6	MD21-10-21706	0.0	0.0	12	988
AOC 21-028(c)	21-612337	15–16	MD21-10-21707	0.0	0.0	6	2430
AOC 21-028(c)	21-612337	24–25	MD21-10-21708	0.0	0.0	17	1151
AOC 21-028(c)	21-612338	5–6	MD21-10-21709	0.0	0.0	2	1060
AOC 21-028(c)	21-612338	15–16	MD21-10-21710	0.0	0.0	7	1201
AOC 21-028(c)	21-612338	24–25	MD21-10-21711	0.0	0.0	2	1379
AOC 21-028(c)	21-612339	5–6	MD21-10-21712	0.0	0.0	0	704
AOC 21-028(c)	21-612339	15–16	MD21-10-21713	0.0	0.0	21	1192
AOC 21-028(c)	21-612339	24–25	MD21-10-21714	0.0	0.0	16	837
AOC 21-028(c)	21-612340	5–6	MD21-10-21715	0.0	0.0	5	1251
AOC 21-028(c)	21-612340	15–16	MD21-10-21716	0.0	0.0	21	1081
AOC 21-028(c)	21-612340	24–25	MD21-10-21717	0.0	0.0	16	955
AOC 21-028(c)	21-612341	5–6	MD21-10-21718	0.0	0.0	21	756
AOC 21-028(c)	21-612341	15–16	MD21-10-21719	0.0	0.0	21	978
AOC 21-028(c)	21-612341	24–25	MD21-10-21720	0.0	0.0	16	807
AOC 21-028(c)	21-612342	5–6	MD21-10-21721	0.0	0.0	6	870

Table 3.2-2 (continued)

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID, Ambient (ppm)	PID, Head Space (ppm)	Alpha (dpm)	Beta/ Gamma (dpm)
AOC 21-028(c)	21-612342	15–16	MD21-10-21722	0.0	0.0	1	1218
AOC 21-028(c)	21-612342	24–25	MD21-10-21723	0.0	0.0	0	1003
TA-26							
TA-26	26-612294	0–0.5	RE26-10-21535	0.0	0.0	13	1677
TA-26	26-612294	5–6	RE26-10-21536	0.0	0.0	13	1677
TA-26	26-612294	9–10	RE26-10-21537	0.0	0.0	13	1677
TA-26	26-612295	0–0.5	RE26-10-21538	0.0	0.0	11	1127
TA-26	26-612295	5–6	RE26-10-21539	0.0	0.0	11	1127
TA-26	26-612295	9–10	RE26-10-21540	0.0	0.0	11	1127
TA-26	26-612296	0–0.5	RE26-10-21541	0.0	0.0	27	1127
TA-26	26-612296	5–6	RE26-10-21542	0.0	0.0	27	1127
TA-26	26-612296	9–10	RE26-10-21543	0.0	0.0	27	1127
TA-26	26-612297	0–0.5	RE26-10-21544	0.0	0.0	11	752
TA-26	26-612297	5–6	RE26-10-21545	0.0	0.0	11	752
TA-26	26-612297	9–10	RE26-10-21546	0.0	0.0	3	454
TA-26	26-612298	0–0.5	RE26-10-21547	0.0	0.0	11	752
TA-26	26-612298	5–6	RE26-10-21548	0.0	0.0	11	752
TA-26	26-612298	9–10	RE26-10-21549	0.0	0.0	11	752
TA-26	26-612299	0–0.5	RE26-10-21550	0.0	0.0	3	454
TA-26	26-612299	5–6	RE26-10-21551	0.0	0.0	0	1149
TA-26	26-612299	9–10	RE26-10-21552	0.0	0.0	0	1149
TA-26	26-612300	0–0.5	RE26-10-21553	0.0	0.0	3	454
TA-26	26-612300	5–6	RE26-10-21554	0.0	0.0	3	454
TA-26	26-612300	6–6.6	RE26-10-21555	0.0	0.0	3	454
TA-26	26-612301	0–0.5	RE26-10-21556	0.0	0.0	3	454
TA-26	26-612301	5–6	RE26-10-21557	0.0	0.0	0	1149
TA-26	26-612301	9–10	RE26-10-21558	0.0	0.0	0	1149
TA-26	26-612302	0–0.5	RE26-10-21559	0.0	0.0	3	454
TA-26	26-612302	5–6	RE26-10-21560	0.0	0.0	0	1149
TA-26	26-612302	9–10	RE26-10-21561	0.0	0.0	0	1149
TA-26	26-612303	0–0.5	RE26-10-21566	0.0	0.0	11	1443
TA-26	26-612303	5–6	RE26-10-21567	0.0	0.0	11	1443
TA-26	26-612303	15–16	RE26-10-21568	0.0	0.0	11	1443
TA-26	26-612303	24–25	RE26-10-21569	0.0	0.0	11	1443
TA-26	26-612304	0–0.5	RE26-10-21570	0.0	0.0	11	1443
TA-26	26-612304	5–6	RE26-10-21571	0.0	0.0	11	1443
TA-26	26-612304	15–16	RE26-10-21572	0.0	0.0	11	1443

Table 3.2-2 (continued)

SWMU/AOC	Location ID	Depth (ft)	Sample ID	PID, Ambient (ppm)	PID, Head Space (ppm)	Alpha (dpm)	Beta/ Gamma (dpm)
TA-26	26-612304	24–25	RE26-10-21573	0.0	0.0	11	1443
TA-26	26-612305	0–0.5	RE26-10-21574	0.0	0.0	11	1443
TA-26	26-612305	5–6	RE26-10-21575	0.0	0.0	13	1677
TA-26	26-612305	15–16	RE26-10-21576	0.0	0.0	13	1677
TA-26	26-612305	24–25	RE26-10-21577	0.0	0.0	13	1677
TA-26	26-612306	0–0.5	RE26-10-21578	0.0	0.0	13	1677
TA-26	26-612306	5–6	RE26-10-21579	0.0	0.0	13	1677
TA-26	26-612306	15–16	RE26-10-21580	0.0	0.0	13	1677
TA-26	26-612306	24–25	RE26-10-21581	0.0	0.0	13	1677

Table 6.2-1
Samples Collected and Analyses Requested at AOC 02-003(a)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
CA02-00-0140	02-01241	3–4	FILL	—[a]	—	7483R[b]	7483R	—	7483R	7483R	7481R, 7482R	—	—	7483R	—	—	—	—
CA02-00-0141	02-01241	7.5–8.5	FILL	—	—	7483R	7483R	—	7483R	7483R	7481R, 7482R	—	—	7483R	—	—	—	—
CA02-00-0142	02-01241	11.5–12.5	SOIL	—	—	7483R	7483R	—	7483R	7483R	7481R, 7482R	—	—	7483R	—	—	—	—
CA02-00-0143	02-01241	15–16.5	SOIL	—	—	7483R	7483R	—	7483R	7483R	7481R, 7482R	—	—	7483R	—	—	—	—
CA02-00-0144	02-01242	0–1	SOIL	—	—	7483R	7483R	—	7483R	7483R	7481R, 7482R	—	—	7483R	—	—	—	—
CA02-00-0145	02-01242	2.5–4	SOIL	—	—	7483R	7483R	—	7483R	7483R	7481R, 7482R	—	—	7483R	—	—	—	—
CA02-00-0146	02-01242	6–7	SOIL	—	—	7483R	7483R	—	7483R	7483R	7481R, 7482R	—	—	7483R	—	—	—	—
CA02-00-0147	02-01242	10.5–14.5	SOIL	—	—	7483R	7483R	—	7483R	7483R	7481R, 7482R	—	—	7483R	—	—	—	—
CA02-00-0148	02-01242	15–16	SOIL	—	—	7483R	7483R	—	7483R	7483R	7481R, 7482R	—	—	7483R	—	—	—	—
RE02-07-670	02-600118	0–0.5	SOIL	07-792	07-792	07-792	07-792	—	07-792	07-792	07-792	07-792	07-792	07-792	07-792	—	—	07-792
RE02-07-673	02-600118	9.5–12	QBO	07-792	07-792	07-792	07-792	—	07-792	07-792	07-792	07-792	07-792	07-792	07-792	—	07-792	07-792
RE02-07-6820	02-600118	14.5–19	QBO	07-1139	07-1139	07-1139	07-1139	—	07-1139	07-1139	07-1137	07-1137	07-1139	07-1139	07-1137	—	07-1137	07-1139
RE02-07-674	02-600119	0–0.5	SOIL	07-593	07-592	07-593	07-593	—	07-593	07-593	07-592	07-591	07-592	07-593	07-591	—	—	07-592
RE02-07-675	02-600119	4.5–7.3	QAL	07-593	07-592	07-593	07-593	—	07-593	07-593	07-592	07-591	07-592	07-593	07-591	—	07-591	07-592
RE02-07-676	02-600119	15–21	QBO	07-607	07-606	07-607	07-607	—	07-607	07-607	07-606	07-605	07-606	07-607	07-605	—	07-605	07-606
RE02-07-678	02-600120	0–0.5	SOIL	07-593	07-592	07-593	07-593	—	07-593	07-593	07-592	07-591	07-592	07-593	07-591	—	—	07-592
RE02-07-679	02-600120	4.5–7.6	QAL	07-593	07-592	07-593	07-593	—	07-593	07-593	07-592	07-591	07-592	07-593	07-591	—	07-591	07-592
RE02-07-680	02-600120	14.5–17.8	QBO	07-593	07-592	07-593	07-593	—	07-593	07-593	07-592	07-591	07-592	07-593	07-591	—	07-591	07-592
RE02-07-682	02-600121	0–0.5	SOIL	07-607	07-606	07-607	07-607	—	07-607	07-607	07-606	07-605	07-606	07-607	07-605	—	—	07-606
RE02-07-683	02-600121	4.5–6.3	QAL	07-662	07-661	07-662	07-662	—	07-662	07-662	07-661	07-660	07-661	07-662	07-660	—	07-660	07-661
RE02-07-685	02-600121	10–12.3	QAL	07-662	07-661	07-662	07-662	—	07-662	07-662	07-661	07-660	07-661	07-662	07-660	—	07-660	07-661
RE02-07-684	02-600121	15–21	QBO	07-662	07-661	07-662	07-662	—	07-662	07-662	07-661	07-660	07-661	07-662	07-660	—	07-660	07-661
RE02-07-686	02-600122	0–0.5	SOIL	07-414	07-414	07-414	07-414	—	07-414	07-414	07-414	07-414	07-414	07-414	07-414	—	—	07-414
RE02-07-687	02-600122	2–4.5	QAL	07-570	07-570	07-570	07-570	—	07-570	07-570	07-570	07-570	07-570	07-570	07-570	—	07-570	07-570
RE02-07-688	02-600122	4.5–7.5	QAL	07-570	07-570	07-570	07-570	—	07-570	07-570	07-570	07-570	07-570	07-570	07-570	—	07-570	07-570
RE02-07-689	02-600123	0–0.5	SOIL	07-607	07-606	07-607	07-607	—	07-607	07-607	07-606	—	07-606	07-607	—	—	—	07-606
RE02-07-690	02-600123	2–2.5	QAL	07-662	07-661	07-662	07-662	—	07-662	07-662	07-661	07-660	07-661	07-662	07-660	—	07-660	07-661
RE02-07-691	02-600123	4.5–6.7	QAL	07-918	07-918	07-918	07-918	—	07-918	07-918	07-918	07-918	07-918	07-918	07-918	—	07-918	07-918
RE02-07-692	02-600124	0–0.5	SOIL	07-607	07-606	07-607	07-607	—	07-607	07-607	07-606	07-605	07-606	07-607	07-605	—	—	07-606
RE02-07-693	02-600124	2–3.7	QAL	07-918	07-918	07-918	07-918	—	07-918	07-918	07-918	07-918	07-918	07-918	07-918	—	07-918	07-918
RE02-07-694	02-600124	4.5–5.7	QAL	07-918	07-918	07-918	07-918	—	07-918	07-918	07-918	07-918	07-918	07-918	07-918	—	07-918	07-918
RE02-10-21768	02-612348	5–7	QAL	—	—	10-4264	10-4264	10-4263	10-4264	10-4264	10-4263	10-4263	—	10-4264	10-4263	—	—	—
RE02-10-21769	02-612348	15–16	QAL	—	—	10-4264	10-4264	10-4263	10-4264	10-4264	10-4263	10-4263	—	10-4264	10-4263	—	—	—

Table 6.2-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
RE02-10-21770	02-612348	25–26	QBO	—	—	10-4264	10-4264	10-4263	10-4264	10-4264	10-4263	10-4263	—	10-4264	10-4263	—	—	—
RE02-10-21771	02-612348	35–36	QBO	—	—	10-4264	10-4264	10-4263	10-4264	10-4264	10-4263	10-4263	—	10-4264	10-4263	—	—	—
RE02-10-21772	02-612348	49–50	QBO	—	—	10-4264	10-4264	10-4263	10-4264	10-4264	10-4263	10-4263	—	10-4264	10-4263	—	—	—
RE02-10-21904	02-612389	5–6	QAL	11-122	—	11-122	11-122	—	11-122	11-122	11-122	11-122	—	11-122	11-122	—	—	—
RE02-10-21905	02-612389	18–19	QAL	11-122	—	11-122	11-122	—	11-122	11-122	11-122	11-122	—	11-122	11-122	—	—	—
RE02-10-21906	02-612389	25–27	QBO	11-152	—	11-152	11-152	—	11-152	11-152	11-151	11-151	—	11-152	11-151	—	—	—
RE02-10-21907	02-612389	35–36	QBO	11-152	—	11-152	11-152	—	11-152	11-152	11-151	11-151	—	11-152	11-151	—	—	—
RE02-10-21908	02-612389	49–50	QBO	11-152	—	11-152	11-152	—	11-152	11-152	11-151	11-151	—	11-152	11-151	—	—	—

[a] — = Analysis not requested.

[b] Analytical request number.

Table 6.2-2
Inorganic Chemicals Detected or Detected above BVs at AOC 02-003(a)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**2.6**	**3.96**	**3700**	**13.5**	**189**	**0.1**	**2**	**na[b]**	**na**	**0.3**	**4.59**	**40**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**19.3**	**14.7**	**21500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**505[d]**	**51,900**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**281[d]**	**24,800**	**434,000**	**1110**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**70.5**	**96.6[d]**	**3130**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**394**	**23,500**
CA02-00-0140	02-01241	3–4	FILL	—[f]	—	—	—	—	—	—	—	—	—	—	—	NA[g]	NA	—	—	290
CA02-00-0144	02-01242	0–1	SOIL	—	—	—	—	—	—	77	—	—	—	—	—	NA	NA	—	—	—
CA02-00-0145	02-01242	2.5–4	SOIL	—	—	—	—	0.84	—	—	—	—	—	—	—	NA	NA	—	—	50
CA02-00-0147	02-01242	10.5–14.5	SOIL	—	—	—	—	—	—	—	—	29	1000	—	—	NA	NA	—	—	110
RE02-07-670	02-600118	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	0.322	—	0.814 (J-)	0.000827 (J-)	—	—	50.4
RE02-07-673	02-600118	9.5–12	QBO	9980	—	2.74	55.8	0.59 (U)	9.65	4.06	5910	—	212	—	4.23	—	—	1.2 (J)	6.46	—
RE02-07-6820	02-600118	14.5–19	QBO	7110 (J+)	0.52 (U)	1.9 (U)	50.9	0.634 (U)	4.06 (J+)	—	5580	—	—	—	—	—	—	7.79	—	—
RE02-07-674	02-600119	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	1.26 (J+)	—	—	—	—
RE02-07-675	02-600119	4.5–7.3	QAL	—	—	—	—	0.651	—	—	—	—	—	—	—	2.72 (J+)	0.00269	1.61 (U)	—	—
RE02-07-676	02-600119	15–21	QBO	6590	—	0.659 (J)	—	0.612 (U)	94.2 (J)	—	6430	—	258	—	43.1	—	—	1.84 (U)	—	—
RE02-07-678	02-600120	0–0.5	SOIL	—	—	—	—	1.05	—	—	—	—	—	—	—	1.72 (J+)	0.00565	—	—	49.1

Table 6.2-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**2.6**	**3.96**	**3700**	**13.5**	**189**	**0.1**	**2**	**na[b]**	**na**	**0.3**	**4.59**	**40**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**19.3**	**14.7**	**21500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**505[d]**	**51,900**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**281[d]**	**24,800**	**434,000**	**1110**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**70.5**	**96.6[d]**	**3130**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**394**	**23,500**
RE02-07-679	02-600120	4.5–7.6	QAL	—	—	—	—	0.535 (U)	123	—	—	—	—	—	22.4 (U)	—	—	—	—	—
RE02-07-680	02-600120	14.5–17.8	QBO	6240	—	1.21 (J)	32.6	0.541 (U)	30.7 (U)	—	6270	—	276	—	8.34 (U)	—	—	0.68 (U)	5.75	—
RE02-07-682	02-600121	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	1.18	—	1.18 (J-)	—	—	—	—
RE02-07-683	02-600121	4.5–6.3	QAL	—	—	—	—	—	20.8	—	—	—	—	—	—	—	—	—	—	—
RE02-07-685	02-600121	10–12.3	QAL	—	—	—	—	—	20	—	—	—	—	—	—	—	—	—	—	—
RE02-07-684	02-600121	15–21	QBO	7110	—	0.797 (J)	—	0.56 (U)	17.8 (U)	—	5400 (J+)	—	231	—	4.04 (U)	—	0.000628 (J)	1.68 (U)	—	—
RE02-07-686	02-600122	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	0.146	—	—	—	—	—	—
RE02-07-687	02-600122	2–4.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	1.3 (J-)	—	—	—	53.7 (J+)
RE02-07-688	02-600122	4.5–7.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	1.39 (J-)	0.000596 (J)	—	—	—
RE02-07-689	02-600123	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	0.408	—	2.13 (J-)	—	1.54 (U)	—	—
RE02-07-690	02-600123	2–2.5	QAL	—	—	—	—	2.23	—	—	—	—	—	0.545	—	—	—	—	—	49
RE02-07-691	02-600123	4.5–6.7	QAL	—	—	—	—	0.453 (J)	—	—	—	—	—	—	—	—	0.000608 (J)	—	—	—
RE02-07-692	02-600124	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	0.355	—	—	—	—	—	—
RE02-07-693	02-600124	2–3.7	QAL	—	—	—	—	0.548 (U)	—	—	—	—	—	0.226	—	—	—	—	—	—
RE02-07-694	02-600124	4.5–5.7	QAL	—	—	—	—	0.531 (U)	—	—	—	—	—	—	—	—	—	1.59 (U)	—	—
RE02-10-21768	02-612348	5–7	QAL	—	1.12 (U)	—	—	0.559 (U)	—	—	—	—	—	—	—	NA	NA	—	—	—
RE02-10-21769	02-612348	15–16	QAL	—	1.16 (U)	—	—	0.579 (U)	—	—	—	—	—	—	—	NA	NA	—	—	—
RE02-10-21770	02-612348	25–26	QBO	—	1.32 (U)	1.27 (U)	—	0.662 (U)	—	—	5350	—	214 (J+)	—	—	NA	NA	1.27 (U)	—	—
RE02-10-21771	02-612348	35–36	QBO	—	1.19 (U)	1.26 (U)	—	—	3.66	—	5390	—	199 (J+)	—	—	NA	NA	1.26 (U)	—	—
RE02-10-21772	02-612348	49–50	QBO	—	1.19 (U)	1.18 (U)	—	0.594 (U)	—	—	5600	—	223 (J+)	—	—	NA	NA	1.18 (U)	—	—
RE02-10-21904	02-612389	5–6	QAL	—	0.902 (U)	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—
RE02-10-21905	02-612389	18–19	QAL	—	1.17 (U)	—	—	0.584 (U)	—	—	—	—	—	—	—	NA	NA	—	—	—
RE02-10-21906	02-612389	25–27	QBO	—	1.21 (U)	1.26 (U)	—	0.607 (U)	—	—	4930	—	—	—	—	NA	NA	1.26 (U)	—	—
RE02-10-21907	02-612389	35–36	QBO	—	1.3 (U)	1.28 (U)	—	0.65 (U)	—	—	5450	—	219	—	—	NA	NA	1.28 (U)	—	—
RE02-10-21908	02-612389	49–50	QBO	—	1.29 (U)	1.27 (U)	—	0.645 (U)	—	—	5750	—	243	—	—	NA	NA	1.27 (U)	4.6	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 6.2-3
Organic Chemicals Detected at AOC 02-003(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	Chrysene	Dichlorobenzene[1,4-]	Fluoranthene	Indeno(1,2,3-cd)pyrene	Methylene Chloride	Naphthalene	Phenanthrene	Pyrene	Toluene
Industrial SSL[a]				**50,500**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**1830**	**3230**	**6730**	**33,700**	**32.3**	**5110**	**16,800**	**25,300**	**25,300**	**61,100**
Recreational SSL[c]				**17,300**	**863,000**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**888**	**1770**	**8880**	**1140**	**11,500**	**88.8**	**3610**	**1930**	**8630**	**8630**	**47,600**
Residential SSL[a]				**3480**	**17,400**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**380**	**152**	**1290**	**2320**	**1.53**	**409**	**1160**	**1740**	**1740**	**5220**
RE02-07-670	02-600118	0–0.5	SOIL	—[d]	0.0104 (J)	—	0.74	—	0.0298 (J)	0.0327 (J)	0.0121 (J)	—	—	0.021 (J)	—	0.0345 (J)	—	NA[e]	0.0111 (J)	0.0344 (J)	0.0356 (J)	NA
RE02-07-6820	02-600118	14.5–19	QBO	—	—	—	0.0886	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-674	02-600119	0–0.5	SOIL	0.0136 (J)	0.0214 (J)	0.171	0.262	0.0683	0.0974	—	—	—	—	0.0649	—	0.173	—	NA	—	0.0942	0.158	NA
RE02-07-675	02-600119	4.5–7.3	QAL	—	—	0.513	0.185	—	—	—	—	—	—	—	—	0.0102 (J)	—	—	—	—	—	—
RE02-07-678	02-600120	0–0.5	SOIL	—	—	0.0094	0.0109	0.0285 (J)	—	—	—	—	—	0.0232 (J)	—	0.0538	—	NA	—	0.0253 (J)	0.0557	NA
RE02-07-679	02-600120	4.5–7.6	QAL	—	—	0.0624	0.0045	—	—	—	—	—	—	—	—	0.0163 (J)	—	—	—	0.0145 (J)	0.0137 (J)	0.000362 (J)
RE02-07-682	02-600121	0–0.5	SOIL	—	0.007 (J)	0.0116 (J)	—	0.0267 (J)	0.099	0.0436	—	—	—	0.028 (J)	—	0.0514	0.0554	NA	—	0.0372	0.0462	NA
RE02-07-683	02-600121	4.5–6.3	QAL	—	—	0.0587	0.0574	0.0122 (J)	—	—	—	—	—	—	—	0.0114 (J)	—	0.00452 (J)	—	—	—	0.00037 (J)
RE02-07-685	02-600121	10–12.3	QAL	—	—	—	0.0066	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-686	02-600122	0–0.5	SOIL	—	—	0.0183 (J)	0.0191 (J)	—	—	—	—	—	—	0.0152 (J)	—	0.0182 (J)	—	NA	—	0.0111 (J)	0.0327 (J)	NA
RE02-07-687	02-600122	2–4.5	QAL	—	—	0.653	1.25	0.0328 (J)	0.0278 (J)	0.0327 (J)	0.0203 (J)	0.0182 (J)	—	0.0287 (J)	0.000563 (J)	0.0568	0.0165 (J)	—	—	0.0279 (J)	0.048	—
RE02-07-688	02-600122	4.5–7.5	QAL	—	—	0.0776	0.0226	—	—	—	—	—	0.153 (J)	—	—	—	—	—	—	—	—	—
RE02-07-690	02-600123	2–2.5	QAL	—	—	—	0.0018 (J)	0.0125 (J)	—	—	—	—	—	—	—	0.0141 (J)	—	0.00355 (J)	—	0.0107 (J)	0.0114 (J)	—
RE02-07-692	02-600124	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	0.0145 (J)	—	NA	—	—	0.0253 (J)	NA
RE02-07-693	02-600124	2–3.7	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0151 (J)	—
RE02-10-21768	02-612348	5–7	QAL	—	—	0.0103 (J)	0.0049	—	—	—	—	—	—	—	—	—	—	NA	—	—	—	NA
RE02-10-21771	02-612348	35–36	QBO	—	—	—	0.0022 (J)	—	—	—	—	—	—	—	—	—	—	NA	—	—	—	NA
RE02-10-21904	02-612389	5–6	QAL	—	—	0.298 (J)	0.0326 (J)	—	—	—	—	—	—	—	—	—	—	NA	—	—	—	NA

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273), unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSLs are from LANL (2017, 602581).

[d] — = Not detected.

[e] NA = Not analyzed.

Table 6.2-4
Radionuclides Detected or Detected above BVs/FVs at AOC 02-003(a)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Strontium-90	Tritium	Uranium-235/236
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**0.18**
Qbt 2,3,4 BV[a]				**na**	**na**	**na**	**na**	**0.09**
Soil BV/FV[a]				**1.65**	**0.054**	**1.31**	**na**	**0.2**
Industrial SAL[c]				**41**	**1200**	**2400**	**2,400,000**	**160**
Recreational SAL[c]				**370**	**1300**	**4900**	**5,700,000**	**1000**
Residential SAL[c]				**12**	**79**	**15**	**1700**	**42**
CA02-00-0140	02-01241	3–4	FILL	33.3	3.34	7.66	0.0319462	—[d]
CA02-00-0141	02-01241	7.5–8.5	FILL	1.6	—	43 (J-)	0.107304	—
CA02-00-0142	02-01241	11.5–12.5	SOIL	0.165	—	—	—	—
CA02-00-0143	02-01241	15–16.5	SOIL	0.0471	—	—	0.0356339	—
CA02-00-0145	02-01242	2.5–4	SOIL	0.264	0.177	0.374	—	—
CA02-00-0148	02-01242	15–16	SOIL	0.232	—	—	—	—
RE02-07-675	02-600119	4.5–7.3	QAL	6.5	0.119	2.07	0.0361173	—
RE02-07-678	02-600120	0–0.5	SOIL	5.7	0.252	—	0.011825	—
RE02-07-679	02-600120	4.5–7.6	QAL	8.96	0.0393	4.69	—	—
RE02-07-683	02-600121	4.5–6.3	QAL	2.22	1.49	0.745	—	—
RE02-07-687	02-600122	2–4.5	QAL	3.65	0.115	0.367	—	—
RE02-07-688	02-600122	4.5–7.5	QAL	48.4	0.247	8.85	0.0423011	—
RE02-07-691	02-600123	4.5–6.7	QAL	0.215	0.706	—	—	—
RE02-07-692	02-600124	0–0.5	SOIL	—	0.084	—	—	—
RE02-07-693	02-600124	2–3.7	QAL	0.245	0.0886	—	0.0345	—
RE02-07-694	02-600124	4.5–5.7	QAL	0.144	—	—	—	—
RE02-10-21772	02-612348	49–50	QBO	—	—	—	0.0525806	—
RE02-10-21904	02-612389	5–6	QAL	274	0.644	32.8	0.021	—
RE02-10-21908	02-612389	49–50	QBO	—	—	—	—	0.194

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SALs are from LANL (2015, 600929).

[d] — = Not detected.

Table 6.3-1
Samples Collected and Analyses Requested at AOC 02-003(b)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
CA02-00-0085	02-01235	5–5.5	SOIL	—[a]	—	7473R[b]	7473R	7473R	7473R	7471R, 7472R	—	—	7473R	7470R	—	—	—
CA02-00-0086	02-01235	6–7.5	SOIL	—	—	7473R	7473R	7473R	7473R	7471R, 7472R	—	—	7473R	7470R	—	—	—
CA02-00-0087	02-01235	8.5–9.5	SOIL	—	—	7473R	7473R	7473R	7473R	7471R, 7472R	—	—	7473R	7470R	—	—	—
CA02-00-0088	02-01235	10–12	SOIL	—	—	7473R	7473R	7473R	7473R	7471R, 7472R	—	—	7473R	7470R	—	—	—
CA02-00-0089	02-01235	12.5–13.7	SOIL	—	—	7473R	7473R	7473R	7473R	7471R, 7472R	—	—	7473R	7470R	—	—	—
CA02-00-0090	02-01235	15–17	QBT 2	—	—	7473R	7473R	7473R	7473R	7471R, 7472R	—	—	7473R	7470R	—	—	—
RE02-07-696	02-600125	0–0.5	SOIL	07-680	07-679	07-680	07-680	07-680	07-680	07-679	07-678	07-679	07-680	07-678	—	—	07-679
RE02-07-697	02-600125	4.5–9	QAL	07-813	07-812	07-813	07-813	07-813	07-813	07-812	07-811	07-812	07-813	07-811	—	07-811	07-812
RE02-07-698	02-600125	9–11.3	QAL	07-813	07-812	07-813	07-813	07-813	07-813	07-812	07-811	07-812	07-813	07-811	—	07-811	07-812
RE02-07-699	02-600125	14.5–16.7	QBO	07-813	07-812	07-813	07-813	07-813	07-813	07-812	07-811	07-812	07-813	07-811	—	07-811	07-812
RE02-07-701	02-600126	0–0.5	SOIL	07-680	07-679	07-680	07-680	07-680	07-680	07-679	07-678	07-679	07-680	07-678	—	—	07-679
RE02-07-702	02-600126	4.5–5.2	QAL	07-680	07-679	07-680	07-680	07-680	07-680	07-679	07-678	07-679	07-680	07-678	—	07-678	07-679
RE02-07-703	02-600126	9.5–12.7	QAL	07-813	07-812	07-813	07-813	07-813	07-813	07-812	07-811	07-812	07-813	07-811	—	07-811	07-812
RE02-07-704	02-600126	14.5–16.7	QBO	07-813	07-812	07-813	07-813	07-813	07-813	07-812	07-811	07-812	07-813	07-811	—	07-811	07-812
RE02-07-706	02-600127	0–0.5	SOIL	07-680	07-679	07-680	07-680	07-680	07-680	07-679	07-678	07-679	07-680	07-678	—	—	07-679
RE02-07-707	02-600127	4.5–6.4	QAL	07-954	07-954	07-954	07-954	07-954	07-954	07-954	07-954	07-954	07-954	07-954	—	07-954	07-954
RE02-07-708	02-600127	9.5–11.9	QBO	07-925	07-925	07-925	07-925	07-925	07-925	07-925	07-925	07-925	07-925	07-925	—	07-925	07-925
RE02-07-711	02-600128	0–0.5	SED	07-680	07-679	07-680	07-680	07-680	07-680	07-679	07-678	07-679	07-680	07-678	—	—	07-679
RE02-07-716	02-600129	0–0.5	SOIL	07-680	07-679	07-680	07-680	07-680	07-680	07-679	07-678	07-679	07-680	07-678	—	—	07-679
RE02-10-21911	02-612390	5–6	QAL	10-4513	—	10-4513	10-4513	10-4513	10-4513	10-4512	10-4512	—	10-4513	10-4512	—	—	—
RE02-10-21912	02-612390	15–17	QBO	10-4513	—	10-4513	10-4513	10-4513	10-4513	10-4512	10-4512	—	10-4513	10-4512	—	—	—
RE02-10-21913	02-612390	26–27	QBO	10-4513	—	10-4513	10-4513	10-4513	10-4513	10-4512	10-4512	—	10-4513	10-4512	—	—	—
RE02-10-21914	02-612390	35–36	QBO	10-4513	—	10-4513	10-4513	10-4513	10-4513	10-4512	10-4512	—	10-4513	10-4512	—	—	—
RE02-10-21915	02-612390	49–50	QBO	10-4513	—	10-4513	10-4513	10-4513	10-4513	10-4512	10-4512	—	10-4513	10-4512	—	—	—

[a] — = Analysis not requested.

[b] Analytical request number.

Table 6.3-2
Inorganic Chemicals Detected or Detected above BVs at AOC 02-003(b)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Chromium	Copper	Iron	Manganese	Mercury	Nickel	Nitrate	Selenium	Silver	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**2.6**	**3.96**	**3700**	**189**	**0.1**	**2**	**na[b]**	**0.3**	**1**	**4.59**	**40**
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.63**	**7.14**	**4.66**	**14500**	**482**	**0.1**	**6.58**	**na**	**0.3**	**1**	**17**	**63.5**
Sediment BV[a]				**15400**	**0.83**	**3.98**	**127**	**0.4**	**10.5**	**11.2**	**13800**	**543**	**0.1**	**9.38**	**na**	**0.3**	**1**	**19.7**	**60.2**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**19.3**	**14.7**	**21500**	**671**	**0.1**	**15.4**	**na**	**1.52**	**1**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**505[d]**	**51,900**	**908,000**	**160,000**	**389**	**25,700**	**2,080,000**	**6490**	**6490**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**281[d]**	**24,800**	**434,000**	**14,800**	**186**	**12,400**	**991,000**	**3100**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**70.5**	**96.6[d]**	**3130**	**54,800**	**10,500**	**23.5**	**1560**	**125,000**	**391**	**391**	**394**	**23,500**
CA02-00-0085	02-01235	5–5.5	SOIL	—[f]	—	—	—	—	—	—	—	—	0.21 (U)	—	NA[g]	—	—	—	—
CA02-00-0087	02-01235	8.5–9.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	NA	—	1.1	—	—
CA02-00-0089	02-01235	12.5–13.7	SOIL	—	—	—	—	—	—	—	—	—	—	—	NA	—	1.3	—	—
CA02-00-0090	02-01235	15–17	QBT 2	14000	—	—	—	—	—	—	—	—	—	—	NA	—	—	—	—
RE02-07-696	02-600125	0–0.5	SOIL	—	—	—	—	0.512 (U)	—	—	—	—	—	—	1.62 (J)	—	—	—	—
RE02-07-697	02-600125	4.5–9	QAL	—	—	—	—	0.547 (U)	—	—	—	—	—	—	2.74	1.64 (U)	—	—	—
RE02-07-698	02-600125	9–11.3	QAL	—	—	—	—	0.515 (U)	—	—	—	—	—	—	—	1.54 (U)	—	—	—
RE02-07-699	02-600125	14.5–16.7	QBO	8130	—	0.99 (J)	—	0.592 (U)	58.7 (U)	—	5760	199	—	3.42 (U)	—	1.78 (U)	—	—	—
RE02-07-701	02-600126	0–0.5	SOIL	—	—	—	—	0.49 (U)	—	—	—	—	—	—	—	—	—	—	—
RE02-07-702	02-600126	4.5–5.2	QAL	—	—	—	—	0.544 (U)	—	—	—	—	—	—	1.45 (J)	1.63 (U)	—	—	—
RE02-07-703	02-600126	9.5–12.7	QAL	—	—	—	—	0.552 (U)	—	—	—	—	—	—	—	1.65 (U)	—	—	—
RE02-07-704	02-600126	14.5–16.7	QBO	9950	—	1.15 (J)	61.7	0.575 (U)	8.77 (U)	—	6440	199	—	3.26 (U)	—	1.73 (U)	—	—	—
RE02-07-706	02-600127	0–0.5	SOIL	—	—	—	—	0.505 (U)	—	—	—	—	—	—	7.94 (J)	—	—	—	—
RE02-07-707	02-600127	4.5–6.4	QAL	—	—	—	—	0.534 (U)	—	—	—	—	—	—	1.22	—	—	—	—
RE02-07-708	02-600127	9.5–11.9	QBO	7190	—	1.49 (J)	48	0.562 (U)	15	4.47	8300	235	—	3.12	1.92	1.69 (U)	—	10.4 (J)	—
RE02-07-711	02-600128	0–0.5	SED	—	—	—	—	0.521 (U)	—	—	—	—	—	—	3.55 (J)	1.56 (U)	—	—	—
RE02-07-716	02-600129	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	0.443	—	3.09 (J)	—	—	—	—
RE02-10-21911	02-612390	5–6	QAL	—	0.941 (U)	—	—	—	—	—	—	—	—	—	NA	—	—	—	49.2 (J)
RE02-10-21912	02-612390	15–17	QBO	5810	1.2 (U)	1.14 (U)	—	0.599 (U)	—	—	4700	—	—	—	NA	1.14 (U)	—	—	—
RE02-10-21913	02-612390	26–27	QBO	—	1.15 (U)	1.21 (U)	—	0.573 (U)	—	—	5230	219	—	—	NA	1.21 (U)	—	—	—
RE02-10-21914	02-612390	35–36	QBO	—	1.27 (U)	1.16 (U)	—	0.635 (U)	—	—	5010	—	—	—	NA	1.16 (U)	—	—	—
RE02-10-21915	02-612390	49–50	QBO	—	1.23 (U)	1.24 (U)	—	0.615 (U)	—	—	5850	—	—	—	NA	1.24 (U)	—	—	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 6.3-3
Organic Chemicals Detected at AOC 02-003(b)

Sample ID	Location ID	Depth (ft)	Media	Anthracene	Aroclor-1248	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Butylbenzene[n-]	Chrysene	Fluoranthene	Fluorene	Isopropyltoluene[4-]	Methylnaphthalene[2-]	Phenanthrene	Pyrene	Trimethylbenzene[1,2,4-]
Industrial SSL[a]				**253,000**	**10.7**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**58,400[c]**	**3230**	**33,700**	**33,700**	**14,100[d]**	**3370**	**25,300**	**25,300**	**260[e]**
Recreational SSL[f]				**863,000**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**888**	**31,400**	**8880**	**11,500**	**11,500**	**42,100[d]**	**1150**	**8630**	**8630**	**6880**
Residential SSL[a]				**17,400**	**2.43**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**3900[c]**	**152**	**2320**	**2320**	**2350[d]**	**232**	**1740**	**1740**	**62[e]**
CA02-00-0085	02-01235	5–5.5	SOIL	—[g]	NA[h]	NA	NA	—	—	—	—	—	NA	—	0.099 (J)	—	NA	—	0.091 (J)	0.11 (J)	NA
RE02-07-696	02-600125	0–0.5	SOIL	—	—	0.844	0.369	—	—	—	—	—	NA	—	0.0138 (J)	—	NA	—	—	0.0111 (J)	NA
RE02-07-697	02-600125	4.5–9	QAL	—	—	0.103 (J-)	0.0423 (J-)	—	—	—	—	—	0.000661 (J)	—	—	—	0.000403 (J)	—	—	—	0.000229 (J)
RE02-07-698	02-600125	9–11.3	QAL	—	—	—	0.0016 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-701	02-600126	0–0.5	SOIL	0.00862 (J)	—	0.0242	0.0131	—	—	0.0105 (J)	—	—	NA	—	0.0125 (J)	—	NA	—	—	—	NA
RE02-07-702	02-600126	4.5–5.2	QAL	—	—	0.0035 (J)	0.0022 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-703	02-600126	9.5–12.7	QAL	—	0.0076	—	0.0022 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-706	02-600127	0–0.5	SOIL	—	—	0.0559	0.025	—	—	—	—	—	NA	—	—	—	NA	—	—	—	NA
RE02-07-707	02-600127	4.5–6.4	QAL	—	—	0.0067	0.0058	—	—	—	—	—	—	—	0.0124 (J)	—	—	—	—	—	—
RE02-07-708	02-600127	9.5–11.9	QBO	—	—	—	0.0015 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-711	02-600128	0–0.5	SED	0.0158 (J)	—	0.0644	0.0896	0.0831	0.114	0.164	0.0467 (J)	0.0654	NA	0.107	0.228	—	NA	—	—	0.175	NA
RE02-07-716	02-600129	0–0.5	SOIL	0.0351	—	0.0079	0.0093	0.0609	0.0709	0.0814	—	0.039	NA	0.0538	0.134	0.0223 (J)	NA	0.0137 (J)	—	0.103	NA
RE02-10-21911	02-612390	5–6	QAL	—	—	0.0121	0.0086	—	—	—	—	—	NA	—	—	—	NA	—	—	0.0126 (J)	NA

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273), unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSLs are from EPA (2007, 099314).

[d] Isopropylbenzene used as surrogate based on structural similarity.

[e] SSLs are from EPA regional screening tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

[f] SSLs are from LANL (2015, 600929).

[g] — = Not detected.

[h] NA = Not analyzed.

Table 6.3-4
Radionuclides Detected or Detected above BVs/FVs at AOC 02-003(b)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Strontium-90	Tritium	Uranium-234	Uranium-235/236	Uranium-238
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**4**	**0.18**	**3.9**
Qbt 2,3,4 BV[a]				**na**	**na**	**na**	**na**	**1.98**	**0.09**	**1.93**
Sediment BV[a]				**0.9**	**0.068**	**1.04**	**0.093**	**2.59**	**0.2**	**2.29**
Soil BV[a]				**1.65**	**0.054**	**1.31**	**na**	**2.59**	**0.2**	**2.29**
Industrial SAL[c]				**41**	**1200**	**2400**	**2,400,000**	**3100**	**160**	**710**
Recreational SAL[c]				**370**	**1300**	**4900**	**5,700,000**	**3900**	**1000**	**2800**
Residential SAL[c]				**12**	**79**	**15**	**1700**	**290**	**42**	**150**
CA02-00-0085	02-01235	5–5.5	SOIL	0.329	0.027	—[d]	—	—	—	—
CA02-00-0086	02-01235	6–7.5	SOIL	0.274	—	—	—	—	—	—
CA02-00-0087	02-01235	8.5–9.5	SOIL	0.254	—	—	—	—	—	—
CA02-00-0088	02-01235	10–12	SOIL	0.0921	—	—	0.0174346	—	—	—
CA02-00-0089	02-01235	12.5–13.7	SOIL	0.154	0.0391	—	0.0266187	—	—	—
CA02-00-0090	02-01235	15–17	QBT 2	—	—	—	0.0479599	2.8	—	2.64
RE02-07-697	02-600125	4.5–9	QAL	4.46	0.542	0.96	0.0262783	—	—	—
RE02-07-702	02-600126	4.5–5.2	QAL	—	—	—	0.032082	—	—	—
RE02-07-703	02-600126	9.5–12.7	QAL	—	—	0.173	0.0295674	—	—	—
RE02-07-704	02-600126	14.5–16.7	QBO	—	—	—	0.0408605	—	—	—
RE02-07-707	02-600127	4.5–6.4	QAL	0.171	0.267 (J-)	—	—	—	—	—
RE02-07-711	02-600128	0–0.5	SED	—	0.631	—	—	—	—	—
RE02-07-716	02-600129	0–0.5	SOIL	—	0.768	—	0.0110688	—	—	—
RE02-10-21911	02-612390	5–6	QAL	4.44	0.595	0.347	0.0184875	—	—	—
RE02-10-21912	02-612390	15–17	QBO	—	0.0171	—	—	—	—	—
RE02-10-21913	02-612390	26–27	QBO	—	—	—	0.0472884	—	0.191	—
RE02-10-21914	02-612390	35–36	QBO	—	—	—	0.077599	—	—	—
RE02-10-21915	02-612390	49–50	QBO	—	—	—	0.121403	—	—	—

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SALs are from LANL (2015, 600929).

[d] — = Not detected.

Table 6.4-1
Samples Collected and Analyses Requested at AOC 02-003(c)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
CA02-00-0125	02-01237	8–8.75	SOIL	—[a]	—	7460R[b]	7460R	7460R	7460R	7458R, 7459R	—	—	7460R	—	—	—	—
CA02-00-0128	02-01238	14–14.75	SOIL	—	—	7460R	7460R	7460R	7460R	7458R, 7459R	—	—	7460R	—	—	—	—
RE02-07-6177	02-600196	0–0.5	SOIL	07-838	07-838	07-838	07-838	07-838	07-838	07-838	07-837	07-838	07-838	07-837	—	—	07-838
RE02-07-806	02-600196	0–4.5	SOIL	07-349	07-348	07-349	07-349	07-349	07-349	07-348	07-347	07-348	07-349	07-347	—	—	07-348
RE02-07-807	02-600196	4.5–9	QAL	07-349	07-348	07-349	07-349	07-349	07-349	07-348	07-347	07-348	07-349	07-347	—	07-347	07-348
RE02-07-808	02-600196	19–22	QBO	07-386	07-385	07-386	07-386	07-386	07-386	07-385	07-384	07-385	07-386	07-384	—	07-384	07-385
RE02-07-810	02-600197	0–0.5	SOIL	07-1077	07-1077	07-1077	07-1077	07-1077	07-1077	07-1077	—	07-1077	07-1077	07-1077	—	—	07-1077
RE02-07-811	02-600197	4.5–9.5	QAL	07-1101	07-1101	07-1101	07-1101	07-1101	07-1101	07-1101	—	07-1101	07-1101	07-1101	—	07-1101	07-1101
RE02-07-813	02-600197	9.5–12	QAL	07-1101	07-1101	07-1101	07-1101	07-1101	07-1101	07-1101	—	07-1101	07-1101	07-1101	—	07-1101	07-1101
RE02-07-812	02-600197	14.5–18.5	QBO	07-1101	07-1101	07-1101	07-1101	07-1101	07-1101	07-1101	—	07-1101	07-1101	07-1101	—	07-1101	07-1101
RE02-07-814	02-600198	0–0.5	SOIL	07-1061	07-1060	07-1061	07-1061	07-1061	07-1061	07-1060	—	07-1060	07-1061	07-1059	—	—	07-1060
RE02-07-815	02-600198	0.5–5	QAL	07-1061	07-1060	07-1061	07-1061	07-1061	07-1061	07-1060	—	07-1060	07-1061	07-1059	—	07-1059	07-1060
RE02-07-817	02-600198	14.5–19.5	QAL	07-1061	07-1060	07-1061	07-1061	07-1061	07-1061	07-1060	—	07-1060	07-1061	07-1059	—	07-1059	07-1060
RE02-07-816	02-600198	19.5–24.5	QBO	07-1061	07-1060	07-1061	07-1061	07-1061	07-1061	07-1060	—	07-1060	07-1061	07-1059	—	07-1059	07-1060
RE02-07-818	02-600199	0–0.5	SOIL	07-1061	07-1060	07-1061	07-1061	07-1061	07-1061	07-1060	—	07-1060	07-1061	07-1059	—	—	07-1060
RE02-07-819	02-600199	4.5–7.3	QAL	07-1061	07-1060	07-1061	07-1061	07-1061	07-1061	07-1060	—	07-1060	07-1061	07-1059	—	07-1059	07-1060
RE02-07-822	02-600200	0–0.5	SOIL	07-674	07-674	07-674	07-674	07-674	07-674	07-674	—	07-674	07-674	—	—	—	07-674
RE02-07-823	02-600200	4.5–7	QAL	07-1078	07-1078	07-1078	07-1078	07-1078	07-1078	07-1078	—	07-1078	07-1078	07-1078	—	07-1078	07-1078
RE02-07-825	02-600200	9.5–14.5	QBO	07-1078	07-1078	07-1078	07-1078	07-1078	07-1078	07-1078	—	07-1078	07-1078	07-1078	—	07-1078	07-1078
RE02-07-824	02-600200	14.5–19.5	QBO	07-1078	07-1078	07-1078	07-1078	07-1078	07-1078	07-1078	—	07-1078	07-1078	07-1078	—	07-1078	07-1078
RE02-07-826	02-600201	0–0.5	SOIL	07-1080	07-1080	07-1080	07-1080	07-1080	07-1080	07-1080	—	07-1080	07-1080	07-1080	—	—	07-1080
RE02-07-827	02-600201	4.5–6.7	QAL	07-1101	07-1101	07-1101	07-1101	07-1101	07-1101	07-1101	—	07-1101	07-1101	07-1101	—	07-1101	07-1101
RE02-07-829	02-600201	9.5–11.5	QAL	07-1101	07-1101	07-1101	07-1101	07-1101	07-1101	07-1101	—	07-1101	07-1101	07-1101	—	07-1101	07-1101
RE02-07-828	02-600201	15.9–20.5	QBO	07-1101	07-1101	07-1101	07-1101	07-1101	07-1101	07-1101	—	07-1101	07-1101	07-1101	—	07-1101	07-1101
RE02-07-830	02-600202	0–0.5	SOIL	07-1077	07-1077	07-1077	07-1077	07-1077	07-1077	07-1077	—	07-1077	07-1077	07-1077	—	—	07-1077
RE02-07-831	02-600202	4.5–6.2	QAL	07-1080	07-1080	07-1080	07-1080	07-1080	07-1080	07-1080	—	07-1080	07-1080	—	—	07-1080	07-1080
RE02-07-834	02-600203	0–0.5	SOIL	07-1077	07-1077	07-1077	07-1077	07-1077	07-1077	07-1077	—	07-1077	07-1077	07-1077	—	—	07-1077
RE02-07-835	02-600203	4.5–6.5	QAL	07-1106	07-1106	07-1106	07-1106	07-1106	07-1106	07-1106	—	07-1106	07-1106	07-1106	—	07-1106	07-1106
RE02-07-837	02-600203	9–11	QAL	07-1106	07-1106	07-1106	07-1106	07-1106	07-1106	07-1106	—	07-1106	07-1106	07-1106	—	07-1106	07-1106
RE02-07-836	02-600203	14–16.5	QBO	07-1106	07-1106	07-1106	07-1106	07-1106	07-1106	07-1106	—	07-1106	07-1106	07-1106	—	07-1106	07-1106
RE02-07-838	02-600204	0–0.5	SOIL	07-1077	07-1077	07-1077	07-1077	07-1077	07-1077	07-1077	—	07-1077	07-1077	07-1077	—	—	07-1077

Table 6.4-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
RE02-07-839	02-600204	4.5–9.5	QAL	07-1080	07-1080	07-1080	07-1080	07-1080	07-1080	07-1080	—	07-1080	07-1080	07-1080	—	07-1080	07-1080
RE02-07-841	02-600204	9.5–14	QAL	07-1080	07-1080	07-1080	07-1080	07-1080	07-1080	07-1080	—	07-1080	07-1080	07-1080	—	07-1080	07-1080
RE02-07-840	02-600204	19–24	QBO	07-1085	07-1085	07-1085	07-1085	07-1085	07-1085	07-1085	—	07-1085	07-1085	07-1085	—	07-1085	07-1085
RE02-07-842	02-600205	0–0.5	SED	07-1113	07-1113	07-1113	07-1113	07-1113	07-1113	07-1113	—	07-1113	07-1113	07-1113	—	—	07-1113
RE02-10-22027	02-612420	6–7	QAL	10-4641	—	10-4641	10-4641	10-4641	10-4641	10-4640	10-4640	—	10-4641	10-4640	—	—	—
RE02-10-22028	02-612420	15.5–16.5	QAL	10-4641	—	10-4641	10-4641	10-4641	10-4641	10-4640	10-4640	—	10-4641	10-4640	—	—	—
RE02-10-22029	02-612420	26–27	QBO	10-4641	—	10-4641	10-4641	10-4641	10-4641	10-4640	10-4640	—	10-4641	10-4640	—	—	—
RE02-10-22030	02-612420	35–37	QBO	10-4641	—	10-4641	10-4641	10-4641	10-4641	10-4640	10-4640	—	10-4641	10-4640	—	—	—
RE02-10-22031	02-612420	49–50	QBO	10-4641	—	10-4641	10-4641	10-4641	10-4641	10-4640	10-4640	—	10-4641	10-4640	—	—	—

[a] — = Analysis not requested.

[b] Analytical request number.

Table 6.4-2
Inorganic Chemicals Detected or Detected above BVs at AOC 02-003(c)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Thallium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**1900**	**2.6**	**3.96**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**[b]	**na**	**0.3**	**1.22**	**4.59**	**40**
Sediment BV[a]				**15400**	**0.83**	**3.98**	**127**	**0.4**	**4420**	**10.5**	**11.2**	**13800**	**19.7**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**0.73**	**19.7**	**60.2**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**14.7**	**21500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**0.73**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**na**	**505**[d]	**51,900**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**13**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**na**	**281**[d]	**24,800**	**434,000**	**1110**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**6.19**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**70.5**	**na**	**96.6**[d]	**3130**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**0.782**	**394**	**23,500**
CA02-00-0125	02-01237	8–8.75	SOIL	—[f]	—	—	—	—	—	—	—	—	—	—	0.11	—	NA[g]	NA	—	—	—	—
RE02-07-6177	02-600196	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	0.255	—	1.36	0.000591 (J)	1.61 (U)	—	—	54.1
RE02-07-806	02-600196	0–4.5	SOIL	—	—	—	—	0.505 (U)	—	—	—	—	—	—	0.292 (J)	—	—	0.000745 (J-)	—	—	—	—
RE02-07-807	02-600196	4.5–9	QAL	—	—	—	—	0.525 (U)	—	23.2	—	—	—	—	0.174 (J)	—	—	—	—	—	—	—
RE02-07-808	02-600196	19–22	QBO	8750	0.513 (UJ)	1.16 (J)	—	0.66 (U)	—	13.4	—	7030	—	309	—	4.46	—	—	1.98 (U)	—	—	—
RE02-07-810	02-600197	0–0.5	SOIL	—	—	—	380 (J+)	—	—	—	33.6	—	—	—	0.457	—	2.53	—	—	—	—	—
RE02-07-811	02-600197	4.5–9.5	QAL	—	—	—	2230	0.524 (U)	7440	21.3	18.7	—	36.9	—	—	—	1.74	—	11	—	—	—
RE02-07-813	02-600197	9.5–12	QAL	—	—	—	—	0.562 (U)	—	—	—	—	—	—	—	—	—	—	7.29	—	—	—
RE02-07-812	02-600197	14.5–18.5	QBO	13600	0.55 (UJ)	1.52 (J)	83.6	0.683 (U)	—	3.69	—	5160	—	198 (J+)	—	—	—	—	9.11	—	—	—
RE02-07-814	02-600198	0–0.5	SOIL	—	—	—	—	0.519 (U)	—	—	43.9	—	—	—	0.229	—	—	—	14.6	—	—	—
RE02-07-815	02-600198	0.5–5	QAL	—	—	—	—	0.521 (U)	—	—	—	—	—	—	—	—	—	—	7.71	—	—	—

Table 6.4-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Thallium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**1900**	**2.6**	**3.96**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**1.22**	**4.59**	**40**
Sediment BV[a]				**15400**	**0.83**	**3.98**	**127**	**0.4**	**4420**	**10.5**	**11.2**	**13800**	**19.7**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**0.73**	**19.7**	**60.2**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**14.7**	**21500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**0.73**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**na**	**505[d]**	**51,900**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**13**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**na**	**281[d]**	**24,800**	**434,000**	**1110**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**6.19**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**70.5**	**na**	**96.6[d]**	**3130**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**0.782**	**394**	**23,500**
RE02-07-817	02-600198	14.5–19.5	QAL	—	—	—	—	0.567 (U)	—	—	—	—	—	—	—	—	—	0.000712 (J)	6.82	—	—	—
RE02-07-816	02-600198	19.5–24.5	QBO	8420	0.551 (UJ)	0.727 (J)	—	0.678 (U)	—	8.2	—	5450	—	258	—	2.01	—	—	7.56	—	—	—
RE02-07-818	02-600199	0–0.5	SOIL	—	—	—	—	0.547 (U)	—	—	—	—	—	—	0.144	—	1.22	—	6.68	—	—	—
RE02-07-819	02-600199	4.5–7.3	QAL	—	—	—	—	0.514 (U)	—	—	—	—	—	—	—	—	—	0.00113 (J)	7.83	8.21	—	—
RE02-07-822	02-600200	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	0.243 (J-)	—	1.86 (J)	—	—	—	—	—
RE02-07-823	02-600200	4.5–7	QAL	—	—	—	—	0.524 (U)	—	—	—	—	—	—	—	—	2.95	—	1.57 (U)	—	—	—
RE02-07-825	02-600200	9.5–14.5	QBO	—	—	1.69 (J)	—	0.567 (U)	—	6.41 (J)	—	7360 (J)	—	205 (J)	—	—	—	—	0.61 (J)	—	7.63 (J)	—
RE02-07-824	02-600200	14.5–19.5	QBO	11600	—	0.793 (J)	42.3 (J+)	0.597 (U)	—	6.84 (J)	—	6430 (J)	—	235 (J)	—	2.63	—	—	1.79 (U)	—	—	—
RE02-07-826	02-600201	0–0.5	SOIL	—	—	—	—	—	—	—	80	—	—	—	—	—	0.858 (J)	—	1.54 (U)	—	—	61.6
RE02-07-827	02-600201	4.5–6.7	QAL	—	—	—	—	0.553 (U)	—	—	—	—	—	—	—	—	1.62	—	8.56	—	—	—
RE02-07-829	02-600201	9.5–11.5	QAL	—	—	—	—	0.571 (U)	—	—	—	—	—	—	—	—	—	—	6.19	—	—	—
RE02-07-828	02-600201	15.9–20.5	QBO	5270	—	1.14 (J)	—	0.58 (U)	—	8.15	—	5300	—	—	—	—	—	—	6.73	—	4.87	—
RE02-07-830	02-600202	0–0.5	SOIL	—	—	—	—	0.506 (U)	—	—	—	—	—	—	0.683	—	1.87	—	—	—	—	—
RE02-07-831	02-600202	4.5–6.2	QAL	—	—	—	—	0.507 (U)	—	—	—	—	—	—	2.43	—	1.59	—	—	—	—	—
RE02-07-834	02-600203	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	0.52	—	—	—	—	—	—	—
RE02-07-835	02-600203	4.5–6.5	QAL	—	—	—	1550	0.522 (U)	—	—	—	—	62	—	0.797	—	1.62	—	7.18	—	—	—
RE02-07-837	02-600203	9–11	QAL	—	—	—	—	0.544 (U)	—	—	—	—	—	—	—	—	—	—	9.4	—	—	—
RE02-07-836	02-600203	14–16.5	QBO	3790 (J+)	—	2	31.6	0.586 (U)	—	6.32	—	6740	—	289	—	4.69	—	—	8.25	—	6.62	—
RE02-07-838	02-600204	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	1.11	—	1.41 (J-)	—	1.56 (U)	—	—	—
RE02-07-839	02-600204	4.5–9.5	QAL	—	—	—	—	0.524 (U)	—	—	—	—	—	—	—	—	—	—	1.57 (U)	—	—	—
RE02-07-841	02-600204	9.5–14	QAL	—	—	—	—	0.543 (U)	—	—	—	—	—	—	—	—	—	—	1.63 (U)	—	—	—
RE02-07-840	02-600204	19–24	QBO	8610	—	2.76	55.8	0.58 (U)	—	6.99	—	8750	—	251	—	3.78	—	—	1.74 (U)	—	10.2	—
RE02-07-842	02-600205	0–0.5	SED	—	—	—	—	0.59 (U)	—	—	—	—	—	—	—	—	—	—	1.18 (J)	—	—	—
RE02-10-22027	02-612420	6–7	QAL	—	0.947 (U)	—	—	0.474 (U)	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—
RE02-10-22028	02-612420	15.5–16.5	QAL	—	1.05 (U)	—	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—

Table 6.4-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Thallium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**1900**	**2.6**	**3.96**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**1.22**	**4.59**	**40**
Sediment BV[a]				**15400**	**0.83**	**3.98**	**127**	**0.4**	**4420**	**10.5**	**11.2**	**13800**	**19.7**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**0.73**	**19.7**	**60.2**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**14.7**	**21500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**0.73**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**na**	**505[d]**	**51,900**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**13**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**na**	**281[d]**	**24,800**	**434,000**	**1110**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**6.19**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**70.5**	**na**	**96.6[d]**	**3130**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**0.782**	**394**	**23,500**
RE02-10-22029	02-612420	26–27	QBO	7420	1.39 (U)	1.32 (U)	—	0.693 (U)	—	—	—	4010	—	—	—	—	NA	NA	1.32 (U)	—	—	—
RE02-10-22030	02-612420	35–37	QBO	8230	1.28 (U)	1.29 (U)	—	0.642 (U)	—	3.18	—	5530	—	223 (J+)	—	—	NA	NA	1.29 (U)	—	—	—
RE02-10-22031	02-612420	49–50	QBO	6810	1.29 (U)	1.28 (U)	—	0.647 (U)	—	—	—	5320	—	—	—	—	NA	NA	1.28 (U)	—	—	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 6.4-3
Organic Chemicals Detected at AOC 02-003(c)

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	Chloroform	Chrysene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Toluene
Industrial SSL[a]				**50,500**	**959,000**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**28.4**	**3230**	**33,700**	**32.3**	**3370**	**16,800**	**25,300**	**25,300**	**61,100**
Recreational SSL[c]				**17,300**	**505,000**	**863,000**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**888**	**204**	**8880**	**11,500**	**88.8**	**1150**	**1930**	**8630**	**8630**	**47,600**
Residential SSL[a]				**3480**	**66,300**	**17,400**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**5.85**	**152**	**2320**	**1.53**	**232**	**1160**	**1740**	**1740**	**5220**
RE02-07-6177	02-600196	0–0.5	SOIL	—[d]	NA[e]	0.00767 (J)	0.0065	0.0077 (J)	0.0294 (J)	—	0.0586	—	—	NA	0.0383	0.0641	—	—	—	0.0342 (J)	0.0599	NA
RE02-07-806	02-600196	0–4.5	SOIL	—	NA	0.0132 (J)	—	0.0019 (J)	—	—	0.0584	—	—	NA	0.0322 (J)	0.0576	—	—	—	0.0494	0.0548	NA
RE02-07-807	02-600196	4.5–9	QAL	—	0.0101	—	—	0.0047	—	—	0.0192 (J)	—	—	—	0.0161 (J)	0.0252 (J)	—	—	—	0.0203 (J)	0.025 (J)	0.000892 (J)
RE02-07-810	02-600197	0–0.5	SOIL	—	NA	0.0125 (J)	NA	NA	0.0702	0.0858 (J)	0.132 (J)	—	—	NA	0.0891	0.103	—	—	—	0.0702	0.131	NA
RE02-07-811	02-600197	4.5–9.5	QAL	—	—	—	NA	NA	0.0232 (J)	0.0197 (J)	0.0214 (J)	—	—	0.000265 (J)	0.0152 (J)	0.0239 (J)	—	—	—	0.0191 (J)	0.0245 (J)	0.000458 (J)
RE02-07-813	02-600197	9.5–12	QAL	—	—	—	NA	NA	—	—	—	—	—	0.000288 (J)	—	—	—	—	—	—	—	—
RE02-07-812	02-600197	14.5–18.5	QBO	—	—	—	NA	NA	—	—	—	—	—	0.000322 (J)	—	—	—	—	—	—	—	—
RE02-07-814	02-600198	0–0.5	SOIL	—	NA	—	NA	NA	—	—	—	—	—	NA	—	0.0149 (J)	—	—	—	—	0.0141 (J)	NA
RE02-07-815	02-600198	0.5–5	QAL	—	—	—	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—	—	0.000928 (J)
RE02-07-819	02-600199	4.5–7.3	QAL	—	—	—	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00037 (J)
RE02-07-827	02-600201	4.5–6.7	QAL	—	—	—	NA	NA	—	—	—	—	—	0.000319 (J)	—	—	—	—	—	—	—	0.000665 (J)
RE02-07-829	02-600201	9.5–11.5	QAL	—	—	—	NA	NA	—	—	—	—	—	0.000257 (J)	—	—	—	—	—	—	—	—
RE02-07-828	02-600201	15.9–20.5	QBO	—	—	—	NA	NA	—	—	—	—	—	0.000266 (J)	—	—	—	—	—	—	—	—
RE02-07-830	02-600202	0–0.5	SOIL	—	NA	—	NA	NA	—	0.0231 (J)	0.0213 (J)	—	—	NA	0.0144 (J)	0.0197 (J)	—	—	—	0.0141 (J)	0.0155 (J)	NA
RE02-07-831	02-600202	4.5–6.2	QAL	NA	—	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA	NA	NA	0.000394 (J)
RE02-07-834	02-600203	0–0.5	SOIL	—	NA	—	NA	NA	—	0.0258 (J)	0.0257 (J)	—	—	NA	0.0149 (J)	0.0218 (J)	—	—	—	0.0167 (J)	0.0155 (J)	NA
RE02-07-835	02-600203	4.5–6.5	QAL	0.0167 (J)	—	0.0185 (J)	NA	NA	0.0609	0.108	0.0802	0.0434	0.0393	—	0.072	0.116	0.158	0.00792 (J)	0.0161 (J)	0.0945	0.102	—
RE02-07-837	02-600203	9–11	QAL	—	—	—	NA	NA	—	—	—	—	—	—	0.0228 (J)	0.0322 (J)	—	—	—	0.0327 (J)	0.0304 (J)	—
RE02-07-838	02-600204	0–0.5	SOIL	—	NA	—	NA	NA	0.0334 (J)	0.0403	0.0552	0.0137 (J)	—	NA	0.0309 (J)	0.047	—	—	—	0.0303 (J)	0.0458	NA
RE02-07-842	02-600205	0–0.5	SED	—	NA	0.00967 (J-)	NA	NA	0.0628 (J-)	—	0.0841 (J-)	—	—	NA	0.0671 (J-)	0.129 (J-)	—	—	—	0.0498 (J-)	0.115 (J-)	NA
RE02-10-22028	02-612420	15.5–16.5	QAL	—	NA	—	—	0.0046	—	—	—	—	—	NA	—	—	—	—	—	—	—	NA
RE02-10-22030	02-612420	35–37	QBO	—	NA	—	0.003 (J)	—	—	—	—	—	—	NA	—	—	—	—	—	—	—	NA

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273), unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSLs are from LANL (2017, 602581).

[d] — = Not detected.

[e] NA = Not analyzed.

Table 6.4-4
Radionuclides Detected or Detected above BVs/FVs at AOC 02-003(c)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Cobalt-60	Plutonium-239/240	Tritium	Uranium-235/236	Uranium-238
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**0.18**	**3.9**
Sediment BV[a]				**0.9**	**na**	**0.068**	**0.093**	**0.2**	**2.29**
Soil BV[a]				**1.65**	**na**	**0.054**	**na**	**0.2**	**2.29**
Industrial SAL[c]				**41**	**9**	**1200**	**2,400,000**	**160**	**710**
Recreational SAL[c]				**370**	**81**	**1300**	**5,700,000**	**1000**	**2800**
Residential SAL[c]				**12**	**2.6**	**79**	**1700**	**42**	**150**
CA02-00-0125	02-01237	8–8.75	SOIL	0.135	—[d]	—	—	—	—
CA02-00-0128	02-01238	14–14.75	SOIL	0.434	—	—	0.030874	—	—
RE02-07-6177	02-600196	0–0.5	SOIL	1.76	—	0.129	0.138152	—	—
RE02-07-806	02-600196	0–4.5	SOIL	2.34	—	0.033	—	—	—
RE02-07-807	02-600196	4.5–9	QAL	0.214	—	0.0266	—	—	—
RE02-07-808	02-600196	19–22	QBO	—	—	—	0.111356	0.186	—
RE02-07-810	02-600197	0–0.5	SOIL	3.32	—	0.178	—	—	—
RE02-07-811	02-600197	4.5–9.5	QAL	0.337	—	0.0537	—	—	—
RE02-07-814	02-600198	0–0.5	SOIL	1.71	—	0.155	0.0110671	—	—
RE02-07-815	02-600198	0.5–5	QAL	—	—	—	0.0191741	—	—
RE02-07-818	02-600199	0–0.5	SOIL	—	—	0.0587	—	—	—
RE02-07-819	02-600199	4.5–7.3	QAL	0.496	—	—	0.0271396	—	—
RE02-07-822	02-600200	0–0.5	SOIL	—	—	0.121	—	—	—
RE02-07-823	02-600200	4.5–7	QAL	—	—	—	0.0594386	—	—
RE02-07-826	02-600201	0–0.5	SOIL	—	0.24	—	—	—	—
RE02-07-827	02-600201	4.5–6.7	QAL	—	—	—	0.159712	—	—
RE02-07-831	02-600202	4.5–6.2	QAL	0.162	—	—	—	—	—
RE02-07-834	02-600203	0–0.5	SOIL	—	—	0.327	—	—	2.54
RE02-07-835	02-600203	4.5–6.5	QAL	1.41	—	0.063	—	—	—
RE02-07-837	02-600203	9–11	QAL	0.624	—	—	—	—	—
RE02-07-836	02-600203	14–16.5	QBO	0.175	—	2.72	—	—	—
RE02-07-838	02-600204	0–0.5	SOIL	—	—	0.167	—	—	—
RE02-07-839	02-600204	4.5–9.5	QAL	0.334	—	—	—	—	—
RE02-07-841	02-600204	9.5–14	QAL	0.29	—	0.0429	—	—	—
RE02-07-842	02-600205	0–0.5	SED	—	—	0.255	—	—	—
RE02-10-22028	02-612420	15.5–16.5	QAL	0.147	—	—	—	—	—

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.
[a] BVs/FVs are from LANL (1998, 059730).
[b] na = Not available.
[c] SALs are from LANL (2015, 600929).
[d] — = Not detected.

Table 6.5-1
Samples Collected and Analyses Requested at AOC 02-003(d)

Sample ID	Location ID	Depth (ft)	Media	Americium 241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
CA02-00-0281	02-01254	0–0.5	SOIL	—[a]	—	7571R[b]	—	—	7571R	7571R	7568R, 7570R	—	—	7571R	—	—	—
CA02-00-0282	02-01254	2–2.5	SOIL	—	—	7571R	7571R	—	7571R	7571R	7568R, 7570R	—	—	7571R	—	—	—
CA02-00-0283	02-01255	0–0.5	SOIL	—	—	7571R	7571R	—	7571R	7571R	7568R, 7570R	—	—	7571R	—	—	—
CA02-00-0284	02-01255	2.2–2.5	SOIL	—	—	7571R	7571R	—	7571R	7571R	7568R, 7570R	—	—	7571R	—	—	—
CA02-00-0285	02-01256	0–0.5	FILL	—	—	7558R	7558R	—	7558R	7558R	7556R, 7557R	—	—	7558R	—	—	—
CA02-00-0286	02-01256	2–2.75	FILL	—	—	7558R	7558R	—	7558R	7558R	7556R, 7557R	—	—	7558R	—	—	—
RE02-07-6885	02-600216	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	07-1174	—	—
RE02-07-926	02-600216	0–0.5	SOIL	07-895	07-895	07-895	07-895	—	07-895	07-895	07-895	—	07-895	07-895	—	—	07-895
RE02-07-6888	02-600217	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	07-1174	—	—
RE02-07-929	02-600217	0–0.8	SOIL	07-994	07-994	07-994	07-994	—	07-994	07-994	07-994	—	07-994	07-994	—	—	07-994
RE02-07-6891	02-600218	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	07-1174	—	—
RE02-07-932	02-600218	0–1.3	SOIL	07-903	07-903	07-903	07-903	—	07-903	07-903	07-903	—	07-903	07-903	—	—	07-903
RE02-07-6892	02-600218	2–2.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	07-1178	07-1178	—
RE02-07-933	02-600218	2–4	SOIL	07-903	07-903	07-903	07-903	—	07-903	07-903	07-903	—	07-903	07-903	—	—	07-903
RE02-07-934	02-600218	4–5.25	QCT	07-903	07-903	07-903	07-903	—	07-903	07-903	07-903	—	07-903	07-903	—	—	07-903
RE02-07-6893	02-600218	4.5–5	QCT	—	—	—	—	—	—	—	—	—	—	—	07-1178	07-1178	—
RE02-07-935	02-600219	0–0.5	SOIL	07-355	07-354	07-355	07-355	—	07-355	07-355	07-354	07-353	07-354	07-355	07-353	—	07-354
RE02-07-936	02-600219	2–2.5	QAL	07-355	07-354	07-355	07-355	—	07-355	07-355	07-354	07-353	07-354	07-355	07-353	07-353	07-354
RE02-07-937	02-600219	2.7–3.4	QAL	07-355	07-354	07-355	07-355	—	07-355	07-355	07-354	07-353	07-354	07-355	07-353	07-353	07-354
RE02-07-6894	02-600220	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	07-1174	—	—
RE02-07-938	02-600220	0–0.5	SOIL	07-895	07-895	07-895	07-895	—	07-895	07-895	07-895	—	07-895	07-895	—	—	07-895
RE02-07-6897	02-600221	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	07-1174	—	—
RE02-07-941	02-600221	0–1.2	SOIL	07-895	07-895	07-895	07-895	—	07-895	07-895	07-895	—	07-895	07-895	—	—	07-895
RE02-07-6900	02-600222	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	07-1174	—	—
RE02-07-944	02-600222	0–0.5	SOIL	07-878	07-878	07-878	07-878	—	07-878	07-878	07-878	—	07-878	07-878	—	—	07-878
RE02-07-6903	02-600223	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	07-1174	—	—
RE02-07-947	02-600223	0–0.5	SOIL	07-878	07-878	07-878	07-878	—	07-878	07-878	07-878	—	07-878	07-878	—	—	07-878
RE02-07-6906	02-600224	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	07-1174	—	—
RE02-07-950	02-600224	0–1.3	SOIL	07-1008	07-1008	07-1008	07-1008	—	07-1008	07-1008	07-1008	—	07-1008	07-1008	—	—	07-1008
RE02-07-6909	02-600225	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	07-1174	—	—
RE02-07-953	02-600225	0–0.5	SOIL	07-878	07-878	07-878	07-878	—	07-878	07-878	07-878	—	07-878	07-878	—	—	07-878
RE02-07-6912	02-600226	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	07-1174	—	—
RE02-07-956	02-600226	0–0.5	SOIL	07-878	07-878	07-878	07-878	—	07-878	07-878	07-878	—	07-878	07-878	—	—	07-878
RE02-07-6913	02-600226	2–2.5	QAL	—	—	—	—	—	—	—	—	—	—	—	07-1174	07-1174	—

Table 6.5-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium 241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
RE02-07-957	02-600226	2–3	QAL	07-878	07-878	07-878	07-878	—	07-878	07-878	07-878	—	07-878	07-878	—	—	07-878
RE02-07-6915	02-600227	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	07-1174	—	—
RE02-07-959	02-600227	0–0.5	SOIL	07-878	07-878	07-878	07-878	—	07-878	07-878	07-878	—	07-878	07-878	—	—	07-878
RE02-07-6916	02-600227	2–2.5	QAL	—	—	—	—	—	—	—	—	—	—	—	07-1174	07-1174	—
RE02-07-960	02-600227	2–2.8	QAL	07-878	07-878	07-878	07-878	—	07-878	07-878	07-878	—	07-878	07-878	—	—	07-878
RE02-07-6917	02-600227	4.5–5	QAL	—	—	—	—	—	—	—	—	—	—	—	07-1174	07-1174	—
RE02-07-961	02-600227	4.5–5.7	QAL	07-878	07-878	07-878	07-878	—	07-878	07-878	07-878	—	07-878	07-878	—	—	07-878
RE02-07-6918	02-600228	0–0.5	SOIL	—	—	—	—	—	—	—	—	07-1174	—	—	07-1174	—	—
RE02-07-962	02-600228	0–0.5	SOIL	07-1079	07-1079	07-1079	07-1079	—	07-1079	07-1079	07-1079	—	07-1079	07-1079	—	—	07-1079
RE02-07-6919	02-600228	2–2.5	QAL	—	—	—	—	—	—	—	—	07-1178	—	—	07-1178	07-1178	—
RE02-07-963	02-600228	2–2.5	QAL	07-1079	07-1079	07-1079	07-1079	—	07-1079	07-1079	07-1079	—	07-1079	07-1079	—	—	07-1079
RE02-07-6920	02-600228	4.5–5	QAL	—	—	—	—	—	—	—	—	07-1178	—	—	07-1178	07-1178	—
RE02-07-964	02-600228	4.5–5	QAL	07-1079	07-1079	07-1079	07-1079	—	07-1079	07-1079	07-1079	—	07-1079	07-1079	—	—	07-1079
RE02-07-6921	02-600229	0–0.5	SOIL	—	—	—	—	—	—	—	—	07-1178	—	—	07-1178	—	—
RE02-07-965	02-600229	0–0.5	SOIL	07-1112	07-1112	07-1112	07-1112	—	07-1112	07-1112	07-1112	—	07-1112	07-1112	—	—	07-1112
RE02-07-6922	02-600229	2–2.5	QAL	—	—	—	—	—	—	—	—	07-1178	—	—	07-1178	07-1178	—
RE02-07-966	02-600229	2–3.1	QAL	07-1112	07-1112	07-1112	07-1112	—	07-1112	07-1112	07-1112	—	07-1112	07-1112	—	—	07-1112
RE02-07-6923	02-600229	4.5–5	QCT	—	—	—	—	—	—	—	—	07-1178	—	—	07-1178	07-1178	—
RE02-07-967	02-600229	4.5–5.7	QCT	07-1112	07-1112	07-1112	07-1112	—	07-1112	07-1112	07-1112	—	07-1112	07-1112	—	—	07-1112
RE02-07-6924	02-600230	0–0.5	SOIL	—	—	—	—	—	—	—	—	07-1178	—	—	07-1178	—	—
RE02-07-968	02-600230	0–0.5	SOIL	07-1112	07-1112	07-1112	07-1112	—	07-1112	07-1112	07-1112	—	07-1112	07-1112	—	—	07-1112
RE02-07-6925	02-600230	2–2.5	QAL	—	—	—	—	—	—	—	—	07-1178	—	—	07-1178	07-1178	—
RE02-07-969	02-600230	2–2.5	QAL	07-1112	07-1112	07-1112	07-1112	—	07-1112	07-1112	07-1112	—	07-1112	07-1112	—	—	07-1112
RE02-07-6927	02-600231	0–0.5	SOIL	—	—	—	—	—	—	—	—	07-1178	—	—	07-1178	—	—
RE02-07-971	02-600231	0–1	SOIL	07-1132	07-1132	07-1132	07-1132	—	07-1132	07-1132	07-1132	—	07-1132	07-1132	—	—	07-1132
RE02-07-6928	02-600231	2–2.5	QBT3	—	—	—	—	—	—	—	—	07-1178	—	—	07-1178	07-1178	—
RE02-07-972	02-600231	2–2.5	QBT3	07-1132	07-1132	07-1132	07-1132	—	07-1132	07-1132	07-1132	—	07-1132	07-1132	—	—	07-1132
RE02-07-6929	02-600231	4.5–5	QBT3	—	—	—	—	—	—	—	—	07-1178	—	—	07-1178	07-1178	—
RE02-07-973	02-600231	4.5–5.5	QBT3	07-1132	07-1132	07-1132	07-1132	—	07-1132	07-1132	07-1132	—	07-1132	07-1132	—	—	07-1132
RE02-10-21991	02-612412	0–0.5	SOIL	10-4398	—	10-4398	10-4398	10-4397	10-4398	10-4398	10-4397	10-4396	—	10-4398	10-4396	—	10-4397
RE02-10-21992	02-612412	4–5	QCT	10-4398	—	10-4398	10-4398	10-4397	10-4398	10-4398	10-4397	10-4396	—	10-4398	10-4396	—	10-4397
RE02-10-21993	02-612412	9–10	QCT	10-4398	—	10-4398	10-4398	10-4397	10-4398	10-4398	10-4397	10-4396	—	10-4398	10-4396	—	10-4397

[a] — = Analysis not requested.

[b] Analytical request number.

Table 6.5-2
Inorganic Chemicals Detected or Detected above BVs at AOC 02-003(d)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Uranium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**1900**	**2.6**	**3.96**	**3700**	**13.5**	**739**	**189**	**0.1**	**2**	**na[b]**	**na**	**2390**	**0.3**	**1**	**1.22**	**na**	**4.59**	**40**
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**4.66**	**14500**	**11.2**	**1690**	**482**	**0.1**	**6.58**	**na**	**na**	**3500**	**0.3**	**1**	**1.1**	**na**	**17**	**63.5**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**14.7**	**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**3460**	**1.52**	**1**	**0.73**	**1.82**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**2580**	**1110**	**na**	**505[d]**	**51,900**	**908,000**	**800**	**na**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**na**	**6490**	**6490**	**13**	**3880**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**1240**	**457**	**na**	**281[d]**	**24,800**	**434,000**	**1110**	**na**	**14,800**	**186**	**12,400**	**991,000**	**434**	**na**	**3100**	**3100**	**6.19**	**1860**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**156**	**70.5**	**na**	**96.6[d]**	**3130**	**54,800**	**400**	**na**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**na**	**391**	**391**	**0.782**	**234**	**394**	**23,500**
CA02-00-0281	02-01254	0–0.5	SOIL	—[f]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	NA[g]	NA	—	—	1.3	—	3.63	—	62 (J+)
CA02-00-0282	02-01254	2–2.5	SOIL	—	—	—	—	2.5 (J+)	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—	—	59 (J+)
CA02-00-0283	02-01255	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	—	—	53 (J+)
CA02-00-0285	02-01256	0–0.5	FILL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	2.33	—	—
RE02-07-926	02-600216	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	0.139	—	22.6 (J-)	0.00183 (J)	—	1.67 (U)	—	—	NA	—	—
RE02-07-929	02-600217	0–0.8	SOIL	—	—	—	—	—	0.536 (U)	—	—	—	—	—	—	—	—	—	9.94	0.00167 (J)	—	—	—	—	NA	—	—
RE02-07-932	02-600218	0–1.3	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.67 (J-)	0.00065 (J)	—	—	—	—	NA	—	54.4
RE02-07-933	02-600218	2–4	SOIL	—	—	—	—	4.15	—	—	—	—	—	—	—	—	—	—	1.04 (J-)	0.000864 (J)	—	1.62 (U)	—	—	NA	—	71.3
RE02-07-934	02-600218	4–5.25	QCT	11400	—	2.11	63.7	5.84	—	3030 (J+)	13.7	5.81	9040	16.6	2380 (J+)	324 (J+)	—	7.69	1 (J-)	—	2420	0.874 (J)	—	—	NA	13.5	76.4
RE02-07-935	02-600219	0–0.5	SOIL	—	—	—	—	—	0.52 (U)	—	—	—	—	—	—	—	—	—	4.58 (J-)	0.000783 (J)	—	—	—	—	NA	—	—
RE02-07-936	02-600219	2–2.5	QAL	—	—	—	—	—	0.511 (U)	—	—	—	—	—	—	—	—	—	1.01 (J-)	—	—	—	—	—	NA	—	—
RE02-07-937	02-600219	2.7–3.4	QAL	—	—	—	—	—	0.509 (U)	—	—	—	—	—	—	—	—	—	1.44 (J-)	—	—	—	—	—	NA	—	51.6
RE02-07-938	02-600220	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7.19 (J-)	0.00125 (J)	—	1.73 (U)	—	—	NA	—	50.2
RE02-07-941	02-600221	0–1.2	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	11.2 (J-)	0.000692 (J)	—	—	—	—	NA	—	49.8
RE02-07-944	02-600222	0–0.5	SOIL	—	—	—	—	—	0.557 (U)	—	—	—	—	—	—	—	0.11	—	7.36	0.00237	—	—	—	—	NA	—	57
RE02-07-947	02-600223	0–0.5	SOIL	—	—	—	—	—	0.547 (U)	—	—	—	—	—	—	—	—	—	7.34	0.00226 (J)	—	—	—	—	NA	—	—
RE02-07-950	02-600224	0–1.3	SOIL	—	—	—	—	—	0.53 (U)	—	—	—	—	—	—	—	—	—	6.45	0.00243	—	—	—	—	NA	—	—
RE02-07-953	02-600225	0–0.5	SOIL	—	—	—	—	—	0.546 (U)	—	—	—	—	—	—	—	—	—	2	0.000629 (J)	—	1.64 (U)	—	—	NA	—	71.2
RE02-07-956	02-600226	0–0.5	SOIL	—	—	—	—	—	0.553 (U)	—	—	—	—	—	—	—	—	—	13.9	0.00152 (J)	—	—	—	—	NA	—	54
RE02-07-957	02-600226	2–3	QAL	—	—	—	—	—	0.506 (U)	—	—	—	—	—	—	—	—	—	6.67	0.000565 (J)	—	—	—	—	NA	—	—
RE02-07-959	02-600227	0–0.5	SOIL	—	—	—	—	—	0.572 (U)	—	—	—	—	—	—	—	—	—	1.2	—	—	—	—	—	NA	—	—
RE02-07-960	02-600227	2–2.8	QAL	—	—	—	—	—	0.53 (U)	—	—	—	—	—	—	—	—	—	0.888 (J)	—	—	1.59 (U)	—	—	NA	—	—
RE02-07-961	02-600227	4.5–5.7	QAL	—	—	—	—	—	0.536 (U)	—	—	—	—	—	—	—	—	—	—	0.00109 (J)	—	1.61 (U)	—	—	NA	—	—
RE02-07-962	02-600228	0–0.5	SOIL	—	—	—	—	—	0.524 (U)	—	—	—	—	—	—	—	—	—	2.39	—	—	1.57 (U)	—	—	NA	—	—
RE02-07-963	02-600228	2–2.5	QAL	—	—	—	—	—	0.495 (U)	—	—	—	—	—	—	—	—	—	0.907 (J)	0.00164 (J)	—	—	—	—	NA	—	—
RE02-07-964	02-600228	4.5–5	QAL	—	—	—	—	—	0.512 (U)	—	—	—	—	—	—	—	—	—	—	0.00271	—	—	—	—	NA	—	—
RE02-07-965	02-600229	0–0.5	SOIL	—	—	—	—	—	0.542 (U)	—	—	—	—	—	—	—	—	—	3.71	—	—	6.97	—	1.13 (U)	NA	—	—
RE02-07-966	02-600229	2–3.1	QAL	—	—	—	—	—	0.514 (U)	—	—	—	—	—	—	—	—	—	—	—	—	5.18	—	—	NA	—	—

Table 6.5-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Thallium	Uranium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**1900**	**2.6**	**3.96**	**3700**	**13.5**	**739**	**189**	**0.1**	**2**	**na**	**na**	**2390**	**0.3**	**1**	**1.22**	**na**	**4.59**	**40**
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**4.66**	**14500**	**11.2**	**1690**	**482**	**0.1**	**6.58**	**na**	**na**	**3500**	**0.3**	**1**	**1.1**	**na**	**17**	**63.5**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**14.7**	**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**3460**	**1.52**	**1**	**0.73**	**1.82**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**2580**	**1110**	**na**	**505[d]**	**51,900**	**908,000**	**800**	**na**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**na**	**6490**	**6490**	**13**	**3410**	**6530**	**389,000**
Recreational SSL[f]				**619,000**	**248**	**42.9**	**124,000**	**1240**	**457**	**na**	**281[d]**	**24,800**	**434,000**	**1110**	**na**	**14,800**	**186**	**12,400**	**991,000**	**434**	**na**	**3100**	**3100**	**6.19**	**1860**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**156**	**70.5**	**na**	**96.6[d]**	**3130**	**54,800**	**400**	**na**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**na**	**391**	**391**	**0.782**	**234**	**394**	**23,500**
RE02-07-967	02-600229	4.5–5.7	QCT	—	—	0.926 (J)	—	—	0.539 (U)	—	—	—	—	—	—	—	—	—	—	—	—	4.6	—	—	NA	—	—
RE02-07-968	02-600230	0–0.5	SOIL	—	—	—	—	—	0.537 (U)	—	—	—	—	—	—	—	—	—	—	—	—	9.04	—	—	NA	—	—
RE02-07-969	02-600230	2–2.5	QAL	—	—	—	—	—	0.538 (U)	—	29.5	—	—	—	—	—	—	—	—	0.000791 (J)	—	12	—	—	NA	—	—
RE02-07-971	02-600231	0–1	SOIL	—	—	—	—	—	0.532 (U)	—	—	—	—	—	—	—	—	—	3.79	0.000627 (J)	—	5.14	—	—	NA	—	—
RE02-07-972	02-600231	2–2.5	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.37	—	—	4.12	—	—	NA	—	—
RE02-07-973	02-600231	4.5–5.5	QBT3	—	—	—	—	—	—	—	8.14	—	—	—	—	—	—	—	1.26	—	—	4.37	—	—	NA	—	—
RE02-10-21991	02-612412	0–0.5	SOIL	—	1.08 (U)	—	—	—	0.541 (U)	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—	NA	—	53.5
RE02-10-21992	02-612412	4–5	QCT	6150	1.05 (U)	0.988(J)	51.2	2.46	0.523 (U)	3250(J-)	3.03	—	4690	—	1160 (J+)	219	—	3.88	NA	NA	—	1.03(U)	—	—	NA	6.65	62.2
RE02-10-21993	02-612412	9–10	QCT	6510	1.07 (U)	0.777 (J)	63.2	2.04	—	—	17.1	4.36	5320	—	1230 (J+)	297	—	5.15	NA	NA	—	1.08 (U)	—	—	NA	6.63	78.2

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 6.5-3
Organic Chemicals Detected at AOC 02-003(d)

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Fluoranthene	Phenanthrene	Pyrene	Toluene
Industrial SSL[a]				**11**	**11.1**	**32.3**	**23.6**	**32.3**	**323**	**3230**	**33,700**	**25,300**	**25,300**	**61,100**
Recreational SSL[b]				**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**888**	**8880**	**11,500**	**8630**	**8630**	**47,600**
Residential SSL[a]				**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**15.3**	**152**	**2320**	**1740**	**1740**	**5220**
RE02-07-6885	02-600216	0–0.5	SOIL	NA[c]	NA	—[d]	—	—	—	—	0.0119 (J)	—	—	NA
RE02-07-935	02-600219	0–0.5	SOIL	0.0066	0.0043	—	—	—	—	—	0.0154 (J)	—	0.0165 (J)	NA
RE02-07-936	02-600219	2–2.5	QAL	0.0015 (J)	—	—	—	—	—	—	—	—	—	0.000458 (J)
RE02-07-937	02-600219	2.7–3.4	QAL	—	—	—	—	—	—	—	—	—	—	0.000646 (J)
RE02-07-6894	02-600220	0–0.5	SOIL	NA	NA	0.0135 (J)	—	0.0251 (J)	0.013 (J)	0.0178 (J)	0.0204 (J)	—	0.0168 (J)	NA
RE02-07-6897	02-600221	0–0.5	SOIL	NA	NA	0.026 (J)	0.0299 (J)	0.0763	—	0.0498	0.0779	0.0342 (J)	0.0919	NA
RE02-07-6900	02-600222	0–0.5	SOIL	NA	NA	0.0151 (J)	—	0.0285 (J)	—	0.025 (J)	0.0249 (J)	0.0107 (J)	0.026 (J)	NA
RE02-07-6903	02-600223	0–0.5	SOIL	NA	NA	0.0137 (J)	—	0.0374 (J)	—	0.0236 (J)	0.039	0.0163 (J)	0.0474	NA
RE02-07-6906	02-600224	0–0.5	SOIL	NA	NA	0.0219 (J)	—	0.0439	—	0.0288 (J)	0.0585	0.0272 (J)	0.0579	NA
RE02-07-6909	02-600225	0–0.5	SOIL	NA	NA	0.019 (J)	—	0.0199 (J)	—	0.0139 (J)	0.022 (J)	—	0.0242 (J)	NA
RE02-07-6912	02-600226	0–0.5	SOIL	NA	NA	0.014 (J)	—	0.0174 (J)	—	0.0159 (J)	0.0252 (J)	0.0109 (J)	0.0243 (J)	NA
RE02-07-6913	02-600226	2–2.5	QAL	NA	NA	0.0233 (J)	0.0143 (J)	0.0279 (J)	0.0144 (J)	0.032 (J)	0.109	0.0631	0.0838	—
RE02-07-6921	02-600229	0–0.5	SOIL	0.0035 (J)	0.0027 (J)	—	—	—	—	—	—	—	—	NA
RE02-07-6925	02-600230	2–2.5	QAL	—	—	—	—	—	—	—	—	—	—	0.000375 (J+)
RE02-10-21991	02-612412	0–0.5	SOIL	0.0082	0.0053	—	—	0.0132 (J)	—	—	0.018 (J)	—	0.0143 (J)	NA
RE02-10-21993	02-612412	9–10	QCT	0.0302	—	—	—	—	—	—	—	—	—	NA

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273).

[b] SSLs are from LANL (2017, 602581).

[c] NA = Not analyzed.

[d] — = Not detected.

Table 6.5-4
Radionuclides Detected or Detected above BVs/FVs at AOC 02-003(d)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Cobalt-60	Plutonium-239/240	Tritium	Uranium-234	Uranium-235/236	Uranium-238
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**4**	**0.18**	**3.9**
Qbt 2,3,4 BV[a]				**na**	**na**	**na**	**na**	**1.98**	**0.09**	**1.93**
Soil BV/FV[a]				**1.65**	**na**	**0.054**	**na**	**2.59**	**0.2**	**2.29**
Industrial SAL[c]				**41**	**9**	**1200**	**2,400,000**	**3100**	**160**	**710**
Recreational SAL[c]				**370**	**81**	**1300**	**5,700,000**	**3900**	**1000**	**2800**
Residential SAL[c]				**12**	**2.6**	**79**	**1700**	**290**	**42**	**150**
CA02-00-0281	02-01254	0–0.5	SOIL	—[d]	—	0.198	NA[e]	—	—	2.57
CA02-00-0282	02-01254	2–2.5	SOIL	—	—	—	0.0785106	—	—	—
CA02-00-0283	02-01255	0–0.5	SOIL	—	—	0.071	0.0581633	—	—	—
CA02-00-0284	02-01255	2.2–2.5	SOIL	0.122 (J+)	—	0.066	0.0426804	—	—	—
CA02-00-0285	02-01256	0–0.5	FILL	—	—	0.179	0.103226	—	—	—
CA02-00-0286	02-01256	2–2.75	FILL	0.0507 (J+)	—	0.101	—	—	—	—
RE02-07-926	02-600216	0–0.5	SOIL	—	—	0.076	—	—	—	—
RE02-07-929	02-600217	0–0.8	SOIL	—	—	0.0775	—	—	—	—
RE02-07-932	02-600218	0–1.3	SOIL	0.128	—	—	—	—	—	—
RE02-07-933	02-600218	2–4	SOIL	—	—	—	0.0222609	—	—	—
RE02-07-934	02-600218	4–5.25	QCT	—	—	—	0.0285727	—	—	—
RE02-07-936	02-600219	2–2.5	QAL	—	—	0.0209	—	—	—	—
RE02-07-941	02-600221	0–1.2	SOIL	0.799	—	0.0493	—	—	—	—
RE02-07-944	02-600222	0–0.5	SOIL	—	—	0.0611	—	—	—	—
RE02-07-947	02-600223	0–0.5	SOIL	—	0.97	0.145	—	—	—	—
RE02-07-950	02-600224	0–1.3	SOIL	0.288	—	0.0495	—	—	—	—
RE02-07-953	02-600225	0–0.5	SOIL	—	—	0.0923	—	—	—	—
RE02-07-956	02-600226	0–0.5	SOIL	—	—	0.0614	—	—	—	—
RE02-07-957	02-600226	2–3	QAL	—	—	—	0.0119969	—	—	—
RE02-07-963	02-600228	2–2.5	QAL	0.721	—	—	—	—	—	—
RE02-07-964	02-600228	4.5–5	QAL	0.164	—	—	0.0123808	—	—	—
RE02-07-966	02-600229	2–3.1	QAL	—	—	—	—	2.89	—	2.86
RE02-07-967	02-600229	4.5–5.7	QCT	—	—	—	0.041431	—	0.185	—
RE02-07-969	02-600230	2–2.5	QAL	—	—	—	0.0247065	—	—	—
RE02-07-972	02-600231	2–2.5	QBT3	0.269	—	—	—	—	—	—
RE02-07-973	02-600231	4.5–5.5	QBT3	—	—	—	—	—	0.133	—
RE02-10-21991	02-612412	0–0.5	SOIL	—	—	0.0723	—	—	—	—
RE02-10-21992	02-612412	4–5	QCT	—	—	—	0.0154917	—	—	—
RE02-10-21993	02-612412	9–10	QCT	—	—	—	0.0359022	—	—	—

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.
[a] BVs/FVs are from LANL (1998, 059730).
[b] na = Not available.
[c] SALs are from LANL (2015, 600929).
[d] — = Not detected.
[e] NA = Not analyzed.

Table 6.6-1
Samples Collected and Analyses Requested at AOC 02-003(e)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
CA02-00-0132	02-01240	3–4	SOIL	—[a]	—	7460R[b]	7460R	7460R	7460R	7458R, 7459R	—	—	7460R	—	—	—
CA02-00-0133	02-01240	6–7	SOIL	—	—	7460R	7460R	7460R	7460R	7458R, 7459R	—	—	7460R	—	—	—
CA02-00-0134	02-01240	8.5–10	SOIL	—	—	7460R	7460R	7460R	7460R	7458R, 7459R	—	—	7460R	—	—	—
CA02-00-0135	02-01240	11.5–12.5	SOIL	—	—	7460R	7460R	7460R	7460R	7458R, 7459R	—	—	7460R	—	—	—
CA02-00-0136	02-01240	15–16	SOIL	—	—	7460R	7460R	7460R	7460R	7458R, 7459R	—	—	7460R	—	—	—
CA02-00-0137	02-01240	18.5–19.5	SOIL	—	—	7460R	7460R	7460R	7460R	7458R, 7459R	—	—	7460R	—	—	—
CA02-00-0138	02-01240	21.5–22.5	QBT3	—	—	7460R	7460R	7460R	7460R	7458R, 7459R	—	—	7460R	—	—	—
RE02-07-858	02-600206	0–0.5	SOIL	07-437	07-437	07-437	07-437	07-437	07-437	07-437	07-437	07-437	07-437	07-437	—	07-437
RE02-07-859	02-600206	4.5–7.5	QAL	07-424	07-424	07-424	07-424	07-424	07-424	07-424	07-424	07-424	07-424	07-424	07-424	07-424
RE02-07-860	02-600206	9.5–12.1	QAL	07-580	07-579	07-580	07-580	07-580	07-580	07-579	07-578	07-579	07-580	07-578	07-578	07-579
RE02-07-861	02-600206	19.5–23.4	QBO	07-580	07-579	07-580	07-580	07-580	07-580	07-579	07-578	07-579	07-580	07-578	07-578	07-579
RE02-07-863	02-600207	0–0.5	SOIL	07-655	07-654	07-655	07-655	07-655	07-655	07-654	07-653	07-654	07-655	07-653	—	07-654
RE02-07-864	02-600207	4.5–8.1	QAL	07-655	07-654	07-655	07-655	07-655	07-655	07-654	07-653	07-654	07-655	07-653	07-653	07-654
RE02-07-865	02-600207	9.5–11.4	QAL	07-655	07-654	07-655	07-655	07-655	07-655	07-654	07-653	07-654	07-655	07-653	07-653	07-654
RE02-07-866	02-600207	13.5–16.6	QBO	07-655	07-654	07-655	07-655	07-655	07-655	07-654	07-653	07-654	07-655	07-653	07-653	07-654
RE02-07-868	02-600208	0–0.5	SOIL	07-655	07-654	07-655	07-655	07-655	07-655	07-654	07-653	07-654	07-655	07-653	—	07-654
RE02-07-869	02-600208	4.5–6.7	QAL	07-863	07-863	07-863	07-863	07-863	07-863	07-863	07-863	07-863	07-863	07-863	07-863	07-863
RE02-07-870	02-600208	9.5–11.6	QAL	07-863	07-863	07-863	07-863	07-863	07-863	07-863	07-863	07-863	07-863	07-863	07-863	07-863
RE02-07-871	02-600208	14.5–16.5	QBO	07-863	07-863	07-863	07-863	07-863	07-863	07-863	07-863	07-863	07-863	07-863	07-863	07-863
RE02-07-873	02-600209	0–0.5	SOIL	07-608	07-608	07-608	07-608	07-608	07-608	07-608	07-608	07-608	07-608	07-608	—	07-608
RE02-07-874	02-600209	4.5–6.5	QAL	07-655	07-654	07-655	07-655	07-655	07-655	07-654	07-653	07-654	07-655	07-653	07-653	07-654
RE02-07-875	02-600209	9.5–11.9	QAL	07-655	07-654	07-655	07-655	07-655	07-655	07-654	07-653	07-654	07-655	07-653	07-653	07-654
RE02-07-876	02-600209	14.5–17.1	QBO	07-655	07-654	07-655	07-655	07-655	07-655	07-654	07-653	07-654	07-655	07-653	07-653	07-654
RE02-10-21904	02-612389	5–6	QAL	11-122	—	11-122	11-122	11-122	11-122	11-122	11-122	—	11-122	11-122	—	—
RE02-10-21905	02-612389	18–19	QAL	11-122	—	11-122	11-122	11-122	11-122	11-122	11-122	—	11-122	11-122	—	—
RE02-10-21906	02-612389	25–27	QBO	11-152	—	11-152	11-152	11-152	11-152	11-151	11-151	—	11-152	11-151	—	—
RE02-10-21907	02-612389	35–36	QBO	11-152	—	11-152	11-152	11-152	11-152	11-151	11-151	—	11-152	11-151	—	—
RE02-10-21908	02-612389	49–50	QBO	11-152	—	11-152	11-152	11-152	11-152	11-151	11-151	—	11-152	11-151	—	—

[a] — = Analysis not requested.
[b] Analytical request number.

Table 6.6-2
Inorganic Chemicals Detected or Detected above BVs at AOC 02-003(e)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Uranium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**1900**	**2.6**	**3.96**	**3700**	**13.5**	**189**	**0.1**	**2**	**na[b]**	**na**	**0.3**	**1**	**na**	**4.59**	**40**
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**4.66**	**14500**	**11.2**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**2.4**	**17**	**63.5**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**14.7**	**21500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**1.82**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**na**	**505[d]**	**51,900**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**3880**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**na**	**281[d]**	**24,800**	**434,000**	**1110**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**3100**	**1860**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**70.5**	**na**	**96.6[d]**	**3130**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**234**	**394**	**23,500**
CA02-00-0132	02-01240	3–4	SOIL	—[f]	—	—	—	—	—	—	—	—	—	—	—	—	NA[g]	NA	—	—	—	—	51
CA02-00-0134	02-01240	8.5–10	SOIL	—	2.3 (J-)	—	—	—	—	—	16	—	3400	—	—	—	NA	NA	—	—	—	—	—
CA02-00-0135	02-01240	11.5–12.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	1.97	—	—
CA02-00-0136	02-01240	15–16	SOIL	—	—	—	—	—	—	—	—	—	1200	—	—	—	NA	NA	—	—	—	—	—
CA02-00-0137	02-01240	18.5–19.5	SOIL	—	—	—	—	—	—	—	—	—	49	—	—	—	NA	NA	—	—	—	—	—
CA02-00-0138	02-01240	21.5–22.5	QBT3	7800 (J-)	—	—	—	—	—	—	—	—	76	—	—	—	NA	NA	0.32 (U)	—	—	—	—
RE02-07-858	02-600206	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.53 (U)	—	NA	—	—
RE02-07-859	02-600206	4.5–7.5	QAL	—	—	—	—	—	12300 (J)	—	—	—	—	—	—	—	1.65	0.0296	1.58 (U)	—	NA	—	49.2
RE02-07-860	02-600206	9.5–12.1	QAL	—	—	—	—	0.53 (U)	—	—	—	—	—	—	—	—	—	—	—	—	NA	—	—
RE02-07-861	02-600206	19.5–23.4	QBO	5260	—	1.46 (U)	—	0.486 (U)	—	7.45 (U)	—	4110	—	—	—	2.11 (U)	—	—	1.46 (U)	—	NA	—	—
RE02-07-863	02-600207	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	2.58	—	—	0.000527 (J-)	—	—	NA	—	—
RE02-07-864	02-600207	4.5–8.1	QAL	—	—	—	—	—	—	—	—	—	33.9	—	0.156	—	—	—	—	—	NA	—	—
RE02-07-865	02-600207	9.5–11.4	QAL	—	—	—	—	0.538 (U)	—	34.7 (U)	—	—	—	—	0.281	—	—	—	—	1.06	NA	—	—
RE02-07-866	02-600207	13.5–16.6	QBO	7940	—	1.96	32.7	0.579 (U)	—	19.7 (U)	—	7890	—	348	—	7.28 (U)	—	—	1.74 (U)	—	NA	8.5 (J)	—
RE02-07-868	02-600208	0–0.5	SOIL	—	—	—	—	0.507 (U)	—	—	—	—	—	—	0.384	—	1.11	—	—	—	NA	—	—
RE02-07-869	02-600208	4.5–6.7	QAL	—	—	—	—	1.18	—	—	—	—	—	—	0.236	—	1.59	—	2.46	—	NA	—	543
RE02-07-870	02-600208	9.5–11.6	QAL	—	—	—	—	0.547 (U)	—	—	—	—	—	—	—	—	—	—	2.63	—	NA	—	—
RE02-07-871	02-600208	14.5–16.5	QBO	13300	0.513 (UJ)	2.09	47.7	0.639 (U)	—	61.5	—	7070	—	205 (J+)	—	8.66 (U)	—	—	2.02	—	NA	4.66	45.2
RE02-07-873	02-600209	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	2.13 (J+)	—	—	—	NA	—	59.1
RE02-07-874	02-600209	4.5–6.5	QAL	—	—	—	—	0.531 (U)	—	—	—	—	—	—	—	—	—	0.000869 (J-)	—	—	NA	—	—
RE02-07-875	02-600209	9.5–11.9	QAL	—	—	—	—	0.522 (U)	—	72.9 (J)	—	—	—	—	—	—	—	—	—	—	NA	—	—
RE02-07-876	02-600209	14.5–17.1	QBO	9490	—	1.8 (U)	—	0.598 (U)	—	27.7 (J)	—	6000	22.3	293	—	7.23	—	—	0.663 (J)	—	NA	4.68 (J)	—
RE02-10-21904	02-612389	5–6	QAL	—	0.902 (U)	—	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	NA	—	—
RE02-10-21905	02-612389	18–19	QAL	—	1.17 (U)	—	—	0.584 (U)	—	—	—	—	—	—	—	—	NA	NA	—	—	NA	—	—

Table 6.6-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Uranium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**1900**	**2.6**	**3.96**	**3700**	**13.5**	**189**	**0.1**	**2**	**na[b]**	**na**	**0.3**	**1**	**na**	**4.59**	**40**
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**4.66**	**14500**	**11.2**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**2.4**	**17**	**63.5**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**14.7**	**21500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**1.82**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**na**	**505[d]**	**51,900**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**3880**	**6530**	**389,000**
Recreational SSL[f]				**619,000**	**248**	**42.9**	**124,000**	**457**	**na**	**281[d]**	**24,800**	**434,000**	**1110**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**3100**	**1860**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**70.5**	**na**	**96.6[d]**	**3130**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**234**	**394**	**23,500**
RE02-10-21906	02-612389	25–27	QBO	—	1.21 (U)	1.26 (U)	—	0.607 (U)	—	—	—	4930	—	—	—	—	NA	NA	1.26 (U)	—	NA	—	—
RE02-10-21907	02-612389	35–36	QBO	—	1.3 (U)	1.28 (U)	—	0.65 (U)	—	—	—	5450	—	219	—	—	NA	NA	1.28 (U)	—	NA	—	—
RE02-10-21908	02-612389	49–50	QBO	—	1.29 (U)	1.27 (U)	—	0.645 (U)	—	—	—	5750	—	243	—	—	NA	NA	1.27 (U)	—	NA	4.6	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 6.6-3
Organic Chemicals Detected at AOC 02-003(e)

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	Bis(2-ethylhexyl)phthalate	Chrysene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene	Toluene
Industrial SSL[a]				**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**1830**	**3230**	**33,700**	**32.3**	**25,300**	**25,300**	**61,100**
Recreational SSL[c]				**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**1770**	**8880**	**11,500**	**88.8**	**8630**	**8630**	**47,600**
Residential SSL[a]				**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**380**	**152**	**2320**	**1.53**	**1740**	**1740**	**5220**
RE02-07-858	02-600206	0–0.5	SOIL	—[d]	—	—	0.023 (J)	0.0412 (J)	—	—	0.0224 (J)	0.0442	—	0.025 (J)	0.0462	NA[e]
RE02-07-859	02-600206	4.5–7.5	QAL	0.0974	0.138	—	0.0184 (J)	0.0187 (J)	—	—	0.0152 (J)	0.0271 (J)	—	0.0159 (J)	0.0244 (J)	0.00043 (J)
RE02-07-860	02-600206	9.5–12.1	QAL	0.0116	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-863	02-600207	0–0.5	SOIL	—	0.0216 (J)	0.0174 (J)	—	0.0153 (J)	—	0.0882 (J)	0.0109 (J)	0.0195 (J)	—	0.0123 (J)	0.0155 (J)	NA
RE02-07-864	02-600207	4.5–8.1	QAL	0.0166 (J)	0.0163 (J)	—	—	—	—	—	—	—	—	0.0106 (J)	—	—
RE02-07-865	02-600207	9.5–11.4	QAL	—	0.004	—	—	—	—	—	—	—	—	—	—	—
RE02-07-868	02-600208	0–0.5	SOIL	—	0.0293	0.0239 (J)	0.0188 (J)	0.0269 (J)	—	—	0.0205 (J)	0.0276 (J)	—	0.0132 (J)	0.0315 (J)	NA
RE02-07-869	02-600208	4.5–6.7	QAL	0.0539	0.0249	0.021 (J)	0.0206 (J)	0.0285 (J)	—	—	0.0203 (J)	0.0442	—	0.0327 (J)	0.0288 (J)	—
RE02-07-873	02-600209	0–0.5	SOIL	—	0.611	—	0.101	0.0467	0.0458 (J)	—	0.0336 (J)	0.0679	0.0607	0.0328 (J)	0.0669	NA
RE02-07-874	02-600209	4.5–6.5	QAL	—	0.0032 (J)	—	—	—	—	0.11 (J)	—	—	—	—	—	—
RE02-10-21904	02-612389	5–6	QAL	0.298 (J)	0.0326 (J)	—	—	—	—	—	—	—	—	—	—	NA

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273).

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSLs are from LANL (2017, 602581).

[d] — = Not detected.

[e] NA = Not analyzed.

Table 6.6-4
Radionuclides Detected or Detected above BVs/FVs at AOC 02-003(e)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-239/240	Strontium-90	Tritium	Uranium-234	Uranium-235/236	Uranium-238
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**na**	**4**	**0.18**	**3.9**
Qbt 2,3,4 BV[a]				**na**	**na**	**na**	**na**	**na**	**1.98**	**0.09**	**1.93**
Soil BV/FV[a]				**0.013**	**1.65**	**0.054**	**1.31**	**na**	**2.59**	**0.2**	**2.29**
Industrial SAL[c]				**1000**	**41**	**1200**	**2400**	**2,400,000**	**3100**	**160**	**710**
Recreational SAL[c]				**1500**	**370**	**1300**	**4900**	**5,700,000**	**3900**	**1000**	**2800**
Residential SAL[c]				**83**	**12**	**79**	**15**	**1700**	**290**	**42**	**150**
CA02-00-0132	02-01240	3–4	SOIL	NA[d]	22.7	1.66	2.76	0.0357229	—[e]	—	—
CA02-00-0133	02-01240	6–7	SOIL	NA	2.75	—	3.38 (J-)	0.021324	—	—	—
CA02-00-0134	02-01240	8.5–10	SOIL	NA	450	0.359	—	0.0778849	—	—	—
CA02-00-0135	02-01240	11.5–12.5	SOIL	NA	1.69	—	4.58 (J-)	—	—	—	—
CA02-00-0136	02-01240	15–16	SOIL	NA	42.4	0.169	10.2 (J-)	0.0465945	—	—	—
CA02-00-0137	02-01240	18.5–19.5	SOIL	NA	5.1	—	0.987	0.076466	—	—	—
CA02-00-0138	02-01240	21.5–22.5	QBT3	NA	—	—	—	0.0748537	2.55	—	2.48
RE02-07-859	02-600206	4.5–7.5	QAL	—	38.4	0.455	6.44	0.0182553	—	—	—
RE02-07-860	02-600206	9.5–12.1	QAL	—	2.86	—	1.2	—	—	—	—
RE02-07-864	02-600207	4.5–8.1	QAL	0.0376	51.6	2.9	10.4	—	—	—	—
RE02-07-865	02-600207	9.5–11.4	QAL	—	—	0.0598	—	0.0507753	—	—	—
RE02-07-868	02-600208	0–0.5	SOIL	—	—	—	—	0.0099606	—	—	—
RE02-07-869	02-600208	4.5–6.7	QAL	—	43.5	0.758	4.52	0.0170256	—	—	—
RE02-07-871	02-600208	14.5–16.5	QBO	—	0.82	—	—	—	—	—	—
RE02-07-874	02-600209	4.5–6.5	QAL	—	0.478	—	—	—	—	—	—
RE02-10-21904	02-612389	5–6	QAL	—	274	0.644	32.8	0.021	—	—	—
RE02-10-21908	02-612389	49–50	QBO	—	—	—	—	—	—	0.194	—

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from LANL (2015, 600929).

[d] NA = Not analyzed.

[e] — = Not detected.

Table 6.7-1
Samples Collected and Analyses Requested at AOC 02-004(a)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Dioxins/Furans	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	TPH-DRO	VOCs	Cyanide (Total)
RE02-03-51840	02-22359	9–9.5	SOIL	—[a]	—	—	1822S[b]	1822S	1821S	1822S	1822S	1821S	—	—	1822S	—	1822S	—	—	—
RE02-03-51841	02-22359	10.5–11	SOIL	—	—	—	1822S	1822S	1821S	1822S	1822S	1821S	—	—	1822S	—	1822S	—	—	—
RE02-03-51860	02-22369	9–9.5	SOIL	—	—	—	1822S	1822S	1821S	1822S	1822S	1821S	—	—	1822S	—	1822S	—	—	—
RE02-03-51861	02-22369	10.5–11.03	SOIL	—	—	—	1822S	1822S	1821S	1822S	1822S	1821S	—	—	1822S	—	1822S	—	—	—
RE02-03-51862	02-22370	8–8.5	SOIL	—	—	—	1822S	1822S	1821S	1822S	1822S	1821S	—	—	1822S	—	1822S	—	—	—
RE02-03-51863	02-22370	9.5–10	SOIL	—	—	—	1822S	1822S	1821S	1822S	1822S	1821S	—	—	1822S	—	1822S	—	—	—
RE02-03-51864	02-22371	9–9.5	SOIL	—	—	—	1822S	1822S	1821S	1822S	1822S	1821S	—	—	1822S	—	1822S	—	—	—
RE02-03-51865	02-22371	10.5–11	SOIL	—	—	—	1822S	1822S	1821S	1822S	1822S	1821S	—	—	1822S	—	1822S	—	—	—
RE02-07-1528	02-600378	0–0.5	SOIL	07-748	07-747	—	07-748	07-748	—	07-748	07-748	07-747	07-746	07-747	07-748	—	—	—	—	07-747
RE02-07-6840	02-600378	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	07-1152	—	—	—	—
RE02-07-6841	02-600378	9.5–10	QAL	—	—	—	—	—	—	—	—	—	—	—	—	07-1152	—	—	07-1152	—
RE02-07-1529	02-600378	9.5–12	QBO	07-920	07-920	—	07-920	07-920	—	07-920	07-920	07-920	07-920	07-920	07-920	—	—	—	—	07-920
RE02-07-1530	02-600378	12–15	QBO	07-920	07-920	—	07-920	07-920	—	07-920	07-920	07-920	07-920	07-920	07-920	—	—	—	—	07-920
RE02-07-6843	02-600378	13–14.5	QBO	—	—	—	—	—	—	—	—	—	—	—	—	07-1152	—	—	07-1152	—
RE02-07-1532	02-600379	0–0.5	SOIL	07-748	07-747	—	07-748	07-748	—	07-748	07-748	07-747	07-746	07-747	07-748	—	—	—	—	07-747
RE02-07-6844	02-600379	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	07-1152	—	—	—	—
RE02-07-6845	02-600379	9.5–10.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	07-1152	—	—	07-1152	—
RE02-07-1533	02-600379	9.5–14	QBO	07-939	07-938	—	07-939	07-939	—	07-939	07-939	07-938	07-937	07-938	07-939	—	—	—	—	07-938
RE02-07-6847	02-600379	10.5–11.5	QBO	—	—	—	—	—	—	—	—	—	—	—	—	07-1152	—	—	07-1152	—
RE02-07-1536	02-600380	0–0.5	SOIL	07-748	07-747	—	07-748	07-748	—	07-748	07-748	07-747	07-746	07-747	07-748	—	—	—	—	07-747
RE02-07-6848	02-600380	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	07-1152	—	—	—	—
RE02-07-6849	02-600380	9.5–10.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	07-1152	—	—	07-1152	—
RE02-07-1537	02-600380	9.5–12	QBO	07-939	07-938	—	07-939	07-939	—	07-939	07-939	07-938	07-937	07-938	07-939	—	—	—	—	07-938
RE02-07-6851	02-600380	11–12	QBO	—	—	—	—	—	—	—	—	—	—	—	—	07-1152	—	—	07-1152	—
RE02-07-1540	02-600381	0–0.5	SOIL	07-340	07-339	—	07-340	07-340	—	07-340	07-340	07-339	07-338	07-339	07-340	07-338	—	—	—	07-339
RE02-07-1541	02-600381	7–10	QAL	07-340	07-339	—	07-340	07-340	—	07-340	07-340	07-339	07-338	07-339	07-340	07-338	—	—	07-338	07-339
RE02-07-1542	02-600381	16.5–20	QBO	07-340	07-339	—	07-340	07-340	—	07-340	07-340	07-339	07-338	07-339	07-340	07-338	—	—	07-338	07-339
RE02-07-1544	02-600382	0–0.5	SOIL	07-748	07-747	—	07-748	07-748	—	07-748	07-748	07-747	07-746	07-747	07-748	—	—	—	—	07-747
RE02-07-6856	02-600382	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	07-1152	—	—	—	—
RE02-07-6857	02-600382	9.5–10.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	07-1152	—	—	07-1152	—
RE02-07-1545	02-600382	9.5–12	QBO	07-939	07-938	—	07-939	07-939	—	07-939	07-939	07-938	07-937	07-938	07-939	—	—	—	—	07-938
RE02-07-6859	02-600382	12–13	QBO	—	—	—	—	—	—	—	—	—	—	—	—	07-1152	—	—	07-1152	—

Table 6.7-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Dioxins/Furans	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	TPH-DRO	VOCs	Cyanide (Total)
RE02-07-1546	02-600382	12.5–16	QBO	07-939	07-938	—	07-939	07-939	—	07-939	07-939	07-938	07-937	07-938	07-939	—	—	—	—	07-938
RE02-07-1548	02-600383	0–0.5	SOIL	07-748	07-747	—	07-748	—	—	07-748	07-748	07-747	07-748	07-747	07-748	—	—	—	—	07-747
RE02-07-6860	02-600383	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	07-1152	—	—	—	—
RE02-07-6861	02-600383	9.5–10.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	07-1152	—	—	07-1152	—
RE02-07-1549	02-600383	9.5–12	QAL	07-939	07-938	—	07-939	07-939	—	07-939	07-939	07-938	07-937	07-938	07-939	—	—	—	—	07-938
RE02-07-1550	02-600383	13–18.5	QBO	07-939	07-938	—	07-939	07-939	—	07-939	07-939	07-938	07-937	07-938	07-939	—	—	—	—	07-938
RE02-07-6863	02-600383	15–18.5	QBO	—	—	—	—	—	—	—	—	—	—	—	—	07-1152	—	—	07-1152	—
RE02-07-1552	02-600384	0–0.5	SOIL	07-748	07-747	—	07-748	—	—	07-748	07-748	07-747	07-748	07-747	07-748	—	—	—	—	07-747
RE02-07-6864	02-600384	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	07-1152	—	—	—	—
RE02-07-6865	02-600384	9.5–10.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	07-1152	—	—	07-1152	—
RE02-07-1553	02-600384	9.5–13	QAL	07-939	07-938	—	07-939	07-939	—	07-939	07-939	07-938	07-937	07-938	07-939	—	—	—	—	07-938
RE02-07-1554	02-600384	13.5–17	QBO	07-939	07-938	—	07-939	07-939	—	07-939	07-939	07-938	07-937	07-938	07-939	—	—	—	—	07-938
RE02-07-6867	02-600384	15–17	QBO	—	—	—	—	—	—	—	—	—	—	—	—	07-1152	—	—	07-1152	—
RE02-07-1655	02-600409	0–0.5	SOIL	07-445	07-444	07-442	07-445	07-445	—	07-445	07-445	07-444	07-443	07-444	07-445	07-443	—	07-443	—	07-444
RE02-07-1656	02-600409	4.5–9.5	QAL	—	07-754	07-773	—	—	—	—	—	07-754	07-753	07-754	—	07-753	—	07-753	07-753	07-754
RE02-07-1657	02-600409	9.5–14.5	QAL	07-755	07-754	07-773	07-755	07-755	—	07-755	07-755	07-754	07-753	07-754	07-755	07-753	—	07-753	07-753	07-754
RE02-07-1659	02-600409	14.5–24.5	QBO	07-755	07-754	07-773	07-755	07-755	—	07-755	07-755	07-754	07-753	07-754	07-755	07-753	—	07-753	07-753	07-754
RE02-07-1661	02-600410	0–0.5	SOIL	07-466	07-465	07-463	07-466	07-466	—	07-466	07-466	07-465	07-464	07-465	07-466	07-464	—	07-464	—	07-465
RE02-07-1662	02-600410	4.5–9.5	QAL	07-732	07-731	07-729	07-732	07-732	—	07-732	07-732	07-731	07-730	07-731	07-732	07-730	—	07-730	07-730	07-731
RE02-07-1667	02-600411	0–0.5	SOIL	07-466	07-465	07-463	07-466	07-466	—	07-466	07-466	07-465	07-464	07-465	07-466	07-464	—	07-464	—	07-465
RE02-07-1668	02-600411	4.5–7	QAL	07-732	07-731	07-729	07-732	07-732	—	07-732	07-732	07-731	07-730	07-731	07-732	07-730	—	07-730	07-730	07-731
RE02-07-1669	02-600411	9.5–14.5	QAL	07-732	07-731	07-729	07-732	07-732	—	07-732	07-732	07-731	07-730	07-731	07-732	07-730	—	07-730	07-730	07-731
RE02-07-1671	02-600411	14.5–21	QBO	07-732	07-731	07-729	07-732	07-732	—	07-732	07-732	07-731	07-730	07-731	07-732	07-730	—	07-730	07-730	07-731
RE02-07-1673	02-600412	0–0.5	SOIL	07-466	07-465	07-463	07-466	07-466	—	07-466	07-466	07-465	07-464	07-465	07-466	07-464	—	07-464	—	07-465
RE02-07-1674	02-600412	4.5–9.5	QAL	07-721	07-721	07-720	07-721	07-721	—	07-721	07-721	07-721	07-721	07-721	07-721	07-721	—	07-721	07-721	07-721
RE02-07-1675	02-600412	9.5–12	QAL	07-721	07-721	07-720	07-721	07-721	—	07-721	07-721	07-721	07-721	07-721	07-721	07-721	—	07-721	07-721	07-721
RE02-07-1679	02-600413	0–0.5	SOIL	07-466	07-465	07-463	07-466	07-466	—	07-466	07-466	07-465	07-464	07-465	07-466	07-464	—	07-464	—	07-465
RE02-07-1680	02-600413	4.5–9.5	QAL	07-744	07-743	07-774	07-744	07-744	—	07-744	07-744	07-743	07-742	07-743	07-744	07-742	—	07-742	07-742	07-743
RE02-07-1681	02-600413	9.5–14.5	QAL	07-744	07-743	07-774	07-744	07-744	—	07-744	07-744	07-743	07-742	07-743	07-744	07-742	—	07-742	07-742	07-743
RE02-07-1683	02-600413	14.5–22.5	QBO	07-744	07-743	07-774	07-744	07-744	—	07-744	07-744	07-743	07-742	07-743	07-744	07-742	—	07-742	07-742	07-743
RE02-07-1685	02-600414	0–0.5	SOIL	07-493	07-492	07-491	07-493	07-493	—	07-493	07-493	07-492	07-492	07-492	07-493	07-492	—	—	—	07-492
RE02-07-1686	02-600414	4.5–9.5	QAL	07-744	07-743	07-774	07-744	07-744	—	07-744	07-744	07-743	07-742	07-743	07-744	07-742	—	—	07-742	07-743
RE02-07-1687	02-600414	9.5–14.5	QAL	07-744	07-743	07-774	07-744	07-744	—	07-744	07-744	07-743	07-742	07-743	07-744	07-742	—	—	07-742	07-743

Table 6.7-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Dioxins/Furans	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	TPH-DRO	VOCs	Cyanide (Total)
RE02-07-1689	02-600414	14.5–20	QBO	07-744	07-743	07-774	07-744	07-744	—	07-744	07-744	07-743	07-742	07-743	07-744	07-742	—	—	07-742	07-743
RE02-07-1691	02-600415	0–0.5	SOIL	07-379	07-378	07-376	07-379	07-379	—	07-379	07-379	07-378	07-377	07-378	07-379	07-377	—	—	—	07-378
RE02-07-1692	02-600415	4.5–5.1	SOIL	07-379	07-378	07-376	07-379	07-379	—	07-379	07-379	07-378	07-377	07-378	07-379	07-377	—	—	07-377	07-378
RE02-07-1693	02-600415	9.5–14	QAL	07-417	07-416	07-431	07-417	07-417	—	07-417	07-417	07-416	07-415	07-416	07-417	07-415	—	—	07-415	07-416
RE02-07-1696	02-600415	14.5–16.6	QAL	07-417	07-416	07-431	07-417	07-417	—	07-417	07-417	07-416	07-415	07-416	07-417	07-415	—	—	07-415	07-416
RE02-07-1695	02-600415	19.5–21.7	QBO	07-417	07-416	07-431	07-417	07-417	—	07-417	07-417	07-416	07-415	07-416	07-417	07-415	—	—	07-415	07-416
RE02-07-1697	02-600416	0–0.5	SOIL	07-493	07-492	07-491	07-493	07-493	—	07-493	07-493	07-492	07-492	07-492	07-493	07-492	—	—	—	07-492
RE02-07-1699	02-600416	9.5–14.5	QAL	07-771	07-770	07-772	07-771	07-771	—	07-771	07-771	07-770	07-769	07-770	07-771	07-769	—	—	07-769	07-770
RE02-07-1701	02-600416	14.5–19.5	QBO	07-771	07-770	07-772	07-771	07-771	—	07-771	07-771	07-770	07-769	07-770	07-771	07-769	—	—	07-769	07-770
RE02-07-1703	02-600417	0–0.5	SOIL	07-493	—	07-491	07-493	07-493	—	07-493	07-493	07-492	07-492	07-492	07-493	07-492	—	—	—	07-492
RE02-07-1704	02-600417	4.5–9.5	QAL	07-771	07-770	07-772	07-771	07-771	—	07-771	07-771	07-770	07-769	07-770	07-771	07-769	—	—	07-769	07-770
RE02-07-1707	02-600417	13–15.5	QBO	07-771	07-770	07-772	07-771	07-771	—	07-771	07-771	07-770	07-769	07-770	07-771	07-769	—	—	07-769	07-770
RE02-07-1919	02-600456	0–0.5	SOIL	07-1073	07-1072	—	07-1073	07-1073	—	07-1073	07-1073	07-1072	07-1071	07-1072	07-1073	07-1071	—	07-1071	—	07-1072
RE02-07-1922	02-600456	10–14	QAL	07-1073	07-1072	—	07-1073	07-1073	—	07-1073	07-1073	07-1072	07-1071	07-1072	07-1073	07-1071	—	07-1071	07-1071	07-1072
RE02-07-1921	02-600456	14–19	QBO	07-1073	07-1072	—	07-1073	07-1073	—	07-1073	07-1073	07-1072	07-1071	07-1072	07-1073	07-1071	—	07-1071	07-1071	07-1072
RE02-07-1923	02-600457	0–0.5	SOIL	07-1062	07-1062	—	07-1062	07-1062	—	07-1062	07-1062	07-1062	07-1062	07-1062	07-1062	07-1062	—	07-1062	—	07-1062
RE02-07-1926	02-600457	9.5–14	QAL	07-1073	07-1072	—	07-1073	07-1073	—	07-1073	07-1073	07-1072	07-1071	07-1072	07-1073	07-1071	—	07-1071	07-1071	07-1072
RE02-07-1925	02-600457	14–19	QBO	07-1073	07-1072	—	07-1073	07-1073	—	07-1073	07-1073	07-1072	07-1071	07-1072	07-1073	07-1071	—	07-1071	07-1071	07-1072
RE02-07-1927	02-600458	0–0.5	SOIL	07-1047	07-1046	—	07-1047	07-1047	—	07-1047	07-1047	07-1046	07-1045	07-1046	07-1047	07-1045	—	07-1045	—	07-1046
RE02-07-1930	02-600458	9.5–14.5	QAL	07-1047	07-1046	—	07-1047	07-1047	—	07-1047	07-1047	07-1046	07-1045	07-1046	07-1047	07-1045	—	07-1045	07-1045	07-1046
RE02-07-1929	02-600458	15.5–19.5	QBO	07-1052	07-1051	—	07-1052	07-1052	—	07-1052	07-1052	07-1051	07-1050	07-1051	07-1052	07-1050	—	07-1050	07-1050	07-1051
RE02-07-1931	02-600459	0–0.5	SOIL	07-1047	07-1046	—	07-1047	07-1047	—	07-1047	07-1047	07-1046	07-1045	07-1046	07-1047	07-1045	—	07-1045	—	07-1046
RE02-07-1934	02-600459	9.5–14	QAL	07-1047	07-1046	—	07-1047	07-1047	—	07-1047	07-1047	07-1046	07-1045	07-1046	07-1047	07-1045	—	07-1045	07-1045	07-1046
RE02-07-1933	02-600459	15–19	QBO	07-1047	07-1046	—	07-1047	07-1047	—	07-1047	07-1047	07-1046	07-1045	07-1046	07-1047	07-1045	—	07-1045	07-1045	07-1046
RE02-07-1935	02-600460	0–2.3	SOIL	07-334	07-333	—	07-334	07-334	—	07-334	07-334	07-333	07-332	07-333	07-334	07-332	—	07-333	—	07-333
RE02-07-1937	02-600460	15.5–20	QBO	07-334	07-333	—	07-334	07-334	—	07-334	07-334	07-333	07-332	07-333	07-334	07-332	—	07-333	07-332	07-333
RE02-07-1939	02-600461	0–0.5	SOIL	07-1052	07-1051	—	07-1052	07-1052	—	07-1052	07-1052	07-1051	07-1050	07-1051	07-1052	07-1050	—	07-1050	—	07-1051
RE02-07-1941	02-600461	9.5–14	QBO	07-1052	07-1051	—	07-1052	07-1052	—	07-1052	07-1052	07-1051	07-1050	07-1051	07-1052	07-1050	—	07-1050	07-1050	07-1051
RE02-07-1943	02-600462	0–0.5	SOIL	07-1052	07-1051	—	07-1052	07-1052	—	07-1052	07-1052	07-1051	07-1050	07-1051	07-1052	07-1050	—	07-1050	—	07-1051
RE02-07-1946	02-600462	9.5–14	QAL	07-1052	07-1051	—	07-1052	07-1052	—	07-1052	07-1052	07-1051	07-1050	07-1051	07-1052	07-1050	—	07-1050	07-1050	07-1051
RE02-07-1945	02-600462	15–20	QBO	07-1052	07-1051	—	07-1052	07-1052	—	07-1052	07-1052	07-1051	07-1050	07-1051	07-1052	07-1050	—	07-1050	07-1050	07-1051
RE02-07-1947	02-600463	0–0.5	SOIL	07-1062	07-1062	—	07-1062	07-1062	—	07-1062	07-1062	07-1062	07-1062	07-1062	07-1062	07-1062	—	07-1062	—	07-1062
RE02-07-1951	02-600464	0–0.5	SOIL	07-1047	07-1046	—	07-1047	07-1047	—	07-1047	07-1047	07-1046	07-1045	07-1046	07-1047	07-1045	—	07-1045	—	07-1046

Table 6.7-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Dioxins/Furans	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	TPH-DRO	VOCs	Cyanide (Total)
RE02-07-1955	02-600465	0–0.5	SOIL	07-1052	07-1051	—	07-1052	07-1052	—	07-1052	07-1052	07-1051	07-1050	07-1051	07-1052	07-1050	—	07-1050	—	07-1051
RE02-07-1957	02-600465	9.5–17	QBO	07-1052	07-1051	—	07-1052	07-1052	—	07-1052	07-1052	07-1051	07-1050	07-1051	07-1052	07-1050	—	07-1050	07-1050	07-1051
RE02-07-1959	02-600466	0–0.5	SOIL	07-1052	07-1051	—	07-1052	07-1052	—	07-1052	07-1052	07-1051	07-1050	07-1051	07-1052	07-1050	—	07-1050	—	07-1051
RE02-07-1961	02-600466	10–15	QBO	07-1052	07-1051	—	07-1052	07-1052	—	07-1052	07-1052	07-1051	07-1050	07-1051	07-1052	07-1050	—	07-1050	07-1050	07-1051
RE02-07-1963	02-600467	0–0.8	SOIL	07-334	07-333	—	07-334	07-334	—	07-334	07-334	07-333	07-332	07-333	07-334	07-332	—	07-333	—	07-333
RE02-07-1964	02-600467	9.5–10	QAL	07-334	07-333	—	07-334	07-334	—	07-334	07-334	07-333	07-332	07-333	07-334	07-332	—	07-333	07-332	07-333
RE02-07-1965	02-600467	10–12.5	QBO	07-358	07-357	—	07-358	07-358	—	07-358	07-358	07-357	07-356	07-357	07-358	07-356	—	07-357	07-356	07-357
RE02-07-1967	02-600468	0–1.9	SOIL	07-1105	07-1105	—	07-1105	07-1105	—	07-1105	07-1105	07-1105	07-1105	07-1105	07-1105	07-1105	—	07-1105	—	07-1105
RE02-10-21775	02-600580	3–3.2	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	10-4023	—	—	—	—
RE02-10-21777	02-600580	5–5.2	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	10-4023	—	—	—	—
RE02-07-2586	02-600580	11–16	QBO	07-1081	07-1081	—	07-1081	07-1081	—	07-1081	07-1081	07-1081	—	07-1081	07-1081	07-1081	—	—	—	07-1081
RE02-07-2589	02-600581	0–0.5	SOIL	07-1081	07-1081	—	07-1081	07-1081	—	07-1081	07-1081	07-1081	—	07-1081	07-1081	07-1081	—	—	—	07-1081
RE02-07-6930	02-600581	9.5–10	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	07-1174	—
RE02-07-2592	02-600581	9.5–13	QAL	07-1089	07-1089	—	07-1089	07-1089	—	07-1089	07-1089	07-1089	—	07-1089	07-1089	07-1089	—	—	—	07-1089
RE02-07-6931	02-600581	13.5–14.5	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	07-1174	—
RE02-07-2591	02-600581	14–16	QBO	07-1089	07-1089	—	07-1089	07-1089	—	07-1089	07-1089	07-1089	—	07-1089	07-1089	07-1089	—	—	—	07-1089
RE02-07-2594	02-600582	0–0.5	SOIL	07-1136	07-1136	—	07-1136	07-1136	—	07-1136	07-1136	07-1136	—	07-1136	07-1136	07-1136	—	—	—	07-1136
RE02-07-2599	02-600583	0–1.5	SOIL	07-372	07-371	—	07-372	07-372	—	07-372	07-372	07-371	—	07-371	07-372	07-370	—	—	—	07-371
RE02-07-2601	02-600583	8.5–10	SOIL	07-372	07-371	—	07-372	07-372	—	07-372	07-372	07-371	—	07-371	07-372	07-370	—	—	07-370	07-371
RE02-07-2602	02-600583	15.5–20	QBO	07-375	07-374	—	07-375	07-375	—	07-375	07-375	07-374	—	07-374	07-375	07-373	—	—	07-373	07-374
RE02-07-6932	02-600584	1.5–2	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	07-1174	—
RE02-07-2604	02-600584	1.5–3.3	SOIL	07-1049	07-1049	—	07-1049	07-1049	—	07-1049	07-1049	07-1049	—	07-1049	07-1049	07-1049	—	—	—	07-1049
RE02-07-6933	02-600584	9.5–10	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	07-1174	—
RE02-07-2605	02-600584	9.5–11.7	QAL	07-1049	07-1049	—	07-1049	07-1049	—	07-1049	07-1049	07-1049	—	07-1049	07-1049	07-1049	—	—	—	07-1049
RE02-07-6934	02-600584	16.5–18.5	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	07-1174	—
RE02-07-2606	02-600584	16.5–21	QBO	07-1049	07-1049	—	07-1049	07-1049	—	07-1049	07-1049	07-1049	—	07-1049	07-1049	07-1049	—	—	—	07-1049
RE02-10-21656	02-612325	5–6	SOIL	—	—	—	10-4286	10-4286	—	10-4286	10-4286	10-4286	—	—	—	—	—	—	—	—
RE02-10-21657	02-612325	15–16	QAL	—	—	—	10-4286	10-4286	—	10-4286	10-4286	10-4286	—	—	—	—	—	—	—	—
RE02-10-21658	02-612325	25–26	QBO	—	—	—	10-4322	10-4322	—	10-4322	10-4322	10-4322	—	—	—	—	—	—	—	—
RE02-10-21659	02-612325	35–37	QBO	—	—	—	10-4322	10-4322	—	10-4322	10-4322	10-4322	—	—	—	—	—	—	—	—
RE02-10-21660	02-612325	49–50	QBO	—	—	—	10-4322	10-4322	—	10-4322	10-4322	10-4322	—	—	—	—	—	—	—	—
RE02-10-21661	02-612326	5–6	SOIL	—	—	—	10-4568	10-4568	—	10-4568	10-4568	10-4568	—	—	—	—	—	—	—	—
RE02-10-21662	02-612326	15–16	QAL	—	—	—	10-4562	10-4562	—	10-4562	10-4562	10-4561	—	—	—	—	—	—	—	—

Table 6.7-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Dioxins/Furans	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	TPH-DRO	VOCs	Cyanide (Total)
RE02-10-21663	02-612326	25–26	QBO	—	—	—	10-4562	10-4562	—	10-4562	10-4562	10-4561	—	—	—	—	—	—	—	—
RE02-10-21664	02-612326	35–37	QBO	—	—	—	10-4562	10-4562	—	10-4562	10-4562	10-4561	—	—	—	—	—	—	—	—
RE02-10-21665	02-612326	49–50	QBO	—	—	—	10-4562	10-4562	—	10-4562	10-4562	10-4561	—	—	—	—	—	—	—	—
RE02-10-21666	02-612327	5–6	QAL	—	—	—	10-4632	10-4632	—	10-4632	10-4632	10-4631	—	—	—	—	—	—	—	—
RE02-10-21667	02-612327	15–16	QAL	—	—	—	10-4632	10-4632	—	10-4632	10-4632	10-4631	—	—	—	—	—	—	—	—
RE02-10-21668	02-612327	25–26	QBO	—	—	—	10-4632	10-4632	—	10-4632	10-4632	10-4631	—	—	—	—	—	—	—	—
RE02-10-21669	02-612327	35–36	QBO	—	—	—	10-4632	10-4632	—	10-4632	10-4632	10-4631	—	—	—	—	—	—	—	—
RE02-10-21670	02-612327	49–50	QBO	—	—	—	10-4632	10-4632	—	10-4632	10-4632	10-4631	—	—	—	—	—	—	—	—
RE02-10-21671	02-612328	5–6	SOIL	—	—	—	10-4638	10-4638	—	10-4638	10-4638	10-4638	—	—	—	—	—	—	—	—
RE02-10-21672	02-612328	15–16	QAL	—	—	—	10-4638	10-4638	—	10-4638	10-4638	10-4638	—	—	—	—	—	—	—	—
RE02-10-21673	02-612328	25–26	QBO	—	—	—	10-4638	10-4638	—	10-4638	10-4638	10-4638	—	—	—	—	—	—	—	—
RE02-10-21674	02-612328	35–36	QBO	—	—	—	10-4638	10-4638	—	10-4638	10-4638	10-4638	—	—	—	—	—	—	—	—
RE02-10-21675	02-612328	49–50	QBO	—	—	—	10-4700	10-4700	—	10-4700	10-4700	10-4700	—	—	—	—	—	—	—	—
RE02-10-21747	02-612346	8–9	QAL	—	—	—	10-4701	10-4701	10-4701	10-4701	10-4701	10-4701	10-4701	—	—	10-4701	—	—	—	—
RE02-10-21748	02-612346	15–16	QAL	—	—	—	10-4694	10-4694	10-4693	10-4694	10-4694	10-4693	10-4693	—	—	10-4693	—	—	—	—
RE02-10-21749	02-612346	25–26	QBO	—	—	—	10-4694	10-4694	10-4693	10-4694	10-4694	10-4693	10-4693	—	—	10-4693	—	—	—	—
RE02-10-21750	02-612346	35–36	QBO	—	—	—	10-4694	10-4694	10-4693	10-4694	10-4694	10-4693	10-4693	—	—	10-4693	—	—	—	—
RE02-10-21751	02-612346	49–50	QBO	—	—	—	10-4694	10-4694	10-4693	10-4694	10-4694	10-4693	10-4693	—	—	10-4693	—	—	—	—
RE02-10-21778	02-612350	3–3.2	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	10-4023	—	—	—	—
RE02-10-21779	02-612350	5–5.2	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	10-4023	—	—	—	—
RE02-10-21781	02-612351	3–3.2	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	10-4023	—	—	—	—
RE02-10-21782	02-612351	5–5.2	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	10-4023	—	—	—	—
RE02-10-21784	02-612352	3–3.2	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	10-4023	—	—	—	—
RE02-10-21785	02-612352	5–5.2	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	10-4023	—	—	—	—
RE02-10-21787	02-612353	3–3.4	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	10-4023	—	—	—	—
RE02-10-21788	02-612353	5–5.2	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	10-4023	—	—	—	—

[a] — = Analysis not requested.

[b] Analytical request number.

Table 6.7-2
Inorganic Chemicals Detected or Detected above BVs at AOC 02-004(a)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Cobalt	Copper	Cyanide (Total)
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**1900**	**2.6**	**na[b]**	**8.89**	**3.96**	**0.5**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**na**	**8.64**	**14.7**	**0.5**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**2580**	**1110**	**na**	**505[d]**	**72.1**	**388**	**51,900**	**62.8**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**1240**	**457**	**na**	**281[d]**	**40.2**	**186**	**24,800**	**224**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**156**	**70.5**	**na**	**96.6[d]**	**3.05**	**23.4**	**3130**	**11.1**
RE02-03-51840	02-22359	9–9.5	SOIL	—[f]	—	—	—	—	0.541 (U)	—	—	0.13	—	—	NA[g]
RE02-03-51841	02-22359	10.5–11	SOIL	—	—	—	—	—	0.527 (U)	—	—	0.101 (J)	—	—	NA
RE02-03-51860	02-22369	9–9.5	SOIL	—	—	—	—	—	0.545 (U)	—	—	0.0641 (J)	—	—	NA
RE02-03-51861	02-22369	10.5–11.03	SOIL	—	—	—	—	—	0.569 (U)	—	—	0.129	—	—	NA
RE02-03-51862	02-22370	8–8.5	SOIL	—	—	—	—	—	0.517 (U)	—	—	0.107	—	—	NA
RE02-03-51863	02-22370	9.5–10	SOIL	—	—	—	—	—	0.539 (U)	—	—	—	—	—	NA
RE02-03-51864	02-22371	9–9.5	SOIL	—	—	—	—	—	—	—	—	0.118	—	—	NA
RE02-03-51865	02-22371	10.5–11	SOIL	—	—	—	—	—	0.515 (U)	—	—	0.084 (J)	—	—	NA
RE02-07-1528	02-600378	0–0.5	SOIL	—	—	—	—	—	1.07	—	—	NA	—	—	0.576
RE02-07-1529	02-600378	9.5–12	QBO	4490	—	3.11	59.7	—	—	9410 (J+)	6.07	NA	—	—	—
RE02-07-1530	02-600378	12–15	QBO	3860	—	1.68 (J)	—	—	0.585 (U)	—	12.9	NA	—	4.19	—
RE02-07-1532	02-600379	0–0.5	SOIL	—	—	—	—	—	—	—	—	NA	—	—	—
RE02-07-1533	02-600379	9.5–14	QBO	—	—	0.894 (U)	—	—	0.555 (U)	—	4.71	NA	—	—	—
RE02-07-1536	02-600380	0–0.5	SOIL	—	—	—	—	—	—	—	—	NA	—	—	—
RE02-07-1537	02-600380	9.5–12	QBO	3660	—	1.14 (U)	34.4	—	5.63	—	9.4	NA	—	—	—
RE02-07-1540	02-600381	0–0.5	SOIL	—	—	—	—	—	14.8	—	—	NA	—	—	—
RE02-07-1541	02-600381	7–10	QAL	—	—	—	—	—	0.574 (U)	—	—	NA	—	—	—
RE02-07-1542	02-600381	16.5–20	QBO	—	—	1.76 (U)	—	—	0.587 (U)	—	—	NA	—	—	—
RE02-07-1544	02-600382	0–0.5	SOIL	—	—	—	—	—	—	—	—	NA	—	—	—
RE02-07-1545	02-600382	9.5–12	QBO	—	—	2.79 (U)	—	—	0.582 (U)	—	6.66	NA	—	—	—
RE02-07-1546	02-600382	12.5–16	QBO	10000	—	1.72 (U)	69.3	—	0.581 (U)	—	17.1	NA	—	4	—
RE02-07-1548	02-600383	0–0.5	SOIL	—	—	—	—	—	0.501 (U)	—	—	NA	—	—	—
RE02-07-1549	02-600383	9.5–12	QAL	—	—	—	—	—	—	7790	—	NA	—	—	—
RE02-07-1550	02-600383	13–18.5	QBO	11600	—	1.41 (U)	86	—	0.603 (U)	—	34.3	NA	—	5.88	—
RE02-07-1552	02-600384	0–0.5	SOIL	—	—	—	—	—	0.5 (U)	—	—	NA	—	—	—
RE02-07-1553	02-600384	9.5–13	QAL	—	—	—	—	—	0.561 (U)	—	—	NA	—	—	—
RE02-07-1554	02-600384	13.5–17	QBO	5110	—	0.686 (U)	—	—	0.62 (U)	—	—	NA	—	—	—
RE02-07-1655	02-600409	0–0.5	SOIL	—	—	—	—	—	0.498 (U)	—	—	NA	—	—	—
RE02-07-1656	02-600409	4.5–9.5	QAL	—	—	—	—	—	0.541 (U)	—	—	NA	—	—	—

Table 6.7-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Cobalt	Copper	Cyanide (Total)
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**1900**	**2.6**	**na[b]**	**8.89**	**3.96**	**0.5**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**na**	**8.64**	**14.7**	**0.5**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**2580**	**1110**	**na**	**505[d]**	**72.1**	**388[e]**	**51,900**	**62.8**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**1240**	**457**	**na**	**281[d]**	**40.2**	**186**	**24,800**	**224**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**156**	**70.5**	**na**	**96.6[d]**	**3.05**	**23.4[e]**	**3130**	**11.1**
RE02-07-1657	02-600409	9.5–14.5	QAL	—	—	—	—	—	0.583 (U)	—	—	NA	—	—	—
RE02-07-1659	02-600409	14.5–24.5	QBO	7860	—	1.72 (U)	29	—	0.573 (U)	—	4.49	NA	—	—	—
RE02-07-1661	02-600410	0–0.5	SOIL	—	—	—	—	—	—	—	—	NA	—	—	—
RE02-07-1662	02-600410	4.5–9.5	QAL	—	—	—	—	—	0.561 (U)	—	—	NA	—	—	—
RE02-07-1667	02-600411	0–0.5	SOIL	—	—	—	—	—	0.516 (U)	9010 (J)	—	NA	—	—	—
RE02-07-1668	02-600411	4.5–7	QAL	—	—	—	—	—	0.55 (U)	9170	—	NA	—	—	—
RE02-07-1669	02-600411	9.5–14.5	QAL	—	—	—	—	—	0.547 (U)	—	—	NA	—	—	—
RE02-07-1671	02-600411	14.5–21	QBO	9820	—	1.01 (J)	36.9	—	0.561 (U)	—	3.16	NA	—	—	—
RE02-07-1673	02-600412	0–0.5	SOIL	—	—	—	—	—	—	—	—	NA	—	—	—
RE02-07-1674	02-600412	4.5–9.5	QAL	—	—	—	—	—	0.547 (U)	13200	—	NA	—	—	—
RE02-07-1675	02-600412	9.5–12	QAL	—	—	—	—	—	0.542 (U)	—	—	NA	—	—	—
RE02-07-1679	02-600413	0–0.5	SOIL	—	—	—	—	—	—	17600 (J)	—	NA	—	—	—
RE02-07-1680	02-600413	4.5–9.5	QAL	—	—	—	—	—	0.577 (U)	12300	—	NA	—	—	—
RE02-07-1681	02-600413	9.5–14.5	QAL	—	—	—	—	—	0.576 (U)	—	—	NA	—	—	—
RE02-07-1683	02-600413	14.5–22.5	QBO	7760	—	2.31	80.1	—	0.629 (U)	—	26.2	NA	—	5.31	—
RE02-07-1685	02-600414	0–0.5	SOIL	—	—	—	—	—	0.504 (U)	—	—	NA	—	—	—
RE02-07-1686	02-600414	4.5–9.5	QAL	—	—	—	—	—	0.552 (U)	—	—	NA	—	—	—
RE02-07-1687	02-600414	9.5–14.5	QAL	—	—	—	—	—	0.56 (U)	—	—	NA	—	—	—
RE02-07-1689	02-600414	14.5–20	QBO	7040	0.543 (UJ)	1.49 (J)	33.3	—	0.712 (U)	—	6.63	NA	—	—	—
RE02-07-1691	02-600415	0–0.5	SOIL	—	—	—	—	—	—	—	—	NA	—	—	—
RE02-07-1692	02-600415	4.5–5.1	SOIL	—	—	—	—	—	0.562 (U)	—	—	NA	—	—	—
RE02-07-1693	02-600415	9.5–14	QAL	—	—	—	—	—	0.559 (U)	—	19.9	NA	—	—	—
RE02-07-1696	02-600415	14.5–16.6	QAL	—	—	—	—	—	0.553 (U)	—	—	NA	—	—	—
RE02-07-1695	02-600415	19.5–21.7	QBO	8020	—	1.01 (J)	—	—	0.605 (U)	—	3.4	NA	—	—	—
RE02-07-1697	02-600416	0–0.5	SOIL	—	—	—	—	—	0.51 (U)	—	20.8	NA	—	—	—
RE02-07-1699	02-600416	9.5–14.5	QAL	—	—	—	—	—	0.54 (U)	—	—	NA	—	—	—
RE02-07-1701	02-600416	14.5–19.5	QBO	11900	—	0.908 (J)	38	—	0.611 (U)	—	8.18 (J)	NA	—	—	—
RE02-07-1703	02-600417	0–0.5	SOIL	—	—	—	—	—	0.509 (U)	—	—	NA	—	—	0.543
RE02-07-1704	02-600417	4.5–9.5	QAL	—	—	—	—	—	0.526 (U)	—	—	NA	—	—	—
RE02-07-1707	02-600417	13–15.5	QBO	5930	—	3.18	32.8	—	0.55 (U)	—	10.2 (J)	NA	—	6.68	—
RE02-07-1919	02-600456	0–0.5	SOIL	—	—	—	—	—	0.536 (U)	—	—	NA	—	—	2.59
RE02-07-1922	02-600456	10–14	QAL	—	—	—	—	—	0.598 (U)	—	—	NA	—	—	—
RE02-07-1921	02-600456	14–19	QBO	6040	—	1.48 (J)	57.3 (J+)	—	0.593 (U)	—	14.4 (J)	NA	—	5.52	—

Table 6.7-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Cobalt	Copper	Cyanide (Total)
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**1900**	**2.6**	**na[b]**	**8.89**	**3.96**	**0.5**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**na**	**8.64**	**14.7**	**0.5**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**2580**	**1110**	**na**	**505[d]**	**72.1**	**388[e]**	**51,900**	**62.8**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**1240**	**457**	**na**	**281[d]**	**40.2**	**186**	**24,800**	**224**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**156**	**70.5**	**na**	**96.6[d]**	**3.05**	**23.4[e]**	**3130**	**11.1**
RE02-07-1923	02-600457	0–0.5	SOIL	—	—	—	—	—	0.544 (U)	—	—	NA	—	—	—
RE02-07-1926	02-600457	9.5–14	QAL	—	—	—	—	—	0.551 (U)	—	—	NA	—	—	—
RE02-07-1925	02-600457	14–19	QBO	15800	—	1.47 (J)	102 (J+)	1.48	0.62 (U)	—	13.1 (J)	NA	—	4.94	—
RE02-07-1927	02-600458	0–0.5	SOIL	—	—	—	—	—	0.515 (U)	—	21.6	NA	—	—	—
RE02-07-1930	02-600458	9.5–14.5	QAL	—	—	—	—	—	0.568 (U)	—	—	NA	—	—	—
RE02-07-1929	02-600458	15.5–19.5	QBO	14500	—	1.87	30.2	—	0.603 (U)	—	4.92 (U)	NA	—	—	—
RE02-07-1931	02-600459	0–0.5	SOIL	—	—	—	—	—	0.523 (U)	—	—	NA	—	—	1.11
RE02-07-1934	02-600459	9.5–14	QAL	—	—	—	—	—	0.551 (U)	—	—	NA	—	—	—
RE02-07-1933	02-600459	15–19	QBO	14600	—	0.672 (J)	—	—	0.608 (U)	—	6.07 (U)	NA	—	—	—
RE02-07-1935	02-600460	0–2.3	SOIL	—	—	—	—	—	0.513 (U)	—	—	NA	—	—	—
RE02-07-1937	02-600460	15.5–20	QBO	6110	—	1.8 (U)	—	—	0.6 (U)	—	4.83	NA	—	—	—
RE02-07-1939	02-600461	0–0.5	SOIL	—	—	—	—	—	0.502 (U)	—	—	NA	—	—	—
RE02-07-1941	02-600461	9.5–14	QBO	4150	—	2.1	35.4	—	0.57 (U)	—	7.66 (J)	NA	—	4.05 (J)	—
RE02-07-1943	02-600462	0–0.5	SOIL	—	—	—	—	—	0.517 (U)	—	24.3	NA	—	—	—
RE02-07-1946	02-600462	9.5–14	QAL	—	—	—	—	—	0.562 (U)	—	—	NA	—	—	—
RE02-07-1945	02-600462	15–20	QBO	12300	—	2.23	92.8	—	0.619 (U)	—	10.4 (J)	NA	—	4.51 (J)	—
RE02-07-1947	02-600463	0–0.5	SOIL	—	—	—	—	—	0.514 (U)	—	23.5	NA	—	—	—
RE02-07-1951	02-600464	0–0.5	SOIL	—	—	—	—	—	0.524 (U)	—	44.9	NA	—	—	—
RE02-07-1955	02-600465	0–0.5	SOIL	—	—	—	—	—	0.555 (U)	—	—	NA	—	—	—
RE02-07-1957	02-600465	9.5–17	QBO	—	0.527 (UJ)	1.24 (J)	—	—	0.662 (U)	—	14.2 (J)	NA	—	—	—
RE02-07-1959	02-600466	0–0.5	SOIL	—	—	—	—	—	—	—	—	NA	—	43.4 (J)	—
RE02-07-1961	02-600466	10–15	QBO	—	—	0.782 (J)	—	—	0.566 (U)	—	18.2 (J)	NA	—	4.93 (J)	—
RE02-07-1963	02-600467	0–0.8	SOIL	—	—	—	—	—	0.512 (U)	—	—	NA	—	—	—
RE02-07-1964	02-600467	9.5–10	QAL	—	—	—	—	—	0.507 (U)	—	—	NA	—	—	—
RE02-07-1965	02-600467	10–12.5	QBO	7430	—	0.966 (J)	39.5	—	0.587 (U)	—	5.34	NA	—	—	—
RE02-07-1967	02-600468	0–1.9	SOIL	—	—	—	—	—	0.562 (U)	—	—	NA	—	—	—
RE02-07-2586	02-600580	11–16	QBO	12800	0.512 (UJ)	2	88.3	—	0.635 (U)	—	10.1	NA	—	—	—
RE02-07-2589	02-600581	0–0.5	SOIL	—	—	—	—	—	0.531 (U)	—	—	NA	—	—	—
RE02-07-2592	02-600581	9.5–13	QAL	—	—	—	—	—	0.568 (U)	—	—	NA	—	—	—
RE02-07-2591	02-600581	14–16	QBO	8790	—	1.81 (U)	—	—	0.603 (U)	—	49.3	NA	—	11.1	—
RE02-07-2594	02-600582	0–0.5	SOIL	—	—	—	—	—	0.601 (U)	—	—	NA	—	—	0.567
RE02-07-2599	02-600583	0–1.5	SOIL	—	—	—	—	—	0.504 (U)	—	—	NA	—	—	—
RE02-07-2601	02-600583	8.5–10	SOIL	—	—	—	—	—	0.523 (U)	—	—	NA	—	—	—

Table 6.7-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Cobalt	Copper	Cyanide (Total)
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**1900**	**2.6**	**na[b]**	**8.89**	**3.96**	**0.5**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**na**	**8.64**	**14.7**	**0.5**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**2580**	**1110**	**na**	**505[d]**	**72.1**	**388[e]**	**51,900**	**62.8**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**1240**	**457**	**na**	**281[d]**	**40.2**	**186**	**24,800**	**224**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**156**	**70.5**	**na**	**96.6[d]**	**3.05**	**23.4[e]**	**3130**	**11.1**
RE02-07-2602	02-600583	15.5–20	QBO	5870	—	1.77 (U)	—	—	0.589 (U)	—	—	NA	—	—	—
RE02-07-2604	02-600584	1.5–3.3	SOIL	—	—	—	—	—	—	—	—	NA	—	—	—
RE02-07-2605	02-600584	9.5–11.7	QAL	—	—	—	—	—	0.566 (U)	—	—	NA	—	19.5	—
RE02-07-2606	02-600584	16.5–21	QBO	4410	—	2.02	—	—	0.572 (U)	—	8.62	NA	—	—	—
RE02-10-21656	02-612325	5–6	SOIL	—	1.21 (U)	—	—	—	0.87	—	—	NA	—	—	NA
RE02-10-21657	02-612325	15–16	QAL	—	1.27 (U)	—	—	—	0.633 (U)	—	—	NA	—	—	NA
RE02-10-21658	02-612325	25–26	QBO	—	1.31 (U)	—	—	—	0.656 (U)	—	2.64	NA	—	—	NA
RE02-10-21659	02-612325	35–37	QBO	—	1.19 (U)	1.19 (U)	—	—	0.597 (U)	—	—	NA	—	—	NA
RE02-10-21660	02-612325	49–50	QBO	—	1.31 (U)	—	—	—	0.656 (U)	—	—	NA	—	—	NA
RE02-10-21661	02-612326	5–6	SOIL	—	1.11 (U)	—	—	—	—	—	—	NA	18	—	NA
RE02-10-21662	02-612326	15–16	QAL	—	1.21 (U)	—	—	—	0.603 (U)	—	—	NA	—	—	NA
RE02-10-21663	02-612326	25–26	QBO	3880	1.2 (U)	1.24 (U)	—	—	0.599 (U)	—	3.59	NA	—	—	NA
RE02-10-21664	02-612326	35–37	QBO	—	1.17 (U)	1.09 (U)	—	—	0.584 (U)	—	—	NA	—	—	NA
RE02-10-21665	02-612326	49–50	QBO	—	1.14 (U)	1.15 (U)	—	—	0.568 (U)	—	—	NA	—	—	NA
RE02-10-21666	02-612327	5–6	QAL	—	1.1 (U)	—	—	—	0.55 (U)	—	—	NA	—	—	NA
RE02-10-21667	02-612327	15–16	QAL	—	1.1 (U)	—	—	—	0.548 (U)	—	—	NA	—	—	NA
RE02-10-21668	02-612327	25–26	QBO	—	1.24 (U)	1.24 (U)	—	—	0.621 (U)	—	—	NA	—	—	NA
RE02-10-21669	02-612327	35–36	QBO	—	1.2 (U)	1.26 (U)	—	—	0.602 (U)	—	—	NA	—	—	NA
RE02-10-21670	02-612327	49–50	QBO	—	1.29 (U)	1.23 (U)	—	—	0.643 (U)	—	—	NA	—	—	NA
RE02-10-21671	02-612328	5–6	SOIL	—	1.09 (U)	—	—	—	0.545 (U)	—	—	NA	—	—	NA
RE02-10-21672	02-612328	15–16	QAL	—	1.06 (U)	—	—	—	0.529 (U)	—	—	NA	—	—	NA
RE02-10-21673	02-612328	25–26	QBO	—	1.29 (U)	1.28 (U)	—	—	0.644 (U)	—	3.24	NA	—	—	NA
RE02-10-21674	02-612328	35–36	QBO	—	1.26 (U)	1.21 (U)	—	—	0.628 (U)	—	—	NA	—	—	NA
RE02-10-21675	02-612328	49–50	QBO	—	1.28 (U)	1.38 (U)	—	—	0.641 (U)	—	—	NA	—	—	NA
RE02-10-21747	02-612346	8–9	QAL	—	1.05 (U)	—	—	—	0.525 (U)	—	—	—	—	—	NA
RE02-10-21748	02-612346	15–16	QAL	—	1.11 (U)	—	—	—	0.555 (U)	—	—	0.448 (J)	—	—	NA
RE02-10-21749	02-612346	25–26	QBO	3820	1.25 (U)	1.22 (U)	—	—	0.625 (U)	—	—	—	—	—	NA
RE02-10-21750	02-612346	35–36	QBO	—	1.28 (U)	1.28 (U)	—	—	0.642 (U)	—	—	—	—	—	NA
RE02-10-21751	02-612346	49–50	QBO	—	1.15 (U)	1.19 (U)	—	—	0.573 (U)	—	—	—	—	—	NA

Table 6.7-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3700**	**13.5**	**739**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**4.59**	**40**
Soil BV[a]				**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**39.6**	**48.8**
Industrial SSL[c]				**908,000**	**800**	**na**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6530**	**389,000**
Recreational SSL[e]				**434,000**	**1110**	**na**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**3100**	**186,000**
Residential SSL[c]				**54,800**	**400**	**na**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**394**	**23,500**
RE02-03-51840	02-22359	9–9.5	SOIL	—	—	—	—	8.4	—	NA	NA	—	—	—
RE02-03-51841	02-22359	10.5–11	SOIL	—	—	—	—	13	—	NA	NA	—	—	—
RE02-03-51860	02-22369	9–9.5	SOIL	—	—	—	—	0.267	—	NA	NA	—	—	—
RE02-03-51861	02-22369	10.5–11.03	SOIL	—	—	—	—	0.318	—	NA	NA	—	—	—
RE02-03-51862	02-22370	8–8.5	SOIL	—	—	—	—	3.58	—	NA	NA	—	—	—
RE02-03-51863	02-22370	9.5–10	SOIL	—	—	—	—	3.32	—	NA	NA	—	—	—
RE02-03-51864	02-22371	9–9.5	SOIL	—	—	—	—	3.74	—	NA	NA	—	—	—
RE02-03-51865	02-22371	10.5–11	SOIL	—	—	—	—	2.41	—	NA	NA	—	—	—
RE02-07-1528	02-600378	0–0.5	SOIL	—	—	—	—	1.66	—	—	—	—	—	—
RE02-07-1529	02-600378	9.5–12	QBO	8580	15	—	505	0.28	3.76	0.996 (J)	—	0.852 (J)	10.2 (J)	—
RE02-07-1530	02-600378	12–15	QBO	7220	—	—	255	—	2.11	2.92	—	1.76 (U)	6.27 (J)	—
RE02-07-1532	02-600379	0–0.5	SOIL	—	—	—	—	8.2	—	—	0.000521 (J)	—	—	51.8
RE02-07-1533	02-600379	9.5–14	QBO	4710	—	—	244	0.448	2.04	—	—	1.67 (U)	—	—
RE02-07-1536	02-600380	0–0.5	SOIL	—	23.8	—	—	0.135	—	2.57	—	—	—	73.1
RE02-07-1537	02-600380	9.5–12	QBO	4920	—	—	211	0.207	2.36	—	—	1.59 (U)	—	—
RE02-07-1540	02-600381	0–0.5	SOIL	—	—	—	—	0.843	—	—	0.000674 (J)	—	—	—
RE02-07-1541	02-600381	7–10	QAL	—	—	—	—	—	—	1.02 (J)	0.000973 (J)	2.08 (U)	—	—
RE02-07-1542	02-600381	16.5–20	QBO	5170	—	—	207	—	—	—	—	1.42 (U)	—	—
RE02-07-1544	02-600382	0–0.5	SOIL	—	—	—	—	1.45	—	—	—	—	—	50.4
RE02-07-1545	02-600382	9.5–12	QBO	8730	—	—	247	0.144	2.5	—	—	1.1 (J)	7.84	44
RE02-07-1546	02-600382	12.5–16	QBO	7080	—	—	276	—	—	—	—	0.64 (J)	5.53	—
RE02-07-1548	02-600383	0–0.5	SOIL	—	—	—	—	0.719	—	—	—	—	—	—
RE02-07-1549	02-600383	9.5–12	QAL	—	—	—	—	0.264	—	1.32	—	—	—	69.4
RE02-07-1550	02-600383	13–18.5	QBO	7080	—	—	231	—	3.09	—	—	0.888 (J)	6.71	—
RE02-07-1552	02-600384	0–0.5	SOIL	—	—	—	—	0.567	—	—	—	—	—	—
RE02-07-1553	02-600384	9.5–13	QAL	—	—	—	—	—	—	4.41	0.00254	1.68 (U)	—	—
RE02-07-1554	02-600384	13.5–17	QBO	4810	—	—	193	—	6.33	—	—	0.723 (J)	—	—
RE02-07-1655	02-600409	0–0.5	SOIL	—	—	—	—	0.131	—	2.79	—	—	—	62.4 (J)
RE02-07-1656	02-600409	4.5–9.5	QAL	—	—	—	—	—	—	0.957 (J)	—	1.62 (U)	—	—
RE02-07-1657	02-600409	9.5–14.5	QAL	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1659	02-600409	14.5–24.5	QBO	5030	—	—	199	—	—	—	—	1.72 (U)	—	—
RE02-07-1661	02-600410	0–0.5	SOIL	—	—	—	—	0.384	—	1.52	—	1.54 (U)	—	60.6

Table 6.7-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3700**	**13.5**	**739**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**4.59**	**40**
Soil BV[a]				**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**39.6**	**48.8**
Industrial SSL[c]				**908,000**	**800**	**na**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6530**	**389,000**
Recreational SSL[e]				**434,000**	**1110**	**na**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**3100**	**186,000**
Residential SSL[c]				**54,800**	**400**	**na**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**394**	**23,500**
RE02-07-1662	02-600410	4.5–9.5	QAL	—	—	—	—	—	—	1.38	—	2.17	—	—
RE02-07-1667	02-600411	0–0.5	SOIL	—	—	—	—	0.653	—	1.78	0.000557 (J)	—	—	—
RE02-07-1668	02-600411	4.5–7	QAL	—	—	—	—	0.432	—	14.5	0.00227 (J+)	1.58 (J)	—	—
RE02-07-1669	02-600411	9.5–14.5	QAL	—	—	—	—	—	—	3.02	—	1.88	—	—
RE02-07-1671	02-600411	14.5–21	QBO	5400	—	—	—	—	2.53	—	—	1.3 (J)	—	—
RE02-07-1673	02-600412	0–0.5	SOIL	—	—	—	—	0.106	—	2.96	—	—	—	62
RE02-07-1674	02-600412	4.5–9.5	QAL	—	—	—	—	0.337 (J+)	—	3.42	—	—	—	—
RE02-07-1675	02-600412	9.5–12	QAL	—	—	—	—	0.131 (J+)	—	—	—	1.62 (U)	—	—
RE02-07-1679	02-600413	0–0.5	SOIL	—	—	—	—	0.68	—	1.55	—	—	—	—
RE02-07-1680	02-600413	4.5–9.5	QAL	—	—	—	—	0.509	—	4.2	0.0016 (J)	1.73 (U)	—	—
RE02-07-1681	02-600413	9.5–14.5	QAL	—	—	—	—	—	—	—	—	1.73 (U)	—	—
RE02-07-1683	02-600413	14.5–22.5	QBO	8480	22.2	3710 (J+)	380	—	3.04	—	—	1.89 (U)	9.54	43.7
RE02-07-1685	02-600414	0–0.5	SOIL	—	—	—	—	0.551	—	6.1	—	—	—	51.1
RE02-07-1686	02-600414	4.5–9.5	QAL	—	—	—	—	—	—	3	—	1.66 (U)	—	—
RE02-07-1687	02-600414	9.5–14.5	QAL	—	—	—	—	—	—	0.927 (J)	—	1.68 (U)	—	—
RE02-07-1689	02-600414	14.5–20	QBO	7910	—	—	349	—	2.36	—	—	2.14 (U)	5.09	—
RE02-07-1691	02-600415	0–0.5	SOIL	—	—	—	—	0.125	—	—	—	—	—	—
RE02-07-1692	02-600415	4.5–5.1	SOIL	—	—	—	—	0.283	—	10.3	0.00119 (J)	1.73	—	—
RE02-07-1693	02-600415	9.5–14	QAL	—	—	—	—	1.92	—	—	—	—	—	—
RE02-07-1696	02-600415	14.5–16.6	QAL	—	—	—	—	0.164	—	—	—	—	—	—
RE02-07-1695	02-600415	19.5–21.7	QBO	5610	—	—	—	—	—	3.64	—	1.02 (J)	—	—
RE02-07-1697	02-600416	0–0.5	SOIL	—	—	—	—	4	—	—	—	—	—	51.3
RE02-07-1699	02-600416	9.5–14.5	QAL	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1701	02-600416	14.5–19.5	QBO	7330	—	—	207 (J+)	—	2.2 (J)	—	—	1.83 (U)	—	—
RE02-07-1703	02-600417	0–0.5	SOIL	—	—	—	—	1.24	—	NA	0.000899 (J)	1.53 (U)	—	—
RE02-07-1704	02-600417	4.5–9.5	QAL	—	—	—	—	—	—	1.46 (J-)	—	—	—	—
RE02-07-1707	02-600417	13–15.5	QBO	11500	—	844 (J+)	281 (J+)	—	2.19 (J)	—	—	1.39 (J)	14.2	42.4
RE02-07-1919	02-600456	0–0.5	SOIL	—	—	—	—	0.252	—	1.73 (J-)	0.00151 (J-)	—	—	—
RE02-07-1922	02-600456	10–14	QAL	—	—	—	—	7.22	—	1.12 (J-)	—	—	—	—
RE02-07-1921	02-600456	14–19	QBO	8070 (J)	—	—	389 (J)	0.276	3.2	—	—	1.78 (U)	8.74 (J)	—
RE02-07-1923	02-600457	0–0.5	SOIL	—	—	—	—	7.78	—	1.15	0.000802 (J)	10	—	—
RE02-07-1926	02-600457	9.5–14	QAL	—	—	—	—	2.96	—	—	—	—	—	49.5 (J)

Table 6.7-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3700**	**13.5**	**739**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**4.59**	**40**
Soil BV[a]				**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**39.6**	**48.8**
Industrial SSL[c]				**908,000**	**800**	**na**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6530**	**389,000**
Recreational SSL[e]				**434,000**	**1110**	**na**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**3100**	**186,000**
Residential SSL[c]				**54,800**	**400**	**na**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**394**	**23,500**
RE02-07-1925	02-600457	14–19	QBO	8720 (J)	—	—	198 (J)	—	6.21	—	—	1.86 (U)	6.42 (J)	—
RE02-07-1927	02-600458	0–0.5	SOIL	—	—	—	—	0.839	—	2.6	—	9.52	—	—
RE02-07-1930	02-600458	9.5–14.5	QAL	—	—	—	—	—	—	—	—	5.72	—	—
RE02-07-1929	02-600458	15.5–19.5	QBO	6000	—	—	367	—	—	—	—	10.2	—	—
RE02-07-1931	02-600459	0–0.5	SOIL	—	—	—	—	2.68	—	1.4	—	11.3	—	50.7
RE02-07-1934	02-600459	9.5–14	QAL	—	—	—	—	0.16	—	—	—	9.15	—	—
RE02-07-1933	02-600459	15–19	QBO	6530	—	—	243	—	3.27 (U)	—	—	11.4	—	—
RE02-07-1935	02-600460	0–2.3	SOIL	—	—	—	—	1.48	—	—	—	—	—	—
RE02-07-1937	02-600460	15.5–20	QBO	5990 (J+)	—	—	233 (J-)	—	—	—	—	1.27 (J)	—	—
RE02-07-1939	02-600461	0–0.5	SOIL	—	—	—	—	3.56	—	1.34	—	9.72	—	—
RE02-07-1941	02-600461	9.5–14	QBO	5620	—	—	208	0.256	2.03 (J)	—	—	7.18	5.83	—
RE02-07-1943	02-600462	0–0.5	SOIL	—	—	—	—	0.407	—	—	—	10.7	—	—
RE02-07-1946	02-600462	9.5–14	QAL	—	—	—	—	0.311	—	—	—	9.01	—	—
RE02-07-1945	02-600462	15–20	QBO	8170	—	—	417	—	3.83 (J)	—	—	12.7	6.07	—
RE02-07-1947	02-600463	0–0.5	SOIL	—	—	—	—	0.298	—	—	—	7.9	—	—
RE02-07-1951	02-600464	0–0.5	SOIL	—	—	—	—	0.124	—	1.86	—	10.9	—	—
RE02-07-1955	02-600465	0–0.5	SOIL	—	—	—	—	—	—	—	—	9.99	—	—
RE02-07-1957	02-600465	9.5–17	QBO	6670	—	—	211	—	3.86 (J)	1.23 (J)	—	8.33	4.84	—
RE02-07-1959	02-600466	0–0.5	SOIL	—	—	—	—	0.348	—	1.16	—	9.1	—	55.3
RE02-07-1961	02-600466	10–15	QBO	5190	—	—	—	—	—	—	—	6.55	—	—
RE02-07-1963	02-600467	0–0.8	SOIL	—	—	—	—	0.4	—	1.24	—	1.54 (U)	—	90.5
RE02-07-1964	02-600467	9.5–10	QAL	—	—	—	—	—	—	1.01 (J)	—	—	—	—
RE02-07-1965	02-600467	10–12.5	QBO	4540	—	—	—	—	—	—	—	1.24 (U)	—	—
RE02-07-1967	02-600468	0–1.9	SOIL	—	—	—	—	—	—	1.5	—	7.95	—	—
RE02-07-2586	02-600580	11–16	QBO	6700	—	—	321	0.11	—	—	—	1.9 (U)	5.02	—
RE02-07-2589	02-600581	0–0.5	SOIL	—	—	—	—	7.47	—	1.16	—	1.59 (U)	—	—
RE02-07-2592	02-600581	9.5–13	QAL	—	—	—	—	0.481	—	—	—	8.44	—	—
RE02-07-2591	02-600581	14–16	QBO	5850	—	—	—	—	3.78	—	—	9.19	—	—
RE02-07-2594	02-600582	0–0.5	SOIL	—	—	—	—	0.506	—	1.29 (J-)	—	11.1	—	64.3
RE02-07-2599	02-600583	0–1.5	SOIL	—	—	—	—	0.419	—	3.02	—	—	—	—
RE02-07-2601	02-600583	8.5–10	SOIL	—	—	—	—	—	—	1.82	—	1.89 (U)	—	—
RE02-07-2602	02-600583	15.5–20	QBO	5190	—	—	—	—	—	—	—	1.3 (U)	—	—

Table 6.7-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3700**	**13.5**	**739**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**4.59**	**40**
Soil BV[a]				**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**39.6**	**48.8**
Industrial SSL[c]				**908,000**	**800**	**na**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6530**	**389,000**
Recreational SSL[e]				**434,000**	**1110**	**na**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**3100**	**186,000**
Residential SSL[c]				**54,800**	**400**	**na**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**394**	**23,500**
RE02-07-2604	02-600584	1.5–3.3	SOIL	—	43.7	—	—	0.158	—	1.43	—	10.4	—	—
RE02-07-2605	02-600584	9.5–11.7	QAL	—	—	—	—	—	—	—	—	9.26	—	—
RE02-07-2606	02-600584	16.5–21	QBO	6960	—	—	248	—	4.95 (J+)	—	—	9.12	7.39	—
RE02-10-21656	02-612325	5–6	SOIL	—	—	—	—	0.117 (J+)	—	NA	NA	—	—	—
RE02-10-21657	02-612325	15–16	QAL	—	—	—	—	—	—	NA	NA	—	—	—
RE02-10-21658	02-612325	25–26	QBO	5680	—	—	281	0.334	—	NA	NA	1.27 (U)	4.74	—
RE02-10-21659	02-612325	35–37	QBO	5620	—	—	247	—	—	NA	NA	1.19 (U)	—	—
RE02-10-21660	02-612325	49–50	QBO	5140	—	—	202	—	—	NA	NA	1.28 (U)	—	—
RE02-10-21661	02-612326	5–6	SOIL	—	—	—	—	0.311	—	NA	NA	—	—	50.7
RE02-10-21662	02-612326	15–16	QAL	—	—	—	1860 (J-)	—	—	NA	NA	—	—	—
RE02-10-21663	02-612326	25–26	QBO	5620	—	—	194 (J-)	—	—	NA	NA	1.24 (U)	—	—
RE02-10-21664	02-612326	35–37	QBO	6020	—	—	190 (J-)	—	—	NA	NA	1.09 (U)	—	—
RE02-10-21665	02-612326	49–50	QBO	5800	—	—	213 (J-)	—	—	NA	NA	1.15 (U)	—	—
RE02-10-21666	02-612327	5–6	QAL	—	—	—	—	—	—	NA	NA	—	—	—
RE02-10-21667	02-612327	15–16	QAL	—	—	—	—	—	—	NA	NA	—	—	—
RE02-10-21668	02-612327	25–26	QBO	5930	—	—	198	—	—	NA	NA	1.24 (U)	—	—
RE02-10-21669	02-612327	35–36	QBO	5750	—	—	215	—	—	NA	NA	1.26 (U)	—	—
RE02-10-21670	02-612327	49–50	QBO	5210	—	—	—	—	—	NA	NA	1.23 (U)	—	—
RE02-10-21671	02-612328	5–6	SOIL	—	—	—	—	—	—	NA	NA	—	—	—
RE02-10-21672	02-612328	15–16	QAL	—	—	—	—	—	—	NA	NA	—	—	—
RE02-10-21673	02-612328	25–26	QBO	4860	—	—	—	—	—	NA	NA	1.28 (U)	—	—
RE02-10-21674	02-612328	35–36	QBO	5090	—	—	294 (J+)	—	—	NA	NA	1.21 (U)	—	—
RE02-10-21675	02-612328	49–50	QBO	5670	—	—	235	—	—	NA	NA	1.38 (U)	—	—
RE02-10-21747	02-612346	8–9	QAL	—	—	—	—	40.6	—	NA	NA	—	—	—

Table 6.7-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3700**	**13.5**	**739**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**4.59**	**40**
Soil BV[a]				**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**39.6**	**48.8**
Industrial SSL[c]				**908,000**	**800**	**na**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6530**	**389,000**
Recreational SSL[e]				**434,000**	**1110**	**na**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**3100**	**186,000**
Residential SSL[c]				**54,800**	**400**	**na**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**394**	**23,500**
RE02-10-21748	02-612346	15–16	QAL	—	—	—	—	5.87	—	NA	NA	—	—	—
RE02-10-21749	02-612346	25–26	QBO	6340	—	—	226	0.148	—	NA	NA	1.22 (U)	—	—
RE02-10-21750	02-612346	35–36	QBO	5340	—	—	195	0.154	—	NA	NA	1.28 (U)	—	—
RE02-10-21751	02-612346	49–50	QBO	5990	—	—	260	—	—	NA	NA	1.19 (U)	—	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 6.7-3
Organic Chemicals Detected at AOC 02-004(a)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1242	Aroclor-1248	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chloroform	Chrysene
Industrial SSL[a]				**50,500**	**959,000**	**253,000**	**10.7**	**10.7**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**28.4**	**3230**
Recreational SSL[c]				**17,300**	**505,000**	**863,000**	**10.3**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**888**	**204**	**8880**
Residential SSL[a]				**3480**	**66,300**	**17,400**	**2.43**	**2.43**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**5.85**	**152**
RE02-07-1528	02-600378	0–0.5	SOIL	NA[d]	NA	NA	—[e]	—	0.346	0.395	NA	NA	NA	NA	NA	NA	NA
RE02-07-6840	02-600378	0–0.5	SOIL	—	NA	—	NA	NA	NA	NA	0.0291 (J)	0.0463	0.0322 (J)	0.0143 (J)	0.0217 (J)	NA	0.0293 (J)
RE02-07-1532	02-600379	0–0.5	SOIL	NA	NA	NA	—	—	—	1.74	NA	NA	NA	NA	NA	NA	NA
RE02-07-6844	02-600379	0–0.5	SOIL	—	NA	0.0134 (J)	NA	NA	NA	NA	0.0295 (J)	0.0513	0.0412	—	—	NA	0.0286 (J)
RE02-07-6845	02-600379	9.5–10.5	QAL	0.0187 (J)	—	0.0269 (J)	NA	NA	NA	NA	0.0583	0.0801	0.106	0.0333 (J)	—	—	0.0584
RE02-07-1533	02-600379	9.5–14	QBO	NA	NA	NA	—	—	—	0.0052	NA	NA	NA	NA	NA	NA	NA
RE02-07-6847	02-600379	10.5–11.5	QBO	—	—	0.00737 (J)	NA	NA	NA	NA	0.0131 (J)	—	—	—	—	—	—
RE02-07-1536	02-600380	0–0.5	SOIL	NA	NA	NA	—	—	0.105	0.0769	NA	NA	NA	NA	NA	NA	NA
RE02-07-6848	02-600380	0–0.5	SOIL	0.0138 (J)	NA	0.0332 (J)	NA	NA	NA	NA	0.141	0.14	0.269	0.0799 (J)	—	NA	0.163
RE02-07-1537	02-600380	9.5–12	QBO	NA	NA	NA	—	—	0.0143 (J)	0.0163 (J)	NA	NA	NA	NA	NA	NA	NA
RE02-07-1540	02-600381	0–0.5	SOIL	—	NA	—	—	—	0.659	0.439	—	—	—	—	—	NA	—
RE02-07-1544	02-600382	0–0.5	SOIL	NA	NA	NA	—	—	—	2.42	NA	NA	NA	NA	NA	NA	NA
RE02-07-6856	02-600382	0–0.5	SOIL	—	NA	—	NA	NA	NA	NA	—	—	0.0121 (J)	—	—	NA	—
RE02-07-1545	02-600382	9.5–12	QBO	NA	NA	NA	—	—	—	0.003 (J)	NA	NA	NA	NA	NA	NA	NA
RE02-07-1548	02-600383	0–0.5	SOIL	NA	NA	NA	—	—	0.0405	0.0876	NA	NA	NA	NA	NA	NA	NA
RE02-07-6860	02-600383	0–0.5	SOIL	—	NA	—	NA	NA	NA	NA	—	0.0388	0.0809	0.0302 (J)	—	NA	0.0393
RE02-07-6861	02-600383	9.5–10.5	QAL	—	0.004 (J)	0.0106 (J)	NA	NA	NA	NA	0.0483	0.0573	0.0775	0.027 (J)	—	—	0.0488
RE02-07-1549	02-600383	9.5–12	QAL	NA	NA	NA	—	—	—	0.0164 (J)	NA	NA	NA	NA	NA	NA	NA
RE02-07-6864	02-600384	0–0.5	SOIL	—	NA	—	NA	NA	NA	NA	0.0288 (J)	0.0482	0.0673	—	—	NA	0.033 (J)
RE02-07-6865	02-600384	9.5–10.5	QAL	—	—	—	NA	NA	NA	NA	0.033 (J)	0.0443	0.035 (J)	0.0198 (J)	—	—	0.0299 (J)
RE02-07-1553	02-600384	9.5–13	QAL	NA	NA	NA	—	—	0.0094 (J)	0.0077 (J)	NA	NA	NA	NA	NA	NA	NA
RE02-07-1655	02-600409	0–0.5	SOIL	0.0177 (J)	NA	0.028 (J)	—	—	—	2.11	0.0607	0.0693	0.102	0.0422	—	NA	0.0747
RE02-07-1656	02-600409	4.5–9.5	QAL	—	—	—	—	—	0.0327	0.0577	—	—	—	—	—	—	—
RE02-07-1657	02-600409	9.5–14.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1659	02-600409	14.5–24.5	QBO	—	—	—	—	—	—	0.0014 (J)	—	—	—	—	—	—	—
RE02-07-1661	02-600410	0–0.5	SOIL	0.0427	NA	0.0901	—	—	0.0231 (J)	0.0384	0.195	0.228	0.369	0.16	—	NA	0.189
RE02-07-1662	02-600410	4.5–9.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1667	02-600411	0–0.5	SOIL	0.0381	NA	0.0764	—	—	0.093	0.213	0.181	0.206	0.351	0.156	—	NA	0.197
RE02-07-1668	02-600411	4.5–7	QAL	—	—	0.0125 (J)	—	—	0.0243 (J-)	0.0246 (J-)	0.0426	0.0413 (J)	0.0493 (J)	—	—	—	0.0423

Table 6.7-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1242	Aroclor-1248	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chloroform	Chrysene
Industrial SSL[a]				**50,500**	**959,000**	**253,000**	**10.7**	**10.7**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**28.4**	**3230**
Recreational SSL[c]				**17,300**	**505,000**	**863,000**	**10.3**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**888**	**204**	**8880**
Residential SSL[a]				**3480**	**66,300**	**17,400**	**2.43**	**2.43**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**5.85**	**152**
RE02-07-1669	02-600411	9.5–14.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1671	02-600411	14.5–21	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1673	02-600412	0–0.5	SOIL	0.0511	NA	0.0793	—	—	0.412	1.05	0.139	0.157	0.246	0.147	—	NA	0.134
RE02-07-1674	02-600412	4.5–9.5	QAL	—	—	0.0238 (J)	—	0.0296 (J-)	0.0335 (J-)	0.0314 (J-)	0.0512	0.0614 (J)	0.0644 (J)	0.0359 (J)	—	—	0.0624
RE02-07-1675	02-600412	9.5–12	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1679	02-600413	0–0.5	SOIL	0.303	NA	0.483	—	—	0.358	0.839	0.807	0.899	1.37	0.43	—	NA	0.785
RE02-07-1680	02-600413	4.5–9.5	QAL	—	—	0.013 (J)	0.0209 (J)	—	0.0247 (J-)	0.0281 (J-)	—	0.0164 (J)	0.0627 (J)	—	—	—	0.0404
RE02-07-1681	02-600413	9.5–14.5	QAL	—	—	0.0186 (J)	—	—	—	—	—	—	—	—	—	—	0.0257 (J)
RE02-07-1683	02-600413	14.5–22.5	QBO	—	—	—	—	—	—	—	—	—	—	—	—	0.000268 (J)	—
RE02-07-1685	02-600414	0–0.5	SOIL	0.0497	NA	0.119	—	—	0.255	0.514	0.327	0.379 (J)	0.648 (J)	0.224 (J)	—	NA	0.336
RE02-07-1686	02-600414	4.5–9.5	QAL	—	—	—	—	—	—	0.003 (J)	—	—	—	—	—	—	—
RE02-07-1687	02-600414	9.5–14.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1689	02-600414	14.5–20	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1691	02-600415	0–0.5	SOIL	0.0269 (J)	NA	0.0599	—	—	—	0.0166 (J)	0.161	0.254	0.324	—	—	NA	0.177
RE02-07-1692	02-600415	4.5–5.1	SOIL	—	—	—	—	—	0.0258 (J)	0.0475	—	—	0.037 (J)	—	—	0.000242 (J)	—
RE02-07-1693	02-600415	9.5–14	QAL	—	0.00865	—	—	—	—	0.0057	0.0143 (J)	0.0126 (J)	0.0127 (J)	—	—	—	0.0118 (J)
RE02-07-1696	02-600415	14.5–16.6	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1695	02-600415	19.5–21.7	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1697	02-600416	0–0.5	SOIL	0.0178 (J)	NA	0.027 (J)	—	—	0.35	0.142	0.167	0.151 (J)	0.303 (J)	—	—	NA	0.148
RE02-07-1699	02-600416	9.5–14.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1701	02-600416	14.5–19.5	QBO	—	—	—	—	—	—	0.0021 (J)	—	—	—	—	—	—	—
RE02-07-1703	02-600417	0–0.5	SOIL	—	NA	—	—	—	—	0.0224 (J)	0.0683 (J)	—	—	—	—	NA	—
RE02-07-1704	02-600417	4.5–9.5	QAL	—	—	—	—	0.0867	—	0.0047	—	—	—	—	—	—	—
RE02-07-1707	02-600417	13–15.5	QBO	—	—	—	—	—	—	0.0398	—	—	—	—	—	—	—
RE02-07-1919	02-600456	0–0.5	SOIL	—	NA	—	—	—	—	0.0106 (J-)	0.0278 (J)	—	0.0313 (J)	—	—	NA	0.0221 (J)
RE02-07-1922	02-600456	10–14	QAL	—	0.00366 (J)	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1923	02-600457	0–0.5	SOIL	—	NA	—	—	—	—	0.0731 (J)	—	0.000251 (J)	0.000318 (J)	0.00012 (J)	—	NA	0.000201 (J)
RE02-07-1926	02-600457	9.5–14	QAL	—	—	—	—	—	0.0219	0.0071	—	—	—	—	—	—	—
RE02-07-1927	02-600458	0–0.5	SOIL	—	NA	—	—	—	0.248	0.229 (J)	—	—	—	—	0.0314 (J)	NA	0.05
RE02-07-1930	02-600458	9.5–14.5	QAL	—	—	—	—	—	0.0251	0.0182 (J)	—	—	—	—	—	—	—
RE02-07-1929	02-600458	15.5–19.5	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1931	02-600459	0–0.5	SOIL	0.0152 (J)	NA	0.0187 (J)	—	—	0.0534	0.0743 (J)	0.119 (J)	0.178 (J)	0.191 (J)	0.0602 (J)	—	NA	0.145 (J)
RE02-07-1934	02-600459	9.5–14	QAL	—	—	—	—	—	—	0.0255 (J)	—	—	—	—	—	—	—
RE02-07-1933	02-600459	15–19	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 6.7-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1242	Aroclor-1248	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chloroform	Chrysene
Industrial SSL[a]				**50,500**	**959,000**	**253,000**	**10.7**	**10.7**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**28.4**	**3230**
Recreational SSL[c]				**17,300**	**505,000**	**863,000**	**10.3**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**888**	**204**	**8880**
Residential SSL[a]				**3480**	**66,300**	**17,400**	**2.43**	**2.43**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**5.85**	**152**
RE02-07-1935	02-600460	0–2.3	SOIL	—	NA	—	—	—	—	0.0088 (J-)	—	—	—	—	—	NA	—
RE02-07-1937	02-600460	15.5–20	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1939	02-600461	0–0.5	SOIL	—	NA	0.00824 (J)	—	—	—	0.0078 (J)	0.064 (J)	—	—	—	—	NA	0.0687 (J)
RE02-07-1941	02-600461	9.5–14	QBO	—	—	—	—	—	—	0.0026 (J)	—	—	—	—	—	—	—
RE02-07-1943	02-600462	0–0.5	SOIL	—	NA	0.00986 (J-)	—	—	0.0177	0.0193	0.0964 (J)	0.139 (J)	0.161 (J)	—	—	NA	0.11 (J)
RE02-07-1946	02-600462	9.5–14	QAL	—	—	0.112	—	—	—	0.0073 (J)	0.803 (J)	0.523 (J)	0.859 (J)	0.156 (J)	—	—	0.961 (J)
RE02-07-1945	02-600462	15–20	QBO	—	—	0.00993 (J)	—	—	—	—	0.0584 (J)	—	—	—	—	—	0.0564 (J)
RE02-07-1947	02-600463	0–0.5	SOIL	—	NA	0.0115 (J)	—	—	0.0551 (J-)	0.0393 (J)	0.114	0.141 (J)	0.315 (J)	0.0752 (J)	—	NA	0.162
RE02-07-1951	02-600464	0–0.5	SOIL	—	NA	—	—	—	—	0.103 (J)	—	—	—	—	—	NA	—
RE02-07-1955	02-600465	0–0.5	SOIL	—	NA	—	—	—	—	0.0064	—	—	—	—	—	NA	—
RE02-07-1959	02-600466	0–0.5	SOIL	—	NA	—	—	—	—	0.0067 (J)	0.0439 (J)	—	0.0778 (J)	—	—	NA	0.046 (J)
RE02-07-1963	02-600467	0–0.8	SOIL	—	NA	—	—	—	0.002 (J)	0.003 (J)	—	—	0.0105 (J)	—	—	NA	—
RE02-07-1964	02-600467	9.5–10	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1965	02-600467	10–12.5	QBO	—	0.0053 (J)	—	—	—	—	—	—	—	—	—	—	—	—
RE02-10-21775	02-600580	3–3.2	SOIL	0.0219	NA	0.0426	NA	NA	NA	NA	0.222	0.203	0.276	0.104	0.0875	NA	0.213
RE02-10-21777	02-600580	5–5.2	SOIL	0.0853	NA	0.127	NA	NA	NA	NA	0.59	0.545	0.683	0.31	0.244	NA	0.493
RE02-07-2586	02-600580	11–16	QBO	—	NA	0.0334 (J)	NA	NA	NA	NA	0.122	0.108	0.162	0.0618	—	NA	0.131
RE02-07-2589	02-600581	0–0.5	SOIL	0.0312 (J)	NA	0.0613	NA	NA	NA	NA	0.422	0.361	0.609	0.182	—	NA	0.435
RE02-07-2592	02-600581	9.5–13	QAL	—	NA	—	NA	NA	NA	NA	0.0756	0.103	0.0771	—	0.0369 (J)	NA	0.0829
RE02-07-2591	02-600581	14–16	QBO	—	NA	0.023 (J)	NA	NA	NA	NA	0.101	0.104	0.0772	—	0.038 (J)	NA	0.0948
RE02-07-2594	02-600582	0–0.5	SOIL	—	NA	0.0104 (J)	NA	NA	NA	NA	0.062	0.088	0.138	0.0266 (J)	—	NA	0.0669
RE02-07-2599	02-600583	0–1.5	SOIL	—	NA	0.00735 (J)	NA	NA	NA	NA	0.034 (J)	0.0806	0.0709	—	—	NA	0.0392
RE02-07-2601	02-600583	8.5–10	SOIL	—	—	—	NA	NA	NA	NA	—	—	—	—	—	0.000232 (J)	—
RE02-07-2602	02-600583	15.5–20	QBO	—	—	—	NA	NA	NA	NA	—	—	—	—	—	—	—
RE02-10-21747	02-612346	8–9	QAL	—	NA	—	—	—	—	0.0046	—	—	—	—	—	NA	—
RE02-10-21748	02-612346	15–16	QAL	—	NA	—	—	—	0.0068	0.014	—	—	—	—	—	NA	—
RE02-10-21778	02-612350	3–3.2	SOIL	0.0102	NA	0.0214	NA	NA	NA	NA	0.157	—	0.294	0.105	—	NA	—
RE02-10-21779	02-612350	5–5.2	SOIL	0.225	NA	0.885	NA	NA	NA	NA	2.23	—	2.78	0.668	—	NA	2.16
RE02-10-21782	02-612351	5–5.2	SOIL	—	NA	0.00519 (J)	NA	NA	NA	NA	0.0176	0.0117	0.0203	0.00405 (J)	—	NA	0.0147
RE02-10-21784	02-612352	3–3.2	SOIL	0.0777	NA	0.0938	NA	NA	NA	NA	0.377	0.362	0.482	0.21	0.145	NA	0.313
RE02-10-21785	02-612352	5–5.2	SOIL	—	NA	0.00473 (J)	NA	NA	NA	NA	0.0193	0.0169	0.023	0.00837	0.00747	NA	0.0161
RE02-10-21787	02-612353	3–3.4	SOIL	—	NA	—	NA	NA	NA	NA	0.0192	0.0141	0.0209	0.00663 (J)	—	NA	0.0163
RE02-10-21788	02-612353	5–5.2	SOIL	—	NA	—	NA	NA	NA	NA	0.00428 (J)	0.00368 (J)	0.00477 (J)	—	—	NA	—

Table 6.7-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Dibenzofuran	Fluoranthene	Fluorene	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-]
Industrial SSL[a]				**1000**[f]	**33,700**	**33,700**	**na**[g]	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Recreational SSL[c]				**489**	**11,500**	**11,500**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Residential SSL[a]				**73**[f]	**2320**	**2320**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
RE02-07-1528	02-600378	0–0.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-6840	02-600378	0–0.5	SOIL	—	0.0451	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1532	02-600379	0–0.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-6844	02-600379	0–0.5	SOIL	—	0.043	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-6845	02-600379	9.5–10.5	QAL	—	0.105	0.0145 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1533	02-600379	9.5–14	QBO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-6847	02-600379	10.5–11.5	QBO	—	0.0154 (J)	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1536	02-600380	0–0.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-6848	02-600380	0–0.5	SOIL	—	0.334	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1537	02-600380	9.5–12	QBO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1540	02-600381	0–0.5	SOIL	—	0.0161 (J)	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1544	02-600382	0–0.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-6856	02-600382	0–0.5	SOIL	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1545	02-600382	9.5–12	QBO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1548	02-600383	0–0.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-6860	02-600383	0–0.5	SOIL	—	0.0571	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-6861	02-600383	9.5–10.5	QAL	—	0.106	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1549	02-600383	9.5–12	QAL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-6864	02-600384	0–0.5	SOIL	—	0.0499	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-6865	02-600384	9.5–10.5	QAL	—	0.063	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1553	02-600384	9.5–13	QAL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1655	02-600409	0–0.5	SOIL	—	0.101	0.0142 (J)	0.0000275	0.0000741	0.000018	0.00000205 (J)	0.000039	—	—	—	0.00000531	0.0000144
RE02-07-1656	02-600409	4.5–9.5	QAL	—	—	—	0.000000805 (J)	0.00000237	0.00000056 (J)	—	0.00000143	—	—	—	—	0.000000156 (J)
RE02-07-1657	02-600409	9.5–14.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	0.000000096 (J)
RE02-07-1659	02-600409	14.5–24.5	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1661	02-600410	0–0.5	SOIL	—	0.373	0.0398	0.0000328	0.0000761	0.00000552	—	0.0000176	—	0.000000917 (J)	0.000000506 (J)	0.00000626	0.000000533 (J)
RE02-07-1662	02-600410	4.5–9.5	QAL	—	—	—	—	—	0.000000117 (J)	—	0.000000117	—	—	—	—	—

Table 6.7-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Dibenzofuran	Fluoranthene	Fluorene	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-]
Industrial SSL[a]				**1000**[f]	**33,700**	**33,700**	**na**[g]	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Recreational SSL[c]				**489**	**11,500**	**11,500**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Residential SSL[a]				**73**[f]	**2320**	**2320**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
RE02-07-1667	02-600411	0–0.5	SOIL	—	0.368	0.031 (J)	0.0000322	0.0000766	0.00000673	0.000000489 (J)	0.0000204	—	0.000000871 (J)	0.000000485 (J)	0.00000648	0.0000018 (J)
RE02-07-1668	02-600411	4.5–7	QAL	—	0.0982	—	0.0000162	0.0000366	0.00000331	—	0.00000898	0.000000557 (J)	0.000000565 (J)	—	0.00000305	0.000000349 (J)
RE02-07-1669	02-600411	9.5–14.5	QAL	—	—	—	0.00000107 (J)	0.00000107	—	—	0.00000058	—	—	—	—	—
RE02-07-1671	02-600411	14.5–21	QBO	—	—	—	—	0.000000313	—	—	—	—	—	—	—	—
RE02-07-1673	02-600412	0–0.5	SOIL	—	0.271	0.0462	0.000046	0.000114	0.0000156	0.00000105 (J)	0.0000409	—	0.00000151 (J)	—	0.00000947	0.0000071
RE02-07-1674	02-600412	4.5–9.5	QAL	—	0.121	0.0117 (J)	0.0000184	0.0000359	0.00000433	0.000000993 (J)	0.0000119	—	0.000000527 (J)	—	0.00000159	0.00000234 (J)
RE02-07-1675	02-600412	9.5–12	QAL	—	—	—	0.00000196 (J)	0.00000402	—	—	0.00000119	—	—	—	—	—
RE02-07-1679	02-600413	0–0.5	SOIL	0.174 (J)	1.52	0.273	0.000116	0.000385	0.0000424	0.00000181 (J)	0.000155	—	0.00000224 (J)	—	0.000013	0.00000821
RE02-07-1680	02-600413	4.5–9.5	QAL	—	0.0711	—	0.0000164	0.000034	0.00000358	0.000000288 (J)	0.00000952	0.000000226 (J)	0.000000602 (J)	0.000000465 (J)	0.00000461	0.000000552 (J)
RE02-07-1681	02-600413	9.5–14.5	QAL	—	0.0544	—	0.000000476 (J)	0.000000934	0.000000178 (J)	—	0.000000178	—	—	—	—	—
RE02-07-1683	02-600413	14.5–22.5	QBO	—	—	—	0.000000754 (J)	0.00000148	0.000000189 (J)	—	0.000000567	—	—	—	—	—
RE02-07-1685	02-600414	0–0.5	SOIL	—	0.583	0.046	0.000042	0.0000908	0.0000114	0.00000145 (J)	0.0000294	—	0.00000135 (J)	0.000000849 (J)	0.0000104	0.00000759
RE02-07-1686	02-600414	4.5–9.5	QAL	—	—	—	0.000000369 (J)	0.000000881	0.00000011 (J)	—	0.00000011	—	—	—	—	—
RE02-07-1687	02-600414	9.5–14.5	QAL	—	—	—	0.00000072 (J)	0.0000014	0.000000235 (J)	—	0.000000626	—	—	—	—	—
RE02-07-1689	02-600414	14.5–20	QBO	—	—	—	—	0.000000212	—	—	—	—	—	—	—	—
RE02-07-1691	02-600415	0–0.5	SOIL	—	0.221	0.0264 (J)	0.0000203	0.0000571	0.00000591 (J)	0.00000018 (J)	0.0000213 (J)	—	0.000000518 (J)	—	0.00000304	0.000000183 (J)
RE02-07-1692	02-600415	4.5–5.1	SOIL	—	0.0312 (J)	—	0.0000193	0.0000403	0.0000027 (J)	0.000000262 (J)	0.0000075 (J)	0.000000276 (J)	—	0.000000543 (J)	0.00000498	0.00000033 (J)
RE02-07-1693	02-600415	9.5–14	QAL	—	0.023 (J)	—	0.0000124	0.0000241	0.00000194 (J)	—	0.0000065	—	—	—	0.00000137	—
RE02-07-1696	02-600415	14.5–16.6	QAL	—	—	—	0.00000878	0.0000162	0.00000142 (J)	—	0.00000724	—	—	—	0.000000695	—
RE02-07-1695	02-600415	19.5–21.7	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1697	02-600416	0–0.5	SOIL	—	0.261	0.0122 (J)	0.0000718	0.000132	0.0000105	0.000000706 (J)	0.0000382	0.000000532 (J)	0.00000244 (J)	—	0.0000144	0.00000108 (J)
RE02-07-1699	02-600416	9.5–14.5	QAL	—	—	—	0.0000235	0.0000484	0.00000447	—	0.0000234	—	—	—	0.0000019	0.000000166 (J-)
RE02-07-1701	02-600416	14.5–19.5	QBO	—	—	—	0.00000862	0.0000159	0.00000166 (J)	—	0.0000075	—	—	—	—	0.00000014 (J)
RE02-07-1703	02-600417	0–0.5	SOIL	—	0.101	—	0.0000461	0.0000973	0.00000792	0.000000625 (J)	0.0000217	0.000000755 (J)	0.00000163 (J)	0.00000148 (J)	0.0000173	0.00000153 (J)
RE02-07-1704	02-600417	4.5–9.5	QAL	—	—	—	0.00000163 (J)	0.0000033	—	—	—	—	—	—	—	—
RE02-07-1707	02-600417	13–15.5	QBO	—	—	—	0.000118	0.000233	0.0000256	0.0000027	0.000132	0.00000376	0.00000362	—	0.0000122	0.000000648 (J)
RE02-07-1919	02-600456	0–0.5	SOIL	—	0.0399	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 6.7-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Dibenzofuran	Fluoranthene	Fluorene	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-]
Industrial SSL[a]				**1000[f]**	**33,700**	**33,700**	**na[g]**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Recreational SSL[c]				**489**	**11,500**	**11,500**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Residential SSL[a]				**73[f]**	**2320**	**2320**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
RE02-07-1922	02-600456	10–14	QAL	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1923	02-600457	0–0.5	SOIL	—	0.000348 (J)	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1926	02-600457	9.5–14	QAL	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1927	02-600458	0–0.5	SOIL	—	0.0917	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1930	02-600458	9.5–14.5	QAL	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1929	02-600458	15.5–19.5	QBO	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1931	02-600459	0–0.5	SOIL	—	0.174	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1934	02-600459	9.5–14	QAL	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1933	02-600459	15–19	QBO	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1935	02-600460	0–2.3	SOIL	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1937	02-600460	15.5–20	QBO	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1939	02-600461	0–0.5	SOIL	—	0.0723	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1941	02-600461	9.5–14	QBO	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1943	02-600462	0–0.5	SOIL	—	0.0979 (J-)	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1946	02-600462	9.5–14	QAL	—	1.21	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1945	02-600462	15–20	QBO	—	0.1	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1947	02-600463	0–0.5	SOIL	—	0.115	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1951	02-600464	0–0.5	SOIL	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1955	02-600465	0–0.5	SOIL	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1959	02-600466	0–0.5	SOIL	—	0.0383	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1963	02-600467	0–0.8	SOIL	—	0.0183 (J)	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1964	02-600467	9.5–10	QAL	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1965	02-600467	10–12.5	QBO	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21775	02-600580	3–3.2	SOIL	NA	0.246	0.0121	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21777	02-600580	5–5.2	SOIL	NA	0.595	0.04	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-2586	02-600580	11–16	QBO	—	0.213	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-2589	02-600581	0–0.5	SOIL	—	0.626	0.0143 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 6.7-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Dibenzofuran	Fluoranthene	Fluorene	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-]
Industrial SSL[a]				**1000[f]**	**33,700**	**33,700**	**na[g]**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Recreational SSL[c]				**489**	**11,500**	**11,500**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Residential SSL[a]				**73[f]**	**2320**	**2320**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
RE02-07-2592	02-600581	9.5–13	QAL	—	0.103	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-2591	02-600581	14–16	QBO	—	0.202	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-2594	02-600582	0–0.5	SOIL	—	0.124	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-2599	02-600583	0–1.5	SOIL	—	0.0538	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-2601	02-600583	8.5–10	SOIL	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-2602	02-600583	15.5–20	QBO	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21747	02-612346	8–9	QAL	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21748	02-612346	15–16	QAL	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21778	02-612350	3–3.2	SOIL	NA	0.131	0.00675 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21779	02-612350	5–5.2	SOIL	NA	2.46	0.242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21782	02-612351	5–5.2	SOIL	NA	0.0206	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21784	02-612352	3–3.2	SOIL	NA	0.394	0.0336	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21785	02-612352	5–5.2	SOIL	NA	0.0241	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21787	02-612353	3–3.4	SOIL	NA	0.0153	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21788	02-612353	5–5.2	SOIL	NA	0.00387 (J)	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 6.7-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofuran[1,2,3,6,7,8-]	Hexachlorodibenzofuran[1,2,3,7,8,9-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	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)
Industrial SSL[a]				**na**	**na**	**na**	**na**	**32.3**	**14,100[h]**	**5110**	**3370**	**16,800**	**na**	**na**	**na**	**na**
Recreational SSL[c]				**na**	**na**	**na**	**na**	**88.8**	**42,100[h]**	**3610**	**1150**	**1930**	**na**	**na**	**na**	**na**
Residential SSL[a]				**na**	**na**	**na**	**na**	**1.53**	**2350[h]**	**409**	**232**	**1160**	**na**	**na**	**na**	**na**
RE02-07-1528	02-600378	0–0.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-6840	02-600378	0–0.5	SOIL	NA	NA	NA	NA	—	NA	NA	—	—	NA	NA	NA	NA
RE02-07-1532	02-600379	0–0.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-6844	02-600379	0–0.5	SOIL	NA	NA	NA	NA	—	NA	NA	—	0.0146 (J)	NA	NA	NA	NA
RE02-07-6845	02-600379	9.5–10.5	QAL	NA	NA	NA	NA	0.0269 (J)	—	—	0.0145 (J)	0.0383	NA	NA	NA	NA
RE02-07-1533	02-600379	9.5–14	QBO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-6847	02-600379	10.5–11.5	QBO	NA	NA	NA	NA	—	—	—	0.00764 (J)	0.0237 (J)	NA	NA	NA	NA
RE02-07-1536	02-600380	0–0.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-6848	02-600380	0–0.5	SOIL	NA	NA	NA	NA	0.0715	NA	NA	—	—	NA	NA	NA	NA
RE02-07-1537	02-600380	9.5–12	QBO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1540	02-600381	0–0.5	SOIL	NA	NA	NA	NA	—	NA	NA	—	—	NA	NA	NA	NA
RE02-07-1544	02-600382	0–0.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-6856	02-600382	0–0.5	SOIL	NA	NA	NA	NA	—	NA	NA	—	—	NA	NA	NA	NA
RE02-07-1545	02-600382	9.5–12	QBO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1548	02-600383	0–0.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-6860	02-600383	0–0.5	SOIL	NA	NA	NA	NA	0.0252 (J)	NA	NA	—	—	NA	NA	NA	NA
RE02-07-6861	02-600383	9.5–10.5	QAL	NA	NA	NA	NA	0.0183 (J)	—	—	—	—	NA	NA	NA	NA
RE02-07-1549	02-600383	9.5–12	QAL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-6864	02-600384	0–0.5	SOIL	NA	NA	NA	NA	—	NA	NA	—	—	NA	NA	NA	NA
RE02-07-6865	02-600384	9.5–10.5	QAL	NA	NA	NA	NA	0.0116 (J)	—	—	—	—	NA	NA	NA	NA
RE02-07-1553	02-600384	9.5–13	QAL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1655	02-600409	0–0.5	SOIL	0.00000556	0.00000101 (J)	0.00000823	0.000101	0.0403	NA	NA	—	—	0.000292	0.0000254	—	0.000000327
RE02-07-1656	02-600409	4.5–9.5	QAL	—	—	0.000000124 (J)	0.00000101	—	—	—	—	—	0.00000649	0.00000119 (J)	—	—
RE02-07-1657	02-600409	9.5–14.5	QAL	—	—	—	0.000000096	—	—	—	—	—	—	—	—	—
RE02-07-1659	02-600409	14.5–24.5	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1661	02-600410	0–0.5	SOIL	—	—	0.000000365 (J)	0.00000579	0.153	NA	NA	0.0172 (J)	0.0328 (J)	0.000384	0.000016	—	—

Table 6.7-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofuran[1,2,3,6,7,8-]	Hexachlorodibenzofuran[1,2,3,7,8,9-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	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)
Industrial SSL[a]				**na**	**na**	**na**	**na**	**32.3**	**14,100[h]**	**5110**	**3370**	**16,800**	**na**	**na**	**na**	**na**
Recreational SSL[c]				**na**	**na**	**na**	**na**	**88.8**	**42,100[h]**	**3610**	**1150**	**1930**	**na**	**na**	**na**	**na**
Residential SSL[a]				**na**	**na**	**na**	**na**	**1.53**	**2350[h]**	**409**	**232**	**1160**	**na**	**na**	**na**	**na**
RE02-07-1662	02-600410	4.5–9.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1667	02-600411	0–0.5	SOIL	0.000000787 (J)	—	0.00000121 (J)	0.000016	0.153	NA	NA	0.00986 (J)	0.017 (J)	0.000404	0.0000184	0.000000192 (J)	0.000000192
RE02-07-1668	02-600411	4.5–7	QAL	—	—	0.00000016 (J)	0.00000334	—	—	—	—	—	0.000217	0.00000896	—	—
RE02-07-1669	02-600411	9.5–14.5	QAL	—	—	—	—	—	—	—	—	—	0.0000122	—	—	—
RE02-07-1671	02-600411	14.5–21	QBO	—	—	—	—	—	—	—	—	—	0.00000209 (J)	—	—	—
RE02-07-1673	02-600412	0–0.5	SOIL	0.0000031	0.000000608 (J)	0.00000527	0.0000641	0.14	NA	NA	0.033 (J)	0.0897	0.000522	0.0000287	—	0.000000262
RE02-07-1674	02-600412	4.5–9.5	QAL	0.00000111 (J)	—	0.000000656 (J)	0.00000923	0.0317 (J)	—	—	—	0.014 (J)	0.000203	0.0000104	—	—
RE02-07-1675	02-600412	9.5–12	QAL	—	—	—	—	—	—	—	—	—	0.0000254	0.000000994 (J)	—	—
RE02-07-1679	02-600413	0–0.5	SOIL	0.0000032	0.000000636 (J)	0.00000559	0.0000746	0.411	NA	NA	0.16	0.352	0.0022	0.000183	—	—
RE02-07-1680	02-600413	4.5–9.5	QAL	—	—	0.000000368 (J)	0.00000474	—	—	—	—	—	0.000164	0.00000901	0.000000128 (J)	0.000000408
RE02-07-1681	02-600413	9.5–14.5	QAL	—	—	—	—	—	—	—	—	—	0.00000585	0.000000369 (J)	—	—
RE02-07-1683	02-600413	14.5–22.5	QBO	—	—	—	0.0000000332	—	—	—	—	—	0.00000854	0.000000668 (J)	—	—
RE02-07-1685	02-600414	0–0.5	SOIL	0.00000261	0.000000589 (J)	0.00000383	0.0000481 (J)	0.221 (J)	NA	NA	0.0251 (J)	0.0439	0.000387	0.0000233	—	—
RE02-07-1686	02-600414	4.5–9.5	QAL	—	—	—	0.000000105	—	—	—	—	—	0.00000368 (J)	0.000000341 (J)	—	—
RE02-07-1687	02-600414	9.5–14.5	QAL	—	—	—	—	—	—	—	—	—	0.00000837	0.000000593 (J)	—	—
RE02-07-1689	02-600414	14.5–20	QBO	—	—	—	—	—	—	—	—	—	0.00000159 (J)	0.000000262 (J)	—	—
RE02-07-1691	02-600415	0–0.5	SOIL	—	—	0.000000165 (J)	0.00000463	0.213	NA	NA	0.0167 (J)	0.0446	0.000292 (J)	0.0000195	—	—
RE02-07-1692	02-600415	4.5–5.1	SOIL	—	—	0.000000234 (J)	0.00000346	—	—	—	—	—	0.000152 (J)	0.0000062	0.000000154 (J)	0.000000154
RE02-07-1693	02-600415	9.5–14	QAL	—	—	—	0.0000015	—	0.0006 (J)	—	—	—	0.00018	0.00000481	—	—
RE02-07-1696	02-600415	14.5–16.6	QAL	—	—	—	0.0000011	—	—	—	—	—	0.000102	0.00000502 (J)	—	—
RE02-07-1695	02-600415	19.5–21.7	QBO	—	—	—	—	—	—	—	—	—	0.000000553 (J)	—	—	—
RE02-07-1697	02-600416	0–0.5	SOIL	0.000000543 (J)	—	0.000000675 (J)	0.0000144 (J)	—	NA	NA	—	—	0.000659	0.0000392	0.000000243 (J)	0.00000105
RE02-07-1699	02-600416	9.5–14.5	QAL	—	—	—	0.00000347	—	—	—	—	—	0.00033	0.0000145	—	—
RE02-07-1701	02-600416	14.5–19.5	QBO	—	—	—	0.000000869	—	—	—	—	—	0.00011	0.00000618	—	—
RE02-07-1703	02-600417	0–0.5	SOIL	0.000000997 (J)	—	0.00000125 (J)	0.0000178 (J)	—	NA	NA	—	—	0.000441	0.0000171	0.000000421 (J)	0.00000259
RE02-07-1704	02-600417	4.5–9.5	QAL	—	—	—	0.000000125	—	—	—	—	—	0.0000272	0.00000101 (J)	—	—

Table 6.7-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofuran[1,2,3,6,7,8-]	Hexachlorodibenzofuran[1,2,3,7,8,9-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	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)
Industrial SSL[a]				**na**	**na**	**na**	**na**	**32.3**	**14,100[h]**	**5110**	**3370**	**16,800**	**na**	**na**	**na**	**na**
Recreational SSL[c]				**na**	**na**	**na**	**na**	**88.8**	**42,100[h]**	**3610**	**1150**	**1930**	**na**	**na**	**na**	**na**
Residential SSL[a]				**na**	**na**	**na**	**na**	**1.53**	**2350[h]**	**409**	**232**	**1160**	**na**	**na**	**na**	**na**
RE02-07-1707	02-600417	13–15.5	QBO	0.000000228 (J)	—	—	0.0000153	—	—	—	—	—	0.00149	0.0000889	—	—
RE02-07-1919	02-600456	0–0.5	SOIL	NA	NA	NA	NA	—	NA	NA	—	—	NA	NA	NA	NA
RE02-07-1922	02-600456	10–14	QAL	NA	NA	NA	NA	—	—	—	—	—	NA	NA	NA	NA
RE02-07-1923	02-600457	0–0.5	SOIL	NA	NA	NA	NA	—	NA	NA	—	—	NA	NA	NA	NA
RE02-07-1926	02-600457	9.5–14	QAL	NA	NA	NA	NA	—	—	—	—	—	NA	NA	NA	NA
RE02-07-1927	02-600458	0–0.5	SOIL	NA	NA	NA	NA	—	NA	NA	—	—	NA	NA	NA	NA
RE02-07-1930	02-600458	9.5–14.5	QAL	NA	NA	NA	NA	—	—	—	—	—	NA	NA	NA	NA
RE02-07-1929	02-600458	15.5–19.5	QBO	NA	NA	NA	NA	—	—	—	—	—	NA	NA	NA	NA
RE02-07-1931	02-600459	0–0.5	SOIL	NA	NA	NA	NA	—	NA	NA	—	—	NA	NA	NA	NA
RE02-07-1934	02-600459	9.5–14	QAL	NA	NA	NA	NA	—	—	—	—	—	NA	NA	NA	NA
RE02-07-1933	02-600459	15–19	QBO	NA	NA	NA	NA	—	—	—	—	—	NA	NA	NA	NA
RE02-07-1935	02-600460	0–2.3	SOIL	NA	NA	NA	NA	—	NA	NA	—	—	NA	NA	NA	NA
RE02-07-1937	02-600460	15.5–20	QBO	NA	NA	NA	NA	—	—	—	—	—	NA	NA	NA	NA
RE02-07-1939	02-600461	0–0.5	SOIL	NA	NA	NA	NA	—	NA	NA	—	—	NA	NA	NA	NA
RE02-07-1941	02-600461	9.5–14	QBO	NA	NA	NA	NA	—	—	—	—	—	NA	NA	NA	NA
RE02-07-1943	02-600462	0–0.5	SOIL	NA	NA	NA	NA	—	NA	NA	—	—	NA	NA	NA	NA
RE02-07-1946	02-600462	9.5–14	QAL	NA	NA	NA	NA	0.269 (J)	—	—	—	—	NA	NA	NA	NA
RE02-07-1945	02-600462	15–20	QBO	NA	NA	NA	NA	—	—	—	—	—	NA	NA	NA	NA
RE02-07-1947	02-600463	0–0.5	SOIL	NA	NA	NA	NA	0.0627 (J)	NA	NA	—	—	NA	NA	NA	NA
RE02-07-1951	02-600464	0–0.5	SOIL	NA	NA	NA	NA	—	NA	NA	—	—	NA	NA	NA	NA
RE02-07-1955	02-600465	0–0.5	SOIL	NA	NA	NA	NA	—	NA	NA	—	—	NA	NA	NA	NA
RE02-07-1959	02-600466	0–0.5	SOIL	NA	NA	NA	NA	—	NA	NA	—	—	NA	NA	NA	NA
RE02-07-1963	02-600467	0–0.8	SOIL	NA	NA	NA	NA	—	NA	NA	—	—	NA	NA	NA	NA
RE02-07-1964	02-600467	9.5–10	QAL	NA	NA	NA	NA	—	—	—	—	—	NA	NA	NA	NA
RE02-07-1965	02-600467	10–12.5	QBO	NA	NA	NA	NA	—	—	—	—	—	NA	NA	NA	NA
RE02-10-21775	02-600580	3–3.2	SOIL	NA	NA	NA	NA	0.0984	NA	NA	NA	0.00598 (J)	NA	NA	NA	NA

Table 6.7-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofuran[1,2,3,6,7,8-]	Hexachlorodibenzofuran[1,2,3,7,8,9-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	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)
Industrial SSL[a]				**na**	**na**	**na**	**na**	**32.3**	**14,100[h]**	**5110**	**3370**	**16,800**	**na**	**na**	**na**	**na**
Recreational SSL[c]				**na**	**na**	**na**	**na**	**88.8**	**42,100[h]**	**3610**	**1150**	**1930**	**na**	**na**	**na**	**na**
Residential SSL[a]				**na**	**na**	**na**	**na**	**1.53**	**2350[h]**	**409**	**232**	**1160**	**na**	**na**	**na**	**na**
RE02-10-21777	02-600580	5–5.2	SOIL	NA	NA	NA	NA	0.305	NA	NA	NA	0.0292	NA	NA	NA	NA
RE02-07-2586	02-600580	11–16	QBO	NA	NA	NA	NA	0.0429 (J)	NA	NA	—	—	NA	NA	NA	NA
RE02-07-2589	02-600581	0–0.5	SOIL	NA	NA	NA	NA	0.145	NA	NA	—	—	NA	NA	NA	NA
RE02-07-2592	02-600581	9.5–13	QAL	NA	NA	NA	NA	—	NA	NA	—	—	NA	NA	NA	NA
RE02-07-2591	02-600581	14–16	QBO	NA	NA	NA	NA	0.162	NA	NA	—	—	NA	NA	NA	NA
RE02-07-2594	02-600582	0–0.5	SOIL	NA	NA	NA	NA	0.0207 (J)	NA	NA	—	—	NA	NA	NA	NA
RE02-07-2599	02-600583	0–1.5	SOIL	NA	NA	NA	NA	—	NA	NA	—	—	NA	NA	NA	NA
RE02-07-2601	02-600583	8.5–10	SOIL	NA	NA	NA	NA	—	—	—	—	—	NA	NA	NA	NA
RE02-07-2602	02-600583	15.5–20	QBO	NA	NA	NA	NA	—	—	0.00242 (J)	—	—	NA	NA	NA	NA
RE02-10-21747	02-612346	8–9	QAL	NA	NA	NA	NA	—	NA	NA	—	—	NA	NA	NA	NA
RE02-10-21748	02-612346	15–16	QAL	NA	NA	NA	NA	—	NA	NA	—	—	NA	NA	NA	NA
RE02-10-21778	02-612350	3–3.2	SOIL	NA	NA	NA	NA	—	NA	NA	NA	0.00258 (J)	NA	NA	NA	NA
RE02-10-21779	02-612350	5–5.2	SOIL	NA	NA	NA	NA	0.635	NA	NA	NA	—	NA	NA	NA	NA
RE02-10-21782	02-612351	5–5.2	SOIL	NA	NA	NA	NA	0.00348 (J)	NA	NA	NA	—	NA	NA	NA	NA
RE02-10-21784	02-612352	3–3.2	SOIL	NA	NA	NA	NA	0.209	NA	NA	NA	0.0283	NA	NA	NA	NA
RE02-10-21785	02-612352	5–5.2	SOIL	NA	NA	NA	NA	0.00755	NA	NA	NA	—	NA	NA	NA	NA
RE02-10-21787	02-612353	3–3.4	SOIL	NA	NA	NA	NA	0.00524 (J)	NA	NA	NA	—	NA	NA	NA	NA
RE02-10-21788	02-612353	5–5.2	SOIL	NA	NA	NA	NA	0.0024 (J)	NA	NA	NA	—	NA	NA	NA	NA

Table 6.7-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Toluene	TPH-DRO	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
Industrial SSL[a]				**na**	**na**	**na**	**25,300**	**25,300**	**0.00243**	**na**	**61,100**	**3000[i]**	**3910**	**3610[j]**
Recreational SSL[c]				**na**	**na**	**na**	**8630**	**8630**	**0.00297**	**na**	**47,600**	**na**	**26,000**	**27800[j]**
Residential SSL[a]				**na**	**na**	**na**	**1740**	**1740**	**0.00049**	**na**	**5220**	**1000[j]**	**798**	**1090[j]**
RE02-07-1528	02-600378	0–0.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-6840	02-600378	0–0.5	SOIL	NA	NA	NA	0.0266 (J)	0.0497	NA	NA	NA	NA	NA	NA
RE02-07-1532	02-600379	0–0.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-6844	02-600379	0–0.5	SOIL	NA	NA	NA	0.0454	0.0573	NA	NA	NA	NA	NA	NA
RE02-07-6845	02-600379	9.5–10.5	QAL	NA	NA	NA	0.0923	0.108	NA	NA	—	NA	—	—
RE02-07-1533	02-600379	9.5–14	QBO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-6847	02-600379	10.5–11.5	QBO	NA	NA	NA	0.0247 (J)	0.0172 (J)	NA	NA	—	NA	—	—
RE02-07-1536	02-600380	0–0.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-6848	02-600380	0–0.5	SOIL	NA	NA	NA	0.144	0.31	NA	NA	NA	NA	NA	NA
RE02-07-1537	02-600380	9.5–12	QBO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1540	02-600381	0–0.5	SOIL	NA	NA	NA	—	0.0147 (J)	NA	NA	NA	NA	NA	NA
RE02-07-1544	02-600382	0–0.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-6856	02-600382	0–0.5	SOIL	NA	NA	NA	—	—	NA	NA	NA	NA	NA	NA
RE02-07-1545	02-600382	9.5–12	QBO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1548	02-600383	0–0.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-6860	02-600383	0–0.5	SOIL	NA	NA	NA	0.0272 (J)	0.0525	NA	NA	NA	NA	NA	NA
RE02-07-6861	02-600383	9.5–10.5	QAL	NA	NA	NA	0.047	0.104	NA	NA	—	NA	—	—
RE02-07-1549	02-600383	9.5–12	QAL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-6864	02-600384	0–0.5	SOIL	NA	NA	NA	0.0238 (J)	0.0579	NA	NA	NA	NA	NA	NA
RE02-07-6865	02-600384	9.5–10.5	QAL	NA	NA	NA	0.0304 (J)	0.0577	NA	NA	—	NA	—	—
RE02-07-1553	02-600384	9.5–13	QAL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1655	02-600409	0–0.5	SOIL	0.00000481	0.0000272	0.000172	0.0958	0.138	0.0000153	0.0000854	NA	9.88	NA	NA
RE02-07-1656	02-600409	4.5–9.5	QAL	0.0000000647 (J)	0.000000213 (J)	0.00000117	—	—	0.000000162 (J)	0.000000416	—	3.37 (J)	—	—
RE02-07-1657	02-600409	9.5–14.5	QAL	—	—	—	—	—	—	—	—	15.9	—	—
RE02-07-1659	02-600409	14.5–24.5	QBO	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1661	02-600410	0–0.5	SOIL	—	0.000000697 (J)	0.0000043	0.287	0.299	—	0.000000487	NA	24.6	NA	NA
RE02-07-1662	02-600410	4.5–9.5	QAL	—	—	—	—	—	—	—	0.000569 (J)	—	—	—

Table 6.7-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Toluene	TPH-DRO	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
Industrial SSL[a]				**na**	**na**	**na**	**25,300**	**25,300**	**0.00243**	**na**	**61,100**	**3000[i]**	**3910**	**3610[j]**
Recreational SSL[c]				**na**	**na**	**na**	**8630**	**8630**	**0.00297**	**na**	**47,600**	**na**	**26,000**	**27800[j]**
Residential SSL[a]				**na**	**na**	**na**	**1740**	**1740**	**0.00049**	**na**	**5220**	**1000[j]**	**798**	**1090[j]**
RE02-07-1667	02-600411	0–0.5	SOIL	0.000000552 (J)	0.00000291	0.0000192	0.267	0.332	0.00000185	0.00000818	NA	38	NA	NA
RE02-07-1668	02-600411	4.5–7	QAL	—	0.000000286 (J)	0.00000199	0.0442	0.11	0.000000196 (J)	0.000000196	—	23	—	—
RE02-07-1669	02-600411	9.5–14.5	QAL	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1671	02-600411	14.5–21	QBO	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1673	02-600412	0–0.5	SOIL	0.00000237 (J)	0.0000154	0.0000975	0.265	0.237	0.00000839	0.000047	NA	16.5	NA	NA
RE02-07-1674	02-600412	4.5–9.5	QAL	0.000000183 (J)	0.000000869 (J)	0.00000499	0.0765	0.114	0.00000042 (J)	0.00000068	—	32.1	—	—
RE02-07-1675	02-600412	9.5–12	QAL	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1679	02-600413	0–0.5	SOIL	0.00000218 (J)	0.0000149	0.0000947	1.5	1.36	0.00000773	0.0000413	NA	56.2	NA	NA
RE02-07-1680	02-600413	4.5–9.5	QAL	0.0000002 (J)	0.000000663 (J)	0.0000049	0.0519	0.0773	0.000000552 (J)	0.00000212	—	16.9 (J)	—	—
RE02-07-1681	02-600413	9.5–14.5	QAL	—	—	—	0.0661	0.0609	—	—	—	—	—	—
RE02-07-1683	02-600413	14.5–22.5	QBO	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1685	02-600414	0–0.5	SOIL	0.00000184 (J)	0.0000115	0.0000683	0.389	0.498	0.00000604	0.0000284	NA	NA	NA	NA
RE02-07-1686	02-600414	4.5–9.5	QAL	—	0.0000000642 (J)	0.0000000642	—	—	—	—	—	NA	—	—
RE02-07-1687	02-600414	9.5–14.5	QAL	—	—	—	—	—	—	—	—	NA	—	—
RE02-07-1689	02-600414	14.5–20	QBO	—	—	—	—	—	0.000000111 (J)	0.000000208	—	NA	—	—
RE02-07-1691	02-600415	0–0.5	SOIL	—	0.00000018 (J)	0.000000293	0.188	0.257	0.000000102 (J)	0.000000231	NA	NA	NA	NA
RE02-07-1692	02-600415	4.5–5.1	SOIL	0.0000000847 (J)	0.000000281 (J)	0.00000198	0.0208 (J)	0.042	—	0.00000026	—	NA	—	—
RE02-07-1693	02-600415	9.5–14	QAL	—	—	0.000000266	0.0211 (J)	0.0209 (J)	0.000000135 (J)	0.000000238	—	NA	—	—
RE02-07-1696	02-600415	14.5–16.6	QAL	—	—	—	—	—	—	—	—	NA	—	—
RE02-07-1695	02-600415	19.5–21.7	QBO	—	—	—	—	—	0.000000079 (J)	0.000000079	—	NA	—	—
RE02-07-1697	02-600416	0–0.5	SOIL	0.000000227 (J)	0.00000103 (J)	0.0000063	0.134	0.258	0.000000631 (J)	0.00000292	NA	NA	NA	NA
RE02-07-1699	02-600416	9.5–14.5	QAL	—	—	0.000000231	—	—	—	—	—	NA	—	—
RE02-07-1701	02-600416	14.5–19.5	QBO	—	—	—	—	—	—	—	—	NA	—	—
RE02-07-1703	02-600417	0–0.5	SOIL	0.000000611 (J)	0.00000294	0.0000198	0.0357 (J)	0.153	0.00000193	0.0000246	NA	NA	NA	NA
RE02-07-1704	02-600417	4.5–9.5	QAL	—	—	—	—	—	—	—	—	NA	—	—
RE02-07-1707	02-600417	13–15.5	QBO	0.00000104 (J)	0.000000445 (J)	0.00000148	—	—	0.000000176 (J)	0.000000324	—	NA	—	—
RE02-07-1919	02-600456	0–0.5	SOIL	NA	NA	NA	0.0254 (J)	0.0385	NA	NA	NA	8.21 (J)	NA	NA

Table 6.7-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Toluene	TPH-DRO	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
Industrial SSL[a]				**na**	**na**	**na**	**25,300**	**25,300**	**0.00243**	**na**	**61,100**	**3000[i]**	**3910**	**3610[j]**
Recreational SSL[c]				**na**	**na**	**na**	**8630**	**8630**	**0.00297**	**na**	**47,600**	**na**	**26,000**	**27800[j]**
Residential SSL[a]				**na**	**na**	**na**	**1740**	**1740**	**0.00049**	**na**	**5220**	**1000[j]**	**798**	**1090[j]**
RE02-07-1922	02-600456	10–14	QAL	NA	NA	NA	—	—	NA	NA	—	4.65 (J)	—	—
RE02-07-1923	02-600457	0–0.5	SOIL	NA	NA	NA	0.000179 (J)	0.000265 (J)	NA	NA	NA	13.1 (J)	NA	NA
RE02-07-1926	02-600457	9.5–14	QAL	NA	NA	NA	—	—	NA	NA	—	2.21 (J)	—	—
RE02-07-1927	02-600458	0–0.5	SOIL	NA	NA	NA	0.0438	0.101	NA	NA	NA	25.3 (J)	NA	NA
RE02-07-1930	02-600458	9.5–14.5	QAL	NA	NA	NA	—	—	NA	NA	—	7.31 (J)	—	—
RE02-07-1929	02-600458	15.5–19.5	QBO	NA	NA	NA	—	—	NA	NA	—	1.74 (J)	—	—
RE02-07-1931	02-600459	0–0.5	SOIL	NA	NA	NA	0.0668	0.249 (J)	NA	NA	NA	18.4 (J)	NA	NA
RE02-07-1934	02-600459	9.5–14	QAL	NA	NA	NA	—	—	NA	NA	—	9.63 (J)	—	—
RE02-07-1933	02-600459	15–19	QBO	NA	NA	NA	—	—	NA	NA	—	2.42 (J)	—	—
RE02-07-1935	02-600460	0–2.3	SOIL	NA	NA	NA	0.017 (J)	—	NA	NA	NA	454	NA	NA
RE02-07-1937	02-600460	15.5–20	QBO	NA	NA	NA	—	—	NA	NA	—	4.35	—	—
RE02-07-1939	02-600461	0–0.5	SOIL	NA	NA	NA	0.0372	0.122 (J)	NA	NA	NA	29 (J)	NA	NA
RE02-07-1941	02-600461	9.5–14	QBO	NA	NA	NA	—	0.0157 (J)	NA	NA	—	3.02 (J)	—	—
RE02-07-1943	02-600462	0–0.5	SOIL	NA	NA	NA	0.0326 (J-)	0.242 (J)	NA	NA	NA	40.8 (J)	NA	NA
RE02-07-1946	02-600462	9.5–14	QAL	NA	NA	NA	0.38	2.42 (J)	NA	NA	0.00107 (J)	—	—	—
RE02-07-1945	02-600462	15–20	QBO	NA	NA	NA	0.0591	0.155 (J)	NA	NA	—	1.57 (J)	—	—
RE02-07-1947	02-600463	0–0.5	SOIL	NA	NA	NA	0.0433	0.144	NA	NA	NA	—	NA	NA
RE02-07-1951	02-600464	0–0.5	SOIL	NA	NA	NA	—	—	NA	NA	NA	13.1 (J)	NA	NA
RE02-07-1955	02-600465	0–0.5	SOIL	NA	NA	NA	—	—	NA	NA	NA	1.68 (J)	NA	NA
RE02-07-1959	02-600466	0–0.5	SOIL	NA	NA	NA	—	0.0891 (J)	NA	NA	NA	12 (J)	NA	NA
RE02-07-1963	02-600467	0–0.8	SOIL	NA	NA	NA	—	0.0143 (J)	NA	NA	NA	16.7 (J)	NA	NA
RE02-07-1964	02-600467	9.5–10	QAL	NA	NA	NA	—	—	NA	NA	0.000478 (J)	2.65 (J)	—	—
RE02-07-1965	02-600467	10–12.5	QBO	NA	NA	NA	—	—	NA	NA	—	3.38 (J)	—	—
RE02-10-21775	02-600580	3–3.2	SOIL	NA	NA	NA	0.122	0.267	NA	NA	NA	NA	NA	NA
RE02-10-21777	02-600580	5–5.2	SOIL	NA	NA	NA	0.342	0.57	NA	NA	NA	NA	NA	NA
RE02-07-2586	02-600580	11–16	QBO	NA	NA	NA	0.0964	0.174	NA	NA	NA	NA	NA	NA
RE02-07-2589	02-600581	0–0.5	SOIL	NA	NA	NA	0.194	0.764	NA	NA	NA	NA	NA	NA

Table 6.7-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Toluene	TPH-DRO	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
Industrial SSL[a]				**na**	**na**	**na**	**25,300**	**25,300**	**0.00243**	**na**	**61,100**	**3000[i]**	**3910**	**3610[j]**
Recreational SSL[c]				**na**	**na**	**na**	**8630**	**8630**	**0.00297**	**na**	**47,600**	**na**	**26,000**	**27800[j]**
Residential SSL[a]				**na**	**na**	**na**	**1740**	**1740**	**0.00049**	**na**	**5220**	**1000[j]**	**798**	**1090[j]**
RE02-07-2592	02-600581	9.5–13	QAL	NA	NA	NA	0.0391	0.105	NA	NA	NA	NA	NA	NA
RE02-07-2591	02-600581	14–16	QBO	NA	NA	NA	0.0896	0.201	NA	NA	NA	NA	NA	NA
RE02-07-2594	02-600582	0–0.5	SOIL	NA	NA	NA	0.0557	0.119	NA	NA	NA	NA	NA	NA
RE02-07-2599	02-600583	0–1.5	SOIL	NA	NA	NA	0.0336 (J)	0.0584	NA	NA	NA	NA	NA	NA
RE02-07-2601	02-600583	8.5–10	SOIL	NA	NA	NA	—	—	NA	NA	—	NA	0.000353 (J)	0.000839 (J)
RE02-07-2602	02-600583	15.5–20	QBO	NA	NA	NA	—	—	NA	NA	—	NA	—	—
RE02-10-21747	02-612346	8–9	QAL	NA	NA	NA	—	—	NA	NA	NA	NA	NA	NA
RE02-10-21748	02-612346	15–16	QAL	NA	NA	NA	—	—	NA	NA	NA	NA	NA	NA
RE02-10-21778	02-612350	3–3.2	SOIL	NA	NA	NA	0.0758	0.129	NA	NA	NA	NA	NA	NA
RE02-10-21779	02-612350	5–5.2	SOIL	NA	NA	NA	2.29	2.31	NA	NA	NA	NA	NA	NA
RE02-10-21782	02-612351	5–5.2	SOIL	NA	NA	NA	0.0149	0.0211	NA	NA	NA	NA	NA	NA
RE02-10-21784	02-612352	3–3.2	SOIL	NA	NA	NA	0.264	0.341	NA	NA	NA	NA	NA	NA
RE02-10-21785	02-612352	5–5.2	SOIL	NA	NA	NA	0.017	0.022	NA	NA	NA	NA	NA	NA
RE02-10-21787	02-612353	3–3.4	SOIL	NA	NA	NA	0.00325 (J)	0.0192	NA	NA	NA	NA	NA	NA
RE02-10-21788	02-612353	5–5.2	SOIL	NA	NA	NA	—	0.00347 (J)	NA	NA	NA	NA	NA	NA

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273), unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSLs are from LANL (2017, 602581).

[d] NA = Not analyzed.

[e] — = Not detected.

[f] SSLs are from EPA regional screening tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

[g] na = Not available.

[h] Isopropylbenzene used as surrogate based on structural similarity.

[I] Screening guidelines for diesel #2 from NMED (2017, 602273).

[j] Xylene used as a surrogate based on structural similarity.

Table 6.7-4
Radionuclides Detected or Detected above BVs/FVs at AOC 02-004(a)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Cobalt-60	Plutonium-239/240	Strontium-90	Tritium	Uranium-235/236
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**na**	**na**	**0.18**
Soil BV/FV[a]				**0.013**	**1.65**	**na**	**0.054**	**1.31**	**na**	**0.2**
Industrial SAL[c]				**1000**	**41**	**9**	**1200**	**2400**	**2,400,000**	**160**
Recreational SAL[c]				**1500**	**370**	**81**	**1300**	**4900**	**5,700,000**	**1000**
Residential SAL[c]				**83**	**12**	**2.6**	**79**	**15**	**1700**	**42**
RE02-03-51840	02-22359	9–9.5	SOIL	NA[d]	0.0461	4.29	—[e]	—	19.2	—
RE02-03-51841	02-22359	10.5–11	SOIL	NA	0.0241	1.52	0.034	—	20	—
RE02-03-51860	02-22369	9–9.5	SOIL	NA	—	—	—	—	0.897	—
RE02-03-51861	02-22369	10.5–11.03	SOIL	NA	—	0.0822	0.0426	—	5.4	—
RE02-03-51862	02-22370	8–8.5	SOIL	NA	—	—	0.0447	—	4.28	—
RE02-03-51863	02-22370	9.5–10	SOIL	NA	—	—	—	—	4.58	—
RE02-03-51864	02-22371	9–9.5	SOIL	NA	—	1.75	—	—	1.87	—
RE02-03-51865	02-22371	10.5–11	SOIL	NA	—	—	—	—	1.69	—
RE02-07-1528	02-600378	0–0.5	SOIL	—	2.97	—	0.0855 (J-)	—	0.00649711	—
RE02-07-1529	02-600378	9.5–12	QBO	—	0.263	—	—	—	0.311517	—
RE02-07-1533	02-600379	9.5–14	QBO	—	—	—	—	—	0.358994	—
RE02-07-1536	02-600380	0–0.5	SOIL	—	—	—	0.0609 (J-)	—	0.0144918	—
RE02-07-1537	02-600380	9.5–12	QBO	—	0.378	—	—	—	0.0771247	—
RE02-07-1540	02-600381	0–0.5	SOIL	—	4.76	—	—	1.61	0.0261236	—
RE02-07-1541	02-600381	7–10	QAL	—	—	—	—	—	0.394286	—
RE02-07-1542	02-600381	16.5–20	QBO	—	—	—	—	—	0.0517562	0.286
RE02-07-1544	02-600382	0–0.5	SOIL	—	—	—	—	—	0.0102681	—
RE02-07-1545	02-600382	9.5–12	QBO	—	—	—	—	—	0.11326	—
RE02-07-1549	02-600383	9.5–12	QAL	—	0.552	—	—	—	0.110905	—
RE02-07-1553	02-600384	9.5–13	QAL	—	0.253	—	—	—	0.0954164	—
RE02-07-1554	02-600384	13.5–17	QBO	—	—	—	—	—	0.0666584	—
RE02-07-1655	02-600409	0–0.5	SOIL	—	—	0.872	—	—	—	—
RE02-07-1657	02-600409	9.5–14.5	QAL	—	—	—	—	—	0.20381	—
RE02-07-1661	02-600410	0–0.5	SOIL	—	—	—	—	—	0.017688	—
RE02-07-1662	02-600410	4.5–9.5	QAL	—	—	—	—	—	0.101121	—
RE02-07-1667	02-600411	0–0.5	SOIL	—	—	—	—	—	0.0298578	—
RE02-07-1668	02-600411	4.5–7	QAL	—	—	2.01	—	—	0.867054	—

Table 6.7-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Cobalt-60	Plutonium-239/240	Strontium-90	Tritium	Uranium-235/236
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**na**	**na**	**0.18**
Soil BV/FV[a]				**0.013**	**1.65**	**na**	**0.054**	**1.31**	**na**	**0.2**
Industrial SAL[c]				**1000**	**41**	**9**	**1200**	**2400**	**2,400,000**	**160**
Recreational SAL[c]				**1500**	**370**	**81**	**1300**	**4900**	**5,700,000**	**1000**
Residential SAL[c]				**83**	**12**	**2.6**	**79**	**15**	**1700**	**42**
RE02-07-1669	02-600411	9.5–14.5	QAL	—	—	—	—	—	0.376188	—
RE02-07-1674	02-600412	4.5–9.5	QAL	—	—	—	—	—	0.439091	—
RE02-07-1675	02-600412	9.5–12	QAL	—	—	—	—	—	0.0344831	—
RE02-07-1680	02-600413	4.5–9.5	QAL	—	—	2.7	—	—	0.518501	—
RE02-07-1683	02-600413	14.5–22.5	QBO	—	—	—	—	—	0.0708587	—
RE02-07-1686	02-600414	4.5–9.5	QAL	—	—	—	—	—	0.283677	—
RE02-07-1687	02-600414	9.5–14.5	QAL	—	—	—	—	—	0.1762	—
RE02-07-1689	02-600414	14.5–20	QBO	—	—	—	—	—	0.109635	—
RE02-07-1691	02-600415	0–0.5	SOIL	—	—	—	—	—	0.0375676	—
RE02-07-1692	02-600415	4.5–5.1	SOIL	—	—	—	—	—	0.321476	—
RE02-07-1693	02-600415	9.5–14	QAL	—	—	—	—	—	0.166274	—
RE02-07-1695	02-600415	19.5–21.7	QBO	—	—	—	—	—	0.0842927	—
RE02-07-1697	02-600416	0–0.5	SOIL	—	—	—	—	—	0.00968911	—
RE02-07-1699	02-600416	9.5–14.5	QAL	—	—	—	—	—	0.0256196	—
RE02-07-1701	02-600416	14.5–19.5	QBO	—	—	—	—	—	0.0623223	—
RE02-07-1704	02-600417	4.5–9.5	QAL	—	—	—	0.0577	—	0.0323971	—
RE02-07-1707	02-600417	13–15.5	QBO	—	—	—	—	—	—	0.211
RE02-07-1919	02-600456	0–0.5	SOIL	—	—	—	—	—	0.0330946	—
RE02-07-1922	02-600456	10–14	QAL	—	—	—	—	—	0.406077	—
RE02-07-1926	02-600457	9.5–14	QAL	—	—	—	—	—	0.0894932	—
RE02-07-1925	02-600457	14–19	QBO	—	—	—	—	—	0.0711927	—
RE02-07-1931	02-600459	0–0.5	SOIL	—	—	—	—	—	0.022959	—
RE02-07-1934	02-600459	9.5–14	QAL	—	—	—	—	—	0.0421229	—
RE02-07-1935	02-600460	0–2.3	SOIL	—	—	—	0.0299	—	—	—
RE02-07-1937	02-600460	15.5–20	QBO	—	—	—	—	—	—	0.197
RE02-07-1939	02-600461	0–0.5	SOIL	—	—	—	0.0636	—	—	—
RE02-07-1943	02-600462	0–0.5	SOIL	—	—	2.86	—	—	—	—
RE02-07-1964	02-600467	9.5–10	QAL	—	—	—	—	—	0.0605579	—
RE02-07-1965	02-600467	10–12.5	QBO	—	—	—	—	—	—	0.2
RE02-07-2592	02-600581	9.5–13	QAL	—	—	—	0.0512	—	—	—
RE02-07-2594	02-600582	0–0.5	SOIL	—	—	—	0.806	—	—	—

Table 6.7-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Cobalt-60	Plutonium-239/240	Strontium-90	Tritium	Uranium-235/236
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**na**	**na**	**0.18**
Soil BV/FV[a]				**0.013**	**1.65**	**na**	**0.054**	**1.31**	**na**	**0.2**
Industrial SAL[c]				**1000**	**41**	**9**	**1200**	**2400**	**2,400,000**	**160**
Recreational SAL[c]				**1500**	**370**	**81**	**1300**	**4900**	**5,700,000**	**1000**
Residential SAL[c]				**83**	**12**	**2.6**	**79**	**15**	**1700**	**42**
RE02-07-2599	02-600583	0–1.5	SOIL	—	—	—	—	—	0.0188167	—
RE02-07-2601	02-600583	8.5–10	SOIL	—	—	—	—	—	0.0520148	—
RE02-07-2602	02-600583	15.5–20	QBO	—	—	—	—	—	0.0411766	—
RE02-07-2604	02-600584	1.5–3.3	SOIL	0.0532	0.956	—	2.44	—	—	—
RE02-07-2605	02-600584	9.5–11.7	QAL	—	—	—	0.0688	—	—	—
RE02-10-21656	02-612325	5–6	SOIL	NA	0.0993	—	—	NA	0.0987805	—
RE02-10-21659	02-612325	35–37	QBO	NA	—	—	—	NA	0.166541	—
RE02-10-21660	02-612325	49–50	QBO	NA	—	—	—	NA	0.119684	—
RE02-10-21661	02-612326	5–6	SOIL	NA	0.218	—	—	NA	0.0263707	—
RE02-10-21665	02-612326	49–50	QBO	NA	—	—	—	NA	0.0654051	—
RE02-10-21666	02-612327	5–6	QAL	NA	—	—	—	NA	0.321046	—
RE02-10-21671	02-612328	5–6	SOIL	NA	0.186	—	—	NA	0.264706	—
RE02-10-21672	02-612328	15–16	QAL	NA	—	—	0.0175	NA	—	—
RE02-10-21673	02-612328	25–26	QBO	NA	—	—	—	NA	0.0480909	—
RE02-10-21674	02-612328	35–36	QBO	NA	—	—	—	NA	0.04925	—
RE02-10-21747	02-612346	8–9	QAL	NA	—	—	0.0476	NA	—	—
RE02-10-21748	02-612346	15–16	QAL	NA	—	—	—	NA	0.0512404	—
RE02-10-21750	02-612346	35–36	QBO	NA	—	—	—	NA	0.0746471	—
RE02-10-21751	02-612346	49–50	QBO	NA	—	—	—	NA	0.0884761	—

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from LANL (2015, 600929).

[d] NA = Not analyzed.

[e] — = Not detected.

Table 6.8-1
Samples Collected and Analyses Requested at AOCs 02-004(b,c,d)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Dioxins/Furans	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
RE02-07-2222	02-600508	0–0.5	SOIL	07-483[a]	07-482	07-481	07-483	07-483	—[b]	07-483	07-483	07-482	07-482	07-482	07-483	07-482	—	07-482
RE02-07-2224	02-600508	13–15	QBO	07-713	07-713	07-712	07-713	07-713	—	07-713	07-713	07-713	07-713	07-713	07-713	07-713	07-713	07-713
RE02-07-2226	02-600509	0–0.5	SOIL	07-483	07-482	07-481	07-483	07-483	—	07-483	07-483	07-482	07-482	07-482	07-483	07-482	—	07-482
RE02-07-2228	02-600509	9.5–15	QBO	07-718	07-718	07-717	07-718	07-718	—	07-718	07-718	07-718	07-718	07-718	07-718	07-718	07-718	07-718
RE02-07-2230	02-600510	0–0.5	SOIL	07-483	07-482	07-481	07-483	07-483	—	07-483	07-483	07-482	07-482	07-482	07-483	07-482	—	07-482
RE02-07-2234	02-600511	0–0.5	SOIL	07-483	07-482	07-481	07-483	07-483	—	07-483	07-483	07-482	07-482	07-482	07-483	07-482	—	07-482
RE02-07-2237	02-600511	14–19	QBO	07-703	07-703	07-702	07-703	07-703	—	07-703	07-703	07-703	07-703	07-703	07-703	07-703	07-703	07-703
RE02-07-2320	02-600526	0–0.5	SOIL	07-490	07-489	07-488	07-490	07-490	—	07-490	07-490	07-489	07-489	07-489	07-490	07-489	—	07-489
RE02-07-2321	02-600526	9.5–12	QAL	07-659	07-658	07-656	07-659	07-659	—	07-659	07-659	07-658	07-657	07-658	07-659	07-657	07-657	07-658
RE02-07-2324	02-600527	0–0.5	SOIL	07-490	07-489	07-488	07-490	07-490	—	07-490	07-490	07-489	07-489	07-489	07-490	07-489	—	07-489
RE02-07-2325	02-600527	9.5–14	QAL	—	07-658	07-656	—	—	—	—	—	07-658	07-657	07-658	—	07-657	07-657	07-658
RE02-07-2328	02-600528	0–0.5	SOIL	07-490	07-489	07-488	07-490	07-490	—	07-490	07-490	07-489	07-489	07-489	07-490	07-489	—	07-489
RE02-07-2329	02-600528	9.5–17.3	QAL	07-659	07-658	07-656	07-659	07-659	—	07-659	07-659	07-658	07-657	07-658	07-659	07-657	07-657	07-658
RE02-07-2330	02-600528	17.4–23	QBO	07-659	07-658	07-656	07-659	07-659	—	07-659	07-659	07-658	07-657	07-658	07-659	07-657	07-657	07-658
RE02-07-2434	02-600545	0–0.5	SOIL	07-504	07-504	07-503	07-504	07-504	—	07-504	07-504	07-504	07-504	07-504	07-504	07-504	—	07-504
RE02-07-2435	02-600545	9.5–14.3	QAL	—	07-672	07-670	—	—	—	—	—	07-672	07-671	07-672	—	07-671	07-671	07-672
RE02-07-2437	02-600545	14.3–18.5	QBO	07-673	07-672	07-670	07-673	07-673	—	07-673	07-673	07-672	07-671	07-672	07-673	07-671	07-671	07-672
RE02-07-2438	02-600546	0–0.5	SOIL	07-504	07-504	07-503	07-504	07-504	—	07-504	07-504	07-504	07-504	07-504	07-504	07-504	—	07-504
RE02-07-2439	02-600546	9.5–11	QAL	—	07-706	07-705	—	07-706	—	—	—	07-706	07-706	07-706	—	07-706	07-706	07-706
RE02-10-21501	02-612280	5–7	QAL	—	—	—	10-4812	10-4812	10-4811	10-4812	10-4812	10-4811	10-4810	—	—	—	—	—
RE02-10-21500	02-612280	15–16	QBO	—	—	—	10-4812	10-4812	10-4811	10-4812	10-4812	10-4811	10-4810	—	—	—	—	—
RE02-10-21495	02-612280	25–27	QBO	—	—	—	10-4812	10-4812	10-4811	10-4812	10-4812	10-4811	10-4810	—	—	—	—	—
RE02-10-21490	02-612280	35–36	QBO	—	—	—	10-4812	10-4812	10-4811	10-4812	10-4812	10-4811	10-4810	—	—	—	—	—
RE02-10-21485	02-612280	49–50	QBO	—	—	—	10-4812	10-4812	10-4811	10-4812	10-4812	10-4811	10-4810	—	—	—	—	—

[a] Analytical request number.

[b] — = Analysis not requested.

Table 6.8-2
Inorganic Chemicals Detected or Detected above BVs at AOCs 02-004(b,c,d)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Cyanide (Total)	Iron	Manganese	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**1900**	**2.6**	**0.5**	**3700**	**189**	**2**	**na[b]**	**na**	**0.3**	**4.59**	**40**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**0.5**	**21500**	**671**	**15.4**	**na**	**na**	**1.52**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**na**	**505[d]**	**62.8**	**908,000**	**160,000**	**25,700**	**2,080,000**	**908**	**6490**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**na**	**281[d]**	**224**	**434,000**	**14,800**	**12,400**	**991,000**	**434**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**70.5**	**na**	**96.6[d]**	**11.1**	**54,800**	**10,500**	**1560**	**125,000**	**54.8**	**391**	**394**	**23,500**
RE02-07-2222	02-600508	0–0.5	SOIL	—[f]	—	—	—	0.525 (U)	—	—	0.54	—	—	—	1.92	0.000992 (J)	1.57 (U)	—	—
RE02-07-2224	02-600508	13–15	QBO	13700	—	1.42 (J)	65.8	0.637 (U)	—	5.68	—	8090	322	2.57	—	—	0.662 (J)	4.88 (J)	—
RE02-07-2226	02-600509	0–0.5	SOIL	—	—	—	—	—	—	34.4 (J)	—	—	—	—	1.98	0.000912 (J)	1.55 (U)	—	158
RE02-07-2228	02-600509	9.5–15	QBO	8160	—	1.71 (J)	26.4	0.604 (U)	—	5.2	—	7210	198	2.09	—	—	0.781 (J)	4.61 (J)	—
RE02-07-2230	02-600510	0–0.5	SOIL	—	—	—	—	0.492 (U)	—	20.3 (J)	—	—	—	—	5.15	0.00168 (J)	—	—	64.9
RE02-07-2234	02-600511	0–0.5	SOIL	—	—	—	—	—	—	20 (J)	—	—	—	—	6.47	—	—	—	56.5
RE02-07-2237	02-600511	14–19	QBO	9960	—	1.22 (J)	32.1	0.604 (U)	—	13	—	7240	340	2.02	—	—	0.663 (J)	4.79 (J)	—
RE02-07-2320	02-600526	0–0.5	SOIL	—	—	—	—	0.502 (U)	7960 (J+)	37.3	—	—	—	—	1.64	0.00149 (J)	—	—	98.2
RE02-07-2321	02-600526	9.5–12	QAL	—	—	—	—	—	—	—	—	—	—	—	17.3 (J-)	0.00216 (J-)	—	—	—
RE02-07-2324	02-600527	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	8.04	0.000719 (J)	—	—	56.2
RE02-07-2328	02-600528	0–0.5	SOIL	—	—	—	—	0.5 (U)	—	—	—	—	—	—	1.41	—	—	—	—
RE02-07-2329	02-600528	9.5–17.3	QAL	—	—	—	—	—	—	—	—	—	—	—	1.02 (J-)	—	1.61 (U)	—	—
RE02-07-2330	02-600528	17.4–23	QBO	7720	—	0.721 (J)	—	—	—	—	—	5810	208	—	—	—	1.78 (U)	—	—
RE02-07-2434	02-600545	0–0.5	SOIL	—	—	—	—	0.509 (U)	—	—	—	—	—	—	1.75 (J-)	—	1.53 (U)	—	49.3
RE02-07-2435	02-600545	9.5–14.3	QAL	—	—	—	—	0.548 (U)	—	—	—	—	—	—	—	—	1.64 (U)	—	—
RE02-07-2437	02-600545	14.3–18.5	QBO	10500 (J)	0.525 (UJ)	1.95 (U)	—	0.649 (U)	—	3.77 (J)	—	5280 (J)	—	—	—	—	1.95 (U)	—	—
RE02-07-2438	02-600546	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	3.02	0.000599 (J)	—	—	—
RE02-07-2439	02-600546	9.5–11	QAL	—	—	—	—	0.548 (U)	—	24.5	—	—	733	—	3.32	—	—	—	—
RE02-10-21500	02-612280	15–16	QBO	8240	1.18 (U)	—	—	0.589 (U)	—	—	NA[g]	4950	196 (J-)	2.49	NA	NA	1.19 (U)	—	—
RE02-10-21495	02-612280	25–27	QBO	—	1.26 (U)	1.25 (U)	—	0.631 (U)	—	—	NA	5290	200 (J-)	—	NA	NA	1.25 (U)	—	—
RE02-10-21490	02-612280	35–36	QBO	—	1.19 (U)	1.26 (U)	—	0.593 (U)	—	—	NA	5120	253 (J-)	—	NA	NA	1.26 (U)	—	—
RE02-10-21485	02-612280	49–50	QBO	—	1.23 (U)	1.25 (U)	—	0.617 (U)	—	3.39	NA	5400	—	—	NA	NA	1.25 (U)	—	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 6.8-3
Organic Chemicals Detected at AOCs 02-004(b,c,d)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Anthracene	Aroclor-1248	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzofuran	Fluoranthene	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]
Industrial SSL[a]				**50,500**	**253,000**	**10.7**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**3230**	**1000[c]**	**33,700**	**33,700**	**na[d]**	**na**	**na**
Recreational SSL[e]				**17,300**	**863,000**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**888**	**8880**	**489**	**11,500**	**11,500**	**na**	**na**	**na**
Residential SSL[a]				**3480**	**17,400**	**2.43**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**152**	**73[c]**	**2320**	**2320**	**na**	**na**	**na**
RE02-07-2222	02-600508	0–0.5	SOIL	0.0265 (J)	0.0415	—[f]	0.197	0.431	0.108	0.108 (J)	0.213 (J)	—	—	0.107	—	0.22	0.0233 (J)	0.00228	0.0042	0.000112 (J)
RE02-07-2224	02-600508	13–15	QBO	—	—	—	—	0.0023 (J)	—	—	—	—	—	—	—	—	—	0.0000217	0.0000376	0.00000109 (J)
RE02-07-2226	02-600509	0–0.5	SOIL	0.0291 (J)	0.0396	—	0.0802 (J-)	0.152 (J-)	0.102	0.0927	0.184	—	—	0.0941	—	0.207	0.0247 (J)	0.00651	0.0113	0.00027 (J)
RE02-07-2228	02-600509	9.5–15	QBO	—	—	—	—	0.0025 (J-)	—	—	—	—	—	—	—	—	—	0.00000522	0.00000943	0.00000104 (J)
RE02-07-2230	02-600510	0–0.5	SOIL	—	0.037	—	0.0733	0.0423	0.241	0.253	0.421	0.195	—	0.251	—	0.384	—	0.000815	0.00153	0.0000541 (J)
RE02-07-2234	02-600511	0–0.5	SOIL	—	—	—	0.0482	0.023 (J+)	0.0172 (J)	—	0.0282 (J)	—	—	0.0167 (J)	—	0.0319 (J)	—	0.00356	0.00727	0.000165 (J)
RE02-07-2237	02-600511	14–19	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.000000638 (J)	0.0000013	—
RE02-07-2320	02-600526	0–0.5	SOIL	—	—	—	0.172	0.378	0.0234 (J)	—	—	—	—	0.0149 (J)	—	0.0294 (J)	—	0.0012	0.00239	0.000162
RE02-07-2321	02-600526	9.5–12	QAL	—	—	—	—	0.0275	—	—	—	—	—	—	—	—	—	0.000244	0.000476	0.0000284
RE02-07-2324	02-600527	0–0.5	SOIL	—	0.0143 (J)	—	0.0192	0.0219	0.06	0.0514	0.0971	0.0875	—	0.0538	—	0.12	—	0.000959	0.00198	0.0000704
RE02-07-2325	02-600527	9.5–14	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.000000654	0.000000196 (J)
RE02-07-2328	02-600528	0–0.5	SOIL	—	—	—	0.0075	0.0092	0.0194 (J)	—	—	—	—	0.0211 (J)	—	0.0423	—	0.000355	0.000641	0.0000228
RE02-07-2329	02-600528	9.5–17.3	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00000114 (J)	0.00000221	0.000000324 (J)
RE02-07-2330	02-600528	17.4–23	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.000000244 (J)	0.000000514	—
RE02-07-2434	02-600545	0–0.5	SOIL	0.231	0.301	—	—	0.242	0.351	0.411	0.537	0.285 (J)	—	0.369	0.163 (J)	0.818	0.254	0.00122	0.00221	0.00011
RE02-07-2435	02-600545	9.5–14.3	QAL	—	0.0166 (J)	—	—	0.0019 (J)	0.0595	0.049	0.085	—	—	0.0624	—	0.116	—	0.00000197 (J)	0.00000369	0.000000759 (J)
RE02-07-2437	02-600545	14.3–18.5	QBO	—	—	0.306	—	—	—	—	—	—	—	—	—	—	—	0.00000172 (J)	0.00000335	0.000000384 (J)
RE02-07-2438	02-600546	0–0.5	SOIL	—	0.0105 (J)	—	—	0.0241 (J)	0.0562	0.112	0.0741	0.0505 (J)	—	0.0499	—	0.105	—	0.000197	0.000396	0.0000215
RE02-07-2439	02-600546	9.5–11	QAL	—	0.0152 (J)	—	0.0149	0.0142	0.0354 (J)	0.0221 (J)	0.0233 (J)	0.0142 (J)	0.0186 (J)	0.0238 (J)	—	0.0645	—	0.00000133 (J)	0.00000299	0.000000793 (J)
RE02-10-21501	02-612280	5–7	QAL	NA[g]	NA	—	0.0438 (J)	0.0286 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 6.8-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	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-]	Hexachlorodibenzofuran[1,2,3,7,8,9-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Methylnaphthalene[2-]	Naphthalene
Industrial SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**32.3**	**3370**	**16,800**
Recreational SSL[e]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**88.8**	**1150**	**1930**
Residential SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**1.53**	**232**	**1160**
RE02-07-2222	02-600508	0–0.5	SOIL	0.00000868	0.000418 (J)	0.0000056	0.0000236	0.0000131	0.000233	0.00000864	0.00000542	0.000000959 (J)	0.00000763	0.000143	—	0.00703 (J)	0.017 (J)
RE02-07-2224	02-600508	13–15	QBO	—	0.00000417	—	0.00000022 (J)	—	0.00000287	—	—	—	—	0.00000101	—	—	—
RE02-07-2226	02-600509	0–0.5	SOIL	0.0000215	0.0011 (J)	0.0000139	0.000078	0.000033	0.00075	0.00000988	0.00000805	0.00000142 (J)	0.0000115	0.000304	0.107	0.00916 (J)	0.018 (J)
RE02-07-2228	02-600509	9.5–15	QBO	—	0.00000403	—	0.000000212 (J)	—	0.000000714	0.000000105 (J)	0.0000000382 (J)	—	0.0000000508 (J)	0.00000109	—	—	—
RE02-07-2230	02-600510	0–0.5	SOIL	0.00000425	0.000201 (J)	0.00000361	0.0000133	0.00000746	0.000138	0.00000229 (J)	0.00000183 (J)	0.000000466 (J)	0.00000223 (J)	0.0000553	0.175	—	—
RE02-07-2234	02-600511	0–0.5	SOIL	0.0000121	0.000828 (J)	0.00000623	0.0000363	0.0000155	0.000356	0.00000393	0.00000222 (J)	0.000000566 (J)	0.00000359	0.000147	—	—	—
RE02-07-2237	02-600511	14–19	QBO	—	0.000000546	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2320	02-600526	0–0.5	SOIL	0.0000205 (J)	0.000664	0.00000575	0.00003	0.0000133	0.000211	0.0000058	0.00000527	0.00000112 (J)	0.00000744	0.000161 (J)	—	—	—
RE02-07-2321	02-600526	9.5–12	QAL	0.00000296	0.000101	0.00000137 (J)	0.00000548	0.00000304	0.0000451	0.00000104 (J)	0.00000109 (J)	—	0.00000123 (J)	0.0000267	—	—	—
RE02-07-2324	02-600527	0–0.5	SOIL	0.00000659	0.000299	0.00000334	0.0000143	0.00000729	0.000123	0.0000023 (J)	0.00000159 (J)	0.000000388 (J)	0.00000232 (J)	0.0000617 (J)	0.0842	—	—
RE02-07-2325	02-600527	9.5–14	QAL	—	0.000000358	—	—	—	—	—	—	—	—	0.000000169	—	—	—
RE02-07-2328	02-600528	0–0.5	SOIL	0.00000198 (J)	0.0000798	0.00000128 (J)	0.00000508	0.00000339	0.0000482	0.000000841 (J)	0.00000074 (J)	0.000000176 (J)	0.000000927 (J)	0.0000212 (J)	—	—	—
RE02-07-2329	02-600528	9.5–17.3	QAL	—	0.00000067	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2330	02-600528	17.4–23	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2434	02-600545	0–0.5	SOIL	0.0000132	0.000388	0.00000502	0.0000222	0.0000114	0.000185	0.00000603	0.00000468	0.000000856 (J)	0.00000641	0.000128 (J)	0.263	0.156	0.551
RE02-07-2435	02-600545	9.5–14.3	QAL	—	0.00000157	—	—	—	—	—	—	—	—	0.00000032	0.0258 (J)	—	—
RE02-07-2437	02-600545	14.3–18.5	QBO	—	0.00000146	—	—	—	—	—	—	—	—	0.000000135	—	—	—
RE02-07-2438	02-600546	0–0.5	SOIL	—	0.0000711	0.00000157 (J)	0.00000437	0.00000308	0.0000396	—	0.000000737 (J)	—	0.00000101 (J)	0.000017 (J)	0.0665	—	—
RE02-07-2439	02-600546	9.5–11	QAL	—	0.000000793	—	—	—	—	—	—	—	—	0.000000403	0.0127 (J)	—	—
RE02-10-21501	02-612280	5–7	QAL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 6.8-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	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	Tetrachlorodibenzodioxin[2,3,7,8-]	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)
Industrial SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**25,300**	**25,300**	**0.000238**	**na**	**0.00243**	**na**
Recreational SSL[e]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**8630**	**8630**	**0.000297**	**na**	**0.00297**	**na**
Residential SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**1740**	**1740**	**0.000049**	**na**	**0.00049**	**na**
RE02-07-2222	02-600508	0–0.5	SOIL	0.0234	0.000378	0.00000222 (J)	0.0000156	0.00000217 (J)	0.0000136	0.0000834	0.164	0.273	0.000000348 (J)	0.00000154	0.00000761	0.0000411
RE02-07-2224	02-600508	13–15	QBO	0.000153	0.00000344 (J)	—	—	—	—	0.000000253	—	—	—	—	—	—
RE02-07-2226	02-600509	0–0.5	SOIL	0.0494	0.000859	0.00000483	0.0000325	0.00000146 (J)	0.00000701	0.0000669	0.175	0.185	0.000000633	0.00000507	0.00000337	0.0000237
RE02-07-2228	02-600509	9.5–15	QBO	0.0000578	0.00000323 (J)	—	—	—	0.000000072 (J)	0.000000331	—	—	—	—	0.0000000472 (J)	0.0000000472
RE02-07-2230	02-600510	0–0.5	SOIL	0.00766	0.000167	0.00000117 (J)	0.0000104	0.000000359 (J)	0.00000105 (J)	0.000013	0.107	0.416	—	0.000000775	0.000000774 (J)	0.0000054
RE02-07-2234	02-600511	0–0.5	SOIL	0.0444	0.000745	0.0000021 (J)	0.0000139	0.00000024 (J)	0.000000672 (J)	0.0000121	0.0145 (J)	0.0266 (J)	0.000000286 (J)	0.00000112	0.000000447 (J)	0.0000026
RE02-07-2237	02-600511	14–19	QBO	0.00000681	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2320	02-600526	0–0.5	SOIL	0.0123	0.000539	0.00000226 (J)	0.0000182	0.00000099 (J)	0.00000445	0.0000406	0.0141 (J)	0.0275 (J)	—	0.0000011	0.00000217	0.0000126
RE02-07-2321	02-600526	9.5–12	QAL	0.00238	0.0000769 (J)	—	0.00000291	—	—	0.00000453	—	—	—	—	0.000000156 (J)	0.000000824
RE02-07-2324	02-600527	0–0.5	SOIL	0.0114	0.000325	0.00000112 (J)	0.0000061	—	—	0.00000706	0.061	0.0904	0.00000018 (J)	0.00000018	0.000000305 (J)	0.00000144
RE02-07-2325	02-600527	9.5–14	QAL	0.00000283 (J)	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2328	02-600528	0–0.5	SOIL	0.00274	0.0000834	0.000000602 (J)	0.00000254	—	—	0.00000369	0.0321 (J)	0.0371	—	—	—	0.000000511
RE02-07-2329	02-600528	9.5–17.3	QAL	0.000011	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2330	02-600528	17.4–23	QBO	0.00000171 (J)	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2434	02-600545	0–0.5	SOIL	0.00984	0.000324	0.00000172 (J)	0.000015	0.00000103 (J)	0.00000622	0.0000468	1.21	0.904	—	0.000000221	0.00000328	0.0000172
RE02-07-2435	02-600545	9.5–14.3	QAL	0.0000181	0.00000156 (J)	—	—	—	—	0.000000302	0.0699	0.111	—	—	—	—
RE02-07-2437	02-600545	14.3–18.5	QBO	0.00002	0.00000143 (J)	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2438	02-600546	0–0.5	SOIL	0.00182	0.0000838	—	0.00000272	—	—	0.00000339	0.0435	0.0991	—	—	0.000000304 (J)	0.000000979
RE02-07-2439	02-600546	9.5–11	QAL	0.0000119	0.00000153 (J)	—	—	—	—	0.000000558	0.0527	0.0509	—	—	—	—
RE02-10-21501	02-612280	5–7	QAL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273), unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSLs are from EPA regional screening tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

[d] na = Not available.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected.

[g] NA = Not analyzed.

Table 6.8-4
Radionuclides Detected or Detected above BVs/FVs at AOCs 02-004(b)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Cobalt-60	Plutonium-239/240	Tritium	Uranium-235/236
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**0.18**
Soil BV[a]				**1.65**	**na**	**0.054**	**na**	**0.2**
Industrial SAL[c]				**41**	**9**	**1200**	**2,400,000**	**160**
Recreational SAL[c]				**370**	**81**	**1300**	**5,700,000**	**1000**
Residential SAL[c]				**12**	**2.6**	**79**	**1700**	**42**
RE02-07-2222	02-600508	0–0.5	SOIL	—[d]	0.806	0.164	0.0166164	—
RE02-07-2226	02-600509	0–0.5	SOIL	—	0.884	0.149	0.0165105	—
RE02-07-2230	02-600510	0–0.5	SOIL	—	—	0.756	—	—
RE02-07-2234	02-600511	0–0.5	SOIL	—	—	0.197	0.0102305	—
RE02-07-2237	02-600511	14–19	QBO	—	—	—	—	0.207
RE02-07-2320	02-600526	0–0.5	SOIL	—	—	—	0.00837898	—
RE02-07-2321	02-600526	9.5–12	QAL	—	—	—	0.915975	—
RE02-07-2324	02-600527	0–0.5	SOIL	—	—	0.0761	—	—
RE02-07-2328	02-600528	0–0.5	SOIL	—	—	0.0705	—	—
RE02-07-2437	02-600545	14.3–18.5	QBO	—	—	—	—	0.251
RE02-07-2439	02-600546	9.5–11	QAL	NA[e]	NA	NA	0.0417753	NA
RE02-10-21501	02-612280	5–7	QAL	0.23	0.139	0.0581	0.217365	—

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from LANL (2015, 600929).

[d] — = Not detected.

[e] NA = Not analyzed.

Table 6.11-1
Samples Collected and Analyses Requested at AOC 02-004(e)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Dioxins/Furans	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
RE02-07-2390	02-600537	0–0.5	SOIL	07-560[a]	07-560	07-595	07-560	07-560	—[b]	07-560	07-560	07-560	07-560	07-560	07-560	07-560	—	07-560
RE02-07-2391	02-600537	9.5–14.5	QAL	07-803	07-802	07-800	07-803	07-803	—	07-803	07-803	07-802	07-801	07-802	07-803	07-801	07-801	07-802
RE02-07-2392	02-600537	15–19.5	QBO	07-803	07-802	07-800	07-803	07-803	—	07-803	07-803	07-802	07-801	07-802	07-803	07-801	07-801	07-802
RE02-07-2394	02-600538	0–0.5	SOIL	07-560	07-560	07-595	07-560	07-560	—	07-560	07-560	07-560	07-560	07-560	07-560	07-560	—	07-560
RE02-07-2396	02-600538	14.5–16	QBO	07-816	07-816	07-815	07-816	07-816	—	07-816	07-816	07-816	07-816	07-816	07-816	07-816	07-816	07-816
RE02-07-2398	02-600539	0–0.5	SOIL	07-816	07-816	07-815	07-816	07-816	—	07-816	07-816	07-816	07-816	07-816	07-816	07-816	—	07-816
RE02-07-2399	02-600539	9.5–12.8	QAL	07-816	07-816	07-815	07-816	07-816	—	07-816	07-816	07-816	07-816	07-816	07-816	07-816	07-816	07-816
RE02-07-2400	02-600539	12.8–17.5	QBO	07-825	07-825	07-824	07-825	07-825	—	07-825	07-825	07-825	07-825	07-825	07-825	07-825	07-825	07-825
RE02-10-21501	02-612280	5–7	QAL	—	—	—	10-4812	10-4812	10-4811	10-4812	10-4812	10-4811	10-4810	—	—	—	—	—
RE02-10-21500	02-612280	15–16	QBO	—	—	—	10-4812	10-4812	10-4811	10-4812	10-4812	10-4811	10-4810	—	—	—	—	—
RE02-10-21495	02-612280	25–27	QBO	—	—	—	10-4812	10-4812	10-4811	10-4812	10-4812	10-4811	10-4810	—	—	—	—	—
RE02-10-21490	02-612280	35–36	QBO	—	—	—	10-4812	10-4812	10-4811	10-4812	10-4812	10-4811	10-4810	—	—	—	—	—
RE02-10-21485	02-612280	49–50	QBO	—	—	—	10-4812	10-4812	10-4811	10-4812	10-4812	10-4811	10-4810	—	—	—	—	—

[a] Analytical request number.

[b] — = Analysis not requested.

Table 6.11-2
Inorganic Chemicals Detected or Detected above BVs at AOC 02-004(e)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Chromium	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**2.6**	**3.96**	**3700**	**13.5**	**739**	**189**	**0.1**	**2**	**na[b]**	**na**	**0.3**	**4.59**	**40**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**19.3**	**14.7**	**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**505[d]**	**51,900**	**908,000**	**800**	**na**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**281[d]**	**24,800**	**434,000**	**1110**	**na**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**70.5**	**96.6[d]**	**3130**	**54,800**	**400**	**na**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**394**	**23,500**
RE02-07-2390	02-600537	0–0.5	SOIL	—[f]	—	—	—	—	29	—	—	—	—	—	—	—	—	0.000929 (J)	—	—	65.8
RE02-07-2391	02-600537	9.5–14.5	QAL	—	—	—	—	0.529 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2392	02-600537	15–19.5	QBO	9700	—	2.28	30.9	0.591 (U)	14.2	4.36	9850	26.5	988 (J+)	399	—	—	—	—	2.51	8.86	41.8
RE02-07-2394	02-600538	0–0.5	SOIL	—	—	—	—	—	31.6	—	—	—	—	—	—	—	1.31 (J-)	0.00162 (J)	—	—	73.9
RE02-07-2396	02-600538	14.5–16	QBO	8030	—	1.35 (J)	—	0.587 (U)	11.6 (U)	—	5800	—	—	258	—	2.14 (U)	—	—	1.76 (U)	4.85	—
RE02-07-2398	02-600539	0–0.5	SOIL	—	—	—	—	—	66.2 (U)	19	—	23.2	—	—	1.2	—	3.44	0.000536 (J)	—	—	120
RE02-07-2399	02-600539	9.5–12.8	QAL	—	—	—	—	0.573 (U)	33.4 (U)	—	—	—	—	—	—	—	—	—	1.72 (U)	—	—
RE02-07-2400	02-600539	12.8–17.5	QBO	9150	—	1.32 (J)	28.9 (J+)	0.602 (U)	13.7 (U)	—	5840 (J+)	—	—	209	—	3.26 (U)	—	—	1.72 (J)	—	—
RE02-10-21500	02-612280	15–16	QBO	8240	1.18 (U)	—	—	0.589 (U)	—	—	4950	—	—	196 (J-)	—	2.49	NA[g]	NA	1.19 (U)	—	—
RE02-10-21495	02-612280	25–27	QBO	—	1.26 (U)	1.25 (U)	—	0.631 (U)	—	—	5290	—	—	200 (J-)	—	—	NA	NA	1.25 (U)	—	—
RE02-10-21490	02-612280	35–36	QBO	—	1.19 (U)	1.26 (U)	—	0.593 (U)	—	—	5120	—	—	253 (J-)	—	—	NA	NA	1.26 (U)	—	—
RE02-10-21485	02-612280	49–50	QBO	—	1.23 (U)	1.25 (U)	—	0.617 (U)	3.39	—	5400	—	—	—	—	—	NA	NA	1.25 (U)	—	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 6.11-3
Organic Chemicals Detected at AOC 02-004(e)

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	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-]
Industrial SSL[a]				**50,500**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300**[b]	**3230**	**33,700**	**33,700**	**na**[c]	**na**	**na**	**na**
Recreational SSL[d]				**17,300**	**863,000**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630**[b]	**8880**	**11,500**	**11,500**	**na**	**na**	**na**	**na**
Residential SSL[a]				**3480**	**17,400**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740**[b]	**152**	**2320**	**2320**	**na**	**na**	**na**	**na**
RE02-07-2390	02-600537	0–0.5	SOIL	—[e]	—	—	0.18	0.0211 (J)	0.0261 (J)	0.033 (J)	—	0.02 (J)	0.0274 (J)	—	0.00202	0.00383	0.000328	0.0000292
RE02-07-2391	02-600537	9.5–14.5	QAL	—	—	—	0.0033 (J)	—	—	—	—	—	—	—	0.00000234 (J)	0.00000444	0.000000842 (J)	—
RE02-07-2392	02-600537	15–19.5	QBO	—	—	—	—	—	—	—	—	—	—	—	0.000000283 (J)	0.000000596	0.0000000965 (J)	—
RE02-07-2394	02-600538	0–0.5	SOIL	0.0202 (J)	0.0405	—	0.00455	0.139	0.122 (J)	0.204 (J)	0.0618 (J)	0.14	0.278	0.016 (J)	0.00175	0.00324	0.000187	0.0000169
RE02-07-2396	02-600538	14.5–16	QBO	—	—	—	—	—	—	—	—	—	—	—	0.00000827	0.0000158	0.000000823 (J)	—
RE02-07-2398	02-600539	0–0.5	SOIL	—	0.00721 (J)	0.0736	0.107	0.0378	0.0419 (J)	0.0464 (J)	—	0.0306 (J)	0.0568	—	0.00314	0.00569	0.000471	0.0000499
RE02-07-2399	02-600539	9.5–12.8	QAL	—	—	—	0.0024 (J)	—	—	—	—	—	—	—	0.000115	0.0002	0.0000192	0.00000151 (J)
RE02-07-2400	02-600539	12.8–17.5	QBO	—	—	—	—	—	—	—	—	—	—	—	0.00000964	0.0000167	0.00000158 (J)	0.000000116 (J)
RE02-10-21501	02-612280	5–7	QAL	NA[f]	NA	0.0438 (J)	0.0286 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 6.11-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	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-]	Hexachlorodibenzofuran[1,2,3,7,8,9-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene
Industrial SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**32.3**
Recreational SSL[d]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**88.8**
Residential SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**1.53**
RE02-07-2390	02-600537	0–0.5	SOIL	0.00151	0.00000764	0.000047	0.0000173	0.000308	0.0000103	0.00000726	0.00000215 (J)	0.00000995	0.000294	—
RE02-07-2391	02-600537	9.5–14.5	QAL	0.00000181	—	—	—	0.00000026	0.000000084 (J)	—	—	0.0000000642 (J)	0.000000729	—
RE02-07-2392	02-600537	15–19.5	QBO	0.0000000965	—	—	—	—	0.0000000293 (J)	—	—	—	0.0000000293	—
RE02-07-2394	02-600538	0–0.5	SOIL	0.000647	0.00000878	0.0000336	0.0000186	0.000283	0.00000833	0.00000681	0.00000152 (J)	0.00000855	0.00019	0.0486 (J)
RE02-07-2396	02-600538	14.5–16	QBO	0.00000244	—	0.000000154 (J)	—	0.0000011	0.0000000627 (J)	—	—	—	0.000000585	—
RE02-07-2398	02-600539	0–0.5	SOIL	0.0017	0.0000183	0.0000869	0.0000417	0.000594	0.0000155	0.0000161	0.00000341	0.0000213	0.000421	—
RE02-07-2399	02-600539	9.5–12.8	QAL	0.000106	0.000000375 (J)	0.00000356	0.000000621 (J)	0.0000126	0.000000335 (J)	0.000000168 (J)	—	0.000000427 (J)	0.0000141	—
RE02-07-2400	02-600539	12.8–17.5	QBO	0.00000707	0.0000000639 (J)	0.000000296 (J)	—	0.000000936	—	—	—	—	0.00000111	—
RE02-10-21501	02-612280	5–7	QAL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 6.11-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	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	Tetrachlorodibenzodioxin[2,3,7,8-]	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)
Industrial SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**25,300**	**25,300**	**0.000238**	**na**	**0.00243**	**na**
Recreational SSL[d]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**8630**	**8630**	**0.000297**	**na**	**0.00297**	**na**
Residential SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**1740**	**1740**	**0.000049**	**na**	**0.00049**	**na**
RE02-07-2390	02-600537	0–0.5	SOIL	0.0193	0.00126	0.00000278	0.0000236	0.00000144 (J)	0.00000641	0.0000619 (J)	0.0171 (J)	0.0328 (J)	—	0.00000162	0.00000339	0.000017
RE02-07-2391	02-600537	9.5–14.5	QAL	0.0000257	0.00000116 (J)	—	—	—	0.0000000774 (J)	0.000000285	—	—	—	—	0.0000000594 (J)	0.0000000594
RE02-07-2392	02-600537	15–19.5	QBO	0.00000176 (J)	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2394	02-600538	0–0.5	SOIL	0.0151 (J-)	0.000567	0.00000336	0.0000218	0.00000146 (J)	0.00000582	0.0000583 (J)	0.202	0.327	0.000000491 (J)	0.00000249	0.00000282	0.0000203
RE02-07-2396	02-600538	14.5–16	QBO	0.000074	0.00000202 (J)	—	—	—	—	0.0000000767	—	—	—	—	—	—
RE02-07-2398	02-600539	0–0.5	SOIL	0.0285	0.00133	0.00000806	0.0000555	0.00000254	0.00000864	0.0000989	0.0361	0.0794	0.00000105	0.00000813	0.0000047	0.0000384
RE02-07-2399	02-600539	9.5–12.8	QAL	0.00109	0.0000811	—	—	—	—	0.000000917	—	—	—	—	—	—
RE02-07-2400	02-600539	12.8–17.5	QBO	0.000106	0.00000544	—	—	—	—	—	—	—	—	—	—	—
RE02-10-21501	02-612280	5–7	QAL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273).

[b] Pyrene used as a surrogate based on structural similarity.

[c] na = Not available.

[d] SSLs are from LANL (2017, 602581).

[e] — = Not detected.

[f] NA = Not analyzed.

Table 6.11-4
Radionuclides Detected or Detected above BVs/FVs at AOC 02-004(e)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Cobalt-60	Plutonium-239/240	Tritium
Soil BV[a]				**1.65**	**na[b]**	**0.054**	**na**
Industrial SAL[c]				**41**	**9**	**1200**	**2,400,000**
Recreational SAL[c]				**370**	**81**	**1300**	**5,700,000**
Residential SAL[c]				**12**	**2.6**	**79**	**1700**
RE02-07-2391	02-600537	9.5–14.5	QAL	—[d]	—	—	0.0668511
RE02-07-2394	02-600538	0–0.5	SOIL	—	—	0.0829	0.0110539
RE02-07-2398	02-600539	0–0.5	SOIL	—	—	0.392	—
RE02-07-2399	02-600539	9.5–12.8	QAL	0.128	—	0.0546	—
RE02-10-21501	02-612280	5–7	QAL	0.23	0.139	0.0581	0.217365

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SALs for radionuclides from LANL (2015, 600929).

[d] — = Not detected.

Table 6.12-1
Samples Collected and Analyses Requested at AOC 02-004(f)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Dioxins/Furans	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
RE02-03-51874	02-22376	0–0.5	SOIL	—[a]	—	—	1796S[b]	1796S	1795S	1796S	1796S	1795S	—	—	1796S	—	1796S	—	—
RE02-03-51875	02-22376	1.5–2	SOIL	—	—	—	1796S	1796S	1795S	1796S	1796S	1795S	—	—	1796S	—	1796S	—	—
RE02-03-51876	02-22377	0–0.5	SOIL	—	—	—	1796S	1796S	1795S	1796S	1796S	1795S	—	—	1796S	—	1796S	—	—
RE02-03-51877	02-22377	1.5–2	SOIL	—	—	—	1796S	1796S	1795S	1796S	1796S	1795S	—	—	1796S	—	1796S	—	—
RE02-03-51878	02-22378	0–0.5	SOIL	—	—	—	1796S	1796S	1795S	1796S	1796S	1795S	—	—	1796S	—	1796S	—	—
RE02-03-51879	02-22378	1.5–2	SOIL	—	—	—	1796S	1796S	1795S	1796S	1796S	1795S	—	—	1796S	—	1796S	—	—
RE02-03-51880	02-22379	0–0.5	SOIL	—	—	—	1796S	1796S	1795S	1796S	1796S	1795S	—	—	1796S	—	1796S	—	—
RE02-03-51881	02-22379	1.5–2	SOIL	—	—	—	1796S	1796S	1795S	1796S	1796S	1795S	—	—	1796S	—	1796S	—	—
RE02-07-1990	02-600469	4.5–9.5	QAL	07-780	07-780	07-779	07-780	07-780	—	07-780	07-780	07-780	07-780	07-780	07-780	07-780	—	07-780	07-780
RE02-07-1992	02-600469	17–19.5	QBO	07-785	07-785	07-784	07-785	07-785	—	07-785	07-785	07-785	07-785	07-785	07-785	07-785	—	07-785	07-785
RE02-10-21798	02-600470	4–4.2	SOIL	—	—	—	—	—	—	—	—	—	10-4033	—	—	—	—	—	—
RE02-07-1994	02-600470	4.5–7.5	QAL	07-571	07-571	07-600	07-571	07-571	—	07-571	07-571	07-571	07-571	07-571	07-571	07-571	—	07-571	07-571
RE02-10-21799	02-600470	6–6.2	SOIL	—	—	—	—	—	—	—	—	—	10-4033	—	—	—	—	—	—
RE02-07-1997	02-600471	0–0.5	SOIL	07-427	07-426	07-432	07-427	07-427	—	07-427	07-427	07-426	07-425	07-426	07-427	07-425	—	—	07-426
RE02-07-1998	02-600471	4.5–10	SOIL	07-613	07-612	07-610	07-613	07-613	—	07-613	07-613	07-612	07-611	07-612	07-613	07-611	—	07-611	07-612
RE02-07-1999	02-600471	18–25	QBO	07-613	07-612	07-610	07-613	07-613	—	07-613	07-613	07-612	07-611	07-612	07-613	07-611	—	07-611	07-612
RE02-07-2001	02-600472	0–0.5	SOIL	07-427	07-426	07-432	07-427	07-427	—	07-427	07-427	07-426	07-425	07-426	07-427	07-425	—	—	07-426
RE02-07-2002	02-600472	4.5–9	SOIL	07-590	07-590	07-602	07-590	07-590	—	07-590	07-590	07-590	07-590	07-590	07-590	07-590	—	07-590	07-590
RE02-07-2003	02-600472	21–23	QBO	07-613	07-612	07-610	07-613	07-613	—	07-613	07-613	07-612	07-611	07-612	07-613	07-611	—	07-611	07-612
RE02-07-2005	02-600473	0–0.5	SOIL	07-427	07-426	07-432	07-427	07-427	—	07-427	07-427	07-426	07-425	07-426	07-427	07-425	—	—	07-426
RE02-07-2006	02-600473	4.5–13	QAL	07-643	07-643	07-642	07-643	07-643	—	07-643	07-643	07-643	07-643	07-643	07-643	07-643	—	07-643	07-643
RE02-07-2007	02-600473	13–18	QBO	07-652	07-651	07-649	07-652	07-652	—	07-652	07-652	07-651	07-650	07-651	07-652	07-650	—	07-650	07-651
RE02-07-2008	02-600473	18–23	QBO	07-652	07-651	07-649	07-652	07-652	—	07-652	07-652	07-651	07-650	07-651	07-652	07-650	—	07-650	07-651
RE02-07-2010	02-600474	4.5–10	QAL	07-549	07-548	07-531	07-549	07-549	—	07-549	07-549	07-548	07-547	07-548	07-549	07-547	—	07-547	07-548
RE02-07-2011	02-600474	16.5–19	QBO	07-549	07-548	07-531	07-549	07-549	—	07-549	07-549	07-548	07-547	07-548	07-549	07-547	—	07-547	07-548
RE02-07-2013	02-600475	0–0.5	SOIL	07-441	07-440	07-438	07-441	07-441	—	07-441	07-441	07-440	07-439	07-440	07-441	07-439	—	—	07-440
RE02-07-2014	02-600475	4–5	QAL	07-549	07-548	07-531	07-549	07-549	—	07-549	07-549	07-548	07-547	07-548	07-549	07-547	—	07-547	07-548
RE02-07-2015	02-600475	16–18.5	QBO	07-562	07-562	07-597	07-562	07-562	—	07-562	07-562	07-562	07-562	07-562	07-562	07-562	—	07-562	07-562
RE02-07-2017	02-600476	0–0.5	SOIL	07-441	07-440	07-438	07-441	07-441	—	07-441	07-441	07-440	07-439	07-440	07-441	07-439	—	—	07-440
RE02-07-2018	02-600476	4.5–9	QAL	07-550	07-550	07-594	07-550	07-550	—	07-550	07-550	07-550	07-550	07-550	07-550	07-550	—	07-550	07-550
RE02-07-2019	02-600476	20–25	QBO	07-533	07-533	07-527	07-533	07-533	—	07-533	07-533	07-533	07-533	07-533	07-533	07-533	—	07-533	07-533

Table 6.12-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Dioxins/Furans	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
RE02-07-2021	02-600477	0–0.5	SOIL	07-441	07-440	07-438	07-441	07-441	—	07-441	07-441	07-440	07-439	07-440	07-441	07-439	—	—	07-440
RE02-07-2022	02-600477	4.5–9	QAL	07-502	07-502	07-501	07-502	07-502	—	07-502	07-502	07-502	07-502	07-502	07-502	07-502	—	07-502	07-502
RE02-07-2023	02-600477	23–25	QBO	07-550	07-550	07-594	07-550	07-550	—	07-550	07-550	07-550	07-550	07-550	07-550	07-550	—	07-550	07-550
RE02-07-2025	02-600478	0–0.5	SOIL	07-441	07-440	07-438	07-441	07-441	—	07-441	07-441	07-440	07-439	07-440	07-441	07-439	—	—	07-440
RE02-07-2026	02-600478	4.5–9.5	QAL	07-487	07-486	07-484	07-487	07-487	—	07-487	07-487	07-486	07-485	07-486	07-487	07-485	—	07-485	07-486
RE02-07-2028	02-600478	14–18.8	QAL	07-487	07-486	07-484	07-487	07-487	—	07-487	07-487	07-486	07-485	07-486	07-487	07-485	—	07-485	07-486
RE02-07-2027	02-600478	18.8–20.5	QBO	07-487	07-486	07-484	07-487	07-487	—	07-487	07-487	07-486	07-485	07-486	07-487	07-485	—	07-485	07-486
RE02-07-2029	02-600479	0–0.5	SOIL	07-441	07-440	07-438	07-441	07-441	—	07-441	07-441	07-440	07-439	07-440	07-441	07-439	—	—	07-440
RE02-07-2030	02-600479	5–10	QAL	07-441	07-440	07-438	07-441	07-441	—	07-441	07-441	07-440	07-439	07-440	07-441	07-439	—	07-439	07-440
RE02-07-2031	02-600479	12.6–16.5	QBO	07-459	07-458	07-456	07-459	07-459	—	07-459	07-459	07-458	07-457	07-458	07-459	07-457	—	07-457	07-458
RE02-07-2033	02-600480	0–0.5	SOIL	07-441	07-440	07-438	07-441	07-441	—	07-441	07-441	07-440	07-439	07-440	07-441	07-439	—	—	07-440
RE02-07-2034	02-600480	4.5–10	QAL	07-459	07-458	07-456	07-459	07-459	—	07-459	07-459	07-458	07-457	07-458	07-459	07-457	—	07-457	07-458
RE02-07-2035	02-600480	12.5–15	QBO	07-487	07-486	07-484	07-487	07-487	—	07-487	07-487	07-486	07-485	07-486	07-487	07-485	—	07-485	07-486
RE02-07-2515	02-600564	0–0.5	SOIL	07-789	07-788	07-790	07-789	07-789	—	07-789	07-789	07-788	07-791	07-788	07-789	07-791	—	—	07-788
RE02-07-2516	02-600564	9.5–14.5	QAL	07-789	07-788	07-790	07-789	07-789	—	07-789	07-789	07-788	07-791	07-788	07-789	07-791	—	07-791	07-788
RE02-07-2517	02-600564	14.5–22	QBO	07-789	07-788	07-790	07-789	07-789	—	07-789	07-789	07-788	07-791	07-788	07-789	07-791	—	07-791	07-788
RE02-07-2519	02-600565	0–0.5	SOIL	07-789	07-788	07-790	07-789	07-789	—	07-789	07-789	07-788	07-791	07-788	07-789	07-791	—	—	07-788
RE02-07-2520	02-600565	9.5–15	QAL	07-789	07-788	07-790	07-789	07-789	—	07-789	07-789	07-788	07-791	07-788	07-789	07-791	—	07-791	07-788
RE02-07-2521	02-600565	16–21	QBO	07-796	07-795	07-793	07-796	07-796	—	07-796	07-796	07-795	07-794	07-795	07-796	07-794	—	07-794	07-795
RE02-07-2523	02-600566	0–0.5	SOIL	07-796	07-795	07-793	07-796	07-796	—	07-796	07-796	07-795	07-794	07-795	07-796	07-794	—	—	07-795
RE02-07-2525	02-600566	14.5–20	QBO	07-796	07-795	07-793	07-796	07-796	—	07-796	07-796	07-795	07-794	07-795	07-796	07-794	—	07-794	07-795
RE02-10-26122	02-600567	8–8.2	SOIL	—	—	—	—	—	—	—	—	—	10-4699	—	—	—	—	—	—
RE02-07-2531	02-600568	0–0.5	SOIL	07-789	07-788	07-790	07-789	07-789	—	07-789	07-789	07-788	07-791	07-788	07-789	07-791	—	—	07-788
RE02-07-2532	02-600568	9.5–10.9	QAL	07-789	07-788	07-790	07-789	07-789	—	07-789	07-789	07-788	07-791	07-788	07-789	07-791	—	07-791	07-788
RE02-07-2533	02-600568	15–18.3	QBO	07-789	07-788	07-790	07-789	07-789	—	07-789	07-789	07-788	07-791	07-788	07-789	07-791	—	07-791	07-788
RE02-07-2535	02-600569	0–0.5	SOIL	07-789	07-788	07-790	07-789	07-789	—	07-789	07-789	07-788	07-791	07-788	07-789	07-791	—	—	07-788
RE02-07-2536	02-600569	9.5–12.7	QAL	07-789	07-788	07-790	07-789	07-789	—	07-789	07-789	07-788	07-791	07-788	07-789	07-791	—	07-791	07-788
RE02-07-2539	02-600570	0–0.5	SOIL	07-789	07-788	07-790	07-789	07-789	—	07-789	07-789	07-788	07-791	07-788	07-789	07-791	—	—	07-788
RE02-07-2540	02-600570	9.5–11.9	QAL	07-888	07-888	07-887	07-888	07-888	—	07-888	07-888	07-888	07-888	07-888	07-888	07-888	—	07-888	07-888
RE02-07-2541	02-600570	14.5–16.7	QBO	07-888	07-888	07-887	07-888	07-888	—	07-888	07-888	07-888	07-888	07-888	07-888	07-888	—	07-888	07-888
RE02-07-2543	02-600571	0–0.5	SOIL	07-789	07-788	07-790	07-789	07-789	—	07-789	07-789	07-788	07-791	07-788	07-789	07-791	—	—	07-788

Table 6.12-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Dioxins/Furans	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
RE02-07-2544	02-600571	9.5–11.7	QAL	07-894	07-894	07-911	07-894	07-894	—	07-894	07-894	07-894	07-894	07-894	07-894	07-894	—	07-894	07-894
RE02-07-2545	02-600571	11.7–15.5	QBO	07-894	07-894	07-911	07-894	07-894	—	07-894	07-894	07-894	07-894	07-894	07-894	07-894	—	07-894	07-894
RE02-07-2547	02-600572	0–0.5	SOIL	07-789	07-788	07-790	07-789	07-789	—	07-789	07-789	07-788	07-791	07-788	07-789	07-791	—	—	07-788
RE02-07-2548	02-600572	9.5–11.7	QAL	07-894	07-894	07-911	07-894	07-894	—	07-894	07-894	07-894	07-894	07-894	07-894	07-894	—	07-894	07-894
RE02-07-2549	02-600572	19.5–21.7	QBO	07-902	07-902	07-914	07-902	07-902	—	07-902	07-902	07-902	07-902	07-902	07-902	07-902	—	07-902	07-902
RE02-10-21747	02-612346	8–9	QAL	—	—	—	10-4701	10-4701	10-4701	10-4701	10-4701	10-4701	10-4701	—	—	10-4701	—	—	—
RE02-10-21748	02-612346	15–16	QAL	—	—	—	10-4694	10-4694	10-4693	10-4694	10-4694	10-4693	10-4693	—	—	10-4693	—	—	—
RE02-10-21749	02-612346	25–26	QBO	—	—	—	10-4694	10-4694	10-4693	10-4694	10-4694	10-4693	10-4693	—	—	10-4693	—	—	—
RE02-10-21750	02-612346	35–36	QBO	—	—	—	10-4694	10-4694	10-4693	10-4694	10-4694	10-4693	10-4693	—	—	10-4693	—	—	—
RE02-10-21751	02-612346	49–50	QBO	—	—	—	10-4694	10-4694	10-4693	10-4694	10-4694	10-4693	10-4693	—	—	10-4693	—	—	—
RE02-10-21752	02-612347	5–6	QAL	—	—	—	10-4733	10-4733	10-4732	10-4733	10-4733	10-4732	10-4732	—	—	10-4732	—	—	—
RE02-10-21753	02-612347	15–16	QAL	—	—	—	10-4733	10-4733	10-4732	10-4733	10-4733	10-4732	10-4732	—	—	10-4732	—	—	—
RE02-10-21754	02-612347	25–27	QBO	—	—	—	10-4733	10-4733	10-4732	10-4733	10-4733	10-4732	10-4732	—	—	10-4732	—	—	—
RE02-10-21755	02-612347	35–36	QBO	—	—	—	10-4733	10-4733	10-4732	10-4733	10-4733	10-4732	10-4732	—	—	10-4732	—	—	—
RE02-10-21756	02-612347	49–50	QBO	—	—	—	10-4733	10-4733	10-4732	10-4733	10-4733	10-4732	10-4732	—	—	10-4732	—	—	—
RE02-10-21792	02-612354	4–4.2	SOIL	—	—	—	—	—	—	—	—	—	10-4033	—	—	—	—	—	—
RE02-10-21793	02-612354	6–6.2	SOIL	—	—	—	—	—	—	—	—	—	10-4033	—	—	—	—	—	—
RE02-10-21795	02-612355	4–4.4	SOIL	—	—	—	—	—	—	—	—	—	10-4033	—	—	—	—	—	—
RE02-10-21796	02-612355	6–6.2	SOIL	—	—	—	—	—	—	—	—	—	10-4033	—	—	—	—	—	—
RE02-10-21801	02-612357	4–4.2	SOIL	—	—	—	—	—	—	—	—	—	10-4033	—	—	—	—	—	—
RE02-10-21802	02-612357	6–6.2	SOIL	—	—	—	—	—	—	—	—	—	10-4033	—	—	—	—	—	—
RE02-10-21804	02-612358	4–4.2	SOIL	—	—	—	—	—	—	—	—	—	10-4098	—	—	—	—	—	—
RE02-10-21805	02-612358	6–6.4	SOIL	—	—	—	—	—	—	—	—	—	10-4098	—	—	—	—	—	—
RE02-10-21807	02-612359	4–4.2	SOIL	—	—	—	—	—	—	—	—	—	10-4098	—	—	—	—	—	—
RE02-10-21808	02-612359	6–6.2	SOIL	—	—	—	—	—	—	—	—	—	10-4098	—	—	—	—	—	—
RE02-10-21810	02-612360	4–4.2	SOIL	—	—	—	—	—	—	—	—	—	10-4098	—	—	—	—	—	—
RE02-10-21811	02-612360	6–6.2	SOIL	—	—	—	—	—	—	—	—	—	10-4098	—	—	—	—	—	—
RE02-10-21813	02-612361	4–4.4	SOIL	—	—	—	—	—	—	—	—	—	10-4098	—	—	—	—	—	—
RE02-10-21814	02-612361	6–6.2	SOIL	—	—	—	—	—	—	—	—	—	10-4098	—	—	—	—	—	—
RE02-10-21816	02-612362	4–4.2	SOIL	—	—	—	—	—	—	—	—	—	10-4098	—	—	—	—	—	—
RE02-10-21817	02-612362	6–6.2	SOIL	—	—	—	—	—	—	—	—	—	10-4098	—	—	—	—	—	—

Table 6.12-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Dioxins/Furans	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
RE02-10-21819	02-612363	4–4.2	SOIL	—	—	—	—	—	—	—	—	—	10-4098	—	—	—	—	—	—
RE02-10-21820	02-612363	6–6.2	SOIL	—	—	—	—	—	—	—	—	—	10-4098	—	—	—	—	—	—
RE02-10-21822	02-612364	4–4.4	SOIL	—	—	—	—	—	—	—	—	—	10-4089	—	—	—	—	—	—
RE02-10-21823	02-612364	6–6.4	SOIL	—	—	—	—	—	—	—	—	—	10-4089	—	—	—	—	—	—
RE02-10-21825	02-612365	4–4.2	SOIL	—	—	—	—	—	—	—	—	—	10-4089	—	—	—	—	—	—
RE02-10-21826	02-612365	6–6.2	SOIL	—	—	—	—	—	—	—	—	—	10-4089	—	—	—	—	—	—
RE02-10-21828	02-612366	4–4.2	SOIL	—	—	—	—	—	—	—	—	—	10-4089	—	—	—	—	—	—
RE02-10-21829	02-612366	6–6.2	SOIL	—	—	—	—	—	—	—	—	—	10-4089	—	—	—	—	—	—
RE02-10-21831	02-612367	4–4.2	SOIL	—	—	—	—	—	—	—	—	—	10-4089	—	—	—	—	—	—
RE02-10-21832	02-612367	6–6.2	SOIL	—	—	—	—	—	—	—	—	—	10-4089	—	—	—	—	—	—
RE02-10-21834	02-612368	4–4.2	SOIL	—	—	—	—	—	—	—	—	—	10-4089	—	—	—	—	—	—
RE02-10-21835	02-612368	6–6.2	SOIL	—	—	—	—	—	—	—	—	—	10-4089	—	—	—	—	—	—
RE02-10-26115	02-613005	2–2.2	SOIL	—	—	—	—	—	—	—	—	—	10-4519	—	—	—	—	—	—
RE02-10-26116	02-613005	4–4.2	SOIL	—	—	—	—	—	—	—	—	—	10-4519	—	—	—	—	—	—
RE02-11-2210	02-613623	2–3	SOIL	—	—	—	—	—	—	—	—	—	11-540	—	—	—	—	—	—
RE02-11-2211	02-613623	4–5	SOIL	—	—	—	—	—	—	—	—	—	11-540	—	—	—	—	—	—
RE02-11-2213	02-613624	2–3	SOIL	—	—	—	—	—	—	—	—	—	11-540	—	—	—	—	—	—
RE02-11-2214	02-613624	4–5	SOIL	—	—	—	—	—	—	—	—	—	11-540	—	—	—	—	—	—
RE02-11-2215	02-613624	6–7	SOIL	—	—	—	—	—	—	—	—	—	11-540	—	—	—	—	—	—
RE02-11-2216	02-613625	2–3	SOIL	—	—	—	—	—	—	—	—	—	11-540	—	—	—	—	—	—
RE02-11-2217	02-613625	4–5	SOIL	—	—	—	—	—	—	—	—	—	11-540	—	—	—	—	—	—

[a] — = Analysis not requested.

[b] Analytical request number.

Table 6.12-2
Inorganic Chemicals Detected or Detected above BVs at AOC 02-004(f)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Chromium	Hexavalent Chromium	Copper	Cyanide (Total)	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**2.6**	**na[b]**	**3.96**	**0.5**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**4.59**	**40**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**19.3**	**na**	**14.7**	**0.5**	**21500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**505[d]**	**72.1**	**51,900**	**62.8**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**281[d]**	**40.2**	**24,800**	**224**	**434,000**	**1110**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**70.5**	**96.6[d]**	**3.05**	**3130**	**11.1**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**394**	**23,500**
RE02-03-51874	02-22376	0–0.5	SOIL	—[f]	—	—	—	—	—	0.122	—	NA[g]	—	—	—	—	—	NA	NA	—	—	—
RE02-03-51875	02-22376	1.5–2	SOIL	—	—	—	—	0.528 (U)	—	—	—	NA	—	—	—	1.19	—	NA	NA	—	—	—
RE02-03-51876	02-22377	0–0.5	SOIL	—	—	—	—	0.718	—	0.217	61.4	NA	—	45.6	—	—	—	NA	NA	—	—	270
RE02-03-51877	02-22377	1.5–2	SOIL	—	—	—	—	—	—	0.176	—	NA	—	—	—	—	—	NA	NA	—	—	—
RE02-03-51878	02-22378	0–0.5	SOIL	—	—	—	—	0.539 (U)	—	0.327	—	NA	—	—	—	—	—	NA	NA	—	—	—
RE02-03-51879	02-22378	1.5–2	SOIL	—	—	—	—	0.536 (U)	—	—	—	NA	—	—	—	—	—	NA	NA	—	—	—
RE02-03-51880	02-22379	0–0.5	SOIL	—	—	—	—	0.518 (U)	—	0.0666 (J)	—	NA	—	—	—	—	—	NA	NA	—	—	—
RE02-03-51881	02-22379	1.5–2	SOIL	—	—	—	—	0.545 (U)	—	0.0806 (J)	—	NA	—	—	—	—	—	NA	NA	—	—	—
RE02-07-1990	02-600469	4.5–9.5	QAL	—	—	—	—	0.518 (U)	—	NA	—	—	—	—	—	—	—	1.43	—	—	—	—
RE02-07-1992	02-600469	17–19.5	QBO	11500	—	1.15 (J)	40.5	0.594 (U)	—	NA	—	—	4880	—	—	—	—	—	—	0.954 (J)	—	—
RE02-07-1994	02-600470	4.5–7.5	QAL	—	—	—	—	0.517 (U)	—	NA	—	—	—	—	—	—	—	1.65	—	—	—	—
RE02-07-1997	02-600471	0–0.5	SOIL	—	—	—	—	0.505 (U)	—	NA	—	—	—	—	—	—	—	2.84	0.000724 (J)	—	—	99.3
RE02-07-1998	02-600471	4.5–10	SOIL	—	—	—	—	—	—	NA	—	—	—	—	—	—	—	1.41	0.00237	1.53 (U)	—	65
RE02-07-1999	02-600471	18–25	QBO	8860	—	1.75 (U)	41.5 (J+)	0.585 (U)	20.2 (U)	NA	4	—	5100	—	—	—	2.04 (U)	—	—	1.75 (U)	—	—
RE02-07-2001	02-600472	0–0.5	SOIL	—	—	—	—	0.496 (U)	—	NA	—	—	—	—	—	—	—	1.18	—	—	—	—
RE02-07-2002	02-600472	4.5–9	SOIL	—	—	—	—	0.537 (U)	—	NA	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2003	02-600472	21–23	QBO	10500	—	1.66 (U)	38 (J+)	0.552 (U)	2.99 (J)	NA	—	—	4790	—	—	—	—	—	—	1.66 (U)	—	—
RE02-07-2005	02-600473	0–0.5	SOIL	—	—	—	—	0.509 (U)	—	NA	—	—	—	—	—	—	—	9.16	0.00327	—	—	—
RE02-07-2006	02-600473	4.5–13	QAL	—	—	—	—	—	80.3	NA	19.5	—	—	—	—	—	—	2.18 (J-)	—	—	—	—
RE02-07-2007	02-600473	13–18	QBO	9220	—	1.65 (J)	71	—	13.7 (U)	NA	4.69	—	5650	—	364	—	3.55 (U)	—	—	1.7 (U)	—	—
RE02-07-2008	02-600473	18–23	QBO	6170	0.575 (UJ)	0.776 (J)	—	0.723 (U)	3.8 (U)	NA	—	—	4250	—	—	—	—	—	—	2.17 (U)	—	—
RE02-07-2010	02-600474	4.5–10	QAL	—	—	—	—	0.524 (U)	—	NA	—	—	—	—	—	0.101	—	—	—	—	—	—
RE02-07-2011	02-600474	16.5–19	QBO	10100	—	1.43 (J)	77.3	0.586 (U)	13.3	NA	148	—	6000	15.8	303	—	6.36	—	—	0.912 (J)	—	—
RE02-07-2013	02-600475	0–0.5	SOIL	—	—	—	—	0.507 (U)	—	NA	—	—	—	—	—	1.64	—	1.34	—	—	—	57.3 (J)
RE02-07-2014	02-600475	4–5	QAL	—	—	—	—	—	—	NA	—	—	—	—	—	1.82	—	—	—	—	—	76.3
RE02-07-2015	02-600475	16–18.5	QBO	13000 (J+)	—	1.71 (U)	48.7 (J+)	0.572 (U)	4.32	NA	—	—	5080	—	216 (J+)	—	2.2	1.41 (J-)	0.00363	0.852 (J)	—	—
RE02-07-2017	02-600476	0–0.5	SOIL	—	—	—	—	0.517 (U)	—	NA	—	—	—	—	—	—	—	—	—	1.55 (U)	—	—
RE02-07-2018	02-600476	4.5–9	QAL	—	—	—	—	0.544 (U)	—	NA	—	—	—	—	—	—	—	0.979 (J)	—	—	—	—

Table 6.12-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Chromium	Hexavalent Chromium	Copper	Cyanide (Total)	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**2.6**	**na[b]**	**3.96**	**0.5**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**4.59**	**40**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**19.3**	**na**	**14.7**	**0.5**	**21500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**505[d]**	**72.1**	**51,900**	**62.8**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**281[d]**	**40.2**	**24,800**	**224**	**434,000**	**1110**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**70.5**	**96.6[d]**	**3.05**	**3130**	**11.1**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**394**	**23,500**
RE02-07-2019	02-600476	20–25	QBO	5210	—	1.75 (U)	—	0.583 (U)	9.87 (U)	NA	8.87 (U)	—	4610	—	—	—	2.97 (U)	—	—	0.908 (J)	—	—
RE02-07-2021	02-600477	0–0.5	SOIL	—	—	—	—	—	24.7	NA	—	—	—	—	—	2.9	—	1.23	—	—	—	69.7 (J)
RE02-07-2022	02-600477	4.5–9	QAL	—	—	—	—	0.527 (U)	—	NA	27.3 (U)	—	—	—	—	0.941	—	1 (J)	—	1.58 (U)	—	53.7
RE02-07-2023	02-600477	23–25	QBO	7030	0.518 (UJ)	1.93 (U)	—	0.643 (U)	8.89 (U)	NA	16.9 (U)	—	5540	—	204	—	5.76 (U)	—	—	0.834 (J)	—	—
RE02-07-2025	02-600478	0–0.5	SOIL	—	—	—	—	—	—	NA	—	—	—	—	—	0.465	—	1.67	—	—	—	62.5 (J)
RE02-07-2026	02-600478	4.5–9.5	QAL	—	—	—	—	0.548 (U)	—	NA	—	—	—	—	—	—	—	5.72	—	—	—	—
RE02-07-2028	02-600478	14–18.8	QAL	—	—	—	—	0.535 (U)	—	NA	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2027	02-600478	18.8–20.5	QBO	12800 (J+)	—	0.835 (J)	109	0.6 (U)	5.02 (U)	NA	4.36 (U)	—	7270	—	1370	—	2.52 (U)	2.68	—	1.33 (J)	—	—
RE02-07-2029	02-600479	0–0.5	SOIL	—	—	—	—	0.499 (U)	37	NA	—	—	—	—	—	0.292	—	1.49	—	—	—	77.1 (J)
RE02-07-2030	02-600479	5–10	QAL	—	—	—	—	0.664	29.2	NA	85.9	—	—	—	—	—	—	1.24	—	—	—	49.1 (J)
RE02-07-2031	02-600479	12.6–16.5	QBO	5950	—	1.31 (J)	38 (J+)	—	10.2	NA	10.6 (J)	—	7140	—	378	—	2.98	—	—	1.67 (U)	7.84	—
RE02-07-2033	02-600480	0–0.5	SOIL	—	—	—	—	0.509 (U)	23.5	NA	—	—	—	—	—	0.223	—	1.86	—	1.53 (U)	—	97.9 (J)
RE02-07-2034	02-600480	4.5–10	QAL	—	—	—	—	—	32.1	NA	—	—	—	—	—	—	—	3.07	—	1.71 (U)	—	—
RE02-07-2035	02-600480	12.5–15	QBO	8460 (J+)	—	1.36 (J)	36.7	0.598 (U)	22.7 (U)	NA	116	—	9690	19.5 (U)	253	—	4.98 (U)	2.72	—	0.897 (J)	13.7	—
RE02-07-2515	02-600564	0–0.5	SOIL	—	—	—	—	0.516 (U)	—	NA	—	—	—	—	—	—	—	0.843 (J)	0.000732 (J-)	1.84	—	58.4
RE02-07-2516	02-600564	9.5–14.5	QAL	—	—	—	—	0.512 (U)	—	NA	—	—	—	—	—	—	—	1.43	—	—	—	—
RE02-07-2517	02-600564	14.5–22	QBO	10100	—	1.04 (J)	40.8	0.583 (U)	4.21 (U)	NA	—	—	5180	—	—	—	—	—	—	1.28 (J)	—	—
RE02-07-2519	02-600565	0–0.5	SOIL	—	—	—	—	0.494 (U)	—	NA	—	—	—	—	—	—	—	3.06	0.000556 (J-)	—	—	—
RE02-07-2520	02-600565	9.5–15	QAL	—	—	—	—	0.558 (U)	—	NA	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2521	02-600565	16–21	QBO	9640	—	1.81	33.3	0.57 (U)	7 (U)	NA	—	—	7030	—	191	—	2.08 (U)	—	—	1.34 (J)	5.82	—
RE02-07-2523	02-600566	0–0.5	SOIL	—	—	—	—	—	—	NA	—	—	—	—	—	—	—	1.92 (J-)	0.00162 (J-)	—	—	56.2
RE02-07-2525	02-600566	14.5–20	QBO	7740	—	2.35	51.1	0.562 (U)	7.07 (U)	NA	—	—	11900	—	576	—	—	—	—	2.48	6.01	—
RE02-07-2531	02-600568	0–0.5	SOIL	—	—	—	—	0.51 (U)	—	NA	—	—	—	—	—	—	—	1.18	0.00657 (J-)	—	—	—
RE02-07-2532	02-600568	9.5–10.9	QAL	—	—	—	—	0.525 (U)	—	NA	—	—	—	—	—	—	—	—	—	2.25	—	—
RE02-07-2533	02-600568	15–18.3	QBO	5270	—	0.716 (J)	—	0.57 (U)	12.9	NA	—	—	5220	—	—	—	3.41 (J)	—	—	1.49 (J)	—	—
RE02-07-2535	02-600569	0–0.5	SOIL	—	—	—	—	0.524 (U)	—	NA	—	1.06	—	—	—	0.302	—	1.22	—	—	—	—
RE02-07-2536	02-600569	9.5–12.7	QAL	—	—	—	—	0.507 (U)	—	NA	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2539	02-600570	0–0.5	SOIL	—	—	—	—	0.505 (U)	—	NA	—	—	—	—	—	0.282	—	—	—	—	—	—
RE02-07-2540	02-600570	9.5–11.9	QAL	—	—	—	—	0.532 (U)	—	NA	—	—	—	—	—	0.364	—	—	—	—	—	—
RE02-07-2541	02-600570	14.5–16.7	QBO	4650	—	1.41 (J)	30.9	0.55 (U)	13.2 (U)	NA	—	—	7470	—	—	—	3.66 (U)	—	—	1.65 (U)	7.48 (J)	—

Table 6.12-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Chromium	Hexavalent Chromium	Copper	Cyanide (Total)	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**2.6**	**na[b]**	**3.96**	**0.5**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**4.59**	**40**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**19.3**	**na**	**14.7**	**0.5**	**21500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**505[d]**	**72.1**	**51,900**	**62.8**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**281[d]**	**40.2**	**24,800**	**224**	**434,000**	**1110**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**70.5**	**96.6[d]**	**3.05**	**3130**	**11.1**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**394**	**23,500**
RE02-07-2543	02-600571	0–0.5	SOIL	—	—	—	—	0.528 (U)	—	NA	—	—	—	—	—	0.194	—	—	0.00123 (J-)	1.57 (J)	—	50.4
RE02-07-2544	02-600571	9.5–11.7	QAL	—	—	—	—	0.547 (U)	19.5 (J)	NA	—	—	—	—	—	—	—	—	—	1.64 (U)	—	—
RE02-07-2545	02-600571	11.7–15.5	QBO	7140	—	1.04 (J)	40.7	0.605 (U)	11.4 (J)	NA	—	—	6680	—	210 (J-)	—	5.59	—	—	1.81 (U)	—	—
RE02-07-2547	02-600572	0–0.5	SOIL	—	—	—	—	0.494 (U)	—	NA	—	—	—	—	—	0.759	—	1.1	—	—	—	—
RE02-07-2548	02-600572	9.5–11.7	QAL	—	—	—	—	0.516 (U)	50.9 (J)	NA	—	—	—	—	—	—	—	—	—	1.55 (U)	—	—
RE02-07-2549	02-600572	19.5–21.7	QBO	8870	—	1.32 (J)	44.8	0.588 (U)	13.7	NA	—	—	6680	—	325 (J+)	—	3.96	—	—	1.76 (U)	6.56	—
RE02-10-21747	02-612346	8–9	QAL	—	1.05 (U)	—	—	0.525 (U)	—	—	—	NA	—	—	—	40.6	—	NA	NA	—	—	—
RE02-10-21748	02-612346	15–16	QAL	—	1.11 (U)	—	—	0.555 (U)	—	0.448 (J)	—	NA	—	—	—	5.87	—	NA	NA	—	—	—
RE02-10-21749	02-612346	25–26	QBO	3820	1.25 (U)	1.22 (U)	—	0.625 (U)	—	—	—	NA	6340	—	226	0.148	—	NA	NA	1.22 (U)	—	—
RE02-10-21750	02-612346	35–36	QBO	—	1.28 (U)	1.28 (U)	—	0.642 (U)	—	—	—	NA	5340	—	195	0.154	—	NA	NA	1.28 (U)	—	—
RE02-10-21751	02-612346	49–50	QBO	—	1.15 (U)	1.19 (U)	—	0.573 (U)	—	—	—	NA	5990	—	260	—	—	NA	NA	1.19 (U)	—	—
RE02-10-21752	02-612347	5–6	QAL	—	0.996 (U)	—	—	—	—	—	—	NA	—	—	—	—	—	NA	NA	—	—	—
RE02-10-21753	02-612347	15–16	QAL	—	0.962 (U)	—	—	0.481 (U)	—	—	—	NA	—	—	—	—	—	NA	NA	—	—	—
RE02-10-21754	02-612347	25–27	QBO	—	1.19 (U)	1.21 (U)	—	0.593 (U)	—	—	—	NA	4940	—	200 (J-)	—	—	NA	NA	1.21 (U)	—	—
RE02-10-21755	02-612347	35–36	QBO	—	1.18 (U)	1.18 (U)	—	0.59 (U)	—	—	—	NA	5850	—	227 (J-)	—	—	NA	NA	1.18 (U)	—	—
RE02-10-21756	02-612347	49–50	QBO	—	1.24 (U)	1.22 (U)	—	0.622 (U)	—	—	—	NA	5020	—	232 (J-)	—	—	NA	NA	1.22 (U)	—	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 6.12-3
Organic Chemicals Detected at AOC 02-004(f)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	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	Bis(2-ethylhexyl)phthalate	Chloroform	Chrysene	Di-n-butylphthalate	Fluoranthene	Fluorene
Industrial SSL[a]				**50,500**	**959,000**	**253,000**	**10.7**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300**[b]	**323**	**1830**	**28.4**	**3230**	**91,600**	**33,700**	**33,700**
Recreational SSL[c]				**17,300**	**505,000**	**863,000**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630**[b]	**888**	**1770**	**204**	**8880**	**32,800**	**11,500**	**11,500**
Residential SSL[a]				**3480**	**66,300**	**17,400**	**2.43**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740**[b]	**15.3**	**380**	**5.85**	**152**	**6160**	**2320**	**2320**
RE02-07-1990	02-600469	4.5–9.5	QAL	—[d]	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0404 (J)	—	—
RE02-07-1992	02-600469	17–19.5	QBO	—	—	—	0.042	—	—	—	—	—	—	—	—	—	—	0.0566 (J)	—	—
RE02-10-21798	02-600470	4–4.2	SOIL	NA[e]	NA	NA	—	0.0031 (J)	0.0082	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1994	02-600470	4.5–7.5	QAL	0.0466	—	0.0532	—	0.0544 (J)	0.068	0.201	—	0.247 (J)	0.0597 (J)	—	—	—	0.162	—	0.323	0.0185 (J)
RE02-07-1997	02-600471	0–0.5	SOIL	—	NA	—	—	0.219	0.533	—	—	—	—	—	—	NA	0.0135 (J)	—	0.0231 (J)	—
RE02-07-1998	02-600471	4.5–10	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1999	02-600471	18–25	QBO	—	—	—	—	0.0969 (J+)	0.0728 (J+)	—	0.155 (J)	0.131 (J)	—	—	—	—	0.0799	—	0.0792	—
RE02-07-2001	02-600472	0–0.5	SOIL	—	NA	—	—	0.24	0.561	—	—	—	—	—	—	NA	—	—	0.0236 (J)	—
RE02-07-2002	02-600472	4.5–9	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2003	02-600472	21–23	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2005	02-600473	0–0.5	SOIL	—	NA	—	—	0.0802	0.202	—	—	—	—	—	—	NA	—	—	0.0151 (J)	—
RE02-07-2006	02-600473	4.5–13	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2007	02-600473	13–18	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2008	02-600473	18–23	QBO	—	—	—	—	—	—	—	—	—	—	—	—	0.000317 (J)	—	—	—	—
RE02-07-2010	02-600474	4.5–10	QAL	—	—	—	—	—	0.0435	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2011	02-600474	16.5–19	QBO	—	0.00356 (J)	—	—	—	0.0027 (J)	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2013	02-600475	0–0.5	SOIL	—	NA	—	—	0.0546	0.0994	0.018 (J)	0.0152 (J)	0.021 (J)	—	—	—	NA	0.0143 (J)	—	0.0245 (J)	—
RE02-07-2014	02-600475	4–5	QAL	—	—	—	—	—	0.0686	—	0.093	0.0202 (J)	—	—	—	—	0.0115 (J)	—	0.0237 (J)	—
RE02-07-2015	02-600475	16–18.5	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2017	02-600476	0–0.5	SOIL	—	NA	—	—	0.0528	0.0999	—	—	—	—	—	0.591	NA	—	—	—	—
RE02-07-2018	02-600476	4.5–9	QAL	—	—	—	—	0.0034 (J)	0.0049	—	—	—	—	—	—	—	—	0.0502 (J)	—	—
RE02-07-2019	02-600476	20–25	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0439 (J)	—	—
RE02-07-2021	02-600477	0–0.5	SOIL	—	NA	—	—	0.0408	0.0284 (J)	0.0978	0.0853	0.143	—	—	—	NA	0.113	—	0.137	—
RE02-07-2022	02-600477	4.5–9	QAL	—	—	—	—	0.149	—	—	0.088	0.0135 (J)	—	—	—	—	—	—	0.0148 (J)	—
RE02-07-2023	02-600477	23–25	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0954 (J)	—	—
RE02-07-2025	02-600478	0–0.5	SOIL	—	NA	—	—	—	0.313	0.0304 (J)	0.0234 (J)	0.055	—	—	—	NA	0.0266 (J)	—	0.0439	—
RE02-07-2026	02-600478	4.5–9.5	QAL	—	—	—	—	0.0027 (J)	0.0073	—	—	—	—	—	—	—	—	—	—	—

Table 6.12-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	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	Bis(2-ethylhexyl)phthalate	Chloroform	Chrysene	Di-n-butylphthalate	Fluoranthene	Fluorene
Industrial SSL[a]				**50,500**	**959,000**	**253,000**	**10.7**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300**[b]	**323**	**1830**	**28.4**	**3230**	**91,600**	**33,700**	**33,700**
Recreational SSL[c]				**17,300**	**505,000**	**863,000**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630**[b]	**888**	**1770**	**204**	**8880**	**32,800**	**11,500**	**11,500**
Residential SSL[a]				**3480**	**66,300**	**17,400**	**2.43**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740**[b]	**15.3**	**380**	**5.85**	**152**	**6160**	**2320**	**2320**
RE02-07-2028	02-600478	14–18.8	QAL	—	—	—	—	—	0.0021 (J)	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2027	02-600478	18.8–20.5	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2029	02-600479	0–0.5	SOIL	0.0194 (J)	NA	0.0282 (J)	—	—	0.687	0.0604	0.0539	0.104	0.0337 (J)	—	—	NA	0.0654	—	0.153	0.0196 (J)
RE02-07-2030	02-600479	5–10	QAL	—	—	—	—	—	0.0066	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2031	02-600479	12.6–16.5	QBO	—	—	—	—	—	0.0015 (J)	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2033	02-600480	0–0.5	SOIL	—	NA	—	—	0.052	0.087	0.0127 (J)	0.0126 (J)	0.0136 (J)	—	—	—	NA	0.0127 (J)	—	0.0208 (J)	—
RE02-07-2034	02-600480	4.5–10	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2035	02-600480	12.5–15	QBO	—	—	—	—	—	0.0022 (J)	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2515	02-600564	0–0.5	SOIL	—	NA	—	—	0.0542	0.136	0.015 (J)	0.0152 (J)	0.0172 (J)	—	0.0107 (J)	—	NA	0.0161 (J)	0.04 (J)	0.0222 (J)	—
RE02-07-2516	02-600564	9.5–14.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0375 (J)	—	—
RE02-07-2517	02-600564	14.5–22	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.043 (J)	—	—
RE02-07-2519	02-600565	0–0.5	SOIL	—	NA	—	—	0.0329	0.0625	0.0178 (J)	0.0157 (J)	0.0239 (J)	—	0.0235 (J)	—	NA	0.0143 (J)	0.0486 (J)	0.0222 (J)	—
RE02-07-2520	02-600565	9.5–15	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2523	02-600566	0–0.5	SOIL	—	NA	—	—	0.0135	0.0162	—	0.0302 (J)	0.0412	0.0141 (J)	—	—	NA	0.0345	—	0.0582	—
RE02-07-2525	02-600566	14.5–20	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-10-26122	02-600567	8–8.2	SOIL	NA	NA	NA	—	0.0997	0.174	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-2531	02-600568	0–0.5	SOIL	—	NA	—	—	—	—	—	—	—	—	—	—	NA	—	—	—	—
RE02-07-2532	02-600568	9.5–10.9	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0385 (J)	—	—
RE02-07-2533	02-600568	15–18.3	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0472 (J)	—	—
RE02-07-2535	02-600569	0–0.5	SOIL	—	NA	—	—	—	—	0.0109 (J)	—	0.0124 (J)	—	—	—	NA	—	0.0491 (J)	0.0123 (J)	—
RE02-07-2536	02-600569	9.5–12.7	QAL	—	—	—	—	—	0.0014 (J)	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2539	02-600570	0–0.5	SOIL	—	NA	—	—	—	—	0.0132 (J)	0.0129 (J)	0.0202 (J)	—	—	—	NA	0.0118 (J)	0.0413 (J)	0.0157 (J)	—
RE02-07-2540	02-600570	9.5–11.9	QAL	—	—	—	—	—	—	—	—	0.0141 (J)	—	—	—	—	—	—	0.0133 (J)	—
RE02-07-2541	02-600570	14.5–16.7	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2543	02-600571	0–0.5	SOIL	—	NA	—	—	—	0.0148 (J)	—	—	—	—	—	—	NA	—	0.0591 (J)	—	—
RE02-07-2544	02-600571	9.5–11.7	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2545	02-600571	11.7–15.5	QBO	—	—	—	—	—	—	—	—	—	—	—	—	0.000258 (J)	—	—	—	—
RE02-07-2547	02-600572	0–0.5	SOIL	—	NA	—	—	—	0.0056	—	—	—	—	—	—	NA	—	—	0.0127 (J)	—
RE02-07-2549	02-600572	19.5–21.7	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 6.12-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	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	Bis(2-ethylhexyl)phthalate	Chloroform	Chrysene	Di-n-butylphthalate	Fluoranthene	Fluorene
Industrial SSL[a]				**50,500**	**959,000**	**253,000**	**10.7**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**1830**	**28.4**	**3230**	**91,600**	**33,700**	**33,700**
Recreational SSL[c]				**17,300**	**505,000**	**863,000**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**888**	**1770**	**204**	**8880**	**32,800**	**11,500**	**11,500**
Residential SSL[a]				**3480**	**66,300**	**17,400**	**2.43**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**380**	**5.85**	**152**	**6160**	**2320**	**2320**
RE02-10-21747	02-612346	8–9	QAL	—	NA	—	—	—	0.0046	—	—	—	—	—	—	NA	—	—	—	—
RE02-10-21748	02-612346	15–16	QAL	—	NA	—	—	0.0068	0.014	—	—	—	—	—	—	NA	—	—	—	—
RE02-10-21752	02-612347	5–6	QAL	—	NA	—	—	—	0.0078 (J)	—	—	—	—	—	—	NA	—	—	—	—
RE02-10-21792	02-612354	4–4.2	SOIL	NA	NA	NA	—	—	0.135	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21795	02-612355	4–4.4	SOIL	NA	NA	NA	—	0.0025 (J)	0.0052	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21796	02-612355	6–6.2	SOIL	NA	NA	NA	—	—	0.0043	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21801	02-612357	4–4.2	SOIL	NA	NA	NA	—	—	0.0077	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21804	02-612358	4–4.2	SOIL	NA	NA	NA	—	0.591	0.482	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21805	02-612358	6–6.4	SOIL	NA	NA	NA	—	—	0.0047	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21807	02-612359	4–4.2	SOIL	NA	NA	NA	—	0.0483	0.0448	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21808	02-612359	6–6.2	SOIL	NA	NA	NA	—	0.0472	0.0777	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21810	02-612360	4–4.2	SOIL	NA	NA	NA	—	0.155	0.0985	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21811	02-612360	6–6.2	SOIL	NA	NA	NA	—	—	0.0054	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21817	02-612362	6–6.2	SOIL	NA	NA	NA	—	—	0.0022 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21819	02-612363	4–4.2	SOIL	NA	NA	NA	—	0.0284	0.0215	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21820	02-612363	6–6.2	SOIL	NA	NA	NA	—	—	0.0025 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21822	02-612364	4–4.4	SOIL	NA	NA	NA	—	—	0.007	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21823	02-612364	6–6.4	SOIL	NA	NA	NA	—	—	0.0034 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26115	02-613005	2–2.2	SOIL	NA	NA	NA	—	0.822	1.11	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26116	02-613005	4–4.2	SOIL	NA	NA	NA	—	0.768	0.888	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2210	02-613623	2–3	SOIL	NA	NA	NA	—	0.0792	0.163	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2211	02-613623	4–5	SOIL	NA	NA	NA	—	0.179	0.237	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2213	02-613624	2–3	SOIL	NA	NA	NA	—	0.112	0.167	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2214	02-613624	4–5	SOIL	NA	NA	NA	—	0.0924	0.179	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2215	02-613624	6–7	SOIL	NA	NA	NA	—	0.215	0.386	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2216	02-613625	2–3	SOIL	NA	NA	NA	—	0.218	0.637	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2217	02-613625	4–5	SOIL	NA	NA	NA	—	0.24	0.66	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 6.12-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	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-]
Industrial SSL[a]				**na[f]**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Recreational SSL[c]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Residential SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
RE02-07-1990	02-600469	4.5–9.5	QAL	0.00000134 (J)	0.00000261	—	—	0.000000524	—	—	—	—	—	—
RE02-07-1992	02-600469	17–19.5	QBO	—	—	—	—	—	—	—	—	—	—	—
RE02-10-21798	02-600470	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1994	02-600470	4.5–7.5	QAL	0.00146	0.00306	0.000162	0.00000539	0.000646	0.000000562 (J)	0.0000271	0.00000262	0.000089	0.00000141 (J)	0.000000575 (J)
RE02-07-1997	02-600471	0–0.5	SOIL	0.000065	0.000124	0.0000147	0.000000975 (J)	0.0000406	—	0.00000185 (J)	—	0.0000136	0.00000208 (J)	0.000000904 (J)
RE02-07-1998	02-600471	4.5–10	SOIL	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1999	02-600471	18–25	QBO	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2001	02-600472	0–0.5	SOIL	0.0000332	0.0000911	0.0000107	0.000000885 (J)	0.0000239	0.000000593 (J)	0.00000113 (J)	—	0.00000588	0.00000964	0.00000421
RE02-07-2002	02-600472	4.5–9	SOIL	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2003	02-600472	21–23	QBO	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2005	02-600473	0–0.5	SOIL	0.0000998	0.000188	0.00000773	0.000000521 (J)	0.0000218	0.00000101 (J)	0.00000419	0.00000174 (J)	0.000027	0.00000182 (J)	0.000000933 (J)
RE02-07-2006	02-600473	4.5–13	QAL	0.0000014 (J)	0.00000248	0.000000339 (J)	—	0.00000122	—	—	—	—	—	—
RE02-07-2007	02-600473	13–18	QBO	—	0.0000018	—	—	0.00000122	—	—	—	—	—	—
RE02-07-2008	02-600473	18–23	QBO	0.00000103 (J)	0.00000206	—	—	—	—	—	—	—	—	—
RE02-07-2010	02-600474	4.5–10	QAL	0.0000199	0.0000453	0.00000176 (J)	—	0.00000598	—	0.000000507 (J)	—	0.0000023	0.000000792 (J)	0.000000321 (J)
RE02-07-2011	02-600474	16.5–19	QBO	0.000000749 (J)	0.0000015	0.000000184 (J)	—	0.000000488	—	—	—	—	—	—
RE02-07-2013	02-600475	0–0.5	SOIL	0.0000552	0.000107	0.00000607 (J)	0.000000487 (J)	0.0000188 (J)	—	0.00000102 (J)	0.000000623 (J)	0.0000088	0.00000119 (J)	0.000000562 (J)
RE02-07-2014	02-600475	4–5	QAL	0.000283	0.000688	0.0000192	0.00000103 (J)	0.0000824	0.00000132 (J)	0.00000514	0.00000375	0.0000333	0.00000142 (J)	0.000000785 (J)
RE02-07-2015	02-600475	16–18.5	QBO	0.00000525	0.0000096	0.00000101 (J)	—	0.00000432	—	—	—	—	—	—
RE02-07-2017	02-600476	0–0.5	SOIL	0.000205	0.000386	0.0000166 (J)	0.00000186 (J)	0.0000612 (J)	0.00000122 (J)	0.00000445	0.00000269	0.0000401	0.00000141 (J)	0.000000967 (J)
RE02-07-2018	02-600476	4.5–9	QAL	0.0000431	0.0000784	0.00000238 (J)	0.000000232 (J)	0.00000844	—	—	0.000000443 (J)	0.00000487	0.000000257 (J)	0.000000127 (J)
RE02-07-2019	02-600476	20–25	QBO	0.000000941 (J)	0.00000316	0.00000244 (J)	0.000000319 (J)	0.00000503	—	—	—	—	0.00000305	0.00000116 (J)
RE02-07-2021	02-600477	0–0.5	SOIL	0.000297	0.000522	0.0000319 (J)	0.00000186 (J)	0.000116 (J)	0.00000169 (J)	0.00000618	0.00000343	0.0000513	0.00000207 (J)	0.00000127 (J)
RE02-07-2022	02-600477	4.5–9	QAL	0.0000715	0.000126	0.0000101	0.000000588 (J)	0.0000332	—	0.00000178 (J)	0.000000971 (J)	0.0000128	0.000000383 (J)	0.000000352 (J)
RE02-07-2023	02-600477	23–25	QBO	0.000000454 (J)	0.000000939	—	—	0.000000212	—	—	—	—	—	—
RE02-07-2025	02-600478	0–0.5	SOIL	0.0017	0.00287	0.000269 (J)	0.0000157	0.00116 (J)	0.00000498	0.0000384	0.0000128	0.000231	0.00000634	0.00000524
RE02-07-2026	02-600478	4.5–9.5	QAL	0.0000748	0.000123	0.00000883 (J)	0.000000616 (J)	0.0000323 (J)	—	0.00000164 (J)	—	0.0000106	0.000000277 (J)	0.000000232 (J)
RE02-07-2028	02-600478	14–18.8	QAL	0.00000527	0.00000973	0.00000105 (J)	—	0.00000366 (J)	—	—	—	0.000000554	—	—
RE02-07-2027	02-600478	18.8–20.5	QBO	0.000000718 (J)	0.00000123	—	—	—	—	—	—	—	—	—

Table 6.12-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	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-]
Industrial SSL[a]				**na[f]**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Recreational SSL[c]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Residential SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
RE02-07-2029	02-600479	0–0.5	SOIL	0.000645	0.00113	0.0000634 (J)	0.00000593	0.000227 (J)	0.00000293	0.0000123	0.00000649	0.000106	0.00000357	0.00000271
RE02-07-2030	02-600479	5–10	QAL	0.0000138	0.0000264	0.00000241 (J)	0.000000184 (J)	0.0000075 (J)	—	0.000000362 (J)	—	0.00000451	—	—
RE02-07-2031	02-600479	12.6–16.5	QBO	0.0000246	0.0000419	0.00000397 (J)	—	0.00002 (J)	—	0.000000699 (J)	—	0.00000266	0.000000626 (J)	0.000000149 (J)
RE02-07-2033	02-600480	0–0.5	SOIL	0.00129	0.00223	0.0000794 (J)	0.00000568	0.000268 (J)	0.00000585	0.0000234	0.0000131	0.000222	0.00000282	0.00000303
RE02-07-2034	02-600480	4.5–10	QAL	0.000203	0.00033	0.00000473 (J)	0.000000514 (J)	0.0000201 (J)	—	0.00000336	0.00000145 (J)	0.0000344	0.00000036 (J)	—
RE02-07-2035	02-600480	12.5–15	QBO	0.0000419	0.0000736	0.00000516 (J)	0.000000409 (J)	0.0000259 (J)	—	0.00000119 (J)	—	0.00000476	—	—
RE02-07-2515	02-600564	0–0.5	SOIL	0.000638	0.00115	0.000127	0.0000107	0.000396	0.00000431	0.0000184	0.00000901	0.000124	0.00000493	0.00000465
RE02-07-2516	02-600564	9.5–14.5	QAL	0.000000591 (J)	0.00000112	0.000000286 (J)	—	0.000000533	—	—	—	—	0.000000138 (J)	0.0000000561 (J)
RE02-07-2517	02-600564	14.5–22	QBO	—	—	0.0000000319 (J)	—	0.0000000319	—	—	—	—	—	—
RE02-07-2519	02-600565	0–0.5	SOIL	0.000442	0.000783	0.0000856	0.00000763	0.000275	0.00000357	0.0000111	0.00000704	0.0000843	0.00000296	0.00000269
RE02-07-2520	02-600565	9.5–15	QAL	0.000000318 (J)	0.000000622	0.000000366 (J)	—	0.000000366	—	—	—	—	0.000000176 (J)	—
RE02-07-2523	02-600566	0–0.5	SOIL	0.0011	0.00194	0.000169	0.0000168	0.000711	0.00000839	0.0000231	0.0000166	0.000159	0.00000534	0.00000369
RE02-07-2525	02-600566	14.5–20	QBO	0.000000493 (J)	0.000000493	—	—	—	—	—	—	—	—	—
RE02-10-26122	02-600567	8–8.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-2531	02-600568	0–0.5	SOIL	0.00000999	0.0000194	0.00000336	0.000000227 (J)	0.00000775	0.000000187 (J)	0.000000463 (J)	0.000000377 (J)	0.00000389	0.000000359 (J)	0.0000002 (J)
RE02-07-2532	02-600568	9.5–10.9	QAL	0.000000354 (J)	0.000000354	0.000000154 (J)	—	0.000000253	—	—	—	—	0.0000000418 (J)	—
RE02-07-2533	02-600568	15–18.3	QBO	—	—	0.000000084 (J)	—	0.000000084	—	—	—	—	—	—
RE02-07-2535	02-600569	0–0.5	SOIL	0.0000224	0.000046	0.00000325	—	0.0000122	0.000000155 (J)	0.000000702 (J)	0.000000284 (J)	0.00000367	0.000000172 (J)	—
RE02-07-2536	02-600569	9.5–12.7	QAL	0.00000383	0.00000749	0.00000077 (J)	0.0000000554 (J)	0.00000244	—	0.000000129 (J)	—	0.000000129	0.0000000725 (J)	—
RE02-07-2539	02-600570	0–0.5	SOIL	0.00000672	0.000012	0.00000172 (J)	—	0.00000441	0.000000124 (J)	0.000000327 (J)	0.000000256 (J)	0.00000183	0.000000106 (J)	0.000000108 (J)
RE02-07-2540	02-600570	9.5–11.9	QAL	0.0000103	0.0000179	0.00000252 (J)	—	0.00000748	—	—	—	0.00000146	—	—
RE02-07-2541	02-600570	14.5–16.7	QBO	0.00000351	0.00000569	0.000000717 (J)	—	0.00000321	—	—	—	0.00000112	—	—
RE02-07-2543	02-600571	0–0.5	SOIL	0.0000107	0.0000228	0.0000029	0.000000177 (J)	0.00000923	0.0000000967 (J)	0.000000405 (J)	0.000000257 (J)	0.00000285	0.000000233 (J)	0.000000154 (J)
RE02-07-2544	02-600571	9.5–11.7	QAL	0.00000119 (J)	0.00000262	—	—	0.000000399	—	—	—	—	—	—
RE02-07-2545	02-600571	11.7–15.5	QBO	—	0.000000824	—	—	—	—	—	—	—	—	—
RE02-07-2547	02-600572	0–0.5	SOIL	0.0000177	0.0000369	0.0000442	0.000000297 (J)	0.0000759	—	0.000000919 (J)	0.000000317 (J)	0.00000617	0.000000313 (J)	—
RE02-07-2549	02-600572	19.5–21.7	QBO	0.000000915 (J)	0.00000185	—	—	0.000000586	—	—	—	—	—	—
RE02-10-21747	02-612346	8–9	QAL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21748	02-612346	15–16	QAL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 6.12-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	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-]
Industrial SSL[a]				**na[f]**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Recreational SSL[c]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Residential SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
RE02-10-21752	02-612347	5–6	QAL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21792	02-612354	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21795	02-612355	4–4.4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21796	02-612355	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21801	02-612357	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21804	02-612358	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21805	02-612358	6–6.4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21807	02-612359	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21808	02-612359	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21810	02-612360	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21811	02-612360	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21817	02-612362	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21819	02-612363	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21820	02-612363	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21822	02-612364	4–4.4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21823	02-612364	6–6.4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26115	02-613005	2–2.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26116	02-613005	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2210	02-613623	2–3	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2211	02-613623	4–5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2213	02-613624	2–3	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2214	02-613624	4–5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2215	02-613624	6–7	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2216	02-613625	2–3	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2217	02-613625	4–5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 6.12-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofuran [1,2,3,7,8,9-]	Hexachlorodibenzofuran [2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Isopropylbenzene	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin [1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran [1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxin [1,2,3,7,8-]
Industrial SSL[a]				**na**	**na**	**na**	**32.3**	**14,100**	**5110**	**3370**	**16,800**	**na**	**na**	**na**
Recreational SSL[c]				**na**	**na**	**na**	**88.8**	**42,100**	**3610**	**1150**	**1930**	**na**	**na**	**na**
Residential SSL[a]				**na**	**na**	**na**	**1.53**	**2350**	**409**	**232**	**1160**	**na**	**na**	**na**
RE02-07-1990	02-600469	4.5–9.5	QAL	—	—	0.0000000567	—	—	—	—	—	0.0000135	—	—
RE02-07-1992	02-600469	17–19.5	QBO	—	—	—	—	—	—	—	—	—	—	—
RE02-10-21798	02-600470	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1994	02-600470	4.5–7.5	QAL	—	0.0000014 (J)	0.000122	0.0631 (J)	—	—	—	0.0143 (J)	0.0338	0.000297 (J)	—
RE02-07-1997	02-600471	0–0.5	SOIL	—	0.00000128 (J)	0.0000214	—	NA	NA	—	—	0.000645	0.0000379	—
RE02-07-1998	02-600471	4.5–10	SOIL	—	—	—	—	—	—	—	—	0.00000133 (J)	—	—
RE02-07-1999	02-600471	18–25	QBO	—	—	—	—	—	—	—	—	0.00000105 (J)	—	—
RE02-07-2001	02-600472	0–0.5	SOIL	—	0.00000614	0.000071	—	NA	NA	—	—	0.000324	0.0000142	—
RE02-07-2002	02-600472	4.5–9	SOIL	—	—	—	—	—	—	—	—	0.00000395 (J)	—	—
RE02-07-2003	02-600472	21–23	QBO	—	—	—	—	—	—	—	—	0.000000743 (J)	—	—
RE02-07-2005	02-600473	0–0.5	SOIL	0.00000025 (J)	0.00000147 (J)	0.00002	—	NA	NA	—	—	0.000991	0.000017	0.000000734 (J)
RE02-07-2006	02-600473	4.5–13	QAL	—	—	0.000000233	—	—	—	—	—	0.000014	—	—
RE02-07-2007	02-600473	13–18	QBO	—	—	—	—	—	—	—	—	0.0000192	—	—
RE02-07-2008	02-600473	18–23	QBO	—	—	—	—	—	—	—	—	0.00000941	—	—
RE02-07-2010	02-600474	4.5–10	QAL	—	0.000000357 (J)	0.00000378	—	—	0.0046 (J)	—	—	0.000456	0.00000616	—
RE02-07-2011	02-600474	16.5–19	QBO	—	—	—	—	—	—	—	—	0.00000981	0.000000538 (J)	—
RE02-07-2013	02-600475	0–0.5	SOIL	—	0.00000075 (J)	0.0000101	—	NA	NA	—	—	0.000718	0.0000176	0.000000134 (J)
RE02-07-2014	02-600475	4–5	QAL	—	0.00000112 (J)	0.0000191	—	—	—	—	—	0.00602	0.0000854	0.000000954 (J)
RE02-07-2015	02-600475	16–18.5	QBO	—	—	0.000000713	—	—	0.00588 (J)	—	—	0.000072	0.00000383 (J)	—
RE02-07-2017	02-600476	0–0.5	SOIL	—	0.00000134 (J)	0.0000234	—	NA	NA	—	—	0.00198	0.0000449	0.000000645 (J)
RE02-07-2018	02-600476	4.5–9	QAL	—	0.000000191 (J)	0.00000292 (J)	—	—	0.00478 (J)	—	—	0.000379	0.00000665	—
RE02-07-2019	02-600476	20–25	QBO	—	0.00000188 (J)	0.0000191 (J)	—	—	—	—	—	0.00000748	0.00000315 (J)	—
RE02-07-2021	02-600477	0–0.5	SOIL	0.000000311 (J)	0.00000141 (J)	0.0000315	—	NA	NA	—	—	0.00245	0.000111	0.000000548 (J)
RE02-07-2022	02-600477	4.5–9	QAL	—	0.000000399 (J)	0.00000889 (J)	—	—	0.00563	—	—	0.000599	0.0000371	—
RE02-07-2023	02-600477	23–25	QBO	—	—	—	—	—	0.00968	—	—	0.00000483 (J)	0.000000331 (J)	—
RE02-07-2025	02-600478	0–0.5	SOIL	0.000000949 (J)	0.00000704	0.000235	—	NA	NA	—	—	0.0157	0.00124	0.00000186 (J)
RE02-07-2026	02-600478	4.5–9.5	QAL	—	0.000000283 (J)	0.00000745	—	—	—	—	—	0.000654	0.0000308	—
RE02-07-2028	02-600478	14–18.8	QAL	—	—	0.0000008	—	0.000251 (J)	—	—	—	0.0000843	0.00000363 (J)	—

Table 6.12-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofuran [1,2,3,7,8,9-]	Hexachlorodibenzofuran [2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Isopropylbenzene	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin [1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran [1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxin [1,2,3,7,8-]
Industrial SSL[a]				**na**	**na**	**na**	**32.3**	**14,100**	**5110**	**3370**	**16,800**	**na**	**na**	**na**
Recreational SSL[c]				**na**	**na**	**na**	**88.8**	**42,100**	**3610**	**1150**	**1930**	**na**	**na**	**na**
Residential SSL[a]				**na**	**na**	**na**	**1.53**	**2350**	**409**	**232**	**1160**	**na**	**na**	**na**
RE02-07-2027	02-600478	18.8–20.5	QBO	—	—	—	—	—	—	—	—	0.000008	0.000000522 (J)	—
RE02-07-2029	02-600479	0–0.5	SOIL	0.000000664 (J)	0.00000329	0.0000707	—	NA	NA	0.00811 (J)	0.0147 (J)	0.00588	0.000192	0.0000012 (J)
RE02-07-2030	02-600479	5–10	QAL	—	—	0.00000197	—	—	—	—	—	0.000132	0.00000727	—
RE02-07-2031	02-600479	12.6–16.5	QBO	—	—	0.00000375	—	—	—	—	—	0.000285	0.000014	—
RE02-07-2033	02-600480	0–0.5	SOIL	0.000000458 (J)	0.00000383	0.0000902	—	NA	NA	—	—	0.0084	0.000225	0.00000249 (J-)
RE02-07-2034	02-600480	4.5–10	QAL	—	0.000000299 (J)	0.0000057	—	—	0.00215 (J)	—	—	0.00116	0.0000123	0.000000216 (J)
RE02-07-2035	02-600480	12.5–15	QBO	—	0.000000134 (J)	0.00000422	—	—	—	—	—	0.000522	0.0000189	—
RE02-07-2515	02-600564	0–0.5	SOIL	0.000000783 (J)	0.00000637	0.000133	—	NA	NA	—	—	0.00617	0.000309	0.00000163 (J)
RE02-07-2516	02-600564	9.5–14.5	QAL	—	—	0.000000316	—	—	—	—	—	0.00000487 (J)	0.000000394 (J)	—
RE02-07-2517	02-600564	14.5–22	QBO	—	—	—	—	—	—	—	—	—	0.000000119 (J)	—
RE02-07-2519	02-600565	0–0.5	SOIL	0.000000473 (J)	0.00000373	0.0000767	—	NA	NA	—	—	0.00509	0.000273	0.00000146 (J)
RE02-07-2520	02-600565	9.5–15	QAL	—	—	0.00000034	—	—	—	—	—	0.00000241 (J)	0.000000284 (J)	—
RE02-07-2523	02-600566	0–0.5	SOIL	0.000000918 (J)	0.00000556	0.000117	—	NA	NA	—	—	0.0137	0.00113	0.00000303
RE02-07-2525	02-600566	14.5–20	QBO	—	—	—	—	—	—	—	—	0.00000548	0.000000543 (J)	—
RE02-10-26122	02-600567	8–8.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-2531	02-600568	0–0.5	SOIL	—	0.000000213 (J)	0.0000046	—	NA	NA	—	—	0.0000811	0.00000398 (J)	—
RE02-07-2532	02-600568	9.5–10.9	QAL	—	—	0.0000000946	—	—	—	—	—	0.00000277 (J)	0.000000194 (J)	—
RE02-07-2533	02-600568	15–18.3	QBO	—	—	—	—	—	—	—	—	0.000000331 (J)	—	—
RE02-07-2535	02-600569	0–0.5	SOIL	—	0.000000169 (J)	0.00000322	—	NA	NA	—	—	0.000325	0.00000876	0.0000000687 (J)
RE02-07-2536	02-600569	9.5–12.7	QAL	—	—	0.000000712	—	—	—	—	—	0.000059	0.00000164 (J)	—
RE02-07-2539	02-600570	0–0.5	SOIL	—	0.000000118 (J)	0.00000184	—	NA	NA	—	—	0.0000804	0.00000442 (J)	0.0000000817 (J)
RE02-07-2540	02-600570	9.5–11.9	QAL	—	—	0.00000206	—	—	—	—	—	0.000149	0.00000514	—
RE02-07-2541	02-600570	14.5–16.7	QBO	—	—	0.000000306	—	—	—	—	—	0.00004	0.00000249 (J)	—
RE02-07-2543	02-600571	0–0.5	SOIL	—	0.0000002 (J)	0.00000322	—	NA	NA	—	—	0.000108	0.00000926	—
RE02-07-2544	02-600571	9.5–11.7	QAL	—	—	—	—	—	—	—	—	0.0000171	—	—
RE02-07-2545	02-600571	11.7–15.5	QBO	—	—	—	—	—	—	—	—	0.00000678	—	—
RE02-07-2547	02-600572	0–0.5	SOIL	—	0.000000357 (J)	0.0000201	—	NA	NA	—	—	0.000207	0.0000206	—
RE02-07-2549	02-600572	19.5–21.7	QBO	—	—	—	—	—	—	—	—	0.0000107	0.000000919 (J)	—

Table 6.12-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofuran [1,2,3,7,8,9-]	Hexachlorodibenzofuran [2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Isopropylbenzene	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin [1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran [1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxin [1,2,3,7,8-]
Industrial SSL[a]				**na**	**na**	**na**	**32.3**	**14,100**	**5110**	**3370**	**16,800**	**na**	**na**	**na**
Recreational SSL[c]				**na**	**na**	**na**	**88.8**	**42,100**	**3610**	**1150**	**1930**	**na**	**na**	**na**
Residential SSL[a]				**na**	**na**	**na**	**1.53**	**2350**	**409**	**232**	**1160**	**na**	**na**	**na**
RE02-10-21747	02-612346	8–9	QAL	NA	NA	NA	—	NA	NA	—	—	NA	NA	NA
RE02-10-21748	02-612346	15–16	QAL	NA	NA	NA	—	NA	NA	—	—	NA	NA	NA
RE02-10-21752	02-612347	5–6	QAL	NA	NA	NA	—	NA	NA	—	—	NA	NA	NA
RE02-10-21792	02-612354	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21795	02-612355	4–4.4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21796	02-612355	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21801	02-612357	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21804	02-612358	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21805	02-612358	6–6.4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21807	02-612359	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21808	02-612359	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21810	02-612360	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21811	02-612360	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21817	02-612362	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21819	02-612363	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21820	02-612363	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21822	02-612364	4–4.4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21823	02-612364	6–6.4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26115	02-613005	2–2.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26116	02-613005	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2210	02-613623	2–3	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2211	02-613623	4–5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2213	02-613624	2–3	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2214	02-613624	4–5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2215	02-613624	6–7	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2216	02-613625	2–3	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2217	02-613625	4–5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 6.12-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran [1,2,3,7,8-]	Pentachlorodibenzofuran [2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Pentachlorophenol	Phenanthrene	Pyrene	Tetrachlorodibenzodioxin [2,3,7,8-]	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran [2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Toluene
Industrial SSL[a]				**na**	**na**	**na**	**na**	**44.5**	**25,300**	**25,300**	**0.000238**	**na**	**0.00243**	**na**	**61,100**
Recreational SSL[c]				**na**	**na**	**na**	**na**	**32.5**	**8630**	**8630**	**0.000297**	**na**	**0.00297**	**na**	**47,600**
Residential SSL[a]				**na**	**na**	**na**	**na**	**9.85**	**1740**	**1740**	**0.000049**	**na**	**0.00049**	**na**	**5220**
RE02-07-1990	02-600469	4.5–9.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1992	02-600469	17–19.5	QBO	—	—	—	—	—	—	—	—	—	—	—	—
RE02-10-21798	02-600470	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1994	02-600470	4.5–7.5	QAL	0.000000699	—	0.000000623 (J)	0.00000497	—	0.185	0.279	—	—	—	0.000000258	0.000556 (J)
RE02-07-1997	02-600471	0–0.5	SOIL	—	—	0.00000286	0.0000165	—	—	0.0291 (J)	—	—	0.00000177	0.00000433	NA
RE02-07-1998	02-600471	4.5–10	SOIL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1999	02-600471	18–25	QBO	—	—	—	—	—	0.03 (J)	0.135	—	—	—	—	—
RE02-07-2001	02-600472	0–0.5	SOIL	—	0.00000332	0.0000205	0.000115	—	0.0145 (J)	0.0443 (J)	—	—	0.0000112 (J)	0.0000442	NA
RE02-07-2002	02-600472	4.5–9	SOIL	—	—	—	—	—	—	—	—	—	—	—	0.000411 (J)
RE02-07-2003	02-600472	21–23	QBO	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2005	02-600473	0–0.5	SOIL	0.00000322	0.000000484 (J)	0.00000243 (J)	0.0000142	—	—	0.0444 (J)	—	—	0.00000157	0.00000478	NA
RE02-07-2006	02-600473	4.5–13	QAL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2007	02-600473	13–18	QBO	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2008	02-600473	18–23	QBO	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2010	02-600474	4.5–10	QAL	—	—	0.00000105 (J)	0.00000541 (J)	—	—	—	—	—	—	—	—
RE02-07-2011	02-600474	16.5–19	QBO	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2013	02-600475	0–0.5	SOIL	0.000000382	0.000000391 (J)	0.00000199 (J)	0.0000126	—	0.0129 (J)	0.0251 (J)	—	—	0.00000114	0.00000449	NA
RE02-07-2014	02-600475	4–5	QAL	0.00000249	—	0.00000191 (J)	0.0000112 (J)	—	0.0128 (J)	0.0171 (J)	0.00000023 (J)	0.00000023	0.000000988 (J)	0.00000427	—
RE02-07-2015	02-600475	16–18.5	QBO	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2017	02-600476	0–0.5	SOIL	0.00000457	0.000000372 (J)	0.00000193 (J)	0.0000137	—	—	—	—	—	0.00000126	0.00000716	NA
RE02-07-2018	02-600476	4.5–9	QAL	—	—	—	0.00000094	—	—	—	—	—	—	0.000000131	0.000426 (J)
RE02-07-2019	02-600476	20–25	QBO	—	0.000000924	0.00000581 (J)	0.0000307	—	—	—	—	—	0.00000273	0.00000993	—
RE02-07-2021	02-600477	0–0.5	SOIL	0.00000394	0.000000324 (J)	0.00000154 (J)	0.0000108	—	0.0229 (J)	0.177	—	0.000000234	0.000000862 (J)	0.00000631	NA
RE02-07-2022	02-600477	4.5–9	QAL	—	—	—	0.00000141	—	—	0.0143 (J)	—	—	—	0.000000178	—
RE02-07-2023	02-600477	23–25	QBO	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2025	02-600478	0–0.5	SOIL	0.0000119	0.000000901 (J)	0.00000409	0.0000418	—	0.0133 (J)	0.0432	0.000000328 (J)	0.00000141	0.00000197	0.0000128	NA
RE02-07-2026	02-600478	4.5–9.5	QAL	—	—	—	0.000000502	—	—	—	—	—	—	—	0.000504 (J)

Table 6.12-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran [1,2,3,7,8-]	Pentachlorodibenzofuran [2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Pentachlorophenol	Phenanthrene	Pyrene	Tetrachlorodibenzodioxin [2,3,7,8-]	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran [2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Toluene
Industrial SSL[a]				**na**	**na**	**na**	**na**	**44.5**	**25,300**	**25,300**	**0.000238**	**na**	**0.00243**	**na**	**61,100**
Recreational SSL[c]				**na**	**na**	**na**	**na**	**32.5**	**8630**	**8630**	**0.000297**	**na**	**0.00297**	**na**	**47,600**
Residential SSL[a]				**na**	**na**	**na**	**na**	**9.85**	**1740**	**1740**	**0.000049**	**na**	**0.00049**	**na**	**5220**
RE02-07-2028	02-600478	14–18.8	QAL	0.000000151	—	—	0.000000403	—	—	—	—	—	—	—	—
RE02-07-2027	02-600478	18.8–20.5	QBO	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2029	02-600479	0–0.5	SOIL	0.00000895	0.00000081 (J)	0.00000357	0.0000303	—	0.118	0.128	0.000000211 (J)	0.00000143	0.00000192	0.0000119	NA
RE02-07-2030	02-600479	5–10	QAL	0.000000472	—	—	0.000000628	—	—	—	—	—	—	—	—
RE02-07-2031	02-600479	12.6–16.5	QBO	—	—	0.000000829 (J)	0.00000202	—	—	—	—	—	0.00000143	0.00000357	—
RE02-07-2033	02-600480	0–0.5	SOIL	0.0000177	—	0.00000185 (J)	0.0000222	—	0.0114 (J)	0.0211 (J)	0.000000389 (J)	0.00000227	0.000000967 (J)	0.00000895	NA
RE02-07-2034	02-600480	4.5–10	QAL	0.00000162	0.000000381 (J)	0.000000432 (J)	0.00000346	—	—	—	—	—	0.000000877 (J)	0.00000273	0.00112
RE02-07-2035	02-600480	12.5–15	QBO	—	—	—	0.000000266	—	—	—	—	—	—	—	—
RE02-07-2515	02-600564	0–0.5	SOIL	0.00000963	0.000000718 (J)	0.00000253	0.0000273	—	—	0.0213 (J)	0.000000328 (J)	0.00000128	0.00000137	0.0000104	NA
RE02-07-2516	02-600564	9.5–14.5	QAL	—	0.0000000955 (J)	0.0000000908 (J)	0.000000255	—	—	—	—	—	0.000000198 (J)	0.000000362	—
RE02-07-2517	02-600564	14.5–22	QBO	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2519	02-600565	0–0.5	SOIL	0.00000836	0.000000399 (J)	0.00000167 (J)	0.0000169	—	—	0.0216 (J)	0.000000199 (J)	0.000000789	0.00000118	0.00000652	NA
RE02-07-2520	02-600565	9.5–15	QAL	—	0.0000000544 (J)	—	0.000000105	—	—	—	—	—	—	0.0000000704	—
RE02-07-2523	02-600566	0–0.5	SOIL	0.0000155	—	0.000000877 (J)	0.0000166	0.301 (J)	0.0315 (J)	0.0471	0.000000307 (J)	0.000000307	0.000000592 (J)	0.0000046	NA
RE02-07-2525	02-600566	14.5–20	QBO	—	—	—	—	—	—	—	—	—	—	—	—
RE02-10-26122	02-600567	8–8.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-2531	02-600568	0–0.5	SOIL	0.000000314	—	0.000000187 (J)	0.00000171	—	—	—	—	—	0.000000133 (J)	0.000000578	NA
RE02-07-2532	02-600568	9.5–10.9	QAL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2533	02-600568	15–18.3	QBO	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2535	02-600569	0–0.5	SOIL	0.0000000687	—	0.000000119 (J)	0.000000498	—	—	0.0112 (J)	—	—	0.0000000976 (J)	0.000000272	NA
RE02-07-2536	02-600569	9.5–12.7	QAL	—	—	—	0.0000000567	—	—	—	—	—	—	—	0.000425 (J)
RE02-07-2539	02-600570	0–0.5	SOIL	0.000000132	—	—	0.000000193	—	—	0.0159 (J)	—	—	—	0.000000255	NA
RE02-07-2540	02-600570	9.5–11.9	QAL	—	—	—	0.00000022	—	—	0.0149 (J)	—	—	—	—	—
RE02-07-2541	02-600570	14.5–16.7	QBO	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2543	02-600571	0–0.5	SOIL	—	—	0.000000292 (J)	0.00000174	—	—	—	—	—	0.000000247 (J)	0.00000106	NA
RE02-07-2544	02-600571	9.5–11.7	QAL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2545	02-600571	11.7–15.5	QBO	—	—	—	—	—	—	—	—	—	—	—	—

Table 6.12-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran [1,2,3,7,8-]	Pentachlorodibenzofuran [2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Pentachlorophenol	Phenanthrene	Pyrene	Tetrachlorodibenzodioxin [2,3,7,8-]	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran [2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Toluene
Industrial SSL[a]				**na**	**na**	**na**	**na**	**44.5**	**25,300**	**25,300**	**0.000238**	**na**	**0.00243**	**na**	**61,100**
Recreational SSL[c]				**na**	**na**	**na**	**na**	**32.5**	**8630**	**8630**	**0.000297**	**na**	**0.00297**	**na**	**47,600**
Residential SSL[a]				**na**	**na**	**na**	**na**	**9.85**	**1740**	**1740**	**0.000049**	**na**	**0.00049**	**na**	**5220**
RE02-07-2547	02-600572	0–0.5	SOIL	0.000000761	—	0.000000167 (J)	0.00000207	—	—	—	—	—	0.00000018 (J)	0.000000511	NA
RE02-07-2549	02-600572	19.5–21.7	QBO	—	—	—	—	—	—	—	—	—	—	—	—
RE02-10-21747	02-612346	8–9	QAL	NA	NA	NA	NA	—	—	—	NA	NA	NA	NA	NA
RE02-10-21748	02-612346	15–16	QAL	NA	NA	NA	NA	—	—	—	NA	NA	NA	NA	NA
RE02-10-21752	02-612347	5–6	QAL	NA	NA	NA	NA	—	—	—	NA	NA	NA	NA	NA
RE02-10-21792	02-612354	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21795	02-612355	4–4.4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21796	02-612355	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21801	02-612357	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21804	02-612358	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21805	02-612358	6–6.4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21807	02-612359	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21808	02-612359	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21810	02-612360	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21811	02-612360	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21817	02-612362	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21819	02-612363	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21820	02-612363	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21822	02-612364	4–4.4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-21823	02-612364	6–6.4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26115	02-613005	2–2.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26116	02-613005	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2210	02-613623	2–3	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2211	02-613623	4–5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 6.12-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran [1,2,3,7,8-]	Pentachlorodibenzofuran [2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Pentachlorophenol	Phenanthrene	Pyrene	Tetrachlorodibenzodioxin [2,3,7,8-]	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran [2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Toluene
Industrial SSL[a]				**na**	**na**	**na**	**na**	**44.5**	**25,300**	**25,300**	**0.000238**	**na**	**0.00243**	**na**	**61,100**
Recreational SSL[c]				**na**	**na**	**na**	**na**	**32.5**	**8630**	**8630**	**0.000297**	**na**	**0.00297**	**na**	**47,600**
Residential SSL[a]				**na**	**na**	**na**	**na**	**9.85**	**1740**	**1740**	**0.000049**	**na**	**0.00049**	**na**	**5220**
RE02-11-2213	02-613624	2–3	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2214	02-613624	4–5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2215	02-613624	6–7	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2216	02-613625	2–3	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2217	02-613625	4–5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273), unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSLs are from LANL (2017, 602581).

[d] — = Not detected.

[e] NA = Not analyzed.

[f] na = Not available.

Table 6.12-4
Radionuclides Detected or Detected above BVs/FVs at AOC 02-004(f)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Cobalt-60	Plutonium-239/240	Strontium-90	Tritium	Uranium-235/236
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**na**	**0.18**
Soil BV/FV[a]				**1.65**	**na**	**0.054**	**1.31**	**na**	**0.2**
Industrial SAL[c]				**41**	**9**	**1200**	**2400**	**2,400,000**	**160**
Recreational SAL[c]				**370**	**81**	**1300**	**4900**	**5,700,000**	**1000**
Residential SAL[c]				**12**	**2.6**	**79**	**15**	**1700**	**42**
RE02-03-51874	02-22376	0–0.5	SOIL	—[d]	—	—	—	0.0852	—
RE02-03-51875	02-22376	1.5–2	SOIL	—	—	—	—	0.0545	—
RE02-03-51876	02-22377	0–0.5	SOIL	—	0.11	—	—	0.0694	—
RE02-03-51877	02-22377	1.5–2	SOIL	—	—	—	—	0.0622	—
RE02-03-51878	02-22378	0–0.5	SOIL	—	—	—	—	0.923	—
RE02-03-51879	02-22378	1.5–2	SOIL	0.0454	—	—	—	0.614	—
RE02-03-51880	02-22379	0–0.5	SOIL	—	—	—	—	0.357	—
RE02-03-51881	02-22379	1.5–2	SOIL	—	—	—	—	2.41	—
RE02-07-1990	02-600469	4.5–9.5	QAL	—	—	—	—	0.0788696	—
RE02-07-1994	02-600470	4.5–7.5	QAL	—	—	—	—	0.695833	—
RE02-07-1998	02-600471	4.5–10	SOIL	—	—	—	—	0.260671	—
RE02-07-2002	02-600472	4.5–9	SOIL	—	—	—	—	0.111039	—
RE02-07-2003	02-600472	21–23	QBO	—	—	—	—	—	0.225
RE02-07-2006	02-600473	4.5–13	QAL	—	—	—	—	0.0363882	—
RE02-07-2010	02-600474	4.5–10	QAL	—	—	—	—	0.236047	—
RE02-07-2013	02-600475	0–0.5	SOIL	—	—	—	—	0.00966109	—
RE02-07-2018	02-600476	4.5–9	QAL	—	—	—	—	0.440696	—
RE02-07-2019	02-600476	20–25	QBO	—	—	0.133	—	0.0660952	0.182
RE02-07-2021	02-600477	0–0.5	SOIL	—	—	—	—	0.0451419	—
RE02-07-2022	02-600477	4.5–9	QAL	—	—	—	—	0.81017	—
RE02-07-2026	02-600478	4.5–9.5	QAL	—	—	—	0.716	0.56557	—
RE02-07-2028	02-600478	14–18.8	QAL	—	—	—	—	0.254922	—
RE02-07-2029	02-600479	0–0.5	SOIL	—	—	—	—	0.0199386	—
RE02-07-2030	02-600479	5–10	QAL	—	—	—	—	2.17686	—
RE02-07-2031	02-600479	12.6–16.5	QBO	—	—	—	—	—	0.181
RE02-07-2033	02-600480	0–0.5	SOIL	—	—	—	—	0.0380017	—
RE02-07-2034	02-600480	4.5–10	QAL	—	—	—	—	3.80729	—

Table 6.12-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Cobalt-60	Plutonium-239/240	Strontium-90	Tritium	Uranium-235/236
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**na**	**0.18**
Soil BV[a]				**1.65**	**na**	**0.054**	**1.31**	**na**	**0.2**
Industrial SAL[c]				**41**	**9**	**1200**	**2400**	**2,400,000**	**87**
Recreational SAL[c]				**370**	**81**	**1300**	**4900**	**5,700,000**	**1000**
Residential SAL[c]				**12**	**2.6**	**79**	**15**	**1700**	**42**
RE02-07-2035	02-600480	12.5–15	QBO	—	—	0.0316	—	0.0496098	—
RE02-07-2515	02-600564	0–0.5	SOIL	—	—	0.0667	—	0.00719992	—
RE02-07-2519	02-600565	0–0.5	SOIL	—	—	0.0803	—	—	—
RE02-07-2523	02-600566	0–0.5	SOIL	—	—	0.115	—	—	—
RE02-07-2531	02-600568	0–0.5	SOIL	—	—	—	—	0.00980899	—
RE02-07-2535	02-600569	0–0.5	SOIL	—	—	0.0587	—	—	—
RE02-07-2540	02-600570	9.5–11.9	QAL	—	—	—	—	0.0200215	—
RE02-07-2541	02-600570	14.5–16.7	QBO	—	—	—	—	3.18276	—
RE02-07-2545	02-600571	11.7–15.5	QBO	—	—	—	—	—	0.198
RE02-07-2547	02-600572	0–0.5	SOIL	—	—	0.0616	—	—	—
RE02-10-21747	02-612346	8–9	QAL	—	—	0.0476	NA[e]	—	—
RE02-10-21748	02-612346	15–16	QAL	—	—	—	NA	0.0512404	—
RE02-10-21750	02-612346	35–36	QBO	—	—	—	NA	0.0746471	—
RE02-10-21751	02-612346	49–50	QBO	—	—	—	NA	0.0884761	—
RE02-10-21753	02-612347	15–16	QAL	—	—	—	NA	0.190605	—

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from LANL (2015, 600929).

[d] — = Not detected.

[e] NA = Not analyzed.

Table 6.13-1
Samples Collected and Analyses Requested at AOC 02-004(g)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Dioxins/Furans	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
RE02-03-51888	02-22383	1–1.5	SOIL	—*	—	—	1818S	1818S	1816S	1818S	1818S	1816S	—	—	1818S	—	1818S	—	—
RE02-03-51889	02-22383	2.5–3	SOIL	—	—	—	1818S	1818S	1816S	1818S	1818S	1816S	—	—	1818S	—	1818S	—	—
RE02-03-51890	02-22384	0.5–1	SOIL	—	—	—	1820S	1820S	1819S	1820S	1820S	1819S	—	—	1820S	—	1820S	—	—
RE02-03-51891	02-22384	2–2.5	SOIL	—	—	—	1820S	1820S	1819S	1820S	1820S	1819S	—	—	1820S	—	1820S	—	—
RE02-03-51892	02-22385	1–1.5	SOIL	—	—	—	1820S	1820S	1819S	1820S	1820S	1819S	—	—	1820S	—	1820S	—	—
RE02-03-51893	02-22385	2.5–3	SOIL	—	—	—	1820S	1820S	1819S	1820S	1820S	1819S	—	—	1820S	—	1820S	—	—
RE02-03-51894	02-22386	0–0.5	SOIL	—	—	—	1820S	1820S	1819S	1820S	1820S	1819S	—	—	1820S	—	1820S	—	—
RE02-03-51896	02-22387	0–0.5	SOIL	—	—	—	1820S	1820S	1819S	1820S	1820S	1819S	—	—	1820S	—	1820S	—	—
RE02-07-2101	02-600489	0–0.5	SOIL	07-561	07-561	07-596	07-561	07-561	—	07-561	07-561	07-561	07-561	07-561	07-561	07-561	—	—	07-561
RE02-07-6824	02-600490	0.8–1.8	FILL	07-1139	07-1139	07-1138	07-1139	07-1139	—	07-1139	07-1139	07-1137	07-1137	07-1139	07-1139	07-1137	—	—	07-1139
RE02-07-2106	02-600490	4.5–9	QAL	07-865	07-865	07-864	07-865	07-865	—	07-865	07-865	07-865	07-865	07-865	07-865	07-865	—	07-865	07-865
RE02-07-2107	02-600490	14.5–19.5	QBO	07-865	07-865	07-864	07-865	—	—	07-865	07-865	07-865	07-865	07-865	07-865	07-865	—	07-865	07-865
RE02-07-2109	02-600491	0–0.5	SOIL	07-539	07-539	07-529	07-539	07-539	—	07-539	07-539	07-539	07-539	07-539	07-539	07-539	—	—	07-539
RE02-07-2110	02-600491	4.5–9	QAL	07-854	07-854	07-853	07-854	07-854	—	07-854	07-854	07-854	07-854	07-854	07-854	07-854	—	07-854	07-854
RE02-07-2111	02-600491	15.5–19.5	QBO	07-854	07-854	07-853	07-854	07-854	—	07-854	07-854	07-854	07-854	07-854	07-854	07-854	—	07-854	07-854
RE02-07-6825	02-600492	0–0.5	SOIL	07-1151	07-1151	07-1150	07-1151	07-1151	—	07-1151	07-1151	07-1151	07-1151	07-1151	07-1151	07-1151	—	—	07-1151
RE02-07-2114	02-600492	4.5–9.5	QAL	07-835	07-834	07-832	07-835	07-835	—	07-835	07-835	07-834	07-833	07-834	07-835	07-833	—	07-833	07-834
RE02-07-2115	02-600492	14.5–19.5	QBO	07-840	07-840	07-839	07-840	07-840	—	07-840	07-840	07-840	07-840	07-840	07-840	07-840	—	07-840	07-840
RE02-07-6826	02-600493	0.9–1.4	QAL	07-1160	07-1160	07-1161	07-1160	07-1160	—	07-1160	07-1160	07-1160	07-1160	07-1160	07-1160	07-1160	—	—	07-1160
RE02-07-2118	02-600493	4.5–9.5	QAL	07-840	07-840	07-839	07-840	07-840	—	07-840	07-840	07-840	07-840	07-840	07-840	07-840	—	07-840	07-840
RE02-07-2119	02-600493	19–22	QBO	07-854	07-854	07-853	07-854	07-854	—	07-854	07-854	07-854	07-854	07-854	07-854	07-854	—	07-854	07-854
RE02-07-6827	02-600494	0–0.5	SOIL	07-1151	07-1151	07-1150	07-1151	07-1151	—	07-1151	07-1151	07-1151	07-1151	07-1151	07-1151	07-1151	—	—	07-1151
RE02-07-2122	02-600494	4.5–14.5	QAL	07-835	07-834	07-832	07-835	07-835	—	07-835	07-835	07-834	07-833	07-834	07-835	07-833	—	07-833	07-834
RE02-07-2123	02-600494	14.5–22	QBO	07-835	07-834	07-832	07-835	07-835	—	07-835	07-835	07-834	07-833	07-834	07-835	07-833	—	07-833	07-834
RE02-07-2125	02-600495	0–0.5	SOIL	07-561	07-561	07-596	07-561	07-561	—	07-561	07-561	07-561	07-561	07-561	07-561	07-561	—	—	07-561
RE02-07-2129	02-600496	0–0.5	SED	07-561	07-561	07-596	07-561	07-561	—	07-561	07-561	07-561	07-561	07-561	07-561	07-561	—	—	07-561
RE02-07-2133	02-600497	0–0.5	SOIL	07-539	07-539	07-529	07-539	07-539	—	07-539	07-539	07-539	07-539	07-539	07-539	07-539	—	—	07-539
RE02-07-2134	02-600497	4.5–7.5	QAL	07-859	07-859	07-860	07-859	07-859	—	07-859	07-859	07-859	07-859	07-859	07-859	07-859	—	07-859	07-859
RE02-07-2135	02-600497	15–18.5	QBO	07-859	07-859	07-860	07-859	07-859	—	07-859	07-859	07-859	07-859	07-859	07-859	07-859	—	07-859	07-859
RE02-10-21528	02-612293	5–6	QAL	11-21	—	—	11-21	11-21	—	11-21	—	11-20	11-20	—	11-21	11-20	—	—	—
RE02-10-21529	02-612293	15–16	QAL	11-21	—	—	11-21	11-21	—	11-21	—	11-20	11-20	—	11-21	11-20	—	—	—
RE02-10-21530	02-612293	25–26	QBO	11-21	—	—	11-21	11-21	—	11-21	—	11-20	11-20	—	11-21	11-20	—	—	—
RE02-10-21531	02-612293	35–36	QBO	11-43	—	—	11-43	11-43	—	11-43	—	11-42	11-41	—	11-43	11-41	—	—	—
RE02-10-21532	02-612293	49–50	QBO	11-43	—	—	11-43	11-43	—	11-43	—	11-42	11-41	—	11-43	11-41	—	—	—

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

Table 6.13-2
Inorganic Chemicals Detected or Detected above BVs at AOC 02-004(g)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**1900**	**2.6**	**na[b]**	**3.96**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**40**
Sediment BV[a]				**15400**	**0.83**	**3.98**	**127**	**0.4**	**4420**	**10.5**	**na**	**11.2**	**13800**	**19.7**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**60.2**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**na**	**14.7**	**21500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**na**	**505[d]**	**72.1**	**51,900**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**na**	**281[d]**	**40.2**	**24,800**	**434,000**	**1110**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**70.5**	**na**	**96.6[d]**	**3.05**	**3130**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**23,500**
RE02-03-51888	02-22383	1–1.5	SOIL	—[f]	—	—	—	—	—	—	0.262 (J-)	—	—	—	—	1.07 (J)	—	NA[g]	NA	—	—
RE02-03-51889	02-22383	2.5–3	SOIL	—	—	—	—	0.538 (U)	—	—	0.0747 (J-)	—	—	—	—	—	—	NA	NA	—	—
RE02-03-51890	02-22384	0.5–1	SOIL	—	—	—	—	—	—	—	0.0661 (J)	—	—	—	—	—	—	NA	NA	—	—
RE02-03-51891	02-22384	2–2.5	SOIL	—	—	—	—	0.553 (U)	—	—	—	—	—	—	—	—	—	NA	NA	—	—
RE02-03-51893	02-22385	2.5–3	SOIL	—	—	—	—	0.533 (U)	—	—	0.075 (J)	—	—	—	—	—	—	NA	NA	—	—
RE02-03-51894	02-22386	0–0.5	SOIL	—	—	—	—	—	—	—	0.108	—	—	—	—	—	—	NA	NA	—	68.4
RE02-07-2101	02-600489	0–0.5	SOIL	—	—	—	—	—	6610 (J-)	—	NA	—	—	—	—	0.294 (J-)	—	1.22 (J-)	—	—	56.1 (J+)
RE02-07-6824	02-600490	0.8–1.8	FILL	—	—	—	—	0.525 (U)	—	—	NA	—	—	—	—	—	—	4.49 (J-)	—	9.24	—
RE02-07-2106	02-600490	4.5–9	QAL	—	—	—	—	0.554 (U)	—	—	NA	—	—	—	—	—	—	2.8	—	2.4	—
RE02-07-2107	02-600490	14.5–19.5	QBO	12500	0.536 (UJ)	1.35 (J)	57.3	0.668 (U)	—	19.5 (U)	NA	4.79	7880	—	275 (J+)	—	3.56 (U)	—	—	2.49	—
RE02-07-2109	02-600491	0–0.5	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	0.415	—	3.71 (J-)	—	—	—
RE02-07-2110	02-600491	4.5–9	QAL	—	—	—	—	0.548 (U)	—	—	NA	—	—	—	—	—	—	2.55 (J-)	0.000966 (J)	1.64 (U)	—
RE02-07-2111	02-600491	15.5–19.5	QBO	7450	—	1.77 (U)	28.6	0.591 (U)	—	3.35	NA	—	4640	—	207 (J+)	—	—	—	—	1.77 (U)	—
RE02-07-6825	02-600492	0–0.5	SOIL	—	—	—	—	0.527 (U)	—	—	NA	—	—	—	—	—	—	2.7	—	—	—
RE02-07-2114	02-600492	4.5–9.5	QAL	—	—	—	—	0.544 (U)	—	—	NA	—	—	—	—	—	—	1.03 (J)	—	1.79	—
RE02-07-2115	02-600492	14.5–19.5	QBO	10600	—	0.728 (J)	72.4 (J-)	0.546 (U)	—	8.07 (J)	NA	—	5050	—	210 (J)	—	2.5	—	—	1.64 (U)	—
RE02-07-6826	02-600493	0.9–1.4	QAL	—	—	—	—	0.553 (U)	—	—	NA	28.9	—	53.9	—	—	—	1.97	—	14.7	50
RE02-07-2118	02-600493	4.5–9.5	QAL	—	—	—	—	0.574 (U)	—	50.7 (J)	NA	—	—	—	—	—	—	1.5	0.00062 (J)	—	—
RE02-07-2119	02-600493	19–22	QBO	7310	—	1.8 (U)	—	0.599 (U)	—	2.64	NA	—	4790	—	224 (J+)	—	—	—	—	0.615 (J)	—
RE02-07-6827	02-600494	0–0.5	SOIL	—	—	—	—	0.563 (U)	—	56.4	NA	—	—	35.6	—	0.297 (J)	—	1.32	—	—	92.8
RE02-07-2122	02-600494	4.5–14.5	QAL	—	—	—	—	0.549 (U)	—	19.4	NA	51.3	—	—	—	—	—	1.09 (J)	—	2.28	—
RE02-07-2123	02-600494	14.5–22	QBO	6100	—	1.57 (J)	33.7	0.58 (U)	—	4.76	NA	—	5850 (J)	—	305	—	3.81 (J-)	—	—	2.63	—
RE02-07-2125	02-600495	0–0.5	SOIL	—	—	—	—	0.958	—	—	NA	—	—	—	—	—	—	1.33 (J-)	—	—	53.8 (J+)

Table 6.13-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**1900**	**2.6**	**na[b]**	**3.96**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**40**
Sediment BV[a]				**15400**	**0.83**	**3.98**	**127**	**0.4**	**4420**	**10.5**	**na**	**11.2**	**13800**	**19.7**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**60.2**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**na**	**14.7**	**21500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**na**	**505[d]**	**72.1**	**51,900**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**na**	**281[d]**	**40.2**	**24,800**	**434,000**	**1110**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**70.5**	**na**	**96.6[d]**	**3.05**	**3130**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**23,500**
RE02-07-2129	02-600496	0–0.5	SED	—	—	—	—	0.501 (U)	—	—	NA	—	—	—	—	—	—	4.55 (J-)	—	1.5 (U)	—
RE02-07-2134	02-600497	4.5–7.5	QAL	—	—	—	—	0.504 (U)	—	—	NA	—	—	—	—	—	—	—	—	1.87	—
RE02-07-2135	02-600497	15–18.5	QBO	5010	—	1.07 (J)	28.4	0.616 (U)	—	9.21 (U)	NA	—	6300	—	210 (J+)	—	2.43 (U)	—	—	2.15	—
RE02-10-21528	02-612293	5–6	QAL	—	1.06 (U)	—	—	0.529 (U)	—	—	NA	—	—	—	—	—	—	NA	NA	—	—
RE02-10-21529	02-612293	15–16	QAL	—	1.07 (U)	—	—	0.534 (U)	—	—	NA	—	—	—	698	—	—	NA	NA	—	—
RE02-10-21530	02-612293	25–26	QBO	5190	1.33 (U)	1.32 (U)	—	0.666 (U)	—	—	NA	—	4640	—	210	—	—	NA	NA	1.32 (UJ)	—
RE02-10-21531	02-612293	35–36	QBO	—	1.19 (U)	1.17 (U)	—	0.594 (U)	—	—	NA	—	5150	—	252	—	—	NA	NA	1.17 (U)	—
RE02-10-21532	02-612293	49–50	QBO	—	1.16 (U)	1.18 (U)	—	0.579 (U)	—	—	NA	—	4940	—	—	—	—	NA	NA	1.18 (U)	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 6.13-3
Organic Chemicals Detected at AOC 02-004(g)

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	Chloroform	Chrysene	Di-n-butylphthalate	Fluoranthene	Fluorene	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]
Industrial SSL[a]				**50,500**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**28.4**	**3230**	**91,600**	**33,700**	**33,700**	**na[c]**	**na**	**na**
Recreational SSL[d]				**17,300**	**863,000**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**204**	**8880**	**32,800**	**11,500**	**11,500**	**na**	**na**	**na**
Residential SSL[a]				**3480**	**17,400**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**5.85**	**152**	**6160**	**2320**	**2320**	**na**	**na**	**na**
RE02-07-2101	02-600489	0–0.5	SOIL	—[e]	—	0.0528	0.0382	—	0.123 (J)	0.179 (J)	0.0407 (J)	NA[f]	—	—	0.187	—	0.000657	0.00137	0.000084
RE02-07-6824	02-600490	0.8–1.8	FILL	—	—	—	—	—	—	—	—	NA	—	—	—	—	0.00000132 (J)	0.00000328	0.00000166 (J)
RE02-07-2106	02-600490	4.5–9	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	0.000000105 (J)	0.0000003	0.00000007 (J)
RE02-07-2107	02-600490	14.5–19.5	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	0.000000972 (J)	0.0000022	0.00000032 (J)
RE02-07-2109	02-600491	0–0.5	SOIL	0.0261 (J)	0.0356	0.0403	0.0197 (J)	0.119	0.115 (J)	0.18 (J)	0.0552 (J)	NA	0.111	—	0.168	0.0141 (J)	0.0000109	0.0000214	0.00000533
RE02-07-2110	02-600491	4.5–9	QAL	—	—	—	—	—	—	—	—	—	—	0.0641 (J)	—	—	0.000000245 (J)	0.000000245	—
RE02-07-2111	02-600491	15.5–19.5	QBO	—	—	—	—	—	—	—	—	—	—	0.0498 (J)	—	—	0.000000208 (J)	0.000000473	—
RE02-07-6825	02-600492	0–0.5	SOIL	—	—	0.0042 (J-)	—	—	—	—	—	NA	—	—	—	—	0.00000102 (J)	0.00000211	0.00000134 (J)
RE02-07-2114	02-600492	4.5–9.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2115	02-600492	14.5–19.5	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	0.000000445 (J)	0.000000445	—
RE02-07-6826	02-600493	0.9–1.4	QAL	—	—	—	0.0034 (J-)	—	—	—	—	NA	—	—	—	—	0.0000329	0.000117	0.0000105
RE02-07-2118	02-600493	4.5–9.5	QAL	—	—	—	—	—	—	—	—	0.000313 (J)	—	—	—	—	0.000000814 (J)	0.00000147	0.000000243 (J)
RE02-07-2119	02-600493	19–22	QBO	—	—	—	—	—	—	—	—	—	—	0.0703 (J)	—	—	0.000000387 (J)	0.000000762	—
RE02-07-6827	02-600494	0–0.5	SOIL	—	—	0.0052 (J-)	0.0036 (J)	—	—	0.0248 (J)	—	NA	—	—	0.0263 (J)	—	0.0000324	0.0000625	0.0000112
RE02-07-2122	02-600494	4.5–14.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00000156 (J)	0.00000286	0.000000386 (J)
RE02-07-2123	02-600494	14.5–22	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.000000257	0.000000551 (J)
RE02-07-2125	02-600495	0–0.5	SOIL	—	—	0.0245 (J)	0.016 (J)	—	0.0269 (J)	0.045 (J)	—	NA	0.0287 (J)	—	0.0437	—	0.00125	0.00198	0.000553
RE02-07-2129	02-600496	0–0.5	SED	—	—	—	—	—	0.022 (J)	0.0273 (J)	—	NA	0.0176 (J)	—	0.0259 (J)	—	0.00000908	0.0000169	0.00000326
RE02-07-2133	02-600497	0–0.5	SOIL	—	0.00712 (J)	—	—	—	0.0141 (J)	0.0164 (J)	—	NA	0.0167 (J)	—	0.0169 (J)	—	0.0000157	0.0000302	0.00000588
RE02-07-2134	02-600497	4.5–7.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	0.000000585 (J)	0.00000125	0.000000207 (J)
RE02-07-2135	02-600497	15–18.5	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	0.000000127 (J)	0.000000127	0.000000107 (J)

Table 6.13-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	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-]	Hexachlorodibenzofuran[1,2,3,7,8,9-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)
Industrial SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Recreational SSL[d]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Residential SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
RE02-07-2101	02-600489	0–0.5	SOIL	0.0000078	0.000343	0.00000383	0.0000145	0.00000846	0.000114	0.00000387	0.00000318	0.0000009 (J)	0.00000445	0.0000922
RE02-07-6824	02-600490	0.8–1.8	FILL	—	0.0000029	—	—	—	0.000000192	—	—	—	—	0.00000131
RE02-07-2106	02-600490	4.5–9	QAL	—	0.00000007	—	—	—	—	—	—	—	—	—
RE02-07-2107	02-600490	14.5–19.5	QBO	—	0.00000112	—	—	—	—	0.0000000442 (J)	—	—	—	0.00000013
RE02-07-2109	02-600491	0–0.5	SOIL	0.000000786 (J)	0.0000123	—	—	—	0.00000162	0.00000429	0.00000144 (J)	0.000000305 (J)	0.00000218 (J)	0.0000235 (J)
RE02-07-2110	02-600491	4.5–9	QAL	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2111	02-600491	15.5–19.5	QBO	—	—	—	—	—	—	—	—	—	—	—
RE02-07-6825	02-600492	0–0.5	SOIL	—	0.0000025	—	—	—	—	—	—	—	—	0.000000416
RE02-07-2114	02-600492	4.5–9.5	QAL	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2115	02-600492	14.5–19.5	QBO	—	0.000000222	—	—	—	—	—	—	—	—	—
RE02-07-6826	02-600493	0.9–1.4	QAL	0.000000801 (J)	0.0000382	0.000000447 (J)	0.00000127 (J)	0.000000835 (J)	0.0000129	0.000000549 (J)	0.000000604 (J)	—	0.000000897 (J)	0.0000146
RE02-07-2118	02-600493	4.5–9.5	QAL	—	0.000000625	—	—	—	—	—	—	—	—	—
RE02-07-2119	02-600493	19–22	QBO	—	—	—	—	—	—	—	—	—	—	—
RE02-07-6827	02-600494	0–0.5	SOIL	0.000000574 (J)	0.0000325	—	0.00000089 (J)	0.000000462 (J)	0.00000607	0.000000539 (J)	0.000000448 (J)	—	0.00000071 (J)	0.0000113
RE02-07-2122	02-600494	4.5–14.5	QAL	—	0.000000936	—	—	—	0.000000226	0.000000109 (J)	0.0000000397 (J)	—	0.0000000323 (J)	0.000000454
RE02-07-2123	02-600494	14.5–22	QBO	—	0.00000063	—	—	—	—	—	—	—	—	—
RE02-07-2125	02-600495	0–0.5	SOIL	0.0000469	0.00133	0.0000346	0.0000734	0.0000818	0.000461	0.0000489	0.0000424	0.00000819	0.0000492	0.00101
RE02-07-2129	02-600496	0–0.5	SED	—	0.00000691	—	0.000000434 (J)	0.00000041 (J)	0.00000298	0.000000436 (J)	0.000000256 (J)	—	0.000000302 (J)	0.00000504
RE02-07-2133	02-600497	0–0.5	SOIL	0.000000456 (J)	0.0000125	0.000000295 (J)	0.000000722 (J)	—	0.00000477	0.000000915 (J)	0.000000533 (J)	—	0.00000078 (J)	0.00000966 (J)
RE02-07-2134	02-600497	4.5–7.5	QAL	—	0.000000422	—	—	—	—	—	—	—	—	0.000000157
RE02-07-2135	02-600497	15–18.5	QBO	—	0.000000107	—	—	—	—	0.0000000289 (J)	—	—	—	0.0000000289

Table 6.13-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Indeno(1,2,3-cd)pyrene	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	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
Industrial SSL[a]				**32.3**	**5110**	**3370**	**16,800**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**25,300**
Recreational SSL[d]				**88.8**	**3610**	**1150**	**1930**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**8630**
Residential SSL[a]				**1.53**	**409**	**232**	**1160**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**1740**
RE02-07-2101	02-600489	0–0.5	SOIL	—	NA	—	—	0.015	0.000217	0.00000213 (J)	0.0000172	0.000000608 (J)	0.00000237 (J)	0.0000285 (J)	0.0828 (J)
RE02-07-6824	02-600490	0.8–1.8	FILL	—	NA	—	—	0.0000116	0.00000133 (J)	—	—	—	—	0.000000336	—
RE02-07-2106	02-600490	4.5–9	QAL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2107	02-600490	14.5–19.5	QBO	—	—	—	—	0.0000122	0.000000747 (J)	—	—	—	—	—	—
RE02-07-2109	02-600491	0–0.5	SOIL	0.0401 (J)	NA	—	0.0178 (J)	0.000113	0.00000839	—	0.0000000815	0.00000106 (J)	0.00000681	0.0000372	0.118
RE02-07-2110	02-600491	4.5–9	QAL	—	—	—	—	0.00000134 (J)	0.000000168 (J)	—	—	—	—	—	—
RE02-07-2111	02-600491	15.5–19.5	QBO	—	—	—	—	0.00000168 (J)	—	—	—	—	—	—	—
RE02-07-6825	02-600492	0–0.5	SOIL	—	NA	0.00783 (J)	—	0.00000821	0.000000909 (J)	—	—	—	—	—	—
RE02-07-2114	02-600492	4.5–9.5	QAL	—	—	—	—	0.0000015 (J)	—	—	—	—	—	—	—
RE02-07-2115	02-600492	14.5–19.5	QBO	—	—	—	—	0.00000559	0.000000364 (J)	—	—	—	—	—	—
RE02-07-6826	02-600493	0.9–1.4	QAL	—	NA	—	—	0.000259	0.0000325	0.000000312 (J)	0.00000152	—	0.000000859 (J)	0.000011	—
RE02-07-2118	02-600493	4.5–9.5	QAL	—	0.00254 (J)	—	—	0.00000712	0.00000049 (J)	—	—	—	—	—	—
RE02-07-2119	02-600493	19–22	QBO	—	—	—	—	0.0000028 (J)	—	—	—	—	—	—	—
RE02-07-6827	02-600494	0–0.5	SOIL	—	NA	0.0152 (J)	—	0.000275	0.0000335	0.000000152 (J)	0.00000047	—	0.000000604 (J)	0.00000722	0.0267 (J)
RE02-07-2122	02-600494	4.5–14.5	QAL	—	—	—	—	0.0000126	0.000000802 (J)	—	—	—	—	0.000000178	—
RE02-07-2123	02-600494	14.5–22	QBO	—	—	—	—	0.0000017 (J)	0.000000221 (J)	—	—	—	—	—	—
RE02-07-2125	02-600495	0–0.5	SOIL	—	NA	—	—	0.00581	0.000652	0.0000206	0.0000728	0.00000403	0.0000124	0.000295 (J)	0.022 (J)
RE02-07-2129	02-600496	0–0.5	SED	—	NA	—	—	0.0000645	0.00000533	—	—	—	—	0.00000236 (J)	0.0114 (J)
RE02-07-2133	02-600497	0–0.5	SOIL	—	NA	—	—	0.000111	0.00000825	—	—	—	0.00000115 (J)	0.00000721	—
RE02-07-2134	02-600497	4.5–7.5	QAL	—	—	—	—	0.00000462 (J)	0.000000373 (J)	—	—	—	—	—	—
RE02-07-2135	02-600497	15–18.5	QBO	—	—	—	—	0.00000179 (J)	—	—	—	—	—	—	—

Table 6.13-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Pyrene	Tetrachlorodibenzodioxin[2,3,7,8-]	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Tetrachloroethene	Toluene	Trichloroethene
Industrial SSL[a]				**25,300**	**0.000238**	**na**	**0.00243**	**na**	**1640**	**61,100**	**36.1**
Recreational SSL[d]				**8630**	**0.000297**	**na**	**0.00297**	**na**	**2240**	**47,600**	**157**
Residential SSL[a]				**1740**	**0.000049**	**na**	**0.00049**	**na**	**110**	**5220**	**6.72**
RE02-07-2101	02-600489	0–0.5	SOIL	0.221	0.00000026 (J)	0.000000947	—	0.00000842	NA	NA	NA
RE02-07-6824	02-600490	0.8–1.8	FILL	0.0144 (J)	—	—	—	0.000000328	NA	NA	NA
RE02-07-2106	02-600490	4.5–9	QAL	—	—	—	—	0.0000000988	—	0.000583 (J)	0.000884 (J)
RE02-07-2107	02-600490	14.5–19.5	QBO	—	—	—	—	—	—	—	—
RE02-07-2109	02-600491	0–0.5	SOIL	0.185	—	—	0.00000343	0.0000147	NA	NA	NA
RE02-07-2110	02-600491	4.5–9	QAL	—	—	—	—	0.000000136	—	—	—
RE02-07-2111	02-600491	15.5–19.5	QBO	—	—	—	—	—	—	—	—
RE02-07-6825	02-600492	0–0.5	SOIL	—	—	—	—	—	NA	NA	NA
RE02-07-2114	02-600492	4.5–9.5	QAL	—	—	0.0000000937	—	0.000000134	—	—	—
RE02-07-2115	02-600492	14.5–19.5	QBO	—	—	—	—	—	—	—	—
RE02-07-6826	02-600493	0.9–1.4	QAL	—	—	0.000000228	0.000000239 (J)	0.00000364	NA	NA	NA
RE02-07-2118	02-600493	4.5–9.5	QAL	—	—	0.000000167	—	0.000000337	0.000302 (J)	0.00336	—
RE02-07-2119	02-600493	19–22	QBO	—	—	—	—	—	—	—	—
RE02-07-6827	02-600494	0–0.5	SOIL	0.0205 (J)	—	—	0.00000028 (J)	0.0000025	NA	NA	NA
RE02-07-2122	02-600494	4.5–14.5	QAL	—	—	0.0000000695	—	0.000000175	—	0.000343 (J)	—
RE02-07-2123	02-600494	14.5–22	QBO	—	—	—	—	—	—	—	—
RE02-07-2125	02-600495	0–0.5	SOIL	0.0618	0.000000756	0.00000349	0.00000123	0.0000376	NA	NA	NA
RE02-07-2129	02-600496	0–0.5	SED	0.0217 (J)	—	—	0.000000189 (J)	0.000000911	NA	NA	NA
RE02-07-2133	02-600497	0–0.5	SOIL	0.0158 (J)	—	—	0.00000055 (J)	0.00000151	NA	NA	NA
RE02-07-2134	02-600497	4.5–7.5	QAL	—	—	—	—	—	—	—	—
RE02-07-2135	02-600497	15–18.5	QBO	—	—	—	—	—	—	—	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273), unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] na = Not available.

[d] SSLs are from LANL (2017, 602581).

[e] — = Not detected.

[f] NA = Not analyzed.

Table 6.13-4
Radionuclides Detected or Detected above BVs/FVs at AOC 02-004(g)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Cobalt-60	Plutonium-239/240	Strontium-90	Tritium
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**na**	**na**
Sediment BV[a]				**0.04**	**0.9**	**na**	**0.068**	**1.04**	**0.093**
Soil BV/FV[a]				**0.013**	**1.65**	**na**	**0.054**	**1.31**	**na**
Industrial SAL[c]				**1000**	**41**	**9**	**1200**	**2400**	**2,400,000**
Recreational SAL[c]				**1500**	**370**	**81**	**1300**	**4900**	**5,700,000**
Residential SAL[c]				**83**	**12**	**2.6**	**79**	**15**	**1700**
RE02-03-51888	02-22383	1–1.5	SOIL	NA[d]	0.0453	—[e]	—	—	0.04
RE02-03-51889	02-22383	2.5–3	SOIL	NA	—	—	—	0.233	0.0474
RE02-03-51890	02-22384	0.5–1	SOIL	NA	—	—	0.301	—	0.0753
RE02-03-51891	02-22384	2–2.5	SOIL	NA	—	—	—	—	0.0904
RE02-03-51892	02-22385	1–1.5	SOIL	NA	—	—	—	—	0.0201
RE02-03-51893	02-22385	2.5–3	SOIL	NA	—	—	0.105	0.102	0.0144
RE02-03-51894	02-22386	0–0.5	SOIL	NA	—	—	0.115	—	—
RE02-07-2101	02-600489	0–0.5	SOIL	—	—	0.504	0.195 (J+)	—	—
RE02-07-6824	02-600490	0.8–1.8	FILL	—	—	—	1.85	—	0.0286246
RE02-07-2109	02-600491	0–0.5	SOIL	—	—	—	0.0835	—	0.0118856
RE02-07-2111	02-600491	15.5–19.5	QBO	—	—	—	—	—	0.187463
RE02-07-6825	02-600492	0–0.5	SOIL	—	—	—	—	—	0.0345484
RE02-07-2114	02-600492	4.5–9.5	QAL	—	—	—	—	—	0.0539966
RE02-07-6826	02-600493	0.9–1.4	QAL	—	—	—	0.0515	—	—
RE02-07-2125	02-600495	0–0.5	SOIL	0.165	2.88	—	0.169 (J+)	—	—
RE02-07-2129	02-600496	0–0.5	SED	—	—	—	0.13 (J+)	—	—
RE02-10-215279	02-612293	15–16	QAL	—	—	—	0.023	—	—

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from LANL (2015, 600929).

[d] NA = Not analyzed.

[e] — = Not detected.

Table 6.14-1
Samples Collected and Analyses Requested at SWMU 02-005

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
RE02-07-2445	02-600547	0–0.5	SOIL	07-328[a]	07-328	07-328	07-328	07-328	07-328	07-328	07-328	—[b]	07-328	07-328	07-327	—	07-328
RE02-07-2446	02-600547	2–2.5	QAL	07-369	07-368	07-369	07-369	07-368	07-369	07-369	07-368	—	07-368	07-369	07-367	07-367	07-368
RE02-07-2448	02-600548	0–0.5	SOIL	07-1126	07-1125	07-1126	07-1126	07-1125	07-1126	07-1126	07-1125	07-1125	07-1125	07-1126	—	—	07-1125
RE02-07-2451	02-600549	0–0.5	SOIL	07-1126	07-1125	07-1126	07-1126	07-1125	07-1126	07-1126	07-1125	07-1125	07-1125	07-1126	—	—	07-1125
RE02-07-2454	02-600550	0–0.5	SOIL	07-1126	07-1125	07-1126	07-1126	07-1125	07-1126	07-1126	07-1125	07-1125	07-1125	07-1126	—	—	07-1125
RE02-07-2457	02-600551	0–0.5	SOIL	07-1126	07-1125	07-1126	07-1126	07-1125	07-1126	07-1126	07-1125	07-1125	07-1125	07-1126	—	—	07-1125
RE02-07-2460	02-600552	0–0.5	SOIL	07-1030	07-1030	07-1030	07-1030	07-1030	07-1030	07-1030	07-1030	07-1030	07-1030	07-1030	—	—	07-1030
RE02-07-2463	02-600553	0–0.5	SOIL	07-1030	07-1030	07-1030	07-1030	07-1030	07-1030	07-1030	07-1030	07-1030	07-1030	07-1030	—	—	07-1030
RE02-07-2464	02-600553	2–4.5	QAL	07-1104	07-1104	07-1104	07-1104	07-1104	07-1104	07-1104	07-1104	07-1104	07-1104	07-1104	—	—	07-1104
RE02-07-2465	02-600553	4.5–7	QAL	07-1104	07-1104	07-1104	07-1104	07-1104	07-1104	07-1104	07-1104	07-1104	07-1104	07-1104	—	—	07-1104
RE02-07-2466	02-600554	0–1.1	SOIL	07-1036	07-1036	07-1036	07-1036	07-1036	07-1036	07-1036	07-1036	07-1036	07-1036	07-1036	—	—	07-1036
RE02-07-2467	02-600554	2–3	QAL	07-1036	07-1036	07-1036	07-1036	07-1036	07-1036	07-1036	07-1036	07-1036	07-1036	07-1036	—	—	07-1036
RE02-07-2468	02-600554	4.5–5	QCT	07-1036	07-1036	07-1036	07-1036	07-1036	07-1036	07-1036	07-1036	07-1036	07-1036	07-1036	—	—	07-1036
RE02-07-2469	02-600555	0–1.1	SOIL	07-1114	07-1114	07-1114	07-1114	07-1114	07-1114	07-1114	07-1114	07-1114	07-1114	07-1114	—	—	07-1114
RE02-07-2470	02-600555	2–2.5	QAL	07-1114	07-1114	07-1114	07-1114	07-1114	07-1114	07-1114	07-1114	07-1114	07-1114	07-1114	—	—	07-1114
RE02-07-2472	02-600556	0–0.5	SOIL	07-1114	07-1114	07-1114	07-1114	07-1114	07-1114	07-1114	07-1114	07-1114	07-1114	07-1114	—	—	07-1114
RE02-07-2473	02-600556	2–3	QAL	07-1114	07-1114	07-1114	07-1114	07-1114	07-1114	07-1114	07-1114	07-1114	07-1114	07-1114	—	—	07-1114
RE02-07-2475	02-600557	0–0.5	SOIL	07-1126	07-1125	07-1126	07-1126	07-1125	07-1126	07-1126	07-1125	07-1125	07-1125	07-1126	—	—	07-1125
RE02-07-2478	02-600558	0–0.5	SOIL	07-1126	07-1125	07-1126	07-1126	07-1125	07-1126	07-1126	07-1125	07-1125	07-1125	07-1126	—	—	07-1125
RE02-07-2479	02-600558	2–2.5	QAL	07-1126	07-1125	07-1126	07-1126	07-1125	07-1126	07-1126	07-1125	07-1125	07-1125	07-1126	—	—	07-1125
RE02-07-2480	02-600558	4.5–5	QAL	07-1126	07-1125	07-1126	07-1126	07-1125	07-1126	07-1126	07-1125	07-1125	07-1125	07-1126	—	—	07-1125
RE02-07-2481	02-600559	0–0.5	SOIL	07-369	07-368	07-369	07-369	07-368	07-369	07-369	07-368	07-368	07-368	07-369	—	—	07-368
RE02-07-2482	02-600559	2–2.5	QAL	07-369	07-368	07-369	07-369	07-368	07-369	07-369	07-368	07-368	07-368	07-369	—	—	07-368
RE02-07-2484	02-600560	0–0.5	SOIL	07-1126	07-1125	07-1126	07-1126	07-1125	07-1126	07-1126	07-1125	07-1125	07-1125	07-1126	—	—	07-1125
RE02-07-2485	02-600560	2–3	QAL	07-1126	07-1125	07-1126	07-1126	07-1125	07-1126	07-1126	07-1125	07-1125	07-1125	07-1126	—	—	07-1125
RE02-07-2486	02-600560	4.5–5	QAL	07-1126	07-1125	07-1126	07-1126	07-1125	07-1126	07-1126	07-1125	07-1125	07-1125	07-1126	—	—	07-1125
RE02-07-2487	02-600561	0–0.5	SOIL	07-1126	07-1125	07-1126	07-1126	07-1125	07-1126	07-1126	07-1125	07-1125	07-1125	07-1126	—	—	07-1125
RE02-10-21866	02-600561	1–1.2	SOIL	—	—	—	—	—	—	—	—	10-4447	—	—	—	—	—
RE02-10-21867	02-600561	2–2.2	SOIL	—	—	—	—	—	—	—	—	10-4447	—	—	—	—	—
RE02-07-2490	02-600562	0–0.5	SOIL	07-1126	07-1125	07-1126	07-1126	07-1125	07-1126	07-1126	07-1125	07-1125	07-1125	07-1126	—	—	07-1125
RE02-10-21868	02-612376	1–1.2	SOIL	—	—	—	—	—	—	—	—	10-4447	—	—	—	—	—

Table 6.14-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
RE02-10-21869	02-612376	2–2.2	SOIL	—	—	—	—	—	—	—	—	10-4447	—	—	—	—	—
RE02-10-21870	02-612377	1–1.2	SOIL	—	—	—	—	—	—	—	—	10-4447	—	—	—	—	—
RE02-10-21871	02-612377	2–2.2	SOIL	—	—	—	—	—	—	—	—	10-4447	—	—	—	—	—
RE02-10-21872	02-612378	1–1.2	SOIL	—	—	—	—	—	—	—	—	10-4447	—	—	—	—	—
RE02-10-21873	02-612378	2–2.2	SOIL	—	—	—	—	—	—	—	—	10-4447	—	—	—	—	—
RE02-10-21891	02-612379	0–0.5	SOIL	10-4445	—	10-4445	10-4445	—	10-4445	—	10-4445	—	—	—	—	—	—
RE02-10-21874	02-612379	1–1.2	SOIL	—	—	—	—	—	—	—	—	10-4447	—	—	—	—	—
RE02-10-21892	02-612379	1.5–2.5	SOIL	10-4445	—	10-4445	10-4445	—	10-4445	—	10-4445	—	—	—	—	—	—
RE02-10-21875	02-612379	2–2.2	SOIL	—	—	—	—	—	—	—	—	10-4447	—	—	—	—	—
RE02-10-21877	02-612380	0–0.5	SOIL	10-4215	—	10-4215	10-4215	—	10-4215	—	10-4214	—	—	—	—	—	—
RE02-10-21878	02-612380	1.5–2.5	SOIL	10-4215	—	10-4215	10-4215	—	10-4215	—	10-4214	—	—	—	—	—	—
RE02-10-21879	02-612381	0–0.5	SOIL	10-4215	—	10-4215	10-4215	—	10-4215	—	10-4214	—	—	—	—	—	—
RE02-10-21880	02-612381	1.5–2.5	SOIL	10-4215	—	10-4215	10-4215	—	10-4215	—	10-4214	—	—	—	—	—	—
RE02-10-21881	02-612382	0–0.5	SOIL	10-4215	—	10-4215	10-4215	—	10-4215	—	10-4214	—	—	—	—	—	—
RE02-10-21882	02-612382	1.5–2.5	SOIL	10-4215	—	10-4215	10-4215	—	10-4215	—	10-4214	—	—	—	—	—	—
RE02-10-21883	02-612383	0–0.5	SOIL	10-4215	—	10-4215	10-4215	—	10-4215	—	10-4214	—	—	—	—	—	—
RE02-10-21884	02-612383	1.5–2.5	SOIL	10-4215	—	10-4215	10-4215	—	10-4215	—	10-4214	—	—	—	—	—	—
RE02-10-21885	02-612384	0–0.5	SOIL	10-4215	—	10-4215	10-4215	—	10-4215	—	10-4214	—	—	—	—	—	—
RE02-10-21886	02-612384	1.5–2.5	SOIL	10-4215	—	10-4215	10-4215	—	10-4215	—	10-4214	—	—	—	—	—	—
RE02-10-21887	02-612385	0–0.5	SOIL	10-4419	—	10-4419	10-4419	—	10-4419	—	10-4419	—	—	—	—	—	—
RE02-10-21888	02-612385	1.5–2.5	SOIL	10-4419	—	10-4419	10-4419	—	10-4419	—	10-4419	—	—	—	—	—	—
RE02-10-21889	02-612386	0–0.5	SOIL	10-4445	—	10-4445	10-4445	—	10-4445	—	10-4445	—	—	—	—	—	—
RE02-10-21890	02-612386	1.5–2.5	QAL	10-4445	—	10-4445	10-4445	—	10-4445	—	10-4445	—	—	—	—	—	—
RE02-10-21976	02-612407	0–0.5	SOIL	10-4163	—	10-4163	10-4163	10-4162	10-4163	10-4163	10-4162	10-4162	—	10-4163	10-4162	—	10-4162
RE02-10-21977	02-612407	4–5	SOIL	10-4163	—	10-4163	10-4163	10-4162	10-4163	10-4163	10-4162	10-4162	—	10-4163	10-4162	—	10-4162
RE02-10-21978	02-612407	9–10	SOIL	10-4163	—	10-4163	10-4163	10-4162	10-4163	10-4163	10-4162	10-4162	—	10-4163	10-4162	—	10-4162
RE02-11-322	02-613290	2–2.2	SOIL	—	—	—	—	—	—	—	—	11-235	—	—	—	—	—
RE02-11-2209	02-613290	4–4.2	SOIL	—	—	—	—	—	—	—	—	11-547	—	—	—	—	—
RE02-11-323	02-613291	1–1.2	SOIL	—	—	—	—	—	—	—	—	11-235	—	—	—	—	—
RE02-11-2207	02-613622	2–2.2	SOIL	—	—	—	—	—	—	—	—	11-547	—	—	—	—	—
RE02-11-2208	02-613622	4–4.2	SOIL	—	—	—	—	—	—	—	—	11-547	—	—	—	—	—

[a] Analytical request number.

[b] — = Analysis not requested.

Table 6.14-2
Inorganic Chemicals Detected or Detected above BVs at SWMU 02-005

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Cadmium	Chromium	Hexavalent Chromium	Copper	Cyanide (Total)	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**0.5**	**0.56**	**0.4**	**2.6**	**na[b]**	**3.96**	**0.5**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**40**
Soil BV[a]				**0.83**	**8.17**	**0.4**	**19.3**	**na**	**14.7**	**0.5**	**21500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**48.8**
Industrial SSL[c]				**519**	**35.9**	**1110**	**505[d]**	**72.1**	**51,900**	**62.8**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**389,000**
Recreational SSL[e]				**248**	**42.9**	**457**	**281[d]**	**40.2**	**24,800**	**224**	**434,000**	**1110**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**186,000**
Residential SSL[c]				**31.3**	**7.07**	**70.5**	**96.6[d]**	**3.05**	**3130**	**11.1**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**23,500**
RE02-07-2445	02-600547	0–0.5	SOIL	—[f]	—	0.496 (U)	—	0.24 (J)	—	—	—	—	—	—	—	1.74	0.000873 (J)	1.91 (U)	54.2
RE02-07-2446	02-600547	2–2.5	QAL	—	—	0.505 (U)	—	—	—	—	—	—	—	—	—	1.36 (J-)	0.000775 (J-)	—	—
RE02-07-2448	02-600548	0–0.5	SOIL	—	—	0.538 (U)	—	—	—	—	—	—	—	—	—	2.43	—	6.48	—
RE02-07-2451	02-600549	0–0.5	SOIL	—	—	0.522 (U)	—	—	—	—	—	—	—	—	—	2.03	—	7.67	51.9
RE02-07-2454	02-600550	0–0.5	SOIL	—	—	0.514 (U)	—	—	—	—	—	—	—	—	—	2.26	—	8.37	49.8
RE02-07-2457	02-600551	0–0.5	SOIL	—	—	0.518 (U)	—	—	—	—	—	—	—	—	—	3.08	—	6.01	63.1
RE02-07-2460	02-600552	0–0.5	SOIL	—	—	0.545 (U)	—	—	—	—	—	—	—	—	—	1.95 (J-)	0.00108 (J)	1.67	—
RE02-07-2463	02-600553	0–0.5	SOIL	—	—	0.512 (U)	—	—	34.9 (J)	—	—	—	—	2.17	—	1.75 (J-)	—	1.66	—
RE02-07-2464	02-600553	2–4.5	QAL	—	—	0.495 (U)	—	0.34	—	—	—	—	—	0.22	—	—	—	5.89	—
RE02-07-2465	02-600553	4.5–7	QAL	—	—	0.514 (U)	—	0.433 (J)	—	—	—	—	—	—	—	1.27	0.00253	5.74	—
RE02-07-2466	02-600554	0–1.1	SOIL	—	—	0.53 (U)	—	0.527 (J)	—	—	—	—	—	—	—	1.8	—	8.01	—
RE02-07-2467	02-600554	2–3	QAL	—	—	0.504 (U)	—	—	—	—	—	—	—	—	—	1.07	—	8.16	—
RE02-07-2468	02-600554	4.5–5	QCT	—	1.51	0.498 (U)	6.8	—	—	—	5150	—	304	—	2.43	—	—	5.23	44.8
RE02-07-2469	02-600555	0–1.1	SOIL	—	—	0.498 (U)	—	0.106 (J)	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2470	02-600555	2–2.5	QAL	—	—	0.505 (U)	—	0.0522 (J)	—	—	—	—	—	—	—	—	—	—	53.9
RE02-07-2472	02-600556	0–0.5	SOIL	—	—	0.501 (U)	—	0.0497 (J)	—	—	—	—	—	—	—	—	—	—	50.9
RE02-07-2473	02-600556	2–3	QAL	—	—	0.504 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2475	02-600557	0–0.5	SOIL	—	—	0.563 (U)	—	—	—	0.547	—	—	—	—	—	2.49	—	6.68	—
RE02-07-2478	02-600558	0–0.5	SOIL	—	—	0.554 (U)	—	—	—	—	—	—	—	—	—	4.74	0.0007 (J)	6.36	—
RE02-07-2479	02-600558	2–2.5	QAL	—	—	0.5 (U)	—	1.06	—	—	—	—	—	—	—	—	—	5.75	—
RE02-07-2480	02-600558	4.5–5	QAL	—	—	0.508 (U)	—	0.0951 (J)	—	—	—	—	—	—	—	—	0.00108 (J)	6.1	—
RE02-07-2481	02-600559	0–0.5	SOIL	—	—	0.524 (U)	—	0.768 (J)	—	—	—	24.4	—	—	—	2.2 (J-)	0.000622 (J-)	1.71 (U)	68.5
RE02-07-2482	02-600559	2–2.5	QAL	—	—	0.527 (U)	—	0.692 (J)	—	—	—	60.6	—	—	—	1.16 (J-)	—	2.24 (U)	74.4
RE02-07-2484	02-600560	0–0.5	SOIL	—	—	0.523 (U)	—	0.0703 (J)	—	—	—	—	—	—	—	3.55	—	6.71	—
RE02-07-2485	02-600560	2–3	QAL	—	—	0.505 (U)	—	—	—	—	—	—	—	—	—	2.02	—	6.94	—
RE02-07-2486	02-600560	4.5–5	QAL	—	—	0.511 (U)	—	—	—	—	—	—	—	—	—	1.33	—	6.51	—
RE02-07-2487	02-600561	0–0.5	SOIL	—	—	—	—	—	—	—	—	66.6	—	—	—	—	0.000758 (J)	7.35	71.7
RE02-07-2490	02-600562	0–0.5	SOIL	—	—	0.505 (U)	—	—	—	—	—	—	—	—	—	—	—	8.37	—

Table 6.14-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Cadmium	Chromium	Hexavalent Chromium	Copper	Cyanide (Total)	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**0.5**	**0.56**	**0.4**	**2.6**	**na[b]**	**3.96**	**0.5**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**40**
Soil BV[a]				**0.83**	**8.17**	**0.4**	**19.3**	**na**	**14.7**	**0.5**	**21500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**48.8**
Industrial SSL[c]				**519**	**35.9**	**1110**	**505[d]**	**72.1**	**51,900**	**62.8**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**389,000**
Recreational SSL[e]				**248**	**42.9**	**457**	**281[d]**	**40.2**	**24,800**	**224**	**434,000**	**1110**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**186,000**
Residential SSL[c]				**31.3**	**7.07**	**70.5**	**96.6[d]**	**3.05**	**3130**	**11.1**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**23,500**
RE02-10-21891	02-612379	0–0.5	SOIL	1.14 (U)	—	—	—	NA[g]	—	NA	—	51	—	—	—	NA	NA	—	62.1 (J)
RE02-10-21892	02-612379	1.5–2.5	SOIL	1.01 (U)	—	—	—	NA	—	NA	—	—	—	—	—	NA	NA	—	—
RE02-10-21877	02-612380	0–0.5	SOIL	0.974 (U)	—	—	—	NA	—	NA	—	—	—	—	—	NA	NA	—	164
RE02-10-21878	02-612380	1.5–2.5	SOIL	0.995 (U)	—	0.498 (U)	—	NA	—	NA	—	—	—	—	—	NA	NA	—	—
RE02-10-21879	02-612381	0–0.5	SOIL	1.07 (U)	—	0.537 (U)	—	NA	—	NA	—	—	—	—	—	NA	NA	—	—
RE02-10-21880	02-612381	1.5–2.5	SOIL	0.926 (U)	—	0.463 (U)	—	NA	—	NA	—	—	—	—	—	NA	NA	—	—
RE02-10-21881	02-612382	0–0.5	SOIL	1.06 (U)	—	—	—	NA	—	NA	—	—	—	—	—	NA	NA	—	58.3
RE02-10-21882	02-612382	1.5–2.5	SOIL	1.09 (U)	—	—	—	NA	—	NA	—	—	—	—	—	NA	NA	—	66
RE02-10-21883	02-612383	0–0.5	SOIL	1.04 (U)	—	0.519 (U)	—	NA	—	NA	—	—	—	—	—	NA	NA	—	—
RE02-10-21884	02-612383	1.5–2.5	SOIL	1.01 (U)	—	0.507 (U)	—	NA	—	NA	—	—	—	—	—	NA	NA	—	—
RE02-10-21885	02-612384	0–0.5	SOIL	0.996 (U)	—	0.498 (U)	—	NA	—	NA	—	—	—	—	—	NA	NA	—	58.3
RE02-10-21886	02-612384	1.5–2.5	SOIL	1.03 (U)	—	0.516 (U)	—	NA	—	NA	—	—	—	—	—	NA	NA	—	—
RE02-10-21887	02-612385	0–0.5	SOIL	1.06 (U)	—	—	—	NA	—	NA	—	—	—	—	—	NA	NA	—	—
RE02-10-21888	02-612385	1.5–2.5	SOIL	1.04 (U)	—	0.519 (U)	—	NA	—	NA	—	—	—	—	—	NA	NA	—	—
RE02-10-21889	02-612386	0–0.5	SOIL	0.968 (U)	—	—	—	NA	—	NA	—	—	—	—	—	NA	NA	—	53.4 (J)
RE02-10-21890	02-612386	1.5–2.5	QAL	1.08 (U)	—	0.539 (U)	—	NA	—	NA	—	—	—	—	—	NA	NA	—	58.4 (J)
RE02-10-21976	02-612407	0–0.5	SOIL	1.16 (U)	—	0.578 (U)	—	—	—	—	—	—	—	—	—	NA	NA	—	—
RE02-10-21977	02-612407	4–5	SOIL	0.945 (U)	—	0.473 (U)	—	—	—	—	—	—	—	—	—	NA	NA	—	—
RE02-10-21978	02-612407	9–10	SOIL	0.997 (U)	—	0.498 (U)	—	—	—	—	—	—	—	—	—	NA	NA	—	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 6.14-3
Organic Chemicals Detected at SWMU 02-005

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1242	Aroclor-1254	Aroclor-1260	Benzo(b)fluoranthene	Fluoranthene	Phenanthrene	Pyrene	Toluene
Industrial SSL[a]				**10.9**	**11**	**11.1**	**32.3**	**33,700**	**25,300**	**25,300**	**61,100**
Recreational SSL[b]				**10.3**	**5.53**	**10.3**	**88.8**	**11,500**	**8630**	**8630**	**47,600**
Residential SSL[a]				**2.43**	**1.14**	**2.43**	**1.53**	**2320**	**1740**	**1740**	**5220**
RE02-07-2445	02-600547	0–0.5	SOIL	NA[c]	NA	NA	0.0182 (J)	0.0173 (J)	—[d]	0.0154 (J)	NA
RE02-07-2446	02-600547	2–2.5	QAL	NA	NA	NA	—	—	—	—	0.00142
RE02-07-2448	02-600548	0–0.5	SOIL	—	—	0.0055	NA	NA	NA	NA	NA
RE02-07-2451	02-600549	0–0.5	SOIL	—	0.0025 (J)	0.002 (J)	NA	NA	NA	NA	NA
RE02-07-2454	02-600550	0–0.5	SOIL	—	—	0.0094	NA	NA	NA	NA	NA
RE02-07-2460	02-600552	0–0.5	SOIL	—	0.0019 (J)	0.0021 (J)	NA	NA	NA	NA	NA
RE02-07-2463	02-600553	0–0.5	SOIL	—	0.0059	0.0062	NA	NA	NA	NA	NA
RE02-07-2469	02-600555	0–1.1	SOIL	—	0.0022 (J)	0.0027 (J)	NA	NA	NA	NA	NA
RE02-07-2472	02-600556	0–0.5	SOIL	—	0.0027 (J)	0.0022 (J)	NA	NA	NA	NA	NA
RE02-07-2475	02-600557	0–0.5	SOIL	—	0.0064	0.0059	NA	NA	NA	NA	NA
RE02-07-2478	02-600558	0–0.5	SOIL	—	0.0017 (J)	0.0021 (J)	NA	NA	NA	NA	NA
RE02-07-2481	02-600559	0–0.5	SOIL	—	0.0987	0.0958	NA	NA	NA	NA	NA
RE02-07-2482	02-600559	2–2.5	QAL	—	—	0.513	NA	NA	NA	NA	NA
RE02-07-2485	02-600560	2–3	QAL	—	0.0029 (J)	0.0025 (J)	NA	NA	NA	NA	NA
RE02-07-2487	02-600561	0–0.5	SOIL	—	—	1.42	NA	NA	NA	NA	NA
RE02-10-21866	02-600561	1–1.2	SOIL	—	—	2.18	NA	NA	NA	NA	NA
RE02-10-21867	02-600561	2–2.2	SOIL	—	—	0.665	NA	NA	NA	NA	NA
RE02-07-2490	02-600562	0–0.5	SOIL	—	—	0.0025 (J)	NA	NA	NA	NA	NA
RE02-10-21868	02-612376	1–1.2	SOIL	—	—	2.11	NA	NA	NA	NA	NA
RE02-10-21869	02-612376	2–2.2	SOIL	—	—	1.63	NA	NA	NA	NA	NA
RE02-10-21870	02-612377	1–1.2	SOIL	—	—	0.942	NA	NA	NA	NA	NA
RE02-10-21871	02-612377	2–2.2	SOIL	—	—	0.153	NA	NA	NA	NA	NA
RE02-10-21872	02-612378	1–1.2	SOIL	—	—	0.354	NA	NA	NA	NA	NA
RE02-10-21873	02-612378	2–2.2	SOIL	—	—	3.12	NA	NA	NA	NA	NA
RE02-10-21874	02-612379	1–1.2	SOIL	—	—	4.21	NA	NA	NA	NA	NA
RE02-10-21875	02-612379	2–2.2	SOIL	—	—	0.173	NA	NA	NA	NA	NA
RE02-10-21976	02-612407	0–0.5	SOIL	0.0062	0.0308	0.0129	0.0156 (J)	0.0232 (J)	0.0149 (J)	0.0283 (J)	NA
RE02-11-322	02-613290	2–2.2	SOIL	—	—	1.14	NA	NA	NA	NA	NA
RE02-11-2209	02-613290	4–4.2	SOIL	—	0.0242 (J)	0.144	NA	NA	NA	NA	NA
RE02-11-323	02-613291	1–1.2	SOIL	—	—	0.624	NA	NA	NA	NA	NA
RE02-11-2207	02-613622	2–2.2	SOIL	—	0.206	1.33	NA	NA	NA	NA	NA
RE02-11-2208	02-613622	4–4.2	SOIL	—	0.0622	0.225	NA	NA	NA	NA	NA

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.
[a] SSLs are from NMED (2017, 602273).
[b] SSLs are from LANL (2017, 602581).
[c] NA = Not analyzed.
[d] — = Not detected.

Table 6.14-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 02-005

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/240	Tritium
Soil BV/FV[a]				**0.013**	**1.65**	**0.023**	**0.054**	**na[b]**
Industrial SAL[c]				**1000**	**41**	**1300**	**1200**	**2,400,000**
Recreational SAL[c]				**1500**	**370**	**1400**	**1300**	**5,700,000**
Residential SAL[c]				**83**	**12**	**84**	**79**	**1700**
RE02-07-2445	02-600547	0–0.5	SOIL	—[d]	—	—	0.0647	—
RE02-07-2446	02-600547	2–2.5	QAL	—	—	—	—	0.00557382
RE02-07-2451	02-600549	0–0.5	SOIL	—	—	—	0.0962	—
RE02-07-2454	02-600550	0–0.5	SOIL	—	—	—	0.0963	—
RE02-07-2460	02-600552	0–0.5	SOIL	—	—	—	0.114 (J-)	—
RE02-07-2463	02-600553	0–0.5	SOIL	—	—	—	0.224 (J-)	—
RE02-07-2464	02-600553	2–4.5	QAL	—	—	—	0.0368	—
RE02-07-2466	02-600554	0–1.1	SOIL	—	0.216	—	—	—
RE02-07-2470	02-600555	2–2.5	QAL	—	—	—	—	0.00617213
RE02-07-2478	02-600558	0–0.5	SOIL	—	—	—	—	0.251049
RE02-07-2480	02-600558	4.5–5	QAL	—	—	—	—	0.00695318
RE02-07-2481	02-600559	0–0.5	SOIL	0.0275	—	—	1.6	0.0170288
RE02-07-2482	02-600559	2–2.5	QAL	0.139	0.331	—	6.8	0.025821
RE02-07-2486	02-600560	4.5–5	QAL	—	—	—	—	0.0577164
RE02-07-2487	02-600561	0–0.5	SOIL	—	—	—	0.0546	—
RE02-10-21891	02-612379	0–0.5	SOIL	—	—	—	0.243	0.0682093
RE02-10-21892	02-612379	1.5–2.5	SOIL	—	0.163	—	—	0.0353057
RE02-10-21879	02-612381	0–0.5	SOIL	—	—	—	0.0774	—
RE02-10-21880	02-612381	1.5–2.5	SOIL	—	—	0.0138	—	0.00869297
RE02-10-21881	02-612382	0–0.5	SOIL	—	—	—	0.0734	—
RE02-10-21882	02-612382	1.5–2.5	SOIL	—	0.745	—	0.0674	—
RE02-10-21886	02-612384	1.5–2.5	SOIL	—	0.17	—	0.0254	—
RE02-10-21887	02-612385	0–0.5	SOIL	0.0304	—	—	0.202	0.011167
RE02-10-21888	02-612385	1.5–2.5	SOIL	—	0.362	—	0.0932	—
RE02-10-21889	02-612386	0–0.5	SOIL	—	—	—	0.151	—
RE02-10-21976	02-612407	0–0.5	SOIL	—	—	—	1.16	—
RE02-10-21977	02-612407	4–5	SOIL	—	—	—	0.0579	—

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from LANL (2015, 600929).

[d] — = Not detected.

Table 6.15-1
Samples Collected and Analyses Requested at SWMU 02-006(a)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
RE02-03-51142	02-22052	1–1.5	SOIL	—[a]	—	1710S[b]	1710S	—	1710S	1710S	1709S	—	—	1710S	—	1710S	—	—
RE02-03-51143	02-22052	1–1.5	SOIL	—	—	—	—	1709S	—	—	—	—	—	—	—	—	—	—
RE02-03-51168	02-22052	2.5–3	SOIL	—	—	1710S	1710S	—	1710S	1710S	1709S	—	—	1710S	—	1710S	—	—
RE02-03-51169	02-22052	2.5–3	SOIL	—	—	—	—	1709S	—	—	—	—	—	—	—	—	—	—
RE02-03-51144	02-22053	1–1.5	SOIL	—	—	1710S	1710S	—	1710S	1710S	1709S	—	—	1710S	—	1710S	—	—
RE02-03-51145	02-22053	1–1.5	SOIL	—	—	—	—	1709S	—	—	—	—	—	—	—	—	—	—
RE02-03-51170	02-22053	2.5–3	SOIL	—	—	1710S	1710S	—	1710S	1710S	1709S	—	—	1710S	—	1710S	—	—
RE02-03-51171	02-22053	2.5–3	SOIL	—	—	—	—	1709S	—	—	—	—	—	—	—	—	—	—
RE02-03-51146	02-22054	1–1.5	SOIL	—	—	1710S	1710S	—	1710S	1710S	1709S	—	—	1710S	—	1710S	—	—
RE02-03-51147	02-22054	1–1.5	SOIL	—	—	—	—	1709S	—	—	—	—	—	—	—	—	—	—
RE02-03-51172	02-22054	2.5–3	SOIL	—	—	1710S	1710S	—	1710S	1710S	1709S	—	—	1710S	—	1710S	—	—
RE02-03-51173	02-22054	2.5–3	SOIL	—	—	—	—	1709S	—	—	—	—	—	—	—	—	—	—
RE02-03-51148	02-22055	10–10.5	QBT3	—	—	1710S	1710S	—	1710S	1710S	1709S	—	—	1710S	—	1710S	—	—
RE02-03-51149	02-22055	10–10.5	QBT3	—	—	—	—	1709S	—	—	—	—	—	—	—	—	—	—
RE02-03-51174	02-22055	11.5–12	QBT3	—	—	1710S	1710S	—	1710S	1710S	1709S	—	—	1710S	—	1710S	—	—
RE02-03-51175	02-22055	11.5–12	QBT3	—	—	—	—	1709S	—	—	—	—	—	—	—	—	—	—
RE02-03-51150	02-22056	10–10.5	QBT3	—	—	1710S	1710S	—	1710S	1710S	1709S	—	—	1710S	—	1710S	—	—
RE02-03-51151	02-22056	10–10.5	QBT3	—	—	—	—	1709S	—	—	—	—	—	—	—	—	—	—
RE02-03-51176	02-22056	11.5–12	QBT3	—	—	1710S	1710S	—	1710S	1710S	1709S	—	—	1710S	—	1710S	—	—
RE02-03-51177	02-22056	11.5–12	QBT3	—	—	—	—	1709S	—	—	—	—	—	—	—	—	—	—
RE02-03-51152	02-22057	10–10.5	QBT3	—	—	1710S	1710S	—	1710S	1710S	1709S	—	—	1710S	—	1710S	—	—
RE02-03-51153	02-22057	10–10.5	QBT3	—	—	—	—	1709S	—	—	—	—	—	—	—	—	—	—
RE02-03-51178	02-22057	11.5–12	QBT3	—	—	1710S	1710S	—	1710S	1710S	1709S	—	—	1710S	—	1710S	—	—
RE02-03-51179	02-22057	11.5–12	QBT3	—	—	—	—	1709S	—	—	—	—	—	—	—	—	—	—
RE02-03-51154	02-22058	10–10.5	QBT3	—	—	1710S	1710S	—	1710S	1710S	1709S	—	—	1710S	—	1710S	—	—
RE02-03-51155	02-22058	10–10.5	QBT3	—	—	—	—	1709S	—	—	—	—	—	—	—	—	—	—
RE02-03-51180	02-22058	11.5–12	QBT3	—	—	1710S	1710S	—	1710S	1710S	1709S	—	—	1710S	—	1710S	—	—
RE02-03-51181	02-22058	11.5–12	QBT3	—	—	—	—	1709S	—	—	—	—	—	—	—	—	—	—
RE02-03-51156	02-22059	6–6.5	QBT3	—	—	1710S	1710S	—	1710S	1710S	1709S	—	—	1710S	—	1710S	—	—
RE02-03-51157	02-22059	6–6.5	QBT3	—	—	—	—	1709S	—	—	—	—	—	—	—	—	—	—
RE02-03-51182	02-22059	7.5–8	QBT3	—	—	1710S	1710S	—	1710S	1710S	1709S	—	—	1710S	—	1710S	—	—
RE02-03-51183	02-22059	7.5–8	QBT3	—	—	—	—	1709S	—	—	—	—	—	—	—	—	—	—
RE02-07-1025	02-600247	0–0.5	SOIL	07-1133	07-1134	07-1133	07-1133	07-1134	07-1133	07-1133	07-1134	07-1135	07-1134	07-1133	07-1135	—	—	07-1134

Table 6.15-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
RE02-07-1030	02-600247	0.8–1.6	QBT3	07-1133	07-1134	07-1133	07-1133	07-1134	07-1133	07-1133	07-1134	07-1135	07-1134	07-1133	07-1135	—	07-1135	07-1134
RE02-07-1026	02-600247	4.5–6.6	QBT3	07-1164	07-1163	07-1164	07-1164	07-1163	07-1164	07-1164	07-1163	07-1162	07-1163	07-1164	07-1162	—	07-1162	07-1163
RE02-07-1027	02-600247	9.5–11.6	QBT3	07-1164	07-1163	07-1164	07-1164	07-1163	07-1164	07-1164	07-1163	07-1162	07-1163	07-1164	07-1162	—	07-1162	07-1163
RE02-07-1028	02-600247	14.5–17	QBT3	07-1164	07-1163	07-1164	07-1164	07-1163	07-1164	07-1164	07-1163	07-1162	07-1163	07-1164	07-1162	—	07-1162	07-1163
RE02-07-1029	02-600247	19.5–22	QBT3	07-1164	07-1163	07-1164	07-1164	07-1163	07-1164	07-1164	07-1163	07-1162	07-1163	07-1164	07-1162	—	07-1162	07-1163
RE02-07-1031	02-600248	0–0.5	SOIL	07-1149	07-1148	07-1149	07-1149	07-1148	07-1149	07-1149	07-1148	07-1147	07-1148	07-1149	07-1147	—	—	07-1148
RE02-07-1036	02-600248	1–1.9	QBT3	07-1149	07-1148	07-1149	07-1149	07-1148	07-1149	07-1149	07-1148	07-1147	07-1148	07-1149	07-1147	—	07-1147	07-1148
RE02-07-1032	02-600248	4.5–6.5	QBT3	07-1158	07-1157	07-1158	07-1158	07-1157	07-1158	07-1158	07-1157	07-1156	07-1157	07-1158	07-1156	—	07-1156	07-1157
RE02-07-1033	02-600248	9.5–11.7	QBT3	07-1164	07-1163	07-1164	07-1164	07-1163	07-1164	07-1164	07-1163	07-1162	07-1163	07-1164	07-1162	—	07-1162	07-1163
RE02-07-1034	02-600248	14.5–16.5	QBT3	07-1164	07-1163	07-1164	07-1164	07-1163	07-1164	07-1164	07-1163	07-1162	07-1163	07-1164	07-1162	—	07-1162	07-1163
RE02-07-1035	02-600248	19.5–21.7	QBT3	07-1164	07-1163	07-1164	07-1164	07-1163	07-1164	07-1164	07-1163	07-1162	07-1163	07-1164	07-1162	—	07-1162	07-1163
RE02-07-1037	02-600249	0–0.5	SOIL	07-330	07-330	07-330	07-330	07-330	07-330	07-330	07-330	07-329	07-330	07-330	07-329	—	—	07-330
RE02-07-1042	02-600249	1.4–3.1	QBT3	07-330	07-330	07-330	07-330	07-330	07-330	07-330	07-330	07-329	07-330	07-330	07-329	—	07-329	07-330
RE02-07-6673	02-600249	4.5–6.7	QBT3	08-10	08-9	08-10	08-10	08-9	08-10	08-10	08-9	08-8	08-9	08-10	08-8	—	08-8	08-9
RE02-07-6672	02-600249	9.5–11.7	QBT3	08-10	08-9	08-10	08-10	08-9	08-10	08-10	08-9	08-8	08-9	08-10	08-8	—	08-8	08-9
RE02-07-6671	02-600249	14.5–16.7	QBT3	08-10	08-9	08-10	08-10	08-9	08-10	08-10	08-9	08-8	08-9	08-10	08-8	—	08-8	08-9
RE02-07-6674	02-600249	19.5–21.7	QBT3	08-10	08-9	08-10	08-10	08-9	08-10	08-10	08-9	08-8	08-9	08-10	08-8	—	08-8	08-9
RE02-07-1043	02-600250	0–0.5	SOIL	07-1149	07-1148	07-1149	07-1149	07-1148	07-1149	07-1149	07-1148	07-1147	07-1148	07-1149	07-1147	—	—	07-1148
RE02-07-1048	02-600250	0.5–1.2	QBT3	07-1149	07-1148	07-1149	07-1149	07-1148	07-1149	07-1149	07-1148	07-1147	07-1148	07-1149	07-1147	—	07-1147	07-1148
RE02-07-1044	02-600250	4.5–6.7	QBT3	07-1177	07-1176	07-1177	07-1177	07-1176	07-1177	07-1177	07-1176	07-1175	07-1176	07-1177	07-1175	—	07-1175	07-1176
RE02-07-1045	02-600250	9.5–13.4	QBT3	07-1177	07-1176	07-1177	07-1177	07-1176	07-1177	07-1177	07-1176	07-1175	07-1176	07-1177	07-1175	—	07-1175	07-1176
RE02-07-1046	02-600250	14.5–17	QBT3	07-1177	07-1176	07-1177	07-1177	07-1176	07-1177	07-1177	07-1176	07-1175	07-1176	07-1177	07-1175	—	07-1175	07-1176
RE02-07-1047	02-600250	19.5–21.7	QBT3	07-1177	07-1176	07-1177	07-1177	07-1176	07-1177	07-1177	07-1176	07-1175	07-1176	07-1177	07-1175	—	07-1175	07-1176
RE02-07-1049	02-600251	0–0.6	SOIL	07-1133	07-1134	07-1133	07-1133	07-1134	07-1133	07-1133	07-1134	07-1135	07-1134	07-1133	07-1135	—	—	07-1134
RE02-07-1054	02-600251	0.6–1.4	QBT3	07-1133	07-1134	07-1133	07-1133	07-1134	07-1133	07-1133	07-1134	07-1135	07-1134	07-1133	07-1135	—	07-1135	07-1134
RE02-07-1050	02-600251	4.5–8.5	QBT3	07-1149	07-1148	07-1149	07-1149	07-1148	07-1149	07-1149	07-1148	07-1147	07-1148	07-1149	07-1147	—	07-1147	07-1148
RE02-07-1051	02-600251	9.5–14.5	QBT3	07-1149	07-1148	07-1149	07-1149	07-1148	07-1149	07-1149	07-1148	07-1147	07-1148	07-1149	07-1147	—	07-1147	07-1148
RE02-07-1052	02-600251	14.5–18.5	QBT3	07-1149	07-1148	07-1149	07-1149	07-1148	07-1149	07-1149	07-1148	07-1147	07-1148	07-1149	07-1147	—	07-1147	07-1148
RE02-07-1053	02-600251	19.5–23.5	QBT3	07-1149	07-1148	07-1149	07-1149	07-1148	07-1149	07-1149	07-1148	07-1147	07-1148	07-1149	07-1147	—	07-1147	07-1148
RE02-07-1055	02-600252	0–0.8	SOIL	07-1149	07-1148	07-1149	07-1149	07-1148	07-1149	07-1149	07-1148	07-1147	07-1148	07-1149	07-1147	—	—	07-1148
RE02-07-1060	02-600252	0.8–1.5	QBT3	07-1149	07-1148	07-1149	07-1149	07-1148	07-1149	07-1149	07-1148	07-1147	07-1148	07-1149	07-1147	—	07-1147	07-1148
RE02-07-1056	02-600252	4.5–6.5	QBT3	07-1149	07-1148	07-1149	07-1149	07-1148	07-1149	07-1149	07-1148	07-1147	07-1148	07-1149	07-1147	—	07-1147	07-1148
RE02-07-1057	02-600252	9.5–11.7	QBT3	07-1158	07-1157	07-1158	07-1158	07-1157	07-1158	07-1158	07-1157	07-1156	07-1157	07-1158	07-1156	—	07-1156	07-1157
RE02-07-1058	02-600252	14.5–18.2	QBT3	07-1158	07-1157	07-1158	07-1158	07-1157	07-1158	07-1158	07-1157	07-1156	07-1157	07-1158	07-1156	—	07-1156	07-1157
RE02-07-1059	02-600252	19.5–21.5	QBT3	07-1158	07-1157	07-1158	07-1158	07-1157	07-1158	07-1158	07-1157	07-1156	07-1157	07-1158	07-1156	—	07-1156	07-1157

Table 6.15-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
RE02-07-1061	02-600253	0–0.5	SOIL	07-1164	07-1163	07-1164	07-1164	07-1163	07-1164	07-1164	07-1163	07-1162	07-1163	07-1164	07-1162	—	—	07-1163
RE02-07-1066	02-600253	2–3	QBT3	07-1164	07-1163	07-1164	07-1164	07-1163	07-1164	07-1164	07-1163	07-1162	07-1163	07-1164	07-1162	—	07-1162	07-1163
RE02-07-1062	02-600253	4.5–6.7	QBT3	08-13	08-12	08-13	08-13	08-12	08-13	08-13	08-12	08-11	08-12	08-13	08-11	—	08-11	08-12
RE02-07-1063	02-600253	9.5–11.7	QBT3	08-13	08-12	08-13	08-13	08-12	08-13	08-13	08-12	08-11	08-12	08-13	08-11	—	08-11	08-12
RE02-07-1064	02-600253	14.5–16.7	QBT3	08-13	08-12	08-13	08-13	08-12	08-13	08-13	08-12	08-11	08-12	08-13	08-11	—	08-11	08-12
RE02-07-1065	02-600253	19.5–21.7	QBT3	08-13	08-12	08-13	08-13	08-12	08-13	08-13	08-12	08-11	08-12	08-13	08-11	—	08-11	08-12
RE02-07-1067	02-600254	0–0.5	SOIL	07-1158	07-1157	07-1158	07-1158	07-1157	07-1158	07-1158	07-1157	07-1156	07-1157	07-1158	07-1156	—	—	07-1157
RE02-07-1072	02-600254	1.6–2.5	QBT3	07-1158	07-1157	07-1158	07-1158	07-1157	07-1158	07-1158	07-1157	07-1156	07-1157	07-1158	07-1156	—	07-1156	07-1157
RE02-07-1068	02-600254	4.5–7.5	QBT3	07-1177	07-1176	07-1177	07-1177	07-1176	07-1177	07-1177	07-1176	07-1175	07-1176	07-1177	07-1175	—	07-1175	07-1176
RE02-07-1069	02-600254	9.5–11.7	QBT3	07-1177	07-1176	07-1177	07-1177	07-1176	07-1177	07-1177	07-1176	07-1175	07-1176	07-1177	07-1175	—	07-1175	07-1176
RE02-07-1070	02-600254	14.5–16.7	QBT3	07-1177	07-1176	07-1177	07-1177	07-1176	07-1177	07-1177	07-1176	07-1175	07-1176	07-1177	07-1175	—	07-1175	07-1176
RE02-07-1071	02-600254	19.5–21.7	QBT3	07-1177	07-1176	07-1177	07-1177	07-1176	07-1177	07-1177	07-1176	07-1175	07-1176	07-1177	07-1175	—	07-1175	07-1176
RE02-07-1073	02-600255	0–0.5	SOIL	07-1133	07-1134	07-1133	07-1133	07-1134	07-1133	07-1133	07-1134	07-1135	07-1134	07-1133	07-1135	—	—	07-1134
RE02-07-1078	02-600255	0.5–1.5	QBT3	07-1133	07-1134	07-1133	07-1133	07-1134	07-1133	07-1133	07-1134	07-1135	07-1134	07-1133	07-1135	—	07-1135	07-1134
RE02-07-1074	02-600255	4.5–9.5	QBT3	07-1133	07-1134	07-1133	07-1133	07-1135	07-1133	07-1133	07-1135	07-1135	07-1134	07-1133	07-1135	—	07-1135	07-1134
RE02-07-1075	02-600255	9.5–14	QBT3	07-1133	07-1134	07-1133	07-1133	07-1134	07-1133	07-1133	07-1134	07-1135	07-1134	07-1133	07-1135	—	07-1135	07-1134
RE02-07-1076	02-600255	14.5–19	QBT3	07-1133	07-1134	07-1133	07-1133	07-1134	07-1133	07-1133	07-1134	07-1135	07-1134	07-1133	07-1135	—	07-1135	07-1134
RE02-07-1077	02-600255	19.5–23.5	QBT3	07-1133	07-1134	07-1133	07-1133	07-1134	07-1133	07-1133	07-1134	07-1135	07-1134	07-1133	07-1135	—	07-1135	07-1134
RE02-07-1079	02-600256	0–0.5	SOIL	07-1133	07-1134	07-1133	07-1133	07-1134	07-1133	07-1133	07-1134	07-1135	07-1134	07-1133	07-1135	—	—	07-1134
RE02-07-1084	02-600256	0.5–1.9	QBT3	07-1133	07-1134	07-1133	07-1133	07-1134	07-1133	07-1133	07-1134	07-1135	07-1134	07-1133	07-1135	—	07-1135	07-1134
RE02-07-1080	02-600256	4.5–8.5	QBT3	07-1149	07-1148	07-1149	07-1149	07-1148	07-1149	07-1149	07-1148	07-1147	07-1148	07-1149	07-1147	—	07-1147	07-1148
RE02-07-1081	02-600256	9.5–13.5	QBT3	07-1149	07-1148	07-1149	07-1149	07-1148	07-1149	07-1149	07-1148	07-1147	07-1148	07-1149	07-1147	—	07-1147	07-1148
RE02-07-1082	02-600256	14.5–18.5	QBT3	07-1149	07-1148	07-1149	07-1149	07-1148	07-1149	07-1149	07-1148	07-1147	07-1148	07-1149	07-1147	—	07-1147	07-1148
RE02-07-1083	02-600256	19.5–23.5	QBT3	07-1149	07-1148	07-1149	07-1149	07-1148	07-1149	07-1149	07-1148	07-1147	07-1148	07-1149	07-1147	—	07-1147	07-1148
RE02-07-1085	02-600257	0–0.8	SOIL	07-1164	07-1163	07-1164	07-1164	07-1163	07-1164	07-1164	07-1163	07-1162	07-1163	07-1164	07-1162	—	—	07-1163
RE02-07-1090	02-600257	0.8–2.1	QBT3	07-1164	07-1163	07-1164	07-1164	07-1163	07-1164	07-1164	07-1163	07-1162	07-1163	07-1164	07-1162	—	07-1162	07-1163
RE02-07-1086	02-600257	4.5–6.7	QBT3	08-13	08-12	08-13	08-13	08-12	08-13	08-13	08-12	08-11	08-12	08-13	08-11	—	08-11	08-12
RE02-07-1087	02-600257	9.5–11.7	QBT3	08-13	08-12	08-13	08-13	08-12	08-13	08-13	08-12	08-11	08-12	08-13	08-11	—	08-11	08-12
RE02-07-1088	02-600257	14.5–16.7	QBT3	08-13	08-12	08-13	08-13	08-12	08-13	08-13	08-12	08-11	08-12	08-13	08-11	—	08-11	08-12
RE02-07-1089	02-600257	19.5–21.7	QBT3	08-13	08-12	08-13	08-13	08-12	08-13	08-13	08-12	08-11	08-12	08-13	08-11	—	08-11	08-12
RE02-07-1091	02-600258	0–0.5	SOIL	07-1164	07-1163	07-1164	07-1164	07-1163	07-1164	07-1164	07-1163	07-1162	07-1163	07-1164	07-1162	—	—	07-1163
RE02-07-1096	02-600258	0.8–2	QBT3	07-1164	07-1163	07-1164	07-1164	07-1163	07-1164	07-1164	07-1163	07-1162	07-1163	07-1164	07-1162	—	07-1162	07-1163
RE02-07-1092	02-600258	4.5–7.5	QBT3	07-1177	07-1176	07-1177	07-1177	07-1176	07-1177	07-1177	07-1176	07-1175	07-1176	07-1177	07-1175	—	07-1175	07-1176
RE02-07-1093	02-600258	9.5–11.7	QBT3	07-1177	07-1176	07-1177	07-1177	07-1176	07-1177	07-1177	07-1176	07-1175	07-1176	07-1177	07-1175	—	07-1175	07-1176
RE02-07-1094	02-600258	14.5–16.7	QBT3	07-1177	07-1176	07-1177	07-1177	07-1176	07-1177	07-1177	07-1176	07-1175	07-1176	07-1177	07-1175	—	07-1175	07-1176

Table 6.15-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
RE02-07-1095	02-600258	19.5–21.7	QBT3	07-1177	07-1176	07-1177	07-1177	07-1176	07-1177	07-1177	07-1176	07-1175	07-1176	07-1177	07-1175	—	07-1175	07-1176
RE02-10-23289	02-612640	0–0.5	SOIL	—	—	—	11-337	—	—	—	11-336	—	—	—	—	—	—	—
RE02-10-23290	02-612640	5–6	QBT3	—	—	—	11-337	—	—	—	11-336	—	—	—	—	—	—	—
RE02-10-23291	02-612640	15–16	QBT3	—	—	—	11-337	—	—	—	11-336	—	—	—	—	—	—	—
RE02-10-23292	02-612640	25–26	QBT3	—	—	—	11-337	—	—	—	11-336	—	—	—	—	—	—	—
RE02-10-23293	02-612640	35–36	QBT3	—	—	—	11-337	—	—	—	11-336	—	—	—	—	—	—	—
RE02-10-23294	02-612640	49–50	QBT3	—	—	—	11-337	—	—	—	11-336	—	—	—	—	—	—	—
RE02-10-23295	02-612641	0–0.5	SOIL	—	—	—	11-337	—	—	—	11-336	—	—	—	—	—	—	—
RE02-10-23296	02-612641	5–6	QBT3	—	—	—	11-357	—	—	—	11-356	—	—	—	—	—	—	—
RE02-10-23297	02-612641	15–16	QBT3	—	—	—	11-357	—	—	—	11-356	—	—	—	—	—	—	—
RE02-10-23298	02-612641	25–26	QBT3	—	—	—	11-357	—	—	—	11-356	—	—	—	—	—	—	—
RE02-10-23299	02-612641	35–36	QBT3	—	—	—	11-357	—	—	—	11-356	—	—	—	—	—	—	—
RE02-10-23300	02-612641	49–50	QBT3	—	—	—	11-357	—	—	—	11-356	—	—	—	—	—	—	—
RE02-10-23301	02-612642	0–0.5	SOIL	—	—	—	11-357	—	—	—	11-356	—	—	—	—	—	—	—
RE02-10-23302	02-612642	5–6	QBT3	—	—	—	11-357	—	—	—	11-356	—	—	—	—	—	—	—
RE02-10-23303	02-612642	15–16	QBT3	—	—	—	11-357	—	—	—	11-356	—	—	—	—	—	—	—
RE02-10-23304	02-612642	25–26	QBT3	—	—	—	11-357	—	—	—	11-356	—	—	—	—	—	—	—
RE02-10-23305	02-612642	35–36	QBT3	—	—	—	11-357	—	—	—	11-356	—	—	—	—	—	—	—
RE02-10-23306	02-612642	49–50	QBT3	—	—	—	11-357	—	—	—	11-356	—	—	—	—	—	—	—
RE02-10-23307	02-612643	0–0.5	SOIL	—	—	—	11-375	—	—	—	11-374	—	—	—	—	—	—	—
RE02-10-23308	02-612643	5–6	QBT3	—	—	—	11-375	—	—	—	11-374	—	—	—	—	—	—	—
RE02-10-23309	02-612643	15–16	QBT3	—	—	—	11-375	—	—	—	11-374	—	—	—	—	—	—	—
RE02-10-23310	02-612643	25–26	QBT3	—	—	—	11-375	—	—	—	11-374	—	—	—	—	—	—	—
RE02-10-23311	02-612643	35–36	QBT3	—	—	—	11-375	—	—	—	11-374	—	—	—	—	—	—	—
RE02-10-23312	02-612643	49–50	QBT3	—	—	—	11-375	—	—	—	11-374	—	—	—	—	—	—	—
RE02-10-23313	02-612644	0–0.5	SOIL	—	—	—	11-375	—	—	—	11-374	—	—	—	—	—	—	—
RE02-10-23314	02-612644	5–6	QBT3	—	—	—	11-375	—	—	—	11-374	—	—	—	—	—	—	—
RE02-10-23315	02-612644	15–16	QBT3	—	—	—	11-375	—	—	—	11-374	—	—	—	—	—	—	—
RE02-10-23316	02-612644	25–26	QBT3	—	—	—	11-375	—	—	—	11-374	—	—	—	—	—	—	—
RE02-10-23317	02-612644	35–36	QBT3	—	—	—	11-375	—	—	—	11-374	—	—	—	—	—	—	—
RE02-10-23318	02-612644	49–50	QBT3	—	—	—	11-375	—	—	—	11-374	—	—	—	—	—	—	—
RE02-10-23319	02-612645	0–0.5	SOIL	—	—	—	11-390	—	—	—	11-390	—	—	—	—	—	—	—
RE02-10-23320	02-612645	5–6	QBT3	—	—	—	11-390	—	—	—	11-390	—	—	—	—	—	—	—
RE02-10-23321	02-612645	15–16	QBT3	—	—	—	11-390	—	—	—	11-390	—	—	—	—	—	—	—
RE02-10-23322	02-612645	25–26	QBT3	—	—	—	11-390	—	—	—	11-390	—	—	—	—	—	—	—

Table 6.15-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
RE02-10-23323	02-612645	35–36	QBT3	—	—	—	11-390	—	—	—	11-390	—	—	—	—	—	—	—
RE02-10-23324	02-612645	49–50	QBT3	—	—	—	11-390	—	—	—	11-390	—	—	—	—	—	—	—
RE02-10-23325	02-612646	0–0.5	SOIL	—	—	—	11-417	—	—	—	11-416	—	—	—	—	—	—	—
RE02-10-23326	02-612646	5–6	QBT3	—	—	—	11-417	—	—	—	11-416	—	—	—	—	—	—	—
RE02-10-23327	02-612646	15–16	QBT3	—	—	—	11-417	—	—	—	11-416	—	—	—	—	—	—	—
RE02-10-23328	02-612646	25–26	QBT3	—	—	—	11-417	—	—	—	11-416	—	—	—	—	—	—	—
RE02-10-23329	02-612646	35–36	QBT3	—	—	—	11-417	—	—	—	11-416	—	—	—	—	—	—	—
RE02-10-23330	02-612646	49–50	QBT3	—	—	—	11-417	—	—	—	11-416	—	—	—	—	—	—	—
RE02-10-23331	02-612647	0–0.5	SOIL	—	—	—	11-417	—	—	—	11-416	—	—	—	—	—	—	—
RE02-10-23332	02-612647	5–6	QBT3	—	—	—	11-417	—	—	—	11-416	—	—	—	—	—	—	—
RE02-10-23333	02-612647	15–16	QBT3	—	—	—	11-417	—	—	—	11-416	—	—	—	—	—	—	—
RE02-10-23334	02-612647	25–26	QBT3	—	—	—	11-417	—	—	—	11-416	—	—	—	—	—	—	—
RE02-10-23335	02-612647	35–36	QBT3	—	—	—	11-417	—	—	—	11-416	—	—	—	—	—	—	—
RE02-10-23336	02-612647	49–50	QBT3	—	—	—	11-417	—	—	—	11-416	—	—	—	—	—	—	—
RE02-10-23337	02-612648	0–0.5	SOIL	—	—	—	11-436	—	—	—	11-435	—	—	—	—	—	—	—
RE02-10-23338	02-612648	5–6	QBT3	—	—	—	11-436	—	—	—	11-435	—	—	—	—	—	—	—
RE02-10-23339	02-612648	15–16	QBT3	—	—	—	11-436	—	—	—	11-435	—	—	—	—	—	—	—
RE02-10-23340	02-612648	25–26	QBT3	—	—	—	11-436	—	—	—	11-435	—	—	—	—	—	—	—
RE02-10-23341	02-612648	35–36	QBT3	—	—	—	11-436	—	—	—	11-435	—	—	—	—	—	—	—
RE02-10-23342	02-612648	49–50	QBT3	—	—	—	11-436	—	—	—	11-435	—	—	—	—	—	—	—
RE02-10-23343	02-612649	0–0.5	SOIL	—	—	—	11-453	—	—	—	11-453	—	—	—	—	—	—	—
RE02-10-23344	02-612649	5–6	QBT3	—	—	—	11-453	—	—	—	11-453	—	—	—	—	—	—	—
RE02-10-23345	02-612649	15–16	QBT3	—	—	—	11-453	—	—	—	11-453	—	—	—	—	—	—	—
RE02-10-23346	02-612649	25–26	QBT3	—	—	—	11-453	—	—	—	11-453	—	—	—	—	—	—	—
RE02-10-23347	02-612649	35–36	QBT3	—	—	—	11-453	—	—	—	11-453	—	—	—	—	—	—	—
RE02-10-23348	02-612649	49–50	QBT3	—	—	—	11-453	—	—	—	11-453	—	—	—	—	—	—	—
RE02-10-23349	02-612650	0–0.5	SOIL	—	—	—	11-494	—	—	—	11-494	—	—	—	—	—	—	—
RE02-10-23350	02-612650	5–6	QBT3	—	—	—	11-494	—	—	—	11-494	—	—	—	—	—	—	—
RE02-10-23351	02-612650	15–16	QBT3	—	—	—	11-494	—	—	—	11-494	—	—	—	—	—	—	—
RE02-10-23352	02-612650	25–26	QBT3	—	—	—	11-494	—	—	—	11-494	—	—	—	—	—	—	—
RE02-10-23353	02-612650	35–36	QBT3	—	—	—	11-494	—	—	—	11-494	—	—	—	—	—	—	—
RE02-10-23354	02-612650	49–50	QBT3	—	—	—	11-494	—	—	—	11-494	—	—	—	—	—	—	—
RE02-10-23370	02-612651	5–6	QBT3	—	—	—	11-452	—	—	—	—	—	—	—	—	—	—	—
RE02-10-23371	02-612651	15–16	QBT3	—	—	—	11-452	—	—	—	—	—	—	—	—	—	—	—
RE02-10-23372	02-612651	25–26	QBT3	—	—	—	11-452	—	—	—	—	—	—	—	—	—	—	—

Table 6.15-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
RE02-10-23373	02-612651	35–36	QBT3	—	—	—	11-452	—	—	—	—	—	—	—	—	—	—	—
RE02-10-23374	02-612651	49–50	QBT3	—	—	—	11-452	—	—	—	—	—	—	—	—	—	—	—
RE02-10-23377	02-612652	25–26	QBT3	—	—	—	11-399	11-399	—	—	—	—	—	—	—	—	—	11-399
RE02-10-23378	02-612652	35–36	QBT3	—	—	—	11-399	11-399	—	—	—	—	—	—	—	—	—	11-399
RE02-10-23379	02-612652	49–50	QBT3	—	—	—	11-399	11-399	—	—	—	—	—	—	—	—	—	11-399

[a] — = Analysis not requested.

[b] Analytical request number.

Table 6.15-2
Inorganic Chemicals Detected or Detected above BVs at SWMU 02-006(a)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Copper	Cyanide (Total)	Lead	Magnesium	Nickel	Nitrate	Perchlorate	Selenium	Zinc
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**na[b]**	**4.66**	**0.5**	**11.2**	**1690**	**6.58**	**na**	**na**	**0.3**	**63.5**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**na**	**14.7**	**0.5**	**22.3**	**4610**	**15.4**	**na**	**na**	**1.52**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**2580**	**1110**	**na**	**505[d]**	**72.1**	**51,900**	**62.8**	**800**	**na**	**25,700**	**2,080,000**	**908**	**6490**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**1240**	**457**	**na**	**281[d]**	**40.2**	**24,800**	**224**	**1110**	**na**	**12,400**	**991,000**	**434**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**156**	**70.5**	**na**	**96.6[d]**	**3.05**	**3130**	**11.1**	**400**	**na**	**1560**	**125,000**	**54.8**	**391**	**23,500**
RE02-03-51168	02-22052	2.5–3	SOIL	—[f]	—	—	—	—	0.526 (U)	—	—	NA[g]	—	NA	—	—	—	NA	NA	—	—
RE02-03-51170	02-22053	2.5–3	SOIL	—	—	—	—	—	0.539 (U)	—	—	NA	—	NA	—	—	—	NA	NA	—	—
RE02-03-51146	02-22054	1–1.5	SOIL	—	—	—	—	—	0.545 (U)	—	—	NA	—	NA	—	—	—	NA	NA	—	—
RE02-03-51172	02-22054	2.5–3	SOIL	—	—	—	—	—	0.51 (U)	—	—	NA	—	NA	22.7	—	—	NA	NA	—	—
RE02-03-51148	02-22055	10–10.5	QBT3	—	—	—	47.4 (J+)	—	—	—	—	NA	—	NA	—	—	—	NA	NA	0.513 (U)	—
RE02-03-51174	02-22055	11.5–12	QBT3	8660 (J)	—	2.91	63.3 (J+)	—	—	—	—	NA	—	NA	—	—	14.4	NA	NA	0.526 (U)	—
RE02-03-51150	02-22056	10–10.5	QBT3	13960 (J)	—	3.44	107 (J+)	—	—	2500 (J+)	8.37	NA	6.22	NA	11.9	2220 (J)	7.99	NA	NA	0.533 (U)	—
RE02-03-51176	02-22056	11.5–12	QBT3	13580 (J)	—	3.16	98.6 (J+)	—	—	3480 (J+)	7.55	NA	5.73	NA	19.1	2290 (J)	—	NA	NA	0.484 (U)	—
RE02-03-51152	02-22057	10–10.5	QBT3	11320 (J)	—	3.05	80.5 (J+)	—	—	—	—	NA	4.92	NA	—	—	—	NA	NA	0.524 (U)	—
RE02-03-51178	02-22057	11.5–12	QBT3	13220 (J)	—	3	76 (J+)	—	—	2300 (J+)	—	NA	4.87	NA	—	1880 (J)	—	NA	NA	0.525 (U)	—
RE02-03-51154	02-22058	10–10.5	QBT3	10370 (J)	—	2.89	73.3 (J+)	—	—	—	—	NA	4.68	NA	—	1740 (J)	—	NA	NA	0.515 (U)	—
RE02-03-51155	02-22058	10–10.5	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	0.0649 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-03-51156	02-22059	6–6.5	QBT3	12800 (J)	—	3.04	66.3 (J+)	—	—	2640 (J+)	7.37	NA	5.13	NA	16.3	2120 (J)	—	NA	NA	0.509 (U)	—
RE02-03-51182	02-22059	7.5–8	QBT3	15750 (J)	—	3.3	87.3 (J+)	1.3	—	3330 (J+)	9.03	NA	6.61	NA	21.8	2880 (J)	7.86	NA	NA	0.536 (U)	—
RE02-03-51183	02-22059	7.5–8	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	0.064 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 6.15-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Copper	Cyanide (Total)	Lead	Magnesium	Nickel	Nitrate	Perchlorate	Selenium	Zinc
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**na[b]**	**4.66**	**0.5**	**11.2**	**1690**	**6.58**	**na**	**na**	**0.3**	**63.5**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**na**	**14.7**	**0.5**	**22.3**	**4610**	**15.4**	**na**	**na**	**1.52**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**2580**	**1110**	**na**	**505[d]**	**72.1**	**51,900**	**62.8**	**800**	**na**	**25,700**	**2,080,000**	**908**	**6490**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**1240**	**457**	**na**	**281[d]**	**40.2**	**24,800**	**224**	**1110**	**na**	**12,400**	**991,000**	**555**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**156**	**70.5**	**na**	**96.6[d]**	**3.05**	**3130**	**11.1**	**400**	**na**	**1560**	**125,000**	**54.8**	**391**	**23,500**
RE02-07-1025	02-600247	0–0.5	SOIL	—	—	—	—	—	0.587 (U)	—	—	—	—	—	—	—	—	—	0.0011 (J)	13	—
RE02-07-1030	02-600247	0.8–1.6	QBT3	—	—	—	—	—	—	—	7.26	—	—	—	—	—	—	—	—	6.8	—
RE02-07-1026	02-600247	4.5–6.6	QBT3	—	—	—	—	—	—	—	28	0.0247 (J)	—	—	—	—	12.7 (U)	—	0.0023	9.42	—
RE02-07-1027	02-600247	9.5–11.6	QBT3	—	—	—	—	—	—	—	—	—	—	—	16.2	—	—	—	0.000915 (J)	7.1	—
RE02-07-1028	02-600247	14.5–17	QBT3	—	—	—	—	—	—	—	—	0.0328 (J)	—	—	—	—	—	—	0.000584 (J)	5.4	—
RE02-07-1029	02-600247	19.5–22	QBT3	—	—	—	—	—	—	—	—	—	—	—	13	—	—	—	0.00132 (J)	7.99	—
RE02-07-1031	02-600248	0–0.5	SOIL	—	—	—	—	—	0.535 (U)	—	—	—	—	—	—	—	—	1.07 (J)	0.00109 (J)	14.1	—
RE02-07-1036	02-600248	1–1.9	QBT3	—	—	2.96	99.5	—	—	4630 (J+)	10.7	—	—	—	—	—	—	—	0.00176 (J)	12.2	—
RE02-07-1032	02-600248	4.5–6.5	QBT3	—	—	—	55.3	—	—	2620 (J+)	—	0.0349 (J)	—	—	—	—	—	—	0.00307	0.923 (J)	—
RE02-07-1033	02-600248	9.5–11.7	QBT3	—	—	—	—	1.61	—	—	—	—	—	—	13.9	—	—	—	0.00435	8.48	—
RE02-07-1034	02-600248	14.5–16.5	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00194 (J)	6.74	—
RE02-07-1035	02-600248	19.5–21.7	QBT3	—	—	—	—	—	—	—	7.75 (U)	0.0523 (J)	—	—	—	—	—	—	0.00122 (J)	5.85	—
RE02-07-1037	02-600249	0–0.5	SOIL	—	—	—	—	—	0.51 (U)	—	—	—	—	—	—	—	—	2.59	0.00124 (J)	2.42 (U)	—
RE02-07-1042	02-600249	1.4–3.1	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.26	—	1.68 (U)	—
RE02-07-6673	02-600249	4.5–6.7	QBT3	—	—	—	—	—	—	—	—	0.0514 (J-)	—	—	16.8	—	—	—	0.00123 (J)	7.68	—
RE02-07-6672	02-600249	9.5–11.7	QBT3	—	—	—	—	—	—	—	—	—	—	—	18.6	—	—	0.986 (J)	0.00692	6.15	—
RE02-07-6671	02-600249	14.5–16.7	QBT3	—	—	—	—	—	—	—	7.93 (J)	0.0476 (J-)	—	—	—	—	—	—	0.00122 (J)	5.49	—
RE02-07-6674	02-600249	19.5–21.7	QBT3	—	—	—	—	—	—	—	—	0.0288 (J-)	—	—	—	—	—	—	0.000619 (J)	4.16	—
RE02-07-1043	02-600250	0–0.5	SOIL	—	—	—	—	—	0.575 (U)	—	—	—	—	—	—	—	—	8.68	0.00143 (J)	13.2	79.9
RE02-07-1048	02-600250	0.5–1.2	QBT3	—	—	2.81	83.8	—	—	—	—	0.0617 (J)	—	—	—	—	—	3.3	0.00203 (J)	10.1	—
RE02-07-1044	02-600250	4.5–6.7	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.05	0.000825 (J)	0.571 (J)	—
RE02-07-1045	02-600250	9.5–13.4	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.963 (J)	0.000895 (J)	0.582 (J)	—
RE02-07-1046	02-600250	14.5–17	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.26	0.00101 (J)	0.589 (J)	—
RE02-07-1047	02-600250	19.5–21.7	QBT3	—	—	—	—	—	—	—	—	0.0514 (J)	—	—	—	—	—	—	0.000704 (J)	0.942 (J)	—
RE02-07-1049	02-600251	0–0.6	SOIL	—	—	—	—	—	0.523 (U)	—	—	—	—	1.4	—	—	—	2.5	0.000772 (J)	11.3	—
RE02-07-1054	02-600251	0.6–1.4	QBT3	—	—	—	52.6 (J+)	—	—	—	9.51	—	—	—	14.3	—	—	—	0.00109 (J)	10.9	—
RE02-07-1050	02-600251	4.5–8.5	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.002 (J)	6.52	—
RE02-07-1051	02-600251	9.5–14.5	QBT3	—	—	—	—	—	—	—	7.83	—	4.77	—	—	—	—	—	0.00296	11.2	—
RE02-07-1052	02-600251	14.5–18.5	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5.86	—
RE02-07-1053	02-600251	19.5–23.5	QBT3	—	—	—	—	—	—	—	—	0.057 (J)	—	—	—	—	—	—	0.000636 (J)	5	—
RE02-07-1055	02-600252	0–0.8	SOIL	—	—	—	—	—	0.586 (U)	—	—	—	—	—	—	—	—	—	—	12.6	—

Table 6.15-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Copper	Cyanide (Total)	Lead	Magnesium	Nickel	Nitrate	Perchlorate	Selenium	Zinc
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**na[b]**	**4.66**	**0.5**	**11.2**	**1690**	**6.58**	**na**	**na**	**0.3**	**63.5**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**na**	**14.7**	**0.5**	**22.3**	**4610**	**15.4**	**na**	**na**	**1.52**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**2580**	**1110**	**na**	**505[d]**	**72.1**	**51,900**	**62.8**	**800**	**na**	**25,700**	**2,080,000**	**908**	**6490**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**1240**	**457**	**na**	**281[d]**	**40.2**	**24,800**	**224**	**1110**	**na**	**12,400**	**991,000**	**555**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**156**	**70.5**	**na**	**96.6[d]**	**3.05**	**3130**	**11.1**	**400**	**na**	**1560**	**125,000**	**54.8**	**391**	**23,500**
RE02-07-1060	02-600252	0.8–1.5	QBT3	8610	—	2.9	63.9	—	—	—	—	0.0437 (J)	—	—	—	1980 (J+)	9.86 (J-)	—	0.001 (J)	12.9	—
RE02-07-1056	02-600252	4.5–6.5	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00348	7.37	—
RE02-07-1057	02-600252	9.5–11.7	QBT3	—	—	—	—	—	—	—	—	0.0424 (J)	—	—	—	—	—	—	—	1.48 (U)	—
RE02-07-1058	02-600252	14.5–18.2	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.854 (J)	—
RE02-07-1059	02-600252	19.5–21.5	QBT3	—	—	—	—	—	—	—	—	0.0329 (J)	—	—	—	—	—	—	0.001 (J)	1.48 (U)	—
RE02-07-1061	02-600253	0–0.5	SOIL	—	—	—	—	—	0.539 (U)	—	—	0.0561 (J)	—	—	24.1	—	—	1.17	0.00223	10.6	—
RE02-07-1066	02-600253	2–3	QBT3	—	—	—	80.1	—	—	—	—	—	—	—	28.5	—	—	—	0.00189 (J)	9.18	—
RE02-07-1062	02-600253	4.5–6.7	QBT3	—	—	—	—	—	—	—	12.6 (U)	0.0398 (J)	4.67	—	35.3	—	—	—	0.00814	6.19	—
RE02-07-1063	02-600253	9.5–11.7	QBT3	9460 (J+)	—	4.34	132	2.33	—	2790	7.97 (U)	—	7.15	—	116	2090	10.1	0.802 (J)	0.0147	10.1	—
RE02-07-1064	02-600253	14.5–16.7	QBT3	—	—	—	—	—	—	—	12.2 (U)	0.038 (J)	—	—	21.9	—	—	—	0.000778 (J)	5.43	—
RE02-07-1065	02-600253	19.5–21.7	QBT3	—	—	—	—	—	—	—	9.02 (U)	—	—	—	13	—	—	—	—	4.02	—
RE02-07-1067	02-600254	0–0.5	SOIL	—	—	—	—	—	0.57 (U)	—	—	—	—	—	—	—	—	—	0.000917 (J)	—	—
RE02-07-1072	02-600254	1.6–2.5	QBT3	—	—	—	—	—	—	—	13 (U)	0.034 (J)	—	—	—	—	—	—	0.00131 (J)	1.57 (U)	—
RE02-07-1068	02-600254	4.5–7.5	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.000881 (J)	0.598 (J)	—
RE02-07-1069	02-600254	9.5–11.7	QBT3	—	—	—	—	—	—	—	—	—	—	2.89	—	—	—	—	—	1.5 (U)	—
RE02-07-1070	02-600254	14.5–16.7	QBT3	—	—	—	—	—	—	—	—	0.0605 (J)	—	—	—	—	—	—	0.00149 (J)	1.48 (U)	—
RE02-07-1071	02-600254	19.5–21.7	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.5 (U)	—
RE02-07-1073	02-600255	0–0.5	SOIL	—	—	—	—	—	0.539 (U)	—	—	—	—	—	—	—	—	7.04	—	9.8	48.9
RE02-07-1078	02-600255	0.5–1.5	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.38	—	7.3	—
RE02-07-1074	02-600255	4.5–9.5	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.000549 (J)	8.44	—
RE02-07-1075	02-600255	9.5–14	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.000991 (J)	5.33	—
RE02-07-1076	02-600255	14.5–19	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8.47	—
RE02-07-1077	02-600255	19.5–23.5	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.000571 (J)	6.52	—
RE02-07-1079	02-600256	0–0.5	SOIL	—	—	—	—	—	0.582 (U)	—	—	—	—	—	—	—	—	—	—	13	—
RE02-07-1084	02-600256	0.5–1.9	QBT3	—	—	3.32	223 (J+)	—	—	5110 (J)	9.68	—	—	—	—	1760 (J+)	7.95	—	0.00212 (J)	11.3	—
RE02-07-1080	02-600256	4.5–8.5	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00208	6.62	—
RE02-07-1081	02-600256	9.5–13.5	QBT3	—	—	—	—	—	—	—	9.94	—	—	—	—	—	—	—	0.00111 (J)	7.33	—
RE02-07-1082	02-600256	14.5–18.5	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0012 (J)	6.73	—
RE02-07-1083	02-600256	19.5–23.5	QBT3	—	—	—	—	—	—	—	—	0.03 (J)	—	—	—	—	—	—	0.00134 (J)	5.52	—
RE02-07-1085	02-600257	0–0.8	SOIL	—	—	—	395	—	0.573 (U)	—	—	0.0604 (J)	—	—	37.2	—	—	—	—	12.3	—
RE02-07-1090	02-600257	0.8–2.1	QBT3	—	—	—	—	—	—	—	—	—	—	—	42.1	—	—	—	—	5.96	—

Table 6.15-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Copper	Cyanide (Total)	Lead	Magnesium	Nickel	Nitrate	Perchlorate	Selenium	Zinc
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**na[b]**	**4.66**	**0.5**	**11.2**	**1690**	**6.58**	**na**	**na**	**0.3**	**63.5**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**na**	**14.7**	**0.5**	**22.3**	**4610**	**15.4**	**na**	**na**	**1.52**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**2580**	**1110**	**na**	**505[d]**	**72.1**	**51,900**	**62.8**	**800**	**na**	**25,700**	**2,080,000**	**908**	**6490**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**1240**	**457**	**na**	**281[d]**	**40.2**	**24,800**	**224**	**1110**	**na**	**12,400**	**991,000**	**555**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**156**	**70.5**	**na**	**96.6[d]**	**3.05**	**3130**	**11.1**	**400**	**na**	**1560**	**125,000**	**54.8**	**391**	**23,500**
RE02-07-1086	02-600257	4.5–6.7	QBT3	—	—	—	—	—	—	—	—	—	—	—	59.8	—	—	—	0.00234	5.27	—
RE02-07-1087	02-600257	9.5–11.7	QBT3	—	—	—	—	—	—	—	—	—	—	—	55.7	—	—	—	0.000926 (J)	5.61	—
RE02-07-1088	02-600257	14.5–16.7	QBT3	—	—	—	—	—	—	—	—	—	—	—	27.8	—	—	—	0.000876 (J)	4.88	—
RE02-07-1089	02-600257	19.5–21.7	QBT3	—	—	—	—	—	—	—	—	—	—	—	32.4	—	—	—	0.00138 (J)	5.48	—
RE02-07-1091	02-600258	0–0.5	SOIL	—	—	—	—	—	0.596 (U)	—	—	0.0279 (J)	—	—	—	—	—	—	—	8.89	—
RE02-07-1096	02-600258	0.8–2	QBT3	—	—	3.16	75.1	—	—	2330 (J+)	—	0.0381 (J)	—	—	—	—	7.74	—	—	13	—
RE02-07-1092	02-600258	4.5–7.5	QBT3	—	—	—	—	—	—	—	—	0.072 (J)	—	—	—	—	—	—	0.00136 (J)	0.883 (J)	—
RE02-07-1093	02-600258	9.5–11.7	QBT3	—	—	—	—	—	—	—	—	0.0427 (J)	—	—	—	—	—	—	0.000622 (J)	1.52 (U)	—
RE02-07-1094	02-600258	14.5–16.7	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00156 (J)	0.577 (J)	—
RE02-07-1095	02-600258	19.5–21.7	QBT3	—	—	—	49.9 (J-)	—	—	—	—	0.41	—	1.62	—	—	—	—	—	1.03 (J)	—
RE02-10-23289	02-612640	0–0.5	SOIL	—	—	—	—	—	0.523 (U)	—	—	NA	—	NA	—	—	—	NA	NA	—	—
RE02-10-23290	02-612640	5–6	QBT3	—	1.01 (U)	—	—	—	—	—	7.34	NA	—	NA	—	—	—	NA	NA	0.993 (UJ)	—
RE02-10-23291	02-612640	15–16	QBT3	—	1.02 (U)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	1.03 (UJ)	—
RE02-10-23292	02-612640	25–26	QBT3	—	0.931 (U)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	1.01 (UJ)	—
RE02-10-23293	02-612640	35–36	QBT3	—	—	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	0.886 (UJ)	—
RE02-10-23294	02-612640	49–50	QBT3	—	0.954 (U)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	0.956 (UJ)	—
RE02-10-23296	02-612641	5–6	QBT3	10100	1.07 (U)	—	111	1.85	—	6190 (J+)	—	NA	5.66	NA	—	2780 (J+)	9.2 (J-)	NA	NA	1.05 (U)	—
RE02-10-23297	02-612641	15–16	QBT3	—	0.958 (U)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	1 (U)	—
RE02-10-23298	02-612641	25–26	QBT3	—	0.947 (U)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	0.967 (U)	—
RE02-10-23299	02-612641	35–36	QBT3	—	0.987 (U)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	1.01 (U)	—
RE02-10-23300	02-612641	49–50	QBT3	—	0.971 (U)	17	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	0.991 (U)	—
RE02-10-23301	02-612642	0–0.5	SOIL	—	1.06 (U)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	—	68.1 (J+)
RE02-10-23302	02-612642	5–6	QBT3	—	1.03 (U)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	1.01 (U)	—
RE02-10-23303	02-612642	15–16	QBT3	—	1.02 (U)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	0.968 (U)	—
RE02-10-23304	02-612642	25–26	QBT3	—	0.969 (U)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	1 (U)	—
RE02-10-23305	02-612642	35–36	QBT3	—	1.02 (U)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	1 (U)	—
RE02-10-23306	02-612642	49–50	QBT3	—	0.989 (U)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	0.987 (U)	—
RE02-10-23307	02-612643	0–0.5	SOIL	—	1.09 (UJ)	—	—	—	0.546 (U)	—	—	NA	—	NA	—	—	—	NA	NA	—	—
RE02-10-23308	02-612643	5–6	QBT3	—	1.02 (UJ)	—	66.6	—	—	2600 (J+)	—	NA	—	NA	—	—	—	NA	NA	1.01 (U)	—
RE02-10-23309	02-612643	15–16	QBT3	—	0.995 (UJ)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	0.977 (U)	—
RE02-10-23310	02-612643	25–26	QBT3	—	1.01 (UJ)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	1 (U)	—

Table 6.15-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Copper	Cyanide (Total)	Lead	Magnesium	Nickel	Nitrate	Perchlorate	Selenium	Zinc
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**na[b]**	**4.66**	**0.5**	**11.2**	**1690**	**6.58**	**na**	**na**	**0.3**	**63.5**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**na**	**14.7**	**0.5**	**22.3**	**4610**	**15.4**	**na**	**na**	**1.52**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**2580**	**1110**	**na**	**505[d]**	**72.1**	**51,900**	**62.8**	**800**	**na**	**25,700**	**2,080,000**	**908**	**6490**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**1240**	**457**	**na**	**281[d]**	**40.2**	**24,800**	**224**	**1110**	**na**	**12,400**	**991,000**	**555**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**156**	**70.5**	**na**	**96.6[d]**	**3.05**	**3130**	**11.1**	**400**	**na**	**1560**	**125,000**	**54.8**	**391**	**23,500**
RE02-10-23311	02-612643	35–36	QBT3	—	1 (UJ)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	0.931 (U)	—
RE02-10-23312	02-612643	49–50	QBT3	—	1 (UJ)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	0.999 (U)	—
RE02-10-23313	02-612644	0–0.5	SOIL	—	1.04 (UJ)	—	—	—	0.518 (U)	—	—	NA	—	NA	—	—	—	NA	NA	—	—
RE02-10-23314	02-612644	5–6	QBT3	—	1.01 (UJ)	—	47	—	—	—	—	NA	—	NA	—	—	—	NA	NA	1.03 (U)	—
RE02-10-23315	02-612644	15–16	QBT3	7370	1.05 (UJ)	—	—	1.44	—	—	—	NA	—	NA	—	—	—	NA	NA	1.05 (U)	—
RE02-10-23316	02-612644	25–26	QBT3	—	0.953 (UJ)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	0.973 (U)	—
RE02-10-23317	02-612644	35–36	QBT3	—	0.985 (UJ)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	1 (U)	—
RE02-10-23318	02-612644	49–50	QBT3	—	0.959 (UJ)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	0.988 (U)	—
RE02-10-23319	02-612645	0–0.5	SOIL	—	1.14 (U)	—	—	—	0.531 (U)	—	—	NA	—	NA	—	—	—	NA	NA	—	—
RE02-10-23320	02-612645	5–6	QBT3	—	0.506 (U)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	0.971 (UJ)	—
RE02-10-23321	02-612645	15–16	QBT3	—	0.973 (UJ)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	0.953 (UJ)	—
RE02-10-23322	02-612645	25–26	QBT3	—	0.568 (U)	—	64.1 (J-)	1.26	—	—	—	NA	—	NA	—	—	—	NA	NA	0.998 (UJ)	—
RE02-10-23323	02-612645	35–36	QBT3	—	0.519 (U)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	1.01 (UJ)	—
RE02-10-23324	02-612645	49–50	QBT3	—	—	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	1.03 (UJ)	—
RE02-10-23325	02-612646	0–0.5	SOIL	—	1.12 (J-)	—	—	—	0.484 (U)	—	—	NA	—	NA	—	—	—	NA	NA	—	—
RE02-10-23326	02-612646	5–6	QBT3	—	—	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	1 (UJ)	—
RE02-10-23327	02-612646	15–16	QBT3	—	0.979 (UJ)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	0.972 (UJ)	—
RE02-10-23328	02-612646	25–26	QBT3	—	1.01 (UJ)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	1.02 (UJ)	—
RE02-10-23329	02-612646	35–36	QBT3	—	1.02 (UJ)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	1.03 (UJ)	—
RE02-10-23330	02-612646	49–50	QBT3	—	1.02 (UJ)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	1.04 (UJ)	—
RE02-10-23331	02-612647	0–0.5	SOIL	—	—	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	—	120
RE02-10-23332	02-612647	5–6	QBT3	—	1 (UJ)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	0.999 (UJ)	—
RE02-10-23333	02-612647	15–16	QBT3	—	0.994 (UJ)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	0.96 (UJ)	—
RE02-10-23334	02-612647	25–26	QBT3	—	1.01 (UJ)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	1.02 (UJ)	—
RE02-10-23335	02-612647	35–36	QBT3	—	1 (UJ)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	0.925 (UJ)	—
RE02-10-23336	02-612647	49–50	QBT3	—	—	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	0.997 (UJ)	—
RE02-10-23337	02-612648	0–0.5	SOIL	—	—	—	—	—	0.512 (U)	—	—	NA	—	NA	—	—	—	NA	NA	—	—
RE02-10-23338	02-612648	5–6	QBT3	—	0.96 (U)	—	—	—	—	—	—	NA	—	NA	16	—	—	NA	NA	0.984 (U)	—
RE02-10-23339	02-612648	15–16	QBT3	—	0.966 (U)	—	—	—	—	—	—	NA	—	NA	19.3	—	—	NA	NA	0.995 (U)	—
RE02-10-23340	02-612648	25–26	QBT3	—	1 (U)	—	79.7 (J+)	—	—	—	—	NA	—	NA	67.2	—	—	NA	NA	0.939 (U)	—
RE02-10-23341	02-612648	35–36	QBT3	—	0.982 (U)	—	—	—	—	—	—	NA	—	NA	27	—	—	NA	NA	0.959 (U)	—

Table 6.15-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Copper	Cyanide (Total)	Lead	Magnesium	Nickel	Nitrate	Perchlorate	Selenium	Zinc
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**na[b]**	**4.66**	**0.5**	**11.2**	**1690**	**6.58**	**na**	**na**	**0.3**	**63.5**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**na**	**14.7**	**0.5**	**22.3**	**4610**	**15.4**	**na**	**na**	**1.52**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**2580**	**1110**	**na**	**505[d]**	**72.1**	**51,900**	**62.8**	**800**	**na**	**25,700**	**2,080,000**	**908**	**6490**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**1240**	**457**	**na**	**281[d]**	**40.2**	**24,800**	**224**	**1110**	**na**	**12,400**	**991,000**	**555**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**156**	**70.5**	**na**	**96.6[d]**	**3.05**	**3130**	**11.1**	**400**	**na**	**1560**	**125,000**	**54.8**	**391**	**23,500**
RE02-10-23342	02-612648	49–50	QBT3	—	0.991 (U)	3.08	—	—	—	—	—	NA	—	NA	50.4	—	—	NA	NA	0.972 (U)	—
RE02-10-23343	02-612649	0–0.5	SOIL	—	—	—	—	—	0.494 (U)	—	—	NA	—	NA	—	—	—	NA	NA	—	—
RE02-10-23344	02-612649	5–6	QBT3	—	0.988 (U)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	0.998 (UJ)	—
RE02-10-23345	02-612649	15–16	QBT3	—	1.01 (U)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	1.03 (UJ)	—
RE02-10-23346	02-612649	25–26	QBT3	—	0.994 (U)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	0.947 (UJ)	—
RE02-10-23347	02-612649	35–36	QBT3	—	0.992 (U)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	0.913 (UJ)	—
RE02-10-23348	02-612649	49–50	QBT3	—	—	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	0.973 (UJ)	—
RE02-10-23349	02-612650	0–0.5	SOIL	—	—	—	—	—	0.484 (U)	—	—	NA	—	NA	—	—	—	NA	NA	—	—
RE02-10-23350	02-612650	5–6	QBT3	—	—	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	0.94 (UJ)	—
RE02-10-23351	02-612650	15–16	QBT3	—	—	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	1.03 (UJ)	—
RE02-10-23352	02-612650	25–26	QBT3	—	0.95 (UJ)	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	0.932 (UJ)	—
RE02-10-23353	02-612650	35–36	QBT3	—	—	—	—	—	—	—	—	NA	—	NA	—	—	—	NA	NA	0.933 (UJ)	—
RE02-10-23354	02-612650	49–50	QBT3	—	—	—	—	1.33	—	—	—	NA	—	NA	21.4	—	—	NA	NA	1.04 (UJ)	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273).

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 6.15-3
Organic Chemicals Detected at SWMU 02-006(a)

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1242	Aroclor-1254	Aroclor-1260	Dichlorobenzene[1,4-]	Toluene	Trichloroethene
Industrial SSL[a]				**10.9**	**11**	**11.1**	**6730**	**61,100**	**36.1**
Recreational SSL[b]				**10.3**	**5.53**	**10.3**	**1140**	**47,600**	**157**
Residential SSL[a]				**2.43**	**1.14**	**2.43**	**1290**	**5220**	**6.72**
RE02-07-1037	02-600249	0–0.5	SOIL	—[c]	0.011	—	—	NA[d]	NA
RE02-07-1042	02-600249	1.4–3.1	QBT3	—	0.0019 (J)	—	—	—	—
RE02-07-1043	02-600250	0–0.5	SOIL	—	0.0057	0.0028 (J)	—	NA	NA
RE02-07-1048	02-600250	0.5–1.2	QBT3	0.0028 (J)	0.0034 (J)	0.0018 (J)	—	—	—
RE02-07-1054	02-600251	0.6–1.4	QBT3	—	—	—	0.000215 (J)	—	0.000313 (J)
RE02-07-1058	02-600252	14.5–18.2	QBT3	0.009	0.0053	0.0017 (J)	—	—	—
RE02-07-1067	02-600254	0–0.5	SOIL	—	0.0037 (J)	—	—	NA	NA
RE02-07-1073	02-600255	0–0.5	SOIL	—	0.0019 (J-)	0.0016 (J-)	—	NA	NA
RE02-07-1078	02-600255	0.5–1.5	QBT3	—	—	—	—	0.000328 (J)	—
RE02-07-1074	02-600255	4.5–9.5	QBT3	—	—	—	—	—	0.000275 (J)
RE02-07-1084	02-600256	0.5–1.9	QBT3	—	—	—	—	—	0.000276 (J)
RE02-07-1090	02-600257	0.8–2.1	QBT3	0.0042 (J-)	0.002 (J-)	—	—	—	—
RE02-07-1086	02-600257	4.5–6.7	QBT3	0.0043 (J)	0.0023 (J)	—	—	—	—
RE02-07-1091	02-600258	0–0.5	SOIL	—	0.0042	—	—	NA	NA

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273).

[b] SSLs are from LANL (2017, 602581).

[c] — = Not detected.

[d] NA = Not analyzed.

Table 6.15-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 02-006(a)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Strontium-90	Tritium	Uranium-235/236
Qbt 2,3,4 BV[a]				**na[b]**	**na**	**na**	**na**	**0.09**
Soil BV/FV[a]				**1.65**	**0.054**	**1.31**	**na**	**0.2**
Industrial SAL[c]				**41**	**1200**	**2400**	**2,400,000**	**160**
Recreational SAL[c]				**370**	**1300**	**4900**	**5,700,000**	**1000**
Residential SAL[c]				**12**	**79**	**15**	**1700**	**42**
RE02-03-51142	02-22052	1–1.5	SOIL	0.776	—[d]	0.0861	1.39858	—
RE02-03-51168	02-22052	2.5–3	SOIL	0.354	—	0.183	—	—
RE02-03-51144	02-22053	1–1.5	SOIL	3.58	—	0.111	6.35942	—
RE02-03-51170	02-22053	2.5–3	SOIL	2.24	—	0.12	15.6263	—
RE02-03-51146	02-22054	1–1.5	SOIL	5.01	—	0.0534	6.18184	—
RE02-03-51172	02-22054	2.5–3	SOIL	0.418	—	—	14.5839	—
RE02-03-51148	02-22055	10–10.5	QBT3	9.63	—	0.515	4.71	—
RE02-03-51174	02-22055	11.5–12	QBT3	45.4	—	0.713	6.3	—
RE02-03-51150	02-22056	10–10.5	QBT3	11.4	—	0.311	20.4029	—
RE02-03-51176	02-22056	11.5–12	QBT3	8.39	—	0.394	26.6	—
RE02-03-51152	02-22057	10–10.5	QBT3	22.5	—	1.17	18.5	—
RE02-03-51178	02-22057	11.5–12	QBT3	1.06	—	—	33.8	—
RE02-03-51154	02-22058	10–10.5	QBT3	1.49	—	—	22.235	—
RE02-03-51180	02-22058	11.5–12	QBT3	4.35	—	0.221	13.7	—
RE02-03-51156	02-22059	6–6.5	QBT3	1.58	—	—	12.1337	—
RE02-03-51182	02-22059	7.5–8	QBT3	0.149	—	—	10.9811	—
RE02-07-1025	02-600247	0–0.5	SOIL	14.4	—	—	0.512048	—
RE02-07-1030	02-600247	0.8–1.6	QBT3	0.363	—	—	0.850043	—
RE02-07-1026	02-600247	4.5–6.6	QBT3	0.872	—	0.271	5.02181	—
RE02-07-1028	02-600247	14.5–17	QBT3	–	—	—	—	0.104
RE02-07-1029	02-600247	19.5–22	QBT3	–	—	—	39.7566	—
RE02-07-1031	02-600248	0–0.5	SOIL	29.8	—	2.69	0.778652	—
RE02-07-1036	02-600248	1–1.9	QBT3	1.82	—	0.219	4.05451	—
RE02-07-1032	02-600248	4.5–6.5	QBT3	–	—	—	23.8275	—
RE02-07-1033	02-600248	9.5–11.7	QBT3	–	—	—	1.56931	—

Table 6.15-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Strontium-90	Tritium	Uranium-235/236
Qbt 2,3,4 BV[a]				**na**[b]	**na**	**na**	**na**	**0.09**
Soil BV[a]				**1.65**	**0.054**	**1.31**	**na**	**0.2**
Industrial SAL[c]				**41**	**1200**	**2400**	**2,400,000**	**160**
Recreational SAL[c]				**370**	**1300**	**4900**	**5,700,000**	**1000**
Residential SAL[c]				**12**	**79**	**15**	**1700**	**42**
RE02-07-1034	02-600248	14.5–16.5	QBT3	0.736	—	0.212	18.8	—
RE02-07-1035	02-600248	19.5–21.7	QBT3	—	—	—	20.4	0.113
RE02-07-1037	02-600249	0–0.5	SOIL	—	—	—	1.61266	—
RE02-07-1042	02-600249	1.4–3.1	QBT3	—	—	—	1.14866	—
RE02-07-6673	02-600249	4.5–6.7	QBT3	—	—	—	67.6118	—
RE02-07-6672	02-600249	9.5–11.7	QBT3	—	—	—	29.5387	—
RE02-07-6671	02-600249	14.5–16.7	QBT3	—	—	—	8.17	—
RE02-07-6674	02-600249	19.5–21.7	QBT3	—	—	—	6.11	—
RE02-07-1043	02-600250	0–0.5	SOIL	2.62	—	—	0.0938623	—
RE02-07-1048	02-600250	0.5–1.2	QBT3	1.84	—	—	0.190247	—
RE02-07-1044	02-600250	4.5–6.7	QBT3	—	—	—	0.76201	—
RE02-07-1046	02-600250	14.5–17	QBT3	—	—	0.243	12	—
RE02-07-1047	02-600250	19.5–21.7	QBT3	—	—	—	18.8	—
RE02-07-1049	02-600251	0–0.6	SOIL	2.43	—	—	0.13848	—
RE02-07-1054	02-600251	0.6–1.4	QBT3	0.337	—	—	0.449984	—
RE02-07-1050	02-600251	4.5–8.5	QBT3	—	—	—	3.12516	0.0986
RE02-07-1051	02-600251	9.5–14.5	QBT3	—	—	—	53.6455	–
RE02-07-1052	02-600251	14.5–18.5	QBT3	—	—	—	5.15323	0.132
RE02-07-1053	02-600251	19.5–23.5	QBT3	—	—	—	5.43503	—
RE02-07-1055	02-600252	0–0.8	SOIL	19.8	—	2.28	—	—
RE02-07-1060	02-600252	0.8–1.5	QBT3	0.491	—	—	0.575857	—
RE02-07-1056	02-600252	4.5–6.5	QBT3	—	—	—	12.977	—
RE02-07-1057	02-600252	9.5–11.7	QBT3	—	—	—	5.67	—
RE02-07-1059	02-600252	19.5–21.5	QBT3	—	—	—	12.7	—
RE02-07-1061	02-600253	0–0.5	SOIL	7.14	—	—	1.73374	—
RE02-07-1066	02-600253	2–3	QBT3	0.658	—	—	2.79491	—
RE02-07-1062	02-600253	4.5–6.7	QBT3	—	—	—	32.6635	—
RE02-07-1063	02-600253	9.5–11.7	QBT3	—	—	—	167.677	—
RE02-07-1064	02-600253	14.5–16.7	QBT3	—	—	—	8.41	—
RE02-07-1065	02-600253	19.5–21.7	QBT3	—	—	—	4.15	—
RE02-07-1067	02-600254	0–0.5	SOIL	6.2	—	—	0.689108	—

Table 6.15-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Strontium-90	Tritium	Uranium-235/236
Qbt 2,3,4 BV[a]				**na[b]**	**na**	**na**	**na**	**0.09**
Soil BV[a]				**1.65**	**0.054**	**1.31**	**na**	**0.2**
Industrial SAL[c]				**41**	**1200**	**2400**	**2,400,000**	**160**
Recreational SAL[c]				**370**	**1300**	**4900**	**5,700,000**	**1000**
Residential SAL[c]				**12**	**79**	**15**	**1700**	**42**
RE02-07-1072	02-600254	1.6–2.5	QBT3	—	—	—	1.83927	—
RE02-07-1068	02-600254	4.5–7.5	QBT3	—	—	—	13.5914	0.0942
RE02-07-1070	02-600254	14.5–16.7	QBT3	—	—	—	12.2	—
RE02-07-1071	02-600254	19.5–21.7	QBT3	—	—	—	—	0.104
RE02-07-1073	02-600255	0–0.5	SOIL	—	0.0626	–	0.394502	—
RE02-07-1078	02-600255	0.5–1.5	QBT3	—	—	—	0.207156	—
RE02-07-1074	02-600255	4.5–9.5	QBT3	—	—	—	2.91291	—
RE02-07-1075	02-600255	9.5–14	QBT3	—	—	—	10.362	—
RE02-07-1076	02-600255	14.5–19	QBT3	—	—	—	30.3524	—
RE02-07-1077	02-600255	19.5–23.5	QBT3	—	—	—	30.0152	—
RE02-07-1084	02-600256	0.5–1.9	QBT3	—	—	—	1.30913	—
RE02-07-1080	02-600256	4.5–8.5	QBT3	—	—	—	5.067	—
RE02-07-1081	02-600256	9.5–13.5	QBT3	—	—	—	21.6809	0.115
RE02-07-1082	02-600256	14.5–18.5	QBT3	—	—	—	11.3624	—
RE02-07-1083	02-600256	19.5–23.5	QBT3	—	—	—	31.8669	—
RE02-07-1086	02-600257	4.5–6.7	QBT3	—	—	—	1.16667	—
RE02-07-1087	02-600257	9.5–11.7	QBT3	—	—	—	4.56519	—
RE02-07-1088	02-600257	14.5–16.7	QBT3	—	—	—	4.17858	—
RE02-07-1089	02-600257	19.5–21.7	QBT3	—	—	—	5.03305	—
RE02-07-1092	02-600258	4.5–7.5	QBT3	—	—	—	0.0248608	—
RE02-07-1094	02-600258	14.5–16.7	QBT3	—	—	—	0.147696	—
RE02-07-1095	02-600258	19.5–21.7	QBT3	—	—	—	0.0403444	—
RE02-10-23291	02-612640	15–16	QBT3	NA[e]	NA	NA	0.00970432	NA
RE02-10-23292	02-612640	25–26	QBT3	NA	NA	NA	0.0167054	NA
RE02-10-23296	02-612641	5–6	QBT3	NA	NA	NA	0.0359078	NA
RE02-10-23297	02-612641	15–16	QBT3	NA	NA	NA	0.0107842	NA
RE02-10-23299	02-612641	35–36	QBT3	NA	NA	NA	0.00656037	NA
RE02-10-23302	02-612642	5–6	QBT3	NA	NA	NA	0.0058119	NA
RE02-10-23303	02-612642	15–16	QBT3	NA	NA	NA	0.0230473	NA
RE02-10-23304	02-612642	25–26	QBT3	NA	NA	NA	0.00912874	NA
RE02-10-23314	02-612644	5–6	QBT3	NA	NA	NA	0.0331024	NA

Table 6.15-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Strontium-90	Tritium	Uranium-235/236
Qbt 2,3,4 BV[a]				**na[b]**	**na**	**na**	**na**	**0.09**
Soil BV[a]				**1.65**	**0.054**	**1.31**	**na**	**0.2**
Industrial SAL[c]				**41**	**1200**	**2400**	**2,400,000**	**160**
Recreational SAL[c]				**370**	**1300**	**4900**	**5,700,000**	**1000**
Residential SAL[c]				**12**	**79**	**15**	**1700**	**42**
RE02-10-23315	02-612644	15–16	QBT3	NA	NA	NA	0.240765	NA
RE02-10-23316	02-612644	25–26	QBT3	NA	NA	NA	0.0222267	NA
RE02-10-23326	02-612646	5–6	QBT3	NA	NA	NA	0.00235628	NA
RE02-10-23328	02-612646	25–26	QBT3	NA	NA	NA	0.0059823	NA
RE02-10-23329	02-612646	35–36	QBT3	NA	NA	NA	0.00889396	NA
RE02-10-23330	02-612646	49–50	QBT3	NA	NA	NA	0.0168433	NA
RE02-10-23333	02-612647	15–16	QBT3	NA	NA	NA	0.00324959	NA
RE02-10-23334	02-612647	25–26	QBT3	NA	NA	NA	0.0114562	NA
RE02-10-23335	02-612647	35–36	QBT3	NA	NA	NA	0.00244476	NA
RE02-10-23336	02-612647	49–50	QBT3	NA	NA	NA	0.00207458	NA
RE02-10-23338	02-612648	5–6	QBT3	NA	NA	NA	0.0088373	NA
RE02-10-23345	02-612649	15–16	QBT3	NA	NA	NA	0.0240041	NA
RE02-10-23347	02-612649	35–36	QBT3	NA	NA	NA	0.00661196	NA
RE02-10-23350	02-612650	5–6	QBT3	NA	NA	NA	0.00908566	NA
RE02-10-23351	02-612650	15–16	QBT3	NA	NA	NA	0.00788078	NA
RE02-10-23370	02-612651	5–6	QBT3	NA	NA	NA	23.278	NA
RE02-10-23371	02-612651	15–16	QBT3	NA	NA	NA	19.6	NA
RE02-10-23372	02-612651	25–26	QBT3	NA	NA	NA	23.9903	NA
RE02-10-23373	02-612651	35–36	QBT3	NA	NA	NA	6.91	NA
RE02-10-23377	02-612652	25–26	QBT3	NA	NA	NA	0.0861181	NA
RE02-10-23378	02-612652	35–36	QBT3	NA	NA	NA	0.0345511	NA
RE02-10-23379	02-612652	49–50	QBT3	NA	NA	NA	0.0215535	NA

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SALs are from LANL (2015, 600929).

[d] — = Not detected.

[e] NA = Not analyzed.

Table 6.16-1
Samples Collected and Analyses Requested at SWMU 02-006(b)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	TPH-DRO	VOCs	Cyanide (Total)
CA02-00-0157	02-01094	0–0.5	SED	—[a]	7548R[b]	7550R	7550R	—	7550R	7550R	7547R, 7549R	7546R	—	7550R	7546R	—	—	7546R	—
CA02-00-0161	02-01251	0–0.5	SED	—	7569R	7571R	7571R	—	7571R	—	7568R, 7570R	7567R	—	7571R	7567R	—	—	7567R, 7567R-1	—
RE02-03-51812	02-22345	3.5–4	SOIL	—	1816S	1818S	1818S	1816S	1818S	1818S	1816S	—	—	1818S	1817S	1818S	—	—	—
RE02-03-51813	02-22345	5–5.5	SOIL	—	1816S	1818S	1818S	1816S	1818S	1818S	1816S	—	—	1818S	1817S	1818S	—	—	—
RE02-07-1407	02-600351	0–0.5	SOIL	07-401	07-400	07-401	07-401	—	07-401	07-401	07-400	07-399	07-400	07-401	07-399	—	—	—	07-400
RE02-07-1408	02-600351	4.5–6.9	QAL	07-559	07-558	07-559	07-559	—	07-559	07-559	07-558	07-557	07-558	07-559	07-557	—	—	07-557	07-558
RE02-07-1410	02-600351	9.5–14.5	QAL	07-559	07-558	07-559	07-559	—	07-559	07-559	07-558	07-557	07-558	07-559	07-557	—	—	07-557	07-558
RE02-07-1409	02-600351	17–22.5	QBO	07-559	07-558	07-559	07-559	—	07-559	07-559	07-558	07-557	07-558	07-559	07-557	—	—	07-557	07-558
RE02-07-1412	02-600352	0–0.5	SOIL	07-616	07-615	07-616	07-616	—	07-616	07-616	07-615	07-614	07-615	07-616	07-614	—	07-614	—	07-615
RE02-07-1413	02-600352	4.5–9	QAL	07-1007	07-1006	07-1007	07-1007	—	07-1007	07-1007	07-1006	07-1005	07-1006	07-1007	07-1005	—	07-1005	07-1005	07-1006
RE02-07-1415	02-600352	9–15	QAL	07-1007	07-1006	07-1007	07-1007	—	07-1007	07-1007	07-1006	07-1005	07-1006	07-1007	07-1005	—	07-1005	07-1005	07-1006
RE02-07-1414	02-600352	18.5–21	QBO	07-1007	07-1006	07-1007	07-1007	—	07-1007	07-1007	07-1006	07-1005	07-1006	07-1007	07-1005	—	07-1005	07-1005	07-1006
RE02-07-1417	02-600353	0–0.5	SOIL	07-616	07-615	07-616	07-616	—	07-616	07-616	07-615	07-614	07-615	07-616	07-614	—	—	—	07-615
RE02-07-1418	02-600353	4.5–9	QAL	07-991	07-991	07-991	07-991	—	07-991	07-991	07-991	07-991	07-991	07-991	07-991	—	—	07-991	07-991
RE02-07-1420	02-600353	9–14	QAL	07-991	07-991	07-991	07-991	—	07-991	07-991	07-991	07-991	07-991	07-991	07-991	—	—	07-991	07-991
RE02-07-1419	02-600353	19–22	QBO	07-1109	07-1109	07-1109	07-1109	—	07-1109	07-1109	07-1109	07-1109	07-1109	07-1109	07-1109	—	—	07-1109	07-1109
RE02-07-1422	02-600354	0–0.5	SOIL	07-616	07-615	07-616	07-616	—	07-616	07-616	07-615	07-614	07-615	07-616	07-614	—	—	—	07-615
RE02-07-1423	02-600354	4.5–9	QAL	07-967	07-966	07-967	07-967	—	07-967	07-967	07-966	07-965	07-966	07-967	07-965	—	—	07-965	07-966
RE02-07-1425	02-600354	9–14	QAL	07-967	07-966	07-967	07-967	—	07-967	07-967	07-966	07-965	07-966	07-967	07-965	—	—	07-965	07-966
RE02-07-1424	02-600354	14–19	QBO	07-967	07-966	07-967	07-967	—	07-967	07-967	07-966	07-965	07-966	07-967	07-965	—	—	07-965	07-966
RE02-07-1427	02-600355	0–0.5	SOIL	07-616	07-615	07-616	07-616	—	07-616	07-616	07-615	07-614	07-615	07-616	07-614	—	07-614	—	07-615
RE02-07-1428	02-600355	4.5–9	QAL	07-967	07-966	07-967	07-967	—	07-967	07-967	07-966	07-965	07-966	07-967	07-965	—	07-965	07-965	07-966
RE02-07-1429	02-600355	9–15	QBO	07-967	07-966	07-967	07-967	—	07-967	07-967	07-966	07-965	07-966	07-967	07-965	—	07-965	07-965	07-966
RE02-07-1432	02-600356	0–0.5	SOIL	07-616	07-615	07-616	07-616	—	07-616	07-616	07-615	07-614	07-615	07-616	07-614	—	07-614	—	07-615
RE02-07-1433	02-600356	4.5–9	QAL	07-967	07-966	07-967	07-967	—	07-967	07-967	07-966	07-965	07-966	07-967	07-965	—	07-965	07-965	07-966
RE02-07-1437	02-600357	0–0.5	SOIL	07-616	07-615	07-616	07-616	—	07-616	07-616	07-615	07-614	07-615	07-616	07-614	—	07-614	—	07-615
RE02-07-1438	02-600357	4.5–9	QAL	07-975	07-974	07-975	07-975	—	07-975	07-975	07-974	07-973	07-974	07-975	07-973	—	07-973	07-973	07-974
RE02-07-1440	02-600357	14–17	QAL	07-975	07-974	07-975	07-975	—	07-975	07-975	07-974	07-973	07-974	07-975	07-973	—	07-973	07-973	07-974
RE02-07-1439	02-600357	17–19	QBO	07-975	07-974	07-975	07-975	—	07-975	07-975	07-974	07-973	07-974	07-975	07-973	—	07-973	07-973	07-974
RE02-07-1442	02-600358	0–0.5	SOIL	07-616	07-615	07-616	07-616	—	07-616	07-616	07-615	07-614	07-615	07-616	07-614	—	—	—	07-615
RE02-07-1443	02-600358	4.5–9	QAL	07-975	07-974	07-975	07-975	—	07-975	07-975	07-974	07-973	07-974	07-975	07-973	—	—	07-973	07-974
RE02-07-1445	02-600358	9–14	QAL	07-975	07-974	07-975	07-975	—	07-975	07-975	07-974	07-973	07-974	07-975	07-973	—	—	07-973	07-974
RE02-07-1444	02-600358	14–19	QBO	07-975	07-974	07-975	07-975	—	07-975	07-975	07-974	07-973	07-974	07-975	07-973	—	—	07-973	07-974
RE02-07-1447	02-600359	0–0.5	SOIL	07-616	07-615	07-616	07-616	—	07-616	07-616	07-615	07-614	07-615	07-616	07-614	—	—	—	07-615

Table 6.16-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	TPH-DRO	VOCs	Cyanide (Total)
RE02-07-1448	02-600359	4.5–9	QAL	07-1024	07-1023	07-1024	07-1024	—	07-1024	07-1024	07-1023	07-1022	07-1023	07-1024	07-1022	—	—	07-1022	07-1023
RE02-07-1450	02-600359	9–14	QAL	07-1024	07-1023	07-1024	07-1024	—	07-1024	07-1024	07-1023	07-1022	07-1023	07-1024	07-1022	—	—	07-1022	07-1023
RE02-07-1449	02-600359	20–22	QBO	07-1024	07-1023	07-1024	07-1024	—	07-1024	07-1024	07-1023	07-1022	07-1023	07-1024	07-1022	—	—	07-1022	07-1023
RE02-07-1452	02-600360	0–0.5	SOIL	07-616	07-615	07-616	07-616	—	07-616	07-616	07-615	07-614	07-615	07-616	07-614	—	07-614	—	07-615
RE02-07-1453	02-600360	4.5–9	QAL	07-943	07-942	07-943	07-943	—	07-943	07-943	07-942	07-941	07-942	07-943	07-941	—	07-941	07-941	07-942
RE02-07-1454	02-600360	9–14	QBO	07-943	07-942	07-943	07-943	—	07-943	07-943	07-942	07-941	07-942	07-943	07-941	—	07-941	07-941	07-942
RE02-07-1457	02-600361	0–0.5	SOIL	07-641	07-641	07-641	07-641	—	07-641	07-641	07-641	07-641	07-641	07-641	07-641	—	—	—	07-641
RE02-07-1458	02-600361	4.5–7.5	QAL	07-943	07-942	07-943	07-943	—	07-943	07-943	07-942	07-941	07-942	07-943	07-941	—	—	07-941	07-942
RE02-07-1460	02-600361	8.5–13.5	QAL	07-943	07-942	07-943	07-943	—	07-943	07-943	07-942	07-941	07-942	07-943	07-941	—	—	07-941	07-942
RE02-07-1459	02-600361	18.5–21	QBO	07-943	07-942	07-943	07-943	—	07-943	07-943	07-942	07-941	07-942	07-943	07-941	—	—	07-941	07-942
RE02-07-1462	02-600362	0–0.5	SOIL	07-641	07-641	07-641	07-641	—	07-641	07-641	07-641	07-641	07-641	07-641	07-641	—	—	—	07-641
RE02-07-1463	02-600362	4.5–9	QAL	07-1024	07-1023	07-1024	07-1024	—	07-1024	07-1024	07-1023	07-1022	07-1023	07-1024	07-1022	—	—	07-1022	07-1023
RE02-07-1465	02-600362	9–14	QAL	07-1024	07-1023	07-1024	07-1024	—	07-1024	07-1024	07-1023	07-1022	07-1023	07-1024	07-1022	—	—	07-1022	07-1023
RE02-07-1464	02-600362	14–19	QBO	07-1024	07-1023	07-1024	07-1024	—	07-1024	07-1024	07-1023	07-1022	07-1023	07-1024	07-1022	—	—	07-1022	07-1023
RE02-07-1467	02-600363	0–0.5	SOIL	07-641	07-641	07-641	07-641	—	07-641	07-641	07-641	07-641	07-641	07-641	07-641	—	—	—	07-641
RE02-07-1468	02-600363	4.5–8.5	QAL	07-1007	07-1006	07-1007	07-1007	—	07-1007	07-1007	07-1006	07-1005	07-1006	07-1007	07-1005	—	—	07-1005	07-1006
RE02-07-1470	02-600363	8.5–18	QAL	07-1007	07-1006	07-1007	07-1007	—	07-1007	07-1007	07-1006	07-1005	07-1006	07-1007	07-1005	—	—	07-1005	07-1006
RE02-07-1469	02-600363	18.5–20.5	QBO	07-1007	07-1006	07-1007	07-1007	—	07-1007	07-1007	07-1006	07-1005	07-1006	07-1007	07-1005	—	—	07-1005	07-1006
RE02-07-1472	02-600364	0–0.5	SOIL	07-401	07-400	07-401	07-401	—	07-401	07-401	07-400	07-399	07-400	07-401	07-399	—	—	—	07-400
RE02-07-1473	02-600364	4.5–6.5	QAL	07-559	07-558	07-559	07-559	—	07-559	07-559	07-558	07-557	07-558	07-559	07-557	—	—	07-557	07-558
RE02-07-1475	02-600364	9.5–15	QAL	07-559	07-558	07-559	07-559	—	07-559	07-559	07-558	07-557	07-558	07-559	07-557	—	—	07-557	07-558
RE02-07-1474	02-600364	15–20	QBO	07-559	07-558	07-559	07-559	—	07-559	07-559	07-558	07-557	07-558	07-559	07-557	—	—	07-557	07-558
RE02-07-1477	02-600365	0–0.5	SOIL	07-401	07-400	07-401	07-401	—	07-401	07-401	07-400	07-399	07-400	07-401	07-399	—	—	—	07-400
RE02-07-1478	02-600365	4.5–7	QAL	07-540	07-540	07-540	07-540	—	07-540	07-540	07-540	07-540	07-540	07-540	07-540	—	—	07-540	07-540
RE02-07-1480	02-600365	9.5–11.4	QAL	07-534	07-534	07-534	07-534	—	07-534	07-534	07-534	07-534	07-534	07-534	07-534	—	—	07-534	07-534
RE02-07-1479	02-600365	17.5–20	QBO	07-534	07-534	07-534	07-534	—	07-534	07-534	07-534	07-534	07-534	07-534	07-534	—	—	07-534	07-534
RE02-07-1482	02-600366	0–0.5	SOIL	07-616	07-615	07-616	07-616	—	07-616	07-616	07-615	07-614	07-615	07-616	07-614	—	—	—	07-615
RE02-07-1483	02-600366	4.5–9	QAL	07-963	07-963	07-963	07-963	—	07-963	07-963	07-963	07-963	07-963	07-963	07-963	—	—	07-963	07-963
RE02-07-1485	02-600366	9–14	QAL	07-975	07-974	07-975	07-975	—	07-975	07-975	07-974	07-973	07-974	07-975	07-973	—	—	07-973	07-974
RE02-07-1484	02-600366	14–19	QBO	07-975	07-974	07-975	07-975	—	07-975	07-975	07-974	07-973	07-974	07-975	07-973	—	—	07-973	07-974
RE02-07-1486	02-600367	0–0.5	SED	07-401	07-400	07-401	07-401	—	07-401	07-401	07-400	07-399	07-400	07-401	07-399	—	—	—	07-400
RE02-10-21859	02-612374	5–6	SOIL	—	—	—	10-4797	—	10-4797	10-4797	10-4797	10-4797	—	10-4797	10-4797	—	10-4797	—	—
RE02-10-21860	02-612374	15–16	QBO	—	—	—	10-4797	—	10-4797	10-4797	10-4797	10-4797	—	10-4797	10-4797	—	10-4797	—	—
RE02-10-21861	02-612374	25–26	QBO	—	—	—	10-4809	—	10-4809	10-4809	10-4809	10-4808	—	10-4809	10-4808	—	10-4808	—	—
RE02-10-21862	02-612374	35–36	QBO	—	—	—	10-4809	—	10-4809	10-4809	10-4809	10-4808	—	10-4809	10-4808	—	10-4808	—	—
RE02-10-21863	02-612374	49–50	QBO	—	—	—	10-4809	—	10-4809	10-4809	10-4809	10-4808	—	10-4809	10-4808	—	10-4808	—	—

[a] — = Analysis not requested.

[b] Analytical request number.

Table 6.16-2
Inorganic Chemicals Detected or Detected above BVs at SWMU 02-006(b)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**1900**	**2.6**	**na[b]**	**3.96**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**1**	**4.59**	**40**
Sediment BV[a]				**15400**	**0.83**	**3.98**	**127**	**0.4**	**4420**	**10.5**	**na**	**11.2**	**13800**	**19.7**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**	**19.7**	**60.2**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**na**	**14.7**	**21500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**na**	**505[d]**	**72.1**	**51,900**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**na**	**281[d]**	**40.2**	**24,800**	**434,000**	**1110**	**14,800**	**186**	**15,800**	**991,000**	**434**	**3100**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**70.5**	**na**	**96[d]**	**3.05**	**3130**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**394**	**23500**
CA02-00-0157	02-01094	0–0.5	SED	—[f]	—	—	—	—	—	—	NA[g]	—	—	31	—	0.84 (J-)	—	NA	—	0.4	—	—	140
CA02-00-0161	02-01251	0–0.5	SED	—	—	—	—	—	—	—	NA	—	—	28 (J+)	—	0.54	—	NA	—	0.533	1.7	—	110 (J+)
RE02-03-51812	02-22345	3.5–4	SOIL	—	—	—	—	—	—	—	0.158 (J-)	—	—	3970 (J)	—	—	—	NA	—	—	—	—	—
RE02-07-1407	02-600351	0–0.5	SOIL	—	—	—	—	0.531 (U)	—	—	NA	—	—	—	—	2.63	—	2.29	—	—	—	—	—
RE02-07-1408	02-600351	4.5–6.9	QAL	—	—	—	—	0.528 (U)	—	25.8	NA	—	—	103	—	—	—	—	—	1.58 (U)	—	—	—
RE02-07-1410	02-600351	9.5–14.5	QAL	—	—	—	—	0.566 (U)	—	29	NA	—	—	—	—	—	—	—	—	1.7 (U)	—	—	—
RE02-07-1409	02-600351	17–22.5	QBO	8190	—	1.79 (U)	—	0.595 (U)	—	12.5 (U)	NA	—	6040	—	221	—	2.06 (U)	—	—	1.79 (U)	—	—	—
RE02-07-1412	02-600352	0–0.5	SOIL	—	—	—	—	0.488 (U)	—	—	NA	—	—	—	—	0.553	—	1.17	—	—	—	—	—
RE02-07-1413	02-600352	4.5–9	QAL	—	—	—	—	0.542 (U)	—	—	NA	—	—	43	—	—	—	—	—	1.62 (U)	—	—	—
RE02-07-1415	02-600352	9–15	QAL	—	—	—	—	0.56 (U)	—	35.4	NA	—	—	—	—	—	—	—	—	1.68 (U)	—	—	—
RE02-07-1414	02-600352	18.5–21	QBO	11000 (J+)	—	0.849 (U)	31.5	0.583 (U)	—	4.73	NA	—	6110	—	295 (J+)	—	—	—	—	1.75 (U)	—	—	—
RE02-07-1417	02-600353	0–0.5	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	0.503	—	1.26	0.00135 (J)	—	—	—	—
RE02-07-1418	02-600353	4.5–9	QAL	—	—	—	—	0.562 (U)	—	—	NA	—	—	—	—	—	—	25.8	0.000871 (J)	1.69 (U)	—	—	—
RE02-07-1420	02-600353	9–14	QAL	—	—	—	—	0.568 (U)	—	—	NA	—	—	—	—	0.115	—	1.14	—	—	—	—	—
RE02-07-1419	02-600353	19–22	QBO	6270 (J+)	—	1.23 (J)	—	0.624 (U)	—	4.4	NA	—	6140	—	251	—	—	—	—	8.55	—	—	—
RE02-07-1422	02-600354	0–0.5	SOIL	—	—	—	—	2	—	—	NA	—	—	—	—	0.742	—	—	0.000516 (J)	1.53 (U)	—	—	52.2
RE02-07-1423	02-600354	4.5–9	QAL	—	—	—	—	0.545 (U)	—	—	NA	—	—	—	—	—	—	8.11	0.000601 (J)	—	—	—	—
RE02-07-1425	02-600354	9–14	QAL	—	—	—	—	0.556 (U)	—	—	NA	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1424	02-600354	14–19	QBO	9650 (J+)	—	1.74 (U)	55.3	0.578 (U)	—	16.3 (J)	NA	—	6600	—	221	—	2.09	—	—	0.826 (J)	—	—	—
RE02-07-1427	02-600355	0–0.5	SOIL	—	—	—	—	1.44	—	—	NA	—	—	—	—	0.246	—	0.8 (J)	—	—	—	—	59.6
RE02-07-1428	02-600355	4.5–9	QAL	—	—	—	—	0.553 (U)	—	—	NA	—	—	—	—	—	—	5.9	—	—	—	—	—
RE02-07-1429	02-600355	9–15	QBO	5480 (J+)	—	0.902 (J)	31.1	0.574 (U)	—	7.19 (J)	NA	—	6540	—	268	—	—	—	—	0.883 (J)	—	4.99	—
RE02-07-1432	02-600356	0–0.5	SOIL	—	—	—	—	0.764	—	—	NA	—	—	—	—	0.467	—	—	—	—	—	—	—
RE02-07-1433	02-600356	4.5–9	QAL	—	—	—	—	0.549 (U)	11000 (J)	—	NA	—	—	—	—	0.401	—	6.85	0.000747 (J)	—	—	—	54.6
RE02-07-1437	02-600357	0–0.5	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	0.464	—	0.826 (J)	—	1.53 (U)	—	—	—
RE02-07-1438	02-600357	4.5–9	QAL	—	—	—	—	0.56 (U)	35200 (J+)	—	NA	—	—	—	—	0.194	—	8.25 (J-)	0.00169 (J)	—	—	—	—

Table 6.16-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**1900**	**2.6**	**na[b]**	**3.96**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**1**	**4.59**	**40**
Sediment BV[a]				**15400**	**0.83**	**3.98**	**127**	**0.4**	**4420**	**10.5**	**na**	**11.2**	**13800**	**19.7**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**	**19.7**	**60.2**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**na**	**14.7**	**21500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**na**	**505[d]**	**72.1**	**51,900**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**na**	**281[d]**	**40.2**	**24,800**	**434,000**	**1110**	**14,800**	**186**	**15,800**	**991,000**	**434**	**3100**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**70.5**	**na**	**96[d]**	**3.05**	**3130**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**394**	**23500**
RE02-07-1440	02-600357	14–17	QAL	—	—	—	—	0.572 (U)	—	—	NA	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1439	02-600357	17–19	QBO	9840 (J+)	0.508 (UJ)	1.88 (U)	26.2 (J+)	0.626 (U)	—	4.73	NA	—	6010	—	201 (J+)	—	—	—	—	1.24 (J)	—	—	—
RE02-07-1442	02-600358	0–0.5	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	0.302	—	1.6	0.00073 (J)	—	—	—	62.7
RE02-07-1443	02-600358	4.5–9	QAL	—	—	—	—	0.557 (U)	—	—	NA	—	—	—	—	0.471	—	8.37 (J-)	0.0104	1.67 (U)	—	—	—
RE02-07-1445	02-600358	9–14	QAL	—	—	—	—	0.57 (U)	—	—	NA	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1444	02-600358	14–19	QBO	13200 (J+)	—	1.15 (J)	92.1 (J+)	0.624 (U)	—	7.12	NA	4.62	8630	—	548 (J+)	—	4.26	—	—	0.772 (J)	—	6	—
RE02-07-1447	02-600359	0–0.5	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	0.194	—	—	—	—	—	—	—
RE02-07-1448	02-600359	4.5–9	QAL	—	—	—	—	0.555 (U)	—	—	NA	—	—	—	—	0.209	—	8.42 (J-)	—	—	—	—	84.8
RE02-07-1450	02-600359	9–14	QAL	—	—	—	—	0.566 (U)	—	39.5	NA	—	—	—	—	—	—	1.13 (J-)	—	—	—	—	—
RE02-07-1449	02-600359	20–22	QBO	6820 (J+)	0.526 (UJ)	1.98 (U)	—	0.662 (U)	—	9.12	NA	—	8360 (J)	—	215 (J)	—	—	—	—	0.778 (J)	—	—	—
RE02-07-1452	02-600360	0–0.5	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	0.722	—	1.05	—	—	—	—	—
RE02-07-1453	02-600360	4.5–9	QAL	—	—	—	—	0.532 (U)	26100 (J+)	—	NA	—	—	—	—	—	—	4.12	0.0015 (J)	—	—	—	—
RE02-07-1454	02-600360	9–14	QBO	8960	—	1.71 (U)	47.1 (J+)	0.568 (U)	—	—	NA	4.58	7330	—	249 (J+)	—	2.03	—	—	0.999 (J)	—	7.24	—
RE02-07-1457	02-600361	0–0.5	SOIL	—	—	—	—	0.516	—	—	NA	—	—	—	—	0.454	—	1.58	—	—	—	—	52.3 (J+)
RE02-07-1458	02-600361	4.5–7.5	QAL	—	—	—	—	0.542 (U)	26000 (J+)	—	NA	—	—	—	—	0.175	—	—	0.00232	1.58 (J)	—	—	52.4
RE02-07-1460	02-600361	8.5–13.5	QAL	—	—	—	—	0.525 (U)	—	—	NA	—	—	—	—	—	—	1.72	—	—	—	—	—
RE02-07-1459	02-600361	18.5–21	QBO	5900	—	1.82 (U)	—	0.606 (U)	—	—	NA	—	5870	—	—	—	—	—	—	0.996 (J)	—	—	—
RE02-07-1462	02-600362	0–0.5	SOIL	—	—	—	—	0.406 (J)	—	—	NA	—	—	—	—	0.53	—	1.39	—	—	—	—	55.8 (J+)
RE02-07-1463	02-600362	4.5–9	QAL	—	—	—	—	0.553 (U)	—	—	NA	—	—	—	—	0.168	—	4.26 (J-)	—	1.58 (J)	—	—	—
RE02-07-1465	02-600362	9–14	QAL	—	—	—	—	0.566 (U)	—	—	NA	—	—	—	—	0.108	—	—	—	—	—	—	—
RE02-07-1464	02-600362	14–19	QBO	8760 (J+)	—	1.74 (J)	50.3	0.605 (U)	—	28.8	NA	5.42 (J)	8260 (J)	—	380 (J)	—	—	—	—	1.5 (J)	—	7.66	—
RE02-07-1467	02-600363	0–0.5	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	1.52	—	1.38	—	—	—	—	—
RE02-07-1468	02-600363	4.5–8.5	QAL	—	—	—	—	0.562 (U)	—	—	NA	—	—	—	—	—	—	1.26	—	1.69 (U)	—	—	—
RE02-07-1470	02-600363	8.5–18	QAL	—	—	—	—	0.56 (U)	—	—	NA	—	—	—	—	—	—	—	—	1.68 (U)	—	—	—
RE02-07-1469	02-600363	18.5–20.5	QBO	6160 (J+)	0.531 (U)	0.718 (U)	—	0.663 (U)	—	11.9	NA	—	4960	—	217 (J+)	—	2.11	—	—	0.814 (J)	—	—	—
RE02-07-1472	02-600364	0–0.5	SOIL	—	—	—	—	0.52 (U)	—	—	NA	—	—	—	—	6.04	—	—	—	—	—	—	—
RE02-07-1473	02-600364	4.5–6.5	QAL	—	—	—	—	0.523 (U)	—	—	NA	—	—	—	—	—	—	3.2	—	—	—	—	—
RE02-07-1475	02-600364	9.5–15	QAL	—	—	—	—	0.601 (U)	—	—	NA	—	—	—	—	—	—	—	—	1.8 (U)	—	—	—
RE02-07-1474	02-600364	15–20	QBO	10500	—	0.882 (J)	—	0.591 (U)	—	8.9 (U)	NA	—	6140	—	221	—	2.99 (U)	—	—	1.77 (U)	—	—	—

Table 6.16-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**1900**	**2.6**	**na[b]**	**3.96**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**1**	**4.59**	**40**
Sediment BV[a]				**15400**	**0.83**	**3.98**	**127**	**0.4**	**4420**	**10.5**	**na**	**11.2**	**13800**	**19.7**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**	**19.7**	**60.2**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**na**	**14.7**	**21500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**na**	**505[d]**	**72.1**	**51,900**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**na**	**281[d]**	**40.2**	**24,800**	**434,000**	**1110**	**14,800**	**186**	**15,800**	**991,000**	**434**	**3100**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**70.5**	**na**	**96[d]**	**3.05**	**3130**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**394**	**23500**
RE02-07-1477	02-600365	0–0.5	SOIL	—	—	—	—	0.542 (U)	—	—	NA	—	—	—	—	1.33	—	1.81	—	—	—	—	—
RE02-07-1478	02-600365	4.5–7	QAL	—	—	—	—	0.528 (U)	—	—	NA	—	—	—	—	—	—	2.65 (J-)	—	—	—	—	—
RE02-07-1480	02-600365	9.5–11.4	QAL	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	—	—	1.99	—	—	87.6
RE02-07-1479	02-600365	17.5–20	QBO	9420	—	1.87	59.5	0.583 (U)	—	10.5 (U)	NA	—	7030	—	312	—	4.46 (U)	—	—	1.21 (J)	—	7.59	—
RE02-07-1482	02-600366	0–0.5	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	0.619	—	—	—	—	—	—	—
RE02-07-1483	02-600366	4.5–9	QAL	—	—	—	—	0.531 (U)	13900 (J)	—	NA	—	—	—	—	0.193	—	8.47	0.000893 (J)	—	—	—	—
RE02-07-1485	02-600366	9–14	QAL	—	—	—	—	0.556 (U)	—	—	NA	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1484	02-600366	14–19	QBO	4000 (J+)	—	0.611 (J)	26.4 (J+)	0.609 (U)	—	10.3	NA	—	7250	—	—	—	2.57	—	0.0115	1.25 (J)	—	7.79	—
RE02-07-1486	02-600367	0–0.5	SED	—	—	—	—	0.523 (U)	—	—	NA	—	—	—	—	0.179	—	1.55	—	0.842 (J)	—	—	—
RE02-10-21859	02-612374	5–6	SOIL	—	—	—	—	0.512 (U)	—	—	NA	—	—	—	—	—	—	NA	NA	—	—	—	—
RE02-10-21860	02-612374	15–16	QBO	7300	1.37 (U)	0.896 (J)	53.4	0.683 (U)	—	6.35	NA	—	8890	—	283	—	3.08	NA	NA	1.32 (U)	—	10.3	—
RE02-10-21861	02-612374	25–26	QBO	—	1.12 (U)	1.29 (U)	—	0.562 (U)	—	—	NA	—	5560	—	216 (J-)	—	—	NA	NA	1.29 (U)	—	—	—
RE02-10-21862	02-612374	35–36	QBO	—	—	1.21 (U)	—	0.617 (U)	—	—	NA	—	5100	—	—	—	—	NA	NA	1.21 (U)	—	—	—
RE02-10-21863	02-612374	49–50	QBO	—	0.539 (J)	1.25 (U)	—	0.648 (U)	—	—	NA	—	5890	—	213 (J-)	—	—	NA	NA	1.25 (U)	—	—	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 6.16-3
Organic Chemicals Detected at SWMU 02-006(b)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1242	Aroclor-1248	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	Carbon disulfide
Industrial SSL[a]				**50,500**	**959,000**	**253,000**	**10.9**	**10.7**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**1830**	**8470**
Recreational SSL[c]				**17,300**	**505,000**	**863,000**	**10.3**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**888**	**1770**	**34,000**
Residential SSL[a]				**3480**	**66,300**	**17,400**	**2.22**	**2.22**	**1.12**	**2.22**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**380**	**1540**
CA02-00-0157	02-01094	0–0.5	SED	—[d]	—	—	—	—	—	1	—	—	0.12 (J)	—	0.12 (J)	—	—
CA02-00-0161	02-01251	0–0.5	SED	—	—	—	—	—	—	0.56	0.21 (J)	0.23 (J)	0.2 (J)	0.19 (J)	0.21 (J)	—	0.004 (J)
RE02-03-51812	02-22345	3.5–4	SOIL	0.0172 (J)	NA[e]	0.139	NA	NA	NA	NA	—	0.301 (J)	0.615 (J)	—	—	0.109 (J)	—
RE02-03-51813	02-22345	5–5.5	SOIL	—	NA	—	NA	NA	NA	NA	—	—	—	—	—	0.0982 (J)	—
RE02-07-1407	02-600351	0–0.5	SOIL	0.0218 (J)	NA	0.0335 (J)	—	—	—	0.0626	—	0.0978 (J)	0.141 (J)	0.0612 (J)	—	—	—
RE02-07-1408	02-600351	4.5–6.9	QAL	0.0433	—	0.0775	—	—	0.0047	0.0034 (J)	0.113	0.178	0.148	—	—	—	—
RE02-07-1410	02-600351	9.5–14.5	QAL	—	—	—	—	—	0.0088 (J)	0.0124 (J)	—	0.292	0.0465 (J)	—	—	—	—
RE02-07-1409	02-600351	17–22.5	QBO	—	—	—	—	—	—	—	—	0.0963	—	—	—	—	—
RE02-07-1412	02-600352	0–0.5	SOIL	—	NA	0.0282 (J)	—	—	—	0.037	0.178	0.163	0.291	—	—	—	—
RE02-07-1413	02-600352	4.5–9	QAL	0.302	—	0.363	—	—	0.0033 (J)	—	0.454	0.558	0.703	0.259	—	—	—
RE02-07-1415	02-600352	9–15	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1414	02-600352	18.5–21	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1417	02-600353	0–0.5	SOIL	0.0539	NA	0.0784	—	—	—	0.0856	0.14	0.169	0.259	0.0714	—	—	—
RE02-07-1418	02-600353	4.5–9	QAL	0.0738	—	0.117	—	—	0.012	—	0.192	0.184	0.219	0.193	0.11	—	—
RE02-07-1419	02-600353	19–22	QBO	—	—	—	—	—	—	0.0023 (J)	—	—	—	—	—	—	—
RE02-07-1422	02-600354	0–0.5	SOIL	0.4	NA	0.613	—	—	—	0.117	0.977	1.13	1.55	0.526	—	—	—
RE02-07-1423	02-600354	4.5–9	QAL	0.0718	—	0.109	—	—	0.0109	0.0078	0.224	0.264 (J)	0.304 (J)	0.149 (J)	0.183 (J)	—	—
RE02-07-1425	02-600354	9–14	QAL	—	—	—	—	0.0287	—	—	—	—	—	—	—	—	—
RE02-07-1427	02-600355	0–0.5	SOIL	0.285	NA	0.821	—	—	—	0.0347	1.4	1.51	1.75	0.446	—	—	—
RE02-07-1428	02-600355	4.5–9	QAL	0.0596	—	0.098	—	—	—	—	0.18	0.218	0.252	0.122	0.104	—	—
RE02-07-1432	02-600356	0–0.5	SOIL	0.134	NA	0.235	—	—	—	0.0992	0.415	0.53	0.822	0.204	—	—	—
RE02-07-1433	02-600356	4.5–9	QAL	0.0164 (J)	—	0.0222 (J)	—	—	0.0353 (J)	0.0195 (J)	0.0628 (J)	0.0723 (J)	0.0792 (J)	0.0445 (J)	—	—	—
RE02-07-1437	02-600357	0–0.5	SOIL	0.175	NA	0.261	—	—	—	0.0636	0.416	0.485	0.547	0.211	—	—	—
RE02-07-1438	02-600357	4.5–9	QAL	0.0325 (J)	—	0.0428	—	—	0.0245 (J)	—	0.0966	0.076 (J)	0.127 (J)	0.0996 (J)	0.0546 (J)	—	—
RE02-07-1440	02-600357	14–17	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1439	02-600357	17–19	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1442	02-600358	0–0.5	SOIL	0.142	NA	0.231	—	—	—	0.225	0.407	0.47	0.692	0.194	—	—	—
RE02-07-1443	02-600358	4.5–9	QAL	—	—	—	—	—	0.234	0.0914	—	0.061	0.0256 (J)	—	—	—	—

Table 6.16-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1242	Aroclor-1248	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	Carbon disulfide
Industrial SSL[a]				**50,500**	**959,000**	**253,000**	**10.9**	**10.7**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**1830**	**8470**
Recreational SSL[c]				**17,300**	**505,000**	**863,000**	**10.3**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**888**	**1770**	**34,000**
Residential SSL[a]				**3480**	**66,300**	**17,400**	**2.22**	**2.22**	**1.12**	**2.22**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**380**	**1540**
RE02-07-1445	02-600358	9–14	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1447	02-600359	0–0.5	SOIL	0.06	NA	0.0998	—	—	—	0.0983	0.196	0.264	0.426	0.101	—	—	—
RE02-07-1448	02-600359	4.5–9	QAL	—	—	0.0153 (J)	—	—	0.0498	0.0407	0.0399	—	0.0588	—	—	—	—
RE02-07-1450	02-600359	9–14	QAL	—	—	—	—	—	0.003 (J)	0.0027 (J)	—	—	—	—	—	—	—
RE02-07-1452	02-600360	0–0.5	SOIL	0.0172 (J)	NA	0.0277 (J)	—	—	—	0.11	0.0715	0.0817	0.136	—	—	—	—
RE02-07-1453	02-600360	4.5–9	QAL	0.234	0.00434 (J)	0.422	—	—	0.0245	0.0441	0.687	0.791 (J)	0.969 (J)	0.393 (J)	0.432 (J)	—	—
RE02-07-1457	02-600361	0–0.5	SOIL	0.0258 (J)	NA	0.038	—	—	0.0526	0.11	0.0925	0.104	0.118	0.0873	0.0583	—	—
RE02-07-1458	02-600361	4.5–7.5	QAL	0.252 (J-)	—	0.449 (J-)	—	—	0.0336 (J)	0.0354 (J)	0.671 (J-)	0.768 (J)	0.924 (J)	0.37 (J)	0.462 (J)	—	—
RE02-07-1460	02-600361	8.5–13.5	QAL	—	—	—	—	—	—	0.0014 (J)	—	—	—	—	—	—	—
RE02-07-1462	02-600362	0–0.5	SOIL	0.213	NA	0.0382	—	—	0.0782 (J)	0.106 (J-)	0.0985	0.118	0.144	0.0793	0.0733	—	—
RE02-07-1463	02-600362	4.5–9	QAL	0.0277 (J)	—	0.0661	—	—	0.0121	0.0059	0.151	0.157	0.188	0.0764	—	—	—
RE02-07-1464	02-600362	14–19	QBO	—	—	—	0.0151	—	0.00691	0.0031 (J)	—	—	—	—	—	—	—
RE02-07-1467	02-600363	0–0.5	SOIL	0.0222 (J)	NA	0.0693	—	—	0.04	0.0631	0.295	0.241	0.284	0.138	0.154	—	—
RE02-07-1468	02-600363	4.5–8.5	QAL	—	—	—	—	—	—	0.0037 (J)	—	—	—	—	—	—	—
RE02-07-1470	02-600363	8.5–18	QAL	—	—	—	—	—	—	0.0024 (J)	—	—	—	—	—	—	—
RE02-07-1472	02-600364	0–0.5	SOIL	—	NA	0.0117 (J)	—	—	—	0.0229 (J)	—	0.066 (J)	0.101 (J)	0.0573 (J)	—	—	—
RE02-07-1473	02-600364	4.5–6.5	QAL	0.023 (J)	—	—	—	—	0.0014 (J)	—	—	0.085	0.0106 (J)	—	—	—	—
RE02-07-1477	02-600365	0–0.5	SOIL	—	NA	0.0185 (J)	—	—	—	0.115	—	0.0473	0.0623	0.0252 (J)	—	—	—
RE02-07-1478	02-600365	4.5–7	QAL	—	—	—	—	—	—	0.0051	—	0.0357 (J)	0.044	0.0155 (J)	—	—	—
RE02-07-1480	02-600365	9.5–11.4	QAL	—	—	—	—	—	—	0.0021 (J)	—	—	—	—	—	—	—
RE02-07-1479	02-600365	17.5–20	QBO	—	—	—	—	—	—	0.0023 (J)	—	—	—	—	—	—	—
RE02-07-1482	02-600366	0–0.5	SOIL	0.517	NA	0.74	—	—	—	0.0655	1.15	1.36 (J)	2.1 (J)	0.462 (J)	—	—	—
RE02-07-1483	02-600366	4.5–9	QAL	0.364	—	0.518	—	—	0.0072 (J)	0.0065 (J)	0.817	0.891 (J)	1.02 (J)	0.449 (J)	—	—	—
RE02-07-1486	02-600367	0–0.5	SED	—	NA	—	—	—	—	0.0138 (J)	—	0.0696 (J)	0.107 (J)	0.0489 (J)	—	—	—
RE02-10-21859	02-612374	5–6	SOIL	—	NA	—	—	—	0.0027 (J)	0.0019 (J)	—	—	—	—	—	—	—
RE02-10-21860	02-612374	15–16	QBO	—	NA	—	—	—	—	0.0027 (J)	—	—	—	—	—	—	—

Table 6.16-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Chrysene	Dibenz(a,h)anthracene	Dibenzofuran	Dichlorobenzene[1,4-]	Diethylphthalate	Di-n-butylphthalate	Ethylbenzene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methyl-2-pentanone[4-]	Methylene Chloride
Industrial SSL[a]				**3230**	**3.23**	**1000[f]**	**6730**	**733,000**	**92,600**	**365**	**33,700**	**33,700**	**32.3**	**14,900[g]**	**73,300**	**5110**
Recreational SSL[c]				**8880**	**8.88**	**489**	**263,000**	**32,800**	**32,800**	**1930**	**11,500**	**11,500**	**88.8**	**52,700[g]**	**62,300**	**3610**
Residential SSL[a]				**153**	**0.153**	**73[f]**	**1290**	**49,300**	**6160**	**74.5**	**2320**	**2320**	**1.53**	**3210[g]**	**5950**	**409**
CA02-00-0157	02-01094	0–0.5	SED	0.15 (J)	—	—	—	0.37 (J)	—	—	0.21 (J)	—	—	—	—	—
CA02-00-0161	02-01251	0–0.5	SED	0.29 (J)	—	—	—	—	—	—	0.49 (J)	—	0.16 (J)	—	—	—
RE02-03-51812	02-22345	3.5–4	SOIL	0.363	—	0.0269 (J)	—	—	—	NA	0.809	0.0657	—	NA	NA	NA
RE02-03-51813	02-22345	5–5.5	SOIL	—	—	—	—	—	—	NA	0.0518	0.005 (J)	—	NA	NA	NA
RE02-07-1407	02-600351	0–0.5	SOIL	0.0875	—	—	—	—	—	NA	0.128	0.0175 (J)	0.0441 (J)	NA	NA	NA
RE02-07-1408	02-600351	4.5–6.9	QAL	0.0899	—	—	—	—	—	—	0.189	0.0499	0.107	—	—	—
RE02-07-1410	02-600351	9.5–14.5	QAL	—	—	—	—	—	—	—	0.0626 (J)	—	—	—	—	—
RE02-07-1409	02-600351	17–22.5	QBO	—	—	—	—	—	—	—	0.0143 (J)	—	—	—	—	—
RE02-07-1412	02-600352	0–0.5	SOIL	0.192	—	—	—	—	—	NA	0.252	—	0.0576 (J)	NA	NA	NA
RE02-07-1413	02-600352	4.5–9	QAL	0.492	—	0.184 (J)	—	—	—	—	1.04	0.272	0.241	—	—	—
RE02-07-1415	02-600352	9–15	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1414	02-600352	18.5–21	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1417	02-600353	0–0.5	SOIL	0.152	—	—	—	—	—	NA	0.296	0.0444	0.0681	NA	NA	NA
RE02-07-1418	02-600353	4.5–9	QAL	0.205	—	—	—	—	—	—	0.398	0.0627	0.208	—	—	—
RE02-07-1419	02-600353	19–22	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1422	02-600354	0–0.5	SOIL	0.937	—	0.234 (J)	—	—	—	NA	1.94	0.362	0.501	NA	NA	NA
RE02-07-1423	02-600354	4.5–9	QAL	0.233	—	—	—	—	0.0407 (J)	—	0.512	0.0594	0.129 (J)	—	—	—
RE02-07-1425	02-600354	9–14	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1427	02-600355	0–0.5	SOIL	1.3	—	0.132 (J)	—	—	—	NA	2.52	0.306	0.464	NA	NA	NA
RE02-07-1428	02-600355	4.5–9	QAL	0.191	—	—	—	—	—	—	0.328	0.0544	0.115	—	—	—
RE02-07-1432	02-600356	0–0.5	SOIL	0.474	—	0.0704 (J)	—	—	—	NA	0.894	0.111	0.208	NA	NA	NA
RE02-07-1433	02-600356	4.5–9	QAL	0.073 (J)	—	—	—	—	—	—	0.136	0.0129 (J)	0.0454 (J)	—	—	—
RE02-07-1437	02-600357	0–0.5	SOIL	0.421	—	0.102 (J)	—	—	—	NA	0.848	0.153	0.227	NA	NA	NA
RE02-07-1438	02-600357	4.5–9	QAL	0.112	—	—	—	—	—	—	0.263	0.0272 (J)	0.122 (J)	—	—	—
RE02-07-1440	02-600357	14–17	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1439	02-600357	17–19	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1442	02-600358	0–0.5	SOIL	0.399	—	0.0858 (J)	—	—	—	NA	0.828	0.13	0.201	NA	NA	NA
RE02-07-1443	02-600358	4.5–9	QAL	0.0199 (J)	—	—	—	—	—	0.000276 (J)	0.0406	—	—	—	0.01	—
RE02-07-1445	02-600358	9–14	QAL	—	—	—	—	—	0.155 (J)	—	—	—	—	—	—	—
RE02-07-1447	02-600359	0–0.5	SOIL	0.215	—	—	—	—	—	NA	0.394	0.0561	0.107	NA	NA	NA
RE02-07-1448	02-600359	4.5–9	QAL	0.0345 (J)	—	—	—	—	—	—	0.064	—	—	—	—	—

Table 6.16-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Chrysene	Dibenz(a,h)anthracene	Dibenzofuran	Dichlorobenzene[1,4-]	Diethylphthalate	Di-n-butylphthalate	Ethylbenzene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methyl-2-pentanone[4-]	Methylene Chloride
Industrial SSL[a]				**3230**	**3.23**	**1000[f]**	**6730**	**733,000**	**92,600**	**365**	**33,700**	**33,700**	**32.3**	**14,900[g]**	**73,300**	**5110**
Recreational SSL[c]				**8880**	**8.88**	**489**	**263,000**	**32,800**	**32,800**	**1930**	**11,500**	**11,500**	**88.8**	**52,700[g]**	**62,300**	**3610**
Residential SSL[a]				**153**	**0.153**	**73[f]**	**1290**	**49,300**	**6160**	**74.5**	**2320**	**2320**	**1.53**	**3210[g]**	**5950**	**409**
RE02-07-1450	02-600359	9–14	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1452	02-600360	0–0.5	SOIL	0.0807	—	—	—	—	—	NA	0.141	0.0158 (J)	0.0367	NA	NA	NA
RE02-07-1453	02-600360	4.5–9	QAL	0.718	0.194 (J)	0.165 (J)	0.000282 (J)	—	—	—	1.66	0.237	0.389 (J)	0.000507 (J)	—	—
RE02-07-1457	02-600361	0–0.5	SOIL	0.0957	—	—	—	—	0.0343 (J)	NA	0.163	0.0175 (J)	0.0732	NA	NA	NA
RE02-07-1458	02-600361	4.5–7.5	QAL	0.747 (J-)	0.188 (J)	0.178 (J-)	—	—	—	—	1.68 (J-)	0.243 (J-)	0.407 (J)	—	—	—
RE02-07-1460	02-600361	8.5–13.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1462	02-600362	0–0.5	SOIL	0.106	—	—	—	—	—	NA	0.193	0.0205 (J)	0.0764	NA	NA	NA
RE02-07-1463	02-600362	4.5–9	QAL	0.151	—	—	—	—	—	—	0.263	0.0281 (J)	0.0712	—	—	—
RE02-07-1464	02-600362	14–19	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1467	02-600363	0–0.5	SOIL	0.321	—	—	—	—	0.0356 (J)	NA	0.481	0.016 (J)	0.109	NA	NA	NA
RE02-07-1468	02-600363	4.5–8.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1470	02-600363	8.5–18	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1472	02-600364	0–0.5	SOIL	0.0795 (J)	—	—	—	—	—	NA	0.077	—	0.0361 (J)	NA	NA	NA
RE02-07-1473	02-600364	4.5–6.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1477	02-600365	0–0.5	SOIL	0.0415	—	—	—	—	—	NA	0.0643	—	0.0131 (J)	NA	NA	NA
RE02-07-1478	02-600365	4.5–7	QAL	0.0283 (J)	—	—	—	—	0.0379 (J)	—	0.0459	—	—	—	—	0.003 (J)
RE02-07-1480	02-600365	9.5–11.4	QAL	—	—	—	—	—	—	—	—	—	—	—	—	0.00265 (J)
RE02-07-1479	02-600365	17.5–20	QBO	—	—	—	—	—	—	—	—	—	—	—	—	0.00294 (J)
RE02-07-1482	02-600366	0–0.5	SOIL	1.11	—	0.329 (J)	—	—	—	NA	2.21	0.465	0.468 (J)	NA	NA	NA
RE02-07-1483	02-600366	4.5–9	QAL	0.774	—	0.244 (J)	—	—	—	—	1.82	0.342	0.444 (J)	—	—	—
RE02-07-1486	02-600367	0–0.5	SED	0.0497 (J)	—	—	—	—	—	NA	0.0629	—	0.0346 (J)	NA	NA	NA
RE02-10-21859	02-612374	5–6	SOIL	—	—	—	—	—	—	NA	—	—	—	NA	NA	NA
RE02-10-21860	02-612374	15–16	QBO	—	—	—	—	—	—	NA	—	—	—	NA	NA	NA

Table 6.16-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Styrene	Toluene	TPH-DRO	Trichloroethene	Trichlorofuoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
Industrial SSL[a]				**4100[f]**	**16,800**	**25,300**	**25,300**	**50,900**	**61,400**	**3000[h]**	**36.1**	**5980**	**1800[f]**	**1500[f]**	**3910**	**4240[i]**
Recreational SSL[c]				**3170**	**1930**	**8630**	**8630**	**100,000**	**47,600**	**na[j]**	**157**	**39,600**	**4830**	**4830**	**26,000**	**27,800[i]**
Residential SSL[a]				**310[f]**	**1160**	**1740**	**1740**	**7230**	**5220**	**1000[h]**	**6.72**	**1220**	**270[f]**	**270[f]**	**798**	**863[i]**
CA02-00-0157	02-01094	0–0.5	SED	—	—	—	0.2 (J)	—	—	NA	—	—	—	—	NA	NA
CA02-00-0161	02-01251	0–0.5	SED	—	—	0.26 (J)	0.45 (J)	—	—	NA	—	0.002 (J)	—	—	NA	NA
RE02-03-51812	02-22345	3.5–4	SOIL	—	—	0.693	0.812	NA	NA	NA	NA	—	NA	NA	NA	NA
RE02-03-51813	02-22345	5–5.5	SOIL	—	—	0.0391	0.0422	NA	NA	NA	NA	—	NA	NA	NA	NA
RE02-07-1407	02-600351	0–0.5	SOIL	0.0106 (J)	0.0237 (J)	0.131	0.179	NA	NA	NA	NA	—	NA	NA	NA	NA
RE02-07-1408	02-600351	4.5–6.9	QAL	0.0277 (J)	0.0788	0.243	0.206	—	—	NA	—	—	—	—	—	—
RE02-07-1410	02-600351	9.5–14.5	QAL	—	—	0.0565 (J)	0.0525 (J)	—	—	NA	—	—	—	—	—	—
RE02-07-1409	02-600351	17–22.5	QBO	—	—	0.0141 (J)	—	—	—	NA	—	—	—	—	—	—
RE02-07-1412	02-600352	0–0.5	SOIL	—	—	0.109	0.362	NA	NA	66.7	NA	—	NA	NA	NA	NA
RE02-07-1413	02-600352	4.5–9	QAL	0.22	0.585	1.25	1.19	—	—	9.01	—	—	—	—	—	—
RE02-07-1415	02-600352	9–15	QAL	—	—	—	—	—	—	5.1 (J)	—	—	—	—	—	—
RE02-07-1414	02-600352	18.5–21	QBO	—	—	—	—	—	—	1.99 (J)	—	—	—	—	—	—
RE02-07-1417	02-600353	0–0.5	SOIL	0.027 (J)	0.0711	0.269	0.3	NA	NA	NA	NA	—	NA	NA	NA	NA
RE02-07-1418	02-600353	4.5–9	QAL	0.041	0.104	0.417	0.363	—	—	NA	—	—	—	—	—	—
RE02-07-1419	02-600353	19–22	QBO	—	—	—	—	—	—	NA	—	—	—	—	—	—
RE02-07-1422	02-600354	0–0.5	SOIL	0.218	0.566	1.89	1.88	NA	NA	NA	NA	—	NA	NA	NA	NA
RE02-07-1423	02-600354	4.5–9	QAL	0.0345 (J)	0.0804	0.354	0.467	—	—	NA	—	—	—	—	—	—
RE02-07-1425	02-600354	9–14	QAL	—	—	—	—	—	—	NA	—	—	—	—	—	—
RE02-07-1427	02-600355	0–0.5	SOIL	0.05	0.0919	1.96	2.9	NA	NA	29.5	NA	—	NA	NA	NA	NA
RE02-07-1428	02-600355	4.5–9	QAL	0.0348 (J)	0.0795	0.339	0.351	—	—	12.5 (J)	—	—	—	—	—	—
RE02-07-1432	02-600356	0–0.5	SOIL	0.0582	0.116	0.784	1.02	NA	NA	18.9	NA	—	NA	NA	NA	NA
RE02-07-1433	02-600356	4.5–9	QAL	0.0074 (J)	0.0133 (J)	0.0843	0.149 (J)	—	—	20.7 (J)	—	—	—	—	—	—
RE02-07-1437	02-600357	0–0.5	SOIL	0.104	0.294	0.857	0.938	NA	NA	29.7	NA	—	NA	NA	NA	NA
RE02-07-1438	02-600357	4.5–9	QAL	0.0199 (J)	0.0687	0.171	0.244	—	—	29.9 (J)	—	—	—	—	—	—
RE02-07-1440	02-600357	14–17	QAL	—	—	—	—	—	—	9.35 (J)	—	—	—	—	—	—
RE02-07-1439	02-600357	17–19	QBO	—	—	—	—	—	—	1.65 (J)	—	—	—	—	—	—
RE02-07-1442	02-600358	0–0.5	SOIL	0.0747	0.155	0.79	0.86	NA	NA	NA	NA	—	NA	NA	NA	NA
RE02-07-1443	02-600358	4.5–9	QAL	—	—	0.0296 (J)	0.0387	—	—	NA	—	—	—	—	0.000493 (J)	0.000469 (J)
RE02-07-1445	02-600358	9–14	QAL	—	—	—	—	—	—	NA	—	—	—	—	—	—
RE02-07-1447	02-600359	0–0.5	SOIL	0.0354	0.0742	0.349	0.361	NA	NA	NA	NA	—	NA	NA	NA	NA
RE02-07-1448	02-600359	4.5–9	QAL	—	0.013 (J)	0.056	0.0603	—	—	NA	—	—	—	—	—	—
RE02-07-1450	02-600359	9–14	QAL	—	—	—	—	—	—	NA	—	—	—	—	—	—
RE02-07-1452	02-600360	0–0.5	SOIL	0.0078 (J)	0.0177 (J)	0.108	0.158	NA	NA	12.2 (J)	NA	—	NA	NA	NA	NA
RE02-07-1453	02-600360	4.5–9	QAL	0.139	0.286	1.36	1.41	0.00023 (J)	—	46.8	—	—	0.000293 (J)	0.000234 (J)	—	0.000305 (J)
RE02-07-1457	02-600361	0–0.5	SOIL	0.00892 (J)	0.0175 (J)	0.137	0.188	NA	NA	NA	NA	—	NA	NA	NA	NA
RE02-07-1458	02-600361	4.5–7.5	QAL	0.151 (J-)	0.416 (J-)	1.36 (J-)	1.53 (J-)	—	—	NA	—	—	0.000494 (J)	0.000232 (J)	—	0.000451 (J)

Table 6.16-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Styrene	Toluene	TPH-DRO	Trichloroethene	Trichlorofuoromethane	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
Industrial SSL[a]				**4100[f]**	**16,800**	**25,300**	**25,300**	**50,900**	**61,400**	**3000[h]**	**36.1**	**5980**	**1800[f]**	**1500[f]**	**3910**	**4240[i]**
Recreational SSL[c]				**3170**	**1930**	**8630**	**8630**	**100,000**	**47,600**	**na[j]**	**157**	**39,600**	**4830**	**4830**	**26,000**	**27,800[i]**
Residential SSL[a]				**310[f]**	**1160**	**1740**	**1740**	**7230**	**5220**	**1000[h]**	**6.72**	**1220**	**270[f]**	**270[f]**	**798**	**863[i]**
RE02-07-1460	02-600361	8.5–13.5	QAL	—	—	—	—	—	—	NA	—	—	—	—	—	—
RE02-07-1462	02-600362	0–0.5	SOIL	0.00992 (J)	0.0188 (J)	0.152	0.218	NA	NA	NA	NA	—	NA	NA	NA	NA
RE02-07-1463	02-600362	4.5–9	QAL	0.0166 (J)	0.0367 (J)	0.216	0.243	—	—	NA	—	—	—	—	—	—
RE02-07-1464	02-600362	14–19	QBO	—	—	—	—	—	—	NA	—	—	—	—	—	—
RE02-07-1467	02-600363	0–0.5	SOIL	—	—	0.233	0.78	NA	NA	NA	NA	—	NA	NA	NA	NA
RE02-07-1468	02-600363	4.5–8.5	QAL	—	—	—	—	—	—	NA	—	—	—	—	—	—
RE02-07-1470	02-600363	8.5–18	QAL	—	—	—	—	—	—	NA	—	—	—	—	—	—
RE02-07-1472	02-600364	0–0.5	SOIL	—	—	0.0477	0.122 (J)	NA	NA	NA	NA	—	NA	NA	NA	NA
RE02-07-1473	02-600364	4.5–6.5	QAL	—	—	—	—	—	0.000433 (J)	NA	0.000265 (J)	—	—	—	—	—
RE02-07-1477	02-600365	0–0.5	SOIL	—	0.0128 (J)	0.06	0.0759	NA	NA	NA	NA	—	NA	NA	NA	NA
RE02-07-1478	02-600365	4.5–7	QAL	—	—	0.0258 (J)	0.0432	—	—	NA	—	—	—	—	—	—
RE02-07-1480	02-600365	9.5–11.4	QAL	—	—	—	—	—	—	NA	—	—	—	—	—	—
RE02-07-1479	02-600365	17.5–20	QBO	—	—	—	—	—	—	NA	—	—	—	—	—	—
RE02-07-1482	02-600366	0–0.5	SOIL	0.33	0.799	2.39	2.67	NA	NA	NA	NA	—	NA	NA	NA	NA
RE02-07-1483	02-600366	4.5–9	QAL	0.267	0.72	1.81	1.55	—	—	NA	—	—	—	—	—	—
RE02-07-1486	02-600367	0–0.5	SED	—	—	0.0382	0.0845 (J)	NA	NA	NA	NA	—	NA	NA	NA	NA
RE02-10-21859	02-612374	5–6	SOIL	—	—	—	—	NA	NA	—	NA	—	NA	NA	NA	NA
RE02-10-21860	02-612374	15–16	QBO	—	—	—	—	NA	NA	—	NA	—	NA	NA	NA	NA

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273), unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSLs are from LANL (2017, 602581).

[d] — = Not detected.

[e] NA = Not analyzed.

[f] SSLs are from EPA regional screening tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

[g] Isopropylbenzene used as a surrogate based on structural similarity.

[h] SSL for diesel #2 from NMED (2017, 602273).

[i] Xylene used as a surrogate based on structural similarity.

[j] na = Not available.

Table 6.16-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 02-006(b)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Strontium-90	Tritium	Uranium-234	Uranium-235/236
Qbt 1g, Qct, Qbo BV[a]				**na**[b]	**na**	**na**	**na**	**4**	**0.18**
Sediment BV/FV[a]				**0.9**	**0.068**	**1.04**	**0.093**	**2.59**	**0.2**
Soil BV/FV[a]				**1.65**	**0.054**	**1.31**	**na**	**2.59**	**0.2**
Industrial SAL[c]				**41**	**1200**	**2400**	**2,400,000**	**3100**	**160**
Recreational SAL[c]				**370**	**1300**	**4900**	**5,700,000**	**3900**	**1000**
Residential SAL[c]				**12**	**79**	**15**	**1700**	**290**	**42**
CA02-00-0157	02-01094	0–0.5	SED	—[d]	1.91	—	0.277	7.87	0.278
CA02-00-0161	02-01251	0–0.5	SED	—	2.11	—	—	NA[e]	NA
RE02-03-51812	02-22345	3.5–4	SOIL	1.83	—	0.949	0.156	—	—
RE02-03-51813	02-22345	5–5.5	SOIL	0.169	—	1.29	0.0773	—	—
RE02-07-1408	02-600351	4.5–6.9	QAL	0.632	—	0.653	—	—	—
RE02-07-1410	02-600351	9.5–14.5	QAL	0.214	—	—	—	—	—
RE02-07-1412	02-600352	0–0.5	SOIL	—	—	—	0.00558228	—	—
RE02-07-1413	02-600352	4.5–9	QAL	—	—	—	0.174622	—	—
RE02-07-1415	02-600352	9–15	QAL	—	—	—	0.0580188	—	—
RE02-07-1418	02-600353	4.5–9	QAL	—	—	—	0.533933	—	—
RE02-07-1422	02-600354	0–0.5	SOIL	—	—	—	0.0099814	—	—
RE02-07-1423	02-600354	4.5–9	QAL	—	—	—	0.482857	—	—
RE02-07-1428	02-600355	4.5–9	QAL	—	—	—	0.219756	—	—
RE02-07-1433	02-600356	4.5–9	QAL	—	—	—	0.306667	—	—
RE02-07-1437	02-600357	0–0.5	SOIL	—	—	—	0.00564891	—	—
RE02-07-1438	02-600357	4.5–9	QAL	0.197	—	—	0.536697	—	—
RE02-07-1439	02-600357	17–19	QBO	—	—	—	0.0725337	—	—
RE02-07-1442	02-600358	0–0.5	SOIL	—	—	—	0.00642603	—	—
RE02-07-1443	02-600358	4.5–9	QAL	—	—	—	2.46369	—	—
RE02-07-1445	02-600358	9–14	QAL	—	—	—	0.061993	—	—
RE02-07-1444	02-600358	14–19	QBO	—	—	—	0.152202	—	—
RE02-07-1448	02-600359	4.5–9	QAL	—	—	—	0.150582	—	—
RE02-07-1453	02-600360	4.5–9	QAL	—	—	—	0.0949114	—	—
RE02-07-1457	02-600361	0–0.5	SOIL	—	—	—	0.00576766	—	—
RE02-07-1458	02-600361	4.5–7.5	QAL	0.308	—	—	0.209768	—	—
RE02-07-1463	02-600362	4.5–9	QAL	—	—	—	0.285075	—	—

Table 6.16-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Strontium-90	Tritium	Uranium-234	Uranium-235/236
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**4**	**0.18**
Sediment BV[a]				**0.9**	**0.068**	**1.04**	**0.093**	**2.59**	**0.2**
Soil BV[a]				**1.65**	**0.054**	**1.31**	**na**	**2.59**	**0.2**
Industrial SAL[c]				**41**	**1200**	**2400**	**2,400,000**	**3100**	**160**
Recreational SAL[c]				**370**	**1300**	**4900**	**5,700,000**	**3900**	**1000**
Residential SAL[c]				**12**	**79**	**15**	**1700**	**290**	**42**
RE02-07-1467	02-600363	0–0.5	SOIL	—	—	—	0.00535299	—	—
RE02-07-1470	02-600363	8.5–18	QAL	—	0.0371	—	—	—	—
RE02-07-1469	02-600363	18.5–20.5	QBO	—	—	—	—	—	0.218
RE02-07-1472	02-600364	0–0.5	SOIL	—	—	—	0.0073817	—	—
RE02-07-1473	02-600364	4.5–6.5	QAL	—	—	—	0.158302	—	—
RE02-07-1478	02-600365	4.5–7	QAL	—	—	—	0.0897425	—	—
RE02-07-1480	02-600365	9.5–11.4	QAL	—	0.117	—	—	—	—
RE02-07-1479	02-600365	17.5–20	QBO	—	0.0968	—	—	—	—
RE02-07-1482	02-600366	0–0.5	SOIL	—	—	—	0.00350391	—	—
RE02-07-1483	02-600366	4.5–9	QAL	—	—	—	0.331111	—	—
RE02-07-1485	02-600366	9–14	QAL	—	—	—	0.0325006	—	—
RE02-07-1484	02-600366	14–19	QBO	—	—	—	0.0639426	—	—
RE02-07-1486	02-600367	0–0.5	SED	—	0.146	—	—	—	—
RE02-10-21859	02-612374	5–6	SOIL	NA	—	—	0.362727	—	—

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SALs are from LANL (2015, 600929).

[d] — = Not detected.

[e] NA = Not analyzed.

Table 6.17-1
Samples Collected and Analyses Requested at AOC 02-006(c)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	TPH-DRO	VOCs	Cyanide (Total)
RE02-07-2618	02-600585	0–0.5	SOIL	07-976[a]	07-976	07-976	07-976	07-976	07-976	07-976	07-976	07-976	07-976	07-976	07-976	—[b]	—	07-976
RE02-07-2619	02-600585	4.5–9	QAL	07-985	07-984	07-985	07-985	07-984	07-985	07-985	07-984	07-983	07-984	07-985	07-983	—	07-983	07-984
RE02-07-2621	02-600585	9–14	QAL	07-985	07-984	07-985	07-985	07-984	07-985	07-985	07-984	07-983	07-984	07-985	07-983	—	07-983	07-984
RE02-07-2622	02-600586	0–0.5	SOIL	07-976	07-976	07-976	07-976	07-976	07-976	07-976	07-976	07-976	07-976	07-976	07-976	—	—	07-976
RE02-07-2623	02-600586	4.5–9	QAL	07-985	07-984	07-985	07-985	07-984	07-985	07-985	07-984	07-983	07-984	07-985	07-983	—	07-983	07-984
RE02-07-2625	02-600586	9–14	QAL	07-985	07-984	07-985	07-985	07-984	07-985	07-985	07-984	07-983	07-984	07-985	07-983	—	07-983	07-984
RE02-07-2624	02-600586	14–19	QBO	07-996	07-996	07-996	07-996	07-996	07-996	07-996	07-996	07-996	07-996	07-996	07-996	—	07-996	07-996
RE02-07-2626	02-600587	0–0.5	SOIL	07-776	07-776	07-776	07-776	07-776	07-776	07-776	07-776	07-776	07-776	07-776	07-776	—	—	07-776
RE02-07-2628	02-600587	12.5–18	QBO	07-950	07-949	07-950	07-950	07-949	07-950	07-950	07-949	07-948	07-949	07-950	07-948	—	07-948	07-949
RE02-07-2630	02-600588	0–0.5	SOIL	07-360	07-360	07-360	07-360	07-360	07-360	07-360	07-360	07-360	07-360	07-360	07-360	07-360	—	07-360
RE02-07-2631	02-600588	4.5–10	QAL	07-950	07-949	07-950	07-950	07-949	07-950	07-950	07-949	07-948	07-949	07-950	07-948	07-948	07-948	07-949
RE02-07-2633	02-600588	11.5–13	QAL	07-950	07-949	07-950	07-950	07-949	07-950	07-950	07-949	07-948	07-949	07-950	07-948	07-948	07-948	07-949
RE02-07-2634	02-600589	0–0.5	SOIL	07-383	07-383	07-383	07-383	07-383	07-383	07-383	07-383	07-383	07-383	07-383	07-383	07-383	—	07-383
RE02-07-2635	02-600589	4.5–9.5	QAL	07-950	07-949	07-950	07-950	07-949	07-950	07-950	07-949	07-948	07-949	07-950	07-948	07-948	07-948	07-949
RE02-07-2637	02-600589	9.5–13	QAL	07-950	07-949	07-950	07-950	07-949	07-950	07-950	07-949	07-948	07-949	07-950	07-948	07-948	07-948	07-949
RE02-07-2638	02-600590	0–0.5	SOIL	07-604	07-604	07-604	07-604	07-604	07-604	07-604	07-604	07-604	07-604	07-604	07-604	—	—	07-604
RE02-07-2639	02-600590	4.5–7.2	QAL	07-645	07-645	07-645	07-645	07-645	07-645	07-645	07-645	07-644	07-645	07-645	07-644	—	07-644	07-645
RE02-07-2641	02-600590	9.5–11.7	QAL	07-645	07-645	07-645	07-645	07-645	07-645	07-645	07-645	07-644	07-645	07-645	07-644	—	07-644	07-645
RE02-07-2640	02-600590	14.5–16.9	QBO	07-645	07-645	07-645	07-645	07-645	07-645	07-645	07-645	07-644	07-645	07-645	07-644	—	07-644	07-645
RE02-07-2642	02-600591	0–0.5	SOIL	07-776	07-776	07-776	07-776	07-776	07-776	07-776	07-776	07-776	07-776	07-776	07-776	—	—	07-776
RE02-07-2643	02-600591	4.5–9	QAL	07-856	07-856	07-856	07-856	07-856	07-856	07-856	07-856	07-856	07-856	07-856	07-856	—	07-856	07-856
RE02-07-2644	02-600591	14–19	QBO	07-856	07-856	07-856	07-856	07-856	07-856	07-856	07-856	07-856	07-856	07-856	07-856	—	07-856	07-856
RE02-10-21742	02-612345	5–6	QAL	—	—	10-4320	10-4320	10-4321	10-4320	10-4320	10-4321	10-4320	—	—	10-4320	10-4320	—	—
RE02-10-21743	02-612345	15–16	QAL	—	—	10-4320	10-4320	10-4321	10-4320	10-4320	10-4321	10-4320	—	—	10-4320	10-4320	—	—
RE02-10-21744	02-612345	25–26	QBO	—	—	10-4320	10-4320	10-4321	10-4320	10-4320	10-4321	10-4320	—	—	10-4320	10-4320	—	—
RE02-10-21745	02-612345	35–36	QBO	—	—	10-4320	10-4320	10-4321	10-4320	10-4320	10-4321	10-4320	—	—	10-4320	10-4320	—	—
RE02-10-21746	02-612345	49–50	QBO	—	—	10-4320	10-4320	10-4321	10-4320	10-4320	10-4321	10-4320	—	—	10-4320	10-4320	—	—
RE02-10-22178	02-612463	5–6	SOIL	10-4216	—	10-4216	10-4216	10-4216	—	10-4216	10-4216	10-4216	—	10-4216	—	—	—	—
RE02-10-22179	02-612463	15–16	QBO	10-4216	—	10-4216	10-4216	10-4216	—	10-4216	10-4216	10-4216	—	10-4216	—	—	—	—
RE02-10-22180	02-612463	25–27	QBO	10-4250	—	10-4250	10-4250	10-4249	—	10-4250	10-4249	10-4249	—	10-4250	—	—	—	—
RE02-10-22181	02-612463	35–36	QBO	10-4250	—	10-4250	10-4250	10-4249	—	10-4250	10-4249	10-4249	—	10-4250	—	—	—	—
RE02-10-22182	02-612463	49–50	QBO	10-4250	—	10-4250	10-4250	10-4249	—	10-4250	10-4249	10-4249	—	10-4250	—	—	—	—

[a] Analytical request number.
[b] — = Analysis not requested.

Table 6.17-2
Inorganic Chemicals Detected or Detected above BVs at AOC 02-006(c)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**1900**	**2.6**	**na[b]**	**3.96**	**3700**	**13.5**	**739**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**4.59**	**40**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**na**	**14.7**	**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**na**	**505[d]**	**72.1**	**51,900**	**908,000**	**800**	**na**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**na**	**281[d]**	**40.2**	**24,800**	**434,000**	**1110**	**na**	**14,800**	**186**	**15,800**	**991,000**	**434**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**70.5**	**na**	**96[d]**	**3.05**	**3130**	**54,800**	**400**	**na**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**394**	**23500**
RE02-07-2618	02-600585	0–0.5	SOIL	—[f]	—	—	—	—	—	—	—	—	—	—	—	—	0.362	—	2.33 (J-)	—	—	—	54.4
RE02-07-2619	02-600585	4.5–9	QAL	—	—	—	—	0.539 (U)	—	—	—	—	—	—	—	—	0.132	—	6.52	0.00132 (J)	—	—	—
RE02-07-2621	02-600585	9–14	QAL	—	—	—	—	0.569 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2622	02-600586	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	0.378	—	2.23 (J-)	—	—	—	59.7
RE02-07-2623	02-600586	4.5–9	QAL	—	—	—	—	0.572 (U)	—	—	—	—	—	—	—	—	—	—	6.67	0.00162 (J)	—	—	—
RE02-07-2625	02-600586	9–14	QAL	—	—	—	—	0.554 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2624	02-600586	14–19	QBO	7760	—	1.94 (U)	56.9	0.567 (U)	—	15.6	—	—	7440	—	—	287	—	2.14	—	—	0.678 (J)	6.39	—
RE02-07-2626	02-600587	0–0.5	SOIL	—	—	—	—	0.515 (U)	9020 (J+)	—	—	15	—	—	—	—	1.36 (J)	—	1.12	—	—	—	53.4
RE02-07-2628	02-600587	12.5–18	QBO	10,300	—	1.96	51.5	0.61 (U)	—	28.6	0.313	6.27 (U)	6510 (J-)	—	—	299	—	4.18	—	—	1.43 (J)	—	—
RE02-07-2630	02-600588	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	1.08 (J)	—	1.29 (J-)	—	1.56 (U)	—	57.3
RE02-07-2631	02-600588	4.5–10	QAL	—	—	—	—	0.53 (U)	—	25.4	0.0845 (J)	—	—	—	—	—	—	—	1.71	—	1.59 (U)	—	—
RE02-07-2633	02-600588	11.5–13	QAL	—	—	—	—	0.578 (U)	—	27.1	0.365	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2634	02-600589	0–0.5	SOIL	—	—	—	—	—	—	—	0.0733 (J)	—	—	—	—	—	0.183	—	—	—	—	—	—
RE02-07-2635	02-600589	4.5–9.5	QAL	—	—	—	—	0.53 (U)	—	45.7	0.214	—	—	—	—	—	—	—	1.29	—	—	—	—
RE02-07-2637	02-600589	9.5–13	QAL	—	—	—	—	0.554 (U)	—	—	0.0964 (J)	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2638	02-600590	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	0.369	—	3.59 (J+)	—	—	—	—
RE02-07-2639	02-600590	4.5–7.2	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.6 (U)	—	—
RE02-07-2641	02-600590	9.5–11.7	QAL	—	—	—	—	—	—	40.3	—	—	—	—	—	—	—	—	1.26 (J-)	—	—	—	—
RE02-07-2640	02-600590	14.5–16.9	QBO	10,200	—	2.35	39.4	—	—	105	—	4.08	6840	—	—	264	—	22.4	—	—	1.75 (U)	—	—
RE02-07-2642	02-600591	0–0.5	SOIL	—	—	—	—	0.499 (U)	—	—	—	—	—	—	—	—	0.208 (J)	—	—	0.00242	—	—	—
RE02-07-2643	02-600591	4.5–9	QAL	—	—	—	—	0.527 (U)	—	—	0.0302 (J)	—	—	—	—	—	—	—	—	—	2.3	—	—
RE02-07-2644	02-600591	14–19	QBO	12,700	—	1.52 (J)	38.1 (U)	0.596 (U)	—	6.5 (U)	0.0663 (J)	—	5880	—	—	199 (U)	—	2.04 (U)	—	—	1.84	—	—
RE02-10-21742	02-612345	5–6	QAL	—	1.09 (U)	—	—	0.543 (U)	—	—	—	—	—	44.2	—	—	—	—	NA[g]	NA	—	—	92.7
RE02-10-21743	02-612345	15–16	QAL	—	1.11 (U)	—	—	0.557 (U)	—	—	0.316 (J)	—	—	—	—	—	—	—	NA	NA	—	—	—
RE02-10-21744	02-612345	25–26	QBO	4480	1.29 (U)	1.27 (U)	—	0.646 (U)	—	3.28	—	—	6390	—	—	271	—	—	NA	NA	1.27 (U)	—	—
RE02-10-21745	02-612345	35–36	QBO	—	1.4 (U)	1.34 (U)	—	0.699 (U)	—	5.24	—	—	6290	—	—	279	—	—	NA	NA	1.34 (U)	—	—
RE02-10-21746	02-612345	49–50	QBO	—	1.32 (U)	—	—	0.662 (U)	—	4.88	—	—	8580	—	1570 (J-)	355	—	—	NA	NA	1.35 (U)	5.75	—

Table 6.17-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**1900**	**2.6**	**na[b]**	**3.96**	**3700**	**13.5**	**739**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**4.59**	**40**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**na**	**14.7**	**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**na**	**505[d]**	**72.1**	**51,900**	**908,000**	**800**	**na**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**na**	**281[d]**	**40.2**	**24,800**	**434,000**	**1110**	**na**	**14,800**	**186**	**15,800**	**991,000**	**434**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**70.5**	**na**	**96[d]**	**3.05**	**3130**	**54,800**	**400**	**na**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**394**	**23500**
RE02-10-22178	02-612463	5–6	SOIL	—	1.03 (U)	—	—	0.516 (U)	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—
RE02-10-22179	02-612463	15–16	QBO	—	5.73 (U)	1.34	48.7	0.573 (U)	—	404	0.337 (J)	7.89	10700	—	—	838	—	—	NA	NA	1.18 (U)	15.1	—
RE02-10-22180	02-612463	25–27	QBO	8070	1.26 (U)	1.28 (U)	—	0.632 (U)	—	—	—	—	6080	—	—	200 (J+)	—	—	NA	NA	1.28 (U)	—	—
RE02-10-22181	02-612463	35–36	QBO	6990	1.23 (U)	1.29 (U)	—	0.614 (U)	—	—	—	—	5940	—	—	—	—	—	NA	NA	1.29 (U)	—	—
RE02-10-22182	02-612463	49–50	QBO	4590	1.3 (U)	1.26 (U)	—	0.648 (U)	—	2.93	—	—	6330	—	—	203 (J+)	—	—	NA	NA	1.26 (U)	—	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 6.17-3
Organic Chemicals Detected at AOC 02-006(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	Benzo(k)fluoranthene	Chrysene
Industrial SSL[a]				**50,500**	**253,000**	**10.9**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300**[b]	**323**	**3230**
Recreational SSL[c]				**17,300**	**863,000**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630**[b]	**888**	**8880**
Residential SSL[a]				**3480**	**17,400**	**2.22**	**1.12**	**2.22**	**1.53**	**1.12**	**1.53**	**1740**[b]	**15.3**	**153**
RE02-07-2618	02-600585	0–0.5	SOIL	0.0566	0.0992	—[d]	—	0.104	0.203	0.238	0.333	0.142	—	0.226
RE02-07-2619	02-600585	4.5–9	QAL	0.0241 (J)	0.0391	0.0128 (J)	0.0166 (J)	0.0212	0.113	0.101	0.162	0.0479	—	0.107
RE02-07-2622	02-600586	0–0.5	SOIL	0.0245 (J)	0.0359 (J)	—	0.0316 (J)	0.0351 (J)	0.108	0.123	0.181	0.0804	—	0.12
RE02-07-2623	02-600586	4.5–9	QAL	—	0.00951 (J)	—	—	—	0.0275 (J)	0.0211 (J)	0.0219 (J)	0.0115 (J)	—	0.0191 (J)
RE02-07-2625	02-600586	9–14	QAL	—	—	—	—	0.0013 (J)	—	—	—	—	—	—
RE02-07-2626	02-600587	0–0.5	SOIL	0.0321 (J)	0.049	—	0.118	0.169	0.213	—	0.365 (J)	—	—	0.212
RE02-07-2628	02-600587	12.5–18	QBO	—	—	—	0.00394 (J)	0.0061	—	—	—	—	—	—
RE02-07-2630	02-600588	0–0.5	SOIL	—	0.011 (J)	—	0.0412	0.041	—	—	0.0439	—	—	0.0288 (J)
RE02-07-2631	02-600588	4.5–10	QAL	—	—	—	—	0.0026 (J-)	—	—	—	—	—	—
RE02-07-2633	02-600588	11.5–13	QAL	—	—	—	0.0067 (J)	0.0046 (J)	—	—	—	—	—	—
RE02-07-2634	02-600589	0–0.5	SOIL	—	—	—	—	0.0241 (J)	—	—	—	—	—	—
RE02-07-2635	02-600589	4.5–9.5	QAL	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2637	02-600589	9.5–13	QAL	—	—	—	—	0.0034 (J)	—	—	—	—	—	—
RE02-07-2638	02-600590	0–0.5	SOIL	—	—	—	—	0.019 (J)	—	0.0885	0.0209 (J)	0.0349 (J)	—	0.0175 (J)
RE02-07-2639	02-600590	4.5–7.2	QAL	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2641	02-600590	9.5–11.7	QAL	—	—	—	—	0.0014 (J)	—	—	—	—	—	—
RE02-07-2640	02-600590	14.5–16.9	QBO	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2642	02-600591	0–0.5	SOIL	—	—	—	—	0.0242 (J)	—	—	0.112 (J)	—	0.0428 (J)	0.0665
RE02-07-2643	02-600591	4.5–9	QAL	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2644	02-600591	14–19	QBO	—	—	—	—	0.0017 (J)	—	—	—	—	—	—
RE02-10-21742	02-612345	5–6	QAL	—	0.0334 (J)	—	—	—	0.0634	0.0899	0.0838	0.0756 (J)	0.042	0.0616
RE02-10-21743	02-612345	15–16	QAL	—	—	—	—	—	—	—	—	—	—	—
RE02-10-21744	02-612345	25–26	QBO	—	—	—	—	—	—	—	—	—	—	—
RE02-10-21745	02-612345	35–36	QBO	—	—	—	—	—	—	—	—	—	—	—
RE02-10-21746	02-612345	49–50	QBO	—	—	—	—	—	—	—	—	—	—	—

Table 6.17-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Di-n-butylphthalate	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Toluene	TPH-DRO
Industrial SSL[a]				**91,600**	**33,700**	**33,700**	**32.3**	**5110**	**4100**	**16,800**	**25,300**	**25,300**	**61,400**	**3000[e]**
Recreational SSL[c]				**32,800**	**11,500**	**11,500**	**88.8**	**3610**	**3170**	**1930**	**8630**	**8630**	**47,600**	**na[f]**
Residential SSL[a]				**6160**	**2320**	**2320**	**1.53**	**409**	**310**	**1160**	**1740**	**1740**	**5220**	**1000[e]**
RE02-07-2618	02-600585	0–0.5	SOIL	—	0.398	0.0482	0.132	NA[g]	0.0259 (J)	0.054	0.333	0.357	NA	NA
RE02-07-2619	02-600585	4.5–9	QAL	—	0.219	0.0202 (J)	0.046	—	0.011 (J)	0.0295 (J)	0.144	0.205	—	NA
RE02-07-2622	02-600586	0–0.5	SOIL	—	0.194	0.0203 (J)	0.0718	NA	0.0101 (J)	0.0197 (J)	0.156	0.182	NA	NA
RE02-07-2623	02-600586	4.5–9	QAL	—	0.0396	—	—	—	—	—	0.0306 (J)	0.0333 (J)	—	NA
RE02-07-2625	02-600586	9–14	QAL	—	—	—	—	—	—	—	—	—	—	NA
RE02-07-2626	02-600587	0–0.5	SOIL	—	0.347	0.0241 (J)	—	NA	0.00717 (J)	0.0114 (J)	0.233	0.557	NA	NA
RE02-07-2628	02-600587	12.5–18	QBO	—	0.0154 (J)	—	—	0.00272 (J)	—	—	—	—	—	NA
RE02-07-2630	02-600588	0–0.5	SOIL	—	0.0523	—	—	NA	—	—	0.0415	0.0604	NA	13.9 (J)
RE02-07-2631	02-600588	4.5–10	QAL	—	—	—	—	—	—	—	—	—	0.00037 (J)	—
RE02-07-2633	02-600588	11.5–13	QAL	0.121 (J)	—	—	—	—	—	—	—	—	—	3.95 (J)
RE02-07-2634	02-600589	0–0.5	SOIL	—	—	—	—	NA	—	—	—	0.0227 (J)	NA	3.93
RE02-07-2635	02-600589	4.5–9.5	QAL	—	—	—	—	—	—	—	—	—	—	1.39 (J)
RE02-07-2637	02-600589	9.5–13	QAL	—	—	—	—	0.0023 (J)	—	—	—	—	—	—
RE02-07-2638	02-600590	0–0.5	SOIL	—	0.0366	—	—	NA	—	—	0.0235 (J)	0.0364	NA	NA
RE02-07-2639	02-600590	4.5–7.2	QAL	0.0451 (J)	0.0129 (J)	—	—	—	—	—	—	0.0124 (J)	—	NA
RE02-07-2641	02-600590	9.5–11.7	QAL	0.0509 (J)	—	—	—	—	—	—	—	—	—	NA
RE02-07-2640	02-600590	14.5–16.9	QBO	0.0509 (J)	—	—	—	—	—	—	—	—	—	NA
RE02-07-2642	02-600591	0–0.5	SOIL	—	0.0799	—	—	NA	—	—	0.0213 (J)	0.0986	NA	NA
RE02-07-2643	02-600591	4.5–9	QAL	0.0522 (J)	—	—	—	—	—	—	—	—	—	NA
RE02-07-2644	02-600591	14–19	QBO	0.0823 (J)	—	—	—	—	—	—	—	—	—	NA
RE02-10-21742	02-612345	5–6	QAL	—	0.109	—	0.0662 (J)	NA	0.0508	0.0378 (J)	0.102	0.0945	NA	537
RE02-10-21743	02-612345	15–16	QAL	—	—	—	—	NA	—	—	—	—	NA	471
RE02-10-21744	02-612345	25–26	QBO	—	—	—	—	NA	—	—	—	—	NA	12.7
RE02-10-21745	02-612345	35–36	QBO	—	—	—	—	NA	—	—	—	—	NA	33.9
RE02-10-21746	02-612345	49–50	QBO	—	—	—	—	NA	—	—	—	—	NA	16.9

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273), unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSLs are from LANL (2017, 602581).

[d] — = Not detected.

[e] SSL for diesel #2 from NMED (2017, 602273).

[f] na = Not available.

[g] NA = Not analyzed.

Table 6.17-4
Radionuclides Detected or Detected above BVs/FVs at AOC 02-006(c)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Strontium-90	Tritium
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**
Soil BV/FV[a]				**1.65**	**0.054**	**1.31**	**na**
Industrial SAL[c]				**41**	**1200**	**2400**	**2,400,000**
Recreational SAL[c]				**370**	**1300**	**4900**	**5,700,000**
Residential SAL[c]				**12**	**79**	**15**	**1700**
RE02-07-2619	02-600585	4.5–9	QAL	—[d]	—	—	0.413378
RE02-07-2621	02-600585	9–14	QAL	—	—	—	0.0436009
RE02-07-2623	02-600586	4.5–9	QAL	—	—	—	0.505982
RE02-07-2630	02-600588	0–0.5	SOIL	—	—	—	0.0162282
RE02-07-2631	02-600588	4.5–10	QAL	—	—	—	0.0496574 (J-)
RE02-07-2634	02-600589	0–0.5	SOIL	4.95	—	1.76	—
RE02-07-2635	02-600589	4.5–9.5	QAL	—	—	0.222	0.0279391 (J-)
RE02-07-2638	02-600590	0–0.5	SOIL	16.9	0.112	3.86	—
RE02-07-2639	02-600590	4.5–7.2	QAL	10.2	—	2.76	0.0166
RE02-07-2641	02-600590	9.5–11.7	QAL	—	—	—	0.0234916
RE02-10-21742	02-612345	5–6	QAL	0.135	0.0318	NA[e]	0.0869655
RE02-10-21743	02-612345	15–16	QAL	—	—	NA	0.0291951
RE02-10-21744	02-612345	25–26	QBO	—	—	NA	0.0843243
RE02-10-21745	02-612345	35–36	QBO	—	—	NA	0.0827463
RE02-10-21746	02-612345	49–50	QBO	—	—	NA	0.0907536
RE02-10-22178	02-612463	5–6	SOIL	0.158	NA	—	—
RE02-10-22182	02-612463	49–50	QBO	—	NA	—	0.0822838

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SALs are from LANL (2015, 600929).

[d] — = Not detected.

[e] NA = Not analyzed.

Table 6.19-1
Samples Collected and Analyses Requested at AOC 02-006(e)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
CA02-00-0155	02-01095	0–0.5	SED	—[a]	7548R[b]	7550R	7550R	—	7550R	7550R	7547R, 7549R	7546R	—	7550R	7546R	—	7546R	—
CA02-00-0156	02-01095	1.9–2.2	SED	—	7548R	7550R	7550R	—	7550R	7550R	7547R, 7549R	7546R	—	7550R	7546R	—	7546R	—
CA02-00-0162	02-01250	0–0.5	SED	—	7569R	7571R	7571R	—	7571R	7571R	7568R, 7570R	—	—	7571R	7567R	—	—	—
RE02-03-51834	02-22356	9–9.5	SOIL	—	—	1818S	1818S	1816S	1818S	1818S	1816S	—	—	1818S	—	1818S	—	—
RE02-03-51835	02-22356	10.5–11	SOIL	—	—	1818S	1818S	1816S	1818S	1818S	1816S	—	—	1818S	—	1818S	—	—
RE02-03-51836	02-22357	5–5.5	SOIL	—	—	1818S	1818S	1816S	1818S	1818S	1816S	—	—	1818S	—	1818S	—	—
RE02-03-51837	02-22357	6.5–7	SOIL	—	—	1818S	1818S	1816S	1818S	1818S	1816S	—	—	1818S	—	1818S	—	—
RE02-03-51838	02-22358	5–5.5	SOIL	—	—	1818S	1818S	1816S	1818S	1818S	1816S	—	—	1818S	—	1818S	—	—
RE02-03-51839	02-22358	6.5–7	SOIL	—	—	1818S	1818S	1816S	1818S	1818S	1816S	—	—	1818S	—	1818S	—	—
RE02-07-1218	02-600282	0–0.5	SOIL	07-398	07-397	07-398	07-398	07-397	07-398	07-398	07-397	07-396	07-397	07-398	07-396	—	—	07-397
RE02-07-1219	02-600282	4.5–7	SOIL	07-500	07-499	07-500	07-500	07-499	07-500	07-500	07-499	07-498	07-499	07-500	07-498	—	07-498	07-499
RE02-07-1222	02-600282	9.5–11.7	SOIL	07-500	07-499	07-500	07-500	07-499	07-500	07-500	07-499	07-498	07-499	07-500	07-498	—	07-498	07-499
RE02-07-1221	02-600282	13–18	QBO	07-500	07-499	07-500	07-500	07-499	07-500	07-500	07-499	07-498	07-499	07-500	07-498	—	07-498	07-499
RE02-07-1223	02-600283	0–0.5	SOIL	07-398	07-397	07-398	07-398	07-397	07-398	07-398	07-397	07-396	07-397	07-398	07-396	—	—	07-397
RE02-07-1224	02-600283	4.5–6.5	SOIL	07-430	07-429	07-430	07-430	07-429	07-430	07-430	07-429	07-428	07-429	07-430	07-428	—	07-428	07-429
RE02-07-1226	02-600283	9–10.2	SOIL	07-455	07-454	07-455	07-455	07-454	07-455	07-455	07-454	07-453	07-454	07-455	07-453	—	07-453	07-454
RE02-07-1225	02-600283	11.8–15.5	QBO	07-455	07-454	07-455	07-455	07-454	07-455	07-455	07-454	07-453	07-454	07-455	07-453	—	07-453	07-454
RE02-07-1228	02-600284	0–0.5	SOIL	07-398	07-397	07-398	07-398	07-397	07-398	07-398	07-397	07-396	07-397	07-398	07-396	—	—	07-397
RE02-07-1229	02-600284	4.5–9	SOIL	07-462	07-461	07-462	07-462	07-461	07-462	07-462	07-461	07-460	07-461	07-462	07-460	—	07-460	07-461
RE02-07-1232	02-600284	9.5–12	SOIL	07-462	07-461	07-462	07-462	07-461	07-462	07-462	07-461	07-460	07-461	07-462	07-460	—	07-460	07-461
RE02-07-1231	02-600284	14.3–16.5	QBO	07-462	07-461	07-462	07-462	07-461	07-462	07-462	07-461	07-460	07-461	07-462	07-460	—	07-460	07-461
RE02-07-1233	02-600285	0–0.5	SOIL	07-382	07-381	07-382	07-382	07-381	07-382	07-382	07-381	07-380	07-381	07-382	07-380	—	—	07-381
RE02-07-1234	02-600285	4.5–5	QAL	07-406	07-405	07-406	07-406	07-405	07-406	07-406	07-405	07-404	07-405	07-406	07-404	—	07-404	07-405
RE02-07-1236	02-600285	14–17	QBO	07-398	07-397	07-398	07-398	07-397	07-398	07-398	07-397	07-396	07-397	07-398	07-396	—	07-396	07-397
RE02-07-1235	02-600285	21–25	QBO	07-406	07-405	07-406	07-406	07-405	07-406	07-406	07-405	07-404	07-405	07-406	07-404	—	07-404	07-405
RE02-07-1238	02-600286	0–0.5	SOIL	07-382	07-381	07-382	07-382	07-381	07-382	07-382	07-381	07-380	07-381	07-382	07-380	—	—	07-381
RE02-07-1239	02-600286	3–5	SOIL	07-406	07-405	07-406	07-406	07-405	07-406	07-406	07-405	07-404	07-405	07-406	07-404	—	07-404	07-405
RE02-07-1240	02-600286	9.5–10	QAL	07-398	07-397	07-398	07-398	07-397	07-398	07-398	07-397	07-396	07-397	07-398	07-396	—	07-396	07-397
RE02-07-1242	02-600286	12.5–16.5	QAL	07-398	07-397	07-398	07-398	07-397	07-398	07-398	07-397	07-396	07-397	07-398	07-396	—	07-396	07-397
RE02-07-1241	02-600286	18.8–19.5	QBO	07-398	07-397	07-398	07-398	07-397	07-398	07-398	07-397	07-396	07-397	07-398	07-396	—	07-396	07-397
RE02-07-1243	02-600287	0–0.5	SOIL	07-398	07-397	07-398	07-398	07-397	07-398	07-398	07-397	07-396	07-397	07-398	07-396	—	—	07-397
RE02-07-1244	02-600287	4.5–7	SOIL	07-496	07-495	07-496	07-496	07-495	07-496	07-496	07-495	07-494	07-495	07-496	07-494	—	07-494	07-495
RE02-07-1246	02-600287	10–14.2	SOIL	07-496	07-495	07-496	07-496	07-495	07-496	07-496	07-495	07-494	07-495	07-496	07-494	—	07-494	07-495

Table 6.19-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
RE02-07-1245	02-600287	14.2–17	QBO	07-496	07-495	07-496	07-496	07-495	07-496	07-496	07-495	07-494	07-495	07-496	07-494	—	07-494	07-495
RE02-07-1248	02-600288	0–0.5	SOIL	07-389	07-388	07-389	07-389	07-388	07-389	07-389	07-388	07-387	07-388	07-389	07-387	—	—	07-388
RE02-07-1249	02-600288	4.5–7	SOIL	07-430	07-429	07-430	07-430	07-429	07-430	07-430	07-429	07-428	07-429	07-430	07-428	—	07-428	07-429
RE02-07-1251	02-600288	8–11	QAL	07-430	07-429	07-430	07-430	07-429	07-430	07-430	07-429	07-428	07-429	07-430	07-428	—	07-428	07-429
RE02-07-1250	02-600288	13–15	QBO	07-430	07-429	07-430	07-430	07-429	07-430	07-430	07-429	07-428	07-429	07-430	07-428	—	07-428	07-429
RE02-07-1253	02-600289	0–0.5	SOIL	07-389	07-388	07-389	07-389	07-388	07-389	07-389	07-388	07-387	07-388	07-389	07-387	—	—	07-388
RE02-07-1254	02-600289	4.5–6.3	QAL	07-413	07-412	07-413	07-413	07-412	07-413	07-413	07-412	07-411	07-412	07-413	07-411	—	07-411	07-412
RE02-07-1255	02-600289	10–14.5	QBO	07-413	07-412	07-413	07-413	07-412	07-413	07-413	07-412	07-411	07-412	07-413	07-411	—	07-411	07-412
RE02-07-1258	02-600290	0–0.5	SOIL	07-398	07-397	07-398	07-398	07-397	07-398	07-398	07-397	07-396	07-397	07-398	07-396	—	—	07-397
RE02-07-1259	02-600290	4.5–6.7	SOIL	07-496	07-495	07-496	07-496	07-495	07-496	07-496	07-495	07-494	07-495	07-496	07-494	—	07-494	07-495
RE02-07-1261	02-600290	9.5–13	SOIL	07-496	07-495	07-496	07-496	07-495	07-496	07-496	07-495	07-494	07-495	07-496	07-494	—	07-494	07-495
RE02-07-1260	02-600290	13.2–18	QBO	07-500	07-499	07-500	07-500	07-499	07-500	07-500	07-499	07-498	07-499	07-500	07-498	—	07-498	07-499
RE02-07-1263	02-600291	0–0.5	SOIL	07-382	07-381	07-382	07-382	07-381	07-382	07-382	07-381	07-380	07-381	07-382	07-380	—	—	07-381
RE02-07-1264	02-600291	4–8	QAL	07-389	07-388	07-389	07-389	07-388	07-389	07-389	07-388	07-387	07-388	07-389	07-387	—	07-387	07-388
RE02-07-1266	02-600291	9–11	QBO	07-389	07-388	07-389	07-389	07-388	07-389	07-389	07-388	07-387	07-388	07-389	07-387	—	07-387	07-388
RE02-07-1265	02-600291	11–16	QBO	07-389	07-388	07-389	07-389	07-388	07-389	07-389	07-388	07-387	07-388	07-389	07-387	—	07-387	07-388
RE02-07-1268	02-600292	0–0.5	SOIL	07-398	07-397	07-398	07-398	07-397	07-398	07-398	07-397	07-396	07-397	07-398	07-396	—	—	07-397
RE02-10-21521	02-612292	5–6	QAL	—	—	10-4706	10-4706	10-4706	10-4706	—	10-4706	10-4706	—	—	10-4706	—	—	—
RE02-10-21522	02-612292	15–16.5	QBO	—	—	10-4706	10-4706	10-4706	10-4706	—	10-4706	10-4706	—	—	10-4706	—	—	—
RE02-10-21523	02-612292	25–26	QBO	—	—	10-4783	10-4783	10-4782	10-4783	—	10-4782	10-4781	—	—	10-4781	—	—	—
RE02-10-21524	02-612292	35–36	QBO	—	—	10-4783	10-4783	10-4782	10-4783	—	10-4782	10-4781	—	—	10-4781	—	—	—
RE02-10-21525	02-612292	49–50	QBO	—	—	10-4788	10-4788	10-4788	10-4788	—	10-4788	10-4788	—	—	10-4788	—	—	—

[a] — = Analysis not requested.

[b] Analytical request number.

Table 6.19-2
Inorganic Chemicals Detected or Detected above BVs at AOC 02-006(e)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**1900**	**2.6**	**na[b]**	**3.96**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**1**	**4.59**	**40**
Sediment BV[a]				**15,400**	**0.83**	**3.98**	**127**	**0.4**	**4420**	**10.5**	**na**	**11.2**	**13,800**	**19.7**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**	**19.7**	**60.2**
Soil BV[a]				**29,200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**na**	**14.7**	**21,500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**na**	**505[d]**	**72.1**	**51,900**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**na**	**281[d]**	**40.2**	**24,800**	**434,000**	**1110**	**14,800**	**186**	**15,800**	**991,000**	**434**	**3100**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**70.5**	**na**	**96[d]**	**3.05**	**3130**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**394**	**23,500**
CA02-00-0155	02-01095	0–0.5	SED	—[f]	—	—	—	—	—	14	NA[g]	12 (J-)	—	110	—	0.43 (J-)	—	NA	—	—	—	—	320
CA02-00-0156	02-01095	1.9–2.2	SED	—	—	—	—	—	—	—	NA	12 (J-)	—	—	—	3.4 (J-)	—	NA	—	—	—	—	110
CA02-00-0162	02-01250	0–0.5	SED	—	—	—	—	—	—	—	NA	—	—	27 (J+)	—	0.45	—	NA	—	0.489	1.4	—	82 (J+)
RE02-03-51834	02-22356	9–9.5	SOIL	—	—	—	—	—	—	—	0.558 (J-)	—	—	—	—	5.03 (J)	—	NA	NA	—	—	—	60.8
RE02-03-51835	02-22356	10.5–11	SOIL	—	—	—	—	—	—	—	0.0712 (J-)	—	—	—	—	17.2 (J)	—	NA	NA	—	—	—	68
RE02-03-51836	02-22357	5–5.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	0.179 (J)	—	NA	NA	—	—	—	—
RE02-03-51837	02-22357	6.5–7	SOIL	—	—	—	—	0.542 (U)	—	—	0.0907 (J-)	—	—	—	—	0.191 (J)	—	NA	NA	—	—	—	—
RE02-03-51838	02-22358	5–5.5	SOIL	—	—	—	—	—	—	—	0.113 (J-)	—	—	—	—	0.684 (J)	—	NA	NA	—	—	—	—
RE02-03-51839	02-22358	6.5–7	SOIL	—	—	—	—	0.515 (U)	—	—	0.0787 (J-)	—	—	—	—	—	—	NA	NA	—	—	—	—
RE02-07-1218	02-600282	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	2.97 (J-)	—	—	—	—	—	—	—
RE02-07-1219	02-600282	4.5–7	SOIL	—	—	—	—	0.539 (U)	—	—	—	—	—	—	—	0.221	—	1.07	—	—	—	—	—
RE02-07-1222	02-600282	9.5–11.7	SOIL	—	—	—	—	0.54 (U)	—	—	—	—	—	—	—	1.87	—	—	—	—	—	—	—
RE02-07-1221	02-600282	13–18	QBO	11,400	0.522 (UJ)	1.84 (J)	26.4	0.649 (U)	—	25 (J)	—	—	5980 (J)	—	275 (J)	—	5.67	—	—	1.95 (U)	—	—	—
RE02-07-1223	02-600283	0–0.5	SOIL	—	—	—	—	0.499 (U)	—	48.2	—	—	—	—	—	4.34 (J-)	—	—	—	—	—	—	—
RE02-07-1224	02-600283	4.5–6.5	SOIL	—	—	—	—	0.521 (U)	—	52.6	—	—	—	—	—	—	—	1.19	—	1.56 (U)	—	—	—
RE02-07-1226	02-600283	9–10.2	SOIL	—	—	—	—	0.464 (J)	—	43.8	1.01	—	—	—	—	—	—	1.34	—	1.87 (U)	—	—	—
RE02-07-1225	02-600283	11.8–15.5	QBO	5150	—	1.2 (J)	—	0.533 (U)	—	10.5	0.212	—	5520	—	—	—	4.28 (J)	1.36	—	1.6 (U)	—	—	—
RE02-07-1228	02-600284	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	1.43 (J-)	—	6.94	0.000559 (J)	1.58 (U)	—	—	—
RE02-07-1229	02-600284	4.5–9	SOIL	—	—	—	—	0.539 (U)	21,000 (J)	—	0.305	—	—	—	—	—	—	3.53	—	1.62 (U)	—	—	—
RE02-07-1232	02-600284	9.5–12	SOIL	—	—	—	—	0.533 (U)	—	—	0.0361 (J)	—	—	—	—	—	—	4.18	—	1.6 (U)	—	—	—
RE02-07-1231	02-600284	14.3–16.5	QBO	13,800	0.53 (UJ)	0.772 (J)	35.8	0.66 (U)	—	7.8	0.0344 (J)	—	7020	—	340	—	—	—	—	1.98 (U)	—	—	—
RE02-07-1233	02-600285	0–0.5	SOIL	—	—	—	—	0.51 (U)	—	—	0.0984 (J)	—	—	—	—	0.417	—	1.52	—	2.04 (U)	—	—	—
RE02-07-1234	02-600285	4.5–5	QAL	—	—	—	—	0.438 (J)	31,600	59.1	0.174	16	—	—	—	—	24.4 (J)	4.23	—	1.66 (U)	—	—	50.5
RE02-07-1236	02-600285	14–17	QBO	7600	0.514 (U)	1.87 (J)	55.6	0.629 (U)	—	30.7	—	3.97	6400	—	400	0.137 (J-)	5.78 (J+)	—	—	0.9 (J)	—	4.62	—
RE02-07-1235	02-600285	21–25	QBO	4790	—	1.81 (U)	—	0.602 (U)	—	3.48	—	—	5070	—	—	—	—	—	—	1.01 (J)	—	—	—
RE02-07-1238	02-600286	0–0.5	SOIL	—	—	—	—	0.518 (U)	—	—	—	—	—	—	—	0.257	—	—	—	—	—	—	54.1
RE02-07-1239	02-600286	3–5	SOIL	—	—	—	—	—	—	—	0.133	—	—	—	—	1.08	—	6.81	—	1.6 (U)	—	—	—
RE02-07-1240	02-600286	9.5–10	QAL	—	—	—	—	—	8570	—	—	—	—	—	—	4.36 (J-)	—	1.11	—	1.58 (U)	—	—	—
RE02-07-1242	02-600286	12.5–16.5	QAL	—	—	—	—	0.554 (U)	—	—	—	—	—	—	—	0.139 (J-)	—	—	—	—	—	—	—
RE02-07-1241	02-600286	18.8–19.5	QBO	6180	—	0.937 (J)	—	0.605 (U)	—	8.99	—	—	6310	—	213	—	—	1.36	—	1.81 (U)	—	—	—

Table 6.19-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**1900**	**2.6**	**na[b]**	**3.96**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**1**	**4.59**	**40**
Sediment BV[a]				**15,400**	**0.83**	**3.98**	**127**	**0.4**	**4420**	**10.5**	**na**	**11.2**	**13,800**	**19.7**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**	**19.7**	**60.2**
Soil BV[a]				**29,200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**na**	**14.7**	**21,500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**na**	**505d**	**72.1**	**51,900**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**na**	**281[d]**	**40.2**	**24,800**	**434,000**	**1110**	**14,800**	**186**	**15,800**	**991,000**	**434**	**3100**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**70.5**	**na**	**96[d]**	**3.05**	**3130**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**394**	**23,500**
RE02-07-1243	02-600287	0–0.5	SOIL	—	—	—	—	0.502 (U)	—	—	—	—	—	—	—	0.514 (J-)	—	1.22	—	—	—	—	—
RE02-07-1244	02-600287	4.5–7	SOIL	—	—	—	—	0.548 (U)	26,500 (J+)	20.1	0.57	—	—	—	—	0.36	—	1.58	—	1.64 (U)	—	—	—
RE02-07-1246	02-600287	10–14.2	SOIL	—	—	—	—	0.542 (U)	14,400 (J+)	—	0.102 (J)	—	—	—	—	—	—	1.78	—	—	—	—	—
RE02-07-1245	02-600287	14.2–17	QBO	18,200	0.517 (UJ)	0.984 (J)	102 (J+)	0.646 (U)	—	3.1	—	—	7080	—	228	—	2.2	1.53	—	1.94 (U)	—	—	—
RE02-07-1248	02-600288	0–0.5	SOIL	—	—	—	—	0.542 (U)	—	—	0.0855 (J)	—	—	—	—	1.74	—	1.83	0.000701 (J)	—	—	—	—
RE02-07-1249	02-600288	4.5–7	SOIL	—	—	—	—	0.538 (U)	—	—	—	—	—	—	—	—	—	1.77	—	—	—	—	—
RE02-07-1251	02-600288	8–11	QAL	—	—	—	—	0.539 (U)	—	25	—	—	—	—	—	—	—	—	—	1.62 (U)	—	—	—
RE02-07-1250	02-600288	13–15	QBO	12,600	—	1.78 (U)	26.4	0.595 (U)	—	10.3	—	—	6430	—	241	—	2.89	—	—	1.78 (U)	—	—	—
RE02-07-1253	02-600289	0–0.5	SOIL	—	—	—	—	0.508 (U)	—	—	0.117	—	—	—	—	1.87	—	1.48	—	—	—	—	—
RE02-07-1254	02-600289	4.5–6.3	QAL	—	—	—	—	0.525 (U)	—	—	—	—	—	—	—	—	—	2.08	0.000658 (J-)	—	—	—	—
RE02-07-1255	02-600289	10–14.5	QBO	8520	—	1.74	30.8 (J-)	0.581 (U)	—	14.1	0.114 (J)	4.78	7820	—	288	—	4.07 (J)	—	—	1.31 (J)	—	6.41	—
RE02-07-1258	02-600290	0–0.5	SOIL	—	—	—	—	0.551 (U)	—	—	—	—	—	—	—	3.51 (J-)	—	5.63	0.000575 (J)	—	—	—	49.5
RE02-07-1259	02-600290	4.5–6.7	SOIL	—	—	—	—	0.52 (U)	—	—	—	—	—	—	—	0.763	—	—	—	—	—	—	—
RE02-07-1261	02-600290	9.5–13	SOIL	—	—	—	—	0.542 (U)	—	—	0.0558 (J)	—	—	—	—	—	—	2.16	—	1.63 (U)	—	—	—
RE02-07-1260	02-600290	13.2–18	QBO	13,500	0.526 (UJ)	1.55 (J)	43	0.648 (U)	—	14.1 (J)	—	—	8910 (J)	—	333 (J)	—	4.03	—	—	1.94 (U)	—	—	—
RE02-07-1263	02-600291	0–0.5	SOIL	—	—	—	—	0.526 (U)	—	—	—	—	—	—	—	1.09	—	—	0.000677 (J)	1.53 (U)	—	—	—
RE02-07-1264	02-600291	4–8	QAL	—	—	—	—	0.532 (U)	—	—	—	—	—	—	—	—	—	1.36	—	—	—	—	—
RE02-07-1266	02-600291	9–11	QBO	—	—	2.7	—	0.528 (U)	—	13.5	0.252	5.23	8810	—	—	0.346	4.3	—	—	1.45 (J)	—	15.4	—
RE02-07-1265	02-600291	11–16	QBO	22,800	0.52 (UJ)	1.75 (J)	113	0.667 (U)	—	10.1	—	4.09	8550	—	396	—	4.3	—	—	1.29 (J)	—	4.61	—
RE02-07-1268	02-600292	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	0.168 (J-)	—	4.95	0.000863 (J)	—	—	—	99.6
RE02-10-21521	02-612292	5–6	QAL	—	1.03 (U)	—	—	0.513 (U)	—	—	—	—	—	—	—	0.576	—	NA	NA	—	—	—	—
RE02-10-21522	02-612292	15–16.5	QBO	10,900	1.26 (U)	—	—	0.63 (U)	—	2.92	0.202 (J)	—	7550	—	215 (J-)	—	—	NA	NA	1.29 (U)	—	—	—
RE02-10-21523	02-612292	25–26	QBO	4450	1.23 (U)	1.28 (U)	—	0.614 (U)	—	—	—	—	5520	—	263	—	—	NA	NA	1.28 (UJ)	—	—	—
RE02-10-21524	02-612292	35–36	QBO	3750	1.3 (U)	1.29 (U)	—	0.651 (U)	—	—	—	—	5870	—	195	—	—	NA	NA	1.29 (UJ)	—	—	—
RE02-10-21525	02-612292	49–50	QBO	—	1.28 (U)	1.29 (U)	—	0.641 (U)	—	—	—	—	5670	—	219	—	—	NA	NA	1.29 (UJ)	—	—	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 6.19-3
Organic Chemicals Detected at AOC 02-006(e)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Anthracene	Aroclor-1242	Aroclor-1248	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	Chloroform	Chrysene	Dibenzofuran
Industrial SSL[a]				**50,500**	**253,000**	**10.9**	**10.7**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**1830**	**28.4**	**3230**	**1000[c]**
Recreational SSL[d]				**17,300**	**863,000**	**10.3**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**888**	**1770**	**204**	**8880**	**489**
Residential SSL[a]				**3480**	**17,400**	**2.22**	**2.22**	**1.12**	**2.22**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**380**	**5.85**	**153**	**73[c]**
CA02-00-0155	02-01095	0–0.5	SED	—[e]	—	—	—	1.3	—	0.11 (J)	0.11 (J)	0.095 (J)	—	0.12 (J)	—	—	0.13 (J)	—
CA02-00-0156	02-01095	1.9–2.2	SED	—	—	—	—	—	0.14	—	—	—	—	—	—	—	—	—
CA02-00-0162	02-01250	0–0.5	SED	—	—	NA[f]	NA	NA	NA	0.59 (J)	0.62 (J)	0.52 (J)	0.42 (J)	0.56 (J)	—	NA	0.83 (J)	—
RE02-07-1218	02-600282	0–0.5	SOIL	—	0.015 (J)	—	—	0.0339 (J)	0.0426	—	0.0935 (J)	0.141 (J)	0.0594 (J)	—	—	NA	0.112	—
RE02-07-1219	02-600282	4.5–7	SOIL	—	—	—	—	—	0.0023 (J)	—	—	—	—	—	—	—	—	—
RE02-07-1222	02-600282	9.5–11.7	SOIL	—	—	—	—	0.0117	0.0115	—	—	—	—	—	—	—	—	—
RE02-07-1223	02-600283	0–0.5	SOIL	—	0.0108 (J)	—	—	—	0.0198 (J)	—	0.0554	0.0717	0.0351	—	—	NA	0.0496	—
RE02-07-1226	02-600283	9–10.2	SOIL	—	—	—	—	—	0.0057	—	—	—	—	—	—	—	—	—
RE02-07-1228	02-600284	0–0.5	SOIL	0.0492	0.0391	—	—	0.0228 (J)	0.0257 (J)	0.153	0.157 (J)	0.257 (J)	0.101 (J)	—	0.0822 (J)	NA	0.172	—
RE02-07-1229	02-600284	4.5–9	SOIL	—	—	—	—	0.0327	0.0122	—	—	—	—	—	—	—	—	—
RE02-07-1232	02-600284	9.5–12	SOIL	—	—	—	—	0.0043	0.0025 (J)	—	—	—	—	—	—	—	—	—
RE02-07-1231	02-600284	14.3–16.5	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1233	02-600285	0–0.5	SOIL	—	0.0163 (J)	—	—	0.0467	0.115	0.0453	—	0.0594 (J)	—	—	—	NA	0.0369	—
RE02-07-1234	02-600285	4.5–5	QAL	0.172	0.278	—	—	—	0.016 (J)	0.312	0.337 (J)	0.509 (J)	0.195 (J)	—	—	—	0.313	0.13 (J)
RE02-07-1235	02-600285	21–25	QBO	—	—	—	—	0.149	0.155	—	—	—	—	—	—	—	—	—
RE02-07-1238	02-600286	0–0.5	SOIL	0.24	0.439	—	—	—	0.0178 (J)	0.637	—	1.34 (J)	0.411 (J)	—	—	NA	0.645	0.165 (J)
RE02-07-1239	02-600286	3–5	SOIL	0.0603	0.0873	—	—	—	0.0188 (J)	—	0.143 (J)	0.205 (J)	0.0781 (J)	—	—	0.000279 (J)	0.118	—
RE02-07-1240	02-600286	9.5–10	QAL	0.0142 (J)	0.0207 (J)	—	—	—	—	—	0.0549	0.0743	0.0229 (J)	—	—	—	0.0591	—
RE02-07-1242	02-600286	12.5–16.5	QAL	—	—	—	—	—	—	—	—	—	—	—	0.134 (J)	—	—	—
RE02-07-1241	02-600286	18.8–19.5	QBO	—	—	—	—	—	—	—	—	—	—	—	0.087 (J)	—	—	—
RE02-07-1243	02-600287	0–0.5	SOIL	—	0.00794 (J)	—	—	—	—	—	0.0292 (J)	0.0387 (J)	—	—	—	NA	0.0307 (J)	—
RE02-07-1244	02-600287	4.5–7	SOIL	—	0.0101 (J)	—	—	0.0146	0.0054 (J)	0.0464	—	0.0851 (J)	—	—	—	—	0.0402	—
RE02-07-1246	02-600287	10–14.2	SOIL	—	—	—	—	—	0.0015 (J)	—	—	—	—	—	—	—	—	—
RE02-07-1248	02-600288	0–0.5	SOIL	0.0337 (J)	0.128	0.0627 (J)	—	0.0409 (J)	0.0313 (J)	0.56	0.39 (J)	0.702 (J)	—	—	—	NA	0.54	—
RE02-07-1249	02-600288	4.5–7	SOIL	—	—	—	—	0.0022 (J)	0.0072	—	—	—	—	—	—	—	—	—
RE02-07-1251	02-600288	8–11	QAL	—	—	—	0.0036 (J)	0.0035 (J)	0.0054	—	—	—	—	—	—	—	—	—
RE02-07-1250	02-600288	13–15	QBO	—	—	—	—	0.002 (J)	0.0054	—	—	—	—	—	—	—	—	—

Table 6.19-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Anthracene	Aroclor-1242	Aroclor-1248	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	Chloroform	Chrysene	Dibenzofuran
Industrial SSL[a]				**50,500**	**253,000**	**10.9**	**10.7**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300**[b]	**323**	**1830**	**28.4**	**3230**	**1000**[c]
Recreational SSL[d]				**17,300**	**863,000**	**10.3**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630**[b]	**888**	**1770**	**204**	**8880**	**489**
Residential SSL[a]				**3480**	**17,400**	**2.22**	**2.22**	**1.12**	**2.22**	**1.53**	**1.12**	**1.53**	**1740**[b]	**15.3**	**380**	**5.85**	**153**	**73**[c]
RE02-07-1253	02-600289	0–0.5	SOIL	—	0.0294 (J)	—	—	—	—	0.13	0.249	0.315	—	—	—	NA	0.152	—
RE02-07-1255	02-600289	10–14.5	QBO	—	—	—	—	—	0.0045	—	—	—	—	—	—	—	—	—
RE02-07-1258	02-600290	0–0.5	SOIL	—	0.00934 (J)	—	0.408 (J)	—	0.0522	0.0567 (J)	0.076 (J)	0.108 (J)	0.0519 (J)	—	—	NA	0.073 (J)	—
RE02-07-1259	02-600290	4.5–6.7	SOIL	—	—	—	—	0.004	0.0069	0.0331 (J)	—	0.0636 (J)	—	—	—	—	0.0371	—
RE02-07-1261	02-600290	9.5–13	SOIL	—	—	—	—	0.0057	0.0123	—	—	—	—	—	—	—	—	—
RE02-07-1260	02-600290	13.2–18	QBO	—	—	—	—	—	0.0022 (J)	—	—	—	—	—	—	—	—	—
RE02-07-1263	02-600291	0–0.5	SOIL	—	—	—	—	—	0.0211 (J)	—	—	—	—	—	—	NA	—	—
RE02-07-1266	02-600291	9–11	QBO	—	—	—	—	0.0068	0.0152	—	—	—	—	—	—	—	—	—
RE02-07-1265	02-600291	11–16	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1268	02-600292	0–0.5	SOIL	0.0232 (J)	0.042	—	—	0.0688	0.105	—	0.256 (J)	0.42 (J)	0.232 (J)	—	—	NA	0.211	—
RE02-10-21521	02-612292	5–6	QAL	—	—	—	—	0.0582	—	0.0293 (J)	0.0282 (J)	0.0369	—	—	—	NA	0.0253 (J)	—
RE02-10-21524	02-612292	35–36	QBO	—	—	—	—	—	—	—	—	—	—	—	0.231 (J)	NA	—	—
RE02-10-21525	02-612292	49–50	QBO	—	—	0.213	—	0.334	0.0377	—	—	—	—	—	—	NA	—	—

Table 6.19-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Dichlorobenzene[1,4-]	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Isopropylbenzene	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Toluene	Xylene[1,3-]+Xylene[1,4-]
Industrial SSL[a]				**6730**	**33,700**	**33,700**	**32.3**	**14,100**	**5110**	**4100[c]**	**16,800**	**25,300**	**25,300**	**61,400**	**4240[g]**
Recreational SSL[d]				**1140**	**11,500**	**11,500**	**88.8**	**42,100**	**3610**	**3170**	**1930**	**8630**	**8630**	**47,600**	**27,800[g]**
Residential SSL[a]				**1290**	**2320**	**2320**	**1.53**	**2350**	**409**	**310[c]**	**1160**	**1740**	**1740**	**5220**	**863[g]**
CA02-00-0155	02-01095	0–0.5	SED	—	0.25 (J)	—	—	—	—	—	—	0.12 (J)	0.23 (J)	—	NA
CA02-00-0156	02-01095	1.9–2.2	SED	—	—	—	—	—	—	—	—	—	—	—	NA
CA02-00-0162	02-01250	0–0.5	SED	—	1.2 (J)	—	0.37 (J)	NA	NA	—	—	0.58 (J)	1.3 (J)	NA	NA
RE02-07-1218	02-600282	0–0.5	SOIL	—	0.126	—	0.0462 (J)	NA	NA	—	—	0.0729	0.178	NA	NA
RE02-07-1219	02-600282	4.5–7	SOIL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1222	02-600282	9.5–11.7	SOIL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1223	02-600283	0–0.5	SOIL	—	0.0654	—	0.0202 (J)	NA	NA	—	—	0.0437	0.0887	NA	NA
RE02-07-1226	02-600283	9–10.2	SOIL	—	—	—	—	—	—	—	—	—	—	—	0.000282 (J)
RE02-07-1228	02-600284	0–0.5	SOIL	—	0.326	0.0359 (J)	0.0781 (J)	NA	NA	0.0165 (J)	0.0435	0.317	0.466	NA	NA
RE02-07-1229	02-600284	4.5–9	SOIL	0.000322 (J)	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1232	02-600284	9.5–12	SOIL	0.000266 (J)	—	—	—	0.000433 (J)	—	—	—	—	—	—	—
RE02-07-1231	02-600284	14.3–16.5	QBO	0.000384 (J)	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1233	02-600285	0–0.5	SOIL	—	0.0721	—	—	NA	NA	—	—	0.0538	0.0754	NA	NA
RE02-07-1234	02-600285	4.5–5	QAL	—	0.643	0.161	0.149 (J)	—	—	0.145	0.415	0.897	0.762	—	—
RE02-07-1235	02-600285	21–25	QBO	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1238	02-600286	0–0.5	SOIL	—	1.34	0.233	0.451 (J)	NA	NA	0.153	0.39	1.38	1.53	NA	NA
RE02-07-1239	02-600286	3–5	SOIL	—	0.212	0.0498	0.0609 (J)	—	—	0.0592	0.165	0.31	0.272	—	—
RE02-07-1240	02-600286	9.5–10	QAL	—	0.114	—	0.0121 (J)	—	—	—	—	0.0689	0.116	—	—
RE02-07-1242	02-600286	12.5–16.5	QAL	—	—	—	—	—	—	—	—	—	0.0133 (J)	—	—
RE02-07-1241	02-600286	18.8–19.5	QBO	—	—	—	—	—	0.00315 (J)	—	—	—	—	—	—
RE02-07-1243	02-600287	0–0.5	SOIL	—	0.0405	—	—	NA	NA	0.0198 (J)	—	0.0415	0.0579 (J)	NA	NA
RE02-07-1244	02-600287	4.5–7	SOIL	—	0.0591	—	—	0.000392 (J)	—	—	—	0.0496	0.0484	0.000522 (J)	—
RE02-07-1246	02-600287	10–14.2	SOIL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1248	02-600288	0–0.5	SOIL	—	1.01	0.0234 (J)	—	NA	NA	—	—	0.462	1.58	NA	NA
RE02-07-1249	02-600288	4.5–7	SOIL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1251	02-600288	8–11	QAL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1250	02-600288	13–15	QBO	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1253	02-600289	0–0.5	SOIL	—	0.201	—	—	NA	NA	—	—	0.133	0.281	NA	NA
RE02-07-1255	02-600289	10–14.5	QBO	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1258	02-600290	0–0.5	SOIL	—	0.0777	—	0.03 (J)	NA	NA	—	—	0.0436	0.106 (J)	NA	NA
RE02-07-1259	02-600290	4.5–6.7	SOIL	—	0.0464	—	—	—	—	—	—	0.0311 (J)	0.0325 (J)	—	—

Table 6.19-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Dichlorobenzene[1,4-]	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Isopropylbenzene	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Toluene	Xylene[1,3-]+Xylene[1,4-]
Industrial SSL[a]				**6730**	**33,700**	**33,700**	**32.3**	**14,100**	**5110**	**4100[c]**	**16,800**	**25,300**	**25,300**	**61,400**	**4240[g]**
Recreational SSL[d]				**1140**	**11,500**	**11,500**	**88.8**	**42,100**	**3610**	**3170**	**1930**	**8630**	**8630**	**47,600**	**27,800[g]**
Residential SSL[a]				**1290**	**2320**	**2320**	**1.53**	**2350**	**409**	**310[c]**	**1160**	**1740**	**1740**	**5220**	**863[g]**
RE02-07-1261	02-600290	9.5–13	SOIL	—	—	—	—	0.000328 (J)	—	—	—	—	—	—	—
RE02-07-1260	02-600290	13.2–18	QBO	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1263	02-600291	0–0.5	SOIL	—	0.0134 (J)	—	—	NA	NA	—	—	—	0.0193 (J)	NA	NA
RE02-07-1266	02-600291	9–11	QBO	—	—	—	—	—	0.00224 (J)	—	—	—	—	—	—
RE02-07-1265	02-600291	11–16	QBO	—	—	—	—	—	0.00456 (J)	—	—	—	—	—	—
RE02-07-1268	02-600292	0–0.5	SOIL	—	0.353	0.0174 (J)	0.151 (J)	NA	NA	—	—	0.213	0.518	NA	NA
RE02-10-21521	02-612292	5–6	QAL	—	0.0347 (J)	—	0.0148 (J)	NA	NA	—	—	0.0235 (J)	0.0597	NA	NA
RE02-10-21524	02-612292	35–36	QBO	—	—	—	—	NA	NA	—	—	—	—	NA	NA
RE02-10-21525	02-612292	49–50	QBO	—	—	—	—	NA	NA	—	—	—	—	NA	NA

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273), unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSLs are from EPA regional screening tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

[d] SSLs are from LANL (2017, 602581).

[e] — = Not detected.

[f] NA = Not analyzed.

[g] Xylene used as a surrogate based on structural similarity.

Table 6.19-4
Radionuclides Detected or Detected above BVs/FVs at AOC 02-006(e)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Cobalt-60	Plutonium-239/240	Tritium	Uranium-235/236
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**0.18**
Sediment BV/FV[a]				**0.9**	**na**	**0.068**	**0.093**	**0.2**
Soil BV/FV[a]				**1.65**	**na**	**0.054**	**na**	**0.2**
Industrial SAL[c]				**41**	**9**	**1200**	**2,400,000**	**160**
Recreational SAL[c]				**370**	**81**	**1300**	**5,700,000**	**1000**
Residential SAL[c]				**12**	**2.6**	**79**	**1700**	**42**
CA02-00-0155	02-01095	0–0.5	SED	—[d]	0.116	1.09	—	—
CA02-00-0156	02-01095	1.9–2.2	SED	—	—	0.456	—	—
CA02-00-0162	02-01250	0–0.5	SED	—	—	1.62	0.293583	—
RE02-03-51834	02-22356	9–9.5	SOIL	0.0847	0.635	0.191	0.0605	—
RE02-03-51835	02-22356	10.5–11	SOIL	0.14	0.192	0.0707	0.0822	—
RE02-03-51836	02-22357	5–5.5	SOIL	—	—	—	0.1	0.292
RE02-03-51837	02-22357	6.5–7	SOIL	—	0.356	—	0.0493	—
RE02-03-51838	02-22358	5–5.5	SOIL	0.0223	0.156	—	0.0546	—
RE02-07-1223	02-600283	0–0.5	SOIL	—	—	—	0.0190008	—
RE02-07-1224	02-600283	4.5–6.5	SOIL	—	—	—	0.0666307	—
RE02-07-1226	02-600283	9–10.2	SOIL	—	—	0.0306	—	—
RE02-07-1228	02-600284	0–0.5	SOIL	—	—	—	0.0290413	—
RE02-07-1229	02-600284	4.5–9	SOIL	—	—	—	0.184202	—
RE02-07-1233	02-600285	0–0.5	SOIL	1.75	—	—	0.0232644	—
RE02-07-1234	02-600285	4.5–5	QAL	—	—	—	0.833098	—
RE02-07-1235	02-600285	21–25	QBO	—	—	—	0.0774242	0.209
RE02-07-1238	02-600286	0–0.5	SOIL	—	—	—	0.0209255	—
RE02-07-1239	02-600286	3–5	SOIL	—	—	—	0.0669667	—
RE02-07-1240	02-600286	9.5–10	QAL	—	0.266	0.0159 (J-)	0.612857	—
RE02-07-1241	02-600286	18.8–19.5	QBO	—	—	—	0.0503762	—
RE02-07-1243	02-600287	0–0.5	SOIL	—	—	—	0.0281602	—
RE02-07-1244	02-600287	4.5–7	SOIL	—	—	—	0.133873	—
RE02-07-1246	02-600287	10–14.2	SOIL	—	—	0.0514	—	—
RE02-07-1248	02-600288	0–0.5	SOIL	—	—	—	0.0240489	—
RE02-07-1249	02-600288	4.5–7	SOIL	—	—	—	0.0354666	—
RE02-07-1251	02-600288	8–11	QAL	—	—	0.0291	—	—

Table 6.19-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Cobalt-60	Plutonium-239/240	Tritium	Uranium-235/236
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**0.18**
Sediment BV[a]				**0.9**	**na**	**0.068**	**0.093**	**0.2**
Soil BV[a]				**1.65**	**na**	**0.054**	**na**	**0.2**
Industrial SAL[c]				**41**	**9**	**1200**	**2,400,000**	**160**
Recreational SAL[c]				**370**	**81**	**1300**	**5,700,000**	**1000**
Residential SAL[c]				**12**	**2.6**	**79**	**1700**	**42**
RE02-07-1253	02-600289	0–0.5	SOIL	—	—	—	0.0123869	—
RE02-07-1254	02-600289	4.5–6.3	QAL	—	—	—	0.0282271	—
RE02-07-1259	02-600290	4.5–6.7	SOIL	—	1.05	0.0552	—	—
RE02-07-1261	02-600290	9.5–13	SOIL	—	—	0.0812	—	—
RE02-07-1264	02-600291	4–8	QAL	—	—	—	0.0269546	—
RE02-07-1266	02-600291	9–11	QBO	—	—	0.0295 (J-)	0.0279421	—
RE02-07-1265	02-600291	11–16	QBO	—	—	—	0.0820723	—
RE02-07-1268	02-600292	0–0.5	SOIL	—	—	0.622 (J-)	0.0287607	—
RE02-10-21521	02-612292	5–6	QAL	—	—	—	0.512085	NA[e]
RE02-10-21523	02-612292	25–26	QBO	—	—	—	0.0853625	NA

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SALs are from LANL (2015, 600929).

[d] — = Not detected.

[e] NA = Not analyzed.

Table 6.20-1
Samples Collected and Analyses Requested at SWMU 02-007

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
RE02-07-2661	02-600592	0–0.5	SOIL	07-698[a]	07-697	07-698	07-698	07-698	07-698	07-697	07-696	07-697	07-698	07-696	—[b]	07-697
RE02-07-2662	02-600592	4.5–8.5	QAL	07-799	07-798	07-799	07-799	07-799	07-799	07-798	07-797	07-798	07-799	07-797	07-797	07-798
RE02-07-2664	02-600592	16–21	QBO	07-799	07-798	07-799	07-799	07-799	07-799	07-798	07-797	07-798	07-799	07-797	07-797	07-798
RE02-07-2666	02-600593	0–0.5	SOIL	07-698	07-697	07-698	07-698	07-698	07-698	07-697	07-696	07-697	07-698	07-696	—	07-697
RE02-07-2667	02-600593	4.5–7	QAL	07-799	07-798	07-799	07-799	07-799	07-799	07-798	07-797	07-798	07-799	07-797	07-797	07-798
RE02-07-2668	02-600593	9.5–14.5	QAL	07-799	07-798	07-799	07-799	07-799	07-799	07-798	07-797	07-798	07-799	07-797	07-797	07-798
RE02-07-2669	02-600593	14.5–16.7	QBO	07-799	07-798	07-799	07-799	07-799	07-799	07-798	07-797	07-798	07-799	07-797	07-797	07-798
RE02-07-2671	02-600594	0–0.5	SOIL	07-698	07-697	07-698	07-698	07-698	07-698	07-697	07-696	07-697	07-698	07-696	—	07-697
RE02-08-7077	02-600594	4.5–5	QAL	—	—	—	—	—	—	—	—	—	—	—	08-93	—
RE02-07-2672	02-600594	4.5–6.9	QAL	07-809	07-809	07-809	07-809	07-809	07-809	07-809	07-809	07-809	07-809	07-809	—	07-809
RE02-07-2673	02-600594	9.5–11.6	QAL	07-809	07-809	07-809	07-809	07-809	07-809	07-809	07-809	07-809	07-809	07-809	—	07-809
RE02-07-2674	02-600594	14.5–16.7	QBO	07-809	07-809	07-809	07-809	07-809	07-809	07-809	07-809	07-809	07-809	07-809	—	07-809
RE02-07-2676	02-600595	0–0.5	SOIL	07-698	07-697	07-698	07-698	07-698	07-698	07-697	07-696	07-697	07-698	07-696	—	07-697
RE02-07-2677	02-600595	4.5–6	QAL	07-822	07-822	07-822	07-822	07-822	07-822	07-822	07-822	07-822	07-822	07-822	07-822	07-822
RE02-07-2678	02-600595	9.5–11.9	QAL	07-822	07-822	07-822	07-822	07-822	07-822	07-822	07-822	07-822	07-822	07-822	07-822	07-822
RE02-07-2679	02-600595	14.5–20.5	QBO	07-822	07-822	07-822	07-822	07-822	07-822	07-822	07-822	07-822	07-822	07-822	07-822	07-822
RE02-07-2681	02-600596	0–0.5	SOIL	07-669	07-668	07-669	07-669	07-669	07-669	07-668	07-667	07-668	07-669	07-667	—	07-668
RE02-07-2682	02-600596	4.5–6.7	QAL	07-869	07-869	07-869	07-869	07-869	07-869	07-869	07-869	07-869	07-869	07-869	07-869	07-869
RE02-07-2683	02-600596	9.5–11.7	QAL	07-869	07-869	07-869	07-869	07-869	07-869	07-869	07-869	07-869	07-869	07-869	07-869	07-869
RE02-07-2684	02-600596	14.5–16.7	QBO	07-869	07-869	07-869	07-869	07-869	07-869	07-869	07-869	07-869	07-869	07-869	07-869	07-869
RE02-07-2686	02-600597	0–0.5	SOIL	07-669	07-668	07-669	07-669	07-669	07-669	07-668	07-667	07-668	07-669	07-667	—	07-668
RE02-07-2687	02-600597	4.5–5.3	QAL	07-669	07-668	07-669	07-669	07-669	07-669	07-668	07-667	07-668	07-669	07-667	07-667	07-668
RE02-10-21911	02-612390	5–6	QAL	10-4513	—	10-4513	10-4513	10-4513	10-4513	10-4512	10-4512	—	10-4513	10-4512	—	—
RE02-10-21912	02-612390	15–17	QBO	10-4513	—	10-4513	10-4513	10-4513	10-4513	10-4512	10-4512	—	10-4513	10-4512	—	—
RE02-10-21913	02-612390	26–27	QBO	10-4513	—	10-4513	10-4513	10-4513	10-4513	10-4512	10-4512	—	10-4513	10-4512	—	—
RE02-10-21914	02-612390	35–36	QBO	10-4513	—	10-4513	10-4513	10-4513	10-4513	10-4512	10-4512	—	10-4513	10-4512	—	—
RE02-10-21915	02-612390	49–50	QBO	10-4513	—	10-4513	10-4513	10-4513	10-4513	10-4512	10-4512	—	10-4513	10-4512	—	—

[a] Analytical request number.

[b] — = Analysis not requested.

Table 6.20-2
Inorganic Chemicals Detected or Detected above BVs at SWMU 02-007

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Chromium	Cyanide (Total)	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**2.6**	**0.5**	**3700**	**13.5**	**189**	**0.1**	**2**	**na[b]**	**na**	**0.3**	**40**
Soil BV[a]				**29,200**	**0.83**	**8.17**	**295**	**0.4**	**19.3**	**0.5**	**21,500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**505[d]**	**62.8**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**281[d]**	**224**	**434,000**	**1110**	**14,800**	**186**	**15,800**	**991,000**	**434**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**70.5**	**96[d]**	**11.1**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**23,500**
RE02-07-2661	02-600592	0–0.5	SOIL	—[f]	—	—	—	0.494 (U)	—	—	—	—	—	—	—	0.965 (J)	0.000706 (J)	—	—
RE02-07-2662	02-600592	4.5–8.5	QAL	—	—	—	—	0.516 (U)	—	0.762	—	—	—	—	—	—	0.000673 (J+)	—	—
RE02-07-2664	02-600592	16–21	QBO	4350	—	0.719 (J)	—	0.601 (U)	6.87 (J)	—	5250	—	191	—	2.06	—	—	1.8 (U)	—
RE02-07-2666	02-600593	0–0.5	SOIL	—	—	—	—	0.507 (U)	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2667	02-600593	4.5–7	QAL	—	—	—	—	0.522 (U)	—	—	—	—	—	0.297	—	—	—	—	—
RE02-07-2668	02-600593	9.5–14.5	QAL	—	—	—	—	0.567 (U)	—	—	—	—	—	—	—	—	—	1.7 (U)	—
RE02-07-2669	02-600593	14.5–16.7	QBO	8480	0.508 (UJ)	1.02 (J)	—	0.626 (U)	13.7 (J)	—	4630	—	—	—	—	—	—	1.88 (U)	—
RE02-07-2671	02-600594	0–0.5	SOIL	—	—	—	—	0.492 (U)	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2672	02-600594	4.5–6.9	QAL	—	—	—	533	—	—	—	—	66	—	2.91	—	1.74	0.001 (J)	1.61 (U)	—
RE02-07-2673	02-600594	9.5–11.6	QAL	—	—	—	—	0.538 (U)	—	—	—	—	—	—	—	—	—	1.61 (U)	—
RE02-07-2674	02-600594	14.5–16.7	QBO	11400	0.542 (UJ)	0.852 (J)	44.2	0.678 (U)	3.3 (J)	—	5670	—	208	—	2.88 (U)	—	—	1.16 (J)	—
RE02-07-2676	02-600595	0–0.5	SOIL	—	—	—	—	0.492 (U)	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2677	02-600595	4.5–6	QAL	—	—	—	—	0.515 (U)	—	—	—	—	—	—	—	0.959 (J)	0.0048	1.77	—
RE02-07-2678	02-600595	9.5–11.9	QAL	—	—	—	—	0.52 (U)	—	—	—	—	—	—	—	—	—	2.52	—
RE02-07-2679	02-600595	14.5–20.5	QBO	5540	—	1.11 (J)	—	0.581 (U)	9.74 (U)	—	6380 (J+)	—	—	—	3.31 (U)	—	—	1.77	—
RE02-07-2681	02-600596	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	1.94 (J-)	0.000997 (J)	—	—
RE02-07-2682	02-600596	4.5–6.7	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.54 (U)	—
RE02-07-2684	02-600596	14.5–16.7	QBO	11500	—	1.61 (U)	68.7	0.535 (U)	19.8	—	5640	—	258	—	6.54 (J+)	—	—	1.61 (U)	—
RE02-07-2686	02-600597	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	1.56	—	—	—
RE02-07-2687	02-600597	4.5–5.3	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00122 (J)	—	—
RE02-10-21911	02-612390	5–6	QAL	—	0.941 (U)	—	—	—	—	NA[g]	—	—	—	—	—	NA	NA	—	49.2 (J)
RE02-10-21912	02-612390	15–17	QBO	5810	1.2 (U)	1.14 (U)	—	0.599 (U)	—	NA	4700	—	—	—	—	NA	NA	1.14 (U)	—
RE02-10-21913	02-612390	26–27	QBO	—	1.15 (U)	1.21 (U)	—	0.573 (U)	—	NA	5230	—	219	—	—	NA	NA	1.21 (U)	—
RE02-10-21914	02-612390	35–36	QBO	—	1.27 (U)	1.16 (U)	—	0.635 (U)	—	NA	5010	—	—	—	—	NA	NA	1.16 (U)	—
RE02-10-21915	02-612390	49–50	QBO	—	1.23 (U)	1.24 (U)	—	0.615 (U)	—	NA	5850	—	—	—	—	NA	NA	1.24 (U)	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 6.20-3
Organic Chemicals Detected at SWMU 02-007

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	Butylbenzylphthalate	Chrysene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Toluene
Industrial SSL[a]				**50,500**	**959,000**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**12,000[c]**	**3230**	**33,700**	**33,700**	**32.3**	**4100**	**16,800**	**25,300**	**25,300**	**61,400**
Recreational SSL[c]				**17,300**	**505,000**	**863,000**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**13,100**	**8880**	**11,500**	**11,500**	**88.8**	**3170**	**1930**	**8630**	**8630**	**47,600**
Residential SSL[a]				**3480**	**66,300**	**17,400**	**1.12**	**2.22**	**1.53**	**1.12**	**1.53**	**1740[b]**	**2900[c]**	**153**	**2320**	**2320**	**1.53**	**310**	**1160**	**1740**	**1740**	**5220**
RE02-07-2661	02-600592	0–0.5	SOIL	—[d]	NA[e]	—	0.0185 (J)	0.0209	0.0155 (J)	0.0119 (J)	0.0136 (J)	—	—	—	0.0238 (J)	—	—	—	—	0.0131 (J)	0.0191 (J)	NA
RE02-07-2662	02-600592	4.5–8.5	QAL	—	—	—	0.004	0.0025 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2666	02-600593	0–0.5	SOIL	—	NA	—	0.0899	0.0477	—	—	—	—	—	—	—	—	—	—	—	—	—	NA
RE02-07-2667	02-600593	4.5–7	QAL	—	—	—	0.015	0.0072	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2669	02-600593	14.5–16.7	QBO	—	0.00478 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2672	02-600594	4.5–6.9	QAL	0.0443	NA	0.079	0.0822	0.0325	0.102	0.183	0.163	0.101 (J)	—	0.109	0.225	0.0471	0.108	0.0281 (J)	0.0755	0.233	0.18	NA
RE02-07-2673	02-600594	9.5–11.6	QAL	—	NA	—	0.0179	0.008	—	—	—	—	—	—	—	—	—	—	—	—	—	NA
RE02-07-2676	02-600595	0–0.5	SOIL	—	NA	—	0.254	0.0903	—	—	—	—	—	—	0.0115 (J)	—	—	—	—	—	—	NA
RE02-07-2677	02-600595	4.5–6	QAL	—	—	—	0.0977	0.0544	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2681	02-600596	0–0.5	SOIL	—	NA	—	0.0317	0.0192	—	—	—	—	—	—	0.0169 (J)	—	—	—	—	0.0109 (J)	0.02 (J)	NA
RE02-07-2682	02-600596	4.5–6.7	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.000311 (J)
RE02-07-2686	02-600597	0–0.5	SOIL	—	NA	—	1.63	0.859	—	—	—	—	—	—	0.0147 (J)	—	—	—	—	—	0.015 (J)	NA
RE02-07-2687	02-600597	4.5–5.3	QAL	—	—	—	0.543	0.286	—	—	—	—	0.254 (J)	—	—	—	—	—	—	—	—	—
RE02-10-21911	02-612390	5–6	QAL	—	NA	—	0.0121	0.0086	—	—	—	—	—	—	—	—	—	—	—	—	0.0126 (J)	NA

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273), unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSLs are from LANL (2017, 602581).

[d] — = Not detected.

[e] NA = Not analyzed.

Table 6.20-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 02-007

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Strontium-90	Tritium	Uranium-235/236
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**0.18**
Soil BV/FV[a]				**1.65**	**0.054**	**1.31**	**na**	**0.2**
Industrial SAL[c]				**41**	**1200**	**2400**	**2,400,000**	**160**
Recreational SAL[c]				**370**	**1300**	**4900**	**5,700,000**	**1000**
Residential SAL[c]				**12**	**79**	**15**	**1700**	**42**
RE02-07-2661	02-600592	0–0.5	SOIL	—[d]	0.0626	—	0.0168574	—
RE02-07-2664	02-600592	16–21	QBO	—	—	—	0.159145	—
RE02-07-2667	02-600593	4.5–7	QAL	0.855	0.0561	0.276	—	—
RE02-07-2672	02-600594	4.5–6.9	QAL	1.16	0.0394	0.27	0.073	—
RE02-07-2677	02-600595	4.5–6	QAL	—	—	—	0.0274948	—
RE02-07-2681	02-600596	0–0.5	SOIL	—	—	1.41	—	—
RE02-07-2682	02-600596	4.5–6.7	QAL	—	—	—	0.0166681	—
RE02-07-2684	02-600596	14.5–16.7	QBO	—	0.231 (J-)	—	—	—
RE02-10-21911	02-612390	5–6	QAL	4.44	0.595	0.347	0.0184875	—
RE02-10-21912	02-612390	15–17	QBO	—	0.0171	—	—	—
RE02-10-21913	02-612390	26–27	QBO	—	—	—	0.0472884	0.191
RE02-10-21914	02-612390	35–36	QBO	—	—	—	0.077599	—
RE02-10-21915	02-612390	49–50	QBO	—	—	—	0.121403	—

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SALs are from LANL (2015, 600929).

[d] — = Not detected.

Table 6.21-1
Samples Collected and Analyses Requested at SWMU 02-008(a)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
CA02-00-0321	02-01249	0–0.5	SED	—[a]	—	7531R[b]	7531R	—	7531R	7531R	7529R, 7530R	—	—	7531R	—	—	—
RE02-07-2052	02-600481	0–0.5	SOIL	07-820	07-820	07-820	07-820	07-820	07-820	07-820	07-820	07-820	07-820	07-820	07-820	—	07-820
RE02-07-2053	02-600481	4.5–8.5	QAL	07-1033	07-1032	07-1033	07-1033	07-1032	07-1033	07-1033	07-1032	07-1031	07-1032	07-1033	07-1031	07-1031	07-1032
RE02-07-2055	02-600481	8.5–13.5	QAL	07-1033	07-1032	07-1033	07-1033	07-1032	07-1033	07-1033	07-1032	07-1031	07-1032	07-1033	07-1031	07-1031	07-1032
RE02-07-2054	02-600481	13.5–16	QBO	07-1033	07-1032	07-1033	07-1033	07-1032	07-1033	07-1033	07-1032	07-1031	07-1032	07-1033	07-1031	07-1031	07-1032
RE02-07-6286	02-600482	0–0.5	SOIL	07-886	07-886	07-886	07-886	07-886	07-886	07-886	07-886	07-886	07-886	07-886	07-886	—	07-886
RE02-07-2056	02-600482	0–4.5	SOIL	07-403	07-403	07-403	07-403	07-403	07-403	07-403	07-403	07-402	07-403	07-403	07-402	—	07-403
RE02-07-2057	02-600482	4.5–7	QAL	07-448	07-447	07-448	07-448	07-447	07-448	07-448	07-447	07-446	07-447	07-448	07-446	07-446	07-447
RE02-07-2059	02-600482	7–9.5	QAL	07-448	07-447	07-448	07-448	07-447	07-448	07-448	07-447	07-446	07-447	07-448	07-446	07-446	07-447
RE02-07-2058	02-600482	9.5–14.5	QBO	07-448	07-447	07-448	07-448	07-447	07-448	07-448	07-447	07-446	07-447	07-448	07-446	07-446	07-447
RE02-07-2060	02-600483	0–0.5	SOIL	07-820	07-820	07-820	07-820	07-820	07-820	07-820	07-820	07-820	07-820	07-820	07-820	—	07-820
RE02-07-2061	02-600483	4.5–8.5	QAL	07-1033	07-1032	07-1033	07-1033	07-1032	07-1033	07-1033	07-1032	07-1031	07-1032	07-1033	07-1031	07-1031	07-1032
RE02-07-2063	02-600483	8.5–13.5	QAL	07-1033	07-1032	07-1033	07-1033	07-1032	07-1033	07-1033	07-1032	07-1031	07-1032	07-1033	07-1031	07-1031	07-1032
RE02-07-2062	02-600483	13.5–16	QBO	07-1033	07-1032	07-1033	07-1033	07-1032	07-1033	07-1033	07-1032	07-1031	07-1032	07-1033	07-1031	07-1031	07-1032
RE02-07-2064	02-600484	0–0.5	SOIL	07-337	07-336	07-337	07-337	07-336	07-337	07-337	07-336	07-335	07-336	07-337	07-335	—	07-336
RE02-07-2065	02-600484	2–2.7	QAL	07-337	07-336	07-337	07-337	07-336	07-337	07-337	07-336	07-335	07-336	07-337	07-335	07-335	07-336

[a] — = Analysis not requested.

[b] Analytical request number.

Table 6.21-2
Inorganic Chemicals Detected or Detected above BVs at SWMU 02-008(a)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Chromium	Hexavalent Chromium	Copper	Cyanide (Total)	Iron	Lead	Manganese	Nitrate	Selenium	Silver	Thallium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**2.6**	**na[b]**	**3.96**	**0.5**	**3700**	**13.5**	**189**	**na**	**0.3**	**1**	**1.22**	**4.59**	**40**
Sediment BV[a]				**15,400**	**0.83**	**3.98**	**127**	**0.4**	**10.5**	**na**	**11.2**	**0.82**	**13,800**	**19.7**	**543**	**na**	**0.3**	**1**	**0.73**	**19.7**	**60.2**
Soil BV[a]				**29,200**	**0.83**	**8.17**	**295**	**0.4**	**19.3**	**na**	**14.7**	**0.5**	**21,500**	**22.3**	**671**	**na**	**1.52**	**1**	**0.73**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**505[d]**	**72.1**	**51,900**	**62.8**	**908,000**	**800**	**160,000**	**2,080,000**	**6490**	**6490**	**13**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**281[d]**	**40.2**	**24,800**	**224**	**434,000**	**1110**	**14,800**	**991,000**	**3100**	**3100**	**6.19**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**70.5**	**96[d]**	**3.05**	**3130**	**11.1**	**54,800**	**400**	**10,500**	**125,000**	**391**	**391**	**0.782**	**394**	**23,500**
CA02-00-0321	02-01249	0–0.5	SED	—[f]	—	—	—	—	37	NA[g]	13	NA	—	22	—	NA	—	1.1	—	—	68 (J+)
RE02-07-2052	02-600481	0–0.5	SOIL	—	—	—	—	0.53 (U)	29	—	—	—	—	—	—	1.97	1.59 (U)	—	1.06 (U)	—	—
RE02-07-2053	02-600481	4.5–8.5	QAL	—	—	—	—	0.516 (U)	22.4	1.1	—	—	—	—	—	—	10	—	—	—	—
RE02-07-2055	02-600481	8.5–13.5	QAL	—	—	—	—	0.553 (U)	104	1.12	—	—	—	—	—	—	10.2	—	—	—	—
RE02-07-2054	02-600481	13.5–16	QBO	11,600	0.53 (UJ)	1.25 (J)	29.3	0.66 (U)	36.6	0.196	9	—	7520	—	233 (J-)	—	10.7	—	—	6.77	—
RE02-07-6286	02-600482	0–0.5	SOIL	—	—	—	—	0.562 (U)	—	—	—	—	—	—	—	2.39	1.69 (U)	—	—	—	—
RE02-07-2056	02-600482	0–4.5	SOIL	—	—	—	—	0.501 (U)	—	0.151	—	—	—	—	—	—	2.01	—	—	—	52.6
RE02-07-2057	02-600482	4.5–7	QAL	—	—	—	—	0.526 (U)	30.9 (U)	—	230	—	—	22.4	—	—	—	—	—	—	78.9 (J)
RE02-07-2059	02-600482	7–9.5	QAL	—	—	—	—	0.559 (U)	—	—	68.6	—	—	—	—	—	—	—	—	—	—
RE02-07-2058	02-600482	9.5–14.5	QBO	6610	—	1.79 (U)	—	0.596 (U)	—	—	—	—	5770	—	194	—	1.79 (U)	—	—	—	—
RE02-07-2060	02-600483	0–0.5	SOIL	—	—	—	—	—	34.6	—	—	—	—	—	—	0.937 (J)	1.53 (U)	—	—	—	60.1
RE02-07-2061	02-600483	4.5–8.5	QAL	—	—	—	—	0.531 (U)	40.4	—	—	—	—	—	—	0.983	9.15	—	—	—	—
RE02-07-2063	02-600483	8.5–13.5	QAL	—	—	—	—	0.569 (U)	20	—	—	—	—	—	—	—	8.84	—	—	—	—
RE02-07-2062	02-600483	13.5–16	QBO	11,200	0.534 (UJ)	1.95 (U)	—	0.651 (U)	5.62	—	—	—	5610	—	230 (J-)	—	8.59	—	—	—	—
RE02-07-2064	02-600484	0–0.5	SOIL	—	—	—	—	—	—	—	—	0.723 (J-)	—	—	—	1.22	1.56 (U)	—	—	—	62.1
RE02-07-2065	02-600484	2–2.7	QAL	—	—	—	—	0.516 (U)	40.5	—	19.3	—	—	57.7	—	1.24	2.56 (U)	—	—	—	69.9

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 6.21-3
Organic Chemicals Detected at SWMU 02-008(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	Chrysene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Methylene Chloride	Phenanthrene	Pyrene	Styrene	Toluene
Industrial SSL[a]				**50,500**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**1830**	**3230**	**33,700**	**33,700**	**32.3**	**5110**	**25,300**	**25,300**	**50,900**	**61,400**
Recreational SSL[c]				**17,300**	**863,000**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**888**	**1770**	**8880**	**11,500**	**11,500**	**88.8**	**3610**	**8630**	**8630**	**100,000**	**47,600**
Residential SSL[a]				**3480**	**17,400**	**1.12**	**2.22**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**380**	**153**	**2320**	**2320**	**1.53**	**409**	**1740**	**1740**	**7230**	**5220**
RE02-07-2052	02-600481	0–0.5	SOIL	—[d]	—	—	0.1	—	0.0941 (J)	0.0164 (J)	—	0.0131 (J)	—	0.0157 (J)	0.0247 (J)	—	—	NA[e]	—	0.0335 (J)	NA	NA
RE02-07-2053	02-600481	4.5–8.5	QAL	—	—	0.0086	0.0114	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-6286	02-600482	0–0.5	SOIL	—	—	0.0646	0.109	—	—	—	—	—	—	—	—	—	—	NA	—	—	NA	NA
RE02-07-2056	02-600482	0–4.5	SOIL	—	—	—	0.0034 (J)	—	—	—	—	—	—	—	—	—	—	NA	—	—	NA	NA
RE02-07-2057	02-600482	4.5–7	QAL	—	—	—	0.0027 (J)	—	—	—	—	—	—	—	—	—	—	0.00295 (J)	—	—	—	—
RE02-07-2059	02-600482	7–9.5	QAL	—	—	—	0.0047	—	—	—	—	—	—	—	—	—	—	0.00306 (J)	—	—	—	—
RE02-07-2058	02-600482	9.5–14.5	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00385 (J)	—	—	—	—
RE02-07-2060	02-600483	0–0.5	SOIL	—	—	0.058	0.0944	0.0242 (J)	0.0976 (J)	0.0392 (J)	0.032 (J)	—	0.164 (J)	0.026 (J)	0.0442	—	0.0542 (J)	NA	0.0237 (J)	0.041	NA	NA
RE02-07-2061	02-600483	4.5–8.5	QAL	—	—	0.0078	0.009	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2063	02-600483	8.5–13.5	QAL	—	—	—	0.0045 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2064	02-600484	0–0.5	SOIL	0.021 (J)	0.0368	0.186	0.246	0.096	0.0926	0.144	—	—	—	0.12	0.254	0.0178 (J)	0.104	NA	0.165	0.216	NA	NA
RE02-07-2065	02-600484	2–2.7	QAL	—	0.0238 (J)	0.139	0.222	0.129	0.118	0.162	—	0.0659	—	0.138	0.242	—	0.118	—	0.107	0.267	0.00589	0.000665 (J)

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273).

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSLs are from LANL (2017, 602581).

[d] — = Not detected.

[e] NA = Not analyzed.

Table 6.21-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 02-008(a)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Tritium	Uranium-235/236
Qbt 1g, Qct, Qbo BV[a]				**na**[b]	**na**	**na**	**0.18**
Sediment BV/FV[a]				**0.9**	**0.068**	**0.093**	**0.2**
Soil BV/FV[a]				**1.65**	**0.054**	**na**	**0.2**
Industrial SAL[c]				**41**	**1200**	**2,400,000**	**160**
Recreational SAL[c]				**370**	**1300**	**5,700,000**	**1000**
Residential SAL[c]				**12**	**79**	**1700**	**42**
CA02-00-0321	02-01249	0–0.5	SED	—[d]	1.87	0.257143 (J+)	—
RE02-07-2052	02-600481	0–0.5	SOIL	—	0.216	—	—
RE02-07-2053	02-600481	4.5–8.5	QAL	—	0.0634 (J-)	0.0733034	—
RE02-07-2054	02-600481	13.5–16	QBO	—	—	—	0.213
RE02-07-6286	02-600482	0–0.5	SOIL	—	0.135	—	—
RE02-07-2056	02-600482	0–4.5	SOIL	—	0.64	—	—
RE02-07-2057	02-600482	4.5–7	QAL	—	0.069	0.0190657	—
RE02-07-2059	02-600482	7–9.5	QAL	0.155	0.142	—	—
RE02-07-2060	02-600483	0–0.5	SOIL	—	0.323	0.0286442	—
RE02-07-2061	02-600483	4.5–8.5	QAL	—	—	0.0558085	—
RE02-07-2063	02-600483	8.5–13.5	QAL	0.353	0.128 (J-)	—	—
RE02-07-2064	02-600484	0–0.5	SOIL	—	0.819	—	—
RE02-07-2065	02-600484	2–2.7	QAL	0.313	0.573	—	—

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.
[a] BVs/FVs are from LANL (1998, 059730).
[b] na = Not available.
[c] SALs are from LANL (2015, 600929).
[d] — = Not detected.

Table 6.22-1
Samples Collected and Analyses Requested at AOC 02-008(c)(i)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Cyanide (Total)
RE02-07-884	02-600210	0–0.5	SOIL	07-1028[a]	07-1028	07-1028	07-1028	07-1028	07-1028	07-1028	07-1028	07-1028	07-1028	07-1028	07-1028
RE02-10-21911	02-612390	5–6	QAL	10-4513	—[b]	10-4513	10-4513	10-4513	10-4513	10-4512	10-4512	—	10-4513	10-4512	—
RE02-10-21912	02-612390	15–17	QBO	10-4513	—	10-4513	10-4513	10-4513	10-4513	10-4512	10-4512	—	10-4513	10-4512	—
RE02-10-21913	02-612390	26–27	QBO	10-4513	—	10-4513	10-4513	10-4513	10-4513	10-4512	10-4512	—	10-4513	10-4512	—
RE02-10-21914	02-612390	35–36	QBO	10-4513	—	10-4513	10-4513	10-4513	10-4513	10-4512	10-4512	—	10-4513	10-4512	—
RE02-10-21915	02-612390	49–50	QBO	10-4513	—	10-4513	10-4513	10-4513	10-4513	10-4512	10-4512	—	10-4513	10-4512	—

[a] Analytical request number.
[b] — = Analysis not requested.

Table 6.22-2
Samples Collected and Analyses Requested at AOC 02-008(c)(ii)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
CA02-00-0167	02-01252	0–0.5	SED	—[a]	7569R[b]	7571R	7571R	—	7571R	7571R	7568R, 7570R	—	—	7571R	7567R	—	—
CA02-00-0168	02-01253	0–0.5	SED	—	7569R	7571R	7571R	—	7571R	7571R	7568R, 7570R	—	—	7571R	7567R	—	—
RE02-07-2837	02-600625	0–0.5	SOIL	07-765	07-764	07-765	07-765	—	07-765	07-765	07-764	07-763	07-764	07-765	07-763	—	07-764
RE02-07-2838	02-600625	4.5–8.5	QAL	07-1029	07-1029	07-1029	07-1029	—	07-1029	07-1029	07-1029	07-1029	07-1029	07-1029	07-1029	07-1029	07-1029
RE02-07-2839	02-600625	16.5–21	QBO	07-1029	07-1029	07-1029	07-1029	—	07-1029	07-1029	07-1029	07-1029	07-1029	07-1029	07-1029	07-1029	07-1029
RE02-07-2841	02-600626	0–0.5	SOIL	07-765	07-764	07-765	07-765	—	07-765	07-765	07-764	07-763	07-764	07-765	07-763	—	07-764
RE02-07-2842	02-600626	4.5–8	QAL	07-893	07-893	07-893	07-893	—	07-893	07-893	07-893	07-893	07-893	07-893	07-893	07-893	07-893
RE02-07-2843	02-600626	8–13.5	QAL	07-893	07-893	07-893	07-893	—	07-893	07-893	07-893	07-893	07-893	07-893	07-893	07-893	07-893
RE02-07-2844	02-600626	13.5–18.5	QBO	07-893	07-893	07-893	07-893	—	07-893	07-893	07-893	07-893	07-893	07-893	07-893	07-893	07-893
RE02-07-2845	02-600627	0–0.5	SOIL	07-765	07-764	07-765	07-765	—	07-765	07-765	07-764	07-763	07-764	07-765	07-763	—	07-764
RE02-10-25659	02-612982	6–7	QAL	—	—	11-19	11-19	11-18	11-19	11-19	11-18	11-17	—	—	11-17	—	—
RE02-10-25660	02-612982	15–16	QAL	—	—	11-19	11-19	11-18	11-19	11-19	11-18	11-17	—	—	11-17	—	—
RE02-10-25661	02-612982	25–26	QBO	—	—	11-19	11-19	11-18	11-19	11-19	11-18	11-17	—	—	11-17	—	—
RE02-10-25662	02-612982	35–37	QBO	—	—	11-19	11-19	11-18	11-19	11-19	11-18	11-17	—	—	11-17	—	—
RE02-10-25663	02-612982	49–50	QBO	—	—	11-19	11-19	11-18	11-19	11-19	11-18	11-17	—	—	11-17	—	—

[a] — = Analysis not requested.
[b] Analytical request number.

Table 6.22-3
Inorganic Chemicals Detected or Detected above BVs at AOC 02-008(c)(i)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Cadmium	Iron	Manganese	Nitrate	Selenium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**0.4**	**3700**	**189**	**na**[b]	**0.3**	**40**
Soil BV[a]				**29,200**	**0.83**	**8.17**	**0.4**	**21,500**	**671**	**na**	**1.52**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**1110**	**908,000**	**160,000**	**2,080,000**	**6490**	**389,000**
Recreational SSL[d]				**619,000**	**248**	**42.9**	**457**	**434,000**	**14,800**	**991,000**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**70.5**	**54,800**	**10,500**	**125,000**	**391**	**23,500**
RE02-07-884	02-600210	0–0.5	SOIL	—[e]	—	—	0.625 (U)	—	—	1.2 (J-)	—	65.3
RE02-10-21911	02-612390	5–6	QAL	—	0.941 (U)	—	—	—	—	NA[f]	—	49.2 (J)
RE02-10-21912	02-612390	15–17	QBO	5810	1.2 (U)	1.14 (U)	0.599 (U)	4700	—	NA	1.14 (U)	—
RE02-10-21913	02-612390	26–27	QBO	—	1.15 (U)	1.21 (U)	0.573 (U)	5230	219	NA	1.21 (U)	—
RE02-10-21914	02-612390	35–36	QBO	—	1.27 (U)	1.16 (U)	0.635 (U)	5010	—	NA	1.16 (U)	—
RE02-10-21915	02-612390	49–50	QBO	—	1.23 (U)	1.24 (U)	0.615 (U)	5850	—	NA	1.24 (U)	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are from LANL (2017, 602581).

[e] — = Not detected or not detected above BV.

[f] NA = Not analyzed.

Table 6.22-4
Organic Chemicals Detected at AOC 02-008(c)(i)

Sample ID	Location ID	Depth (ft)	Media	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
Industrial SSL[a]				**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300**[b]	**3230**	**33,700**	**32.3**	**25,300**	**25,300**
Recreational SSL[c]				**863,000**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630**[b]	**8880**	**11,500**	**88.8**	**8630**	**8630**
Residential SSL[a]				**17,400**	**1.12**	**2.22**	**1.53**	**1.12**	**1.53**	**1740**[b]	**153**	**2320**	**1.53**	**1740**	**1740**
RE02-07-884	02-600210	0–0.5	SOIL	0.0137 (J)	—[d]	0.0158	0.0858	0.0911	0.18	0.0513	0.0997	0.193	0.049	0.0871	0.167
RE02-10-21911	02-612390	5–6	QAL	—	0.0121	0.0086	—	—	—	—	—	—	—	—	0.0126 (J)

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273), unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSLs are from LANL (2017, 602581).

[d] — = Not detected.

Table 6.22-5
Radionuclides Detected or Detected above BVs/FVs at AOC 02-008(c)(i)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Strontium-90	Tritium	Uranium-235/236
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**0.18**
Soil BV/FV[a]				**1.65**	**0.054**	**1.31**	**na**	**0.2**
Industrial SAL[c]				**41**	**1200**	**2400**	**2,400,000**	**160**
Recreational SAL[c]				**370**	**1300**	**4900**	**5,700,000**	**1000**
Residential SAL[c]				**12**	**79**	**15**	**1700**	**42**
RE02-07-884	02-600210	0–0.5	SOIL	—[d]	0.556 (J-)	—	—	—
RE02-10-21911	02-612390	5–6	QAL	4.44	0.595	0.347	0.0184875	—
RE02-10-21912	02-612390	15–17	QBO	—	0.0171	—	—	—
RE02-10-21913	02-612390	26–27	QBO	—	—	—	0.0472884	0.191
RE02-10-21914	02-612390	35–36	QBO	—	—	—	0.077599	—
RE02-10-21915	02-612390	49–50	QBO	—	—	—	0.121403	—

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SALs are from LANL (2015, 600929).

[d] — = Not detected.

Table 6.22-6
Inorganic Chemicals Detected or Detected above BVs at AOC 02-008(c)(ii)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Chromium	Hexavalent Chromium	Copper	Iron	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**2.6**	**na[b]**	**3.96**	**3700**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**1**	**4.59**	**40**
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.63**	**7.14**	**na**	**4.66**	**14,500**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**17**	**63.5**
Sediment BV[a]				**15,400**	**0.83**	**3.98**	**127**	**0.4**	**10.5**	**na**	**11.2**	**13,800**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**	**19.7**	**60.2**
Soil BV[a]				**29,200**	**0.83**	**8.17**	**295**	**0.4**	**19.3**	**na**	**14.7**	**21,500**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**505[d]**	**72.1**	**51,900**	**908,000**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**281[d]**	**40.2**	**24,800**	**434,000**	**14,800**	**186**	**15,800**	**991,000**	**434**	**3100**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**70.5**	**96[d]**	**3.05**	**3130**	**54,800**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**394**	**23,500**
CA02-00-0168	02-01253	0–0.5	SED	—[f]	—	—	—	—	—	NA[g]	17 (J+)	—	—	0.25	—	NA	—	—	1.8	21 (J+)	—
RE02-07-2837	02-600625	0–0.5	SOIL	—	—	—	—	—	—	NA	—	—	—	—	—	—	0.00168 (J+)	2.43	—	—	—
RE02-07-2838	02-600625	4.5–8.5	QAL	—	—	—	—	—	30.7	NA	18.6 (J)	—	—	0.138	—	1.87 (J-)	—	1.82	—	—	80.7
RE02-07-2839	02-600625	16.5–21	QBO	5950 (J+)	—	1.79 (U)	34.1	0.598 (U)	66.7	NA	7.84 (J)	9230 (J)	293 (J)	—	4.91	—	—	1.1 (J)	—	7.2	—
RE02-07-2841	02-600626	0–0.5	SOIL	—	—	—	—	0.508 (U)	—	NA	22.5	—	—	3.46	—	—	0.000606 (J+)	2.77	—	—	—
RE02-07-2842	02-600626	4.5–8	QAL	—	—	—	—	0.54 (U)	—	NA	—	—	—	0.326	—	—	—	—	—	—	—
RE02-07-2843	02-600626	8–13.5	QAL	—	—	—	—	0.566 (U)	—	NA	—	—	—	—	—	—	—	—	—	—	52.7
RE02-07-2844	02-600626	13.5–18.5	QBO	—	—	1.65 (J)	—	0.572 (U)	19.2 (J)	NA	—	9070	419 (J-)	—	4.16	—	—	1.72 (U)	—	8.23 (J)	—

Table 6.22-6(continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Chromium	Hexavalent Chromium	Copper	Iron	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**2.6**	**na[b]**	**3.96**	**3700**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**1**	**4.59**	**40**
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.63**	**7.14**	**na**	**4.66**	**14,500**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**17**	**63.5**
Sediment BV[a]				**15,400**	**0.83**	**3.98**	**127**	**0.4**	**10.5**	**na**	**11.2**	**13,800**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**	**19.7**	**60.2**
Soil BV[a]				**29,200**	**0.83**	**8.17**	**295**	**0.4**	**19.3**	**na**	**14.7**	**21,500**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**505[d]**	**72.1**	**51,900**	**908,000**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**281[d]**	**40.2**	**24,800**	**434,000**	**14,800**	**186**	**15,800**	**991,000**	**434**	**3100**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**70.5**	**96[d]**	**3.05**	**3130**	**54,800**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**394**	**23,500**
RE02-07-2845	02-600627	0–0.5	SOIL	—	—	—	—	0.517 (U)	—	NA	—	—	—	0.273	—	0.858 (J-)	—	2.54	—	—	—
RE02-10-25659	02-612982	6–7	QAL	—	1.08 (U)	—	—	0.542 (U)	—	0.191 (J)	—	—	—	—	—	NA	NA	—	—	—	—
RE02-10-25660	02-612982	15–16	QAL	—	—	—	—	0.528 (U)	—	0.413 (J)	—	—	—	—	—	NA	NA	—	—	—	—
RE02-10-25661	02-612982	25–26	QBO	4780	1.2 (U)	1.24 (U)	—	0.6 (U)	6.44	—	—	6980	300	—	—	NA	NA	1.24 (UJ)	—	—	—
RE02-10-25662	02-612982	35–37	QBO	—	1.15 (U)	1.23 (U)	—	0.576 (U)	—	—	—	5160	—	—	—	NA	NA	1.23 (UJ)	—	—	—
RE02-10-25663	02-612982	49–50	QBO	—	—	1.24 (U)	—	0.674 (U)	—	—	—	5270	—	—	—	NA	NA	1.24 (UJ)	—	—	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 6.22-7
Organic Chemicals Detected at AOC 02-008(c)(ii)

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	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Toluene
Industrial SSL[a]				**50,500**	**253,000**	**10.9**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300**[b]	**3230**	**33,700**	**33,700**	**32.3**	**14,100**[c]	**4100**	**16,800**	**25,300**	**25,300**	**61,400**
Recreational SSL[d]				**17,300**	**863,000**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630**[b]	**8880**	**11,500**	**11,500**	**88.8**	**42,100**[c]	**3170**	**1930**	**8630**	**8630**	**47,600**
Residential SSL[a]				**3480**	**17,400**	**2.22**	**1.12**	**2.22**	**1.53**	**1.12**	**1.53**	**1740**[b]	**153**	**2320**	**2320**	**1.53**	**2350**[c]	**310**	**1160**	**1740**	**1740**	**5220**
CA02-00-0168	02-01253	0–0.5	SED	—[e]	—	NA[f]	NA	NA	—	—	—	—	—	0.11 (J)	—	—	NA	—	—	—	0.1 (J)	NA
RE02-07-2837	02-600625	0–0.5	SOIL	—	—	—	—	0.0098 (J)	—	—	—	—	—	0.0233 (J)	—	—	NA	—	—	0.0109 (J)	0.0227 (J)	NA
RE02-07-2838	02-600625	4.5–8.5	QAL	—	—	—	—	0.002 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	0.000475 (J)
RE02-07-2841	02-600626	0–0.5	SOIL	0.118	—	—	0.0788	0.0872	0.682	0.559 (J)	1.09 (J)	0.16 (J)	0.617	1.12	0.0513	0.153 (J)	NA	0.00892 (J)	0.0271 (J)	0.648	1.38	NA
RE02-07-2842	02-600626	4.5–8	QAL	—	—	—	—	0.0018 (J)	—	—	—	—	—	—	—	—	0.0029	—	—	—	—	0.000516 (J)
RE02-07-2843	02-600626	8–13.5	QAL	—	—	—	0.0029 (J)	0.0025 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2844	02-600626	13.5–18.5	QBO	—	—	—	—	0.0049 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2845	02-600627	0–0.5	SOIL	—	0.00914 (J)	—	—	0.0084 (J)	0.0422	0.0674	0.0739	—	0.0687	0.05	—	0.0194 (J)	NA	—	—	0.0199 (J)	0.0621	NA
RE02-10-25659	02-612982	6–7	QAL	—	—	—	0.0018 (J)	—	—	—	—	—	—	—	—	—	NA	—	—	—	—	NA
RE02-10-25660	02-612982	15–16	QAL	—	—	0.191	0.308	0.0293	—	—	—	—	—	—	—	—	NA	—	—	—	—	NA

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273), unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] Isopropylbenzene used as a surrogate based on structural similarity.

[d] SSLs are from LANL (2017, 602581).

[e] — = Not detected.

[f] NA = Not analyzed.

Table 6.22-8
Radionuclides Detected or Detected above BVs/FVs at AOC 02-008(c)(ii)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Strontium-90	Tritium	Uranium-235/236
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**0.18**
Qbt 2,3,4 BV[a]				**na**	**na**	**na**	**na**	**0.09**
Sediment BV/FV[a]				**0.9**	**0.068**	**1.04**	**0.093**	**0.2**
Soil BV/FV[a]				**1.65**	**0.054**	**1.31**	**na**	**0.2**
Industrial SAL[c]				**41**	**1200**	**2400**	**2,400,000**	**160**
Recreational SAL[c]				**370**	**1300**	**4900**	**5,700,000**	**1000**
Residential SAL[c]				**12**	**79**	**15**	**1700**	**42**
CA02-00-0167	02-01252	0–0.5	SED	—[d]	0.275	—	—	—
CA02-00-0168	02-01253	0–0.5	SED	—	0.808	—	—	—
RE02-07-2837	02-600625	0–0.5	SOIL	—	0.161	—	—	—
RE02-07-2838	02-600625	4.5–8.5	QAL	0.485	0.0685 (J-)	0.388	—	—
RE02-07-2839	02-600625	16.5–21	QBO	—	—	—	—	0.236
RE02-07-2842	02-600626	4.5–8	QAL	0.321	0.0573	—	—	—
RE02-07-2845	02-600627	0–0.5	SOIL	—	0.15	—	—	—
RE02-10-25659	02-612982	6–7	QAL	0.416	—	NA[e]	—	—
RE02-10-25662	02-612982	35–37	QBO	—	—	NA	0.116696	—

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SALs are from LANL (2015, 600929).

[d] — = Not detected.

[e] NA = Not analyzed.

Table 6.23-1
Samples Collected and Analyses Requested at SWMU 02-009(a)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
CA02-00-0186	02-01259	0–0.5	SOIL	—[a]	—	7873R[b]	7873R	7873R	7873R	7871R, 7872R	—	—	7873R	—	—	—
CA02-00-0187	02-01259	2–2.5	SOIL	—	—	7873R	7873R	7873R	7873R	7871R, 7872R	—	—	7873R	—	—	—
CA02-00-0188	02-01260	0–0.5	SOIL	—	—	7873R	7873R	7873R	7873R	7871R, 7872R	—	—	7873R	—	—	—
CA02-00-0189	02-01260	2–2.5	SOIL	—	—	7873R	7873R	7873R	7873R	7871R, 7872R	—	—	7873R	—	—	—
CA02-00-0208	02-01263	0–0.5	SOIL	—	—	7869R	7869R	7869R	7869R	7867R, 7868R	—	—	7869R	—	—	—
CA02-00-0209	02-01263	2–2.5	SOIL	—	—	7869R	7869R	7869R	7869R	7867R, 7868R	—	—	7869R	—	—	—
CA02-00-0211	02-01263	5–5.5	SOIL	—	—	7869R	7869R	7869R	7869R	7867R, 7868R	—	—	7869R	—	—	—
CA02-00-0213	02-01264	0–0.5	SOIL	—	—	7869R	7869R	7869R	7869R	7867R, 7868R	—	—	7869R	—	—	—
CA02-00-0214	02-01264	2–2.5	SOIL	—	—	7869R	7869R	7869R	7869R	7867R, 7868R	—	—	7869R	—	—	—
CA02-00-0215	02-01264	5–5.5	SOIL	—	—	7869R	7869R	7869R	7869R	7867R, 7868R	—	—	7869R	—	—	—
RE02-07-1128	02-600259	0–0.5	SOIL	07-1058	07-1057	07-1058	07-1058	07-1058	07-1058	07-1057	07-1056	07-1057	07-1058	07-1056	—	07-1057
RE02-07-1129	02-600259	2–3	QAL	07-1076	07-1075	07-1076	07-1076	07-1076	07-1076	07-1075	07-1074	07-1075	07-1076	07-1074	07-1074	07-1075
RE02-07-1130	02-600259	4.5–5.1	QAL	07-1076	07-1075	07-1076	07-1076	07-1076	07-1076	07-1075	07-1074	07-1075	07-1076	07-1074	07-1074	07-1075
RE02-07-1131	02-600260	0–0.5	SOIL	07-1058	07-1057	07-1058	07-1058	07-1058	07-1058	07-1057	07-1056	07-1057	07-1058	07-1056	—	07-1057
RE02-07-1132	02-600260	2–4.4	QAL	07-1088	07-1087	07-1088	07-1088	07-1088	07-1088	07-1087	07-1086	07-1087	07-1088	07-1086	07-1086	07-1087
RE02-07-1133	02-600260	4.5–7.2	QAL	07-1088	07-1087	07-1088	07-1088	07-1088	07-1088	07-1087	07-1086	07-1087	07-1088	07-1086	07-1086	07-1087
RE02-07-1134	02-600261	0–0.5	SOIL	07-1058	07-1057	07-1058	07-1058	07-1058	07-1058	07-1057	07-1056	07-1057	07-1058	07-1056	—	07-1057
RE02-07-1135	02-600261	2–2.5	SOIL	07-1092	07-1091	07-1092	07-1092	07-1092	07-1092	07-1091	07-1090	07-1091	07-1092	07-1090	07-1090	07-1091
RE02-07-1136	02-600261	4.5–5	SOIL	07-1092	07-1091	07-1092	07-1092	07-1092	07-1092	07-1091	07-1090	07-1091	07-1092	07-1090	07-1090	07-1091
RE02-07-1137	02-600262	0–0.5	SOIL	07-1058	07-1057	07-1058	07-1058	07-1058	07-1058	07-1057	07-1056	07-1057	07-1058	07-1056	—	07-1057
RE02-07-1138	02-600262	2–2.5	QAL	07-1076	07-1075	07-1076	07-1076	07-1076	07-1076	07-1075	07-1074	07-1075	07-1076	07-1074	07-1074	07-1075
RE02-07-1139	02-600262	4.5–5	QAL	07-1076	07-1075	07-1076	07-1076	07-1076	07-1076	07-1075	07-1074	07-1075	07-1076	07-1074	07-1074	07-1075
RE02-07-1146	02-600263	0–0.5	SOIL	07-1084	07-1083	07-1084	07-1084	07-1084	07-1084	07-1083	07-1082	07-1083	07-1084	07-1082	—	07-1083
RE02-07-1141	02-600263	2–2.5	SOIL	07-1084	07-1083	07-1084	07-1084	07-1084	07-1084	07-1083	07-1082	07-1083	07-1084	07-1082	07-1082	07-1083
RE02-07-1142	02-600263	4.5–5	QAL	07-1084	07-1083	07-1084	07-1084	07-1084	07-1084	07-1083	07-1082	07-1083	07-1084	07-1082	07-1082	07-1083
RE02-07-1143	02-600264	0–0.5	SOIL	07-1058	07-1057	07-1058	07-1058	07-1058	07-1058	07-1057	07-1056	07-1057	07-1058	07-1056	—	07-1057
RE02-07-1144	02-600264	2–2.5	SOIL	07-1076	07-1075	07-1076	07-1076	07-1076	07-1076	07-1075	07-1074	07-1075	07-1076	07-1074	07-1074	07-1075
RE02-07-1145	02-600264	4.5–5	SOIL	07-1076	07-1075	07-1076	07-1076	07-1076	07-1076	07-1075	07-1074	07-1075	07-1076	07-1074	07-1074	07-1075
RE02-07-1140	02-600265	0–0.5	SOIL	07-1058	07-1057	07-1058	07-1058	07-1058	07-1058	07-1057	07-1056	07-1057	07-1058	07-1056	—	07-1057
RE02-07-1147	02-600265	2–2.5	SOIL	07-1092	07-1091	07-1092	07-1092	07-1092	07-1092	07-1091	07-1090	07-1091	07-1092	07-1090	07-1090	07-1091
RE02-07-1148	02-600265	4.5–5	SOIL	07-1092	07-1091	07-1092	07-1092	07-1092	07-1092	07-1091	07-1090	07-1091	07-1092	07-1090	07-1090	07-1091
RE02-07-1149	02-600266	0–0.5	SOIL	07-1092	07-1091	07-1092	07-1092	07-1092	07-1092	07-1091	07-1090	07-1091	07-1092	07-1090	—	07-1091

Table 6.23-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
RE02-07-1150	02-600266	2–2.5	SOIL	07-1092	07-1091	07-1092	07-1092	07-1092	07-1092	07-1091	07-1090	07-1091	07-1092	07-1090	07-1090	07-1091
RE02-07-1151	02-600266	4.5–5	SOIL	07-1103	07-1103	07-1103	07-1103	07-1103	07-1103	07-1103	07-1102	07-1103	07-1103	07-1102	07-1102	07-1103
RE02-07-1152	02-600267	0–0.5	SOIL	07-346	07-345	07-346	07-346	07-346	07-346	07-345	07-344	07-345	07-346	07-344	—	07-345
RE02-07-1153	02-600267	2–3.5	SOIL	07-346	07-345	07-346	07-346	07-346	07-346	07-345	07-344	07-345	07-346	07-344	07-344	07-345
RE02-07-1154	02-600267	4.5–5.5	QAL	07-346	07-345	07-346	07-346	07-346	07-346	07-345	07-344	07-345	07-346	07-344	07-344	07-345
RE02-07-1155	02-600268	0–0.5	SOIL	07-1103	07-1103	07-1103	07-1103	07-1103	07-1103	07-1103	07-1102	07-1103	07-1103	07-1102	—	07-1103
RE02-07-1156	02-600268	2–2.5	QAL	07-1103	07-1103	07-1103	07-1103	07-1103	07-1103	07-1103	07-1102	07-1103	07-1103	07-1102	07-1102	07-1103
RE02-07-1157	02-600268	4.5–5	QAL	07-1103	07-1103	07-1103	07-1103	07-1103	07-1103	07-1103	07-1102	07-1103	07-1103	07-1102	07-1102	07-1103
RE02-07-1158	02-600269	0–0.5	SOIL	07-1088	07-1087	07-1088	07-1088	07-1088	07-1088	07-1087	07-1086	07-1087	07-1088	07-1086	—	07-1087
RE02-07-1159	02-600269	2–2.5	QAL	07-1088	07-1087	07-1088	07-1088	07-1088	07-1088	07-1087	07-1086	07-1087	07-1088	07-1086	07-1086	07-1087
RE02-07-1160	02-600269	4.5–5	QAL	07-1088	07-1087	07-1088	07-1088	07-1088	07-1088	07-1087	07-1086	07-1087	07-1088	07-1086	07-1086	07-1087
RE02-07-1161	02-600270	0–1.1	SOIL	07-1084	07-1083	07-1084	07-1084	07-1084	07-1084	07-1083	07-1082	07-1083	07-1084	07-1082	—	07-1083
RE02-07-1162	02-600270	2–2.8	QAL	07-1084	07-1083	07-1084	07-1084	07-1084	07-1084	07-1083	07-1082	07-1083	07-1084	07-1082	07-1082	07-1083
RE02-07-1163	02-600270	4.5–5	QAL	07-1092	07-1091	07-1092	07-1092	07-1092	07-1092	07-1091	07-1090	07-1091	07-1092	07-1090	07-1090	07-1091
RE02-07-1164	02-600271	0–0.5	SOIL	07-1103	07-1103	07-1103	07-1103	07-1103	07-1103	07-1103	07-1102	07-1103	07-1103	07-1102	—	07-1103
RE02-07-1165	02-600271	2–2.5	QAL	07-1103	07-1103	07-1103	07-1103	07-1103	07-1103	07-1103	07-1102	07-1103	07-1103	07-1102	07-1102	07-1103
RE02-07-1166	02-600271	4.5–5	QAL	07-1103	07-1103	07-1103	07-1103	07-1103	07-1103	07-1103	07-1102	07-1103	07-1103	07-1102	07-1102	07-1103
RE02-07-1167	02-600272	0–0.5	SOIL	07-1058	07-1057	07-1058	07-1058	07-1058	07-1058	07-1057	07-1056	07-1057	07-1058	07-1056	—	07-1057
RE02-07-1168	02-600272	2–4	QAL	07-1058	07-1057	07-1058	07-1058	07-1058	07-1058	07-1057	07-1056	07-1057	07-1058	07-1056	07-1056	07-1057
RE02-07-1169	02-600272	4.5–14	QAL	07-1058	07-1057	07-1058	07-1058	07-1058	07-1058	07-1057	07-1056	07-1057	07-1058	07-1056	07-1056	07-1057
RE02-07-1170	02-600273	0–0.5	SOIL	07-1088	07-1087	07-1088	07-1088	07-1088	07-1088	07-1087	07-1086	07-1087	07-1088	07-1086	—	07-1087
RE02-07-1171	02-600273	2–2.5	QAL	07-1058	07-1057	07-1058	07-1058	07-1058	07-1058	07-1057	07-1056	07-1057	07-1058	07-1056	07-1056	07-1057
RE02-07-1172	02-600273	4.5–5	QAL	07-1058	07-1057	07-1058	07-1058	07-1058	07-1058	07-1057	07-1056	07-1057	07-1058	07-1056	07-1056	07-1057
RE02-07-1173	02-600274	0–0.5	SOIL	07-1058	07-1057	07-1058	07-1058	07-1058	07-1058	07-1057	07-1056	07-1057	07-1058	07-1056	—	07-1057
RE02-07-1174	02-600274	2–4.5	QAL	07-1058	07-1057	07-1058	07-1058	07-1058	07-1058	07-1057	07-1056	07-1057	07-1058	07-1056	07-1056	07-1057
RE02-07-1175	02-600274	4.5–10	QAL	07-1058	07-1057	07-1058	07-1058	07-1058	07-1058	07-1057	07-1056	07-1057	07-1058	07-1056	07-1056	07-1057
RE02-07-1176	02-600275	0–0.5	SOIL	07-1088	07-1087	07-1088	07-1088	07-1088	07-1088	07-1087	07-1086	07-1087	07-1088	07-1086	—	07-1087
RE02-07-1177	02-600275	2–3	QAL	07-1088	07-1087	07-1088	07-1088	07-1088	07-1088	07-1087	07-1086	07-1087	07-1088	07-1086	07-1086	07-1087
RE02-07-1178	02-600275	4.5–5.5	QAL	07-1088	07-1087	07-1088	07-1088	07-1088	07-1088	07-1087	07-1086	07-1087	07-1088	07-1086	07-1086	07-1087
RE02-07-1179	02-600276	0–0.5	SOIL	07-1103	07-1103	07-1103	07-1103	07-1103	07-1103	07-1103	07-1102	07-1103	07-1103	07-1102	—	07-1103
RE02-07-1180	02-600276	2–2.5	QAL	07-1108	07-1108	07-1108	07-1108	07-1108	07-1108	07-1107	07-1107	07-1108	07-1108	07-1107	07-1107	07-1108
RE02-07-1181	02-600276	4.5–5	QAL	07-1108	07-1108	07-1108	07-1108	07-1108	07-1108	07-1107	07-1107	07-1108	07-1108	07-1107	07-1107	07-1108
RE02-07-1182	02-600277	0–0.5	SOIL	07-352	07-351	07-352	07-352	07-352	07-352	07-351	07-350	07-351	07-352	07-350	—	07-351
RE02-07-1183	02-600277	2–3	QAL	07-352	07-351	07-352	07-352	07-352	07-352	07-351	07-350	07-351	07-352	07-350	07-350	07-351

Table 6.23-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
RE02-07-1184	02-600277	4.5–5	QAL	07-352	07-351	07-352	07-352	07-352	07-352	07-351	07-350	07-351	07-352	07-350	07-350	07-351
RE02-07-1185	02-600278	0–0.5	SOIL	07-1092	07-1091	07-1092	07-1092	07-1092	07-1092	07-1091	07-1090	07-1091	07-1092	07-1090	—	07-1091
RE02-07-1188	02-600279	0–0.8	SOIL	07-1092	07-1091	07-1092	07-1092	07-1092	07-1092	07-1091	07-1090	07-1091	07-1092	07-1090	—	07-1091
RE02-07-1189	02-600279	2–2.5	QAL	07-1111	07-1110	07-1111	07-1111	07-1111	07-1111	07-1111	07-1110	07-1110	07-1111	07-1110	07-1110	07-1110
RE02-07-1190	02-600279	4.5–5	QAL	07-1111	07-1110	07-1111	07-1111	07-1111	07-1111	07-1111	07-1110	07-1110	07-1111	07-1110	07-1110	07-1110
RE02-07-1191	02-600280	0–0.5	SOIL	07-1111	07-1110	07-1111	07-1111	07-1111	07-1111	07-1111	07-1110	07-1110	07-1111	07-1110	—	07-1110
RE02-07-1192	02-600280	2–2.5	QAL	07-1111	07-1110	07-1111	07-1111	07-1111	07-1111	07-1111	07-1110	07-1110	07-1111	07-1110	07-1110	07-1110
RE02-07-1193	02-600280	4.5–5	QAL	07-1111	07-1110	07-1111	07-1111	07-1111	07-1111	07-1111	07-1110	07-1110	07-1111	07-1110	07-1110	07-1110
RE02-07-1194	02-600281	0–0.5	SOIL	07-1108	07-1108	07-1108	07-1108	07-1108	07-1108	07-1107	07-1107	07-1108	07-1108	07-1107	—	07-1108
RE02-07-1195	02-600281	2–2.5	QAL	07-1108	07-1108	07-1108	07-1108	07-1108	07-1108	07-1107	07-1107	07-1108	07-1108	07-1107	07-1107	07-1108
RE02-07-1196	02-600281	4.5–5	QAL	07-1108	07-1108	07-1108	07-1108	07-1108	07-1108	07-1107	07-1107	07-1108	07-1108	07-1107	07-1107	07-1108
RE02-10-22034	02-612421	5–6	QAL	10-4697	—	10-4697	10-4697	10-4697	10-4697	10-4697	10-4697	—	10-4697	10-4697	—	—
RE02-10-22035	02-612421	15–16	QAL	10-4697	—	10-4697	10-4697	10-4697	10-4697	10-4697	10-4697	—	10-4697	10-4697	—	—
RE02-10-22036	02-612421	28–29	QAL	10-4696	—	10-4696	10-4696	10-4696	10-4696	10-4695	10-4695	—	10-4696	10-4695	—	—
RE02-10-22037	02-612421	35–36	QBO	10-4696	—	10-4696	10-4696	10-4696	10-4696	10-4695	10-4695	—	10-4696	10-4695	—	—
RE02-10-22038	02-612421	48–50	QBO	10-4696	—	10-4696	10-4696	10-4696	10-4696	10-4695	10-4695	—	10-4696	10-4695	—	—
RE02-10-22039	02-612422	5–6	QAL	10-4780	—	10-4780	10-4780	10-4780	10-4780	10-4779	10-4778	—	10-4780	10-4778	—	—
RE02-10-22040	02-612422	15–16	QAL	10-4780	—	10-4780	10-4780	10-4780	10-4780	10-4779	10-4778	—	10-4780	10-4778	—	—
RE02-10-22041	02-612422	25–26	QBO	10-4780	—	10-4780	10-4780	10-4780	10-4780	10-4779	10-4778	—	10-4780	10-4778	—	—
RE02-10-22042	02-612422	35–36	QBO	10-4789	—	10-4789	10-4789	10-4789	10-4789	10-4789	10-4789	—	10-4789	10-4789	—	—
RE02-10-22043	02-612422	49–50	QBO	10-4789	—	10-4789	10-4789	10-4789	10-4789	10-4789	10-4789	—	10-4789	10-4789	—	—

[a] — = Analysis not requested.

[b] Analytical request number.

Table 6.23-2
Inorganic Chemicals Detected or Detected above BVs at SWMU 02-009(a)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Cadmium	Calcium	Chromium	Copper	Cyanide (Total)	Iron	Magnesium	Manganese	Mercury	Nitrate	Perchlorate	Selenium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**0.4**	**1900**	**2.6**	**3.96**	**na[b]**	**3700**	**739**	**189**	**0.1**	**na**	**na**	**0.3**	**40**
Soil BV[a]				**29,200**	**0.83**	**8.17**	**0.4**	**6120**	**19.3**	**14.7**	**0.5**	**21,500**	**4610**	**671**	**0.1**	**na**	**na**	**1.52**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**1110**	**na**	**505[d]**	**51,900**	**62.8**	**908,000**	**na**	**160,000**	**389**	**2,080,000**	**908**	**6490**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**457**	**na**	**281[d]**	**24,800**	**224**	**434,000**	**na**	**14,800**	**186**	**991,000**	**434**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**70.5**	**na**	**96[d]**	**3130**	**11.1**	**54,800**	**na**	**10,500**	**23.5**	**125,000**	**54.8**	**391**	**23,500**
CA02-00-0186	02-01259	0–0.5	SOIL	—[f]	—	—	—	—	—	—	NA[g]	—	—	—	—	NA	NA	—	120
CA02-00-0187	02-01259	2–2.5	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	NA	NA	—	120
CA02-00-0188	02-01260	0–0.5	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	NA	NA	—	80
CA02-00-0189	02-01260	2–2.5	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	NA	NA	—	65
CA02-00-0208	02-01263	0–0.5	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	NA	NA	—	65
CA02-00-0209	02-01263	2–2.5	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	NA	NA	—	110
CA02-00-0211	02-01263	5–5.5	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	NA	NA	—	97
CA02-00-0213	02-01264	0–0.5	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	NA	NA	—	72
CA02-00-0214	02-01264	2–2.5	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	NA	NA	—	76
RE02-07-1128	02-600259	0–0.5	SOIL	—	—	—	0.538 (U)	8290	—	—	—	—	—	—	—	1.33 (J-)	—	12.6	—
RE02-07-1129	02-600259	2–3	QAL	—	—	—	0.515 (U)	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1130	02-600259	4.5–5.1	QAL	—	—	—	0.522 (U)	—	—	—	—	—	—	—	—	—	0.00623 (J-)	1.57 (U)	—
RE02-07-1131	02-600260	0–0.5	SOIL	—	—	—	0.525 (U)	—	—	—	—	—	—	—	0.35	1.78 (J-)	—	8.6	—
RE02-07-1132	02-600260	2–4.4	QAL	—	—	—	0.509 (U)	—	—	—	—	—	—	—	—	1.14 (J-)	0.000939 (J)	8.02	—
RE02-07-1133	02-600260	4.5–7.2	QAL	—	—	—	0.568 (U)	—	—	—	—	—	—	—	—	—	0.000979 (J)	8.91	—
RE02-07-1134	02-600261	0–0.5	SOIL	—	—	—	0.569 (U)	23,300	—	—	—	—	5060	—	—	—	—	21.1	—
RE02-07-1135	02-600261	2–2.5	SOIL	—	—	—	0.546 (U)	6380 (J+)	—	—	—	—	—	—	—	1.57	—	9.93	—
RE02-07-1136	02-600261	4.5–5	SOIL	—	—	—	0.542 (U)	—	—	—	—	—	—	—	—	—	0.000558 (J+)	8.2	—
RE02-07-1137	02-600262	0–0.5	SOIL	—	—	—	0.546 (U)	—	—	—	—	—	—	—	0.349	4.3 (J-)	—	10	—
RE02-07-1138	02-600262	2–2.5	QAL	—	—	—	0.506 (U)	—	—	—	—	—	—	—	—	1.33 (J-)	—	—	—
RE02-07-1139	02-600262	4.5–5	QAL	—	—	—	0.523 (U)	—	—	—	—	—	—	—	—	1.15 (J-)	—	—	—
RE02-07-1146	02-600263	0–0.5	SOIL	—	—	—	0.548 (U)	—	—	—	—	—	—	—	—	6.19 (J-)	0.00204 (J-)	1.65 (U)	—
RE02-07-1141	02-600263	2–2.5	SOIL	—	—	—	0.518 (U)	—	—	—	—	—	—	—	—	1.23	0.00224 (J-)	1.55 (U)	—
RE02-07-1142	02-600263	4.5–5	QAL	—	—	—	0.496 (U)	—	—	—	—	—	—	—	—	2.47	0.00145 (J-)	—	—
RE02-07-1143	02-600264	0–0.5	SOIL	—	—	—	0.567 (U)	—	—	—	—	—	—	—	—	4.26 (J-)	—	9.88	—
RE02-07-1144	02-600264	2–2.5	SOIL	—	—	—	0.512 (U)	—	—	—	—	—	—	—	—	1.06 (J-)	0.000758 (J-)	1.54 (U)	—
RE02-07-1145	02-600264	4.5–5	SOIL	—	—	—	0.526 (U)	—	—	—	—	—	—	—	—	—	0.00159 (J-)	1.58 (U)	—
RE02-07-1140	02-600265	0–0.5	SOIL	—	—	—	0.547 (U)	—	—	—	—	—	—	—	—	3.24 (J-)	0.00151 (J)	9.55	—
RE02-07-1147	02-600265	2–2.5	SOIL	—	—	—	0.532 (U)	—	—	—	—	—	—	—	—	1.48 (J-)	0.000879 (J+)	8.77	—
RE02-07-1148	02-600265	4.5–5	SOIL	—	—	—	0.513 (U)	—	—	—	—	—	—	—	—	0.93 (J-)	0.00262 (J+)	8.3	—

Table 6.23-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Cadmium	Calcium	Chromium	Copper	Cyanide (Total)	Iron	Magnesium	Manganese	Mercury	Nitrate	Perchlorate	Selenium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**0.4**	**1900**	**2.6**	**3.96**	**na[b]**	**3700**	**739**	**189**	**0.1**	**na**	**na**	**0.3**	**40**
Soil BV[a]				**29,200**	**0.83**	**8.17**	**0.4**	**6120**	**19.3**	**14.7**	**0.5**	**21,500**	**4610**	**671**	**0.1**	**na**	**na**	**1.52**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**1110**	**na**	**505[d]**	**51,900**	**62.8**	**908,000**	**na**	**160,000**	**389**	**2,080,000**	**908**	**6490**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**457**	**na**	**281[d]**	**24,800**	**224**	**434,000**	**na**	**14,800**	**186**	**991,000**	**434**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**70.5**	**na**	**96[d]**	**3130**	**11.1**	**54,800**	**na**	**10,500**	**23.5**	**125,000**	**54.8**	**391**	**23,500**
RE02-07-1149	02-600266	0–0.5	SOIL	—	—	—	0.532 (U)	—	—	—	—	—	—	—	—	4.79	0.000612 (J+)	7.95	—
RE02-07-1150	02-600266	2–2.5	SOIL	—	—	—	0.515 (U)	—	—	—	—	—	—	—	—	2.3 (J-)	0.000879 (J+)	7.72	—
RE02-07-1151	02-600266	4.5–5	SOIL	—	—	—	0.502 (U)	—	—	—	—	—	—	—	—	1.27	0.00107 (J)	7.82	—
RE02-07-1152	02-600267	0–0.5	SOIL	—	—	—	0.508 (U)	—	—	—	—	—	—	—	—	2.92 (J-)	—	—	—
RE02-07-1153	02-600267	2–3.5	SOIL	—	—	—	0.515 (U)	—	—	—	—	—	—	—	—	—	0.000551 (J-)	—	—
RE02-07-1154	02-600267	4.5–5.5	QAL	—	—	—	0.519 (U)	—	—	—	—	—	—	—	—	1.34 (J-)	0.00347 (J-)	1.55 (J)	—
RE02-07-1155	02-600268	0–0.5	SOIL	—	—	—	0.534 (U)	19,100	—	—	—	—	—	—	—	2.28	—	16.7	—
RE02-07-1156	02-600268	2–2.5	QAL	—	—	—	0.539 (U)	26,700	—	—	—	—	5170 (J+)	—	—	—	0.000758 (J)	19	—
RE02-07-1157	02-600268	4.5–5	QAL	—	—	—	0.506 (U)	—	—	—	1.21 (U)	—	—	—	—	—	—	6.69	—
RE02-07-1158	02-600269	0–0.5	SOIL	—	—	—	2.65 (U)	—	—	80.7	—	63,200	—	—	—	—	—	70.5	—
RE02-07-1159	02-600269	2–2.5	QAL	—	—	—	0.539 (U)	—	—	69.5	—	—	—	—	—	—	—	21.6	—
RE02-07-1160	02-600269	4.5–5	QAL	—	—	—	0.551 (U)	—	—	66	—	—	—	—	—	—	—	20.7	—
RE02-07-1161	02-600270	0–1.1	SOIL	—	—	—	0.532 (U)	—	—	—	—	—	—	—	—	2.65 (J-)	0.000951 (J-)	—	—
RE02-07-1162	02-600270	2–2.8	QAL	—	—	—	0.507 (U)	—	—	—	—	—	—	—	—	1.23	0.00117 (J-)	—	—
RE02-07-1163	02-600270	4.5–5	QAL	—	—	—	0.524 (U)	—	59.3	—	—	—	—	—	—	1.37 (J-)	0.0016 (J+)	9.39	—
RE02-07-1164	02-600271	0–0.5	SOIL	—	—	—	0.544 (U)	—	—	—	—	—	—	—	—	1.86	—	5.74	—
RE02-07-1165	02-600271	2–2.5	QAL	—	—	—	0.501 (U)	—	—	—	—	—	—	—	—	—	—	6.91	—
RE02-07-1166	02-600271	4.5–5	QAL	—	—	—	0.518 (U)	—	—	—	—	—	—	—	—	1.59	—	6.87	—
RE02-07-1167	02-600272	0–0.5	SOIL	—	—	—	0.553 (U)	13,400	—	—	—	—	—	—	—	—	—	16.9	—
RE02-07-1168	02-600272	2–4	QAL	—	—	—	0.52 (U)	—	—	—	—	—	—	—	—	1.51 (J-)	0.00104 (J)	9.2	—
RE02-07-1169	02-600272	4.5–14	QAL	—	—	—	0.518 (U)	—	—	—	—	—	—	—	—	—	0.00303	8.17	—
RE02-07-1170	02-600273	0–0.5	SOIL	—	—	—	0.509 (U)	—	—	—	—	—	—	—	—	1.39 (J-)	—	7.99	—
RE02-07-1171	02-600273	2–2.5	QAL	—	—	—	0.518 (U)	—	—	—	—	—	—	—	—	—	0.00112 (J)	9.36	—
RE02-07-1172	02-600273	4.5–5	QAL	—	—	—	0.498 (U)	—	—	—	—	—	—	—	—	—	0.00114 (J)	10.2	—
RE02-07-1173	02-600274	0–0.5	SOIL	—	—	—	0.546 (U)	—	—	—	—	—	—	—	—	2.58 (J-)	—	8.05	—
RE02-07-1174	02-600274	2–4.5	QAL	—	—	—	0.512 (U)	—	—	—	—	—	—	—	—	1.13 (J-)	—	9.49	—
RE02-07-1175	02-600274	4.5–10	QAL	—	—	—	0.513 (U)	—	—	—	—	—	—	—	—	—	—	9.33	—
RE02-07-1176	02-600275	0–0.5	SOIL	—	—	—	0.533 (U)	—	—	—	—	—	—	—	—	2.44 (J-)	0.0018 (J)	8.44	—
RE02-07-1177	02-600275	2–3	QAL	—	—	—	0.519 (U)	—	—	—	—	—	—	—	—	1.47 (J-)	0.00205 (J)	8.81	—
RE02-07-1178	02-600275	4.5–5.5	QAL	—	—	—	0.504 (U)	—	—	—	—	—	—	—	—	1.1 (J-)	0.000616 (J)	7.82	—
RE02-07-1179	02-600276	0–0.5	SOIL	—	—	—	0.552 (U)	—	—	—	0.51	—	—	—	—	—	—	6.57	—
RE02-07-1180	02-600276	2–2.5	QAL	—	—	—	0.503 (U)	—	—	—	—	—	—	—	—	1.19	—	6.63	—

Table 6.23-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Cadmium	Calcium	Chromium	Copper	Cyanide (Total)	Iron	Magnesium	Manganese	Mercury	Nitrate	Perchlorate	Selenium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**0.4**	**1900**	**2.6**	**3.96**	**na[b]**	**3700**	**739**	**189**	**0.1**	**na**	**na**	**0.3**	**40**
Soil BV[a]				**29,200**	**0.83**	**8.17**	**0.4**	**6120**	**19.3**	**14.7**	**0.5**	**21,500**	**4610**	**671**	**0.1**	**na**	**na**	**1.52**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**1110**	**na**	**505[d]**	**51,900**	**62.8**	**908,000**	**na**	**160,000**	**389**	**2,080,000**	**908**	**6490**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**457**	**na**	**281[d]**	**24,800**	**224**	**434,000**	**na**	**14,800**	**186**	**991,000**	**434**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**70.5**	**na**	**96[d]**	**3130**	**11.1**	**54,800**	**na**	**10,500**	**23.5**	**125,000**	**54.8**	**391**	**23,500**
RE02-07-1181	02-600276	4.5–5	QAL	—	—	—	0.512 (U)	—	—	—	—	—	—	—	—	1.09	—	7.92	—
RE02-07-1182	02-600277	0–0.5	SOIL	—	—	—	0.525 (U)	—	—	—	—	—	—	—	—	1.94 (J-)	—	—	—
RE02-07-1183	02-600277	2–3	QAL	—	—	—	0.495 (U)	—	—	—	—	—	—	—	—	2.2 (J-)	—	—	—
RE02-07-1184	02-600277	4.5–5	QAL	—	—	—	0.502 (U)	—	—	—	—	—	—	—	—	1.45 (J-)	0.000574 (J)	—	—
RE02-07-1185	02-600278	0–0.5	SOIL	—	—	—	0.529 (U)	—	—	—	—	—	—	—	—	—	—	7.91	—
RE02-07-1188	02-600279	0–0.8	SOIL	—	—	—	0.535 (U)	—	—	—	—	—	—	—	—	6.34	0.000944 (J+)	8.19	—
RE02-07-1189	02-600279	2–2.5	QAL	—	—	—	0.518 (U)	—	—	—	—	—	—	—	—	1.04	0.00176 (J)	7.69	—
RE02-07-1190	02-600279	4.5–5	QAL	—	—	—	0.498 (U)	—	—	—	—	—	—	—	—	1.57	0.000945 (J)	6.65	—
RE02-07-1191	02-600280	0–0.5	SOIL	—	—	—	0.541 (U)	—	—	—	—	—	—	—	—	4.63	0.00061 (J)	7.75	—
RE02-07-1192	02-600280	2–2.5	QAL	—	—	—	0.515 (U)	—	—	—	—	—	—	—	—	1.32	0.00195 (J)	6.73	—
RE02-07-1193	02-600280	4.5–5	QAL	—	—	—	0.507 (U)	—	—	—	—	—	—	—	—	1.76	0.00114 (J)	7.27	—
RE02-07-1194	02-600281	0–0.5	SOIL	—	—	—	0.534 (U)	—	—	—	—	—	—	—	—	2.19	0.00122 (J)	7.74	—
RE02-07-1195	02-600281	2–2.5	QAL	—	—	—	0.511 (U)	—	—	—	—	—	—	—	—	1.51	0.000535 (J)	7.2	—
RE02-07-1196	02-600281	4.5–5	QAL	—	—	—	0.518 (U)	—	—	—	—	—	—	—	—	1.54	0.00129 (J)	7.56	—
RE02-10-22034	02-612421	5–6	QAL	—	—	—	—	—	—	76.1	NA	39,500	—	—	—	NA	NA	—	—
RE02-10-22035	02-612421	15–16	QAL	—	1.06 (U)	—	—	—	—	—	NA	—	—	—	—	NA	NA	—	74
RE02-10-22036	02-612421	28–29	QAL	—	1.16 (U)	—	0.58 (U)	—	—	—	NA	—	—	—	—	NA	NA	—	—
RE02-10-22037	02-612421	35–36	QBO	—	1.26 (U)	1.28 (U)	0.631 (U)	—	—	—	NA	5170	—	217	—	NA	NA	1.28 (U)	—
RE02-10-22038	02-612421	48–50	QBO	—	1.16 (U)	1.06 (U)	0.581 (U)	—	—	—	NA	4950	—	—	—	NA	NA	1.06 (U)	—
RE02-10-22039	02-612422	5–6	QAL	—	1.03 (U)	—	0.516 (U)	—	—	—	NA	—	—	—	—	NA	NA	—	—
RE02-10-22040	02-612422	15–16	QAL	—	1.03 (U)	—	0.513 (U)	—	—	—	NA	—	—	—	—	NA	NA	—	—
RE02-10-22041	02-612422	25–26	QBO	4260	1.22 (U)	1.15 (U)	0.612 (U)	—	—	—	NA	6050	—	225	—	NA	NA	1.15 (UJ)	—
RE02-10-22042	02-612422	35–36	QBO	—	1.17 (U)	1.22 (U)	0.587 (U)	—	—	—	NA	5390	—	216	—	NA	NA	1.22 (UJ)	—
RE02-10-22043	02-612422	49–50	QBO	—	1.23 (U)	—	0.616 (U)	—	—	—	NA	5340	—	—	—	NA	NA	1.21 (UJ)	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 6.23-3
Organic Chemicals Detected at SWMU 02-009(a)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Anthracene	Aroclor-1248	Aroclor-1254	Aroclor-1260	Benzo(a)pyrene	Benzo(b)fluoranthene	Butylbenzylphthalate	Chloroform	Chloromethane	Chrysene	Dichlorobenzene[1,4-]
Industrial SSL[a]				**959,000**	**253,000**	**10.7**	**11**	**11.1**	**23.6**	**32.3**	**12,000**[b]	**28.4**	**199**	**3230**	**6730**
Recreational SSL[c]				**505,000**	**863,000**	**10.3**	**5.53**	**10.3**	**8.88**	**88.8**	**13,100**	**204**	**1200**	**8880**	**1140**
Residential SSL[a]				**66,300**	**17,400**	**2.22**	**1.12**	**2.22**	**1.12**	**1.53**	**2900**[b]	**5.85**	**40.8**	**153**	**1290**
RE02-07-1129	02-600259	2–3	QAL	—[d]	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1131	02-600260	0–0.5	SOIL	NA[e]	0.00912 (J)	—	0.0043	0.0034 (J)	0.02 (J)	0.0297 (J)	—	NA	NA	0.0179 (J)	—
RE02-07-1132	02-600260	2–4.4	QAL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1133	02-600260	4.5–7.2	QAL	0.041	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1135	02-600261	2–2.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1136	02-600261	4.5–5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1137	02-600262	0–0.5	SOIL	NA	—	—	0.0028 (J)	0.0024 (J)	0.0189 (J)	0.0708	—	NA	NA	0.0695	—
RE02-07-1138	02-600262	2–2.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1139	02-600262	4.5–5	QAL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1146	02-600263	0–0.5	SOIL	NA	—	—	—	0.0046	—	—	—	NA	NA	—	—
RE02-07-1141	02-600263	2–2.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1143	02-600264	0–0.5	SOIL	NA	—	—	0.0024 (J)	0.0019 (J)	—	—	—	NA	NA	—	—
RE02-07-1144	02-600264	2–2.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1145	02-600264	4.5–5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1140	02-600265	0–0.5	SOIL	NA	—	—	—	0.0013 (J)	—	—	—	NA	NA	—	—
RE02-07-1147	02-600265	2–2.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1148	02-600265	4.5–5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1150	02-600266	2–2.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1151	02-600266	4.5–5	SOIL	—	—	—	—	—	—	—	—	0.000239 (J)	—	—	—
RE02-07-1152	02-600267	0–0.5	SOIL	NA	—	—	0.0027 (J)	0.0026 (J)	—	—	0.281 (J)	NA	NA	—	—
RE02-07-1153	02-600267	2–3.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1154	02-600267	4.5–5.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1156	02-600268	2–2.5	QAL	—	—	—	—	—	—	—	—	0.000231 (J)	—	—	—
RE02-07-1157	02-600268	4.5–5	QAL	—	—	—	—	—	—	—	—	0.000266 (J)	—	—	—
RE02-07-1159	02-600269	2–2.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1160	02-600269	4.5–5	QAL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1162	02-600270	2–2.8	QAL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1165	02-600271	2–2.5	QAL	0.00731 (J)	—	—	—	—	—	—	—	0.000264 (J)	—	—	—

Table 6.23-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Anthracene	Aroclor-1248	Aroclor-1254	Aroclor-1260	Benzo(a)pyrene	Benzo(b)fluoranthene	Butylbenzylphthalate	Chloroform	Chloromethane	Chrysene	Dichlorobenzene[1,4-]
Industrial SSL[a]				**959,000**	**253,000**	**10.7**	**11**	**11.1**	**23.6**	**32.3**	**12,000[b]**	**28.4**	**199**	**3230**	**6730**
Recreational SSL[c]				**505,000**	**863,000**	**10.3**	**5.53**	**10.3**	**8.88**	**88.8**	**13,100**	**204**	**1200**	**8880**	**1140**
Residential SSL[a]				**66,300**	**17,400**	**2.22**	**1.12**	**2.22**	**1.12**	**1.53**	**2900[b]**	**5.85**	**40.8**	**153**	**1290**
RE02-07-1166	02-600271	4.5–5	QAL	—	—	—	—	—	—	—	—	0.000273 (J)	—	—	—
RE02-07-1170	02-600273	0–0.5	SOIL	NA	—	—	0.0019 (J)	0.0019 (J)	—	—	—	NA	NA	—	—
RE02-07-1171	02-600273	2–2.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1173	02-600274	0–0.5	SOIL	NA	—	—	0.0022 (J)	0.0017 (J)	—	—	—	NA	NA	—	—
RE02-07-1174	02-600274	2–4.5	QAL	—	—	0.0478 (J-)	—	—	—	—	—	—	—	—	—
RE02-07-1175	02-600274	4.5–10	QAL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1176	02-600275	0–0.5	SOIL	NA	—	—	0.0022 (J)	0.0027 (J)	—	—	—	NA	NA	—	—
RE02-07-1177	02-600275	2–3	QAL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1178	02-600275	4.5–5.5	QAL	—	—	—	—	—	—	—	—	—	0.00288	—	—
RE02-07-1181	02-600276	4.5–5	QAL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1183	02-600277	2–3	QAL	—	—	—	—	0.0016 (J)	—	—	—	—	—	—	—
RE02-07-1185	02-600278	0–0.5	SOIL	NA	—	—	—	0.0144	—	—	—	NA	NA	—	—
RE02-07-1188	02-600279	0–0.8	SOIL	NA	—	—	—	0.0033 (J)	—	—	—	NA	NA	—	—
RE02-07-1189	02-600279	2–2.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1190	02-600279	4.5–5	QAL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1192	02-600280	2–2.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1196	02-600281	4.5–5	QAL	—	—	—	—	—	—	—	—	—	—	—	0.000364 (J)
RE02-10-22036	02-612421	28–29	QAL	NA	—	—	—	0.0023 (J)	—	—	—	NA	NA	—	—
RE02-10-22040	02-612422	15–16	QAL	NA	—	—	0.0014 (J)	0.0017 (J)	—	—	—	NA	NA	—	—

Table 6.23-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Di-n-butylphthalate	Fluoranthene	Isopropyltoluene[4-]	Pentachlorophenol	Phenanthrene	Phenol	Pyrene	Toluene	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene[1,2-]
Industrial SSL[a]				**91,600**	**33,700**	**14,900[f]**	**100**	**25,300**	**275,000**	**25,300**	**61,400**	**1800[c]**	**1500[c]**	**3910**
Recreational SSL[e]				**32,800**	**11,500**	**52,700[f]**	**117**	**8630**	**98,500**	**8630**	**47,600**	**5010**	**4830**	**26,000**
Residential SSL[a]				**6160**	**2320**	**3210[f]**	**29.8**	**1740**	**18,500**	**1740**	**5220**	**300[c]**	**270[c]**	**798**
RE02-07-1129	02-600259	2–3	QAL	—	—	—	—	—	—	—	0.000526 (J)	—	—	—
RE02-07-1131	02-600260	0–0.5	SOIL	—	0.0373	NA	—	0.0351 (J)	—	0.0346 (J)	NA	NA	NA	NA
RE02-07-1132	02-600260	2–4.4	QAL	0.0358 (J)	—	—	—	—	—	—	0.000775 (J)	—	—	—
RE02-07-1133	02-600260	4.5–7.2	QAL	—	—	0.000324 (J)	—	—	—	—	0.000428 (J)	—	—	—
RE02-07-1135	02-600261	2–2.5	SOIL	—	—	—	—	—	—	—	0.000392 (J+)	—	—	—
RE02-07-1136	02-600261	4.5–5	SOIL	—	—	—	—	—	—	—	0.00036 (J)	—	—	—
RE02-07-1137	02-600262	0–0.5	SOIL	—	0.171	NA	—	0.0828	—	0.136	NA	NA	NA	NA
RE02-07-1138	02-600262	2–2.5	QAL	—	—	—	—	—	—	—	0.00112 (J+)	—	—	—
RE02-07-1139	02-600262	4.5–5	QAL	—	—	—	—	—	—	—	0.000372 (J)	—	—	—
RE02-07-1146	02-600263	0–0.5	SOIL	—	—	NA	—	—	—	—	NA	NA	NA	NA
RE02-07-1141	02-600263	2–2.5	SOIL	—	—	—	—	—	—	—	0.000498 (J+)	—	—	—
RE02-07-1143	02-600264	0–0.5	SOIL	—	0.0139 (J)	NA	0.257 (J)	—	—	0.0134 (J)	NA	NA	NA	NA
RE02-07-1144	02-600264	2–2.5	SOIL	—	—	—	—	—	—	—	0.000395 (J)	—	—	0.000619 (J)
RE02-07-1145	02-600264	4.5–5	SOIL	—	—	—	—	—	—	—	0.000389 (J)	0.000843 (J)	0.000535 (J)	0.000648 (J)
RE02-07-1140	02-600265	0–0.5	SOIL	—	—	NA	—	—	—	—	NA	NA	NA	NA
RE02-07-1147	02-600265	2–2.5	SOIL	—	—	—	—	—	—	—	0.000949 (J+)	—	—	—
RE02-07-1148	02-600265	4.5–5	SOIL	—	—	—	—	—	—	—	0.000986 (J)	—	—	—
RE02-07-1150	02-600266	2–2.5	SOIL	—	—	—	—	—	—	—	0.000877 (J+)	—	—	—
RE02-07-1151	02-600266	4.5–5	SOIL	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1152	02-600267	0–0.5	SOIL	—	0.014 (J)	NA	—	—	—	0.0133 (J)	NA	NA	NA	NA
RE02-07-1153	02-600267	2–3.5	SOIL	—	—	—	—	—	—	—	0.000786 (J)	—	—	—
RE02-07-1154	02-600267	4.5–5.5	QAL	—	—	—	—	—	—	—	0.000743 (J)	—	—	—
RE02-07-1156	02-600268	2–2.5	QAL	—	—	—	—	—	—	—	0.00037 (J)	—	—	—
RE02-07-1157	02-600268	4.5–5	QAL	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1159	02-600269	2–2.5	QAL	—	—	—	—	—	—	—	0.000761 (J)	—	—	—
RE02-07-1160	02-600269	4.5–5	QAL	—	—	—	—	—	—	—	0.000377 (J)	—	—	—
RE02-07-1162	02-600270	2–2.8	QAL	—	—	—	—	—	—	—	0.000488 (J+)	—	—	—
RE02-07-1165	02-600271	2–2.5	QAL	—	—	0.000519 (J)	—	—	—	—	0.000346 (J)	—	—	—
RE02-07-1166	02-600271	4.5–5	QAL	—	—	0.000345 (J)	—	—	—	—	0.000645 (J)	—	—	—

Table 6.23-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Di-n-butylphthalate	Fluoranthene	Isopropyltoluene[4-]	Pentachlorophenol	Phenanthrene	Phenol	Pyrene	Toluene	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene[1,2-]
Industrial SSL[a]				**91,600**	**33,700**	**14,900[f]**	**100**	**25,300**	**275,000**	**25,300**	**61,400**	**1800[c]**	**1500[c]**	**3910**
Recreational SSL[e]				**32,800**	**11,500**	**52,700[f]**	**117**	**8630**	**98,500**	**8630**	**47,600**	**5010**	**4830**	**26,000**
Residential SSL[a]				**6160**	**2320**	**3210[f]**	**29.8**	**1740**	**18,500**	**1740**	**5220**	**300[c]**	**270[c]**	**798**
RE02-07-1170	02-600273	0–0.5	SOIL	—	—	NA	—	—	—	—	NA	NA	NA	NA
RE02-07-1171	02-600273	2–2.5	QAL	—	—	—	—	—	—	—	0.000405 (J)	—	—	—
RE02-07-1173	02-600274	0–0.5	SOIL	—	—	NA	—	—	—	—	NA	NA	NA	NA
RE02-07-1174	02-600274	2–4.5	QAL	—	—	—	—	—	—	—	0.000331 (J)	—	—	—
RE02-07-1175	02-600274	4.5–10	QAL	—	—	—	—	—	—	—	0.000352 (J)	—	—	—
RE02-07-1176	02-600275	0–0.5	SOIL	—	0.012 (J)	NA	—	—	—	—	NA	NA	NA	NA
RE02-07-1177	02-600275	2–3	QAL	0.0367 (J)	—	—	—	—	0.102 (J)	—	0.00119	—	—	—
RE02-07-1178	02-600275	4.5–5.5	QAL	0.0388 (J)	—	—	—	—	—	—	0.000504 (J)	—	—	—
RE02-07-1181	02-600276	4.5–5	QAL	—	—	—	—	—	—	—	0.000495 (J)	—	—	—
RE02-07-1183	02-600277	2–3	QAL	—	—	—	—	—	—	—	0.00143	—	—	—
RE02-07-1185	02-600278	0–0.5	SOIL	—	0.0164 (J)	NA	—	—	—	0.0142 (J)	NA	NA	NA	NA
RE02-07-1188	02-600279	0–0.8	SOIL	—	—	NA	—	—	—	—	NA	NA	NA	NA
RE02-07-1189	02-600279	2–2.5	QAL	—	—	—	—	—	—	—	0.000308 (J)	—	—	—
RE02-07-1190	02-600279	4.5–5	QAL	—	—	—	—	—	—	—	0.000518 (J)	—	—	—
RE02-07-1192	02-600280	2–2.5	QAL	—	—	—	—	—	—	—	0.000502 (J+)	—	—	—
RE02-07-1196	02-600281	4.5–5	QAL	—	—	—	—	—	—	—	—	—	—	—
RE02-10-22036	02-612421	28–29	QAL	—	—	NA	—	—	—	—	NA	NA	NA	NA
RE02-10-22040	02-612422	15–16	QAL	—	—	NA	—	—	—	—	NA	NA	NA	NA

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273), unless otherwise noted.

[b] SSLs are from EPA regional screening tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

[c] SSLs are from LANL (2017, 602581).

[d] — = Not detected.

[e] NA = Not analyzed.

[f] Isopropylbenzene used as surrogate based on structural similarity.

Table 6.23-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 02-009(a)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-238	Plutonium-239/240	Strontium-90	Tritium
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**na**
Soil BV/FV[a]				**1.65**	**0.023**	**0.054**	**1.31**	**na**
Industrial SAL[c]				**41**	**1300**	**1200**	**2400**	**2,400,000**
Recreational SAL[c]				**370**	**1400**	**1300**	**4900**	**5,700,000**
Residential SAL[c]				**12**	**84**	**79**	**15**	**1700**
CA02-00-0186	02-01259	0–0.5	SOIL	8.72	—[d]	—	—	0.0745361
CA02-00-0187	02-01259	2–2.5	SOIL	4.84	—	—	—	0.041134
CA02-00-0188	02-01260	0–0.5	SOIL	2.79	—	—	—	—
CA02-00-0189	02-01260	2–2.5	SOIL	0.604	—	—	0.395	0.0629167
CA02-00-0208	02-01263	0–0.5	SOIL	—	—	—	—	0.0774023
CA02-00-0209	02-01263	2–2.5	SOIL	—	—	—	—	0.0626316
CA02-00-0211	02-01263	5–5.5	SOIL	0.132	—	—	—	0.0775269
CA02-00-0213	02-01264	0–0.5	SOIL	2.12	—	—	—	—
CA02-00-0214	02-01264	2–2.5	SOIL	0.159	—	—	—	0.05
CA02-00-0215	02-01264	5–5.5	SOIL	1.15	—	—	0.451	0.0445833
RE02-07-1128	02-600259	0–0.5	SOIL	2.23	—	—	—	—
RE02-07-1129	02-600259	2–3	QAL	0.165	—	—	—	—
RE02-07-1130	02-600259	4.5–5.1	QAL	—	—	—	—	0.0150508
RE02-07-1131	02-600260	0–0.5	SOIL	—	—	0.0563	—	—
RE02-07-1132	02-600260	2–4.4	QAL	—	—	—	—	0.0146047
RE02-07-1133	02-600260	4.5–7.2	QAL	—	—	—	—	0.0419636
RE02-07-1135	02-600261	2–2.5	SOIL	0.522	—	—	—	—
RE02-07-1137	02-600262	0–0.5	SOIL	—	—	0.112	—	—
RE02-07-1138	02-600262	2–2.5	QAL	0.234	—	—	—	0.021882
RE02-07-1143	02-600264	0–0.5	SOIL	—	—	0.0648	—	—
RE02-07-1145	02-600264	4.5–5	SOIL	—	—	—	—	0.0211134
RE02-07-1151	02-600266	4.5–5	SOIL	—	—	—	—	0.0224636
RE02-07-1154	02-600267	4.5–5.5	QAL	—	—	—	—	0.010856
RE02-07-1156	02-600268	2–2.5	QAL	0.485	—	—	—	—
RE02-07-1157	02-600268	4.5–5	QAL	1.88	—	—	—	0.0126976
RE02-07-1159	02-600269	2–2.5	QAL	—	—	—	—	0.0253049
RE02-07-1160	02-600269	4.5–5	QAL	—	—	—	—	0.0406606

Table 6.23-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-238	Plutonium-239/240	Strontium-90	Tritium
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**na**
Soil BV[a]				**1.65**	**0.023**	**0.054**	**1.31**	**na**
Industrial SAL[c]				**41**	**1300**	**1200**	**2400**	**2,400,000**
Recreational SAL[c]				**370**	**1400**	**1300**	**4900**	**5,700,000**
Residential SAL[c]				**12**	**84**	**79**	**15**	**1700**
RE02-07-1161	02-600270	0–1.1	SOIL	1.59	—	—	—	—
RE02-07-1162	02-600270	2–2.8	QAL	0.205	—	—	—	—
RE02-07-1163	02-600270	4.5–5	QAL	0.193	—	—	—	0.0110716
RE02-07-1166	02-600271	4.5–5	QAL	0.144	—	—	—	—
RE02-07-1167	02-600272	0–0.5	SOIL	2.76	—	—	—	—
RE02-07-1168	02-600272	2–4	QAL	2.79	—	—	0.483	—
RE02-07-1172	02-600273	4.5–5	QAL	—	—	—	—	0.0160548
RE02-07-1175	02-600274	4.5–10	QAL	—	—	—	—	0.0238351
RE02-07-1176	02-600275	0–0.5	SOIL	12.1	—	0.0774	—	—
RE02-07-1177	02-600275	2–3	QAL	3.91	—	—	0.391	—
RE02-07-1178	02-600275	4.5–5.5	QAL	0.692	—	—	—	—
RE02-07-1179	02-600276	0–0.5	SOIL	—	—	0.142	—	—
RE02-07-1183	02-600277	2–3	QAL	—	—	0.0204	—	—
RE02-07-1185	02-600278	0–0.5	SOIL	—	—	0.114	—	—
RE02-07-1188	02-600279	0–0.8	SOIL	—	—	0.109	—	—
RE02-07-1189	02-600279	2–2.5	QAL	—	—	—	—	0.0105311
RE02-07-1190	02-600279	4.5–5	QAL	—	0.047	4.17	—	0.0124268
RE02-07-1192	02-600280	2–2.5	QAL	—	—	0.0788	—	—
RE02-07-1196	02-600281	4.5–5	QAL	—	—	—	—	0.0146073
RE02-10-22034	02-612421	5–6	QAL	—	—	0.0331	—	—
RE02-10-22039	02-612422	5–6	QAL	—	—	—	—	0.0191112
RE02-10-22042	02-612422	35–36	QBO	—	—	—	—	0.0642716
RE02-10-22043	02-612422	49–50	QBO	—	—	—	—	0.10575

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SALs are from LANL (2015, 600929).

[d] — = Not detected.

Table 6.24-1
Samples Collected and Analyses Requested at SWMU 02-009(b)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
CA02-00-0176	02-01243	5–7	SOIL	—[a]	—	7483R[b]	7483R	7483R	7483R	7481R, 7482R	—	—	7483R	—	—	—
CA02-00-0177	02-01243	11.5–12.5	SOIL	—	—	7483R	7483R	7483R	7483R	7481R, 7482R	—	—	7483R	—	—	—
CA02-00-0178	02-01243	13–14	QBT3	—	—	7483R	7483R	7483R	7483R	7481R, 7482R	—	—	7483R	—	—	—
CA02-00-0181	02-01244	6–7	SOIL	—	—	7483R	7483R	7483R	7483R	7481R, 7482R	—	—	7483R	—	—	—
CA02-00-0182	02-01244	12.5–13.5	QBT3	—	—	7490R	7490R	7490R	7490R	7488R, 7489R	—	—	7490R	—	—	—
RE02-07-2747	02-600605	0–0.5	SOIL	07-648	07-647	07-648	07-648	07-648	07-648	07-647	07-646	07-647	07-648	07-646	—	07-647
RE02-07-2748	02-600605	1.5–3	QAL	07-648	07-647	07-648	07-648	07-648	07-648	07-647	07-646	07-647	07-648	07-646	07-646	07-647
RE02-07-2751	02-600606	0–0.5	SOIL	07-648	07-647	07-648	07-648	07-648	07-648	07-647	07-646	07-647	07-648	07-646	—	07-647
RE02-07-2752	02-600606	1.5–1.9	QAL	07-683	07-682	07-683	07-683	07-683	07-683	07-682	07-681	07-682	07-683	07-681	07-681	07-682
RE02-07-2753	02-600606	17.1–20	QBO	07-683	07-682	07-683	07-683	07-683	07-683	07-682	07-681	07-682	07-683	07-681	07-681	07-682
RE02-07-2755	02-600607	0–0.5	SOIL	07-683	07-682	07-683	07-683	07-683	07-683	07-682	07-681	07-682	07-683	07-681	—	07-682
RE02-07-2756	02-600607	1.5–3.5	QAL	07-683	07-682	07-683	07-683	07-683	07-683	07-682	07-681	07-682	07-683	07-681	07-681	07-682
RE02-07-2757	02-600607	15–21	QBO	07-683	07-682	07-683	07-683	07-683	07-683	07-682	07-681	07-682	07-683	07-681	07-681	07-682
RE02-07-2759	02-600608	0–0.5	SOIL	07-648	07-647	07-648	07-648	07-648	07-648	07-647	07-646	07-647	07-648	07-646	—	07-647
RE02-07-2760	02-600608	1.5–2.3	QAL	07-648	07-647	07-648	07-648	07-648	07-648	07-647	07-646	07-647	07-648	07-646	07-646	07-647
RE02-07-2761	02-600608	11.5–13.7	QAL	07-728	07-728	07-728	07-728	07-728	07-728	07-728	07-728	07-728	07-728	07-728	07-728	07-728
RE02-07-2762	02-600609	0–0.5	SOIL	07-648	07-647	07-648	07-648	07-648	07-648	07-647	07-646	07-647	07-648	07-646	—	07-647
RE02-07-2763	02-600609	1.5–2.3	QAL	07-683	07-682	07-683	07-683	07-683	07-683	07-682	07-681	07-682	07-683	07-681	07-681	07-682
RE02-07-2764	02-600609	11.5–14.5	QAL	07-719	07-719	07-719	07-719	07-719	07-719	07-719	07-719	07-719	07-719	07-719	07-719	07-719
RE02-07-3982	02-600609	21.5–23.5	QBO	07-728	07-728	07-728	07-728	07-728	07-728	07-728	07-728	07-728	07-728	07-728	07-728	07-728
RE02-07-2765	02-600610	0–0.5	SOIL	07-648	07-647	07-648	07-648	07-648	07-648	07-647	07-646	07-647	07-648	07-646	—	07-647
RE02-07-2766	02-600610	1.5–2.5	QAL	07-648	07-647	07-648	07-648	07-648	07-648	07-647	07-646	07-647	07-648	07-646	07-646	07-647
RE02-07-2767	02-600610	11.5–13.5	QAL	07-701	07-700	07-701	07-701	07-701	07-701	07-700	07-699	07-700	07-701	07-699	07-699	07-700
RE02-07-3983	02-600610	21.5–24.5	QBO	07-701	07-700	07-701	07-701	07-701	07-701	07-700	07-699	07-700	07-701	07-699	07-699	07-700
RE02-07-2768	02-600611	0–0.5	SOIL	07-683	07-682	07-683	07-683	07-683	07-683	07-682	07-681	07-682	07-683	07-681	—	07-682
RE02-07-2769	02-600611	1.5–2.4	QAL	07-683	07-682	07-683	07-683	07-683	07-683	07-682	07-681	07-682	07-683	07-681	07-681	07-682
RE02-07-2771	02-600612	0–1.2	SOIL	07-1009	07-1009	07-1009	07-1009	07-1009	07-1009	07-1009	07-1009	07-1009	07-1009	07-1009	—	07-1009
RE02-07-2774	02-600613	0–1.5	SOIL	07-1009	07-1009	07-1009	07-1009	07-1009	07-1009	07-1009	07-1009	07-1009	07-1009	07-1009	—	07-1009
RE02-07-2775	02-600613	1.5–2.5	QAL	07-1009	07-1009	07-1009	07-1009	07-1009	07-1009	07-1009	07-1009	07-1009	07-1009	07-1009	07-1009	07-1009
RE02-10-21895	02-612388	5–6	QAL	10-4484	—	10-4484	10-4484	10-4484	10-4484	10-4484	10-4484	—	10-4484	10-4484	—	—
RE02-10-21896	02-612388	15–16	QAL	10-4515	—	10-4515	10-4515	10-4515	10-4515	10-4514	10-4514	—	10-4515	10-4514	—	—
RE02-10-21897	02-612388	25–26	QBO	10-4515	—	10-4515	10-4515	10-4515	10-4515	10-4514	10-4514	—	10-4515	10-4514	—	—
RE02-10-21898	02-612388	35–36	QBO	10-4515	—	10-4515	10-4515	10-4515	10-4515	10-4514	10-4514	—	10-4515	10-4514	—	—
RE02-10-21899	02-612388	47.5–50	QBO	10-4515	—	10-4515	10-4515	10-4515	10-4515	10-4514	10-4514	—	10-4515	10-4514	—	—

[a] — = Analysis not requested.

[b] Analytical request number.

Table 6.24-2
Inorganic Chemicals Detected or Detected above BVs at SWMU 02-009(b)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Cadmium	Calcium	Chromium	Cyanide (Total)	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Uranium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**0.4**	**1900**	**2.6**	**0.5**	**3700**	**13.5**	**189**	**0.1**	**2**	**na[b]**	**na**	**0.3**	**na**	**4.59**	**40**
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**1.63**	**2200**	**7.14**	**na**	**14,500**	**11.2**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**2.4**	**17**	**63.5**
Soil BV[a]				**29,200**	**0.83**	**8.17**	**0.4**	**6120**	**19.3**	**0.5**	**21,500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1.82**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**1110**	**na**	**505[d]**	**62.8**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**3880**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**457**	**na**	**281[d]**	**224**	**434,000**	**1110**	**14,800**	**186**	**15,800**	**991,000**	**434**	**3100**	**1860**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**70.5**	**na**	**96[d]**	**11.1**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**234**	**394**	**23,500**
CA02-00-0178	02-01243	13–14	QBT3	—[f]	0.57 (J-)	—	—	—	—	NA[g]	—	—	—	—	—	NA	NA	—	2.44	—	—
RE02-07-2747	02-600605	0–0.5	SOIL	—	—	—	—	6510	—	—	—	—	—	1.06	—	2.02 (J-)	—	—	NA	—	70.5 (J+)
RE02-07-2748	02-600605	1.5–3	QAL	—	—	—	—	7020	—	—	—	—	—	0.146	—	2.43	—	—	NA	—	52 (J+)
RE02-07-2751	02-600606	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	0.445	—	2.96 (J-)	—	—	NA	—	—
RE02-07-2752	02-600606	1.5–1.9	QAL	—	—	—	—	—	—	—	—	—	—	0.26	—	5.57 (J-)	—	—	NA	—	—
RE02-07-2753	02-600606	17.1–20	QBO	—	—	1.62	0.524 (U)	—	13	—	7330	—	268	—	4.08 (J)	—	—	0.762 (J)	NA	7.92 (J)	—
RE02-07-2755	02-600607	0–0.5	SOIL	—	—	—	0.49 (J)	—	—	3.82 (U)	—	—	—	—	—	1.82 (J-)	—	—	NA	—	57.7
RE02-07-2756	02-600607	1.5–3.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	1.15 (J-)	—	—	NA	—	—
RE02-07-2757	02-600607	15–21	QBO	4870	—	1.69 (U)	0.564 (U)	—	11.5	—	5800 (J)	—	312	—	3.79 (J)	—	—	1.69 (U)	NA	—	—
RE02-07-2759	02-600608	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	1.27	—	2.2 (J-)	—	—	NA	—	—
RE02-07-2760	02-600608	1.5–2.3	QAL	—	—	—	—	—	—	—	—	—	—	0.14	—	2.93 (J-)	—	1.57 (U)	NA	—	—
RE02-07-2761	02-600608	11.5–13.7	QAL	—	—	—	0.522 (U)	—	—	—	—	—	—	—	—	—	—	2.11	NA	—	—
RE02-07-2763	02-600609	1.5–2.3	QAL	—	—	—	—	—	—	—	—	—	—	—	—	1.98 (J-)	—	—	NA	—	—
RE02-07-2764	02-600609	11.5–14.5	QAL	—	—	—	0.532 (U)	—	—	—	—	—	—	—	—	—	—	—	NA	—	—
RE02-07-3982	02-600609	21.5–23.5	QBO	—	—	1.74 (U)	0.58 (U)	—	5.7 (U)	—	5650	—	218	—	4.73 (U)	—	—	1.62 (J)	NA	—	—
RE02-07-2765	02-600610	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	1.22 (J-)	—	—	NA	—	56.9 (J+)
RE02-07-2766	02-600610	1.5–2.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	1.15 (J-)	0.000913 (J)	—	NA	—	—
RE02-07-2767	02-600610	11.5–13.5	QAL	—	—	—	0.516 (U)	—	32.3	—	—	—	—	—	—	—	—	—	NA	—	—
RE02-07-3983	02-600610	21.5–24.5	QBO	—	—	0.572 (J)	0.564 (U)	—	17.4	—	6210	13.6	243	—	4.66	—	—	0.702 (J)	NA	—	—
RE02-07-2768	02-600611	0–0.5	SOIL	—	—	—	0.495 (U)	—	—	—	—	—	—	—	—	6.18 (J-)	—	—	NA	—	—
RE02-07-2769	02-600611	1.5–2.4	QAL	—	—	—	—	—	—	—	—	—	—	—	—	3.47 (J-)	0.000564 (J-)	—	NA	—	—
RE02-07-2771	02-600612	0–1.2	SOIL	—	—	—	0.564 (U)	—	—	—	—	—	—	—	—	4.17	0.0017 (J)	—	NA	—	—
RE02-07-2774	02-600613	0–1.5	SOIL	—	—	—	—	—	—	1.08	—	—	—	—	—	1.97	0.000669 (J)	—	NA	—	67 (J+)
RE02-07-2775	02-600613	1.5–2.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	1.81	—	—	NA	—	—
RE02-10-21895	02-612388	5–6	QAL	—	0.979 (U)	—	—	—	—	NA	—	—	—	—	—	NA	NA	—	NA	—	—
RE02-10-21896	02-612388	15–16	QAL	—	1.11 (U)	—	0.553 (U)	—	—	NA	—	—	—	—	—	NA	NA	—	NA	—	53.2 (J)

Table 6.24-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Cadmium	Calcium	Chromium	Cyanide (Total)	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Uranium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**0.4**	**1900**	**2.6**	**0.5**	**3700**	**13.5**	**189**	**0.1**	**2**	**na[b]**	**na**	**0.3**	**na**	**4.59**	**40**
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**1.63**	**2200**	**7.14**	**na**	**14500**	**11.2**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**2.4**	**17**	**63.5**
Soil BV[a]				**29200**	**0.83**	**8.17**	**0.4**	**6120**	**19.3**	**0.5**	**21500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1.82**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**1110**	**na**	**505[d]**	**62.8**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**3880**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**457**	**na**	**281[d]**	**224**	**434,000**	**1110**	**14,800**	**186**	**15,800**	**991,000**	**434**	**3100**	**1860**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**70.5**	**na**	**96[d]**	**11.1**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**234**	**394**	**23500**
RE02-10-21897	02-612388	25–26	QBO	—	1.19 (U)	1.17 (U)	0.596 (U)	—	3.59	NA	4640	—	—	—	—	NA	NA	1.17 (U)	NA	—	—
RE02-10-21898	02-612388	35–36	QBO	—	1.13 (U)	1.17 (U)	0.565 (U)	—	3.66	NA	5390	—	223 (J)	—	—	NA	NA	1.17 (U)	NA	—	—
RE02-10-21899	02-612388	47.5–50	QBO	—	1.1 (U)	1.17 (U)	0.55 (U)	—	—	NA	5310	—	—	—	—	NA	NA	1.17 (U)	NA	—	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 6.24-3
Organic Chemicals Detected at SWMU 02-009(b)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	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	Bis(2-ethylhexyl)phthalate
Industrial SSL[a]				**50,500**	**959,000**	**253,000**	**10.7**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**1830**
Recreational SSL[c]				**17,300**	**505,000**	**863,000**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**888**	**1770**
Residential SSL[a]				**3480**	**66,300**	**17,400**	**2.43**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**380**
RE02-07-2747	02-600605	0–0.5	SOIL	—[d]	NA[e]	—	—	—	0.102	0.0209 (J)	0.0188 (J)	0.0261 (J)	—	0.0126 (J)	—
RE02-07-2748	02-600605	1.5–3	QAL	—	—	—	—	—	0.0155	—	—	0.012 (J)	—	—	—
RE02-07-2751	02-600606	0–0.5	SOIL	—	NA	0.00697 (J)	—	—	0.0285	0.0371	0.0349	0.0534	0.0272 (J)	0.0232 (J)	—
RE02-07-2752	02-600606	1.5–1.9	QAL	—	—	—	—	—	0.0136 (J)	0.0161 (J)	—	0.0185 (J)	—	—	—
RE02-07-2755	02-600607	0–0.5	SOIL	—	NA	—	—	0.0186	0.0181	0.0191 (J)	—	0.0424 (J)	—	0.0226 (J)	—
RE02-07-2756	02-600607	1.5–3.5	QAL	—	—	—	0.0438 (J)	—	0.0016 (J-)	—	—	—	—	—	—
RE02-07-2759	02-600608	0–0.5	SOIL	0.0131 (J)	NA	0.0421	—	0.0711	0.14	0.161	0.129	0.208	0.0751	0.095	—
RE02-07-2760	02-600608	1.5–2.3	QAL	—	—	—	—	0.0069	0.0097	—	—	0.0127 (J)	—	—	—
RE02-07-2761	02-600608	11.5–13.7	QAL	—	—	—	—	—	0.0016 (J)	—	—	—	—	—	—
RE02-07-2762	02-600609	0–0.5	SOIL	—	NA	0.0343	—	—	—	0.233	0.198	0.379	0.109	—	0.0684 (J)
RE02-07-2763	02-600609	1.5–2.3	QAL	—	—	—	—	—	—	0.0275 (J)	0.0186 (J)	0.0374	—	—	—
RE02-07-2764	02-600609	11.5–14.5	QAL	—	—	—	—	—	—	0.0488	0.0306 (J)	0.0482	—	0.0194 (J)	—
RE02-07-2765	02-600610	0–0.5	SOIL	—	NA	—	—	0.0139	0.0088	—	—	—	—	—	—
RE02-07-2766	02-600610	1.5–2.5	QAL	—	—	—	—	0.0226	0.0141	—	—	—	—	—	—
RE02-07-2767	02-600610	11.5–13.5	QAL	—	0.0108	—	—	0.0034 (J)	0.002 (J)	—	—	—	—	—	—
RE02-07-2768	02-600611	0–0.5	SOIL	—	NA	0.0139 (J)	—	—	—	0.144	0.129	0.215	0.0407	—	—
RE02-07-2769	02-600611	1.5–2.4	QAL	—	—	—	—	—	—	0.0481	0.0454	0.0764	0.0201 (J)	—	—
RE02-07-2771	02-600612	0–1.2	SOIL	—	NA	—	—	0.0125	0.0066	—	—	—	—	—	—
RE02-07-2774	02-600613	0–1.5	SOIL	—	NA	—	—	0.0153	0.0141	—	—	—	—	—	—
RE02-07-2775	02-600613	1.5–2.5	QAL	—	—	—	—	0.0137	0.0116	—	—	—	—	—	—
RE02-10-21895	02-612388	5–6	QAL	—	NA	—	—	0.0023 (J)	0.0033 (J)	—	—	—	—	—	—

Table 6.24-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Chrysene	Di-n-butylphthalate	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Isopropylbenzene	Isopropyltoluene[4-]	Methylnaphthalene[2-]	Phenanthrene	Pyrene	Toluene
Industrial SSL[a]				**3230**	**91,600**	**33,700**	**33,700**	**32.3**	**14,100**	**14,900[f]**	**4100**	**25,300**	**25,300**	**61,400**
Recreational SSL[c]				**8880**	**32,800**	**11,500**	**11,500**	**88.8**	**42,100**	**52,700[f]**	**3170**	**8630**	**8630**	**47,600**
Residential SSL[a]				**153**	**6160**	**2320**	**2320**	**1.53**	**2350**	**3210[f]**	**310**	**1740**	**1740**	**5220**
RE02-07-2747	02-600605	0–0.5	SOIL	0.0164 (J)	—	0.0299 (J)	—	0.013 (J)	NA	NA	—	0.0114 (J)	0.0339 (J)	NA
RE02-07-2748	02-600605	1.5–3	QAL	—	—	0.0131 (J)	—	—	—	—	—	—	0.0118 (J)	—
RE02-07-2751	02-600606	0–0.5	SOIL	0.0427	—	0.0628	—	0.0248 (J)	NA	NA	—	0.0334 (J)	0.0577	NA
RE02-07-2752	02-600606	1.5–1.9	QAL	0.0111 (J)	—	0.0236 (J)	—	—	—	—	—	—	0.02 (J)	0.00136
RE02-07-2755	02-600607	0–0.5	SOIL	0.0298 (J)	—	0.0424	—	—	NA	NA	—	0.0123 (J)	0.0514	NA
RE02-07-2756	02-600607	1.5–3.5	QAL	—	—	—	—	—	—	—	—	—	—	0.000653 (J)
RE02-07-2759	02-600608	0–0.5	SOIL	0.19	—	0.415	0.0106 (J)	0.0668	NA	NA	—	0.206	0.35	NA
RE02-07-2760	02-600608	1.5–2.3	QAL	—	—	0.0146 (J)	—	—	—	—	—	—	0.0151 (J)	—
RE02-07-2761	02-600608	11.5–13.7	QAL	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2762	02-600609	0–0.5	SOIL	0.253	—	0.559	—	0.106	NA	NA	—	0.156	0.426	NA
RE02-07-2763	02-600609	1.5–2.3	QAL	0.0243 (J)	—	0.0496	—	—	—	—	—	0.0128 (J)	0.0319 (J)	—
RE02-07-2764	02-600609	11.5–14.5	QAL	0.0494	—	0.0974	—	0.0142 (J)	—	—	—	0.0349 (J)	0.0848	—
RE02-07-2765	02-600610	0–0.5	SOIL	—	0.0478 (J)	0.0104 (J)	—	—	NA	NA	—	—	0.0117 (J)	NA
RE02-07-2766	02-600610	1.5–2.5	QAL	—	0.0461 (J)	—	—	—	0.000342 (J)	—	—	—	—	—
RE02-07-2767	02-600610	11.5–13.5	QAL	—	—	—	—	—	—	0.000986 (J)	—	—	—	—
RE02-07-2768	02-600611	0–0.5	SOIL	0.161	—	0.325	—	0.0445	NA	NA	—	0.067	0.241	NA
RE02-07-2769	02-600611	1.5–2.4	QAL	0.0489	—	0.0929	—	0.0195 (J)	—	—	—	0.0214 (J)	0.0678	—
RE02-07-2771	02-600612	0–1.2	SOIL	—	—	—	—	—	NA	NA	—	—	0.0131 (J)	NA
RE02-07-2774	02-600613	0–1.5	SOIL	0.0195 (J)	0.0789 (J)	0.0264 (J)	—	—	NA	NA	0.00949 (J)	—	0.0206 (J)	NA
RE02-07-2775	02-600613	1.5–2.5	QAL	0.0184 (J)	—	0.0232 (J)	—	—	—	—	—	—	0.0207 (J)	—
RE02-10-21895	02-612388	5–6	QAL	—	—	0.0125 (J)	—	—	NA	NA	—	—	—	NA

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273), unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSLs are from LANL (2017, 602581).

[d] — = Not detected.

[e] NA = Not analyzed.

[f] Isopropylbenzene used as surrogate based on structural similarity.

Table 6.24-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 02-009(b)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Strontium-90	Tritium	Uranium-234	Uranium-235/236
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**4**	**0.18**
Qbt 2,3,4 BV[a]				**na**	**na**	**na**	**na**	**1.98**	**0.09**
Soil BV/FV[a]				**1.65**	**0.054**	**1.31**	**na**	**2.59**	**0.2**
Industrial SAL[c]				**41**	**1200**	**2400**	**2,400,000**	**3100**	**160**
Recreational SAL[c]				**370**	**1300**	**4900**	**5,700,000**	**3900**	**1000**
Residential SAL[c]				**12**	**79**	**15**	**1700**	**290**	**42**
CA02-00-0176	02-01243	5–7	SOIL	0.872	0.0502	—[d]	0.0489727	—	—
CA02-00-0181	02-01244	6–7	SOIL	—	—	—	0.05639	—	—
CA02-00-0182	02-01244	12.5–13.5	QBT3	—	—	—	0.115916	—	0.236
RE02-07-2747	02-600605	0–0.5	SOIL	—	0.142	—	—	—	—
RE02-07-2748	02-600605	1.5–3	QAL	0.848	0.0495	—	0.0120486	—	—
RE02-07-2751	02-600606	0–0.5	SOIL	—	0.0647	—	—	—	—
RE02-07-2752	02-600606	1.5–1.9	QAL	6.01	0.426	1.93	0.0130299	—	—
RE02-07-2755	02-600607	0–0.5	SOIL	8.62	0.432	—	—	—	—
RE02-07-2756	02-600607	1.5–3.5	QAL	8.01	0.238	—	—	—	—
RE02-07-2757	02-600607	15–21	QBO	—	—	—	0.0650809	—	—
RE02-07-2760	02-600608	1.5–2.3	QAL	0.391	0.034	—	—	—	—
RE02-07-2761	02-600608	11.5–13.7	QAL	—	—	—	0.0856982	—	—
RE02-07-2762	02-600609	0–0.5	SOIL	2.13	0.11	—	—	—	—
RE02-07-2763	02-600609	1.5–2.3	QAL	5.59	0.344	4.02	0.0131881	—	—
RE02-07-2764	02-600609	11.5–14.5	QAL	0.509	—	—	0.0180749	—	—
RE02-07-3982	02-600609	21.5–23.5	QBO	—	—	—	0.0849524	—	—
RE02-07-2765	02-600610	0–0.5	SOIL	8.32	0.0915	2.49	—	2.87	—
RE02-07-2766	02-600610	1.5–2.5	QAL	2.13	0.0432	0.388	—	—	—
RE02-07-2767	02-600610	11.5–13.5	QAL	2.24	—	0.706	0.0651043	—	—
RE02-07-3983	02-600610	21.5–24.5	QBO	—	—	—	0.051752	—	—
RE02-07-2768	02-600611	0–0.5	SOIL	—	—	—	0.00727748	—	—
RE02-07-2769	02-600611	1.5–2.4	QAL	1.06	—	0.471	—	—	—
RE02-07-2771	02-600612	0–1.2	SOIL	0.829	—	0.261	—	—	—
RE02-07-2774	02-600613	0–1.5	SOIL	0.94	—	—	—	—	—
RE02-07-2775	02-600613	1.5–2.5	QAL	0.609	0.0425	0.247	—	—	—

Table 6.24-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Strontium-90	Tritium	Uranium-234	Uranium-235/236
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**4**	**0.18**
Qbt 2,3,4 BV[a]				**na**	**na**	**na**	**na**	**1.98**	**0.09**
Soil BV[a]				**1.65**	**0.054**	**1.31**	**na**	**2.59**	**0.2**
Industrial SAL[c]				**41**	**1200**	**2400**	**2,400,000**	**3100**	**160**
Recreational SAL[c]				**370**	**1300**	**4900**	**5,700,000**	**3900**	**1000**
Residential SAL[c]				**12**	**79**	**15**	**1700**	**290**	**42**
RE02-10-21895	02-612388	5–6	QAL	1.89	0.118	—	0.174311	—	—
RE02-10-21897	02-612388	25–26	QBO	—	—	—	0.0396043	—	—
RE02-10-21898	02-612388	35–36	QBO	—	—	—	0.11165	—	—
RE02-10-21899	02-612388	47.5–50	QBO	—	—	—	0.766886	—	—

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SALs are from LANL (2015, 600929).

[d] — = Not detected.

Table 6.25-1
Samples Collected and Analyses Requested at SWMU 02-009(c)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
CA02-00-0021	02-01225	5–7	FILL	—[a]	—	7446R[b]	7446R	—	7446R	7446R	7444R, 7445R	—	—	7446R	7432R	—	—	—
CA02-00-0022	02-01225	8–9	SOIL	—	—	7446R	7446R	—	7446R	7446R	7444R, 7445R	—	—	7446R	7432R	—	—	—
CA02-00-0023	02-01225	10–11.5	SOIL	—	—	7446R	7446R	—	7446R	7446R	7444R, 7445R	—	—	7446R	7432R	—	—	—
CA02-00-0024	02-01225	12.5–15	QBT2	—	—	7446R	7446R	—	7446R	7446R	7444R, 7445R	—	—	7446R	7432R	—	—	—
CA02-00-0026	02-01226	5–6.5	QBT2	—	—	7446R	7446R	—	7446R	7446R	7444R, 7445R	—	—	7446R	7432R	—	—	—
CA02-00-0027	02-01226	10–12	QBT2	—	—	7443R	7443R	—	7443R	7443R	7441R, 7442R	—	—	7443R	7431R	—	—	—
CA02-00-0022	02-01225	8–9	SOIL	—	—	7446R	7446R	—	7446R	7446R	7444R, 7445R	—	—	7446R	7432R	—	—	—
CA02-00-0028	02-01226	12.5–14	QBT2	—	—	7443R	7443R	—	7443R	7443R	7441R, 7442R	—	—	7443R	7431R	—	—	—
CA02-00-0031	02-01227	5–7.5	FILL	—	—	7443R	7443R	—	7443R	7443R	7441R, 7442R	—	—	7443R	7431R	—	—	—
CA02-00-0032	02-01227	7.5–9	SOIL	—	—	7443R	7443R	—	7443R	7443R	7441R, 7442R	—	—	7443R	7431R	—	—	—
CA02-00-0033	02-01227	10–12	SOIL	—	—	7443R	7443R	—	7443R	7443R	7441R, 7442R	—	—	7443R	7431R	—	—	—
CA02-00-0034	02-01227	12.5–14	SOIL	—	—	7443R	7443R	—	7443R	7443R	7441R, 7442R	—	—	7443R	7431R	—	—	—

Table 6.25-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
CA02-00-0216	02-01228	0–0.5	SED	—	—	7869R	7869R	—	7869R	7869R	7867R, 7868R	—	—	7869R	—	—	—	—
CA02-00-0035	02-01228	0–2.5	SOIL	—	—	7443R	7443R	—	7443R	7443R	7441R, 7442R	—	—	7443R	7431R	—	—	—
CA02-00-0036	02-01228	2.5–4.5	SOIL	—	—	7443R	7443R	—	7443R	7443R	7441R, 7442R	—	—	7443R	7431R	—	—	—
CA02-00-0037	02-01228	5.5–7.5	FILL	—	—	7443R	7443R	—	7443R	7443R	7441R, 7442R	—	—	7443R	7431R	—	—	—
CA02-00-0038	02-01228	7.5–10	SOIL	—	—	7443R	7443R	—	7443R	7443R	7441R, 7442R	—	—	7443R	7431R	—	—	—
CA02-00-0039	02-01228	10–12.3	SOIL	—	—	7443R	7443R	—	7443R	7443R	7441R, 7442R	—	—	7443R	7431R	—	—	—
CA02-00-0040	02-01228	12.5–14.5	QBT2	—	—	7443R	7443R	—	7443R	7443R	7441R, 7442R	—	—	7443R	7431R	—	—	—
CA02-00-0043	02-01229	5–7.5	FILL	—	—	7450R	7450R	—	7450R	7450R	7448R, 7449R	—	—	7450R	7447R	—	—	—
CA02-00-0044	02-01229	7.5–8.3	SOIL	—	—	7450R	7450R	—	7450R	7450R	7448R, 7449R	—	—	7450R	7447R	—	—	—
CA02-00-0045	02-01229	10.5–12	SOIL	—	—	7450R	7450R	—	7450R	7450R	7448R, 7449R	—	—	7450R	7447R	—	—	—
CA02-00-0046	02-01229	12.5–15	QBT2	—	—	7450R	7450R	—	7450R	7450R	7448R, 7449R	—	—	7450R	7447R	—	—	—
CA02-00-0049	02-01230	5–7	FILL	—	—	7450R	7450R	—	7450R	7450R	7448R, 7449R	—	—	7450R	7447R	—	—	—
CA02-00-0050	02-01230	8–10	SOIL	—	—	7450R	7450R	—	7450R	7450R	7448R, 7449R	—	—	7450R	7447R	—	—	—
CA02-00-0051	02-01230	10–11.5	SOIL	—	—	7450R	7450R	—	7450R	7450R	7448R, 7449R	—	—	7450R	7447R	—	—	—
CA02-00-0052	02-01230	12.5–14	SOIL	—	—	7450R	7450R	—	7450R	7450R	7448R, 7449R	—	—	7450R	7447R	—	—	—
CA02-00-0053	02-01230	15–17.5	QBT2	—	—	7450R	7450R	—	7450R	7450R	7448R, 7449R	—	—	7450R	7447R	—	—	—
CA02-00-0056	02-01231	5–6.5	FILL	—	—	7450R	7450R	—	7450R	7450R	7448R, 7449R	—	—	7450R	7447R	—	—	—
CA02-00-0057	02-01231	7.5–10	SOIL	—	—	7450R	7450R	—	7450R	7450R	7448R, 7449R	—	—	7450R	7447R	—	—	—
CA02-00-0058	02-01231	10–12	SOIL	—	—	7450R	7450R	—	7450R	7450R	7448R, 7449R	—	—	7450R	7447R	—	—	—
CA02-00-0059	02-01231	12.5–13	SOIL	—	—	7450R	7450R	—	7450R	7450R	7448R, 7449R	—	—	7450R	7447R	—	—	—
CA02-00-0060	02-01231	13–15	QBT2	—	—	7450R	7450R	—	7450R	7450R	7448R, 7449R	—	—	7450R	7447R	—	—	—
CA02-00-0063	02-01232	5–7	FILL	—	—	7450R	7450R	—	7450R	7450R	7448R, 7449R	—	—	7450R	7447R	—	—	—
CA02-00-0064	02-01232	7.5–10	SOIL	—	—	7450R	7450R	—	7450R	7450R	7448R, 7449R	—	—	7450R	7447R	—	—	—
CA02-00-0065	02-01232	10–11	SOIL	—	—	7450R	7450R	—	7450R	7450R	7448R, 7449R	—	—	7450R	7447R	—	—	—
CA02-00-0066	02-01232	12.5–15	QBT2	—	—	7450R	7450R	—	7450R	7450R	7448R, 7449R	—	—	7450R	7447R	—	—	—
CA02-00-0077	02-01233	5–7.5	FILL	—	—	7457R	7457R	—	7457R	7457R	7455R, 7456R	—	—	7457R	7454R	—	—	—
CA02-00-0070	02-01233	7.5–10	SOIL	—	—	7457R	7457R	—	7457R	7457R	7455R, 7456R	—	—	7457R	7454R	—	—	—
CA02-00-0071	02-01233	11–12.5	SOIL	—	—	7457R	7457R	—	7457R	7457R	7455R, 7456R	—	—	7457R	7454R	—	—	—
CA02-00-0072	02-01233	12.5–13.5	SOIL	—	—	7457R	7457R	—	7457R	7457R	7455R, 7456R	—	—	7457R	7454R	—	—	—
CA02-00-0073	02-01233	14–15	SOIL	—	—	7457R	7457R	—	7457R	7457R	7455R, 7456R	—	—	7457R	7454R	—	—	—
CA02-00-0074	02-01233	15–17.5	QBT2	—	—	7457R	7457R	—	7457R	7457R	7455R, 7456R	—	—	7457R	7454R	—	—	—
CA02-00-0080	02-01234	5–7	FILL	—	—	7457R	7457R	—	7457R	7457R	7455R, 7456R	—	—	7457R	7454R	—	—	—
CA02-00-0081	02-01234	7.5–9.25	SOIL	—	—	7457R	7457R	—	7457R	7457R	7455R, 7456R	—	—	7457R	7454R	—	—	—
CA02-00-0082	02-01234	10–11.5	SOIL	—	—	7457R	7457R	—	7457R	7457R	7455R, 7456R	—	—	7457R	7454R	—	—	—
CA02-00-0093	02-01236	5–7.5	SOIL	—	—	7473R	7473R	—	7473R	7473R	7471R, 7472R	—	—	7473R	7470R	—	—	—
CA02-00-0094	02-01236	7.5–8	SOIL	—	—	7473R	7473R	—	7473R	7473R	7471R, 7472R	—	—	7473R	7470R	—	—	—

Table 6.25-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
CA02-00-0095	02-01236	8.5–10	SOIL	—	—	7473R	7473R	—	7473R	7473R	7471R, 7472R	—	—	7473R	7470R	—	—	—
CA02-00-0096	02-01236	10–10.5	SOIL	—	—	7473R	7473R	—	7473R	7473R	7471R, 7472R	—	—	7473R	7470R	—	—	—
CA02-00-0097	02-01236	11.5–12	SOIL	—	—	7473R	7473R	—	7473R	7473R	7471R, 7472R	—	—	7473R	7470R	—	—	—
CA02-00-0098	02-01236	12.5–15	SOIL	—	—	7473R	7473R	—	7473R	7473R	7471R, 7472R	—	—	7473R	7470R	—	—	—
RE02-07-2700	02-600598	0–0.5	SOIL	07-692	07-691	07-692	07-692	07-691	07-692	07-692	07-691	—	07-691	07-692	07-690	—	—	07-691
RE02-07-2702	02-600598	9.5–11.5	QAL	07-1034	07-1034	07-1034	07-1034	07-1034	07-1034	07-1034	07-1034	—	07-1034	07-1034	07-1034	—	07-1034	07-1034
RE02-07-2703	02-600598	14.5–16.7	QBO	07-1034	07-1034	07-1034	07-1034	07-1034	07-1034	07-1034	07-1034	—	07-1034	07-1034	07-1034	—	07-1034	07-1034
RE02-07-2705	02-600599	0–0.5	SOIL	07-692	07-691	07-692	07-692	07-691	07-692	07-692	07-691	—	07-691	07-692	07-690	—	—	07-691
RE02-07-2706	02-600599	4.5–7.3	QAL	07-995	07-995	07-995	07-995	07-995	07-995	07-995	07-995	—	07-995	07-995	07-995	—	07-995	07-995
RE02-07-2707	02-600599	9.5–12.5	QAL	07-1034	07-1034	07-1034	07-1034	07-1034	07-1034	07-1034	07-1034	—	07-1034	07-1034	07-1034	—	07-1034	07-1034
RE02-07-2708	02-600599	13.5–20.5	QBO	07-1034	07-1034	07-1034	07-1034	07-1034	07-1034	07-1034	07-1034	—	07-1034	07-1034	07-1034	—	07-1034	07-1034
RE02-07-2710	02-600600	0–0.5	SOIL	07-692	07-691	07-692	07-692	07-691	07-692	07-692	07-691	—	07-691	07-692	07-690	—	—	07-691
RE02-07-2711	02-600600	4.5–6.5	QAL	07-1048	07-1048	07-1048	07-1048	07-1048	07-1048	07-1048	07-1048	—	07-1048	07-1048	07-1048	—	07-1048	07-1048
RE02-07-2712	02-600600	9.5–11.8	QAL	07-1048	07-1048	07-1048	07-1048	07-1048	07-1048	07-1048	07-1048	—	07-1048	07-1048	07-1048	—	07-1048	07-1048
RE02-07-2713	02-600600	14.5–17	QBO	07-1048	07-1048	07-1048	07-1048	07-1048	07-1048	07-1048	07-1048	—	07-1048	07-1048	07-1048	—	07-1048	07-1048
RE02-07-2715	02-600601	0–0.5	SOIL	07-692	07-691	07-692	07-692	07-691	07-692	07-692	07-691	—	07-691	07-692	07-690	—	—	07-691
RE02-07-2716	02-600601	4.5–6.7	QAL	07-1055	07-1054	07-1055	07-1055	07-1054	07-1055	07-1055	07-1054	—	07-1054	07-1055	07-1053	—	07-1053	07-1054
RE02-07-2717	02-600601	9.5–11.3	QAL	07-1055	07-1054	07-1055	07-1055	07-1054	07-1055	07-1055	07-1054	—	07-1054	07-1055	07-1053	—	07-1053	07-1054
RE02-07-2718	02-600601	14.5–16.8	QBO	07-1055	07-1054	07-1055	07-1055	07-1054	07-1055	07-1055	07-1054	—	07-1054	07-1055	07-1053	—	07-1053	07-1054
RE02-07-2720	02-600602	0–0.5	SOIL	07-692	07-691	07-692	07-692	07-691	07-692	07-692	07-691	—	07-691	07-692	07-690	—	—	07-691
RE02-07-2721	02-600602	4.5–9.5	QAL	07-1055	07-1054	07-1055	07-1055	07-1054	07-1055	07-1055	07-1054	—	07-1054	07-1055	07-1053	—	07-1053	07-1054
RE02-07-2723	02-600602	14.5–19.5	QBO	07-1055	07-1054	07-1055	07-1055	07-1054	07-1055	07-1055	07-1054	—	07-1054	07-1055	07-1053	—	07-1053	07-1054
RE02-07-2725	02-600603	0–0.5	SED	07-692	07-691	07-692	07-692	07-691	07-692	07-692	07-691	—	07-691	07-692	07-690	—	—	07-691
RE02-07-2730	02-600604	0–0.5	SED	07-692	07-691	07-692	07-692	07-691	07-692	07-692	07-691	—	07-691	07-692	07-690	—	—	07-691
RE02-07-2948	02-600643	0–0.5	SOIL	07-704	07-704	07-704	07-704	07-704	07-704	07-704	07-704	07-704	07-704	07-704	07-704	—	—	07-704
RE02-07-2949	02-600643	4.5–5.5	QAL	07-704	07-704	07-704	07-704	07-704	07-704	07-704	07-704	07-704	07-704	07-704	07-704	—	07-704	07-704
RE02-07-2950	02-600643	9.5–12.4	QAL	07-814	07-814	07-814	07-814	07-814	07-814	07-814	07-814	07-814	07-814	07-814	07-814	—	07-814	07-814
RE02-07-2951	02-600643	14.5–16.9	QBO	07-814	07-814	07-814	07-814	07-814	07-814	07-814	07-814	07-814	07-814	07-814	07-814	—	07-814	07-814
RE02-07-2953	02-600644	0–0.5	SOIL	07-711	07-710	07-711	07-711	07-710	07-711	07-711	07-710	07-709	07-710	07-711	07-709	—	—	07-710
RE02-07-2954	02-600644	4.5–5.2	QAL	07-711	07-710	07-711	07-711	07-710	07-711	07-711	07-710	07-709	07-710	07-711	07-709	—	07-709	07-710
RE02-07-2955	02-600644	9.5–11.7	QAL	07-821	07-821	07-821	07-821	07-821	07-821	07-821	07-821	07-821	07-821	07-821	07-821	—	07-821	07-821
RE02-07-2956	02-600644	14.5–19.5	QBO	07-821	07-821	07-821	07-821	07-821	07-821	07-821	07-821	07-821	07-821	07-821	07-821	—	07-821	07-821
RE02-07-2958	02-600645	0–0.5	SOIL	07-711	07-710	07-711	07-711	07-710	07-711	07-711	07-710	07-709	07-710	07-711	07-709	—	—	07-710
RE02-07-2959	02-600645	4.5–5.25	QAL	07-711	07-710	07-711	07-711	07-710	07-711	07-711	07-710	07-709	07-710	07-711	07-709	—	07-709	07-710
RE02-07-2960	02-600645	9.5–12.2	QAL	07-846	07-845	07-846	07-846	07-845	07-846	07-846	07-845	07-844	07-845	07-846	07-844	—	07-844	07-845
RE02-07-2961	02-600645	14.5–20.5	QBO	07-846	07-845	07-846	07-846	07-845	07-846	07-846	07-845	07-844	07-845	07-846	07-844	—	07-844	07-845

Table 6.25-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
RE02-07-2963	02-600646	0–0.5	SOIL	07-711	07-710	07-711	07-711	07-710	07-711	07-711	07-710	07-709	07-710	07-711	07-709	—	—	07-710
RE02-07-2964	02-600646	4.5–8.3	QAL	07-846	07-845	07-846	07-846	07-845	07-846	07-846	07-845	07-844	07-845	07-846	07-844	—	07-844	07-845
RE02-07-2965	02-600646	9.5–11.7	QAL	07-846	07-845	07-846	07-846	07-845	07-846	07-846	07-845	07-844	07-845	07-846	07-844	—	07-844	07-845
RE02-07-2966	02-600646	14.5–16.8	QBO	07-846	07-845	07-846	07-846	07-845	07-846	07-846	07-845	07-844	07-845	07-846	07-844	—	07-844	07-845
RE02-07-2968	02-600647	0–0.5	SOIL	07-724	07-723	07-724	07-724	07-723	07-724	07-724	07-723	07-722	07-723	07-724	07-722	—	—	07-723
RE02-07-2969	02-600647	4.5–4.9	QAL	07-1027	07-1027	07-1027	07-1027	07-1027	07-1027	07-1027	07-1027	07-1027	07-1027	07-1027	07-1027	—	07-1027	07-1027
RE02-07-2973	02-600648	0–0.5	SOIL	07-724	07-723	07-724	07-724	07-723	07-724	07-724	07-723	07-722	07-723	07-724	07-722	—	—	07-723
RE02-07-2974	02-600648	4.5–7	QAL	07-944	07-944	07-944	07-944	07-944	07-944	07-944	07-944	07-944	07-944	07-944	07-944	—	07-944	07-944
RE02-07-2976	02-600648	13.5–14.5	QBO	07-944	07-944	07-944	07-944	07-944	07-944	07-944	07-944	07-944	07-944	07-944	07-944	—	07-944	07-944
RE02-07-2977	02-600648	14.5–19.5	QBO	07-944	07-944	07-944	07-944	07-944	07-944	07-944	07-944	07-944	07-944	07-944	07-944	—	07-944	07-944
RE02-07-2978	02-600649	0–0.5	SOIL	07-724	07-723	07-724	07-724	07-723	07-724	07-724	07-723	07-722	07-723	07-724	07-722	—	—	07-723
RE02-07-2983	02-600650	0–0.5	SOIL	07-724	07-723	07-724	07-724	07-723	07-724	07-724	07-723	07-722	07-723	07-724	07-722	—	—	07-723
RE02-07-2984	02-600650	4.5–6.3	QAL	07-977	07-977	07-977	07-977	07-977	07-977	07-977	07-977	07-977	07-977	07-977	07-977	—	07-977	07-977
RE02-07-2985	02-600650	9.5–11.3	QAL	07-977	07-977	07-977	07-977	07-977	07-977	07-977	07-977	07-977	07-977	07-977	07-977	—	07-977	07-977
RE02-07-2988	02-600651	0–0.5	SOIL	07-711	07-710	07-711	07-711	07-710	07-711	07-711	07-710	07-709	07-710	07-711	07-709	—	—	07-710
RE02-07-2989	02-600651	4.5–5	QAL	07-711	07-710	07-711	07-711	07-710	07-711	07-711	07-710	07-709	07-710	07-711	07-709	—	07-709	07-710
RE02-07-2990	02-600651	9.5–12.7	QAL	07-836	07-836	07-836	07-836	07-836	07-836	07-836	07-836	07-836	07-836	07-836	07-836	—	07-836	07-836
RE02-07-2992	02-600651	14.5–16.9	QBO	07-836	07-836	07-836	07-836	07-836	07-836	07-836	07-836	07-836	07-836	07-836	07-836	—	07-836	07-836
RE02-07-2991	02-600651	19.5–21.6	QBO	07-836	07-836	07-836	07-836	07-836	07-836	07-836	07-836	07-836	07-836	07-836	07-836	—	07-836	07-836
RE02-07-2993	02-600652	0–0.5	SOIL	07-711	07-710	07-711	07-711	07-710	07-711	07-711	07-710	07-709	07-710	07-711	07-709	—	—	07-710
RE02-07-2994	02-600652	4.5–5.3	QAL	07-711	07-710	07-711	07-711	07-710	07-711	07-711	07-710	07-709	07-710	07-711	07-709	—	07-709	07-710
RE02-07-2995	02-600652	9.5–11.7	QAL	07-858	07-858	07-858	07-858	07-858	07-858	07-858	07-858	07-858	07-858	07-858	07-858	—	07-858	07-858
RE02-07-2997	02-600652	14.5–16.6	QAL	07-858	07-858	07-858	07-858	07-858	07-858	07-858	07-858	07-858	07-858	07-858	07-858	—	07-858	07-858
RE02-07-2996	02-600652	16.6–18.4	QBO	07-858	07-858	07-858	07-858	07-858	07-858	07-858	07-858	07-858	07-858	07-858	07-858	—	07-858	07-858
RE02-07-3200	02-600698	0–0.5	SOIL	07-695	07-694	07-695	07-695	07-694	07-695	07-695	07-694	07-693	07-694	07-695	07-693	—	—	07-694
RE02-07-3201	02-600698	4.5–7.3	QAL	07-852	07-851	07-852	07-852	07-851	07-852	07-852	07-851	07-850	07-851	07-852	07-850	—	07-850	07-851
RE02-07-3202	02-600698	9.5–12.2	QAL	07-852	07-851	07-852	07-852	07-851	07-852	07-852	07-851	07-850	07-851	07-852	07-850	—	07-850	07-851
RE02-07-3205	02-600699	0–0.5	SOIL	07-695	07-694	07-695	07-695	07-694	07-695	07-695	07-694	07-693	07-694	07-695	07-693	—	—	07-694
RE02-07-3206	02-600699	4.5–7	QAL	07-936	07-935	07-936	07-936	07-935	07-936	07-936	07-935	07-934	07-935	07-936	07-934	—	07-934	07-935
RE02-07-3208	02-600699	14.5–19.5	QBO	07-936	07-935	07-936	07-936	07-935	07-936	07-936	07-935	07-934	07-935	07-936	07-934	—	07-934	07-935
RE02-07-3209	02-600699	19.5–21.7	QBO	07-936	07-935	07-936	07-936	07-935	07-936	07-936	07-935	07-934	07-935	07-936	07-934	—	07-934	07-935
RE02-07-3210	02-600700	0–0.5	SOIL	07-666	07-665	07-666	07-666	07-665	07-666	07-666	07-665	07-664	07-665	07-666	07-664	—	—	07-665
RE02-07-3211	02-600700	4.5–6.7	QAL	07-936	07-935	07-936	07-936	07-935	07-936	07-936	07-935	07-934	07-935	07-936	07-934	—	07-934	07-935
RE02-07-3212	02-600700	9.5–11.1	QAL	07-936	07-935	07-936	07-936	07-935	07-936	07-936	07-935	07-934	07-935	07-936	07-934	—	07-934	07-935
RE02-07-3213	02-600700	14.5–16.7	QBO	07-936	07-935	07-936	07-936	07-935	07-936	07-936	07-935	07-934	07-935	07-936	07-934	—	07-934	07-935
RE02-07-3215	02-600701	0–0.5	SOIL	07-695	07-694	07-695	07-695	07-694	07-695	07-695	07-694	07-693	07-694	07-695	07-693	—	—	07-694

Table 6.25-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
RE02-07-3216	02-600701	4.5–6.2	QAL	07-936	07-935	07-936	07-936	07-935	07-936	07-936	07-935	07-934	07-935	07-936	07-934	—	07-934	07-935
RE02-07-3217	02-600701	9.5–11.7	QBO	07-936	07-935	07-936	07-936	07-935	07-936	07-936	07-935	07-934	07-935	07-936	07-934	—	07-934	07-935
RE02-07-3220	02-600702	0–0.5	SOIL	07-695	07-694	07-695	07-695	07-694	07-695	07-695	07-694	07-693	07-694	07-695	07-693	—	—	07-694
RE02-07-3221	02-600702	4.5–6.7	QAL	07-852	07-851	07-852	07-852	07-851	07-852	07-852	07-851	07-850	07-851	07-852	07-850	—	07-850	07-851
RE02-07-3222	02-600702	9.5–12.7	QBO	07-852	07-851	07-852	07-852	07-851	07-852	07-852	07-851	07-850	07-851	07-852	07-850	—	07-850	07-851
RE02-07-3225	02-600703	0–0.5	SED	07-666	07-665	07-666	07-666	07-665	07-666	07-666	07-665	07-664	07-665	07-666	07-664	—	—	07-665
RE02-07-3230	02-600704	0–0.5	SED	07-666	07-665	07-666	07-666	07-665	07-666	07-666	07-665	07-664	07-665	07-666	07-664	—	—	07-665
RE02-07-3233	02-600704	14.5–16.7	QBO	07-964	07-964	07-964	07-964	07-964	07-964	07-964	07-964	07-964	07-964	07-964	07-964	—	07-964	07-964
RE02-07-3235	02-600705	0–0.5	SED	07-666	07-665	07-666	07-666	07-665	07-666	07-666	07-665	07-664	07-665	07-666	07-664	—	—	07-665
RE02-07-3236	02-600705	4.5–6.3	QAL	07-986	07-986	07-986	07-986	07-986	07-986	07-986	07-986	07-986	07-986	07-986	07-986	—	07-986	07-986
RE02-07-3237	02-600705	9.5–11.7	QBO	07-986	07-986	07-986	07-986	07-986	07-986	07-986	07-986	07-986	07-986	07-986	07-986	—	07-986	07-986
RE02-07-3240	02-600706	0–0.5	SED	07-666	07-665	07-666	07-666	07-665	07-666	07-666	07-665	07-664	07-665	07-666	07-664	—	—	07-665
RE02-10-21918	02-612391	5–6	SOIL	10-4517	—	10-4517	10-4517	—	10-4517	10-4517	10-4516	10-4516	—	10-4517	10-4516	—	—	—
RE02-10-21919	02-612391	15–16	QAL	10-4517	—	10-4517	10-4517	—	10-4517	10-4517	10-4516	10-4516	—	10-4517	10-4516	—	—	—
RE02-10-21920	02-612391	25–26	QBO	10-4517	—	10-4517	10-4517	—	10-4517	10-4517	10-4516	10-4516	—	10-4517	10-4516	—	—	—
RE02-10-21921	02-612391	35–37	QBO	10-4517	—	10-4517	10-4517	—	10-4517	10-4517	10-4516	10-4516	—	10-4517	10-4516	—	—	—
RE02-10-21922	02-612391	49–50	QBO	10-4517	—	10-4517	10-4517	—	10-4517	10-4517	10-4516	10-4516	—	10-4517	10-4516	—	—	—
RE02-10-21923	02-612392	5–6	QAL	10-4569	—	10-4569	10-4569	—	10-4569	10-4569	10-4569	10-4569	—	10-4569	10-4569	—	—	—
RE02-10-21924	02-612392	19–20	QBO	10-4560	—	10-4560	10-4560	—	10-4560	10-4560	10-4559	10-4558	—	10-4560	10-4558	—	—	—
RE02-10-21925	02-612392	25–26	QBO	10-4560	—	10-4560	10-4560	—	10-4560	10-4560	10-4559	10-4558	—	10-4560	10-4558	—	—	—
RE02-10-21926	02-612392	35–37	QBO	10-4560	—	10-4560	10-4560	—	10-4560	10-4560	10-4559	10-4558	—	10-4560	10-4558	—	—	—
RE02-10-21927	02-612392	49–50	QBO	10-4560	—	10-4560	10-4560	—	10-4560	10-4560	10-4559	10-4558	—	10-4560	10-4558	—	—	—
RE02-10-21928	02-612393	5–6	QAL	10-4634	—	10-4634	10-4634	—	10-4634	10-4634	10-4633	10-4633	—	10-4634	10-4633	—	—	—
RE02-10-21929	02-612393	15.5–16.5	QAL	10-4634	—	10-4634	10-4634	—	10-4634	10-4634	10-4633	10-4633	—	10-4634	10-4633	—	—	—
RE02-10-21930	02-612393	25–26	QBO	10-4634	—	10-4634	10-4634	—	10-4634	10-4634	10-4633	10-4633	—	10-4634	10-4633	—	—	—
RE02-10-21931	02-612393	35–36	QBO	10-4634	—	10-4634	10-4634	—	10-4634	10-4634	10-4633	10-4633	—	10-4634	10-4633	—	—	—
RE02-10-21932	02-612393	49–50	QBO	10-4634	—	10-4634	10-4634	—	10-4634	10-4634	10-4633	10-4633	—	10-4634	10-4633	—	—	—
RE02-10-22027	02-612420	6–7	QAL	10-4641	—	10-4641	10-4641	—	10-4641	10-4641	10-4640	10-4640	—	10-4641	10-4640	—	—	—
RE02-10-22028	02-612420	15.5–16.5	QAL	10-4641	—	10-4641	10-4641	—	10-4641	10-4641	10-4640	10-4640	—	10-4641	10-4640	—	—	—
RE02-10-22029	02-612420	26–27	QBO	10-4641	—	10-4641	10-4641	—	10-4641	10-4641	10-4640	10-4640	—	10-4641	10-4640	—	—	—
RE02-10-22030	02-612420	35–37	QBO	10-4641	—	10-4641	10-4641	—	10-4641	10-4641	10-4640	10-4640	—	10-4641	10-4640	—	—	—
RE02-10-22031	02-612420	49–50	QBO	10-4641	—	10-4641	10-4641	—	10-4641	10-4641	10-4640	10-4640	—	10-4641	10-4640	—	—	—

[a] — = Analysis not requested.

[b] Analytical request number.

Table 6.25-2
Inorganic Chemicals Detected or Detected above BVs at SWMU 02-009(c)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Hexavalent Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Uranium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**2.6**	**na[b]**	**3.96**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**1**	**na**	**4.59**	**40**
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**7.14**	**na**	**4.66**	**14,500**	**11.2**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**2.4**	**17**	**63.5**
Sediment BV[a]				**15,400**	**0.83**	**3.98**	**127**	**1.31**	**0.4**	**10.5**	**na**	**11.2**	**13,800**	**19.7**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**	**2.22**	**19.7**	**60.2**
Soil BV[a]				**29,200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**19.3**	**na**	**14.7**	**21,500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**1.82**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**2580**	**1110**	**505[d]**	**72.1**	**51,900**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**3880**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**1240**	**457**	**281[d]**	**40.2**	**24,800**	**434,000**	**1110**	**14,800**	**186**	**15,800**	**991,000**	**434**	**3100**	**3100**	**1860**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**156**	**70.5**	**96[d]**	**3.05**	**3130**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**234**	**394**	**23,500**
CA02-00-0021	02-01225	5–7	FILL	—[f]	—	—	—	—	—	—	NA[g]	—	—	—	—	—	—	NA	NA	—	1.1	—	—	—
CA02-00-0022	02-01225	8–9	SOIL	—	—	—	—	—	—	34	NA	—	—	—	—	—	—	NA	NA	—	1.5	—	—	—
CA02-00-0023	02-01225	10–11.5	SOIL	—	—	—	—	—	—	28	NA	—	—	—	—	—	—	NA	NA	—	1.5	—	—	—
CA02-00-0024	02-01225	12.5–15	QBT2	8200	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	—	—	—	—	—
CA02-00-0026	02-01226	5–6.5	QBT2	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	0.509 (J)	—	—	—	—
CA02-00-0027	02-01226	10–12	QBT2	11,000	—	—	54	—	—	—	NA	—	—	—	—	—	—	NA	NA	—	1.1	—	—	—
CA02-00-0028	02-01226	12.5–14	QBT2	10,000	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	—	—	—	—	—
CA02-00-0216	02-01228	0–0.5	SED	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	0.316	1.2	—	—	—
CA02-00-0035	02-01228	0–2.5	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	—	1.5	—	—	—
CA02-00-0040	02-01228	12.5–14.5	QBT2	9600	—	—	65	—	—	—	NA	—	—	—	—	—	—	NA	NA	—	—	—	—	—
CA02-00-0044	02-01229	7.5–8.3	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	—	1.1	7.1	—	—
CA02-00-0045	02-01229	10.5–12	SOIL	—	—	—	—	—	—	20 (J+)	NA	—	—	—	—	—	—	NA	NA	—	—	4.77	—	—
CA02-00-0046	02-01229	12.5–15	QBT2	13,000	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	—	—	—	—	—
CA02-00-0050	02-01230	8–10	SOIL	—	—	—	—	—	—	33 (J+)	NA	—	—	—	—	—	—	NA	NA	—	—	3.01	—	—
CA02-00-0051	02-01230	10–11.5	SOIL	—	—	—	—	—	—	52 (J+)	NA	—	—	—	—	—	—	NA	NA	—	1.4	—	—	—
CA02-00-0053	02-01230	15–17.5	QBT2	12,000	—	—	73	—	—	—	NA	—	—	—	—	—	—	NA	NA	—	—	—	—	—
CA02-00-0057	02-01231	7.5–10	SOIL	—	—	—	—	—	—	26 (J+)	NA	—	—	—	—	—	—	NA	NA	—	—	—	—	—
CA02-00-0058	02-01231	10–12	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	—	1.2	—	—	—
CA02-00-0060	02-01231	13–15	QBT2	—	—	—	—	—	—	11 (J+)	NA	—	—	—	—	—	—	NA	NA	—	—	—	—	—
CA02-00-0063	02-01232	5–7	FILL	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	—	2.2	—	—	—
CA02-00-0064	02-01232	7.5–10	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	—	1.6	—	—	—
CA02-00-0065	02-01232	10–11	SOIL	—	—	—	—	—	—	22	NA	—	—	—	—	—	—	NA	NA	—	1.5	—	—	—
CA02-00-0066	02-01232	12.5–15	QBT2	11,000	—	—	56	—	—	—	NA	—	—	—	—	—	—	NA	NA	—	1.6	—	—	—
CA02-00-0077	02-01233	5–7.5	FILL	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	—	2.8	—	—	—
CA02-00-0070	02-01233	7.5–10	SOIL	—	—	—	—	—	—	38	NA	—	—	—	—	—	—	NA	NA	—	1.6	—	—	—
CA02-00-0071	02-01233	11–12.5	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	—	2.1	—	—	—
CA02-00-0072	02-01233	12.5–13.5	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	—	2.3	—	—	—

Table 6.25-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Hexavalent Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Uranium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**2.6**	**na[b]**	**3.96**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**1**	**na**	**4.59**	**40**
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**7.14**	**na**	**4.66**	**14,500**	**11.2**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**2.4**	**17**	**63.5**
Sediment BV[a]				**15,400**	**0.83**	**3.98**	**127**	**1.31**	**0.4**	**10.5**	**na**	**11.2**	**13,800**	**19.7**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**	**2.22**	**19.7**	**60.2**
Soil BV[a]				**29,200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**19.3**	**na**	**14.7**	**21,500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**1.82**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**2580**	**1110**	**505[d]**	**72.1**	**51,900**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**3880**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**1240**	**457**	**281[d]**	**40.2**	**24,800**	**434,000**	**1110**	**14,800**	**186**	**15,800**	**991,000**	**434**	**3100**	**3100**	**1860**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**156**	**70.5**	**96[d]**	**3.05**	**3130**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**234**	**394**	**23,500**
CA02-00-0073	02-01233	14–15	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	—	1.7	—	—	—
CA02-00-0074	02-01233	15–17.5	QBT2	7800	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	—	1.4	—	—	—
CA02-00-0080	02-01234	5–7	FILL	—	—	—	—	—	—	—	NA	—	—	—	—	0.23	—	NA	NA	—	2.3	—	—	—
CA02-00-0081	02-01234	7.5–9.25	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	0.25	—	NA	NA	—	1.9	—	—	—
CA02-00-0082	02-01234	10–11.5	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	0.25	—	NA	NA	—	1.8	—	—	—
CA02-00-0093	02-01236	5–7.5	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	0.22 (U)	—	NA	NA	—	1.1	—	—	—
CA02-00-0094	02-01236	7.5–8	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	0.14 (U)	—	NA	NA	—	1.2	—	—	—
CA02-00-0095	02-01236	8.5–10	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	0.32 (U)	—	NA	NA	—	1.2	—	—	—
CA02-00-0097	02-01236	11.5–12	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	0.19 (U)	—	NA	NA	—	—	—	—	—
RE02-07-2700	02-600598	0–0.5	SOIL	—	—	—	355	—	—	—	—	—	—	—	—	0.679	—	2.59 (J-)	—	—	—	NA	—	—
RE02-07-2702	02-600598	9.5–11.5	QAL	—	—	—	—	—	0.565 (U)	24.7	—	—	—	—	—	—	—	—	—	11.4	—	NA	—	—
RE02-07-2703	02-600598	14.5–16.7	QBO	—	—	1.87	—	—	0.613 (U)	3.06 (U)	—	—	5820	—	253 (J-)	—	—	—	—	6.66	—	NA	8.4	—
RE02-07-2705	02-600599	0–0.5	SOIL	—	—	—	320	—	—	—	—	—	—	—	—	0.856	—	2.93	—	—	—	NA	—	—
RE02-07-2706	02-600599	4.5–7.3	QAL	—	—	—	—	—	0.522 (U)	—	—	—	—	—	—	0.31	—	—	—	—	—	NA	—	—
RE02-07-2707	02-600599	9.5–12.5	QAL	—	—	—	—	—	0.553 (U)	—	0.761	—	—	—	—	—	—	—	—	9.97	—	NA	—	—
RE02-07-2708	02-600599	13.5–20.5	QBO	—	—	1.57 (J)	—	—	0.609 (U)	7.79 (U)	—	—	6930	—	195 (J-)	—	—	—	—	8.05	—	NA	7.79	—
RE02-07-2710	02-600600	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.14	—	1.57 (U)	—	NA	—	—
RE02-07-2711	02-600600	4.5–6.5	QAL	—	—	—	—	—	0.52 (U)	—	0.299 (J)	—	—	—	—	—	—	—	—	8.76	—	NA	—	—
RE02-07-2712	02-600600	9.5–11.8	QAL	—	—	—	—	—	0.556 (U)	—	0.251	—	—	—	—	—	—	—	—	7.7	—	NA	—	—
RE02-07-2713	02-600600	14.5–17	QBO	7000	0.527 (UJ)	2.01 (U)	—	—	0.67 (U)	5.81 (U)	—	—	5580	—	223 (J-)	—	—	—	—	7.79	—	NA	—	—
RE02-07-2715	02-600601	0–0.5	SOIL	—	—	—	636	—	0.52 (U)	—	—	—	—	31.2	—	1.13	—	5.57 (J-)	—	—	—	NA	—	—
RE02-07-2716	02-600601	4.5–6.7	QAL	—	—	—	—	—	0.518 (U)	—	—	—	—	—	—	0.308	—	1.01	0.00058 (J)	9.06	—	NA	—	—
RE02-07-2717	02-600601	9.5–11.3	QAL	—	—	—	—	—	0.561 (U)	—	—	—	—	—	—	—	—	—	—	6.39	—	NA	—	—
RE02-07-2718	02-600601	14.5–16.8	QBO	6180 (J)	—	1.37 (J)	—	—	0.581 (U)	7.91 (U)	—	—	5740 (J)	—	320	—	3.2 (U)	—	—	8.59	—	NA	5.33	—
RE02-07-2720	02-600602	0–0.5	SOIL	—	—	—	—	—	0.536 (U)	—	0.267 (J)	—	—	—	—	0.377	—	3.33 (J-)	—	—	—	NA	—	—
RE02-07-2721	02-600602	4.5–9.5	QAL	—	—	—	520	—	0.525 (U)	—	—	—	—	—	—	—	—	—	—	8.99	—	NA	—	—
RE02-07-2723	02-600602	14.5–19.5	QBO	21,800	0.557 (U)	1.18 (J)	29.4	—	0.678 (U)	4.91	—	4.15	10,600	—	458	—	2.28 (J+)	—	—	17.7	—	NA	—	—
RE02-07-2725	02-600603	0–0.5	SED	—	—	—	—	—	0.512 (U)	—	1.33	—	—	—	—	—	—	1.03	—	1.54 (U)	—	NA	—	—
RE02-07-2730	02-600604	0–0.5	SED	—	—	—	—	—	0.522 (U)	—	—	—	15,200	—	—	0.179	—	—	—	1.05 (J)	—	NA	—	77.2
RE02-07-2948	02-600643	0–0.5	SOIL	—	—	—	—	—	0.496 (U)	—	—	—	—	—	—	—	—	—	—	—	—	NA	—	—
RE02-07-2949	02-600643	4.5–5.5	QAL	—	—	—	—	—	0.544 (U)	—	0.0919 (J)	—	—	—	—	—	—	—	—	—	—	NA	—	—

Table 6.25-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Hexavalent Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Uranium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**2.6**	**na[b]**	**3.96**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**1**	**na**	**4.59**	**40**
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**7.14**	**na**	**4.66**	**14,500**	**11.2**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**2.4**	**17**	**63.5**
Sediment BV[a]				**15,400**	**0.83**	**3.98**	**127**	**1.31**	**0.4**	**10.5**	**na**	**11.2**	**13,800**	**19.7**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**	**2.22**	**19.7**	**60.2**
Soil BV[a]				**29,200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**19.3**	**na**	**14.7**	**21,500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**1.82**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**2580**	**1110**	**505[d]**	**72.1**	**51,900**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**3880**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**1240**	**457**	**281[d]**	**40.2**	**24,800**	**434,000**	**1110**	**14,800**	**186**	**15,800**	**991,000**	**434**	**3100**	**3100**	**1860**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**156**	**70.5**	**96[d]**	**3.05**	**3130**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**234**	**394**	**23,500**
RE02-07-2950	02-600643	9.5–12.4	QAL	—	—	—	—	—	0.55 (U)	—	—	—	—	—	—	—	—	0.81 (J)	—	1.65 (U)	—	NA	—	—
RE02-07-2951	02-600643	14.5–16.9	QBO	9780	—	0.892 (J)	62.4	—	0.604 (U)	9.12 (U)	0.0647 (J)	—	6720	—	240	—	2.18 (U)	—	—	1.81 (U)	—	NA	—	—
RE02-07-2953	02-600644	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.36	—	—	—	NA	—	—
RE02-07-2954	02-600644	4.5–5.2	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.000825 (J)	1.53 (U)	—	NA	—	—
RE02-07-2955	02-600644	9.5–11.7	QAL	—	—	—	—	—	0.555 (U)	—	0.199 (J)	—	—	—	905	—	—	—	—	2.56	—	NA	—	—
RE02-07-2956	02-600644	14.5–19.5	QBO	10,000	—	1.5 (J)	66.1 (J+)	—	0.574 (U)	6.17 (U)	0.0592 (J)	—	6340 (J+)	—	260	—	2.77 (U)	—	—	2.04	—	NA	—	—
RE02-07-2958	02-600645	0–0.5	SOIL	—	—	—	—	—	0.507 (U)	—	0.297 (J)	—	—	—	—	—	—	4.06	0.00109 (J)	—	—	NA	—	—
RE02-07-2959	02-600645	4.5–5.25	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	11.4	0.00536	1.57 (U)	—	NA	—	—
RE02-07-2960	02-600645	9.5–12.2	QAL	—	—	—	—	—	0.554 (U)	—	0.162 (J-)	—	—	—	—	—	—	1.34 (J-)	—	—	—	NA	—	—
RE02-07-2961	02-600645	14.5–20.5	QBO	6810	—	1.73 (U)	37.5 (J-)	—	0.576 (U)	5.39 (U)	—	—	6530	—	240 (J)	—	2.65 (U)	—	—	1.73 (U)	—	NA	—	—
RE02-07-2963	02-600646	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.26	0.00144 (J)	—	—	NA	—	—
RE02-07-2964	02-600646	4.5–8.3	QAL	—	—	—	—	—	0.545 (U)	—	—	—	—	—	—	—	—	—	0.00461	—	—	NA	—	—
RE02-07-2965	02-600646	9.5–11.7	QAL	—	—	—	—	—	0.561 (U)	—	—	—	—	—	—	—	—	—	—	—	—	NA	—	—
RE02-07-2966	02-600646	14.5–16.8	QBO	4450	—	1.26 (J)	—	—	0.539 (U)	23.3 (J)	0.147 (J-)	—	6560	—	—	—	4.31 (U)	1.03 (J-)	—	1.62 (U)	—	NA	8.42	—
RE02-07-2968	02-600647	0–0.5	SOIL	—	—	—	—	—	0.517 (U)	—	—	—	—	—	—	—	—	1.42	0.0015 (J+)	—	—	NA	—	—
RE02-07-2969	02-600647	4.5–4.9	QAL	—	—	—	—	—	0.502 (U)	—	0.488 (J)	—	—	—	—	—	—	—	0.00901	—	—	NA	—	—
RE02-07-2973	02-600648	0–0.5	SOIL	—	—	—	—	—	0.523 (U)	—	0.396 (J)	—	—	—	—	—	—	1.32	0.000776 (J+)	—	—	NA	—	—
RE02-07-2974	02-600648	4.5–7	QAL	—	—	—	—	—	0.565 (U)	—	—	—	—	—	—	—	—	—	—	—	—	NA	—	—
RE02-07-2976	02-600648	13.5–14.5	QBO	4730	—	1.53 (J)	32.1 (J+)	—	0.604 (U)	—	0.0737 (J)	8.11 (U)	8250	—	211 (J+)	—	4.5 (U)	—	—	1.2 (J)	—	NA	8.32	—
RE02-07-2977	02-600648	14.5–19.5	QBO	11,000	—	1.78 (U)	—	—	0.593 (U)	—	0.207	—	8040	—	239 (J+)	—	—	—	—	0.626 (J)	—	NA	—	—
RE02-07-2978	02-600649	0–0.5	SOIL	—	—	—	—	—	0.535 (U)	—	0.8 (J)	—	—	—	—	—	—	1.31	0.00194 (J+)	—	—	NA	—	—
RE02-07-2983	02-600650	0–0.5	SOIL	—	—	—	—	—	0.526 (U)	—	0.26 (J)	—	—	—	—	—	—	1.28	0.000878 (J+)	—	—	NA	—	—
RE02-07-2984	02-600650	4.5–6.3	QAL	—	—	—	—	—	0.546 (U)	—	—	—	—	—	—	—	—	—	—	—	—	NA	—	—
RE02-07-2985	02-600650	9.5–11.3	QAL	—	—	—	—	—	0.568 (U)	—	—	—	—	—	—	—	—	—	—	—	—	NA	—	—
RE02-07-2988	02-600651	0–0.5	SOIL	—	—	—	—	—	0.515 (U)	—	—	—	—	—	—	—	—	1.01 (J)	0.000557 (J)	1.54 (U)	—	NA	—	—
RE02-07-2989	02-600651	4.5–5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.93	—	1.6 (U)	—	NA	—	—
RE02-07-2990	02-600651	9.5–12.7	QAL	—	—	—	—	—	—	—	—	—	—	—	—	0.129	—	1.06 (J)	—	1.68 (U)	—	NA	—	—
RE02-07-2992	02-600651	14.5–16.9	QBO	4800	—	1.51 (J)	117 (J-)	—	0.59 (U)	11.8 (U)	0.144 (J-)	—	7560	—	639 (J)	—	2.06 (U)	—	—	0.973 (J)	—	NA	6.45	—
RE02-07-2991	02-600651	19.5–21.6	QBO	4700	0.54 (UJ)	1.99 (U)	—	—	0.662 (U)	—	—	—	4920	—	204 (J)	—	—	—	—	1.99 (U)	—	NA	—	—
RE02-07-2993	02-600652	0–0.5	SOIL	—	—	—	—	—	0.529 (U)	—	0.287	—	—	—	—	—	—	—	—	—	—	NA	—	—
RE02-07-2994	02-600652	4.5–5.3	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.61 (U)	—	NA	—	—

Table 6.25-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Hexavalent Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Uranium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**2.6**	**na[b]**	**3.96**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**1**	**na**	**4.59**	**40**
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**7.14**	**na**	**4.66**	**14,500**	**11.2**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**2.4**	**17**	**63.5**
Sediment BV[a]				**15,400**	**0.83**	**3.98**	**127**	**1.31**	**0.4**	**10.5**	**na**	**11.2**	**13,800**	**19.7**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**	**2.22**	**19.7**	**60.2**
Soil BV[a]				**29,200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**19.3**	**na**	**14.7**	**21,500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**1.82**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**2580**	**1110**	**505[d]**	**72.1**	**51,900**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**3880**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**1240**	**457**	**281[d]**	**40.2**	**24,800**	**434,000**	**1110**	**14,800**	**186**	**15,800**	**991,000**	**434**	**3100**	**3100**	**1860**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**156**	**70.5**	**96[d]**	**3.05**	**3130**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**234**	**394**	**23,500**
RE02-07-2995	02-600652	9.5–11.7	QAL	—	—	—	—	—	0.537 (U)	—	0.124	—	—	—	—	—	—	—	—	2.43	—	NA	—	—
RE02-07-2997	02-600652	14.5–16.6	QAL	—	—	—	—	—	0.578 (U)	52.3	—	—	—	—	—	—	—	—	—	2.04	—	NA	—	—
RE02-07-2996	02-600652	16.6–18.4	QBO	14,000	0.519 (UJ)	1.09 (J)	97.5	1.49	0.64 (U)	6.67 (U)	—	—	6650	—	234 (J+)	—	3.48 (U)	—	—	1.8 (J)	—	NA	—	—
RE02-07-3200	02-600698	0–0.5	SOIL	—	—	—	—	—	0.537 (U)	—	—	—	—	—	—	—	—	2.75	—	—	—	NA	—	—
RE02-07-3201	02-600698	4.5–7.3	QAL	—	—	—	—	—	0.536 (U)	—	—	—	—	—	—	—	—	1.01 (J-)	—	1.61 (U)	—	NA	—	—
RE02-07-3202	02-600698	9.5–12.2	QAL	—	—	—	—	—	0.524 (U)	22.2	0.168 (J-)	—	—	—	—	—	—	—	—	1.57 (U)	—	NA	—	—
RE02-07-3205	02-600699	0–0.5	SOIL	—	—	—	—	—	0.507 (U)	—	—	—	—	—	—	—	—	—	0.000836 (J)	—	—	NA	—	—
RE02-07-3206	02-600699	4.5–7	QAL	—	—	—	—	—	0.553 (U)	—	0.0387 (J)	—	—	—	—	—	—	—	—	—	—	NA	—	—
RE02-07-3208	02-600699	14.5–19.5	QBO	—	—	1.7 (J)	—	—	0.573 (U)	—	0.0692 (J)	—	7250	—	210 (J+)	—	2.15	2.1	—	0.639 (J)	—	NA	8.07	—
RE02-07-3209	02-600699	19.5–21.7	QBO	3690	0.552 (UJ)	2.04 (U)	—	—	0.679 (U)	—	0.0964 (J)	—	4460	—	—	—	—	—	—	2.04 (U)	—	NA	—	—
RE02-07-3210	02-600700	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0012 (J-)	—	—	NA	—	—
RE02-07-3211	02-600700	4.5–6.7	QAL	—	—	—	—	—	0.56 (U)	—	0.136	—	—	—	—	—	—	—	—	—	—	NA	—	—
RE02-07-3212	02-600700	9.5–11.1	QAL	—	—	—	—	—	0.557 (U)	—	—	—	—	—	—	—	—	—	—	—	—	NA	—	—
RE02-07-3213	02-600700	14.5–16.7	QBO	12,900	0.578 (UJ)	2.22 (U)	—	—	0.739 (U)	—	0.0493 (J)	—	5940	—	194 (J+)	—	—	—	—	0.806 (J)	—	NA	—	—
RE02-07-3215	02-600701	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	23.1	—	—	—	1.98	0.00151 (J)	—	—	NA	—	60.8
RE02-07-3216	02-600701	4.5–6.2	QAL	—	—	—	—	—	0.536 (U)	—	0.0471 (J)	—	—	—	—	—	—	1.15 (J-)	—	—	—	NA	—	—
RE02-07-3217	02-600701	9.5–11.7	QBO	15,700	0.586 (UJ)	2.19 (U)	69.2 (J+)	—	0.73 (U)	—	0.0745 (J)	4.44 (U)	6710	—	259 (J+)	—	—	—	—	1.16 (J)	—	NA	—	—
RE02-07-3220	02-600702	0–0.5	SOIL	—	—	—	—	—	0.538 (U)	—	—	—	—	—	—	—	—	1.57	0.000709 (J)	1.62 (U)	—	NA	—	—
RE02-07-3221	02-600702	4.5–6.7	QAL	—	—	—	—	—	0.529 (U)	—	0.166 (J-)	—	—	—	—	—	—	—	—	1.59 (U)	—	NA	—	—
RE02-07-3222	02-600702	9.5–12.7	QBO	15,300	—	0.831 (J)	91.1	—	0.601 (U)	43.5	—	—	6420	—	287 (J+)	—	7.15	—	—	1.8 (U)	—	NA	—	—
RE02-07-3225	02-600703	0–0.5	SED	—	—	—	—	—	0.431 (J)	—	—	—	—	21.3	—	—	—	1.47 (J-)	—	1.03 (J)	—	NA	—	67.4
RE02-07-3230	02-600704	0–0.5	SED	—	—	—	—	—	0.418 (J)	—	—	—	—	19.9	—	—	—	0.95 (J-)	—	1.56 (U)	—	NA	—	—
RE02-07-3233	02-600704	14.5–16.7	QBO	5430 (J+)	—	0.942 (J)	—	—	0.621 (U)	10.9 (J)	—	—	7630	—	227	—	2.19	—	—	1 (J)	—	NA	6.24	—
RE02-07-3235	02-600705	0–0.5	SED	—	—	—	—	—	—	—	0.349 (J)	—	—	20.8	—	—	—	—	—	1.53 (U)	—	NA	—	—
RE02-07-3236	02-600705	4.5–6.3	QAL	—	—	—	—	—	0.539 (U)	37.6	—	—	—	—	—	—	—	—	—	—	—	NA	—	—
RE02-07-3237	02-600705	9.5–11.7	QBO	9420	—	1.8 (U)	50.1	—	0.584 (U)	13.5	—	—	7630	—	243	—	2.12	—	—	1.23 (J)	—	NA	6.54	—
RE02-07-3240	02-600706	0–0.5	SED	—	—	—	—	—	—	—	—	—	—	—	—	0.108	—	2.55 (J-)	—	1.49 (U)	—	NA	—	—
RE02-10-21918	02-612391	5–6	SOIL	—	1.05 (U)	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	—	—	NA	—	—
RE02-10-21919	02-612391	15–16	QAL	—	1.19 (U)	—	—	—	0.595 (U)	—	NA	—	—	—	—	—	—	NA	NA	—	—	NA	—	—
RE02-10-21920	02-612391	25–26	QBO	—	1.21 (U)	1.17 (U)	—	—	0.606 (U)	—	NA	—	4820	—	—	—	—	NA	NA	1.17 (U)	—	NA	—	—
RE02-10-21921	02-612391	35–37	QBO	—	1.13 (U)	1.16 (U)	—	—	0.567 (U)	4.21	NA	—	5140	—	—	—	—	NA	NA	1.16 (U)	—	NA	—	—

Table 6.25-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Hexavalent Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Uranium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**1.44**	**0.4**	**2.6**	**na[b]**	**3.96**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**1**	**na**	**4.59**	**40**
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**7.14**	**na**	**4.66**	**14,500**	**11.2**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**2.4**	**17**	**63.5**
Sediment BV[a]				**15,400**	**0.83**	**3.98**	**127**	**1.31**	**0.4**	**10.5**	**na**	**11.2**	**13,800**	**19.7**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**	**2.22**	**19.7**	**60.2**
Soil BV[a]				**29,200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**19.3**	**na**	**14.7**	**21,500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**1.82**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**2580**	**1110**	**505[d]**	**72.1**	**51,900**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**3880**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**1240**	**457**	**281[d]**	**40.2**	**24,800**	**434,000**	**1110**	**14,800**	**186**	**15,800**	**991,000**	**434**	**3100**	**3100**	**1860**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**156**	**70.5**	**96[d]**	**3.05**	**3130**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**234**	**394**	**23,500**
RE02-10-21922	02-612391	49–50	QBO	—	1.2 (U)	1.17 (U)	—	—	0.598 (U)	—	NA	—	5030	—	—	—	—	NA	NA	1.17 (U)	—	NA	—	—
RE02-10-21923	02-612392	5–6	QAL	—	1.06 (U)	—	—	—	0.53 (U)	—	NA	—	—	—	—	—	—	NA	NA	—	—	NA	—	—
RE02-10-21924	02-612392	19–20	QBO	7420	1.22 (U)	—	—	—	0.608 (U)	—	NA	—	6050	—	215 (J-)	—	—	NA	NA	1.24 (U)	—	NA	—	—
RE02-10-21925	02-612392	25–26	QBO	—	1.33 (U)	1.21 (U)	—	—	0.664 (U)	—	NA	—	5400	—	—	—	—	NA	NA	1.21 (U)	—	NA	—	—
RE02-10-21926	02-612392	35–37	QBO	—	1.2 (U)	1.17 (U)	—	—	0.602 (U)	—	NA	—	5540	—	—	—	—	NA	NA	1.17 (U)	—	NA	—	—
RE02-10-21927	02-612392	49–50	QBO	—	1.23 (U)	1.24 (U)	—	—	0.616 (U)	—	NA	—	6030	—	253 (J-)	—	—	NA	NA	1.24 (U)	—	NA	—	—
RE02-10-21928	02-612393	5–6	QAL	—	1.05 (U)	—	—	—	0.527 (U)	—	NA	—	—	—	—	—	—	NA	NA	—	—	NA	—	—
RE02-10-21929	02-612393	15.5–16.5	QAL	—	1.2 (U)	—	—	—	0.599 (U)	—	NA	—	—	—	—	—	—	NA	NA	—	—	NA	—	—
RE02-10-21930	02-612393	25–26	QBO	4090	1.33 (U)	—	—	—	0.666 (U)	—	NA	—	5750	—	237	—	—	NA	NA	1.32 (U)	—	NA	—	—
RE02-10-21931	02-612393	35–36	QBO	3830	1.26 (U)	1.1 (U)	—	—	0.632 (U)	—	NA	—	5640	—	—	—	—	NA	NA	1.1 (U)	—	NA	—	—
RE02-10-21932	02-612393	49–50	QBO	6770	1.27 (U)	1.23 (U)	—	—	0.636 (U)	—	NA	—	6240	—	226	—	—	NA	NA	1.23 (U)	—	NA	—	—
RE02-10-22027	02-612420	6–7	QAL	—	0.947 (U)	—	—	—	0.474 (U)	—	NA	—	—	—	—	—	—	NA	NA	—	—	NA	—	—
RE02-10-22028	02-612420	15.5–16.5	QAL	—	1.05 (U)	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	—	—	NA	—	—
RE02-10-22029	02-612420	26–27	QBO	7420	1.39 (U)	1.32 (U)	—	—	0.693 (U)	—	NA	—	4010	—	—	—	—	NA	NA	1.32 (U)	—	NA	—	—
RE02-10-22030	02-612420	35–37	QBO	8230	1.28 (U)	1.29 (U)	—	—	0.642 (U)	3.18	NA	—	5530	—	223 (J+)	—	—	NA	NA	1.29 (U)	—	NA	—	—
RE02-10-22031	02-612420	49–50	QBO	6810	1.29 (U)	1.28 (U)	—	—	0.647 (U)	—	NA	—	5320	—	—	—	—	NA	NA	1.28 (U)	—	NA	—	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 6.25-3
Organic Chemicals Detected at SWMU 02-009(c)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	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	Bis(2-ethylhexyl)phthalate	Chloroform	Chrysene
Industrial SSL[a]				**50,500**	**959,000**	**253,000**	**10.7**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**1830**	**28.4**	**3230**
Recreational SSL[c]				**17,300**	**505,000**	**863,000**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**888**	**1770**	**204**	**8880**
Residential SSL[a]				**3480**	**66,300**	**17,400**	**2.22**	**1.12**	**2.22**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**380**	**5.85**	**153**
CA02-00-0021	02-01225	5–7	FILL	—[d]	NA[e]	—	NA	NA	NA	—	—	—	—	—	0.2 (J)	NA	—
CA02-00-0035	02-01228	0–2.5	SOIL	—	NA	—	NA	NA	NA	—	—	0.061 (J)	—	—	—	NA	0.085 (J)
CA02-00-0037	02-01228	5.5–7.5	FILL	—	NA	—	NA	NA	NA	—	—	—	—	—	0.18 (J)	NA	—
CA02-00-0043	02-01229	5–7.5	FILL	—	NA	—	NA	NA	NA	—	—	—	—	—	0.02 (J-)	NA	—
CA02-00-0044	02-01229	7.5–8.3	SOIL	—	NA	—	NA	NA	NA	—	—	—	—	—	0.026 (J)	NA	—
CA02-00-0050	02-01230	8–10	SOIL	—	NA	—	NA	NA	NA	—	—	—	—	—	—	NA	—
CA02-00-0051	02-01230	10–11.5	SOIL	—	NA	—	NA	NA	NA	—	—	—	—	—	0.026 (J-)	NA	—
CA02-00-0052	02-01230	12.5–14	SOIL	—	NA	—	NA	NA	NA	—	—	—	—	—	0.051 (J)	NA	—
CA02-00-0056	02-01231	5–6.5	FILL	—	NA	—	NA	NA	NA	—	—	—	—	—	0.02 (J)	NA	—
CA02-00-0057	02-01231	7.5–10	SOIL	—	NA	—	NA	NA	NA	—	—	—	—	—	0.02 (J)	NA	—
CA02-00-0059	02-01231	12.5–13	SOIL	—	NA	—	NA	NA	NA	—	—	—	—	—	0.021 (J)	NA	—
CA02-00-0060	02-01231	13–15	QBT2	—	NA	—	NA	NA	NA	—	—	—	—	—	0.019 (J)	NA	—
CA02-00-0064	02-01232	7.5–10	SOIL	—	NA	—	NA	NA	NA	—	—	—	—	—	—	NA	—
CA02-00-0074	02-01233	15–17.5	QBT2	—	NA	—	NA	NA	NA	—	—	—	—	—	—	NA	—
CA02-00-0080	02-01234	5–7	FILL	—	NA	—	NA	NA	NA	—	—	—	—	—	—	NA	—
RE02-07-2700	02-600598	0–0.5	SOIL	0.0236 (J)	NA	0.0285 (J)	NA	NA	NA	0.108	0.147	0.173	0.0838	—	—	NA	0.15
RE02-07-2705	02-600599	0–0.5	SOIL	0.0489	NA	0.0526	NA	NA	NA	0.178	0.226	0.379	0.109	—	—	NA	0.217
RE02-07-2706	02-600599	4.5–7.3	QAL	—	—	—	NA	NA	NA	0.0136 (J)	0.0118 (J)	0.0195 (J)	—	—	—	—	0.0132 (J)
RE02-07-2710	02-600600	0–0.5	SOIL	0.106	NA	0.177	NA	NA	NA	0.277	0.222	0.257	0.089	0.15	—	NA	0.262
RE02-07-2711	02-600600	4.5–6.5	QAL	—	—	—	NA	NA	NA	—	—	—	—	—	—	0.000223 (J)	—
RE02-07-2713	02-600600	14.5–17	QBO	—	—	—	NA	NA	NA	—	—	—	—	—	—	0.000305 (J)	—
RE02-07-2715	02-600601	0–0.5	SOIL	0.0229 (J)	NA	0.0286 (J)	NA	NA	NA	0.0923	0.12	0.136	0.0713	0.0664	—	NA	0.109
RE02-07-2716	02-600601	4.5–6.7	QAL	—	—	—	NA	NA	NA	—	—	—	—	—	—	—	0.0175 (J)
RE02-07-2720	02-600602	0–0.5	SOIL	—	NA	—	NA	NA	NA	0.0239 (J)	0.0205 (J)	0.0459 (J)	—	—	—	NA	0.0232 (J)
RE02-07-2725	02-600603	0–0.5	SED	0.0161 (J)	NA	0.0334 (J)	NA	NA	NA	0.119	0.143 (J)	0.197 (J)	0.0777 (J)	0.0855 (J)	—	NA	0.132
RE02-07-2948	02-600643	0–0.5	SOIL	—	NA	—	—	0.0048	0.0025 (J)	—	—	—	—	—	—	NA	—
RE02-07-2949	02-600643	4.5–5.5	QAL	—	—	—	—	0.0115	0.0072	—	—	—	—	—	—	—	—

Table 6.25-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	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	Bis(2-ethylhexyl)phthalate	Chloroform	Chrysene
Industrial SSL[a]				**50,500**	**959,000**	**253,000**	**10.7**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**1830**	**28.4**	**3230**
Recreational SSL[c]				**17,300**	**505,000**	**863,000**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**888**	**1770**	**204**	**8880**
Residential SSL[a]				**3480**	**66,300**	**17,400**	**2.22**	**1.12**	**2.22**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**380**	**5.85**	**153**
RE02-07-2950	02-600643	9.5–12.4	QAL	—	—	—	—	0.003 (J)	0.0016 (J)	—	—	—	—	—	—	—	—
RE02-07-2953	02-600644	0–0.5	SOIL	—	NA	—	—	0.0127 (J)	0.0064 (J)	—	0.0195 (J-)	0.0168 (J-)	—	—	—	NA	—
RE02-07-2954	02-600644	4.5–5.2	QAL	—	—	—	—	0.0039	0.0019 (J)	—	—	—	—	—	—	—	—
RE02-07-2955	02-600644	9.5–11.7	QAL	—	—	—	—	—	—	—	—	—	—	—	—	0.000231 (J)	—
RE02-07-2958	02-600645	0–0.5	SOIL	—	NA	—	—	0.0026 (J)	0.0017 (J)	—	—	—	—	—	—	NA	—
RE02-07-2963	02-600646	0–0.5	SOIL	—	NA	—	—	—	—	—	—	—	—	—	—	NA	—
RE02-07-2964	02-600646	4.5–8.3	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2965	02-600646	9.5–11.7	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2968	02-600647	0–0.5	SOIL	—	NA	—	0.0045 (J-)	0.0055 (J-)	0.0057 (J-)	—	—	—	—	—	—	NA	—
RE02-07-2976	02-600648	13.5–14.5	QBO	—	—	—	—	—	0.0017 (J)	—	—	—	—	—	—	—	—
RE02-07-2978	02-600649	0–0.5	SOIL	—	NA	—	—	—	0.0075 (J-)	—	0.0145 (J)	0.0111 (J)	—	—	—	NA	—
RE02-07-2983	02-600650	0–0.5	SOIL	—	NA	—	—	—	0.0052 (J-)	—	—	—	—	—	—	NA	—
RE02-07-2984	02-600650	4.5–6.3	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2988	02-600651	0–0.5	SOIL	—	NA	—	—	0.0094	0.0045	—	—	—	—	—	—	NA	—
RE02-07-2989	02-600651	4.5–5	QAL	—	—	—	—	0.0032 (J)	0.0019 (J)	—	—	—	—	—	—	—	—
RE02-07-2990	02-600651	9.5–12.7	QAL	0.0297 (J)	—	0.0425	—	0.0263	0.0206	0.106	0.171	0.151	0.0799 (J)	—	—	—	0.0837
RE02-07-2992	02-600651	14.5–16.9	QBO	—	—	—	—	0.0163	0.0096	—	—	—	—	—	—	—	—
RE02-07-2991	02-600651	19.5–21.6	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2993	02-600652	0–0.5	SOIL	—	NA	—	—	0.0022 (J)	0.0016 (J)	—	—	—	—	—	—	NA	—
RE02-07-2995	02-600652	9.5–11.7	QAL	—	—	—	—	—	0.0049	—	—	—	—	—	—	—	—
RE02-07-2997	02-600652	14.5–16.6	QAL	—	—	—	0.352	0.149	0.0196	—	—	—	—	—	—	—	—
RE02-07-3200	02-600698	0–0.5	SOIL	—	NA	—	—	—	0.0025 (J)	—	—	—	—	—	—	NA	—
RE02-07-3201	02-600698	4.5–7.3	QAL	—	—	—	—	0.0137	0.02	—	—	—	—	—	—	—	—
RE02-07-3202	02-600698	9.5–12.2	QAL	—	—	—	—	—	0.003 (J)	—	—	—	—	—	—	—	—
RE02-07-3205	02-600699	0–0.5	SOIL	—	NA	—	—	0.0144	0.0121 (J)	—	—	—	—	—	—	NA	—
RE02-07-3208	02-600699	14.5–19.5	QBO	—	—	—	—	0.0023 (J)	0.0036 (J)	—	—	—	—	—	—	—	—
RE02-07-3210	02-600700	0–0.5	SOIL	—	NA	—	—	0.0078	0.0085	0.0283 (J)	—	0.0533 (J)	—	—	—	NA	0.0325 (J)
RE02-07-3211	02-600700	4.5–6.7	QAL	—	—	—	—	0.0477	0.0457	0.0145 (J)	—	0.0135 (J)	—	—	—	—	—
RE02-07-3212	02-600700	9.5–11.1	QAL	—	—	—	—	0.0025 (J)	0.0014 (J)	—	—	—	—	—	—	—	—
RE02-07-3215	02-600701	0–0.5	SOIL	0.023 (J)	NA	0.0415	—	0.08	0.0991 (J)	0.162	—	0.262 (J)	0.0551 (J)	0.132 (J)	—	NA	0.172
RE02-07-3216	02-600701	4.5–6.2	QAL	—	—	—	—	0.0261	0.0396	0.0186 (J)	0.0122 (J)	0.0134 (J)	—	—	—	—	0.0137 (J)

Table 6.25-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	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	Bis(2-ethylhexyl)phthalate	Chloroform	Chrysene
Industrial SSL[a]				**50,500**	**959,000**	**253,000**	**10.7**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**1830**	**28.4**	**3230**
Recreational SSL[c]				**17,300**	**505,000**	**863,000**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**888**	**1770**	**204**	**8880**
Residential SSL[a]				**3480**	**66,300**	**17,400**	**2.22**	**1.12**	**2.22**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**380**	**5.85**	**153**
RE02-07-3217	02-600701	9.5–11.7	QBO	—	—	—	—	—	0.002 (J)	—	—	—	—	—	—	—	—
RE02-07-3220	02-600702	0–0.5	SOIL	—	NA	0.00744 (J)	—	—	—	—	—	—	—	—	—	NA	0.0392
RE02-07-3221	02-600702	4.5–6.7	QAL	—	—	—	—	0.0063	0.0137	—	—	—	—	—	—	—	—
RE02-07-3225	02-600703	0–0.5	SED	0.0182 (J)	NA	0.0473	—	0.0578	0.1	0.163	0.168 (J)	0.318 (J)	—	—	—	NA	0.156
RE02-07-3230	02-600704	0–0.5	SED	—	NA	0.00832 (J)	—	0.126	0.146	0.0458	—	0.0851 (J)	—	—	—	NA	0.0452
RE02-07-3233	02-600704	14.5–16.7	QBO	—	—	—	—	0.0448	0.0371	0.0159 (J)	0.0136 (J)	0.0189 (J)	—	—	—	—	—
RE02-07-3235	02-600705	0–0.5	SED	—	NA	0.0173 (J)	—	0.0948	0.0959	0.0647	—	—	—	—	—	NA	0.0691
RE02-07-3236	02-600705	4.5–6.3	QAL	—	0.133 (J)	—	—	0.0089	0.0059	—	—	—	—	—	—	—	—
RE02-07-3237	02-600705	9.5–11.7	QBO	—	—	—	—	0.0125	0.0067	—	—	—	—	—	—	—	—
RE02-07-3240	02-600706	0–0.5	SED	—	NA	—	—	0.0136	0.0154	—	—	—	—	—	—	NA	0.0116 (J)
RE02-10-21918	02-612391	5–6	SOIL	—	NA	—	—	0.0128	0.0072	—	—	—	—	—	—	NA	—
RE02-10-22028	02-612420	15.5–16.5	QAL	—	NA	—	—	—	0.0046	—	—	—	—	—	—	NA	—
RE02-10-22030	02-612420	35–37	QBO	—	NA	—	—	0.003 (J)	—	—	—	—	—	—	—	NA	—

Table 6.25-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Dibenzofuran	Di-n-butylphthalate	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Phenol	Pyrene	Styrene	Toluene
Industrial SSL[a]				**1000[f]**	**91,600**	**33,700**	**33,700**	**32.3**	**14,900[g]**	**5110**	**4100**	**16,800**	**25,300**	**275,000**	**25,300**	**50,900**	**61,400**
Recreational SSL[c]				**489**	**32,800**	**11,500**	**11,500**	**88.8**	**52,700[g]**	**3610**	**3170**	**1930**	**8630**	**98,500**	**8630**	**100,000**	**47,600**
Residential SSL[a]				**73[f]**	**6160**	**2320**	**2320**	**1.53**	**3210[g]**	**409**	**310**	**1160**	**1740**	**18,500**	**1740**	**7230**	**5220**
CA02-00-0021	02-01225	5–7	FILL	—	—	—	—	—	NA	NA	—	—	—	—	—	NA	NA
CA02-00-0035	02-01228	0–2.5	SOIL	0.061 (J)	—	0.058 (J)	—	—	NA	NA	0.29 (J)	0.2 (J)	0.16 (J)	—	0.097 (J)	NA	NA
CA02-00-0037	02-01228	5.5–7.5	FILL	—	—	—	—	—	NA	NA	—	—	—	—	—	NA	NA
CA02-00-0043	02-01229	5–7.5	FILL	—	—	—	—	—	NA	NA	—	—	—	—	—	NA	NA
CA02-00-0044	02-01229	7.5–8.3	SOIL	—	—	—	—	—	NA	NA	—	—	—	—	—	NA	NA
CA02-00-0050	02-01230	8–10	SOIL	—	—	—	—	—	NA	NA	—	—	—	0.04 (J)	—	NA	NA
CA02-00-0051	02-01230	10–11.5	SOIL	—	—	—	—	—	NA	NA	—	—	—	—	—	NA	NA
CA02-00-0052	02-01230	12.5–14	SOIL	—	—	—	—	—	NA	NA	—	—	—	0.14 (J)	—	NA	NA
CA02-00-0056	02-01231	5–6.5	FILL	—	—	0.023 (J)	—	—	NA	NA	—	0.022 (J)	0.036 (J)	—	0.032 (J)	NA	NA
CA02-00-0057	02-01231	7.5–10	SOIL	—	—	—	—	—	NA	NA	—	—	—	—	—	NA	NA
CA02-00-0059	02-01231	12.5–13	SOIL	—	—	—	—	—	NA	NA	—	—	—	—	—	NA	NA
CA02-00-0060	02-01231	13–15	QBT2	—	—	—	—	—	NA	NA	—	—	—	—	—	NA	NA
CA02-00-0064	02-01232	7.5–10	SOIL	—	0.038 (J)	—	—	—	NA	NA	—	—	—	—	—	NA	NA
CA02-00-0074	02-01233	15–17.5	QBT2	—	0.03 (J)	—	—	—	NA	NA	—	—	—	—	—	NA	NA
CA02-00-0080	02-01234	5–7	FILL	—	0.068 (J)	—	—	—	NA	NA	—	—	—	—	—	NA	NA
RE02-07-2700	02-600598	0–0.5	SOIL	—	—	0.211	0.0213 (J)	0.0819	NA	NA	—	—	0.185	—	0.222	NA	NA
RE02-07-2705	02-600599	0–0.5	SOIL	—	—	0.31	0.041	0.109	NA	NA	0.0162 (J)	0.0254 (J)	0.313	—	0.386	NA	NA
RE02-07-2706	02-600599	4.5–7.3	QAL	—	—	0.0185 (J)	—	—	—	—	—	—	0.0159 (J)	—	0.0177 (J)	—	—
RE02-07-2710	02-600600	0–0.5	SOIL	—	—	0.668	0.0924	0.0942	NA	NA	0.0359	0.0701	0.589	—	0.592	NA	NA
RE02-07-2711	02-600600	4.5–6.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2713	02-600600	14.5–17	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2715	02-600601	0–0.5	SOIL	—	—	0.171	0.0175 (J)	0.0686	NA	NA	—	—	0.13	—	0.169	NA	NA
RE02-07-2716	02-600601	4.5–6.7	QAL	—	—	0.0337 (J)	—	—	—	—	—	—	0.0271 (J)	—	0.0387	—	0.000511 (J+)
RE02-07-2720	02-600602	0–0.5	SOIL	—	—	0.0376	—	—	NA	NA	—	—	0.0191 (J)	—	0.0386	NA	NA
RE02-07-2725	02-600603	0–0.5	SED	—	—	0.257	0.0152 (J)	0.0728 (J)	NA	NA	—	—	0.157	—	0.28	NA	NA
RE02-07-2948	02-600643	0–0.5	SOIL	—	—	—	—	—	NA	NA	—	—	—	—	—	NA	NA
RE02-07-2949	02-600643	4.5–5.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2950	02-600643	9.5–12.4	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2953	02-600644	0–0.5	SOIL	—	—	0.0153 (J-)	—	—	NA	NA	—	—	—	—	0.0114 (J-)	NA	NA
RE02-07-2954	02-600644	4.5–5.2	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2955	02-600644	9.5–11.7	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2958	02-600645	0–0.5	SOIL	—	—	—	—	—	NA	NA	—	—	—	—	—	NA	NA

Table 6.25-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Dibenzofuran	Di-n-butylphthalate	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Phenol	Pyrene	Styrene	Toluene
Industrial SSL[a]				**1000[f]**	**91,600**	**33,700**	**33,700**	**32.3**	**14,900[g]**	**5110**	**4100**	**16,800**	**25,300**	**275,000**	**25,300**	**50,900**	**61,400**
Recreational SSL[c]				**489**	**32,800**	**11,500**	**11,500**	**88.8**	**52,700[g]**	**3610**	**3170**	**1930**	**8630**	**98,500**	**8630**	**100,000**	**47,600**
Residential SSL[a]				**73[f]**	**6160**	**2320**	**2320**	**1.53**	**3210[g]**	**409**	**310**	**1160**	**1740**	**18,500**	**1740**	**7230**	**5220**
RE02-07-2963	02-600646	0–0.5	SOIL	—	—	0.0112 (J)	—	—	NA	NA	—	—	—	—	0.0129 (J)	NA	NA
RE02-07-2964	02-600646	4.5–8.3	QAL	—	0.0364 (J)	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2965	02-600646	9.5–11.7	QAL	—	—	—	—	—	—	—	—	—	—	—	—	0.000239 (J)	—
RE02-07-2968	02-600647	0–0.5	SOIL	—	—	—	—	—	NA	NA	0.0323 (J)	0.0143 (J)	0.0169 (J)	—	—	NA	NA
RE02-07-2976	02-600648	13.5–14.5	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2978	02-600649	0–0.5	SOIL	—	—	—	—	—	NA	NA	0.0224 (J)	0.011 (J)	0.0141 (J)	—	—	NA	NA
RE02-07-2983	02-600650	0–0.5	SOIL	—	—	0.0109 (J)	—	—	NA	NA	0.0108 (J)	—	—	—	—	NA	NA
RE02-07-2984	02-600650	4.5–6.3	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	0.000552 (J)
RE02-07-2988	02-600651	0–0.5	SOIL	—	—	—	—	—	NA	NA	—	—	—	—	—	NA	NA
RE02-07-2989	02-600651	4.5–5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2990	02-600651	9.5–12.7	QAL	—	—	0.183	0.0248 (J)	0.0934	—	—	0.0217 (J)	0.0763	0.15	—	0.142	—	—
RE02-07-2992	02-600651	14.5–16.9	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2991	02-600651	19.5–21.6	QBO	—	—	—	—	—	—	0.0031 (J)	—	—	—	—	—	—	—
RE02-07-2993	02-600652	0–0.5	SOIL	—	—	—	—	—	NA	NA	—	—	—	—	—	NA	NA
RE02-07-2995	02-600652	9.5–11.7	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2997	02-600652	14.5–16.6	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-3200	02-600698	0–0.5	SOIL	—	—	—	—	—	NA	NA	0.00922 (J)	—	—	—	—	NA	NA
RE02-07-3201	02-600698	4.5–7.3	QAL	—	—	0.0111 (J)	—	—	—	—	—	—	—	—	—	—	—
RE02-07-3202	02-600698	9.5–12.2	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-3205	02-600699	0–0.5	SOIL	—	—	—	—	—	NA	NA	—	—	—	—	—	NA	NA
RE02-07-3208	02-600699	14.5–19.5	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-3210	02-600700	0–0.5	SOIL	—	—	0.0531	—	—	NA	NA	0.0308 (J)	0.0209 (J)	0.0395	—	0.0522	NA	NA
RE02-07-3211	02-600700	4.5–6.7	QAL	—	—	0.0152 (J)	—	—	—	—	0.0116 (J)	—	0.0137 (J)	—	0.0138 (J)	—	0.000418 (J)
RE02-07-3212	02-600700	9.5–11.1	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-3215	02-600701	0–0.5	SOIL	—	—	0.377	0.0231 (J)	—	NA	NA	0.0121 (J)	0.0174 (J)	0.22	—	0.324	NA	NA
RE02-07-3216	02-600701	4.5–6.2	QAL	—	—	0.0262 (J)	—	—	—	—	—	—	0.0143 (J)	—	0.0197 (J)	—	—
RE02-07-3217	02-600701	9.5–11.7	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-3220	02-600702	0–0.5	SOIL	—	—	0.0822	—	—	NA	NA	0.0256 (J)	0.0173 (J)	0.0402	—	0.0799	NA	NA
RE02-07-3221	02-600702	4.5–6.7	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-3225	02-600703	0–0.5	SED	—	—	0.348	0.0175 (J)	—	NA	NA	—	—	0.219	—	0.355	NA	NA
RE02-07-3230	02-600704	0–0.5	SED	—	—	0.0852	—	—	NA	NA	—	—	0.0451	—	0.0816	NA	NA
RE02-07-3233	02-600704	14.5–16.7	QBO	—	—	0.0233 (J)	—	—	—	—	—	—	0.0208 (J)	—	0.0196 (J)	—	—

Table 6.25-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Dibenzofuran	Di-n-butylphthalate	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Phenol	Pyrene	Styrene	Toluene
Industrial SSL[a]				**1000[f]**	**91,600**	**33,700**	**33,700**	**32.3**	**14,900[g]**	**5110**	**4100**	**16,800**	**25,300**	**275,000**	**25,300**	**50,900**	**61,400**
Recreational SSL[c]				**489**	**32,800**	**11,500**	**11,500**	**88.8**	**52,700[g]**	**3610**	**3170**	**1930**	**8630**	**98,500**	**8630**	**100,000**	**47,600**
Residential SSL[a]				**73[f]**	**6160**	**2320**	**2320**	**1.53**	**3210[g]**	**409**	**310**	**1160**	**1740**	**18,500**	**1740**	**7230**	**5220**
RE02-07-3235	02-600705	0–0.5	SED	—	—	0.133	—	—	NA	NA	—	—	0.0778	—	0.148	NA	NA
RE02-07-3236	02-600705	4.5–6.3	QAL	—	—	—	—	—	0.0505	—	—	—	—	—	—	—	0.00456
RE02-07-3237	02-600705	9.5–11.7	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-3240	02-600706	0–0.5	SED	—	—	0.0226 (J)	—	—	NA	NA	—	—	0.0105 (J)	—	0.0246 (J)	NA	NA
RE02-10-21918	02-612391	5–6	SOIL	—	—	—	—	—	NA	NA	—	—	—	—	—	NA	NA
RE02-10-22028	02-612420	15.5–16.5	QAL	—	—	—	—	—	NA	NA	—	—	—	—	—	NA	NA
RE02-10-22030	02-612420	35–37	QBO	—	—	—	—	—	NA	NA	—	—	—	—	—	NA	NA

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273), unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSLs are from LANL (2017, 602581).

[d] — = Not detected.

[e] NA = Not analyzed.

[f] SSLs are from EPA regional screening tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

[g] Isopropylbenzene used as surrogate based on structural similarity.

Table 6.25-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 02-009(c)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Strontium-90	Tritium	Uranium-234	Uranium-235/236	Uranium-238
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**4**	**0.18**	**3.9**
Qbt 2,3,4 BV[a]				**na**	**na**	**na**	**na**	**1.98**	**0.09**	**1.93**
Sediment BV/FV[a]				**0.9**	**0.068**	**1.04**	**0.093**	**2.59**	**0.2**	**2.29**
Soil BV/FV[a]				**1.65**	**0.054**	**1.31**	**na**	**2.59**	**0.2**	**2.29**
Industrial SAL[c]				**41**	**1200**	**2400**	**2,400,000**	**3100**	**160**	**710**
Recreational SAL[c]				**370**	**1300**	**4900**	**5,700,000**	**3900**	**1000**	**2800**
Residential SAL[c]				**12**	**79**	**15**	**1700**	**290**	**42**	**150**
CA02-00-0021	02-01225	5–7	FILL	0.143	0.0571	—[d]	0.0475939	—	—	—
CA02-00-0022	02-01225	8–9	SOIL	0.162	—	—	0.0546123	—	—	—
CA02-00-0023	02-01225	10–11.5	SOIL	0.0687	—	3.78	0.050789	—	—	—
CA02-00-0024	02-01225	12.5–15	QBT2	—	—	—	0.0416412	2.57	0.111	2.69
CA02-00-0027	02-01226	10–12	QBT2	—	—	1.67	—	2.2	—	2.21
CA02-00-0028	02-01226	12.5–14	QBT2	—	—	—	—	2.62	0.111 (J-)	2.71
CA02-00-0031	02-01227	5–7.5	FILL	0.266	0.0582	0.525	—	—	—	—
CA02-00-0032	02-01227	7.5–9	SOIL	0.36	—	0.716	—	—	—	—
CA02-00-0033	02-01227	10–12	SOIL	0.399	0.0283	1.12	—	—	—	—
CA02-00-0034	02-01227	12.5–14	SOIL	—	—	0.574	0.0403466	—	—	2.3
CA02-00-0216	02-01228	0–0.5	SED	7.61	0.391	—	—	—	—	—
CA02-00-0035	02-01228	0–2.5	SOIL	15.2	0.934	1.5	0.0465446	—	—	—
CA02-00-0036	02-01228	2.5–4.5	SOIL	0.815	0.992	1.22	—	—	—	—
CA02-00-0037	02-01228	5.5–7.5	FILL	1.45	0.382	2.15	—	—	—	—
CA02-00-0038	02-01228	7.5–10	SOIL	1.31	—	1.07	—	—	—	—
CA02-00-0039	02-01228	10–12.3	SOIL	1.01	0.0482	1.53	—	—	—	—
CA02-00-0040	02-01228	12.5–14.5	QBT2	—	—	1.83	0.0551244	2.33	0.098	2.32
CA02-00-0043	02-01229	5–7.5	FILL	20.7	0.189	0.471 (J-)	—	—	—	—
CA02-00-0044	02-01229	7.5–8.3	SOIL	15.6	0.347	1.38 (J-)	—	4.37	—	3.92
CA02-00-0045	02-01229	10.5–12	SOIL	7.66	0.243	4.03 (J-)	0.0325556	4.33	—	3.87
CA02-00-0046	02-01229	12.5–15	QBT2	—	—	—	0.043619	2.58	0.106 (J-)	2.56
CA02-00-0049	02-01230	5–7	FILL	0.314	—	—	0.0781364	—	—	—
CA02-00-0050	02-01230	8–10	SOIL	64.9	0.0265	2.82 (J-)	0.0183191	—	—	—
CA02-00-0051	02-01230	10–11.5	SOIL	7.64	0.06	1.05 (J-)	0.0488182	—	—	—
CA02-00-0052	02-01230	12.5–14	SOIL	10.5	0.0503	1.39 (J-)	0.0472184	—	—	—
CA02-00-0053	02-01230	15–17.5	QBT2	0.149	—	1.86 (J-)	0.0643291	2.43	—	2.68
CA02-00-0056	02-01231	5–6.5	FILL	77.7	0.078	11.8 (J-)	0.177778	—	—	—
CA02-00-0057	02-01231	7.5–10	SOIL	2.18	0.0465	0.353 (J-)	0.0809551	—	—	—

Table 6.25-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Strontium-90	Tritium	Uranium-234	Uranium-235/236	Uranium-238
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**4**	**0.18**	**3.9**
Qbt 2,3,4 BV[a]				**na**	**na**	**na**	**na**	**1.98**	**0.09**	**1.93**
Sediment BV/FV[a]				**0.9**	**0.068**	**1.04**	**0.093**	**2.59**	**0.2**	**2.29**
Soil BV/FV[a]				**1.65**	**0.054**	**1.31**	**na**	**2.59**	**0.2**	**2.29**
Industrial SAL[c]				**41**	**1200**	**2400**	**2,400,000**	**3100**	**160**	**710**
Recreational SAL[c]				**370**	**1300**	**4900**	**5,700,000**	**3900**	**1000**	**2800**
Residential SAL[c]				**12**	**79**	**15**	**1700**	**290**	**42**	**150**
CA02-00-0058	02-01231	10–12	SOIL	0.853	0.0515	0.434 (J-)	—	—	—	—
CA02-00-0059	02-01231	12.5–13	SOIL	0.291	0.0421	—	—	—	—	—
CA02-00-0060	02-01231	13–15	QBT2	2.22	0.0222	0.546 (J-)	0.0557356	—	—	—
CA02-00-0063	02-01232	5–7	FILL	0.208	0.0323	—	0.0812174	—	—	—
CA02-00-0064	02-01232	7.5–10	SOIL	0.501	0.025	—	0.0411702	—	—	—
CA02-00-0065	02-01232	10–11	SOIL	1.66	0.0845	—	0.0481648	—	—	—
CA02-00-0066	02-01232	12.5–15	QBT2	0.433	0.0323	—	0.0570805	—	—	—
CA02-00-0077	02-01233	5–7.5	FILL	1.03	0.0838	—	0.0544194	—	—	—
CA02-00-0070	02-01233	7.5–10	SOIL	1.36	0.0952	—	—	—	—	—
CA02-00-0071	02-01233	11–12.5	SOIL	0.609	0.0423	—	0.0901364	—	—	—
CA02-00-0072	02-01233	12.5–13.5	SOIL	0.408	—	—	0.0312366	—	—	—
CA02-00-0073	02-01233	14–15	SOIL	0.427	—	—	0.0806849	—	—	—
CA02-00-0074	02-01233	15–17.5	QBT2	0.165	—	—	0.241605	2.19	0.0914 (J-)	2.11
CA02-00-0080	02-01234	5–7	FILL	17	0.333	2.78	0.210659	—	—	—
CA02-00-0081	02-01234	7.5–9.25	SOIL	30.5	0.629	3.27	0.572727	—	—	—
CA02-00-0082	02-01234	10–11.5	SOIL	31.7	0.697	3.15	0.024433	—	—	—
CA02-00-0093	02-01236	5–7.5	SOIL	0.913	0.0554	1.36	0.026961	—	—	—
CA02-00-0094	02-01236	7.5–8	SOIL	0.237	—	0.432	—	—	—	—
CA02-00-0095	02-01236	8.5–10	SOIL	0.76	—	0.952	—	—	—	—
CA02-00-0097	02-01236	11.5–12	SOIL	0.297	—	0.509	—	—	—	—
CA02-00-0098	02-01236	12.5–15	SOIL	0.23	0.0245	—	—	—	—	—
RE02-07-2700	02-600598	0–0.5	SOIL	2.32	0.0849	—	—	—	—	—
RE02-07-2703	02-600598	14.5–16.7	QBO	—	—	—	—	—	0.233	—
RE02-07-2706	02-600599	4.5–7.3	QAL	0.158	0.0346	—	—	—	—	—
RE02-07-2711	02-600600	4.5–6.5	QAL	0.168	—	—	—	—	—	—
RE02-07-2713	02-600600	14.5–17	QBO	—	—	—	—	—	0.184	—
RE02-07-2715	02-600601	0–0.5	SOIL	1.9	0.0566	—	—	—	—	—
RE02-07-2716	02-600601	4.5–6.7	QAL	1.64	0.0621	—	—	—	—	—
RE02-07-2718	02-600601	14.5–16.8	QBO	—	0.0543	—	—	—	—	—
RE02-07-2720	02-600602	0–0.5	SOIL	—	0.0582	—	—	—	—	—

Table 6.25-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Strontium-90	Tritium	Uranium-234	Uranium-235/236	Uranium-238
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**4**	**0.18**	**3.9**
Qbt 2,3,4 BV[a]				**na**	**na**	**na**	**na**	**1.98**	**0.09**	**1.93**
Sediment BV/FV[a]				**0.9**	**0.068**	**1.04**	**0.093**	**2.59**	**0.2**	**2.29**
Soil BV/FV[a]				**1.65**	**0.054**	**1.31**	**na**	**2.59**	**0.2**	**2.29**
Industrial SAL[c]				**41**	**1200**	**2400**	**2,400,000**	**3100**	**160**	**710**
Recreational SAL[c]				**370**	**1300**	**4900**	**5,700,000**	**3900**	**1000**	**2800**
Residential SAL[c]				**12**	**79**	**15**	**1700**	**290**	**42**	**150**
RE02-07-2721	02-600602	4.5–9.5	QAL	0.272	—	—	—	—	—	—
RE02-07-2723	02-600602	14.5–19.5	QBO	—	0.0397	—	—	—	—	—
RE02-07-2725	02-600603	0–0.5	SED	—	0.188	—	—	—	—	—
RE02-07-2730	02-600604	0–0.5	SED	—	0.487	—	—	—	—	—
RE02-07-2948	02-600643	0–0.5	SOIL	—	—	—	0.0110722	—	—	—
RE02-07-2949	02-600643	4.5–5.5	QAL	0.96	—	—	0.0317137	—	—	—
RE02-07-2950	02-600643	9.5–12.4	QAL	—	—	1.21	0.0238539	—	—	—
RE02-07-2954	02-600644	4.5–5.2	QAL	—	—	—	0.0240805	—	—	—
RE02-07-2955	02-600644	9.5–11.7	QAL	0.188	—	0.244	—	—	0.211	—
RE02-07-2956	02-600644	14.5–19.5	QBO	—	—	0.449	—	—	—	—
RE02-07-2959	02-600645	4.5–5.25	QAL	10.3	—	1.87	0.0373926	—	—	—
RE02-07-2960	02-600645	9.5–12.2	QAL	0.431	—	0.559	0.0375111	—	—	—
RE02-07-2964	02-600646	4.5–8.3	QAL	—	—	—	0.0912322	—	—	—
RE02-07-2965	02-600646	9.5–11.7	QAL	—	—	2.01	—	—	—	—
RE02-07-2968	02-600647	0–0.5	SOIL	—	0.0588	1.94	—	—	—	—
RE02-07-2969	02-600647	4.5–4.9	QAL	—	—	—	0.0222857	—	—	—
RE02-07-2976	02-600648	13.5–14.5	QBO	2.26	—	2.56	—	—	—	—
RE02-07-2977	02-600648	14.5–19.5	QBO	0.16	—	0.333	—	—	—	—
RE02-07-2978	02-600649	0–0.5	SOIL	—	0.0636	—	0.0168726	—	—	—
RE02-07-2983	02-600650	0–0.5	SOIL	—	0.0608	—	—	—	—	—
RE02-07-2984	02-600650	4.5–6.3	QAL	—	0.115 (J-)	0.359	—	—	—	—
RE02-07-2985	02-600650	9.5–11.3	QAL	0.495	—	0.505	—	—	—	—
RE02-07-2989	02-600651	4.5–5	QAL	3.36	—	—	0.0404346	—	—	—
RE02-07-2990	02-600651	9.5–12.7	QAL	232	0.288	1.34	0.0497727	—	—	—
RE02-07-2992	02-600651	14.5–16.9	QBO	8.12	0.0542	—	—	—	—	—
RE02-07-2991	02-600651	19.5–21.6	QBO	0.316	—	—	—	—	—	—
RE02-07-2995	02-600652	9.5–11.7	QAL	1.58	—	—	—	—	—	—
RE02-07-3201	02-600698	4.5–7.3	QAL	121	0.283	0.899	—	—	—	—
RE02-07-3202	02-600698	9.5–12.2	QAL	4.56	—	—	—	—	—	—
RE02-07-3206	02-600699	4.5–7	QAL	2.95	—	1.16	—	—	—	—

Table 6.25-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Strontium-90	Tritium	Uranium-234	Uranium-235/236	Uranium-238
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**4**	**0.18**	**3.9**
Qbt 2,3,4 BV[a]				**na**	**na**	**na**	**na**	**1.98**	**0.09**	**1.93**
Sediment BV/FV[a]				**0.9**	**0.068**	**1.04**	**0.093**	**2.59**	**0.2**	**2.29**
Soil BV/FV[a]				**1.65**	**0.054**	**1.31**	**na**	**2.59**	**0.2**	**2.29**
Industrial SAL[c]				**41**	**1200**	**2400**	**2,400,000**	**3100**	**160**	**710**
Recreational SAL[c]				**370**	**1300**	**4900**	**5,700,000**	**3900**	**1000**	**2800**
Residential SAL[c]				**12**	**79**	**15**	**1700**	**290**	**42**	**150**
RE02-07-3208	02-600699	14.5–19.5	QBO	13.9	0.051	1.1	—	—	—	—
RE02-07-3209	02-600699	19.5–21.7	QBO	2.82	—	—	—	—	—	—
RE02-07-3210	02-600700	0–0.5	SOIL	—	0.223	—	—	—	—	—
RE02-07-3211	02-600700	4.5–6.7	QAL	0.527	0.616	0.326	0.0748952	—	—	—
RE02-07-3212	02-600700	9.5–11.1	QAL	0.215	—	—	0.0930691	—	—	—
RE02-07-3215	02-600701	0–0.5	SOIL	—	0.804	—	—	—	—	—
RE02-07-3216	02-600701	4.5–6.2	QAL	0.565	0.254	—	—	—	—	—
RE02-07-3220	02-600702	0–0.5	SOIL	—	0.142	—	—	—	—	—
RE02-07-3221	02-600702	4.5–6.7	QAL	—	0.0456	—	—	—	—	—
RE02-07-3225	02-600703	0–0.5	SED	—	0.547	—	—	—	—	—
RE02-07-3230	02-600704	0–0.5	SED	—	0.409	—	—	—	—	—
RE02-07-3233	02-600704	14.5–16.7	QBO	0.183	0.149 (J-)	—	—	—	—	—
RE02-07-3235	02-600705	0–0.5	SED	—	0.676	—	—	—	—	—
RE02-07-3236	02-600705	4.5–6.3	QAL	0.119	0.138	—	—	—	—	—
RE02-07-3237	02-600705	9.5–11.7	QBO	—	0.0256	1.12	—	—	—	—
RE02-07-3240	02-600706	0–0.5	SED	—	0.214	—	—	—	—	—
RE02-10-21918	02-612391	5–6	SOIL	89.5	0.0361	—	—	—	—	—
RE02-10-21919	02-612391	15–16	QAL	1.03	—	—	—	—	—	—
RE02-10-21923	02-612392	5–6	QAL	0.0675	—	—	—	—	—	—
RE02-10-21928	02-612393	5–6	QAL	10	0.0613	—	—	—	—	—
RE02-10-21929	02-612393	15.5–16.5	QAL	1.79	0.0243	2.55	—	—	—	—
RE02-10-21931	02-612393	35–36	QBO	—	—	—	0.147436	—	—	—
RE02-10-21932	02-612393	49–50	QBO	—	—	—	1.17891	—	—	—
RE02-10-22028	02-612420	15.5–16.5	QAL	0.147	—	—	—	—	—	—

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SALs are from LANL (2015, 600929).

[d] — = Not detected.

Table 6.26-1
Samples Collected and Analyses Requested at AOC 02-009(d)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
CA02-00-0290	02-01245	4–5	SOIL	—[a]	—	7483R[b]	7483R	—	7483R	7483R	7481R, 7482R	—	—	7483R	7480R	—	—
CA02-00-0291	02-01245	5–8	SOIL	—	—	7483R	7483R	—	7483R	7483R	7481R, 7482R	—	—	7483R	7480R	—	—
CA02-00-0292	02-01245	10–11.5	SOIL	—	—	7483R	7483R	—	7483R	7483R	7481R, 7482R	—	—	7483R	7480R	—	—
CA02-00-0293	02-01245	14.5–15.5	QBT3	—	—	7483R	7483R	—	7483R	7483R	7481R, 7482R	—	—	7483R	7480R	—	—
RE02-07-2786	02-600614	0–0.5	SOIL	07-741	07-740	07-741	07-741	07-740	07-741	07-741	07-740	07-739	07-740	07-741	07-739	—	07-740
RE02-07-2787	02-600614	1.5–3.7	QAL	07-778	07-778	07-778	07-778	07-778	07-778	07-778	07-778	07-778	07-778	07-778	07-778	07-778	07-778
RE02-07-2788	02-600614	11.5–13.5	QAL	07-778	07-778	07-778	07-778	07-778	07-778	07-778	07-778	07-778	07-778	07-778	07-778	07-778	07-778
RE02-07-2790	02-600614	13–15.5	QAL	07-810	07-810	07-810	07-810	07-810	07-810	07-810	07-810	07-810	07-810	07-810	07-810	07-810	07-810
RE02-07-2789	02-600614	15–19.2	QBO	07-810	07-810	07-810	07-810	07-810	07-810	07-810	07-810	07-810	07-810	07-810	07-810	07-810	07-810
RE02-07-2791	02-600615	0–0.5	SOIL	07-727	07-726	07-727	07-727	07-726	07-727	07-727	07-726	07-725	07-726	07-727	07-725	—	07-726
RE02-07-2792	02-600615	1.5–3.5	QAL	07-741	07-740	07-741	07-741	07-740	07-741	07-741	07-740	07-739	07-740	07-741	07-739	07-739	07-740
RE02-07-2794	02-600615	16.5–18.7	QBO	07-741	07-740	07-741	07-741	07-740	07-741	07-741	07-740	07-739	07-740	07-741	07-739	07-739	07-740
RE02-07-2796	02-600616	0–0.5	SOIL	07-727	07-726	07-727	07-727	07-726	07-727	07-727	07-726	07-725	07-726	07-727	07-725	—	07-726
RE02-07-2797	02-600616	1.5–3.6	QAL	07-751	07-750	07-751	07-751	07-750	07-751	07-751	07-750	07-749	07-750	07-751	07-749	07-749	07-750
RE02-07-2798	02-600616	11.5–13.7	QAL	07-751	07-750	07-751	07-751	07-750	07-751	07-751	07-750	07-749	07-750	07-751	07-749	07-749	07-750
RE02-07-2801	02-600617	0–0.5	SOIL	07-727	07-726	07-727	07-727	—	07-727	07-727	07-726	07-725	07-726	07-727	07-725	—	07-726
RE02-07-2802	02-600617	1.5–5	QAL	07-1011	07-1011	07-1011	07-1011	—	07-1011	07-1011	07-1011	07-1011	07-1011	07-1011	07-1011	07-1011	07-1011
RE02-07-2803	02-600617	11.5–13	QAL	07-1011	07-1011	07-1011	07-1011	—	07-1011	07-1011	07-1011	07-1011	07-1011	07-1011	07-1011	07-1011	07-1011
RE02-07-2804	02-600618	0–0.5	SOIL	07-727	07-726	07-727	07-727	—	07-727	07-727	07-726	07-725	07-726	07-727	07-725	—	07-726
RE02-07-2805	02-600618	1.5–3.3	QAL	07-778	07-778	07-778	07-778	—	07-778	07-778	07-778	07-778	07-778	07-778	07-778	07-778	07-778
RE02-07-2806	02-600618	11.5–14.1	QAL	07-778	07-778	07-778	07-778	—	07-778	07-778	07-778	07-778	07-778	07-778	07-778	07-778	07-778
RE02-07-2807	02-600619	0–0.5	SOIL	07-751	07-750	07-751	07-751	07-750	07-751	07-751	07-750	07-749	07-750	07-751	07-749	—	07-750
RE02-07-2808	02-600619	1.5–5	QAL	07-751	07-750	07-751	07-751	07-750	07-751	07-751	07-750	07-749	07-750	07-751	07-749	07-749	07-750
RE02-07-2809	02-600619	11.5–13.6	QAL	07-751	07-750	07-751	07-751	07-750	07-751	07-751	07-750	07-749	07-750	07-751	07-749	07-749	07-750
RE02-07-2810	02-600620	0–0.5	SOIL	07-727	07-726	07-727	07-727	—	07-727	07-727	07-726	07-725	07-726	07-727	07-725	—	07-726
RE02-07-2811	02-600620	1.5–2.5	QAL	07-727	07-726	07-727	07-727	—	07-727	07-727	07-726	07-725	07-726	07-727	07-725	07-725	07-726
RE02-07-2812	02-600620	11.5–13.9	QAL	07-727	07-726	07-727	07-727	—	07-727	07-727	07-726	07-725	07-726	07-727	07-725	07-725	07-726
RE02-07-2813	02-600621	0–0.5	SOIL	07-741	07-740	07-741	07-741	—	07-741	07-741	07-740	07-739	07-740	07-741	07-739	—	07-740
RE02-07-2814	02-600621	1.5–3.7	QAL	07-768	07-767	07-768	07-768	—	07-768	07-768	07-767	07-766	07-767	07-768	07-766	07-766	07-767
RE02-07-2815	02-600621	11.5–13.4	QAL	07-768	07-767	07-768	07-768	—	07-768	07-768	07-767	07-766	07-767	07-768	07-766	07-766	07-767
RE02-07-2816	02-600622	0–0.5	SOIL	07-741	07-740	07-741	07-741	—	07-741	07-741	07-740	07-739	07-740	07-741	07-739	—	07-740
RE02-07-2817	02-600622	1.5–2	QAL	07-741	07-740	07-741	07-741	—	07-741	07-741	07-740	07-739	07-740	07-741	07-739	07-739	07-740
RE02-07-2818	02-600622	11.5–15	QAL	07-768	07-767	07-768	07-768	—	07-768	07-768	07-767	07-766	07-767	07-768	07-766	07-766	07-767
RE02-07-2819	02-600623	0–0.5	SOIL	07-741	07-740	07-741	07-741	—	07-741	07-741	07-740	07-739	07-740	07-741	07-739	—	07-740
RE02-07-2820	02-600623	1.5–3.8	QAL	07-768	07-767	07-768	07-768	—	07-768	07-768	07-767	07-766	07-767	07-768	07-766	07-766	07-767
RE02-07-2821	02-600623	11.5–13.9	QAL	07-768	07-767	07-768	07-768	—	07-768	07-768	07-767	07-766	07-767	07-768	07-766	07-766	07-767

Table 6.26-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
RE02-07-2822	02-600624	0–0.5	SOIL	07-741	07-740	07-741	07-741	—	07-741	07-741	07-740	07-739	07-740	07-741	07-739	—	07-740
RE02-07-2823	02-600624	1.5–1.9	QAL	07-1011	07-1011	07-1011	07-1011	—	07-1011	07-1011	07-1011	07-1011	07-1011	07-1011	07-1011	07-1011	07-1011
RE02-10-21768	02-612348	5–7	QAL	—	—	10-4264	10-4264	10-4263	10-4264	10-4264	10-4263	10-4263	—	10-4264	10-4263	—	—
RE02-10-21769	02-612348	15–16	QAL	—	—	10-4264	10-4264	10-4263	10-4264	10-4264	10-4263	10-4263	—	10-4264	10-4263	—	—
RE02-10-21770	02-612348	25–26	QBO	—	—	10-4264	10-4264	10-4263	10-4264	10-4264	10-4263	10-4263	—	10-4264	10-4263	—	—
RE02-10-21771	02-612348	35–36	QBO	—	—	10-4264	10-4264	10-4263	10-4264	10-4264	10-4263	10-4263	—	10-4264	10-4263	—	—
RE02-10-21772	02-612348	49–50	QBO	—	—	10-4264	10-4264	10-4263	10-4264	10-4264	10-4263	10-4263	—	10-4264	10-4263	—	—

[a] — = Analysis not requested.

[b] Analytical request number.

Table 6.26-2
Inorganic Chemicals Detected or Detected above BVs at AOC 02-009(d)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Cyanide (Total)	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**1900**	**2.6**	**na[b]**	**0.5**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**4.59**	**40**
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**na**	**na**	**14,500**	**11.2**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**17**	**63.5**
Soil BV[a]				**29,200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**na**	**0.5**	**21,500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**na**	**505[d]**	**72.1**	**62.8**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**na**	**281[d]**	**40.2**	**224**	**434,000**	**1110**	**14,800**	**186**	**15,800**	**991,000**	**434**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**70.5**	**na**	**96[d]**	**3.05**	**11.1**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**394**	**23,500**
CA02-00-0293	02-01245	14.5–15.5	QBT3	—[f]	—	—	—	—	—	15 (J)	NA[g]	NA	—	—	—	—	—	NA	NA	0.36 (J)	—	—
RE02-07-2786	02-600614	0–0.5	SOIL	—	—	—	—	—	17,400	—	—	—	—	—	—	0.176	—	1.04	—	—	—	56.1
RE02-07-2787	02-600614	1.5–3.7	QAL	—	—	—	—	0.517 (U)	—	—	—	—	—	—	—	0.279	—	3.55	0.000961 (J)	—	—	—
RE02-07-2788	02-600614	11.5–13.5	QAL	—	—	—	—	0.528 (U)	—	75.5 (J)	0.083 (J)	—	—	53.2	—	—	—	1.34	—	—	—	—
RE02-07-2790	02-600614	13–15.5	QAL	—	—	—	—	0.559 (U)	—	—	0.0835 (J)	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2789	02-600614	15–19.2	QBO	8540	—	1.3 (J)	38.3	0.582 (U)	—	10.6 (J)	0.0648 (J)	—	5850	—	228	—	5.06	—	—	1.39 (J)	—	—
RE02-07-2791	02-600615	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	0.512	—	1.23	—	—	—	—
RE02-07-2792	02-600615	1.5–3.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	0.374	—	0.984 (J)	—	—	—	—
RE02-07-2794	02-600615	16.5–18.7	QBO	6140	—	1.3 (J)	47.4	0.557 (U)	—	29.1 (U)	0.179 (J-)	—	6490	—	567	—	6.33 (U)	1.34	—	1.67 (U)	6.17	—
RE02-07-2796	02-600616	0–0.5	SOIL	—	—	—	—	0.586	—	—	—	—	—	—	—	1.75	—	1.48	—	1.85	—	—
RE02-07-2797	02-600616	1.5–3.6	QAL	—	—	—	—	0.533 (U)	—	—	0.156 (J)	—	—	—	—	—	—	1.04 (J)	—	1.6 (U)	—	—
RE02-07-2798	02-600616	11.5–13.7	QAL	—	—	—	—	0.53 (U)	—	—	—	—	—	—	—	—	—	—	—	1.59 (U)	—	—
RE02-07-2801	02-600617	0–0.5	SOIL	—	—	—	—	0.495 (U)	—	—	NA	—	—	—	—	1.55	—	1.49	0.00104 (J)	—	—	—
RE02-07-2802	02-600617	1.5–5	QAL	—	—	—	—	0.483 (J)	—	—	NA	—	—	—	—	—	—	—	—	1.67 (U)	—	—

Table 6.26-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Cyanide (Total)	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**1900**	**2.6**	**na[b]**	**0.5**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**4.59**	**40**
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**na**	**na**	**14,500**	**11.2**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**17**	**63.5**
Soil BV[a]				**29,200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**na**	**0.5**	**21,500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**na**	**505[d]**	**72.1**	**62.8**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**na**	**281[d]**	**40.2**	**224**	**434,000**	**1110**	**14,800**	**186**	**15,800**	**991,000**	**434**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**70.5**	**na**	**96[d]**	**3.05**	**11.1**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**394**	**23,500**
RE02-07-2803	02-600617	11.5–13	QAL	—	—	—	—	0.572 (U)	—	—	NA	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2804	02-600618	0–0.5	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	0.595	—	1.53	0.00104 (J)	—	—	—
RE02-07-2805	02-600618	1.5–3.3	QAL	—	—	—	—	0.517 (U)	—	—	NA	—	—	—	—	0.26	—	1.12	—	—	—	—
RE02-07-2806	02-600618	11.5–14.1	QAL	—	—	—	—	0.55 (U)	—	—	NA	—	—	—	—	—	—	—	0.0033	—	—	—
RE02-07-2807	02-600619	0–0.5	SOIL	—	—	—	—	0.773	—	—	—	—	—	—	—	0.386	—	—	0.000672 (J)	1.54 (U)	—	—
RE02-07-2808	02-600619	1.5–5	QAL	—	—	—	—	0.532 (U)	—	—	—	—	—	—	—	—	—	1.57	—	1.6 (U)	—	—
RE02-07-2809	02-600619	11.5–13.6	QAL	—	—	—	—	0.528 (U)	—	—	—	—	—	—	—	—	—	1.04 (J)	0.0017 (J)	1.58 (U)	—	—
RE02-07-2810	02-600620	0–0.5	SOIL	—	—	—	—	0.49 (U)	—	—	NA	—	—	—	—	—	—	2.92	—	1.94	—	—
RE02-07-2811	02-600620	1.5–2.5	QAL	—	—	—	—	0.511 (U)	—	—	NA	—	—	—	—	—	—	1.78	0.00112 (J)	2.01	—	—
RE02-07-2812	02-600620	11.5–13.9	QAL	—	—	—	—	0.521 (U)	—	—	NA	—	—	—	—	—	—	—	—	1.55 (J)	—	—
RE02-07-2813	02-600621	0–0.5	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	0.613	—	—	0.0011 (J+)	—	—	—
RE02-07-2814	02-600621	1.5–3.7	QAL	—	—	—	—	0.512 (U)	—	—	NA	—	—	—	—	0.22 (J)	—	0.851 (J-)	—	2.09	—	—
RE02-07-2815	02-600621	11.5–13.4	QAL	—	—	—	—	0.544 (U)	—	—	NA	—	—	—	—	—	—	—	0.00142 (J+)	2.14	—	—
RE02-07-2816	02-600622	0–0.5	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	0.192	—	—	0.000779 (J+)	1.56 (U)	—	—
RE02-07-2817	02-600622	1.5–2	QAL	—	—	—	—	0.495 (U)	—	—	NA	—	—	—	—	—	—	1.2	0.000642 (J+)	—	—	—
RE02-07-2818	02-600622	11.5–15	QAL	—	—	—	—	0.521 (U)	—	—	NA	—	—	—	—	—	—	—	0.0016 (J+)	2.86	—	—
RE02-07-2819	02-600623	0–0.5	SOIL	—	—	—	—	0.48 (J)	—	—	NA	0.502 (U)	—	—	—	0.128	—	—	0.000603 (J+)	1.54 (U)	—	—
RE02-07-2820	02-600623	1.5–3.8	QAL	—	—	—	—	—	—	—	NA	—	—	—	—	0.115 (J)	—	0.971 (J-)	0.000665 (J+)	2.14	—	—
RE02-07-2821	02-600623	11.5–13.9	QAL	—	—	—	—	0.518 (U)	—	22.2	NA	—	—	—	—	—	—	—	0.00279 (J+)	2.13	—	—
RE02-07-2822	02-600624	0–0.5	SOIL	—	—	—	—	0.511 (U)	—	—	NA	—	—	—	—	—	—	1.98	0.0019 (J+)	—	—	—
RE02-07-2823	02-600624	1.5–1.9	QAL	—	—	—	—	0.547 (U)	—	—	NA	—	—	—	—	—	—	1.87	0.000663 (J)	—	—	—
RE02-10-21768	02-612348	5–7	QAL	—	1.12 (U)	—	—	0.559 (U)	—	—	—	NA	—	—	—	—	—	NA	NA	—	—	—
RE02-10-21769	02-612348	15–16	QAL	—	1.16 (U)	—	—	0.579 (U)	—	—	—	NA	—	—	—	—	—	NA	NA	—	—	—
RE02-10-21770	02-612348	25–26	QBO	—	1.32 (U)	1.27 (U)	—	0.662 (U)	—	—	—	NA	5350	—	214 (J+)	—	—	NA	NA	1.27 (U)	—	—
RE02-10-21771	02-612348	35–36	QBO	—	1.19 (U)	1.26 (U)	—	—	—	3.66	—	NA	5390	—	199 (J+)	—	—	NA	NA	1.26 (U)	—	—
RE02-10-21772	02-612348	49–50	QBO	—	1.19 (U)	1.18 (U)	—	0.594 (U)	—	—	—	NA	5600	—	223 (J+)	—	—	NA	NA	1.18 (U)	—	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 6.26-3
Organic Chemicals Detected at AOC 02-009(d)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Anthracene	Aroclor-1248	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dichlorobenzene[1,4-]
Industrial SSL[a]				**50,500**	**253,000**	**10.7**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300**[b]	**323**	**3230**	**6730**
Recreational SSL[c]				**17,300**	**863,000**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630**[b]	**888**	**8880**	**1140**
Residential SSL[a]				**3480**	**17,400**	**2.22**	**1.12**	**2.22**	**1.53**	**1.12**	**1.53**	**1740**[b]	**15.3**	**153**	**1290**
RE02-07-2786	02-600614	0–0.5	SOIL	—[d]	0.0176 (J)	—	0.0291	0.0488	0.086	0.0878 (J)	0.164 (J)	0.0981 (J)	0.0555 (J)	0.111	—
RE02-07-2787	02-600614	1.5–3.7	QAL	—	—	—	—	0.0272 (J)	—	—	—	—	—	—	—
RE02-07-2788	02-600614	11.5–13.5	QAL	—	—	—	—	0.0018 (J)	—	—	—	—	—	—	—
RE02-07-2790	02-600614	13–15.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2789	02-600614	15–19.2	QBO	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2791	02-600615	0–0.5	SOIL	—	—	—	0.0177 (J-)	0.0405 (J-)	—	0.0193 (J)	0.0223 (J)	—	—	0.0136 (J)	—
RE02-07-2792	02-600615	1.5–3.5	QAL	—	—	—	0.0314	0.0536	—	—	0.0335 (J)	—	0.011 (J)	0.0256 (J)	—
RE02-07-2796	02-600616	0–0.5	SOIL	—	0.0185 (J)	—	0.0581 (J-)	0.118 (J-)	—	0.0676 (J)	0.102 (J)	0.0286 (J)	—	0.0685	—
RE02-07-2797	02-600616	1.5–3.6	QAL	—	—	—	0.0056	0.0076	—	—	—	—	—	—	0.000595 (J)
RE02-07-2801	02-600617	0–0.5	SOIL	—	—	—	—	0.057	—	0.0225 (J)	0.0236 (J)	—	—	0.0161 (J)	—
RE02-07-2802	02-600617	1.5–5	QAL	—	—	—	0.0734	0.0412	—	—	—	—	—	—	—
RE02-07-2804	02-600618	0–0.5	SOIL	0.0156 (J-)	0.0195 (J)	—	0.0238 (J-)	0.0549 (J-)	—	0.0417 (J)	0.0604 (J)	—	—	0.0348 (J)	—
RE02-07-2805	02-600618	1.5–3.3	QAL	—	0.00877 (J)	—	—	0.0401	0.0331 (J)	—	—	—	—	0.0277 (J)	—
RE02-07-2807	02-600619	0–0.5	SOIL	0.0805	0.239	—	0.0308 (J)	0.0745	0.588	0.562	0.764	0.312	—	0.615	—
RE02-07-2808	02-600619	1.5–5	QAL	—	—	—	—	0.0024 (J)	—	—	—	—	—	—	—
RE02-07-2810	02-600620	0–0.5	SOIL	—	—	—	—	0.0022 (J-)	—	—	—	—	—	—	—
RE02-07-2811	02-600620	1.5–2.5	QAL	—	—	—	0.0144 (J-)	0.0059 (J-)	—	0.0154 (J)	0.0236 (J)	—	—	0.0179 (J)	—
RE02-07-2813	02-600621	0–0.5	SOIL	—	—	—	0.0301	0.077	—	—	—	—	—	0.0195 (J)	—
RE02-07-2814	02-600621	1.5–3.7	QAL	0.0165 (J)	0.0241 (J)	—	0.0232	0.0386	0.069	0.0963	0.137	0.0432	—	0.0887	—
RE02-07-2816	02-600622	0–0.5	SOIL	—	—	—	0.0109 (J)	0.0207	—	—	0.0293 (J)	—	—	0.0213 (J)	—
RE02-07-2817	02-600622	1.5–2	QAL	—	—	—	0.0052	0.0071	—	—	—	—	—	—	0.000213 (J)
RE02-07-2819	02-600623	0–0.5	SOIL	—	—	—	0.0157 (J)	0.04	—	—	0.0311 (J)	—	—	0.0287 (J)	—
RE02-07-2820	02-600623	1.5–3.8	QAL	—	—	—	—	0.0205 (J)	0.012 (J)	—	0.0179 (J)	—	—	0.0116 (J)	—
RE02-07-2822	02-600624	0–0.5	SOIL	—	—	0.0059	0.006	0.0042	—	—	—	—	—	—	—
RE02-07-2823	02-600624	1.5–1.9	QAL	—	—	—	0.0043	0.0035 (J)	—	—	—	—	—	—	—
RE02-10-21768	02-612348	5–7	QAL	—	—	—	0.0103 (J)	0.0049	—	—	—	—	—	—	—
RE02-10-21771	02-612348	35–36	QBO	—	—	—	—	0.0022 (J)	—	—	—	—	—	—	—

Table 6.26-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Di-n-butylphthalate	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Styrene	Toluene	Xylene[1,3-]+Xylene[1,4-]
Industrial SSL[a]				**91,600**	**33,700**	**33,700**	**32.3**	**14,900[e]**	**4100**	**16,800**	**25,300**	**25,300**	**50,900**	**61,400**	**4240[f]**
Recreational SSL[c]				**39900**	**11,500**	**11,500**	**88.8**	**52,700[e]**	**3170**	**1930**	**8630**	**8630**	**100,000**	**47,600**	**27,800[f]**
Residential SSL[a]				**6160**	**2320**	**2320**	**1.53**	**3210[e]**	**310**	**1160**	**1740**	**1740**	**7230**	**5220**	**863[f]**
RE02-07-2786	02-600614	0–0.5	SOIL	—	0.211	—	0.119 (J)	NA[g]	—	—	0.0893	0.198	NA	NA	NA
RE02-07-2787	02-600614	1.5–3.7	QAL	0.0385 (J)	0.0215 (J)	—	—	—	—	—	0.0152 (J)	0.0207 (J)	—	—	—
RE02-07-2788	02-600614	11.5–13.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2790	02-600614	13–15.5	QAL	—	—	—	—	—	—	—	—	—	—	—	0.000302 (J)
RE02-07-2789	02-600614	15–19.2	QBO	0.0545 (J)	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2791	02-600615	0–0.5	SOIL	—	0.0209 (J)	—	—	NA	—	—	0.0168 (J)	0.0283 (J)	NA	NA	NA
RE02-07-2792	02-600615	1.5–3.5	QAL	—	0.0418	—	—	—	—	—	0.027 (J)	0.0372	0.00111	0.000533 (J)	—
RE02-07-2796	02-600616	0–0.5	SOIL	—	0.129	—	0.019 (J)	NA	—	—	0.0898	0.134	NA	NA	NA
RE02-07-2797	02-600616	1.5–3.6	QAL	—	—	—	—	—	—	—	—	—	—	0.000775 (J)	—
RE02-07-2801	02-600617	0–0.5	SOIL	—	0.0248 (J)	—	—	NA	—	—	0.0181 (J)	0.0268 (J)	NA	NA	NA
RE02-07-2802	02-600617	1.5–5	QAL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2804	02-600618	0–0.5	SOIL	—	0.0641	0.0129 (J)	—	NA	0.00756 (J)	0.0121 (J)	0.079	0.0803	NA	NA	NA
RE02-07-2805	02-600618	1.5–3.3	QAL	0.0421 (J)	0.0556	—	—	—	—	—	0.0422	0.0545	—	—	—
RE02-07-2807	02-600619	0–0.5	SOIL	—	1.4	0.0834	0.293	NA	—	0.0122 (J)	0.987	1.53	NA	NA	NA
RE02-07-2808	02-600619	1.5–5	QAL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2810	02-600620	0–0.5	SOIL	—	—	—	—	NA	—	—	—	—	NA	NA	NA
RE02-07-2811	02-600620	1.5–2.5	QAL	—	0.0326 (J)	—	—	—	—	—	—	0.0268 (J)	—	—	—
RE02-07-2813	02-600621	0–0.5	SOIL	—	0.0442	—	—	NA	—	—	0.021 (J)	0.0468	NA	NA	NA
RE02-07-2814	02-600621	1.5–3.7	QAL	—	0.158	0.0144 (J)	0.0366	—	—	—	0.114	0.156	—	—	—
RE02-07-2816	02-600622	0–0.5	SOIL	—	0.0463	—	—	NA	—	—	0.026 (J)	0.0536	NA	NA	NA
RE02-07-2817	02-600622	1.5–2	QAL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2819	02-600623	0–0.5	SOIL	—	0.075	—	—	NA	—	—	0.0139 (J)	0.0804	NA	NA	NA
RE02-07-2820	02-600623	1.5–3.8	QAL	—	0.0223 (J)	—	—	—	—	—	—	0.0181 (J)	—	—	—
RE02-07-2822	02-600624	0–0.5	SOIL	—	0.0141 (J)	—	—	NA	—	—	—	0.0143 (J)	NA	NA	NA
RE02-07-2823	02-600624	1.5–1.9	QAL	—	—	—	—	0.0034	—	—	—	—	—	—	—
RE02-10-21768	02-612348	5–7	QAL	—	—	—	—	NA	—	—	—	—	NA	NA	NA
RE02-10-21771	02-612348	35–36	QBO	—	—	—	—	NA	—	—	—	—	NA	NA	NA

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273), unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSLs are from LANL (2017, 602581).

[d] — = Not detected.

[e] Isopropylbenzene used as a surrogate based on structural similarity.

[f] Xylene used as a surrogate based on structural similarity.

[g] NA = Not analyzed.

Table 6.26-4
Radionuclides Detected or Detected above BVs/FVs at AOC 02-009(d)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Cobalt-60	Plutonium-239/240	Strontium-90	Tritium	Uranium-234	Uranium-235/236
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**na**	**4**	**0.18**
Qbt 2,3,4 BV[a]				**na**	**na**	**na**	**na**	**na**	**1.98**	**0.09**
Soil BV/FV[a]				**1.65**	**na**	**0.054**	**1.31**	**na**	**2.59**	**0.2**
Industrial SAL[c]				**41**	**9**	**1200**	**2400**	**2,400,000**	**3100**	**160**
Recreational SAL[c]				**370**	**81**	**1300**	**4900**	**5,700,000**	**3900**	**1000**
Residential SAL[c]				**12**	**2.6**	**79**	**15**	**1700**	**290**	**42**
CA02-00-0290	02-01245	4–5	SOIL	7.15	—[d]	1.19	4.31	0.0268723	—	—
CA02-00-0291	02-01245	5–8	SOIL	5.45	—	0.136	4.49	0.0454945	—	—
CA02-00-0292	02-01245	10–11.5	SOIL	4.43	—	0.0882 (J-)	7.48	0.0407727	5.68	0.244 (J-)
CA02-00-0293	02-01245	14.5–15.5	QBT3	0.394	—	0.0432	0.486	0.0265055	3.53	0.125 (J-)
RE02-07-2786	02-600614	0–0.5	SOIL	—	0.162	—	—	0.0328342	—	—
RE02-07-2787	02-600614	1.5–3.7	QAL	1.14	—	—	0.61	0.108673	—	—
RE02-07-2788	02-600614	11.5–13.5	QAL	0.638	—	—	0.223	0.0491271	—	—
RE02-07-2792	02-600615	1.5–3.5	QAL	3.98	—	0.0925 (J-)	1.65	—	—	—
RE02-07-2794	02-600615	16.5–18.7	QBO	1.68	—	—	—	—	—	—
RE02-07-2796	02-600616	0–0.5	SOIL	1.74	—	—	—	0.0421242	—	—
RE02-07-2797	02-600616	1.5–3.6	QAL	6.61	—	0.0947	2.18	0.0520993	—	—
RE02-07-2798	02-600616	11.5–13.7	QAL	—	—	—	0.818	0.0191283	—	—
RE02-07-2801	02-600617	0–0.5	SOIL	—	—	—	—	0.0284811	—	—
RE02-07-2802	02-600617	1.5–5	QAL	1.21	—	—	0.493	—	—	—
RE02-07-2804	02-600618	0–0.5	SOIL	2.29	—	0.0583	—	—	—	—
RE02-07-2805	02-600618	1.5–3.3	QAL	1.53	—	—	—	—	—	—
RE02-07-2807	02-600619	0–0.5	SOIL	3.98	—	0.0909	—	—	—	—
RE02-07-2808	02-600619	1.5–5	QAL	0.941	—	—	0.358	—	—	—
RE02-07-2809	02-600619	11.5–13.6	QAL	—	—	—	—	0.136267	—	—
RE02-07-2811	02-600620	1.5–2.5	QAL	3.8	—	0.0454	0.36	—	—	—
RE02-07-2812	02-600620	11.5–13.9	QAL	—	—	—	—	0.0760542	—	—
RE02-07-2813	02-600621	0–0.5	SOIL	2.87	—	—	—	—	—	—
RE02-07-2814	02-600621	1.5–3.7	QAL	7.74	—	—	1.3	—	—	—
RE02-07-2815	02-600621	11.5–13.4	QAL	—	—	—	—	0.0675835	—	—
RE02-07-2816	02-600622	0–0.5	SOIL	7.69	—	—	5.86	—	12.8	0.901
RE02-07-2817	02-600622	1.5–2	QAL	3.57	—	—	2.25	—	3.69	0.247

Table 6.26-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Cobalt-60	Plutonium-239/240	Strontium-90	Tritium	Uranium-234	Uranium-235/236
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**na**	**4**	**0.18**
Qbt 2,3,4 BV[a]				**na**	**na**	**na**	**na**	**na**	**1.98**	**0.09**
Soil BV[a]				**1.65**	**na**	**0.054**	**1.31**	**na**	**2.59**	**0.2**
Industrial SAL[c]				**41**	**9**	**1200**	**2400**	**2,400,000**	**3100**	**160**
Recreational SAL[c]				**370**	**81**	**1300**	**4900**	**5,700,000**	**3900**	**1000**
Residential SAL[c]				**12**	**2.6**	**79**	**15**	**1700**	**290**	**42**
RE02-07-2818	02-600622	11.5–15	QAL	0.624	—	—	—	0.0778023	—	—
RE02-07-2819	02-600623	0–0.5	SOIL	5.62	—	—	3.67	—	—	—
RE02-07-2820	02-600623	1.5–3.8	QAL	14	—	—	29.3	0.00630382	—	—
RE02-07-2821	02-600623	11.5–13.9	QAL	—	—	—	0.433	0.0669414	—	—
RE02-07-2822	02-600624	0–0.5	SOIL	—	—	0.102 (J-)	—	—	—	—
RE02-07-2823	02-600624	1.5–1.9	QAL	0.196	—	—	—	—	—	—
RE02-10-21772	02-612348	49–50	QBO	—	—	—	—	0.0525806	—	—

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SALs are from LANL (2015, 600929).

[d] — = Not detected.

Table 6.28-1
Samples Collected and Analyses Requested at AOC 02-010

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
CA02-00-0300	02-01246	0–1	SOIL	—[a]	7493R[b]	7495R	7495R	—	7495R	7495R	7492R, 7494R	—	—	7495R	7491R	—	—	—
CA02-00-0301	02-01246	7.5–9.5	SOIL	—	7493R	7495R	7495R	—	7495R	7495R	7492R, 7494R	—	—	7495R	7491R	—	—	—
CA02-00-0302	02-01246	17.5–18.5	SOIL	—	7493R	7495R	7495R	—	7495R	7495R	7492R, 7494R	—	—	7495R	7491R	—	—	—
CA02-00-0303	02-01246	34.5–36.5	SOIL	—	7493R	7495R	7495R	—	7495R	7495R	7492R, 7494R	—	—	7495R	7491R	—	—	—
CA02-00-0304	02-01246	37.5–39	QBT3	—	7493R	7495R	7495R	—	7495R	7495R	7492R, 7494R	—	—	7495R	7491R	—	—	—
RE02-03-51822	02-22350	0–0.5	SOIL	—	1827S	1827S	1827S	1827S	1827S	1827S	1827S	—	—	1827S	1827S	1827S	—	—
RE02-03-51823	02-22350	1.5–2	SOIL	—	1827S	1827S	1827S	1827S	1827S	1827S	1827S	—	—	1827S	1827S	1827S	—	—
RE02-03-51900	02-22389	0–0.5	SOIL	—	1827S	1827S	1827S	1827S	1827S	1827S	1827S	—	—	1827S	1827S	1827S	—	—

Table 6.28-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
RE02-03-51901	02-22389	1.5–2	SOIL	—	1827S	1827S	1827S	1827S	1827S	1827S	1827S	—	—	1827S	1827S	1827S	—	—
RE02-03-51902	02-22390	3–3.5	SOIL	—	1830S	1831S	1831S	1830S	1831S	1831S	1830S	—	—	1831S	1829S	1831S	—	—
RE02-03-51903	02-22390	4.5–5	SOIL	—	1830S	1831S	1831S	1830S	1831S	1831S	1830S	—	—	1831S	1829S	1831S	—	—
RE02-03-51904	02-22391	0–0.5	SOIL	—	1830S	1831S	1831S	1830S	1831S	1831S	1830S	—	—	1831S	1829S	1831S	—	—
RE02-03-51905	02-22391	1.5–2	SOIL	—	1830S	1831S	1831S	1830S	1831S	1831S	1830S	—	—	1831S	1829S	1831S	—	—
RE02-07-2856	02-600628	0–0.5	SOIL	07-556	07-555	07-556	07-556	—	07-556	07-556	07-555	07-554	07-555	07-556	07-554	—	—	07-555
RE02-07-2857	02-600628	4.5–7.5	QAL	07-877	07-876	07-877	07-877	—	07-877	07-877	07-876	07-875	07-876	07-877	07-875	—	07-875	07-876
RE02-07-2859	02-600628	13–18	QBO	07-877	07-876	07-877	07-877	—	07-877	07-877	07-876	07-875	07-876	07-877	07-875	—	07-875	07-876
RE02-07-6829	02-600628	19.5–22	QBO	07-1151	07-1151	07-1151	07-1151	—	07-1151	07-1151	07-1151	07-1151	07-1151	07-1151	07-1151	—	07-1151	07-1151
RE02-07-2861	02-600629	0–2.5	SOIL	07-1035	07-1035	07-1035	07-1035	—	07-1035	07-1035	07-1035	07-1035	07-1035	07-1035	07-1035	—	—	07-1035
RE02-07-2862	02-600629	4.5–6.2	QAL	07-1035	07-1035	07-1035	07-1035	—	07-1035	07-1035	07-1035	07-1035	07-1035	07-1035	07-1035	—	07-1035	07-1035
RE02-07-2865	02-600629	9.5–12	QAL	07-1035	07-1035	07-1035	07-1035	—	07-1035	07-1035	07-1035	07-1035	07-1035	07-1035	07-1035	—	07-1035	07-1035
RE02-07-2864	02-600629	14.5–19.5	QBO	07-1035	07-1035	07-1035	07-1035	—	07-1035	07-1035	07-1035	07-1035	07-1035	07-1035	07-1035	—	07-1035	07-1035
RE02-07-6830	02-600629	19.5–22	QBO	07-1131	07-1131	07-1131	07-1131	—	07-1131	07-1131	07-1131	07-1131	07-1131	07-1131	07-1131	—	07-1131	07-1131
RE02-07-2866	02-600630	0–0.5	SOIL	07-537	07-536	07-537	07-537	—	07-537	07-537	07-536	07-535	07-536	07-537	07-535	—	—	07-536
RE02-07-2867	02-600630	4.5–7	QAL	07-877	07-876	07-877	07-877	—	07-877	07-877	07-876	07-875	07-876	07-877	07-875	—	07-875	07-876
RE02-07-2870	02-600630	13–18	QAL	07-877	07-876	07-877	07-877	—	07-877	07-877	07-876	07-875	07-876	07-877	07-875	—	07-875	07-876
RE02-07-2871	02-600631	0–0.5	SOIL	07-900	07-900	07-900	07-900	—	07-900	07-900	07-900	07-900	07-900	07-900	07-900	—	—	07-900
RE02-07-2872	02-600631	4.5–8.5	QAL	07-900	07-900	07-900	07-900	—	07-900	07-900	07-900	07-900	07-900	07-900	07-900	—	07-900	07-900
RE02-07-2875	02-600631	13.5–18.5	QBO	07-900	07-900	07-900	07-900	—	07-900	07-900	07-900	07-900	07-900	07-900	07-900	—	07-900	07-900
RE02-07-6831	02-600631	24–26.5	QBO	07-1131	07-1131	07-1131	07-1131	—	07-1131	07-1131	07-1131	07-1131	07-1131	07-1131	07-1131	—	07-1131	07-1131
RE02-07-2876	02-600632	0–0.5	SOIL	07-537	07-536	07-537	07-537	—	07-537	07-537	07-536	07-535	07-536	07-537	07-535	—	—	07-536
RE02-07-2877	02-600632	4.5–9	QAL	07-904	07-904	07-904	07-904	—	07-904	07-904	07-904	07-904	07-904	07-904	07-904	—	07-904	07-904
RE02-07-2879	02-600632	16–20	QBO	07-904	07-904	07-904	07-904	—	07-904	07-904	07-904	07-904	07-904	07-904	07-904	—	07-904	07-904
RE02-07-2880	02-600632	26–29	QBO	07-904	07-904	07-904	07-904	—	07-904	07-904	07-904	07-904	07-904	07-904	07-904	—	07-904	07-904
RE02-07-2881	02-600633	0–0.5	SOIL	07-420	07-419	07-420	07-420	—	07-420	07-420	07-419	07-418	07-419	07-420	07-418	—	—	07-419
RE02-07-2882	02-600633	4.5–6.8	QAL	07-577	07-576	07-577	07-577	—	07-577	07-577	07-576	07-575	07-576	07-577	07-575	—	07-575	07-576
RE02-07-2885	02-600633	10.5–13.2	QAL	07-577	07-576	07-577	07-577	—	07-577	07-577	07-576	07-575	07-576	07-577	07-575	—	07-575	07-576
RE02-07-2884	02-600633	15–17.9	QBO	07-577	07-576	07-577	07-577	—	07-577	07-577	07-576	07-575	07-576	07-577	07-575	—	07-575	07-576
RE02-07-2883	02-600633	19.5–24.5	QBO	07-577	07-576	07-577	07-577	—	07-577	07-577	07-576	07-575	07-576	07-577	07-575	—	07-575	07-576
RE02-07-2886	02-600634	0–0.5	SOIL	07-905	07-905	07-905	07-905	—	07-905	07-905	07-905	07-905	07-905	07-905	07-905	—	—	07-905
RE02-07-2887	02-600634	4.5–9	QAL	07-905	07-905	07-905	07-905	—	07-905	07-905	07-905	07-905	07-905	07-905	07-905	—	07-905	07-905
RE02-07-2889	02-600634	14–19	QBO	07-905	07-905	07-905	07-905	—	07-905	07-905	07-905	07-905	07-905	07-905	07-905	—	07-905	07-905
RE02-07-6832	02-600634	19.5–22	QBO	07-1139	07-1139	07-1139	07-1139	—	07-1139	07-1139	07-1137	07-1137	07-1139	07-1139	07-1137	—	07-1137	07-1139

Table 6.28-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
RE02-07-2891	02-600635	0–0.5	SOIL	07-537	07-536	07-537	07-537	—	07-537	07-537	07-536	07-535	07-536	07-537	07-535	—	—	07-536
RE02-07-2892	02-600635	4.5–9	QAL	07-917	07-917	07-917	07-917	—	07-917	07-917	07-917	07-917	07-917	07-917	07-917	—	07-917	07-917
RE02-07-2894	02-600635	14–20	QBO	07-917	07-917	07-917	07-917	—	07-917	07-917	07-917	07-917	07-917	07-917	07-917	—	07-917	07-917
RE02-07-2897	02-600636	4.5–9.5	QAL	07-1025	07-1025	07-1025	07-1025	—	07-1025	07-1025	07-1025	07-1025	07-1025	07-1025	07-1025	—	07-1025	07-1025
RE02-07-2899	02-600636	15–19.5	QBO	07-1025	07-1025	07-1025	07-1025	—	07-1025	07-1025	07-1025	07-1025	07-1025	07-1025	07-1025	—	07-1025	07-1025
RE02-07-6833	02-600636	19.5–24	QBO	07-1139	07-1139	07-1139	07-1139	—	07-1139	07-1139	07-1137	07-1137	07-1139	07-1139	07-1137	—	07-1137	07-1139
RE02-07-2901	02-600637	0–0.5	SOIL	07-537	07-536	07-537	07-537	—	07-537	07-537	07-536	07-535	07-536	07-537	07-535	—	—	07-536
RE02-07-2902	02-600637	4.5–7.5	QAL	07-619	07-618	07-619	07-619	—	07-619	07-619	07-618	07-617	07-618	07-619	07-617	—	07-617	07-618
RE02-07-2905	02-600637	13–18	QAL	07-619	07-618	07-619	07-619	—	07-619	07-619	07-618	07-617	07-618	07-619	07-617	—	07-617	07-618
RE02-07-2904	02-600637	18.3–21	QBO	07-619	07-618	07-619	07-619	—	07-619	07-619	07-618	07-617	07-618	07-619	07-617	—	07-617	07-618
RE02-07-2906	02-600638	0–0.5	SOIL	07-537	07-536	07-537	07-537	—	07-537	07-537	07-536	07-535	07-536	07-537	07-535	—	—	07-536
RE02-07-2907	02-600638	4.5–9.5	QAL	07-987	07-987	07-987	07-987	—	07-987	07-987	07-987	07-987	07-987	07-987	07-987	—	07-987	07-987
RE02-07-2910	02-600638	9.5–15	QAL	07-987	07-987	07-987	07-987	—	07-987	07-987	07-987	07-987	07-987	07-987	07-987	—	07-987	07-987
RE02-07-2909	02-600638	18–20	QBO	07-993	07-993	07-993	07-993	—	07-993	07-993	07-993	07-993	07-993	07-993	07-993	—	07-993	07-993
RE02-07-2908	02-600638	29–32	QBO	07-1123	07-1123	07-1123	07-1123	—	07-1123	07-1123	07-1123	07-1123	07-1123	07-1123	07-1123	—	07-1123	07-1123
RE02-07-2911	02-600639	0.75–2.9	SOIL	07-866	07-866	07-866	07-866	—	07-866	07-866	07-866	07-866	07-866	07-866	07-866	—	—	07-866
RE02-07-2912	02-600639	4.5–6.4	QAL	07-877	07-876	07-877	07-877	—	07-877	07-877	07-876	07-875	07-876	07-877	07-875	—	07-875	07-876
RE02-07-2915	02-600639	9.5–11.9	QAL	07-877	07-876	07-877	07-877	—	07-877	07-877	07-876	07-875	07-876	07-877	07-875	—	07-875	07-876
RE02-07-2914	02-600639	14.1–17.5	QBO	07-877	07-876	07-877	07-877	—	07-877	07-877	07-876	07-875	07-876	07-877	07-875	—	07-875	07-876
RE02-07-2913	02-600639	19.5–20.7	QBO	07-877	07-876	07-877	07-877	—	07-877	07-877	07-876	07-875	07-876	07-877	07-875	—	07-875	07-876
RE02-10-22061	02-600640	2–2.2	SOIL	—	—	10-4175	—	—	—	—	—	—	—	—	—	—	—	—
RE02-10-22062	02-600640	4–4.2	SOIL	—	—	10-4175	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2921	02-600641	0–0.5	SOIL	07-556	07-555	07-556	07-556	—	07-556	07-556	07-555	07-554	07-555	07-556	07-554	—	—	07-555
RE02-10-22046	02-612423	2–2.2	SOIL	—	—	10-4175	—	—	—	—	—	—	—	—	—	—	—	—
RE02-10-22047	02-612423	4–4.2	SOIL	—	—	10-4175	—	—	—	—	—	—	—	—	—	—	—	—
RE02-10-22049	02-612424	2–2.4	SOIL	—	—	10-4188	—	—	—	—	—	—	—	—	—	—	—	—
RE02-10-22050	02-612424	4–4.2	SOIL	—	—	10-4188	—	—	—	—	—	—	—	—	—	—	—	—
RE02-10-22052	02-612425	2–2.2	SOIL	—	—	10-4188	—	—	—	—	—	—	—	—	—	—	—	—
RE02-10-22053	02-612425	4–4.2	SOIL	—	—	10-4188	—	—	—	—	—	—	—	—	—	—	—	—
RE02-10-22055	02-612426	2–2.2	SOIL	—	—	10-4188	—	—	—	—	—	—	—	—	—	—	—	—
RE02-10-22056	02-612426	4–4.2	SOIL	—	—	10-4188	—	—	—	—	—	—	—	—	—	—	—	—
RE02-10-22059	02-612427	4–4.2	SOIL	—	—	10-4188	—	—	—	—	—	—	—	—	—	—	—	—
RE02-10-22064	02-612429	2–2.2	SOIL	—	—	10-4175	—	—	—	—	—	—	—	—	—	—	—	—
RE02-10-22065	02-612429	4–4.2	SOIL	—	—	10-4188	—	—	—	—	—	—	—	—	—	—	—	—
RE02-10-22067	02-612430	2–2.2	SOIL	—	—	10-4188	—	—	—	—	—	—	—	—	—	—	—	—
RE02-10-22068	02-612430	4–4.2	SOIL	—	—	10-4188	—	—	—	—	—	—	—	—	—	—	—	—

Table 6.28-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
RE02-10-22070	02-612431	2–2.2	SOIL	—	—	10-4188	—	—	—	—	—	—	—	—	—	—	—	—
RE02-10-22071	02-612431	4–4.2	SOIL	—	—	10-4188	—	—	—	—	—	—	—	—	—	—	—	—
RE02-10-22073	02-612432	2–2.2	SOIL	—	—	10-4188	—	—	—	—	—	—	—	—	—	—	—	—
RE02-10-22074	02-612432	4–4.2	SOIL	—	—	10-4188	—	—	—	—	—	—	—	—	—	—	—	—
RE02-10-22178	02-612463	5–6	SOIL	10-4216	—	10-4216	10-4216	10-4216	—	10-4216	10-4216	10-4216	—	10-4216	—	—	—	—
RE02-10-22179	02-612463	15–16	QBO	10-4216	—	10-4216	10-4216	10-4216	—	10-4216	10-4216	10-4216	—	10-4216	—	—	—	—
RE02-10-22180	02-612463	25–27	QBO	10-4250	—	10-4250	10-4250	10-4249	—	10-4250	10-4249	10-4249	—	10-4250	—	—	—	—
RE02-10-22181	02-612463	35–36	QBO	10-4250	—	10-4250	10-4250	10-4249	—	10-4250	10-4249	10-4249	—	10-4250	—	—	—	—
RE02-10-22182	02-612463	49–50	QBO	10-4250	—	10-4250	10-4250	10-4249	—	10-4250	10-4249	10-4249	—	10-4250	—	—	—	—
RE02-11-163	02-613240	2–2.2	SOIL	—	—	11-161	—	—	—	—	—	—	—	—	—	—	—	—

[a] — = Analysis not requested.

[b] Analytical request number.

Table 6.28-2
Inorganic Chemicals Detected or Detected above BVs at AOC 02-010

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Copper	Cyanide (Total)	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**1900**	**2.6**	**na**[b]	**3.96**	**0.5**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**4.59**	**40**
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**na**	**4.66**	**na**	**14,500**	**11.2**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**17**	**63.5**
Soil BV[a]				**29,200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**na**	**14.7**	**0.5**	**21,500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**na**	**505**[d]	**72.1**	**51,900**	**62.8**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**na**	**281**[d]	**40.2**	**24,800**	**224**	**434,000**	**1110**	**14,800**	**186**	**15,800**	**991,000**	**434**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**70.5**	**na**	**96**[d]	**3.05**	**3130**	**11.1**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**394**	**23,500**
CA02-00-0304	02-01246	37.5–39	QBT3	18,000 (J-)	—[f]	—	180	—	—	—	NA[g]	—	NA	—	—	—	—	—	NA	—	0.34 (UJ)	—	—
RE02-03-51822	02-22350	0–0.5	SOIL	—	—	—	—	0.543 (U)	—	—	0.0652 (J)	—	NA	—	—	—	—	—	NA	—	—	—	—
RE02-03-51823	02-22350	1.5–2	SOIL	—	—	—	—	0.547 (U)	—	—	0.111	—	NA	—	—	—	—	—	NA	—	—	—	—
RE02-03-51900	02-22389	0–0.5	SOIL	—	—	—	—	—	—	—	0.15	—	NA	—	—	—	0.157	—	NA	0.117	—	—	—
RE02-03-51902	02-22390	3–3.5	SOIL	—	—	—	—	—	—	—	0.0895 (J)	—	NA	—	—	—	—	—	NA	—	—	—	—
RE02-03-51903	02-22390	4.5–5	SOIL	—	—	—	—	0.541 (U)	—	—	—	—	NA	—	—	—	—	—	NA	—	—	—	—
RE02-03-51904	02-22391	0–0.5	SOIL	—	—	—	—	0.588	21680	—	0.26	—	NA	—	134	—	0.218	—	NA	0.0244 (J)	—	—	152
RE02-03-51905	02-22391	1.5–2	SOIL	—	—	—	—	—	—	—	—	—	NA	—	60.1	—	0.116	—	NA	0.0547	—	—	55.5
RE02-07-2856	02-600628	0–0.5	SOIL	—	—	—	—	0.51 (U)	8040	—	NA	—	—	—	—	—	—	—	1.06	—	1.53 (U)	—	—
RE02-07-2857	02-600628	4.5–7.5	QAL	—	—	—	—	0.532 (U)	—	—	NA	—	—	—	—	—	—	—	—	—	1.6 (U)	—	—

Table 6.28-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Copper	Cyanide (Total)	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**1900**	**2.6**	**na[b]**	**3.96**	**0.5**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**4.59**	**40**
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**na**	**4.66**	**na**	**14,500**	**11.2**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**17**	**63.5**
Soil BV[a]				**29,200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**na**	**14.7**	**0.5**	**21,500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**na**	**505[d]**	**72.1**	**51,900**	**62.8**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**na**	**281[d]**	**40.2**	**24,800**	**224**	**434,000**	**1110**	**14,800**	**186**	**15,800**	**991,000**	**434**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**70.5**	**na**	**96[d]**	**3.05**	**3130**	**11.1**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**394**	**23,500**
RE02-07-2859	02-600628	13–18	QBO	11,600	—	2.18	93.3	0.629 (U)	—	8	NA	4.3 (U)	—	10,300	—	493	—	3.64	—	—	1.89 (U)	9.19	—
RE02-07-6829	02-600628	19.5–22	QBO	25,800 (J)	0.593 (U)	1.38 (J)	254 (J+)	0.764 (U)	—	8.05	NA	—	—	9120	—	327	—	3.9	—	—	1.77 (J)	4.97	—
RE02-07-2861	02-600629	0–2.5	SOIL	—	—	—	370	0.551	—	—	NA	22.2	—	—	—	—	—	—	1	—	8.72	—	53.9
RE02-07-2862	02-600629	4.5–6.2	QAL	—	—	—	—	0.526 (U)	—	—	NA	—	—	—	—	—	—	—	1.4	—	7.46	—	—
RE02-07-2865	02-600629	9.5–12	QAL	—	—	—	—	0.564 (U)	—	—	NA	—	—	—	—	—	—	—	—	—	6.83	—	—
RE02-07-2864	02-600629	14.5–19.5	QBO	10,100	—	1.08 (J)	71	0.591 (U)	—	14	NA	4.18	—	6680	—	200 (J-)	—	3.37	—	—	9.31	7.57	—
RE02-07-6830	02-600629	19.5–22	QBO	6610	0.556 (UJ)	2.04 (U)	34.3	0.682 (U)	—	21.8	NA	—	0.847	6540	—	234	—	2.1	—	—	6.65	—	—
RE02-07-2866	02-600630	0–0.5	SOIL	—	—	—	447	5.6	—	—	NA	—	—	—	30.2	—	0.246	—	1.33	—	—	—	51.9
RE02-07-2867	02-600630	4.5–7	QAL	—	—	—	—	0.517 (U)	—	—	NA	—	—	—	—	—	—	—	—	—	1.55 (U)	—	—
RE02-07-2870	02-600630	13–18	QAL	—	—	—	—	0.556 (U)	—	—	NA	—	—	—	—	—	—	—	—	—	1.67 (U)	—	—
RE02-07-2871	02-600631	0–0.5	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	—	0.512	—	—	—	—	—	—
RE02-07-2872	02-600631	4.5–8.5	QAL	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	—	1.92 (J-)	—	—	—	—
RE02-07-2875	02-600631	13.5–18.5	QBO	11,600	—	1.7 (U)	52	0.566 (U)	—	17.5	NA	4.21	—	6500	—	280 (J+)	—	3.11	—	—	0.618 (J)	5.03	—
RE02-07-6831	02-600631	24–26.5	QBO	5320	0.524 (UJ)	2.03 (U)	—	0.677 (U)	—	17.7	NA	—	—	5330	—	213	—	2.53	—	—	5.56	—	—
RE02-07-2876	02-600632	0–0.5	SOIL	—	—	—	—	—	—	—	NA	—	6.17	—	—	—	0.132	—	—	—	—	—	—
RE02-07-2877	02-600632	4.5–9	QAL	—	—	—	—	0.526 (U)	—	—	NA	—	—	—	—	—	—	—	1.23	—	—	—	—
RE02-07-2879	02-600632	16–20	QBO	8680	—	0.627 (J)	—	—	—	58.7	NA	—	—	6190	—	249 (J+)	—	3.02	—	—	0.689 (J)	4.87	—
RE02-07-2880	02-600632	26–29	QBO	6050	—	1.83 (U)	—	—	—	3.86	NA	—	—	6230	—	264 (J+)	—	—	—	—	0.915 (J)	—	—
RE02-07-2881	02-600633	0–0.5	SOIL	—	—	—	—	—	—	—	NA	—	—	—	22.8	—	0.176	—	9.77	—	—	—	—
RE02-07-2882	02-600633	4.5–6.8	QAL	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	—	3.23 (J-)	0.0046	—	—	—
RE02-07-2885	02-600633	10.5–13.2	QAL	—	—	—	—	0.537 (U)	—	22.4	NA	—	—	—	—	—	—	—	4.1 (J-)	—	—	—	—
RE02-07-2884	02-600633	15–17.9	QBO	10,700	—	2.03	62.5	0.563 (U)	—	15.5	NA	—	—	6860	—	361	—	7.96	—	—	0.614 (J)	5.38	—
RE02-07-2883	02-600633	19.5–24.5	QBO	9830	—	0.837 (J)	—	0.63 (U)	—	6.41	NA	—	—	5920	—	220	—	3.7	—	—	1.89 (U)	—	—
RE02-07-2886	02-600634	0–0.5	SOIL	—	—	—	—	0.473 (J)	—	—	NA	—	—	—	—	—	0.556	—	—	—	1.66 (U)	—	63
RE02-07-2887	02-600634	4.5–9	QAL	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	—	1.13	—	1.57 (U)	—	—
RE02-07-2889	02-600634	14–19	QBO	12,800	—	1.14 (J)	60	—	—	54.4	NA	10.5	—	7700	—	336	—	6.65	—	—	1.79 (U)	5.97	—
RE02-07-6832	02-600634	19.5–22	QBO	6200 (J+)	0.515 (U)	1.89 (U)	—	0.629 (U)	—	4.79 (J+)	NA	—	—	5360	—	218	—	2.27	1.36 (J-)	—	7.32	—	—
RE02-07-2891	02-600635	0–0.5	SOIL	—	—	—	—	0.578	—	—	NA	—	14.4	—	—	—	0.429	—	1.65 (J-)	—	—	—	—
RE02-07-2892	02-600635	4.5–9	QAL	—	—	—	—	0.548 (U)	—	—	NA	—	—	—	—	—	—	—	—	0.00169 (J)	—	—	—
RE02-07-2894	02-600635	14–20	QBO	3660	—	2.08	—	0.632 (U)	—	7.41	NA	—	—	8740	—	367	—	3.16	9.7	—	1.9 (U)	8.52 (J)	—

Table 6.28-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Copper	Cyanide (Total)	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**1900**	**2.6**	**na[b]**	**3.96**	**0.5**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**4.59**	**40**
Qbt 2,3,4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**na**	**4.66**	**na**	**14,500**	**11.2**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**17**	**63.5**
Soil BV[a]				**29,200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**na**	**14.7**	**0.5**	**21,500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**na**	**505[d]**	**72.1**	**51,900**	**62.8**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**na**	**281[d]**	**40.2**	**24,800**	**224**	**434,000**	**1110**	**14,800**	**186**	**15,800**	**991,000**	**434**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,600**	**70.5**	**na**	**96[d]**	**3.05**	**3130**	**11.1**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**394**	**23,500**
RE02-07-2897	02-600636	4.5–9.5	QAL	—	—	—	—	0.547 (U)	—	—	NA	—	—	—	—	—	—	—	2.19 (J-)	—	1.64 (U)	—	—
RE02-07-2899	02-600636	15–19.5	QBO	11200 (J+)	—	1.76 (U)	35.9	0.586 (U)	—	7.49	NA	—	—	7190 (J)	—	226 (J)	—	—	1.12 (J-)	0.000839 (J)	1.76 (U)	—	—
RE02-07-6833	02-600636	19.5–24	QBO	7470 (J+)	—	1.91 (U)	—	0.637 (U)	—	6.39 (J+)	NA	—	—	5700	—	206	—	2.08	—	—	7.93	—	—
RE02-07-2901	02-600637	0–0.5	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	—	2.36 (J-)	—	1.65	—	—
RE02-07-2902	02-600637	4.5–7.5	QAL	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	—	1.38 (J+)	—	1.57 (U)	—	—
RE02-07-2905	02-600637	13–18	QAL	—	—	—	—	—	—	29.5	NA	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2904	02-600637	18.3–21	QBO	16,300	—	1.53 (J)	134	—	—	7.73	NA	—	—	6000	—	240	—	2.35	—	—	1.61 (U)	—	—
RE02-07-2906	02-600638	0–0.5	SOIL	—	—	—	—	0.435 (J)	—	—	NA	—	—	—	—	—	0.341	—	1.28	—	—	—	62.3
RE02-07-2907	02-600638	4.5–9.5	QAL	—	—	—	—	0.537 (U)	—	—	NA	—	—	—	—	—	—	—	1.38	—	1.61 (U)	—	—
RE02-07-2910	02-600638	9.5–15	QAL	—	—	—	—	0.572 (U)	—	—	NA	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2909	02-600638	18–20	QBO	7880	0.507 (UJ)	1.21 (U)	—	0.639 (U)	—	13.1	NA	—	—	6490	—	—	—	—	—	—	0.745 (J)	—	—
RE02-07-2908	02-600638	29–32	QBO	4150	0.526 (UJ)	1.99 (U)	—	0.662 (U)	—	3.13	NA	—	—	5310 (J+)	—	229	—	—	—	—	6.24	—	—
RE02-07-2911	02-600639	0.75–2.9	SOIL	—	—	—	413	1.01	—	—	NA	32.6	—	—	—	—	—	—	0.849 (J)	—	2.18	—	52.4
RE02-07-2912	02-600639	4.5–6.4	QAL	—	—	—	—	0.462 (J)	—	—	NA	20.5 (U)	—	—	—	—	—	—	—	—	1.71	—	50.3
RE02-07-2915	02-600639	9.5–11.9	QAL	—	—	—	—	0.547 (U)	—	—	NA	—	—	—	—	—	—	—	—	—	1.64 (U)	—	—
RE02-07-2914	02-600639	14.1–17.5	QBO	12,800	—	0.727 (J)	39.1	0.645 (U)	—	5.59	NA	—	—	6150	—	190	—	—	1.03 (J-)	—	1.93 (U)	—	—
RE02-07-2913	02-600639	19.5–20.7	QBO	5930	—	1.81 (U)	—	0.605 (U)	—	26.4	NA	—	—	6470	—	—	—	15.1	0.886 (J-)	—	1.81 (U)	—	—
RE02-07-2921	02-600641	0–0.5	SOIL	—	—	—	—	0.516 (U)	—	—	NA	—	—	—	22.9	—	0.201	—	1.66	—	—	—	61.4
RE02-10-22178	02-612463	5–6	SOIL	—	1.03 (U)	—	—	0.516 (U)	—	—	—	—	NA	—	—	—	—	—	NA	NA	—	—	—
RE02-10-22179	02-612463	15–16	QBO	—	5.73 (U)	1.34	48.7	0.573 (U)	—	404	0.337 (J)	7.89	NA	10,700	—	838	—	—	NA	NA	1.18 (U)	15.1	—
RE02-10-22180	02-612463	25–27	QBO	8070	1.26 (U)	1.28 (U)	—	0.632 (U)	—	—	—	—	NA	6080	—	200 (J+)	—	—	NA	NA	1.28 (U)	—	—
RE02-10-22181	02-612463	35–36	QBO	6990	1.23 (U)	1.29 (U)	—	0.614 (U)	—	—	—	—	NA	5940	—	—	—	—	NA	NA	1.29 (U)	—	—
RE02-10-22182	02-612463	49–50	QBO	4590	1.3 (U)	1.26 (U)	—	0.648 (U)	—	2.93	—	—	NA	6330	—	203 (J+)	—	—	NA	NA	1.26 (U)	—	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 6.28-3
Organic Chemicals Detected at AOC 02-010

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	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	Bis(2-ethylhexyl)phthalate	Chloroform
Industrial SSL[a]				**50,500**	**959,000**	**253,000**	**10.7**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300**[b]	**323**	**1830**	**28.4**
Recreational SSL[c]				**17,300**	**505,000**	**863,000**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630**[b]	**888**	**1770**	**204**
Residential SSL[a]				**3480**	**66,300**	**17,400**	**2.22**	**1.12**	**2.22**	**1.53**	**1.12**	**1.53**	**1740**[b]	**15.3**	**380**	**5.85**
CA02-00-0301	02-01246	7.5–9.5	SOIL	—[d]	NA[e]	—	NA	NA	NA	—	—	—	—	—	0.33 (J)	NA
CA02-00-0304	02-01246	37.5–39	QBT3	—	NA	—	NA	NA	NA	—	—	—	—	—	0.12 (J)	NA
RE02-03-51822	02-22350	0–0.5	SOIL	—	NA	—	NA	NA	NA	—	—	—	—	—	0.0534 (J)	NA
RE02-03-51823	02-22350	1.5–2	SOIL	—	NA	—	NA	NA	NA	—	—	—	—	—	0.0558 (J)	NA
RE02-03-51900	02-22389	0–0.5	SOIL	0.0161 (J)	NA	0.0248 (J)	NA	NA	NA	—	—	—	0.118	—	0.0429 (J)	NA
RE02-03-51901	02-22389	1.5–2	SOIL	—	NA	—	NA	NA	NA	—	—	—	—	—	0.0353 (J)	NA
RE02-03-51904	02-22391	0–0.5	SOIL	—	NA	—	NA	NA	NA	—	—	—	—	—	—	NA
RE02-07-2856	02-600628	0–0.5	SOIL	—	NA	—	—	0.1	0.291	—	—	—	—	—	—	NA
RE02-07-2857	02-600628	4.5–7.5	QAL	—	—	—	—	0.0049	0.0107	—	—	—	—	—	—	—
RE02-07-2859	02-600628	13–18	QBO	—	—	—	—	—	0.0017 (J)	—	—	—	—	—	—	—
RE02-07-6829	02-600628	19.5–22	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2861	02-600629	0–2.5	SOIL	0.0242 (J)	NA	0.0304 (J)	—	—	—	0.064	0.109	0.0851	0.0411	0.0311 (J)	—	NA
RE02-07-6830	02-600629	19.5–22	QBO	—	0.0039 (J)	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2866	02-600630	0–0.5	SOIL	—	NA	0.0387	—	—	0.0503	0.13	0.146	0.182	0.0601	0.0774	—	NA
RE02-07-2867	02-600630	4.5–7	QAL	—	—	—	—	—	0.0013 (J)	—	—	—	—	—	—	—
RE02-07-2871	02-600631	0–0.5	SOIL	—	NA	—	—	—	0.0137 (J)	—	—	0.0698	—	—	—	NA
RE02-07-2872	02-600631	4.5–8.5	QAL	—	—	0.0158 (J)	—	—	—	0.0318 (J)	0.0234 (J)	0.0419	—	—	—	0.000219 (J)
RE02-07-6831	02-600631	24–26.5	QBO	—	0.00815 (J)	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2876	02-600632	0–0.5	SOIL	—	NA	0.00735 (J)	—	—	0.0206 (J)	—	—	0.0328 (J)	—	—	—	NA
RE02-07-2877	02-600632	4.5–9	QAL	—	—	—	—	—	0.0051	—	—	—	—	—	—	—
RE02-07-2881	02-600633	0–0.5	SOIL	0.0374	NA	0.0565	—	—	0.0284 (J)	0.141	0.2 (J)	0.3 (J)	0.105 (J)	—	—	NA
RE02-07-2882	02-600633	4.5–6.8	QAL	—	—	—	—	—	0.0037	—	0.0201 (J)	0.0205 (J)	—	—	—	—
RE02-07-2886	02-600634	0–0.5	SOIL	—	NA	0.0158 (J)	—	—	0.0924	0.057	0.0673	0.0729	0.0364 (J)	0.0514	—	NA
RE02-07-2887	02-600634	4.5–9	QAL	—	—	—	—	—	0.0045	—	—	—	—	—	—	—
RE02-07-2891	02-600635	0–0.5	SOIL	—	NA	—	—	—	0.0415	0.025 (J)	0.105	0.0507	0.0504 (J)	—	—	NA
RE02-07-2897	02-600636	4.5–9.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 6.28-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	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	Bis(2-ethylhexyl)phthalate	Chloroform
Industrial SSL[a]				**50,500**	**959,000**	**253,000**	**10.7**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300**[b]	**323**	**1830**	**28.4**
Recreational SSL[c]				**17,300**	**505,000**	**863,000**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630**[b]	**888**	**1770**	**204**
Residential SSL[a]				**3480**	**66,300**	**17,400**	**2.22**	**1.12**	**2.22**	**1.53**	**1.12**	**1.53**	**1740**[b]	**15.3**	**380**	**5.85**
RE02-07-2901	02-600637	0–0.5	SOIL	—	NA	—	—	0.0191 (J-)	0.0133 (J-)	—	—	—	—	—	—	NA
RE02-07-2902	02-600637	4.5–7.5	QAL	—	—	—	0.0066	0.0051	—	—	—	—	—	—	—	—
RE02-07-2904	02-600637	18.3–21	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2906	02-600638	0–0.5	SOIL	0.0188 (J)	NA	0.0284 (J)	—	—	0.0567	0.0877	0.158	0.14	0.0562 (J)	—	—	NA
RE02-07-2907	02-600638	4.5–9.5	QAL	—	—	—	—	—	0.0027 (J)	—	—	—	—	—	—	—
RE02-07-2910	02-600638	9.5–15	QAL	—	—	—	—	—	0.0018 (J)	—	—	—	—	—	—	—
RE02-07-2912	02-600639	4.5–6.4	QAL	—	—	0.0221 (J)	—	—	—	0.14	0.0961	—	0.0482	0.0621	—	—
RE02-07-2915	02-600639	9.5–11.9	QAL	—	—	—	—	—	0.0015 (J)	—	—	—	—	—	—	—
RE02-07-2921	02-600641	0–0.5	SOIL	—	NA	0.02 (J)	—	0.199	0.329	0.105	0.116	0.206	0.0591	—	—	NA

Table 6.28-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Chrysene	Di-n-butylphthalate	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Isopropylbenzene	Isopropyltoluene[4-]	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Toluene
Industrial SSL[a]				**3230**	**91,600**	**33,700**	**33,700**	**32.3**	**14,100**	**14,900[f]**	**5110**	**4100**	**16,800**	**25,300**	**25,300**	**61,400**
Recreational SSL[c]				**8880**	**39,900**	**11,500**	**11,500**	**88.8**	**42,100**	**52,700[f]**	**3610**	**3170**	**1930**	**8630**	**8630**	**47,600**
Residential SSL[a]				**153**	**6160**	**2320**	**2320**	**1.53**	**2350**	**3210[f]**	**409**	**310**	**1160**	**1740**	**1740**	**5220**
CA02-00-0301	02-01246	7.5–9.5	SOIL	—	—	—	—	—	NA	NA	NA	—	—	—	—	NA
CA02-00-0304	02-01246	37.5–39	QBT3	—	—	—	—	—	NA	NA	NA	—	—	—	—	NA
RE02-03-51822	02-22350	0–0.5	SOIL	—	—	—	—	—	NA	NA	NA	—	—	—	—	NA
RE02-03-51823	02-22350	1.5–2	SOIL	—	—	—	—	—	NA	NA	NA	—	—	—	—	NA
RE02-03-51900	02-22389	0–0.5	SOIL	0.0723	—	0.115	0.0139 (J)	—	NA	NA	NA	—	—	0.0976	0.0944	NA
RE02-03-51901	02-22389	1.5–2	SOIL	—	—	—	—	—	NA	NA	NA	—	—	—	—	NA
RE02-03-51904	02-22391	0–0.5	SOIL	—	—	0.0472	0.0045 (J)	—	NA	NA	NA	—	—	0.0289 (J)	—	NA
RE02-07-2856	02-600628	0–0.5	SOIL	—	—	—	—	—	NA	NA	NA	—	—	—	0.0153 (J)	NA
RE02-07-2857	02-600628	4.5–7.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2859	02-600628	13–18	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-6829	02-600628	19.5–22	QBO	—	—	—	—	—	—	—	0.00406 (J)	—	—	—	—	—
RE02-07-2861	02-600629	0–2.5	SOIL	0.0657	—	0.124	0.0188 (J)	0.16	NA	NA	NA	0.0121 (J)	0.0183 (J)	0.125	0.116	NA
RE02-07-6830	02-600629	19.5–22	QBO	—	—	—	—	—	—	0.000499 (J)	0.00341 (J)	—	—	—	—	—
RE02-07-2866	02-600630	0–0.5	SOIL	0.14	—	0.257	0.0221 (J)	—	NA	NA	NA	0.00715 (J)	—	0.0116 (J)	0.231	NA
RE02-07-2867	02-600630	4.5–7	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2871	02-600631	0–0.5	SOIL	0.0434	—	0.0602	—	—	NA	NA	NA	—	—	0.0252 (J)	0.066	NA
RE02-07-2872	02-600631	4.5–8.5	QAL	0.0233 (J)	—	0.0721	—	—	—	—	—	—	—	0.0662	0.0573	—
RE02-07-6831	02-600631	24–26.5	QBO	—	—	—	—	—	—	—	0.00329 (J)	—	—	—	—	—
RE02-07-2876	02-600632	0–0.5	SOIL	0.0213 (J)	0.983	0.0443	—	—	NA	NA	NA	—	—	—	0.0375	NA
RE02-07-2877	02-600632	4.5–9	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2881	02-600633	0–0.5	SOIL	0.166	—	0.24	0.0293 (J)	0.165 (J)	NA	NA	NA	0.00992 (J)	0.022 (J)	0.222	0.315	NA
RE02-07-2882	02-600633	4.5–6.8	QAL	0.0136 (J)	—	0.0174 (J)	—	—	—	—	—	—	—	0.0154 (J)	0.0236 (J)	—
RE02-07-2886	02-600634	0–0.5	SOIL	0.0691	—	0.11	—	0.0306 (J)	NA	NA	NA	—	—	0.0662	0.113	NA
RE02-07-2887	02-600634	4.5–9	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2891	02-600635	0–0.5	SOIL	0.0248 (J)	—	0.0303 (J)	—	0.064	NA	NA	NA	—	—	0.0179 (J)	0.0352	NA
RE02-07-2897	02-600636	4.5–9.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	0.000417 (J)
RE02-07-2901	02-600637	0–0.5	SOIL	0.0192 (J)	—	0.0284 (J)	—	—	NA	NA	NA	—	—	—	0.023 (J)	NA
RE02-07-2902	02-600637	4.5–7.5	QAL	—	—	—	—	—	—	—	0.00213 (J)	—	—	—	—	0.000372 (J)
RE02-07-2904	02-600637	18.3–21	QBO	—	—	—	—	—	0.000763 (J)	—	0.00415 (J)	—	—	—	—	—
RE02-07-2906	02-600638	0–0.5	SOIL	0.0797	—	0.126	0.0145 (J)	0.0951	NA	NA	NA	0.00701 (J)	0.0169 (J)	0.105	0.167	NA
RE02-07-2907	02-600638	4.5–9.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	0.00042 (J)

Table 6.28-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Chrysene	Di-n-butylphthalate	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Isopropylbenzene	Isopropyltoluene[4-]	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Toluene
Industrial SSL[a]				**3230**	**91,600**	**33,700**	**33,700**	**32.3**	**14,100**	**14,900[f]**	**5110**	**4100**	**16,800**	**25,300**	**25,300**	**61,400**
Recreational SSL[c]				**8880**	**39,900**	**11,500**	**11,500**	**88.8**	**42,100**	**52,700[f]**	**3610**	**3170**	**1930**	**8630**	**8630**	**47,600**
Residential SSL[a]				**153**	**6160**	**2320**	**2320**	**1.53**	**2350**	**3210[f]**	**409**	**310**	**1160**	**1740**	**1740**	**5220**
RE02-07-2910	02-600638	9.5–15	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2912	02-600639	4.5–6.4	QAL	0.154	—	0.397	—	0.0498	—	—	—	—	—	0.0945	0.238	0.000593 (J)
RE02-07-2915	02-600639	9.5–11.9	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2921	02-600641	0–0.5	SOIL	0.121	0.0381 (J)	0.198	—	0.0452	NA	NA	NA	—	—	0.105	0.222	NA

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273), unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSLs are from LANL (2017, 602581).

[d] — = Not detected.

[e] NA = Not analyzed.

[f] Isopropylbenzene used as a surrogate based on structural similarity.

Table 6.28-4
Radionuclides Detected or Detected above BVs/FVs at AOC 02-010

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Strontium-90	Tritium	Uranium-234	Uranium-235/236	Uranium-238
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**4**	**0.18**	**3.9**
Qbt 2,3,4 BV[a]				**na**	**na**	**na**	**na**	**1.98**	**0.09**	**1.93**
Soil BV[a]				**1.65**	**0.054**	**1.31**	**na**	**2.59**	**0.2**	**2.29**
Industrial SAL[c]				**41**	**1200**	**2400**	**2,400,000**	**3100**	**160**	**710**
Recreational SAL[c]				**370**	**1300**	**4900**	**5,700,000**	**3900**	**1000**	**2800**
Residential SAL[c]				**12**	**79**	**15**	**1700**	**290**	**42**	**150**
CA02-00-0300	02-01246	0–1	SOIL	11.3	0.223	7.22	—[d]	—	—	—
CA02-00-0301	02-01246	7.5–9.5	SOIL	0.123	—	3.25	0.131538	—	—	—
CA02-00-0302	02-01246	17.5–18.5	SOIL	—	—	—	0.036087	—	—	—
CA02-00-0303	02-01246	34.5–36.5	SOIL	—	—	—	0.0470455	—	—	—
CA02-00-0304	02-01246	37.5–39	QBT3	—	—	—	—	2.62	0.0953	2.62

Table 6.28-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Strontium-90	Tritium	Uranium-234	Uranium-235/236	Uranium-238
Qbt 1g, Qct, Qbo BV[a]				**na**	**na**	**na**	**na**	**4**	**0.18**	**3.9**
Qbt 2,3,4 BV[a]				**na**	**na**	**na**	**na**	**1.98**	**0.09**	**1.93**
Soil BV[a]				**1.65**	**0.054**	**1.31**	**na**	**2.59**	**0.2**	**2.29**
Industrial SAL[c]				**41**	**1200**	**2400**	**2,400,000**	**3100**	**160**	**710**
Recreational SAL[c]				**370**	**1300**	**4900**	**5,700,000**	**3900**	**1000**	**2800**
Residential SAL[c]				**12**	**79**	**15**	**1700**	**290**	**42**	**150**
RE02-03-51822	02-22350	0–0.5	SOIL	—	—	—	0.136	—	—	—
RE02-03-51823	02-22350	1.5–2	SOIL	—	—	—	0.0545	—	—	—
RE02-03-51900	02-22389	0–0.5	SOIL	—	—	—	0.0638	—	—	—
RE02-03-51901	02-22389	1.5–2	SOIL	0.159	—	0.887	—	—	—	—
RE02-03-51902	02-22390	3–3.5	SOIL	—	—	0.211	—	—	—	—
RE02-03-51904	02-22391	0–0.5	SOIL	17.2	0.0961	2.36	0.0996	—	—	—
RE02-03-51905	02-22391	1.5–2	SOIL	3.6	0.0809	0.391	0.0988	—	—	—
RE02-07-2861	02-600629	0–2.5	SOIL	0.717	1.43 (J-)	—	—	—	—	—
RE02-07-2862	02-600629	4.5–6.2	QAL	0.999	0.867	0.43	0.0206989	—	—	—
RE02-07-2866	02-600630	0–0.5	SOIL	—	1.01 (J-)	—	—	—	—	—
RE02-07-2867	02-600630	4.5–7	QAL	—	—	0.218	—	—	—	—
RE02-07-2870	02-600630	13–18	QAL	—	0.0308	—	—	—	—	—
RE02-07-2871	02-600631	0–0.5	SOIL	—	0.659	—	—	—	—	—
RE02-07-2872	02-600631	4.5–8.5	QAL	0.167	0.299	—	0.0315949	—	—	—
RE02-07-2877	02-600632	4.5–9	QAL	—	—	—	0.0343344	—	—	—
RE02-07-2880	02-600632	26–29	QBO	—	—	—	0.17875	—	—	—
RE02-07-2881	02-600633	0–0.5	SOIL	1.77	—	1.99	—	—	—	—
RE02-07-2882	02-600633	4.5–6.8	QAL	—	—	0.752	0.0542605	—	—	—
RE02-07-2887	02-600634	4.5–9	QAL	0.163	—	—	0.0356757	—	—	—
RE02-07-6832	02-600634	19.5–22	QBO	0.125	—	—	0.167571	—	—	—
RE02-07-2892	02-600635	4.5–9	QAL	—	—	—	0.0679813	—	—	—
RE02-07-2897	02-600636	4.5–9.5	QAL	—	—	0.306	0.0500562	3.26	0.208	2.48
RE02-07-6833	02-600636	19.5–24	QBO	—	—	—	0.0716883	—	0.355	—
RE02-07-2901	02-600637	0–0.5	SOIL	1.7	0.0852 (J-)	—	—	—	—	—
RE02-07-2902	02-600637	4.5–7.5	QAL	0.528	0.0438	—	0.0184587	—	—	—
RE02-07-2907	02-600638	4.5–9.5	QAL	—	—	—	0.0308785	—	—	—
RE02-07-2908	02-600638	29–32	QBO	—	—	—	0.261667	—	—	—
RE02-07-2911	02-600639	0.75–2.9	SOIL	0.886	1.39	—	—	—	—	—
RE02-07-2912	02-600639	4.5–6.4	QAL	1.88	2.93	—	—	—	—	—

Table 6.28-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Strontium-90	Tritium	Uranium-234	Uranium-235/236	Uranium-238
Qbt 1g, Qct, Qbo BV[a]				**na**	**na**	**na**	**na**	**4**	**0.18**	**3.9**
Qbt 2,3,4 BV[a]				**na**	**na**	**na**	**na**	**1.98**	**0.09**	**1.93**
Soil BV[a]				**1.65**	**0.054**	**1.31**	**na**	**2.59**	**0.2**	**2.29**
Industrial SAL[c]				**41**	**1200**	**2400**	**2,400,000**	**3100**	**160**	**710**
Recreational SAL[c]				**370**	**1300**	**4900**	**5,700,000**	**3900**	**1000**	**2800**
Residential SAL[c]				**12**	**79**	**15**	**1700**	**290**	**42**	**150**
RE02-07-2915	02-600639	9.5–11.9	QAL	—	0.0785	—	—	—	—	—
RE02-07-2913	02-600639	19.5–20.7	QBO	—	—	—	0.0564813	—	—	—
RE02-10-22061	02-600640	2–2.2	SOIL	0.714	NA[e]	NA	NA	NA	NA	NA
RE02-10-22062	02-600640	4–4.2	SOIL	0.909	NA	NA	NA	NA	NA	NA
RE02-07-2921	02-600641	0–0.5	SOIL	—	0.791	—	—	—	—	—
RE02-10-22046	02-612423	2–2.2	SOIL	18.2	NA	NA	NA	NA	NA	NA
RE02-10-22047	02-612423	4–4.2	SOIL	7.45	NA	NA	NA	NA	NA	NA
RE02-10-22049	02-612424	2–2.4	SOIL	1.28	NA	NA	NA	NA	NA	NA
RE02-10-22052	02-612425	2–2.2	SOIL	13.3	NA	NA	NA	NA	NA	NA
RE02-10-22055	02-612426	2–2.2	SOIL	15.1	NA	NA	NA	NA	NA	NA
RE02-10-22064	02-612429	2–2.2	SOIL	1.17	NA	NA	NA	NA	NA	NA
RE02-10-22065	02-612429	4–4.2	SOIL	2.08	NA	NA	NA	NA	NA	NA
RE02-10-22067	02-612430	2–2.2	SOIL	0.336	NA	NA	NA	NA	NA	NA
RE02-10-22068	02-612430	4–4.2	SOIL	0.62	NA	NA	NA	NA	NA	NA
RE02-10-22070	02-612431	2–2.2	SOIL	0.761	NA	NA	NA	NA	NA	NA
RE02-10-22071	02-612431	4–4.2	SOIL	0.825	NA	NA	NA	NA	NA	NA
RE02-10-22073	02-612432	2–2.2	SOIL	0.74	NA	NA	NA	NA	NA	NA
RE02-10-22074	02-612432	4–4.2	SOIL	0.202	NA	NA	NA	NA	NA	NA
RE02-10-22178	02-612463	5–6	SOIL	0.158	NA	—	—	—	—	—
RE02-10-22182	02-612463	49–50	QBO	—	NA	—	0.0822838	—	—	—
RE02-11-163	02-613240	2–2.2	SOIL	0.309	NA	NA	NA	NA	NA	NA

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SALs are from LANL (2015, 600929).

[d] — = Not detected.

[e] NA = Not analyzed.

Table 6.29-1
Samples Collected and Analyses Requested at AOCs 02-011(a)(i,ii,iii,iv,v,vi)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Dioxins/Furans	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
RE02-10-22127	02-600385	4–4.2	ALLH	—[a]	—	—	—	—	—	—	—	—	10-4285[b]	—	—	—	—	—
RE02-10-22128	02-600385	6–6.2	ALLH	—	—	—	—	—	—	—	—	—	10-4285	—	—	—	—	—
RE02-10-22111	02-600386	11–11.2	QAL	—	—	—	—	—	—	—	—	—	10-4217	—	—	—	—	—
RE02-10-22109	02-600386	7–7.2	QAL	—	—	—	—	—	—	—	—	—	10-4217	—	—	—	—	—
RE02-10-22110	02-600386	9–9.2	QAL	—	—	—	—	—	—	—	—	—	10-4217	—	—	—	—	—
RE02-07-1572	02-600387	0–0.5	ALLH	07-543	07-542	07-530	07-543	07-543	—	07-543	07-543	07-542	07-541	07-542	07-543	07-541	—	07-542
RE02-07-1573	02-600387	2–2.6	QAL	07-543	07-542	07-530	07-543	07-543	—	07-543	07-543	07-542	07-541	07-542	07-543	07-541	07-541	07-542
RE02-10-22112	02-612444	3.5–4	ALLH	—	—	—	—	—	—	—	—	—	10-4265	—	—	—	—	—
RE02-10-22115	02-612445	4–4.2	ALLH	—	—	—	—	—	—	—	—	—	10-4265	—	—	—	—	—
RE02-10-22116	02-612445	6–6.2	ALLH	—	—	—	—	—	—	—	—	—	10-4265	—	—	—	—	—
RE02-10-22118	02-612446	4–4.2	ALLH	—	—	—	—	—	—	—	—	—	10-4265	—	—	—	—	—
RE02-10-22119	02-612446	5–5.5	ALLH	—	—	—	—	—	—	—	—	—	10-4265	—	—	—	—	—
RE02-10-22121	02-612447	3–3.2	ALLH	—	—	—	—	—	—	—	—	—	10-4265	—	—	—	—	—
RE02-10-22124	02-612448	4–4.2	ALLH	—	—	—	—	—	—	—	—	—	10-4285	—	—	—	—	—
RE02-10-22125	02-612448	6–6.2	ALLH	—	—	—	—	—	—	—	—	—	10-4285	—	—	—	—	—
RE02-11-319	02-613289	4–4.2	ALLH	—	—	—	—	—	—	—	—	—	11-209	—	—	—	—	—
RE02-11-320	02-613289	6–6.2	ALLH	—	—	—	—	—	—	—	—	—	11-209	—	—	—	—	—
RE02-11-325	02-613292	4–4.2	ALLH	—	—	—	—	—	—	—	—	—	11-235	—	—	—	—	—
RE02-11-1526	02-613571	15–16	QBO	—	—	—	11-311	11-311	11-312	11-311	11-311	11-312	11-311	—	—	11-311	—	—
RE02-11-1527	02-613571	25–26	QBO	—	—	—	11-311	11-311	11-312	11-311	11-311	11-312	11-311	—	—	11-311	—	—
RE02-11-1528	02-613571	35–37	QBO	—	—	—	11-311	11-311	11-312	11-311	11-311	11-312	11-311	—	—	11-311	—	—
RE02-11-1529	02-613571	49–50	QBO	—	—	—	11-311	11-311	11-312	11-311	11-311	11-312	11-311	—	—	11-311	—	—
RE02-11-1525	02-613571	5–6	QAL	—	—	—	11-311	11-311	11-312	11-311	11-311	11-312	11-311	—	—	11-311	—	—
RE02-07-1876	02-600449	0–0.5	ALLH	07-532	07-532	07-526	07-532	07-532	—	07-532	07-532	07-532	07-532	07-532	07-532	07-532	—	07-532
RE02-07-1877	02-600449	2–4.5	QAL	07-956	07-956	07-955	07-956	07-956	—	07-956	07-956	07-956	07-956	07-956	07-956	07-956	07-956	07-956
RE02-07-1878	02-600449	4.5–9.5	QAL	07-956	07-956	07-955	07-956	07-956	—	07-956	07-956	07-956	07-956	07-956	07-956	07-956	07-956	07-956
RE02-10-22130	02-600449	6–6.2	ALLH	—	—	—	—	—	—	—	—	—	10-4285	—	—	—	—	—
RE02-10-22133	02-612451	6–6.2	ALLH	—	—	—	—	—	—	—	—	—	10-4285	—	—	—	—	—
RE02-10-22136	02-612452	6–6.2	ALLH	—	—	—	—	—	—	—	—	—	10-4285	—	—	—	—	—
RE02-10-22137	02-612452	8–8.2	ALLH	—	—	—	—	—	—	—	—	—	10-4285	—	—	—	—	—
RE02-10-22139	02-612453	6–6.2	ALLH	—	—	—	—	—	—	—	—	—	10-4285	—	—	—	—	—
RE02-10-22140	02-612453	8–8.2	ALLH	—	—	—	—	—	—	—	—	—	10-4285	—	—	—	—	—
RE02-10-26105	02-613001	6–6.5	ALLH	—	—	—	—	—	—	—	—	—	10-4454	—	—	—	—	—

Table 6.29-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Dioxins/Furans	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
RE02-10-26106	02-613001	7–7.5	ALLH	—	—	—	—	—	—	—	—	—	10-4454	—	—	—	—	—
RE02-10-26107	02-613002	6–6.5	ALLH	—	—	—	—	—	—	—	—	—	10-4454	—	—	—	—	—
RE02-10-26108	02-613002	8–8.5	ALLH	—	—	—	—	—	—	—	—	—	10-4454	—	—	—	—	—
RE02-10-26638	02-613122	2–2.2	ALLH	—	—	—	—	—	—	—	—	—	10-4707	—	—	—	—	—
RE02-10-26639	02-613122	4–4.2	ALLH	—	—	—	—	—	—	—	—	—	10-4707	—	—	—	—	—
RE02-10-26640	02-613124	6–6.2	ALLH	—	—	—	—	—	—	—	—	—	10-4707	—	—	—	—	—
RE02-10-26641	02-613124	8–8.2	ALLH	—	—	—	—	—	—	—	—	—	10-4707	—	—	—	—	—
RE02-11-315	02-613287	6–6.2	ALLH	—	—	—	—	—	—	—	—	—	11-186	—	—	—	—	—
RE02-11-316	02-613287	8–8.2	ALLH	—	—	—	—	—	—	—	—	—	11-186	—	—	—	—	—
RE02-11-317	02-613288	6–6.2	ALLH	—	—	—	—	—	—	—	—	—	11-186	—	—	—	—	—
RE02-11-318	02-613288	8–8.2	ALLH	—	—	—	—	—	—	—	—	—	11-186	—	—	—	—	—
RE02-11-1526	02-613571	15–16	QBO	—	—	—	11-311	11-311	11-312	11-311	11-311	11-312	11-311	—	—	11-311	—	—
RE02-11-1527	02-613571	25–26	QBO	—	—	—	11-311	11-311	11-312	11-311	11-311	11-312	11-311	—	—	11-311	—	—
RE02-11-1528	02-613571	35–37	QBO	—	—	—	11-311	11-311	11-312	11-311	11-311	11-312	11-311	—	—	11-311	—	—
RE02-11-1529	02-613571	49–50	QBO	—	—	—	11-311	11-311	11-312	11-311	11-311	11-312	11-311	—	—	11-311	—	—
RE02-11-1525	02-613571	5–6	QAL	—	—	—	11-311	11-311	11-312	11-311	11-311	11-312	11-311	—	—	11-311	—	—
RE02-11-2219	02-613626	10–11	ALLH	—	—	—	—	—	—	—	—	—	11-541	—	—	—	—	—
RE02-11-2218	02-613626	8–9	ALLH	—	—	—	—	—	—	—	—	—	11-541	—	—	—	—	—
RE02-11-2222	02-613627	10–11	ALLH	—	—	—	—	—	—	—	—	—	11-686	—	—	—	—	—
RE02-11-2220	02-613627	6–7	ALLH	—	—	—	—	—	—	—	—	—	11-541	—	—	—	—	—
RE02-11-2221	02-613627	8–9	ALLH	—	—	—	—	—	—	—	—	—	11-541	—	—	—	—	—
RE02-11-2525	02-613667	10–10.2	ALLH	—	—	—	—	—	—	—	—	—	11-687	—	—	—	—	—
RE02-11-2523	02-613667	6–6.2	ALLH	—	—	—	—	—	—	—	—	—	11-687	—	—	—	—	—
RE02-11-2524	02-613667	8–8.2	ALLH	—	—	—	—	—	—	—	—	—	11-687	—	—	—	—	—
RE02-11-2527	02-613668	10–10.2	ALLH	—	—	—	—	—	—	—	—	—	11-729	—	—	—	—	—
RE02-11-2526	02-613668	8–8.2	ALLH	—	—	—	—	—	—	—	—	—	11-729	—	—	—	—	—
RE02-11-2797	02-613699	10–10.2	QBT3	—	—	—	—	—	—	—	—	—	11-904	—	—	—	—	—
RE02-11-2798	02-613699	12–12.2	QBT3	—	—	—	—	—	—	—	—	—	11-904	—	—	—	—	—
RE02-11-2795	02-613699	6–6.2	QBT3	—	—	—	—	—	—	—	—	—	11-904	—	—	—	—	—
RE02-11-2796	02-613699	8–8.2	QBT3	—	—	—	—	—	—	—	—	—	11-904	—	—	—	—	—
RE02-11-2800	02-613700	10–10.2	ALLH	—	—	—	—	—	—	—	—	—	11-904	—	—	—	—	—
RE02-11-2801	02-613700	12–12.2	ALLH	—	—	—	—	—	—	—	—	—	11-904	—	—	—	—	—
RE02-11-3145	02-613700	14–14.2	ALLH	—	—	—	—	—	—	—	—	—	11-1006	—	—	—	—	—
RE02-11-2799	02-613700	8–8.2	ALLH	—	—	—	—	—	—	—	—	—	11-904	—	—	—	—	—
RE02-11-3148	02-613761	10–10.2	ALLH	—	—	—	—	—	—	—	—	—	11-1009	—	—	—	—	—
RE02-11-3149	02-613761	12–12.2	QBT3	—	—	—	—	—	—	—	—	—	11-1009	—	—	—	—	—

Table 6.29-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Dioxins/Furans	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
RE02-11-3150	02-613761	14–14.2	QBT3	—	—	—	—	—	—	—	—	—	11-1009	—	—	—	—	—
RE02-11-3146	02-613761	6–6.2	ALLH	—	—	—	—	—	—	—	—	—	11-1009	—	—	—	—	—
RE02-11-3147	02-613761	8–8.2	ALLH	—	—	—	—	—	—	—	—	—	11-1009	—	—	—	—	—
RE02-11-3177	02-613762	0–0.5	ALLH	—	—	—	—	—	—	—	—	—	11-1006	—	—	—	—	—
RE02-07-1630	02-600406	15–19.5	QBO	07-924	07-923	07-922	07-924	07-924	—	07-924	07-924	07-923	07-921	07-923	07-924	07-921	07-921	07-923
RE02-07-1629	02-600406	4.5–13	QAL	07-924	07-923	07-922	07-924	07-924	—	07-924	07-924	07-923	07-921	07-923	07-924	07-921	07-921	07-923
RE02-07-1632	02-600407	0–0.5	ALLH	07-553	07-552	07-603	07-553	07-553	—	07-553	07-553	07-552	07-551	07-552	07-553	07-551	—	07-552
RE02-07-1634	02-600407	10–15	QBO	07-924	07-923	07-922	07-924	07-924	—	07-924	07-924	07-923	07-921	07-923	07-924	07-921	07-921	07-923
RE02-07-1633	02-600407	4.5–10	QAL	07-924	07-923	07-922	07-924	07-924	—	07-924	07-924	07-923	07-921	07-923	07-924	07-921	07-921	07-923
RE02-07-1636	02-600408	0–0.5	ALLH	07-553	07-552	07-603	07-553	07-553	—	07-553	07-553	07-552	07-551	07-552	07-553	07-551	—	07-552
RE02-10-22094	02-612438	2–2.2	ALLH	—	—	—	—	—	—	—	—	—	10-4151	—	—	—	—	—
RE02-10-22095	02-612438	4–4.2	ALLH	—	—	—	—	—	—	—	—	—	10-4151	—	—	—	—	—
RE02-10-22097	02-612439	2–2.2	ALLH	—	—	—	—	—	—	—	—	—	10-4151	—	—	—	—	—
RE02-10-22098	02-612439	4–4.4	ALLH	—	—	—	—	—	—	—	—	—	10-4151	—	—	—	—	—
RE02-10-22101	02-612440	4–4.4	ALLH	—	—	—	—	—	—	—	—	—	10-4151	—	—	—	—	—
RE02-10-26109	02-613003	2–2.5	ALLH	—	—	—	—	—	—	—	—	—	10-4454	—	—	—	—	—
RE02-10-26110	02-613003	4–4.5	ALLH	—	—	—	—	—	—	—	—	—	10-4454	—	—	—	—	—
RE02-11-1526	02-613571	15–16	QBO	—	—	—	11-311	11-311	11-312	11-311	11-311	11-312	11-311	—	—	11-311	—	—
RE02-11-1527	02-613571	25–26	QBO	—	—	—	11-311	11-311	11-312	11-311	11-311	11-312	11-311	—	—	11-311	—	—
RE02-11-1528	02-613571	35–37	QBO	—	—	—	11-311	11-311	11-312	11-311	11-311	11-312	11-311	—	—	11-311	—	—
RE02-11-1529	02-613571	49–50	QBO	—	—	—	11-311	11-311	11-312	11-311	11-311	11-312	11-311	—	—	11-311	—	—
RE02-11-1525	02-613571	5–6	QAL	—	—	—	11-311	11-311	11-312	11-311	11-311	11-312	11-311	—	—	11-311	—	—
RE02-07-2508	02-600563	0–0.5	ALLH	07-566	07-566	07-598	07-566	07-566	—	07-566	07-566	07-566	07-566	07-566	07-566	07-566	—	07-566
RE02-07-2511	02-600563	10–15	QAL	07-884	07-884	07-883	07-884	07-884	—	07-884	07-884	07-884	07-884	07-884	07-884	07-884	07-884	07-884
RE02-07-2510	02-600563	15–22.5	QBO	07-884	07-884	07-883	07-884	07-884	—	07-884	07-884	07-884	07-884	07-884	07-884	07-884	07-884	07-884
RE02-07-2509	02-600563	4.5–10	QAL	07-884	07-884	07-883	07-884	07-884	—	07-884	07-884	07-884	07-884	07-884	07-884	07-884	07-884	07-884
RE02-10-21748	02-612346	15–16	QAL	—	—	—	10-4694	10-4694	10-4693	10-4694	10-4694	10-4693	10-4693	—	—	10-4693	—	—
RE02-10-21749	02-612346	25–26	QBO	—	—	—	10-4694	10-4694	10-4693	10-4694	10-4694	10-4693	10-4693	—	—	10-4693	—	—
RE02-10-21750	02-612346	35–36	QBO	—	—	—	10-4694	10-4694	10-4693	10-4694	10-4694	10-4693	10-4693	—	—	10-4693	—	—
RE02-10-21751	02-612346	49–50	QBO	—	—	—	10-4694	10-4694	10-4693	10-4694	10-4694	10-4693	10-4693	—	—	10-4693	—	—
RE02-10-21747	02-612346	8–9	QAL	—	—	—	10-4701	10-4701	10-4701	10-4701	10-4701	10-4701	10-4701	—	—	10-4701	—	—
RE02-10-22080	02-600450	4–4.2	ALLH	—	—	—	—	—	—	—	—	—	10-4127	—	—	—	—	—
RE02-07-1883	02-600450	4.5–10	QAL	07-901	07-901	07-913	07-901	07-901	—	07-901	07-901	07-901	07-901	07-901	07-901	07-901	07-901	07-901
RE02-07-1886	02-600451	0–0.5	ALLH	07-538	07-538	—	07-538	07-538	—	07-538	07-538	07-538	07-538	07-538	07-538	07-538	—	07-538
RE02-07-1889	02-600451	12.5–15	QBO	07-896	07-896	07-912	07-896	07-896	—	07-896	07-896	07-896	07-896	07-896	07-896	07-896	07-896	07-896
RE02-07-1888	02-600451	17–22	QBO	07-896	07-896	07-912	07-896	07-896	—	07-896	07-896	07-896	07-896	07-896	07-896	07-896	07-896	07-896

Table 6.29-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Dioxins/Furans	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
RE02-07-1887	02-600451	4.5–10	QAL	07-896	07-896	07-912	07-896	07-896	—	07-896	07-896	07-896	07-896	07-896	07-896	07-896	07-896	07-896
RE02-10-22083	02-612434	4–4.4	ALLH	—	—	—	—	—	—	—	—	—	10-4151	—	—	—	—	—
RE02-10-22086	02-612435	4–4.2	ALLH	—	—	—	—	—	—	—	—	—	10-4151	—	—	—	—	—
RE02-10-22089	02-612436	4–4.2	ALLH	—	—	—	—	—	—	—	—	—	10-4151	—	—	—	—	—
RE02-10-22092	02-612437	4–4.4	ALLH	—	—	—	—	—	—	—	—	—	10-4151	—	—	—	—	—
RE02-10-26634	02-613118	2–2.2	ALLH	—	—	—	—	—	—	—	—	—	10-4707	—	—	—	—	—
RE02-10-26636	02-613120	2–2.2	ALLH	—	—	—	—	—	—	—	—	—	10-4707	—	—	—	—	—
RE02-10-26637	02-613121	2–2.2	ALLH	—	—	—	—	—	—	—	—	—	10-4707	—	—	—	—	—
RE02-11-1526	02-613571	15–16	QBO	—	—	—	11-311	11-311	11-312	11-311	11-311	11-312	11-311	—	—	11-311	—	—
RE02-11-1527	02-613571	25–26	QBO	—	—	—	11-311	11-311	11-312	11-311	11-311	11-312	11-311	—	—	11-311	—	—
RE02-11-1528	02-613571	35–37	QBO	—	—	—	11-311	11-311	11-312	11-311	11-311	11-312	11-311	—	—	11-311	—	—
RE02-11-1529	02-613571	49–50	QBO	—	—	—	11-311	11-311	11-312	11-311	11-311	11-312	11-311	—	—	11-311	—	—
RE02-11-1525	02-613571	5–6	QAL	—	—	—	11-311	11-311	11-312	11-311	11-311	11-312	11-311	—	—	11-311	—	—
RE02-10-22185	02-600532	2–2.2	ALLH	—	—	—	—	—	—	—	—	—	10-4635	—	—	10-4635	—	—
RE02-10-22186	02-600532	4–4.2	ALLH	—	—	—	—	—	—	—	—	—	10-4639	—	—	10-4639	—	—
RE02-07-2359	02-600532	4.5–9.5	QAL	07-882	07-881	07-879	07-882	07-882	—	07-882	07-882	07-881	07-880	07-881	07-882	07-880	07-880	07-881
RE02-07-2361	02-600532	9.5–12.5	QAL	07-882	07-881	07-879	07-882	07-882	—	07-882	07-882	07-881	07-880	07-881	07-882	07-880	07-880	07-881
RE02-07-2362	02-600533	0–0.5	ALLH	07-567	07-567	07-599	07-567	07-567	—	07-567	07-567	07-567	07-567	07-567	07-567	07-567	—	07-567
RE02-07-2365	02-600533	10–15	QAL	07-882	07-881	07-879	07-882	07-882	—	07-882	07-882	07-881	07-880	07-881	07-882	07-880	07-880	07-881
RE02-07-2364	02-600533	15–20	QBO	07-882	07-881	07-879	07-882	07-882	—	07-882	07-882	07-881	07-880	07-881	07-882	07-880	07-880	07-881
RE02-07-2363	02-600533	4.5–10	QAL	07-882	07-881	07-879	07-882	07-882	—	07-882	07-882	07-881	07-880	07-881	07-882	07-880	07-880	07-881
RE02-07-6828	02-600534	0–0.5	ALLH	07-1151	07-1151	07-1150	07-1151	07-1151	—	07-1151	07-1151	07-1151	07-1151	07-1151	07-1151	07-1151	—	07-1151
RE02-07-2369	02-600534	14.5–20	QBO	07-868	07-868	07-867	07-868	07-868	—	07-868	07-868	07-868	07-868	07-868	07-868	07-868	07-868	07-868
RE02-07-2368	02-600534	4.5–14.5	QAL	07-868	07-868	07-867	07-868	07-868	—	07-868	07-868	07-868	07-868	07-868	07-868	07-868	07-868	07-868
RE02-10-22188	02-612465	2–2.2	ALLH	—	—	—	—	—	—	—	—	—	10-4635	—	—	10-4635	—	—
RE02-10-22198	02-612465	4–4.2	ALLH	—	—	—	—	—	—	—	—	—	10-4639	—	—	10-4639	—	—
RE02-10-22191	02-612466	2–2.2	ALLH	—	—	—	—	—	—	—	—	—	10-4635	—	—	10-4635	—	—
RE02-10-22195	02-612466	4–4.2	ALLH	—	—	—	—	—	—	—	—	—	10-4639	—	—	10-4639	—	—
RE02-10-22194	02-612467	2–2.2	ALLH	—	—	—	—	—	—	—	—	—	10-4635	—	—	10-4635	—	—
RE02-10-22192	02-612467	4–4.2	ALLH	—	—	—	—	—	—	—	—	—	10-4639	—	—	10-4639	—	—
RE02-10-22197	02-612468	2–2.2	ALLH	—	—	—	—	—	—	—	—	—	10-4635	—	—	10-4635	—	—
RE02-10-22189	02-612468	4–4.2	ALLH	—	—	—	—	—	—	—	—	—	10-4639	—	—	10-4639	—	—

[a] — = Analysis not requested.

[b] Analytical request number.

Table 6.29-2
Inorganic Chemicals Detected or Detected above BVs at AOC 02-011(a)(i,ii,iii,iv,v,vi)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Chromium	Copper	Hexavalent Chromium	Iron	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**2.6**	**3.96**	**na[b]**	**3700**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**4.95**	**40**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**19.3**	**14.7**	**na**	**21500**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**48.8**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**505[d]**	**51,900**	**72.1**	**908,000**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**281[d]**	**21,800**	**40.2**	**434,000**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**156,00**	**70.5**	**96.6[d]**	**3130**	**3.05**	**54,800**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**394**	**23500**
RE02-07-1572	02-600387	0–0.5	SOIL	—[f]	—	—	—	—	—	—	NA[g]	—	—	—	—	1.71 (J-)	—	—	—	78.2
RE02-07-1573	02-600387	2–2.6	QAL	—	—	—	—	0.497 (U)	—	—	NA	—	—	—	—	1.77 (J-)	0.000813 (J)	—	—	—
RE02-11-1525	02-613571	5–6	QAL	—	—	—	—	0.514 (U)	—	—	—	—	—	—	—	NA	NA	—	—	50.1
RE02-11-1526	02-613571	15–16	QBO	7070 (J+)	1.16 (U)	1.04 (U)	—	0.58 (U)	—	—	—	4550	—	—	—	NA	NA	1.04 (U)	—	—
RE02-11-1527	02-613571	25–26	QBO	—	1.22 (U)	1.1 (U)	—	0.608 (U)	—	—	—	4960	—	—	—	NA	NA	1.1 (U)	—	—
RE02-11-1528	02-613571	35–37	QBO	—	1.19 (U)	1.2 (U)	—	0.593 (U)	—	—	—	5980	215	—	—	NA	NA	1.2 (U)	—	—
RE02-11-1529	02-613571	49–50	QBO	—	1.19 (U)	1.12 (U)	—	0.597 (U)	—	—	—	5230	198	—	—	NA	NA	1.12 (U)	—	—
RE02-07-1876	02-600449	0–0.5	SOIL	—	—	—	—	—	—	—	NA	—	—	0.472	—	1.01 (J)	—	—	—	—
RE02-07-1877	02-600449	2–4.5	QAL	—	—	—	—	0.552 (U)	—	—	NA	—	—	0.173	—	1.87	—	—	—	—
RE02-07-1878	02-600449	4.5–9.5	QAL	—	—	—	—	0.517 (U)	—	—	NA	—	—	—	—	—	—	—	—	—
RE02-11-1525	02-613571	5–6	QAL	—	5.14 (U)	—	—	0.514 (U)	—	—	—	—	—	—	—	NA	NA	—	—	50.1
RE02-11-1526	02-613571	15–16	QBO	7070 (J+)	1.16 (U)	1.04 (U)	—	0.58 (U)	—	—	—	4550	—	—	—	NA	NA	1.04 (U)	—	—
RE02-11-1527	02-613571	25–26	QBO	—	1.22 (U)	1.1 (U)	—	0.608 (U)	—	—	—	4960	—	—	—	NA	NA	1.1 (U)	—	—
RE02-11-1528	02-613571	35–37	QBO	—	1.19 (U)	1.2 (U)	—	0.593 (U)	—	—	—	5980	215	—	—	NA	NA	1.2 (U)	—	—
RE02-11-1529	02-613571	49–50	QBO	—	1.19 (U)	1.12 (U)	—	0.597 (U)	—	—	—	5230	198	—	—	NA	NA	1.12 (U)	—	—
RE02-07-1629	02-600406	4.5–13	QAL	—	—	—	—	0.544 (U)	19.9	—	NA	—	—	—	—	-	—	1.63 (U)	—	—
RE02-07-1630	02-600406	15–19.5	QBO	11000	—	1.82 (U)	30.5	0.605 (U)	4.01	—	NA	6260	193	—	—	2.03	—	1.82 (U)	—	—
RE02-07-1632	02-600407	0–0.5	SOIL	—	—	—	—	—	—	—	NA	—	—	—	—	1.42	—	—	—	59.8
RE02-07-1633	02-600407	4.5–10	QAL	—	—	—	—	0.543 (U)	—	—	NA	—	—	—	—	—	—	1.63 (U)	—	—
RE02-07-1634	02-600407	10–15	QBO	6430	—	1.1 (J)	52.5	0.56 (U)	12.7	—	NA	7450	298	—	3.06	1.15 (J)	—	1.68 (U)	7.39 (J)	—
RE02-07-1636	02-600408	0–0.5	SOIL	—	—	—	—	0.508 (U)	—	—	NA	—	—	—	—	11	0.00131 (J)	—	—	—
RE02-11-1525	02-613571	5–6	QAL	—	5.14 (U)	—	—	0.514 (U)	—	—	—	—	—	—	—	NA	NA	—	—	50.1
RE02-11-1526	02-613571	15–16	QBO	7070 (J+)	1.16 (U)	1.04 (U)	—	0.58 (U)	—	—	—	4550	—	—	—	NA	NA	1.04 (U)	—	—
RE02-11-1527	02-613571	25–26	QBO	—	1.22 (U)	1.1 (U)	—	0.608 (U)	—	—	—	4960	—	—	—	NA	NA	1.1 (U)	—	—
RE02-11-1528	02-613571	35–37	QBO	—	1.19 (U)	1.2 (U)	—	0.593 (U)	—	—	—	5980	215	—	—	NA	NA	1.2 (U)	—	—
RE02-11-1529	02-613571	49–50	QBO	—	1.19 (U)	1.12 (U)	—	0.597 (U)	—	—	—	5230	198	—	—	NA	NA	1.12 (U)	—	—
RE02-07-2508	02-600563	0–0.5	SOIL	—	—	—	—	—	—	—	NA	—	—	1.27	—	1.78 (J-)	—	—	—	—
RE02-07-2509	02-600563	4.5–10	QAL	—	—	—	—	0.533 (U)	—	—	NA	—	—	0.198	—	1.07	—	—	—	—
RE02-07-2511	02-600563	10–15	QAL	—	—	—	—	0.61 (U)	21.3 (J)	—	NA	—	—	—	—	—	—	1.83 (U)	—	—
RE02-07-2510	02-600563	15–22.5	QBO	11300	0.513 (UJ)	1.88 (U)	74.3	0.627 (U)	8.08 (J)	—	NA	6830	253 (J-)	—	2.27	—	—	1.88 (U)	—	—

Table 6.29-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Chromium	Copper	Hexavalent Chromium	Iron	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**2.6**	**3.96**	**na**	**3700**	**189**	**0.1**	**2**	**na[b]**	**na**	**0.3**	**4.95**	**40**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**19.3**	**14.7**	**na**	**21500**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**48.8**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**505[d]**	**51,900**	**72.1**	**908,000**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6530**	**389,000**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**281[d]**	**21,800**	**40.2**	**434,000**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**156,00**	**70.5**	**96.6[d]**	**3130**	**3.05**	**54,800**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**394**	**23500**
RE02-10-21747	02-612346	8–9	QAL	—	1.05 (U)	—	—	0.525 (U)	—	—	—	—	—	40.6	—	NA	NA	—	—	—
RE02-10-21748	02-612346	15–16	QAL	—	1.11 (U)	—	—	0.555 (U)	—	—	0.448 (J)	—	—	5.87	—	NA	NA	—	—	—
RE02-10-21749	02-612346	25–26	QBO	3820	1.25 (U)	1.22 (U)	—	0.625 (U)	—	—	—	6340	226	0.148	—	NA	NA	1.22 (U)	—	—
RE02-10-21750	02-612346	35–36	QBO	—	1.28 (U)	1.28 (U)	—	0.642 (U)	—	—	—	5340	195	0.154	—	NA	NA	1.28 (U)	—	—
RE02-10-21751	02-612346	49–50	QBO	—	1.15 (U)	1.19 (U)	—	0.573 (U)	—	—	—	5990	260	—	—	NA	NA	1.19 (U)	—	—
RE02-07-1883	02-600450	4.5–10	QAL	—	—	—	—	0.535 (U)	—	—	NA	—	—	—	—	—	—	1.61 (U)	—	—
RE02-07-1886	02-600451	0–0.5	SOIL	—	—	—	—	—	—	—	NA	—	—	0.703	—	1.51 (J-)	—	—	—	—
RE02-07-1887	02-600451	4.5–10	QAL	—	—	—	—	—	—	—	NA	—	—	0.397	—	1.63 (J-)	—	1.67 (U)	—	—
RE02-07-1889	02-600451	12.5–15	QBO	—	—	0.83 (J)	—	0.556 (U)	19.9	4.13	NA	6050	191 (J+)	-	3.44	—	—	0.758 (J)	7.56	—
RE02-07-1888	02-600451	17–22	QBO	5840	—	1.85 (U)	—	—	13.4	—	NA	5550 (J)	—	—	—	—	—	0.899 (J)	—	—
RE02-11-1525	02-613571	5–6	QAL	—	5.14 (U)	-	—	0.514 (U)	—	—	—	-	—	—	—	NA	NA	—	—	50.1
RE02-11-1526	02-613571	15–16	QBO	7070 (J+)	1.16 (U)	1.04 (U)	—	0.58 (U)	—	—	—	4550	—	—	—	NA	NA	1.04 (U)	—	—
RE02-11-1527	02-613571	25–26	QBO	—	1.22 (U)	1.1 (U)	—	0.608 (U)	—	—	—	4960	—	—	—	NA	NA	1.1 (U)	—	—
RE02-11-1528	02-613571	35–37	QBO	—	1.19 (U)	1.2 (U)	—	0.593 (U)	—	—	—	5980	215	—	—	NA	NA	1.2 (U)	—	—
RE02-11-1529	02-613571	49–50	QBO	—	1.19 (U)	1.12 (U)	—	0.597 (U)	—	—	—	5230	198	—	—	NA	NA	1.12 (U)	—	—
RE02-07-2359	02-600532	4.5–9.5	QAL	—	—	—	—	0.524 (U)	—	—	NA	—	—	0.751	—	1.9	—	1.57 (U)	—	—
RE02-07-2361	02-600532	9.5–12.5	QAL	—	—	—	—	0.546 (U)	—	—	NA	—	—	—	—	—	—	1.64 (U)	—	—
RE02-07-2362	02-600533	0–0.5	SOIL	—	—	—	—	0.511 (U)	—	—	NA	—	—	6.57	—	—	0.000599 (J)	—	—	—
RE02-07-2363	02-600533	4.5–10	QAL	—	—	—	—	0.536 (U)	—	—	NA	—	—	—	—	1.29	—	1.61 (U)	—	—
RE02-07-2365	02-600533	10–15	QAL	—	—	—	—	0.555 (U)	27 (J)	—	NA	—	—	—	—	—	—	—	—	—
RE02-07-2364	02-600533	15–20	QBO	7260	0.515 (UJ)	0.765 (J)	—	0.654 (U)	18.9 (J)	4.53 (J)	NA	7190	196 (J-)	—	3	—	—	1.96 (U)	—	—
RE02-07-6828	02-600534	0–0.5	SOIL	—	—	—	—	0.526 (U)	—	—	NA	—	—	0.835 (J)	—	—	—	—	—	—
RE02-07-2368	02-600534	4.5–14.5	QAL	—	—	—	—	0.527 (U)	—	—	NA	—	—	—	—	—	—	—	—	—
RE02-07-2369	02-600534	14.5–20	QBO	11500	—	2.36	97.1	0.582 (U)	15.3	4.17	NA	6400	224 (J+)	—	4.64 (J+)	—	0.000773 (J)	1.76	4.83	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 6.29-3
Organic Chemicals Detected at AOC 02-011(a)(i,ii,iii,iv,v,vi)

Field 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	Benzo(k)fluoranthene	Chloroform	Chrysene
Industrial SSL[a]				**50,500**	**253,000**	**10.9**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**28.4**	**3230**
Recreational SSL[c]				**17,300**	**863,000**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**888**	**204**	**8880**
Residential SSL[a]				**3480**	**17,400**	**2.22**	**1.12**	**2.22**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**5.85**	**153**
RE02-10-22127	02-600385	4–4.2	SOIL	NA[d]	NA	—[e]	—	0.0346	NA	NA	NA	NA	NA	NA	NA
RE02-10-22128	02-600385	6–6.2	SOIL	NA	NA	—	—	0.378	NA	NA	NA	NA	NA	NA	NA
RE02-10-22111	02-600386	11–11.2	QAL	NA	NA	—	—	0.0116	NA	NA	NA	NA	NA	NA	NA
RE02-07-1572	02-600387	0–0.5	SOIL	—	0.00903 (J)	—	0.234	0.553	0.0516	0.0551	0.0702	0.0271 (J)	0.041	NA	0.0598
RE02-07-1573	02-600387	2–2.6	QAL	—	0.00727 (J)	—	0.0532	0.105	0.032 (J)	0.0332 (J)	0.0424	0.0222 (J)	0.0219 (J)	—	0.0386
RE02-10-22112	02-612444	3.5–4	SOIL	NA	NA	—	—	0.208	NA	NA	NA	NA	NA	NA	NA
RE02-10-22115	02-612445	4–4.2	SOIL	NA	NA	—	—	0.0781	NA	NA	NA	NA	NA	NA	NA
RE02-10-22116	02-612445	6–6.2	SOIL	NA	NA	—	—	0.0222	NA	NA	NA	NA	NA	NA	NA
RE02-10-22118	02-612446	4–4.2	SOIL	NA	NA	—	0.236	0.49	NA	NA	NA	NA	NA	NA	NA
RE02-10-22119	02-612446	5–5.5	SOIL	NA	NA	—	0.356	0.668	NA	NA	NA	NA	NA	NA	NA
RE02-10-22121	02-612447	3–3.2	SOIL	NA	NA	—	0.337	0.732	NA	NA	NA	NA	NA	NA	NA
RE02-10-22124	02-612448	4–4.2	SOIL	NA	NA	—	—	0.0361	NA	NA	NA	NA	NA	NA	NA
RE02-10-22125	02-612448	6–6.2	SOIL	NA	NA	—	—	0.357	NA	NA	NA	NA	NA	NA	NA
RE02-11-319	02-613289	4–4.2	SOIL	NA	NA	—	—	0.68	NA	NA	NA	NA	NA	NA	NA
RE02-11-320	02-613289	6–6.2	SOIL	NA	NA	—	—	3.39	NA	NA	NA	NA	NA	NA	NA
RE02-11-325	02-613292	4–4.2	SOIL	NA	NA	—	—	0.825	NA	NA	NA	NA	NA	NA	NA
RE02-11-1525	02-613571	5–6	QAL	—	—	—	—	0.0154	—	—	—	—	—	NA	—
RE02-07-1876	02-600449	0–0.5	SOIL	0.157	0.367	—	—	28	1.54	1.5 (J)	2.09 (J)	0.557 (J)	—	NA	1.5
RE02-07-1877	02-600449	2–4.5	QAL	—	—	—	—	44.8	—	0.0207 (J)	0.0294 (J)	—	—	—	0.0252 (J)
RE02-07-1878	02-600449	4.5–9.5	QAL	—	—	—	—	0.171	—	—	—	—	—	—	—
RE02-10-22130	02-600449	6–6.2	SOIL	NA	NA	—	—	0.69	NA	NA	NA	NA	NA	NA	NA
RE02-10-22133	02-612451	6–6.2	SOIL	NA	NA	—	—	4	NA	NA	NA	NA	NA	NA	NA
RE02-10-22136	02-612452	6–6.2	SOIL	NA	NA	—	—	1.1	NA	NA	NA	NA	NA	NA	NA
RE02-10-22137	02-612452	8–8.2	SOIL	NA	NA	—	—	2.14	NA	NA	NA	NA	NA	NA	NA
RE02-10-22139	02-612453	6–6.2	SOIL	NA	NA	—	—	0.377	NA	NA	NA	NA	NA	NA	NA
RE02-10-22140	02-612453	8–8.2	SOIL	NA	NA	—	—	0.191	NA	NA	NA	NA	NA	NA	NA
RE02-10-26105	02-613001	6–6.5	SOIL	NA	NA	—	—	0.536	NA	NA	NA	NA	NA	NA	NA
RE02-10-26106	02-613001	7–7.5	SOIL	NA	NA	—	—	5.48	NA	NA	NA	NA	NA	NA	NA
RE02-10-26107	02-613002	6–6.5	SOIL	NA	NA	—	—	7.98	NA	NA	NA	NA	NA	NA	NA
RE02-10-26108	02-613002	8–8.5	SOIL	NA	NA	—	—	1.67	NA	NA	NA	NA	NA	NA	NA

Table 6.29-3 (continued)

Field 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	Benzo(k)fluoranthene	Chloroform	Chrysene
Industrial SSL[a]				**50,500**	**253,000**	**10.9**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**28.4**	**3230**
Recreational SSL[c]				**17,300**	**863,000**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**888**	**204**	**8880**
Residential SSL[a]				**3480**	**17,400**	**2.22**	**1.12**	**2.22**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**5.85**	**153**
RE02-10-26638	02-613122	2–2.2	SOIL	NA	NA	—	—	0.328	NA	NA	NA	NA	NA	NA	NA
RE02-10-26639	02-613122	4–4.2	SOIL	NA	NA	—	0.0407 (J)	0.178	NA	NA	NA	NA	NA	NA	NA
RE02-10-26640	02-613124	6–6.2	SOIL	NA	NA	—	—	2.03	NA	NA	NA	NA	NA	NA	NA
RE02-10-26641	02-613124	8–8.2	SOIL	NA	NA	—	0.17	1.24	NA	NA	NA	NA	NA	NA	NA
RE02-11-315	02-613287	6–6.2	SOIL	NA	NA	—	—	13.9	NA	NA	NA	NA	NA	NA	NA
RE02-11-316	02-613287	8–8.2	SOIL	NA	NA	—	—	12.6	NA	NA	NA	NA	NA	NA	NA
RE02-11-317	02-613288	6–6.2	SOIL	NA	NA	—	—	2.48	NA	NA	NA	NA	NA	NA	NA
RE02-11-318	02-613288	8–8.2	SOIL	NA	NA	—	—	1.07	NA	NA	NA	NA	NA	NA	NA
RE02-11-1525	02-613571	5–6	QAL	—	—	—	—	0.0154	—	—	—	—	—	NA	—
RE02-11-2218	02-613626	8–9	SOIL	NA	NA	—	0.197	1.03	NA	NA	NA	NA	NA	NA	NA
RE02-11-2219	02-613626	10–11	SOIL	NA	NA	—	—	3.3	NA	NA	NA	NA	NA	NA	NA
RE02-11-2220	02-613627	6–7	SOIL	NA	NA	—	1.39	7.29	NA	NA	NA	NA	NA	NA	NA
RE02-11-2221	02-613627	8–9	SOIL	NA	NA	—	—	4.16	NA	NA	NA	NA	NA	NA	NA
RE02-11-2222	02-613627	10–11	SOIL	NA	NA	—	—	1.89	NA	NA	NA	NA	NA	NA	NA
RE02-11-2523	02-613667	6–6.2	SOIL	NA	NA	—	7.11	13.3	NA	NA	NA	NA	NA	NA	NA
RE02-11-2524	02-613667	8–8.2	SOIL	NA	NA	—	3.74	6.3	NA	NA	NA	NA	NA	NA	NA
RE02-11-2525	02-613667	10–10.2	SOIL	NA	NA	—	4.93	7.73	NA	NA	NA	NA	NA	NA	NA
RE02-11-2526	02-613668	8–8.2	SOIL	NA	NA	—	—	1.52	NA	NA	NA	NA	NA	NA	NA
RE02-11-2527	02-613668	10–10.2	SOIL	NA	NA	—	—	3.21	NA	NA	NA	NA	NA	NA	NA
RE02-11-2795	02-613699	6–6.2	QBT3	NA	NA	—	6.93	35.8	NA	NA	NA	NA	NA	NA	NA
RE02-11-2796	02-613699	8–8.2	QBT3	NA	NA	—	14.3	65	NA	NA	NA	NA	NA	NA	NA
RE02-11-2797	02-613699	10–10.2	QBT3	NA	NA	—	4.9	24.6	NA	NA	NA	NA	NA	NA	NA
RE02-11-2798	02-613699	12–12.2	QBT3	NA	NA	—	0.636 (J)	3.34	NA	NA	NA	NA	NA	NA	NA
RE02-11-2799	02-613700	8–8.2	SOIL	NA	NA	—	0.0505	0.258	NA	NA	NA	NA	NA	NA	NA
RE02-11-2800	02-613700	10–10.2	SOIL	NA	NA	—	0.0617	0.327	NA	NA	NA	NA	NA	NA	NA
RE02-11-2801	02-613700	12–12.2	SOIL	NA	NA	—	0.256 (J)	1.19	NA	NA	NA	NA	NA	NA	NA
RE02-11-3145	02-613700	14–14.2	SOIL	NA	NA	—	0.779	2.27	NA	NA	NA	NA	NA	NA	NA
RE02-11-3146	02-613761	6–6.2	SOIL	NA	NA	—	—	10.7	NA	NA	NA	NA	NA	NA	NA
RE02-11-3147	02-613761	8–8.2	SOIL	NA	NA	—	—	3.85	NA	NA	NA	NA	NA	NA	NA
RE02-11-3148	02-613761	10–10.2	SOIL	NA	NA	—	—	1.53	NA	NA	NA	NA	NA	NA	NA
RE02-11-3149	02-613761	12–12.2	QBT3	NA	NA	—	—	1.75	NA	NA	NA	NA	NA	NA	NA
RE02-11-3150	02-613761	14–14.2	QBT3	NA	NA	—	—	0.0445	NA	NA	NA	NA	NA	NA	NA

Table 6.29-3 (continued)

Field 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	Benzo(k)fluoranthene	Chloroform	Chrysene
Industrial SSL[a]				**50,500**	**253,000**	**10.9**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**28.4**	**3230**
Recreational SSL[c]				**17,300**	**863,000**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**888**	**204**	**8880**
Residential SSL[a]				**3480**	**17,400**	**2.22**	**1.12**	**2.22**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**5.85**	**153**
RE02-11-3177	02-613762	0–0.5	SOIL	NA	NA	—	—	11.8	NA	NA	NA	NA	NA	NA	NA
RE02-07-1629	02-600406	4.5–13	QAL	—	—	—	—	0.0321	—	—	—	—	—	—	—
RE02-07-1630	02-600406	15–19.5	QBO	—	—	—	—	0.0106	—	—	—	—	—	—	—
RE02-07-1632	02-600407	0–0.5	SOIL	0.144	0.195	—	—	0.172	0.325 (J)	0.352 (J)	0.564 (J)	0.218 (J)	—	NA	0.332 (J)
RE02-07-1633	02-600407	4.5–10	QAL	0.0222 (J)	0.0299 (J)	—	—	0.0884	0.0721	0.0658	0.101	0.0446	—	—	0.0565
RE02-07-1634	02-600407	10–15	QBO	—	—	—	—	0.0025 (J)	—	—	—	—	—	—	—
RE02-07-1636	02-600408	0–0.5	SOIL	0.0134 (J)	0.0234 (J)	—	0.0647	0.102	0.147	0.152	0.281	0.0917	—	NA	0.191
RE02-10-22094	02-612438	2–2.2	SOIL	NA	NA	—	—	0.263	NA	NA	NA	NA	NA	NA	NA
RE02-10-22097	02-612439	2–2.2	SOIL	NA	NA	—	—	0.867	NA	NA	NA	NA	NA	NA	NA
RE02-10-22098	02-612439	4–4.4	SOIL	NA	NA	—	—	0.0076	NA	NA	NA	NA	NA	NA	NA
RE02-10-22101	02-612440	4–4.4	SOIL	NA	NA	0.0162	0.0431	0.0789	NA	NA	NA	NA	NA	NA	NA
RE02-10-26109	02-613003	2–2.5	SOIL	NA	NA	—	—	0.485	NA	NA	NA	NA	NA	NA	NA
RE02-10-26110	02-613003	4–4.5	SOIL	NA	NA	—	—	0.854	NA	NA	NA	NA	NA	NA	NA
RE02-11-1525	02-613571	5–6	QAL	—	—	—	—	0.0154	—	—	—	—	—	NA	—
RE02-07-2508	02-600563	0–0.5	SOIL	—	—	—	0.0556	0.0681	0.0312 (J)	0.0331 (J)	0.0469 (J)	—	—	NA	0.0383 (J)
RE02-07-2509	02-600563	4.5–10	QAL	—	—	—	0.0045	0.0067	—	—	—	—	—	—	—
RE02-07-2511	02-600563	10–15	QAL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2510	02-600563	15–22.5	QBO	—	—	—	—	—	—	—	—	—	—	—	—
RE02-10-21747	02-612346	8–9	QAL	—	—	—	—	0.0046	—	—	—	—	—	NA	—
RE02-10-21748	02-612346	15–16	QAL	—	—	—	0.0068	0.014	—	—	—	—	—	NA	—
RE02-07-1883	02-600450	4.5–10	QAL	—	—	—	—	0.496	—	—	—	—	—	—	—
RE02-07-1886	02-600451	0–0.5	SOIL	0.0211 (J)	0.0395	—	—	0.344	0.0881	0.166	0.148	0.0921 (J)	—	NA	0.0886
RE02-07-1887	02-600451	4.5–10	QAL	—	—	—	0.0475	0.0295	—	—	—	—	—	—	—
RE02-07-1889	02-600451	12.5–15	QBO	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1888	02-600451	17–22	QBO	—	—	—	—	—	—	—	—	—	—	—	—
RE02-10-22083	02-612434	4–4.4	SOIL	NA	NA	—	—	0.0126	NA	NA	NA	NA	NA	NA	NA
RE02-10-22086	02-612435	4–4.2	SOIL	NA	NA	—	0.017	0.0342	NA	NA	NA	NA	NA	NA	NA
RE02-10-22089	02-612436	4–4.2	SOIL	NA	NA	—	—	0.308	NA	NA	NA	NA	NA	NA	NA
RE02-10-22092	02-612437	4–4.4	SOIL	NA	NA	—	—	0.026	NA	NA	NA	NA	NA	NA	NA
RE02-10-26634	02-613118	2–2.2	SOIL	NA	NA	—	—	0.46	NA	NA	NA	NA	NA	NA	NA
RE02-10-26636	02-613120	2–2.2	SOIL	NA	NA	—	—	0.413	NA	NA	NA	NA	NA	NA	NA
RE02-10-26637	02-613121	2–2.2	SOIL	NA	NA	—	—	0.441	NA	NA	NA	NA	NA	NA	NA

Table 6.29-3 (continued)

Field 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	Benzo(k)fluoranthene	Chloroform	Chrysene
Industrial SSL[a]				**50,500**	**253,000**	**10.9**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**28.4**	**3230**
Recreational SSL[c]				**17,300**	**863,000**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**888**	**204**	**8880**
Residential SSL[a]				**3480**	**17,400**	**2.22**	**1.12**	**2.22**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**5.85**	**153**
RE02-11-1525	02-613571	5–6	QAL	—	—	—	—	0.0154	—	—	—	—	—	NA	—
RE02-10-22185	02-600532	2–2.2	SOIL	0.0524 (J)	0.0594 (J)	—	0.174	0.19	0.213 (J)	0.238 (J)	0.419 (J)	0.133 (J)	—	NA	0.248 (J)
RE02-10-22186	02-600532	4–4.2	SOIL	0.00629 (J)	0.00814 (J)	—	0.0175	0.0294	0.0444 (J)	0.0529 (J)	0.064 (J)	0.0366 (J)	—	NA	0.0481 (J)
RE02-07-2359	02-600532	4.5–9.5	QAL	—	—	—	0.0381	0.0652	—	—	0.011 (J)	—	—	—	—
RE02-07-2361	02-600532	9.5–12.5	QAL	—	—	—	0.0023 (J)	0.0055	—	—	—	—	—	—	—
RE02-07-2362	02-600533	0–0.5	SOIL	—	0.00906 (J)	—	—	—	—	0.071	0.101	0.0358	—	NA	0.0612
RE02-07-2363	02-600533	4.5–10	QAL	—	—	—	—	—	—	—	—	—	—	0.000237 (J)	—
RE02-07-2365	02-600533	10–15	QAL	—	—	—	—	0.0018 (J)	—	—	—	—	—	—	—
RE02-07-2364	02-600533	15–20	QBO	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-6828	02-600534	0–0.5	SOIL	—	0.0376 (J)	—	—	—	—	0.259	0.369	—	—	NA	0.197
RE02-07-2368	02-600534	4.5–14.5	QAL	—	—	—	—	0.0021 (J)	—	—	—	—	—	—	—
RE02-07-2369	02-600534	14.5–20	QBO	—	—	—	—	0.0017 (J)	—	—	—	—	—	—	—
RE02-10-22188	02-612465	2–2.2	SOIL	—	0.0629 (J)	—	0.112	0.131	0.206 (J)	0.231 (J)	0.384 (J)	0.15 (J)	—	NA	0.238 (J)
RE02-10-22198	02-612465	4–4.2	SOIL	—	0.0223 (J)	—	0.0097	0.0144	0.0632 (J)	—	0.141 (J)	0.0483 (J)	—	NA	0.0669 (J)
RE02-10-22191	02-612466	2–2.2	SOIL	—	0.0099 (J)	—	—	0.0231	0.148 (J)	0.133 (J)	0.248 (J)	0.0523 (J)	—	NA	0.16 (J)
RE02-10-22195	02-612466	4–4.2	SOIL	—	—	—	0.0614	0.109	0.0959 (J)	0.11 (J)	0.206 (J)	0.0497 (J)	—	NA	0.0995 (J)
RE02-10-22194	02-612467	2–2.2	SOIL	—	—	—	0.13	0.112	0.0793 (J)	0.112 (J)	0.187 (J)	0.0793 (J)	—	NA	0.0829 (J)
RE02-10-22192	02-612467	4–4.2	SOIL	—	0.0218 (J)	—	0.0401	0.0556	0.0472 (J)	—	0.116 (J)	0.0435 (J)	—	NA	0.0544 (J)
RE02-10-22197	02-612468	2–2.2	SOIL	0.0318 (J)	0.0361 (J)	—	—	0.0091 (J)	0.149 (J)	0.196 (J)	0.36 (J)	0.0852 (J)	—	NA	0.191 (J)
RE02-10-22189	02-612468	4–4.2	SOIL	—	—	—	0.0095	0.0136	0.0215 (J)	0.0226 (J)	0.0289 (J)	0.0145 (J)	—	NA	0.0197 (J)

Table 6.29-3 (continued)

Field Sample ID	Location ID	Depth (ft)	Media	Di-n-butylphthalate	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	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-]
Industrial SSL[a]				**91,600**	**3.23**	**33,700**	**33,700**	**na[f]**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Recreational SSL[c]				**32,800**	**8.88**	**11,500**	**11,500**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Residential SSL[a]				**6160**	**0.153**	**11,500**	**11,500**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
RE02-10-22127	02-600385	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22128	02-600385	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22111	02-600386	11–11.2	QAL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1572	02-600387	0–0.5	SOIL	—	—	0.0984	—	0.00016	0.001	4.75E-05	2.35E-06 (J)	0.000205	7.1E-07 (J)	3.32E-06	1.3E-06 (J)
RE02-07-1573	02-600387	2–2.6	QAL	—	—	0.0529	—	0.000166	0.00108	4.72E-05	1.82E-06 (J)	0.000235	7.38E-07 (J)	3.70E-06	9.1E-07 (J)
RE02-10-22112	02-612444	3.5–4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22115	02-612445	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22116	02-612445	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22118	02-612446	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22119	02-612446	5–5.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22121	02-612447	3–3.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22124	02-612448	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22125	02-612448	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-319	02-613289	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-320	02-613289	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-325	02-613292	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-1525	02-613571	5–6	QAL	—	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1876	02-600449	0–0.5	SOIL	0.151 (J)	—	3.84	0.123	4.96E-05	0.000197	0.000159	2.30E-05	0.000325	—	1.61E-06 (J)	8.54E-07 (J)
RE02-07-1877	02-600449	2–4.5	QAL	—	—	0.0481	—	2.08E-05	8.43E-05	8.44E-05	1.59E-05	0.000184	—	7.58E-07 (J)	3.82E-07 (J)
RE02-07-1878	02-600449	4.5–9.5	QAL	—	—	—	—	1.34E-06 (J)	4.29E-06	5.45E-06	7.99E-07 (J)	1.09E-05	—	—	—
RE02-10-22130	02-600449	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22133	02-612451	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22136	02-612452	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22137	02-612452	8–8.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22139	02-612453	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22140	02-612453	8–8.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26105	02-613001	6–6.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 6.29-3 (continued)

Field Sample ID	Location ID	Depth (ft)	Media	Di-n-butylphthalate	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	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-]
Industrial SSL[a]				**91,600**	**3.23**	**33,700**	**33,700**	**na[f]**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Recreational SSL[c]				**32,800**	**8.88**	**11,500**	**11,500**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Residential SSL[a]				**6160**	**0.153**	**11,500**	**11,500**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
RE02-10-26106	02-613001	7–7.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26107	02-613002	6–6.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26108	02-613002	8–8.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26638	02-613122	2–2.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26639	02-613122	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26640	02-613124	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26641	02-613124	8–8.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-315	02-613287	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-316	02-613287	8–8.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-317	02-613288	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-318	02-613288	8–8.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-1525	02-613571	5–6	QAL	—	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2218	02-613626	8–9	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2219	02-613626	10–11	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2220	02-613627	6–7	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2221	02-613627	8–9	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2222	02-613627	10–11	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2523	02-613667	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2524	02-613667	8–8.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2525	02-613667	10–10.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2526	02-613668	8–8.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2527	02-613668	10–10.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2795	02-613699	6–6.2	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2796	02-613699	8–8.2	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2797	02-613699	10–10.2	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2798	02-613699	12–12.2	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2799	02-613700	8–8.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 6.29-3 (continued)

Field Sample ID	Location ID	Depth (ft)	Media	Di-n-butylphthalate	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	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-]
Industrial SSL[a]				**91,600**	**3.23**	**33,700**	**33,700**	**na[f]**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Recreational SSL[c]				**32,800**	**8.88**	**11,500**	**11,500**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Residential SSL[a]				**6160**	**0.153**	**11,500**	**11,500**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
RE02-11-2800	02-613700	10–10.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2801	02-613700	12–12.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-3145	02-613700	14–14.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-3146	02-613761	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-3147	02-613761	8–8.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-3148	02-613761	10–10.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-3149	02-613761	12–12.2	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-3150	02-613761	14–14.2	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-3177	02-613762	0–0.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1629	02-600406	4.5–13	QAL	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1630	02-600406	15–19.5	QBO	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1632	02-600407	0–0.5	SOIL	—	—	0.613	0.106	2.14E-05	7.25E-05	1.36E-05	9.75E-07 (J)	3.38E-05	2.73E-07 (J)	1.03E-06 (J)	6.23E-07 (J)
RE02-07-1633	02-600407	4.5–10	QAL	—	—	0.126	0.0188 (J)	9.64E-06	3.87E-05	8.15E-06	7.2E-07 (J)	1.98E-05	—	—	—
RE02-07-1634	02-600407	10–15	QBO	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1636	02-600408	0–0.5	SOIL	0.101 (J)	—	0.385	—	3.03E-05	0.000179	8.59E-06	4.06E-07 (J)	3.51E-05	2.73E-07 (J)	8.8E-07 (J)	5.7E-07 (J)
RE02-10-22094	02-612438	2–2.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22097	02-612439	2–2.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22098	02-612439	4–4.4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22101	02-612440	4–4.4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26109	02-613003	2–2.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26110	02-613003	4–4.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-1525	02-613571	5–6	QAL	—	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-2508	02-600563	0–0.5	SOIL	—	—	0.0504	—	4.98E-05	0.000101	5.29E-06	3.5E-07 (J)	1.52E-05	—	1.8E-06 (J)	1.12E-06 (J)
RE02-07-2509	02-600563	4.5–10	QAL	—	—	—	—	2E-06 (J)	5.15E-06	4.32E-07 (J)	—	1.22E-06	—	—	—
RE02-07-2511	02-600563	10–15	QAL	—	—	—	—	3.97E-06	6.38E-06	7.79E-07 (J)	—	3.63E-06	—	—	—
RE02-07-2510	02-600563	15–22.5	QBO	—	—	—	—	1.5E-06 (J)	2.82E-06	4.14E-07 (J)	—	1.37E-06	—	—	—
RE02-10-21747	02-612346	8–9	QAL	—	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA

Table 6.29-3 (continued)

Field Sample ID	Location ID	Depth (ft)	Media	Di-n-butylphthalate	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	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-]
Industrial SSL[a]				**91,600**	**3.23**	**33,700**	**33,700**	**na[f]**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Recreational SSL[c]				**32,800**	**8.88**	**11,500**	**11,500**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Residential SSL[a]				**6160**	**0.153**	**11,500**	**11,500**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
RE02-10-21748	02-612346	15–16	QAL	—	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1883	02-600450	4.5–10	QAL	—	—	—	—	—	—	—	—	4.05E-07	—	—	—
RE02-07-1886	02-600451	0–0.5	SOIL	—	—	0.137	0.0167 (J)	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1887	02-600451	4.5–10	QAL	—	—	0.0118 (J)	—	2.81E-06	2.81E-06	—	—	9.06E-07	—	—	—
RE02-07-1889	02-600451	12.5–15	QBO	—	—	—	—	1.39E-06 (J)	2.82E-06	—	—	1.01E-06	—	—	—
RE02-07-1888	02-600451	17–22	QBO	—	—	—	—	—	—	—	—	—	—	—	—
RE02-10-22083	02-612434	4–4.4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22086	02-612435	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22089	02-612436	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22092	02-612437	4–4.4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26634	02-613118	2–2.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26636	02-613120	2–2.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26637	02-613121	2–2.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-1525	02-613571	5–6	QAL	—	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22185	02-600532	2–2.2	SOIL	NA	0.0734 (J)	0.381 (J)	0.0349 (J)	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22186	02-600532	4–4.2	SOIL	NA	0.0266 (J)	0.0688 (J)	0.00407 (J)	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-2359	02-600532	4.5–9.5	QAL	—	—	0.0147 (J)	—	6.70E-06	1.25E-05	2.1E-06 (J)	—	5.23E-06	—	—	—
RE02-07-2361	02-600532	9.5–12.5	QAL	—	—	—	—	7.95E-05	0.000133	1.66E-05	1.84E-06 (J)	8.33E-05	2.41E-07 (J)	2.19E-06 (J)	3.59E-07 (J)
RE02-07-2362	02-600533	0–0.5	SOIL	—	—	0.0815	—	1.33E-05	2.51E-05	3.01E-06	1.49E-07 (J)	7.76E-06	4.23E-07 (J)	4.18E-07 (J)	—
RE02-07-2363	02-600533	4.5–10	QAL	—	—	—	—	3.26E-06	5.22E-06	—	—	1.81E-06	—	—	—
RE02-07-2365	02-600533	10–15	QAL	—	—	—	—	1.68E-05	2.75E-05	2.74E-06	—	1.56E-05	—	6.06E-07 (J)	—
RE02-07-2364	02-600533	15–20	QBO	—	—	—	—	9.48E-07 (J)	1.49E-06	—	—	—	—	—	—
RE02-07-6828	02-600534	0–0.5	SOIL	—	—	0.261	—	6.45E-06	1.53E-05	1.92E-06 (J)	—	5.45E-06	—	2.24E-07 (J)	—
RE02-07-2368	02-600534	4.5–14.5	QAL	—	—	—	—	2.30E-05	4.83E-05	4.30E-06	5.42E-07 (J)	2.17E-05	—	8.27E-07 (J)	—
RE02-07-2369	02-600534	14.5–20	QBO	—	—	—	—	2.48E-05	5.35E-05	7.61E-06	6.17E-07 (J)	2.76E-05	—	7.8E-07 (J)	—
RE02-10-22188	02-612465	2–2.2	SOIL	NA	—	0.322 (J)	0.028 (J)	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22198	02-612465	4–4.2	SOIL	NA	—	0.115 (J)	—	NA	NA	NA	NA	NA	NA	NA	NA

Table 6.29-3 (continued)

Field Sample ID	Location ID	Depth (ft)	Media	Di-n-butylphthalate	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	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-]
Industrial SSL[a]				**91,600**	**3.23**	**33,700**	**33,700**	**na[f]**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Recreational SSL[c]				**32,800**	**8.88**	**11,500**	**11,500**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Residential SSL[a]				**6160**	**0.153**	**11,500**	**11,500**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
RE02-10-22191	02-612466	2–2.2	SOIL	NA	0.0148 (J)	0.119 (J)	0.00318 (J)	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22195	02-612466	4–4.2	SOIL	NA	—	0.156 (J)	—	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22194	02-612467	2–2.2	SOIL	NA	0.0397 (J)	0.123 (J)	—	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22192	02-612467	4–4.2	SOIL	NA	—	0.0944 (J)	—	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22197	02-612468	2–2.2	SOIL	NA	0.052 (J)	0.277 (J)	0.0217 (J)	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22189	02-612468	4–4.2	SOIL	NA	0.00593 (J)	0.023 (J)	—	NA	NA	NA	NA	NA	NA	NA	NA

Table 6.29-3 (continued)

Field Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[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-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
Industrial SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**32.3**	**5110**	**3370**	**16,800**	**na**	**na**
Recreational SSL[c]				**na**	**na**	**na**	**na**	**na**	**na**	**88.8**	**3610**	**1150**	**1930**	**na**	**na**
Residential SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**1.53**	**409**	**232**	**1160**	**na**	**na**
RE02-10-22127	02-600385	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22128	02-600385	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22111	02-600386	11–11.2	QAL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1572	02-600387	0–0.5	SOIL	6.22E-05	4.86E-06	1.66E-06 (J)	5E-07 (J)	2.73E-06	5.61E-05	0.0252 (J)	NA	—	—	0.0012	0.00022
RE02-07-1573	02-600387	2–2.6	QAL	7.43E-05	1.82E-06 (J)	6.21E-07 (J)	—	9.81E-07 (J)	4.46E-05	0.0184 (J)	—	—	—	0.00123	0.000248
RE02-10-22112	02-612444	3.5–4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22115	02-612445	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22116	02-612445	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22118	02-612446	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22119	02-612446	5–5.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22121	02-612447	3–3.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22124	02-612448	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22125	02-612448	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-319	02-613289	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-320	02-613289	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-325	02-613292	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-1525	02-613571	5–6	QAL	NA	NA	NA	NA	NA	NA	—	NA	—	—	NA	NA
RE02-07-1876	02-600449	0–0.5	SOIL	1.97E-05	0.000193	7.37E-05	1.06E-05	0.00012	0.00126 (J)	0.742 (J)	NA	—	—	0.000436	0.000191
RE02-07-1877	02-600449	2–4.5	QAL	8.61E-06	0.000101	4.00E-05	5.69E-06	6.37E-05	0.000641	0.0127 (J)	—	—	—	0.000145	0.00012
RE02-07-1878	02-600449	4.5–9.5	QAL	—	6.41E-06	2.63E-06	5.1E-07 (J)	4.30E-06	4.54E-05	—	—	—	—	1.34E-05	5.70E-06
RE02-10-22130	02-600449	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22133	02-612451	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22136	02-612452	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22137	02-612452	8–8.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22139	02-612453	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22140	02-612453	8–8.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26105	02-613001	6–6.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 6.29-3 (continued)

Field Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[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-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
Industrial SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**32.3**	**5110**	**3370**	**16,800**	**na**	**na**
Recreational SSL[c]				**na**	**na**	**na**	**na**	**na**	**na**	**88.8**	**3610**	**1150**	**1930**	**na**	**na**
Residential SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**1.53**	**409**	**232**	**1160**	**na**	**na**
RE02-10-26106	02-613001	7–7.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26107	02-613002	6–6.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26108	02-613002	8–8.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26638	02-613122	2–2.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26639	02-613122	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26640	02-613124	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26641	02-613124	8–8.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-315	02-613287	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-316	02-613287	8–8.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-317	02-613288	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-318	02-613288	8–8.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-1525	02-613571	5–6	QAL	NA	NA	NA	NA	NA	NA	—	NA	—	—	NA	NA
RE02-11-2218	02-613626	8–9	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2219	02-613626	10–11	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2220	02-613627	6–7	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2221	02-613627	8–9	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2222	02-613627	10–11	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2523	02-613667	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2524	02-613667	8–8.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2525	02-613667	10–10.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2526	02-613668	8–8.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2527	02-613668	10–10.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2795	02-613699	6–6.2	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2796	02-613699	8–8.2	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2797	02-613699	10–10.2	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2798	02-613699	12–12.2	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2799	02-613700	8–8.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 6.29-3 (continued)

Field Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[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-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
Industrial SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**32.3**	**5110**	**3370**	**16,800**	**na**	**na**
Recreational SSL[c]				**na**	**na**	**na**	**na**	**na**	**na**	**88.8**	**3610**	**1150**	**1930**	**na**	**na**
Residential SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**1.53**	**409**	**232**	**1160**	**na**	**na**
RE02-11-2800	02-613700	10–10.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2801	02-613700	12–12.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-3145	02-613700	14–14.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-3146	02-613761	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-3147	02-613761	8–8.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-3148	02-613761	10–10.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-3149	02-613761	12–12.2	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-3150	02-613761	14–14.2	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-3177	02-613762	0–0.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1629	02-600406	4.5–13	QAL	—	—	—	—	—	—	—	—	—	—	3.57E-07 (J)	—
RE02-07-1630	02-600406	15–19.5	QBO	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1632	02-600407	0–0.5	SOIL	9.02E-06	5.93E-06	3.37E-06	7.71E-07 (J)	5.34E-06	6.49E-05	0.188 (J)	NA	0.0611	0.0971	0.000208	2.38E-05 (J)
RE02-07-1633	02-600407	4.5–10	QAL	3.27E-06	5.86E-06	2.54E-06	4.06E-07 (J)	3.68E-06	4.07E-05	0.0395	—	0.0121 (J)	0.0272 (J)	8.43E-05	1.36E-05
RE02-07-1634	02-600407	10–15	QBO	—	—	—	—	—	—	—	—	—	—	6.89E-07 (J)	—
RE02-07-1636	02-600408	0–0.5	SOIL	1.51E-05	9.52E-07 (J)	3.44E-07 (J)	—	6.95E-07 (J)	1.11E-05	0.0703	NA	—	—	0.000222	3.5E-05 (J)
RE02-10-22094	02-612438	2–2.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22097	02-612439	2–2.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22098	02-612439	4–4.4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22101	02-612440	4–4.4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26109	02-613003	2–2.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26110	02-613003	4–4.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-1525	02-613571	5–6	QAL	NA	NA	NA	NA	NA	NA	—	NA	—	—	NA	NA
RE02-07-2508	02-600563	0–0.5	SOIL	1.44E-05	9.62E-07 (J)	5.62E-07 (J)	—	7.18E-07 (J)	1.03E-05	—	NA	—	—	0.000428	1.13E-05
RE02-07-2509	02-600563	4.5–10	QAL	5.38E-07	9.72E-08 (J)	—	—	—	5.40E-07	—	—	—	—	2.65E-05	9E-07 (J)
RE02-07-2511	02-600563	10–15	QAL	—	—	—	—	—	7.19E-07	—	—	—	—	4.13E-05	2.4E-06 (J)
RE02-07-2510	02-600563	15–22.5	QBO	—	—	—	—	6.42E-08 (J)	4.41E-07	—	—	—	—	1.62E-05	8.62E-07 (J)
RE02-10-21747	02-612346	8–9	QAL	NA	NA	NA	NA	NA	NA	—	NA	—	—	NA	NA

Table 6.29-3 (continued)

Field Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[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-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
Industrial SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**32.3**	**5110**	**3370**	**16,800**	**na**	**na**
Recreational SSL[c]				**na**	**na**	**na**	**na**	**na**	**na**	**88.8**	**3610**	**1150**	**1930**	**na**	**na**
Residential SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**1.53**	**409**	**232**	**1160**	**na**	**na**
RE02-10-21748	02-612346	15–16	QAL	NA	NA	NA	NA	NA	NA	—	NA	—	—	NA	NA
RE02-07-1883	02-600450	4.5–10	QAL	—	6.08E-07 (J)	—	—	—	2.31E-06	—	—	—	—	1.11E-06 (J)	—
RE02-07-1886	02-600451	0–0.5	SOIL	NA	NA	NA	NA	NA	NA	0.103	NA	0.00793 (J)	0.015 (J)	NA	NA
RE02-07-1887	02-600451	4.5–10	QAL	—	—	—	—	—	7.91E-07	—	—	—	—	2.35E-05	1.19E-06 (J)
RE02-07-1889	02-600451	12.5–15	QBO	—	—	—	—	—	1.76E-07	—	—	—	—	1.42E-05	7.52E-07 (J)
RE02-07-1888	02-600451	17–22	QBO	—	—	—	—	—	—	—	—	—	—	1.68E-06 (J)	—
RE02-10-22083	02-612434	4–4.4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22086	02-612435	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22089	02-612436	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22092	02-612437	4–4.4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26634	02-613118	2–2.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26636	02-613120	2–2.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26637	02-613121	2–2.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-1525	02-613571	5–6	QAL	NA	NA	NA	NA	NA	NA	—	NA	—	—	NA	NA
RE02-10-22185	02-600532	2–2.2	SOIL	NA	NA	NA	NA	NA	NA	0.115 (J)	NA	NA	0.0175 (J)	NA	NA
RE02-10-22186	02-600532	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	0.0289 (J)	NA	NA	0.00185 (J)	NA	NA
RE02-07-2359	02-600532	4.5–9.5	QAL	6.56E-07	6.42E-07 (J)	3.18E-07 (J)	—	—	2.84E-06	—	—	—	—	7.72E-05	3.9E-06 (J)
RE02-07-2361	02-600532	9.5–12.5	QAL	8.37E-06	4.59E-07 (J)	—	—	2.82E-07 (J)	1.07E-05	—	—	—	—	0.00113	6.39E-05
RE02-07-2362	02-600533	0–0.5	SOIL	2.96E-06	2.01E-07 (J)	1.38E-07 (J)	—	—	3.12E-06	0.022 (J)	NA	—	—	0.000129	5.61E-06
RE02-07-2363	02-600533	4.5–10	QAL	—	—	—	—	—	3.81E-07	—	—	—	—	4.34E-05	1.42E-06 (J)
RE02-07-2365	02-600533	10–15	QAL	2.19E-06	—	—	—	—	3.66E-06	—	—	—	—	0.000241	8.37E-06
RE02-07-2364	02-600533	15–20	QBO	—	—	—	—	—	—	—	0.00273 (J)	—	—	1.18E-05	—
RE02-07-6828	02-600534	0–0.5	SOIL	1.35E-06	1.19E-07 (J)	—	—	—	1.90E-06	—	NA	—	—	7.68E-05	4.38E-06 (J)
RE02-07-2368	02-600534	4.5–14.5	QAL	2.92E-06	—	—	—	1.64E-07 (J)	3.95E-06	—	—	—	—	0.000382	1.23E-05
RE02-07-2369	02-600534	14.5–20	QBO	2.01E-06	2.37E-07 (J)	—	—	1.25E-07 (J)	3.69E-06	—	—	—	—	0.00038	1.63E-05
RE02-10-22188	02-612465	2–2.2	SOIL	NA	NA	NA	NA	NA	NA	0.126 (J)	NA	NA	—	NA	NA
RE02-10-22198	02-612465	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	0.0446 (J)	NA	NA	—	NA	NA

Table 6.29-3 (continued)

Field Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[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-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]
Industrial SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**32.3**	**5110**	**3370**	**16,800**	**na**	**na**
Recreational SSL[c]				**na**	**na**	**na**	**na**	**na**	**na**	**88.8**	**3610**	**1150**	**1930**	**na**	**na**
Residential SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**1.53**	**409**	**232**	**1160**	**na**	**na**
RE02-10-22191	02-612466	2–2.2	SOIL	NA	NA	NA	NA	NA	NA	0.0449 (J)	NA	NA	0.00212 (J)	NA	NA
RE02-10-22195	02-612466	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	0.0497 (J)	NA	NA	—	NA	NA
RE02-10-22194	02-612467	2–2.2	SOIL	NA	NA	NA	NA	NA	NA	0.0541 (J)	NA	NA	—	NA	NA
RE02-10-22192	02-612467	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	0.0399 (J)	NA	NA	—	NA	NA
RE02-10-22197	02-612468	2–2.2	SOIL	NA	NA	NA	NA	NA	NA	0.0737 (J)	NA	NA	—	NA	NA
RE02-10-22189	02-612468	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	0.0111 (J)	NA	NA	—	NA	NA

Table 6.29-3 (continued)

Field Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzodioxin[1,2,3,7,8-]	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Toluene	TPH-DRO
Industrial SSL[a]				**na**	**na**	**na**	**na**	**na**	**25,300**	**25,300**	**na**	**0.00243**	**na**	**61,100**	**3000[g]**
Recreational SSL[c]				**na**	**na**	**na**	**na**	**na**	**8630**	**8630**	**na**	**0.00297**	**na**	**47,600**	**na**
Residential SSL[a]				**na**	**na**	**na**	**na**	**na**	**1740**	**1740**	**na**	**0.00049**	**na**	**5220**	**1000[g]**
RE02-10-22127	02-600385	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22128	02-600385	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22111	02-600386	11–11.2	QAL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1572	02-600387	0–0.5	SOIL	2.04E-07 (J)	2.34E-06	1.01E-06 (J)	6.52E-06	4.49E-05 (J)	0.0317 (J)	0.0771	—	3.77E-06	1.70E-05	NA	NA
RE02-07-1573	02-600387	2–2.6	QAL	1.56E-07 (J)	7.00E-07	—	1.55E-06 (J)	1.02E-05 (J)	0.0212 (J)	0.0423	—	8.67E-07 (J)	2.32E-06	0.000465 (J)	NA
RE02-10-22112	02-612444	3.5–4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22115	02-612445	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22116	02-612445	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22118	02-612446	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22119	02-612446	5–5.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22121	02-612447	3–3.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22124	02-612448	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22125	02-612448	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-319	02-613289	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-320	02-613289	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-325	02-613292	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-1525	02-613571	5–6	QAL	NA	NA	NA	NA	NA	—	—	NA	NA	NA	NA	NA
RE02-07-1876	02-600449	0–0.5	SOIL	—	1.73E-06	5.74E-05	0.000364	0.00199	1.68	3.82	—	0.000175	0.00081	NA	NA
RE02-07-1877	02-600449	2–4.5	QAL	2.2E-07 (J)	2.63E-06	3.31E-05	0.000214	0.00118	0.0134 (J)	0.0353 (J)	1.20E-06	0.000104	0.000538	—	NA
RE02-07-1878	02-600449	4.5–9.5	QAL	—	—	1.9E-06 (J)	1.28E-05	7.30E-05	—	—	—	6.39E-06	3.24E-05	—	NA
RE02-10-22130	02-600449	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22133	02-612451	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22136	02-612452	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22137	02-612452	8–8.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22139	02-612453	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22140	02-612453	8–8.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26105	02-613001	6–6.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26106	02-613001	7–7.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 6.29-3 (continued)

Field Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzodioxin[1,2,3,7,8-]	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Toluene	TPH-DRO
Industrial SSL[a]				**na**	**na**	**na**	**na**	**na**	**25,300**	**25,300**	**na**	**0.00243**	**na**	**61,100**	**3000[g]**
Recreational SSL[c]				**na**	**na**	**na**	**na**	**na**	**8630**	**8630**	**na**	**0.00297**	**na**	**47,600**	**na**
Residential SSL[a]				**na**	**na**	**na**	**na**	**na**	**1740**	**1740**	**na**	**0.00049**	**na**	**5220**	**1000[g]**
RE02-10-26107	02-613002	6–6.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26108	02-613002	8–8.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26638	02-613122	2–2.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26639	02-613122	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26640	02-613124	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26641	02-613124	8–8.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-315	02-613287	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-316	02-613287	8–8.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-317	02-613288	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-318	02-613288	8–8.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-1525	02-613571	5–6	QAL	NA	NA	NA	NA	NA	—	—	NA	NA	NA	NA	NA
RE02-11-2218	02-613626	8–9	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2219	02-613626	10–11	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2220	02-613627	6–7	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2221	02-613627	8–9	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2222	02-613627	10–11	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2523	02-613667	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2524	02-613667	8–8.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2525	02-613667	10–10.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2526	02-613668	8–8.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2527	02-613668	10–10.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2795	02-613699	6–6.2	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2796	02-613699	8–8.2	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2797	02-613699	10–10.2	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2798	02-613699	12–12.2	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2799	02-613700	8–8.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2800	02-613700	10–10.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-2801	02-613700	12–12.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 6.29-3 (continued)

Field Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzodioxin[1,2,3,7,8-]	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Toluene	TPH-DRO
Industrial SSL[a]				**na**	**na**	**na**	**na**	**na**	**25,300**	**25,300**	**na**	**0.00243**	**na**	**61,100**	**3000[g]**
Recreational SSL[c]				**na**	**na**	**na**	**na**	**na**	**8630**	**8630**	**na**	**0.00297**	**na**	**47,600**	**na**
Residential SSL[a]				**na**	**na**	**na**	**na**	**na**	**1740**	**1740**	**na**	**0.00049**	**na**	**5220**	**1000[g]**
RE02-11-3145	02-613700	14–14.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-3146	02-613761	6–6.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-3147	02-613761	8–8.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-3148	02-613761	10–10.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-3149	02-613761	12–12.2	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-3150	02-613761	14–14.2	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-3177	02-613762	0–0.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-1629	02-600406	4.5–13	QAL	—	—	—	—	—	—	—	—	—	—	—	1.59 (J)
RE02-07-1630	02-600406	15–19.5	QBO	—	—	—	—	—	—	—	—	—	—	—	1.59 (J)
RE02-07-1632	02-600407	0–0.5	SOIL	3.16E-07 (J)	1.80E-06	2.04E-06 (J)	1.48E-05	0.00013	0.68	0.8 (J)	1.30E-07	6.84E-06	5.85E-05	NA	20.9 (J)
RE02-07-1633	02-600407	4.5–10	QAL	—	—	1.87E-06 (J)	1.10E-05	6.63E-05	0.105	0.158	—	5.41E-06	2.48E-05	—	—
RE02-07-1634	02-600407	10–15	QBO	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1636	02-600408	0–0.5	SOIL	—	5.04E-07	—	1.4E-06 (J)	8.82E-06	0.158	0.369	—	9.9E-07 (J)	3.44E-06	NA	10
RE02-10-22094	02-612438	2–2.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22097	02-612439	2–2.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22098	02-612439	4–4.4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22101	02-612440	4–4.4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26109	02-613003	2–2.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26110	02-613003	4–4.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-1525	02-613571	5–6	QAL	NA	NA	NA	NA	NA	—	—	NA	NA	NA	NA	NA
RE02-07-2508	02-600563	0–0.5	SOIL	—	9.74E-07	2.63E-07 (J)	1.35E-06 (J)	9.29E-06 (J)	0.0286 (J)	0.0812 (J)	—	8.55E-07 (J)	4.41E-06	NA	NA
RE02-07-2509	02-600563	4.5–10	QAL	—	—	—	—	1.15E-07	—	—	—	1.01E-07 (J)	2.73E-07	—	NA
RE02-07-2511	02-600563	10–15	QAL	—	—	—	—	—	—	—	—	—	—	—	NA
RE02-07-2510	02-600563	15–22.5	QBO	—	—	—	—	—	—	—	—	—	—	—	NA
RE02-10-21747	02-612346	8–9	QAL	NA	NA	NA	NA	NA	—	—	NA	NA	NA	NA	NA
RE02-10-21748	02-612346	15–16	QAL	NA	NA	NA	NA	NA	—	—	NA	NA	NA	NA	NA
RE02-07-1883	02-600450	4.5–10	QAL	—	—	2.29E-07 (J)	1.1E-06 (J)	6.16E-06	—	—	—	7.12E-07 (J)	1.52E-06	—	NA
RE02-07-1886	02-600451	0–0.5	SOIL	NA	NA	NA	NA	NA	0.134	0.176	NA	NA	NA	NA	NA

Table 6.29-3 (continued)

Field Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzodioxin[1,2,3,7,8-]	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Toluene	TPH-DRO
Industrial SSL[a]				**na**	**na**	**na**	**na**	**na**	**25,300**	**25,300**	**na**	**0.00243**	**na**	**61,100**	**3000[g]**
Recreational SSL[c]				**na**	**na**	**na**	**na**	**na**	**8630**	**8630**	**na**	**0.00297**	**na**	**47,600**	**na**
Residential SSL[a]				**na**	**na**	**na**	**na**	**na**	**1740**	**1740**	**na**	**0.00049**	**na**	**5220**	**1000[g]**
RE02-07-1887	02-600451	4.5–10	QAL	—	—	—	4.7E-07 (J)	1.33E-06	—	—	—	5.39E-07 (J)	1.40E-06	—	NA
RE02-07-1889	02-600451	12.5–15	QBO	—	—	—	—	—	—	—	—	—	—	—	NA
RE02-07-1888	02-600451	17–22	QBO	—	—	—	—	—	—	—	—	—	—	—	NA
RE02-10-22083	02-612434	4–4.4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22086	02-612435	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22089	02-612436	4–4.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22092	02-612437	4–4.4	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26634	02-613118	2–2.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26636	02-613120	2–2.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26637	02-613121	2–2.2	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-11-1525	02-613571	5–6	QAL	NA	NA	NA	NA	NA	—	—	NA	NA	NA	NA	NA
RE02-10-22185	02-600532	2–2.2	SOIL	NA	NA	NA	NA	NA	0.332 (J)	0.545 (J)	NA	NA	NA	NA	NA
RE02-10-22186	02-600532	4–4.2	SOIL	NA	NA	NA	NA	NA	0.047 (J)	0.105 (J)	NA	NA	NA	NA	NA
RE02-07-2359	02-600532	4.5–9.5	QAL	—	—	—	3.85E-07 (J)	2.12E-06	—	0.013 (J)	—	—	—	—	NA
RE02-07-2361	02-600532	9.5–12.5	QAL	—	—	—	—	6.68E-07	—	—	—	—	—	—	NA
RE02-07-2362	02-600533	0–0.5	SOIL	—	1.64E-07	—	2.63E-07 (J)	1.72E-06 (J)	0.035	0.0982	—	—	4.03E-07	NA	NA
RE02-07-2363	02-600533	4.5–10	QAL	—	—	—	—	—	—	—	—	—	—	—	NA
RE02-07-2365	02-600533	10–15	QAL	—	—	—	—	1.75E-07	—	—	—	—	—	—	NA
RE02-07-2364	02-600533	15–20	QBO	—	—	—	—	—	—	—	—	—	—	—	NA
RE02-07-6828	02-600534	0–0.5	SOIL	—	—	—	—	9.20E-07	0.156	0.279	—	1.24E-07 (J)	2.58E-07	NA	NA
RE02-07-2368	02-600534	4.5–14.5	QAL	—	—	—	1.33E-07 (J)	8.44E-07	—	—	—	8.66E-08 (J)	8.66E-08	—	NA
RE02-07-2369	02-600534	14.5–20	QBO	—	—	—	—	1.21E-07	—	—	—	—	—	—	NA
RE02-10-22188	02-612465	2–2.2	SOIL	NA	NA	NA	NA	NA	0.252 (J)	0.451 (J)	NA	NA	NA	NA	NA
RE02-10-22198	02-612465	4–4.2	SOIL	NA	NA	NA	NA	NA	0.115 (J)	0.16 (J)	NA	NA	NA	NA	NA
RE02-10-22191	02-612466	2–2.2	SOIL	NA	NA	NA	NA	NA	0.0361 (J)	0.174 (J)	NA	NA	NA	NA	NA
RE02-10-22195	02-612466	4–4.2	SOIL	NA	NA	NA	NA	NA	0.0782 (J)	0.181 (J)	NA	NA	NA	NA	NA

Table 6.29-3 (continued)

Field Sample ID	Location ID	Depth (ft)	Media	Pentachlorodibenzodioxin[1,2,3,7,8-]	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Toluene	TPH-DRO
Industrial SSL[a]				**na**	**na**	**na**	**na**	**na**	**25,300**	**25,300**	**na**	**0.00243**	**na**	**61,100**	**3000[g]**
Recreational SSL[c]				**na**	**na**	**na**	**na**	**na**	**8630**	**8630**	**na**	**0.00297**	**na**	**47,600**	**na**
Residential SSL[a]				**na**	**na**	**na**	**na**	**na**	**1740**	**1740**	**na**	**0.00049**	**na**	**5220**	**1000[g]**
RE02-10-22194	02-612467	2–2.2	SOIL	NA	NA	NA	NA	NA	0.0937 (J)	0.206 (J)	NA	NA	NA	NA	NA
RE02-10-22192	02-612467	4–4.2	SOIL	NA	NA	NA	NA	NA	0.0907 (J)	0.131 (J)	NA	NA	NA	NA	NA
RE02-10-22197	02-612468	2–2.2	SOIL	NA	NA	NA	NA	NA	0.238 (J)	0.394 (J)	NA	NA	NA	NA	NA
RE02-10-22189	02-612468	4–4.2	SOIL	NA	NA	NA	NA	NA	0.01 (J)	0.0363 (J)	NA	NA	NA	NA	NA

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273), unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSLs are from LANL (2017, 602581).

[d] NA = Not analyzed.

[e] — = Not detected.

[f] na = Not available.

[h] SSLs for diesel #2 from NMED (2017, 602273).

Table 6.29-4
Radionuclides Detected or Detected above BVs/FVs at AOC 02-011(a)(i,ii,iii,iv,v,vi)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Cobalt-60	Plutonium-239/240	Tritium	Uranium-235/236
Qbt 1g, Qct, Qbo BV[a]				**na**[b]	**na**	**na**	**na**	**na**	**0.18**
Soil BV/FV[a]				**0.013**	**1.65**	**na**	**0.054**	**na**	**0.2**
Industrial SAL[c]				**1000**	**41**	**9**	**1200**	**2,400,000**	**160**
Recreational SAL[c]				**1500**	**370**	**81**	**1300**	**5,700,000**	**1000**
Residential SAL[c]				**83**	**12**	**2.6**	**79**	**1700**	**42**
RE02-11-1525	02-613571	5–6	QAL	—[d]	—	—	—	0.0560306	—
RE02-11-1527	02-613571	25–26	QBO	—	—	—	—	—	0.208
RE02-07-1876	02-600449	0–0.5	SOIL	—	—	—	0.159	—	—
RE02-11-1525	02-613571	5–6	QAL	—	—	—	—	0.0560306	—
RE02-11-1527	02-613571	25–26	QBO	—	—	—	—	—	0.208
RE02-07-1629	02-600406	4.5–13	QAL	—	—	—	—	0.0502123	—
RE02-07-1633	02-600407	4.5–10	QAL	—	—	—	—	0.0335758	—
RE02-11-1525	02-613571	5–6	QAL	—	—	—	—	0.0560306	—
RE02-11-1527	02-613571	25–26	QBO	—	—	—	—	—	0.208
RE02-07-2508	02-600563	0–0.5	SOIL	—	—	0.762	—	0.00626353	—
RE02-07-2509	02-600563	4.5–10	QAL	—	—	—	—	0.0970386	—
RE02-10-21748	02-612346	15–16	QAL	—	—	—	—	0.0512404	—
RE02-10-21750	02-612346	35–36	QBO	—	—	—	—	0.0746471	—
RE02-10-21751	02-612346	49–50	QBO	—	—	—	—	0.0884761	—
RE02-07-1883	02-600450	4.5–10	QAL	—	—	—	—	0.0792198	—
RE02-07-1887	02-600451	4.5–10	QAL	—	—	—	—	0.0564444	—
RE02-07-1888	02-600451	17–22	QBO	—	0.303	—	—	—	—
RE02-11-1525	02-613571	5–6	QAL	—	—	—	—	0.0560306	—
RE02-11-1527	02-613571	25–26	QBO	—	—	—	—	—	0.208
RE02-07-2359	02-600532	4.5–9.5	QAL	—	—	—	0.164	0.0336043	—
RE02-07-2361	02-600532	9.5–12.5	QAL	—	—	—	0.149	—	—
RE02-07-2362	02-600533	0–0.5	SOIL	0.0924	—	—	0.182 (J—)	—	—
RE02-07-2363	02-600533	4.5–10	QAL	—	—	—	—	0.0369992	—
RE02-07-2365	02-600533	10–15	QAL	—	—	—	—	0.0367991	—
RE02-07-6828	02-600534	0–0.5	SOIL	—	—	—	0.073	—	—

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SALs from LANL (2015, 600929).

[d] — = Not detected.

Table 6.29-5
Samples Collected and Analyses Requested at AOC 02-011(a)(viii)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Dioxins/Furans	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
CA02-00-0192	02-01152	0–0.5	SED	—[a]	—	—	7531R[b]	7531R	—	7531R	7531R	7529R, 7530R	—	—	7531R	—	—	—	—
0402-95-0313	02-01152	0–1	SED	—	—	—	115	115	—	115	115	—	—	—	115	—	—	—	—
RE02-03-51824	02-22351	4–4.5	SOIL	—	—	—	1814S	1814S	1813S	1814S	1814S	1813S	—	—	1814S	—	1814S	—	—
RE02-03-51825	02-22351	5.5–6	SOIL	—	—	—	1814S	1814S	1813S	1814S	1814S	1813S	—	—	1814S	—	1814S	—	—
RE02-03-51826	02-22352	3–3.5	SOIL	—	—	—	1814S	1814S	1813S	1814S	1814S	1813S	—	—	1814S	—	1814S	—	—
RE02-03-51827	02-22352	4.5–5	SOIL	—	—	—	1814S	1814S	1813S	1814S	1814S	1813S	—	—	1814S	—	1814S	—	—
RE02-03-51866	02-22372	4–4.5	SOIL	—	—	—	1822S	1822S	1821S	1822S	1822S	1821S	—	—	1822S	—	1822S	—	—
RE02-03-51867	02-22372	5.5–6	SOIL	—	—	—	1822S	1822S	1821S	1822S	1822S	1821S	—	—	1822S	—	1822S	—	—
RE02-03-51868	02-22373	4–4.5	SOIL	—	—	—	1822S	1822S	1821S	1822S	1822S	1821S	—	—	1822S	—	1822S	—	—
RE02-03-51869	02-22373	5.5–6	SOIL	—	—	—	1822S	1822S	1821S	1822S	1822S	1821S	—	—	1822S	—	1822S	—	—
RE02-03-51870	02-22374	3–3.5	SOIL	—	—	—	1822S	1822S	1821S	1822S	1822S	1821S	—	—	1822S	—	1822S	—	—
RE02-03-51871	02-22374	4.5–5	SOIL	—	—	—	1822S	1822S	1821S	1822S	1822S	1821S	—	—	1822S	—	1822S	—	—
RE02-07-2419	02-600542	0–0.5	SOIL	07-394	07-393	07-392	07-394	07-394	07-393	07-394	07-394	07-393	07-391	07-393	07-394	07-391	—	—	07-393
RE02-07-2420	02-600542	4.5–6.7	QAL	07-452	07-451	07-449	07-452	07-452	07-451	07-452	07-452	07-451	07-450	07-451	07-452	07-450	—	07-450	07-451
RE02-07-2422	02-600542	10–12.2	QAL	07-452	07-451	07-449	07-452	07-452	07-451	07-452	07-452	07-451	07-450	07-451	07-452	07-450	—	07-450	07-451
RE02-07-2421	02-600542	15–17.4	QBO	07-452	07-451	07-449	07-452	07-452	07-451	07-452	07-452	07-451	07-450	07-451	07-452	07-450	—	07-450	07-451
RE02-07-2423	02-600543	0–5	SOIL	07-916	07-916	07-915	07-916	07-916	07-916	07-916	07-916	07-916	07-916	07-916	07-916	07-916	—	—	07-916
RE02-07-2425	02-600543	9.5–11	QAL	07-958	07-958	07-957	07-958	07-958	07-958	07-958	07-958	07-958	07-958	07-958	07-958	07-958	—	07-958	07-958
RE02-07-2426	02-600543	19.5–22	QBO	07-958	07-958	07-957	07-958	07-958	07-958	07-958	07-958	07-958	07-958	07-958	07-958	07-958	—	07-958	07-958
RE02-10-21521	02-612292	5–6	QAL	—	—	—	10-4706	10-4706	10-4706	10-4706	—	10-4706	10-4706	—	—	10-4706	—	—	—
RE02-10-21522	02-612292	15–16.5	QBO	—	—	—	10-4706	10-4706	10-4706	10-4706	—	10-4706	10-4706	—	—	10-4706	—	—	—
RE02-10-21523	02-612292	25–26	QBO	—	—	—	10-4783	10-4783	10-4782	10-4783	—	10-4782	10-4781	—	—	10-4781	—	—	—
RE02-10-21524	02-612292	35–36	QBO	—	—	—	10-4783	10-4783	10-4782	10-4783	—	10-4782	10-4781	—	—	10-4781	—	—	—
RE02-10-21525	02-612292	49–50	QBO	—	—	—	10-4788	10-4788	10-4788	10-4788	—	10-4788	10-4788	—	—	10-4788	—	—	—

[a] — = Analysis not requested.

[b] Analytical request number.

Table 6.29-6
Inorganic Chemicals Detected or Detected above BVs at AOC 02-011(a)(viii)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Copper	Iron	Lead	Manganese	Mercury	Nitrate	Selenium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**1900**	**2.6**	**na[b]**	**3.96**	**3700**	**13.5**	**189**	**0.1**	**na**	**0.3**	**40**
Sediment BV[a]				**15400**	**0.83**	**3.98**	**127**	**0.4**	**4420**	**10.5**	**na**	**11.2**	**13800**	**19.7**	**543**	**0.1**	**na**	**0.3**	**60.2**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**na**	**14.7**	**21500**	**22.3**	**671**	**0.1**	**na**	**1.52**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**na**	**505[d]**	**11.1**	**51,900**	**908,000**	**800**	**160,000**	**389**	**2,080,000**	**6490**	**1860**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**na**	**281[d]**	**40.2**	**24,800**	**434,000**	**1110**	**14,800**	**186**	**991,000**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,000**	**70.5**	**na**	**96.6**d	**3.05**	**3130**	**54,800**	**400**	**10,500**	**23.5**	**125,000**	**391**	**23,500**
CA02-00-0192	02-01152	0–0.5	SED	—[f]	—	—	—	0.63 (J+)	—	13	NA[g]	17	—	40	—	2.2 (J-)	NA	—	390 (J+)
RE02-03-51824	02-22351	4–4.5	SOIL	—	—	—	—	0.463 (J)	—	—	—	—	—	—	—	0.305	NA	—	68.8 (J-)
RE02-03-51825	02-22351	5.5–6	SOIL	—	—	—	—	—	—	—	0.209 (J-)	—	—	—	—	0.197	NA	—	67.3 (J-)
RE02-03-51826	02-22352	3–3.5	SOIL	—	—	—	—	—	—	—	0.676 (J-)	15.1 (J)	—	25.8 (J)	—	5.26	NA	—	66.3 (J-)
RE02-03-51827	02-22352	4.5–5	SOIL	—	—	—	—	—	—	—	0.206 (J-)	—	—	—	—	0.201	NA	—	—
RE02-03-51866	02-22372	4–4.5	SOIL	—	—	—	—	—	—	—	0.061 (J)	—	—	—	—	0.681	NA	—	—
RE02-03-51867	02-22372	5.5–6	SOIL	—	—	—	—	0.513 (U)	—	—	—	—	—	—	—	0.178	NA	—	—
RE02-03-51868	02-22373	4–4.5	SOIL	—	—	—	—	—	22930	—	0.132	—	—	—	—	0.382	NA	—	—
RE02-03-51869	02-22373	5.5–6	SOIL	—	—	—	—	0.531 (U)	—	—	—	—	—	—	—	—	NA	—	—
RE02-03-51870	02-22374	3–3.5	SOIL	—	—	—	—	0.555 (U)	8700	—	—	—	—	—	—	0.122	NA	—	—
RE02-03-51871	02-22374	4.5–5	SOIL	—	—	—	—	0.529 (U)	—	—	0.122	—	—	—	—	0.315	NA	—	—
RE02-07-2419	02-600542	0–0.5	SOIL	—	—	—	—	0.54 (U)	—	—	—	—	—	—	—	2.93 (J-)	1.37	—	—
RE02-07-2420	02-600542	4.5–6.7	QAL	—	—	—	—	0.547 (U)	—	19.6	—	—	—	—	—	—	1.82	1.64 (U)	—
RE02-07-2422	02-600542	10–12.2	QAL	—	—	—	—	0.523 (U)	—	33.4	0.25	—	—	—	—	0.136	—	—	—
RE02-07-2421	02-600542	15–17.4	QBO	22000	0.501 (U)	1.41 (J)	221 (J-)	0.632 (U)	—	2.93	2.12	—	7460	—	267	—	—	1.9 (U)	—
RE02-07-2423	02-600543	0–5	SOIL	—	—	—	—	0.54 (U)	—	—	—	—	—	—	—	0.473	4.09	—	57.4
RE02-07-2425	02-600543	9.5–11	QAL	—	—	—	—	0.568 (U)	—	—	0.206 (J-)	—	—	—	—	1.71	1.31	—	—
RE02-07-2426	02-600543	19.5–22	QBO	7990 (J+)	0.512 (UJ)	1.27 (J)	47 (J)	0.664 (U)	—	21.3	0.0331 (J)	—	5180	—	233	—	—	0.801 (J)	—
RE02-10-21521	02-612292	5–6	QAL	—	1.03 (U)	—	—	0.513 (U)	—	—	—	—	—	—	—	0.576	NA	—	—
RE02-10-21522	02-612292	15–16.5	QBO	10900	1.26 (U)	—	—	0.63 (U)	—	2.92	0.202 (J)	—	7550	—	215 (J-)	—	NA	1.29 (U)	—
RE02-10-21523	02-612292	25–26	QBO	4450	1.23 (U)	1.28 (U)	—	0.614 (U)	—	—	—	—	5520	—	263	—	NA	1.28 (UJ)	—
RE02-10-21524	02-612292	35–36	QBO	3750	1.3 (U)	1.29 (U)	—	0.651 (U)	—	—	—	—	5870	—	195	—	NA	1.29 (UJ)	—
RE02-10-21525	02-612292	49–50	QBO	—	1.28 (U)	1.29 (U)	—	0.641 (U)	—	—	—	—	5670	—	219	—	NA	1.29 (UJ)	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 6.29-7
Organic Chemicals Detected at AOC 02-011(a)(viii)

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	Bis(2-ethylhexyl)phthalate	Chloroform	Chrysene	Fluoranthene	Fluorene
Industrial SSL[a]				**50,500**	**253,000**	**10.9**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**1830**	**28.4**	**3230**	**33,700**	**33,700**
Recreational SSL[c]				**17,300**	**863,000**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**1770**	**20.4**	**8880**	**11,500**	**11,500**
Residential SSL[a]				**3480**	**17,400**	**2.43**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**380**	**5.85**	**153**	**2320**	**2320**
RE02-07-2419	02-600542	0–0.5	SOIL	—d	0.00808 (J)	—	0.0276 (J)	0.0546	—	0.0673 (J)	0.102 (J)	—	—	NA[e]	0.059	0.0678	—
RE02-07-2420	02-600542	4.5–6.7	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2422	02-600542	10–12.2	QAL	—	—	—	—	0.0032 (J)	—	—	—	—	—	—	—	—	—
RE02-07-2421	02-600542	15–17.4	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2423	02-600543	0–5	SOIL	0.033 (J)	0.0559	—	—	0.0429	0.104	0.116	0.166	0.0774	—	NA	0.0939	0.208	0.0286 (J)
RE02-07-2425	02-600543	9.5–11	QAL	—	0.0118 (J)	—	—	0.0238	—	0.0229 (J)	0.038 (J)	—	—	—	0.0244 (J)	0.0484	—
RE02-07-2426	02-600543	19.5–22	QBO	—	—	—	—	0.0514	—	—	—	—	—	0.000304 (J)	—	—	—
RE02-10-21521	02-612292	5–6	QAL	—	—	—	0.0582	—	0.0293 (J)	0.0282 (J)	0.0369	—	—	NA	0.0253 (J)	0.0347 (J)	—
RE02-10-21524	02-612292	35–36	QBO	—	—	—	—	—	—	—	—	—	0.231 (J)	NA	—	—	—
RE02-10-21525	02-612292	49–50	QBO	—	—	0.213	0.334	0.0377	—	—	—	—	—	NA	—	—	—

Table 6.29-7 (continued)

Sample ID	Location ID	Depth (ft)	Media	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	Heptachlorodibenzodioxins (Total)	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	Heptachlorodibenzofurans (Total)	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-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene
Industrial SSL[a]				**na[f]**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**32.3**
Recreational SSL[c]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**88.8**
Residential SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**1.53**
RE02-07-2419	02-600542	0–0.5	SOIL	0.0000262	0.0000536	0.00000372	0.0000103	0.000000991 (J)	0.000000668 (J)	0.00000722	—	0.0000003 (J)	0.000000363 (J)	0.00000504	—
RE02-07-2420	02-600542	4.5–6.7	QAL	0.00000498	0.00000971	0.000000918 (J)	0.0000045	—	—	—	—	—	—	0.000000815	—
RE02-07-2422	02-600542	10–12.2	QAL	0.0000235	0.0000456	0.00000496	0.0000244	0.000000766 (J)	—	0.00000242	0.000000251 (J)	—	—	0.00000398	—
RE02-07-2421	02-600542	15–17.4	QBO	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-2423	02-600543	0–5	SOIL	0.000021	0.0000563	0.00000502	0.0000174	0.000000664 (J)	—	0.00000304	0.000000581 (J)	0.000000347 (J)	—	0.00000558	0.0703
RE02-07-2425	02-600543	9.5–11	QAL	0.0000073	0.0000157	0.00000142 (J)	0.00000446	—	—	0.000000974	0.000000282 (J)	—	0.000000156 (J)	0.00000114	0.0126 (J)
RE02-07-2426	02-600543	19.5–22	QBO	0.00000105 (J)	0.00000218	0.000000446 (J)	0.0000011	—	—	—	0.00000033 (J)	—	—	0.00000146	—
RE02-10-21521	02-612292	5–6	QAL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0148 (J)
RE02-10-21524	02-612292	35–36	QBO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	—
RE02-10-21525	02-612292	49–50	QBO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	—

Table 6.29-7 (continued)

Sample ID	Location ID	Depth (ft)	Media	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzodioxins (Total)	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)
Industrial SSL[a]				**5110**	**3370**	**16,800**	**na**	**na**	**na**	**na**	**na**	**1160**	**25,300**	**0.00243**	**na**
Recreational SSL[c]				**3610**	**1150**	**1930**	**na**	**na**	**na**	**na**	**na**	**1160**	**8630**	**0.00297**	**na**
Residential SSL[a]				**409**	**232**	**1160**	**na**	**na**	**na**	**na**	**na**	**1740**	**1740**	**0.00049**	**na**
RE02-07-2419	02-600542	0–0.5	SOIL	NA	—	—	0.000248	0.00000935	0.000000163	0.000000761 (J)	0.00000415	0.0402	0.0952	0.00000045 (J)	0.000000927
RE02-07-2420	02-600542	4.5–6.7	QAL	—	—	—	0.0000741	0.00000308 (J)	—	—	—	—	—	—	—
RE02-07-2422	02-600542	10–12.2	QAL	—	—	—	0.000388	0.0000194	—	—	0.000000196	—	—	—	—
RE02-07-2421	02-600542	15–17.4	QBO	—	—	—	0.000003 (J)	—	—	—	—	—	—	—	—
RE02-07-2423	02-600543	0–5	SOIL	NA	0.0176 (J)	0.0336 (J)	0.000233	0.0000161	—	0.000000732 (J)	0.00000453	0.195	0.228	—	0.0000013
RE02-07-2425	02-600543	9.5–11	QAL	—	—	—	0.000084	0.00000382 (J)	—	0.000000293 (J)	0.00000151	0.0416	0.0726	—	0.00000021
RE02-07-2426	02-600543	19.5–22	QBO	0.00361 (J)	—	—	0.0000114	0.000000818 (J)	—	0.000000534 (J)	0.00000187	—	—	0.000000278 (J)	0.000000278
RE02-10-21521	02-612292	5–6	QAL	NA	—	—	NA	NA	NA	NA	NA	0.0235 (J)	0.0597	NA	NA
RE02-10-21524	02-612292	35–36	QBO	NA	—	—	NA	NA	NA	NA	NA	—	—	NA	NA
RE02-10-21525	02-612292	49–50	QBO	NA	—	—	NA	NA	NA	NA	NA	—	—	NA	NA

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273), unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSLs are from LANL (2017, 602581).

[d] — = Not detected.

[e] NA = Not analyzed.

[f] na = Not available.

Table 6.29-8
Radionuclides Detected or Detected above BVs/FVs at AOC 02-011(a)(viii)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Cobalt-60	Plutonium-239/240	Tritium	Uranium-235/236
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**0.18**
Sediment BV/FV[a]				**0.9**	**na**	**0.068**	**0.093**	**0.2**
Soil BV/FV[a]				**1.65**	**na**	**0.054**	**na**	**0.2**
Industrial SAL[c]				**41**	**9**	**1200**	**2,400,000**	**160**
Recreational SAL[c]				**370**	**81**	**1300**	**5,700,000**	**1000**
Residential SAL[c]				**12**	**2.6**	**79**	**1700**	**42**
CA02-00-0192	02-01152	0–0.5	SED	—[d]	0.598	1.87	0.278969	—
0402-95-0313	02-01152	0–1	SED	—	0.38	0.184	0.209955	—
RE02-03-51824	02-22351	4–4.5	SOIL	0.169	—	0.0508	0.0372	—
RE02-03-51826	02-22352	3–3.5	SOIL	0.432	0.0519	—	0.14	—
RE02-03-51827	02-22352	4.5–5	SOIL	—	—	—	0.659	—
RE02-03-51866	02-22372	4–4.5	SOIL	—	—	—	0.773	—
RE02-03-51867	02-22372	5.5–6	SOIL	—	—	—	0.548	—
RE02-03-51868	02-22373	4–4.5	SOIL	—	—	—	0.487	—
RE02-03-51869	02-22373	5.5–6	SOIL	—	—	—	0.0893	—
RE02-03-51870	02-22374	3–3.5	SOIL	—	—	—	0.679	—
RE02-03-51871	02-22374	4.5–5	SOIL	—	—	—	0.43	—
RE02-07-2419	02-600542	0–0.5	SOIL	—	—	—	0.0207542	—
RE02-07-2420	02-600542	4.5–6.7	QAL	—	—	—	0.114549	—
RE02-07-2421	02-600542	15–17.4	QBO	—	—	—	—	0.195
RE02-07-2425	02-600543	9.5–11	QAL	—	—	—	0.0437816	—
RE02-07-2426	02-600543	19.5–22	QBO	—	—	—	0.0996667	—
RE02-10-21521	02-612292	5–6	QAL	—	—	—	0.512085	NA[e]
RE02-10-21523	02-612292	25–26	QBO	—	—	—	0.0853625	NA

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SALs from LANL (2015, 600929).

[d] — = Not detected.

[e] NA = Not analyzed.

Table 6.29-9
Samples Collected and Analyses Requested at AOC 02-011(a)(ix)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	TPH-DRO	VOCs	Cyanide (Total)
CA02-00-0320	02-01150	0–0.5	SED	—[a]	—	7531R[b]	7531R	—	7531R	7531R	7529R, 7530R	—	—	7531R	—	—	—	—	—
CA02-00-0323	02-01150	2.3–2.7	SED	—	—	7531R	7531R	—	7531R	7531R	7529R, 7530R	—	—	7531R	—	—	—	—	—
RE02-03-51820	02-22349	4–4.5	SOIL	—	—	1820S	1820S	1819S	1820S	1820S	1819S	—	—	1820S	—	1820S	—	—	—
RE02-03-51821	02-22349	5.5–6	SOIL	—	—	1820S	1820S	1819S	1820S	1820S	1819S	—	—	1820S	—	1820S	—	—	—
RE02-03-51856	02-22367	3.5–4	SOIL	—	—	1814S	1814S	1813S	1814S	1814S	1813S	—	—	1814S	—	1814S	—	—	—
RE02-03-51857	02-22367	5–5.5	SOIL	—	—	1814S	1814S	1813S	1814S	1814S	1813S	—	—	1814S	—	1814S	—	—	—
RE02-07-1763	02-600431	0–0.5	SOIL	07-423	07-422	07-423	07-423	07-422	07-423	07-423	07-422	07-421	07-422	07-423	07-421	—	—	—	07-422
RE02-07-1764	02-600431	7.5–12	QAL	07-565	07-564	07-565	07-565	07-564	07-565	07-565	07-564	07-563	07-564	07-565	07-563	—	—	07-563	07-564
RE02-07-1765	02-600431	15–21	QBO	07-565	07-564	07-565	07-565	07-564	07-565	07-565	07-564	07-563	07-564	07-565	07-563	—	—	07-563	07-564
RE02-07-1768	02-600432	0–0.5	SOIL	07-588	07-587	07-588	07-588	07-587	07-588	07-588	07-587	07-586	07-587	07-588	07-586	—	07-586	—	07-587
RE02-07-1769	02-600432	7.5–14	QAL	07-831	07-830	07-831	07-831	07-830	07-831	07-831	07-830	07-829	07-830	07-831	07-829	—	07-829	07-829	07-830
RE02-07-1770	02-600432	14–19	QBO	07-831	07-830	07-831	07-831	07-830	07-831	07-831	07-830	07-829	07-830	07-831	07-829	—	07-829	07-829	07-830
RE02-07-6823	02-600432	24.5–29	QBO	07-1131	07-1131	07-1131	07-1131	07-1131	07-1131	07-1131	07-1131	07-1131	07-1131	07-1131	07-1131	—	07-1131	07-1131	07-1131
RE02-07-1773	02-600433	0–0.5	SOIL	07-588	07-587	07-588	07-588	07-587	07-588	07-588	07-587	07-586	07-587	07-588	07-586	—	—	—	07-587
RE02-07-1775	02-600433	14–19	QBO	07-831	07-830	07-831	07-831	07-830	07-831	07-831	07-830	07-829	07-830	07-831	07-829	—	—	07-829	07-830
RE02-07-1778	02-600434	0–0.5	SOIL	07-588	07-587	07-588	07-588	07-587	07-588	07-588	07-587	07-586	07-587	07-588	07-586	—	—	—	07-587
RE02-07-1781	02-600434	7.5–16	QAL	07-828	07-827	07-828	07-828	07-827	07-828	07-828	07-827	07-826	07-827	07-828	07-826	—	—	07-826	07-827
RE02-07-1780	02-600434	16–19	QBO	07-828	07-827	07-828	07-828	07-827	07-828	07-828	07-827	07-826	07-827	07-828	07-826	—	—	07-826	07-827
RE02-07-1783	02-600435	0–0.5	SOIL	07-574	07-573	07-574	07-574	07-573	07-574	07-574	07-573	07-572	07-573	07-574	07-572	—	—	—	07-573
RE02-07-1784	02-600435	7.5–14.5	QAL	07-828	07-827	07-828	07-828	07-827	07-828	07-828	07-827	07-826	07-827	07-828	07-826	—	—	07-826	07-827
RE02-07-1785	02-600435	14.5–19	QBO	07-828	07-827	07-828	07-828	07-827	07-828	07-828	07-827	07-826	07-827	07-828	07-826	—	—	07-826	07-827
RE02-07-1788	02-600436	0–0.5	SOIL	07-574	07-573	07-574	07-574	07-573	07-574	07-574	07-573	07-572	07-573	07-574	07-572	—	—	—	07-573
RE02-07-1789	02-600436	7.5–13.5	QAL	07-819	07-818	07-819	07-819	07-818	07-819	07-819	07-818	07-817	07-818	07-819	07-817	—	—	07-817	07-818
RE02-07-1790	02-600436	13.5–18.5	QBO	07-819	07-818	07-819	07-819	07-818	07-819	07-819	07-818	07-817	07-818	07-819	07-817	—	—	07-817	07-818
RE02-07-1793	02-600437	0–0.5	SOIL	07-574	07-573	07-574	07-574	07-573	07-574	07-574	07-573	07-572	07-573	07-574	07-572	—	—	—	07-573
RE02-07-1794	02-600437	7.5–8.8	QAL	07-806	07-805	07-806	07-806	07-805	07-806	07-806	07-805	07-804	07-805	07-806	07-804	—	—	07-804	07-805
RE02-07-1798	02-600438	0–0.5	SOIL	07-574	07-573	07-574	07-574	07-573	07-574	07-574	07-573	07-572	07-573	07-574	07-572	—	—	—	07-573
RE02-07-1799	02-600438	7.5–11	QAL	07-806	07-805	07-806	07-806	07-805	07-806	07-806	07-805	07-804	07-805	07-806	07-804	—	—	07-804	07-805
RE02-07-1800	02-600438	14–16.2	QBO	07-806	07-805	07-806	07-806	07-805	07-806	07-806	07-805	07-804	07-805	07-806	07-804	—	—	07-804	07-805
RE02-07-1803	02-600439	0–0.5	SOIL	07-574	07-573	07-574	07-574	07-573	07-574	07-574	07-573	07-572	07-573	07-574	07-572	—	—	—	07-573
RE02-07-1804	02-600439	7.5–14	QAL	07-819	07-818	07-819	07-819	07-818	07-819	07-819	07-818	07-817	07-818	07-819	07-817	—	—	07-817	07-818
RE02-07-1805	02-600439	14–18.5	QBO	07-819	07-818	07-819	07-819	07-818	07-819	07-819	07-818	07-817	07-818	07-819	07-817	—	—	07-817	07-818
RE02-07-1808	02-600440	0–0.5	SOIL	07-574	07-573	07-574	07-574	07-573	07-574	07-574	07-573	07-572	07-573	07-574	07-572	—	—	—	07-573
RE02-07-1809	02-600440	7.5–14	QAL	07-831	07-830	07-831	07-831	07-830	07-831	07-831	07-830	07-829	07-830	07-831	07-829	—	—	07-829	07-830

Table 6.29-9 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	TPH-DRO	VOCs	Cyanide (Total)
RE02-07-1810	02-600440	14–19	QBO	07-831	07-830	07-831	07-831	07-830	07-831	07-831	07-830	07-829	07-830	07-831	07-829	—	—	07-829	07-830
RE02-07-1813	02-600441	0–0.5	SOIL	07-423	07-422	07-423	07-423	07-422	07-423	07-423	07-422	07-421	07-422	07-423	07-421	—	07-421	—	07-422
RE02-07-1814	02-600441	7.5–8	QAL	07-546	07-545	07-546	07-546	07-545	07-546	07-546	07-545	07-544	07-545	07-546	07-544	—	07-544	07-544	07-545
RE02-07-1816	02-600441	10–15	QAL	07-546	07-545	07-546	07-546	07-545	07-546	07-546	07-545	07-544	07-545	07-546	07-544	—	07-544	07-544	07-545
RE02-07-1815	02-600441	15–22	QBO	07-546	07-545	07-546	07-546	07-545	07-546	07-546	07-545	07-544	07-545	07-546	07-544	—	07-544	07-544	07-545
RE02-07-1818	02-600442	0–0.5	SOIL	07-968	07-968	07-968	07-968	07-968	07-968	07-968	07-968	07-968	07-968	07-968	07-968	—	—	—	07-968
RE02-07-1821	02-600442	8–12	QAL	07-968	07-968	07-968	07-968	07-968	07-968	07-968	07-968	07-968	07-968	07-968	07-968	—	—	07-968	07-968
RE02-07-1820	02-600442	15–20	QBO	07-968	07-968	07-968	07-968	07-968	07-968	07-968	07-968	07-968	07-968	07-968	07-968	—	—	07-968	07-968
RE02-07-1822	02-600443	0–0.5	SOIL	07-423	07-422	07-423	07-423	07-422	07-423	07-423	07-422	07-421	07-422	07-423	07-421	—	07-421	—	07-422
RE02-07-1823	02-600443	2–4	QAL	07-565	07-564	07-565	07-565	07-564	07-565	07-565	07-564	07-563	07-564	07-565	07-563	—	07-563	07-563	07-564
RE02-07-1824	02-600443	4–8	QAL	07-565	07-564	07-565	07-565	07-564	07-565	07-565	07-564	07-563	07-564	07-565	07-563	—	07-563	07-563	07-564
RE02-07-1826	02-600443	10–12.5	QBO	07-565	07-564	07-565	07-565	07-564	07-565	07-565	07-564	07-563	07-564	07-565	07-563	—	07-563	07-563	07-564
RE02-07-1825	02-600443	15–17.5	QBO	07-565	07-564	07-565	07-565	07-564	07-565	07-565	07-564	07-563	07-564	07-565	07-563	—	07-563	07-563	07-564
RE02-07-1828	02-600444	0–0.5	SOIL	07-588	07-587	07-588	07-588	07-587	07-588	07-588	07-587	07-586	07-587	07-588	07-586	—	—	—	07-587
RE02-07-1829	02-600444	7.5–8.5	QAL	07-857	07-857	07-857	07-857	07-857	07-857	07-857	07-857	07-857	07-857	07-857	07-857	—	—	07-857	07-857
RE02-07-1830	02-600444	13.5–20.5	QBO	07-857	07-857	07-857	07-857	07-857	07-857	07-857	07-857	07-857	07-857	07-857	07-857	—	—	07-857	07-857
RE02-07-1833	02-600445	0–0.5	SOIL	07-588	07-587	07-588	07-588	07-587	07-588	07-588	07-587	07-586	07-587	07-588	07-586	—	—	—	07-587
RE02-07-1834	02-600445	7.5–10.5	QAL	07-857	07-857	07-857	07-857	07-857	07-857	07-857	07-857	07-857	07-857	07-857	07-857	—	—	07-857	07-857
RE02-07-1835	02-600445	13–18.5	QBO	07-857	07-857	07-857	07-857	07-857	07-857	07-857	07-857	07-857	07-857	07-857	07-857	—	—	07-857	07-857
RE02-07-1836	02-600445	26–28.5	QBO	07-862	07-862	07-862	07-862	07-862	07-862	07-862	07-862	07-862	07-862	07-862	07-862	—	—	07-862	07-862
RE02-07-1838	02-600446	0–0.5	SOIL	07-588	07-587	07-588	07-588	07-587	07-588	07-588	07-587	07-586	07-587	07-588	07-586	—	—	—	07-587
RE02-07-1839	02-600446	7.5–12	QAL	07-862	07-862	07-862	07-862	07-862	07-862	07-862	07-862	07-862	07-862	07-862	07-862	—	—	07-862	07-862
RE02-07-1840	02-600446	13–18	QBO	07-871	07-871	07-871	07-871	07-871	07-871	07-871	07-871	07-871	07-871	07-871	07-871	—	—	07-871	07-871
RE02-07-1843	02-600447	0–0.5	SOIL	07-588	07-587	07-588	07-588	07-587	07-588	07-588	07-587	07-586	07-587	07-588	07-586	—	—	—	07-587
RE02-07-1844	02-600447	8.5–13.5	QAL	07-871	07-871	07-871	07-871	07-871	07-871	07-871	07-871	07-871	07-871	07-871	07-871	—	—	07-871	07-871
RE02-07-1845	02-600447	14.5–18.5	QBO	07-871	07-871	07-871	07-871	07-871	07-871	07-871	07-871	07-871	07-871	07-871	07-871	—	—	07-871	07-871
RE02-07-1848	02-600448	0–0.5	SOIL	07-574	07-573	07-574	07-574	07-573	07-574	07-574	07-573	07-572	07-573	07-574	07-572	—	—	—	07-573
RE02-07-1849	02-600448	7.5–14	QAL	07-819	07-818	07-819	07-819	07-818	07-819	07-819	07-818	07-817	07-818	07-819	07-817	—	—	07-817	07-818
RE02-10-21742	02-612345	5–6	QAL	—	—	10-4320	10-4320	10-4321	10-4320	10-4320	10-4321	10-4320	—	—	10-4320	—	10-4320	—	—
RE02-10-21743	02-612345	15–16	QAL	—	—	10-4320	10-4320	10-4321	10-4320	10-4320	10-4321	10-4320	—	—	10-4320	—	10-4320	—	—
RE02-10-21744	02-612345	25–26	QBO	—	—	10-4320	10-4320	10-4321	10-4320	10-4320	10-4321	10-4320	—	—	10-4320	—	10-4320	—	—
RE02-10-21745	02-612345	35–36	QBO	—	—	10-4320	10-4320	10-4321	10-4320	10-4320	10-4321	10-4320	—	—	10-4320	—	10-4320	—	—
RE02-10-21746	02-612345	49–50	QBO	—	—	10-4320	10-4320	10-4321	10-4320	10-4320	10-4321	10-4320	—	—	10-4320	—	10-4320	—	—

[a] — = Analysis not requested.

[b] Analytical request number.

Table 6.29-10
Inorganic Chemicals Detected or Detected above BVs at AOC 02-011(a)(ix)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**1900**	**2.6**	**na[b]**	**3.96**	**0.5**	**3700**	**13.5**	**739**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**1**	**4.59**	**40**
Sediment BV[a]				**15400**	**0.83**	**3.98**	**127**	**0.4**	**4420**	**10.5**	**na**	**11.2**	**na**	**13800**	**19.7**	**2370**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**	**19.7**	**60.2**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**na**	**14.7**	**0.5**	**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**na**	**505[d]**	**11.1**	**51,900**	**62.8**	**908,000**	**800**	**na**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**6530**	**1860**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**na**	**281[d]**	**40.2**	**24,800**	**224**	**434,000**	**1110**	**na**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,000**	**70.5**	**na**	**96.6d**	**3.05**	**3130**	**11.1**	**54,800**	**400**	**na**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**394**	**23,500**
CA02-00-0320	02-01150	0–0.5	SED	—[f]	—	—	—	—	—	—	NA[g]	—	NA	—	20	—	—	0.23 (J-)	—	NA	NA	—	1.1	—	—
CA02-00-0323	02-01150	2.3–2.7	SED	—	—	—	—	—	—	15.9	NA	—	NA	—	—	—	—	0.49 (J-)	—	NA	NA	—	—	—	150 (J+)
RE02-03-51820	02-22349	4–4.5	SOIL	—	—	—	—	0.509 (U)	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	—	—	—	—
RE02-03-51821	02-22349	5.5–6	SOIL	—	—	—	—	—	7290	—	—	—	NA	—	—	—	—	—	—	NA	NA	—	—	—	—
RE02-03-51856	02-22367	3.5–4	SOIL	—	—	—	—	—	—	—	1.14 (J-)	—	NA	—	2370 (J)	—	—	—	—	NA	NA	—	—	69.5	256 (J-)
RE02-03-51857	02-22367	5–5.5	SOIL	—	—	—	—	—	—	—	0.726 (J-)	—	NA	—	768 (J)	—	—	—	—	NA	NA	—	—	—	296 (J-)
RE02-07-1763	02-600431	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.24	—	1.91	—	—	—	—	113
RE02-07-1764	02-600431	7.5–12	QAL	—	—	—	—	0.547 (U)	—	30.9	—	—	—	—	—	—	—	—	—	1.11 (J-)	—	—	—	—	—
RE02-07-1765	02-600431	15–21	QBO	4910 (J+)	—	1 (J)	—	0.612 (U)	—	30	—	—	—	7020	—	—	292 (J+)	—	6.52 (U)	—	—	0.91 (J)	—	5.96	—
RE02-07-1768	02-600432	0–0.5	SOIL	—	—	—	—	—	—	—	0.131 (J)	—	—	—	—	—	—	0.74	—	1.04 (J-)	—	—	—	—	—
RE02-07-1769	02-600432	7.5–14	QAL	—	—	—	—	0.537 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	1.62	—	—	—
RE02-07-1770	02-600432	14–19	QBO	10600	—	1.17 (J)	43.6 (J+)	0.601 (U)	—	27.4	0.253	—	—	5580 (J+)	—	—	201	—	2.44	—	—	1.56 (J)	—	—	—
RE02-07-6823	02-600432	24.5–29	QBO	3770	0.509 (UJ)	1.9 (U)	—	0.634 (U)	—	12.3	—	—	—	5630	—	—	263	—	—	—	—	5.63	—	—	—
RE02-07-1773	02-600433	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.25	—	1.33 (J+)	0.000752 (J)	—	—	—	49.6
RE02-07-1775	02-600433	14–19	QBO	8390	—	1.86	50.6 (J+)	0.597 (U)	—	23	0.147 (J)	—	—	7400 (J+)	—	—	310	—	2.17	—	—	2.27	—	4.75	—
RE02-07-1778	02-600434	0–0.5	SOIL	—	—	—	—	—	—	—	0.349 (J)	—	—	—	—	—	—	0.421	—	1.66 (J+)	0.000556 (J)	—	—	—	—
RE02-07-1781	02-600434	7.5–16	QAL	—	—	—	—	0.55 (U)	—	—	—	—	—	—	—	—	—	0.102 (J)	—	—	—	2.07	—	—	—
RE02-07-1780	02-600434	16–19	QBO	11400	—	3.43	212 (J+)	0.587 (U)	2430	34.5	0.227 (J-)	11.8	—	12400 (J+)	48.8	4800 (J)	816	—	2.85 (U)	—	—	5.15	—	15.3	54.1
RE02-07-1783	02-600435	0–0.5	SOIL	—	—	—	—	—	—	—	0.241 (J)	—	0.579	—	—	—	—	0.358	—	1.18 (J-)	—	—	—	—	52
RE02-07-1784	02-600435	7.5–14.5	QAL	—	—	—	—	0.547 (U)	—	—	0.495 (J-)	—	—	—	—	—	—	—	—	1.51	0.0008 (J)	4.6	—	—	—
RE02-07-1785	02-600435	14.5–19	QBO	13000	—	1.56 (J)	34.6 (J+)	0.635 (U)	—	10.4 (U)	—	—	—	6070 (J+)	—	—	228	—	—	—	—	1.9	—	—	—
RE02-07-1788	02-600436	0–0.5	SOIL	—	—	—	—	—	—	—	0.176 (J)	—	—	—	—	—	—	0.311	—	1.05 (J-)	—	—	—	—	—
RE02-07-1789	02-600436	7.5–13.5	QAL	—	—	—	—	0.521 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	1.56 (U)	—	—	—
RE02-07-1790	02-600436	13.5–18.5	QBO	8460	—	1.93	36.1	0.588 (U)	—	27.2	—	—	—	6170	—	—	360	—	2.97 (U)	—	—	1.76 (U)	—	4.74	—
RE02-07-1793	02-600437	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.53 (U)	—	—	—
RE02-07-1794	02-600437	7.5–8.8	QAL	—	—	—	—	0.529 (U)	—	—	—	—	—	—	—	—	—	—	—	1.37	—	1.59 (U)	—	—	—
RE02-07-1798	02-600438	0–0.5	SOIL	—	—	—	—	0.441 (J)	31200	—	—	—	—	—	—	—	—	0.125	—	1.74 (J-)	—	—	—	—	57.9

Table 6.29-10 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**1900**	**2.6**	**na[b]**	**3.96**	**0.5**	**3700**	**13.5**	**739**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**1**	**4.59**	**40**
Sediment BV[a]				**15400**	**0.83**	**3.98**	**127**	**0.4**	**4420**	**10.5**	**na**	**11.2**	**na**	**13800**	**19.7**	**2370**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**	**19.7**	**60.2**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**na**	**14.7**	**0.5**	**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**na**	**505[d]**	**11.1**	**51,900**	**62.8**	**908,000**	**800**	**na**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**6530**	**1860**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**na**	**281[d]**	**40.2**	**24,800**	**224**	**434,000**	**1110**	**na**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,000**	**70.5**	**na**	**96.6d**	**3.05**	**3130**	**11.1**	**54,800**	**400**	**na**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**394**	**23,500**
RE02-07-1799	02-600438	7.5–11	QAL	—	—	—	—	0.544 (U)	—	—	—	—	—	—	—	—	—	—	—	1.42	—	—	—	—	—
RE02-07-1800	02-600438	14–16.2	QBO	10000	—	1.07 (J)	74.2	0.577 (U)	—	10.1 (J)	—	—	—	5750	—	—	374	—	—	—	—	1.73 (U)	—	—	—
RE02-07-1803	02-600439	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.411	—	1.13 (J-)	—	—	—	—	—
RE02-07-1804	02-600439	7.5–14	QAL	—	—	—	—	0.532 (U)	—	—	0.112	—	—	—	—	—	—	—	—	2.35	—	1.59 (U)	—	—	—
RE02-07-1805	02-600439	14–18.5	QBO	10500	—	1.65 (J)	97.3	0.59 (U)	—	8.59 (U)	0.0657 (J)	—	—	8500	—	—	392	—	2.86 (U)	—	—	1.77 (U)	—	5.44	—
RE02-07-1808	02-600440	0–0.5	SOIL	—	—	—	—	0.536 (J)	—	—	—	—	—	—	—	—	—	0.33	—	1.73 (J-)	—	—	—	—	52.9
RE02-07-1809	02-600440	7.5–14	QAL	—	—	—	—	0.563 (U)	—	—	—	—	—	—	—	—	—	—	—	1.52	0.000733 (J)	1.74	—	—	—
RE02-07-1810	02-600440	14–19	QBO	11200	—	1.12 (J)	—	0.642 (U)	—	15.5	—	4.42	—	6200 (J+)	—	—	209	—	3.09	—	—	1.82 (J)	—	—	—
RE02-07-1813	02-600441	0–0.5	SOIL	—	—	—	—	0.543 (U)	—	—	—	—	—	—	—	—	—	4.39	—	—	—	1.63 (U)	—	—	—
RE02-07-1814	02-600441	7.5–8	QAL	—	—	—	—	0.521 (U)	—	20.2	—	—	—	—	—	—	—	0.257	—	1.28 (J-)	—	—	—	—	—
RE02-07-1816	02-600441	10–15	QAL	—	—	—	—	0.554 (U)	—	27.2 (U)	0.0646 (J)	16.7 (U)	—	—	—	—	—	—	—	5.72 (J-)	—	—	—	—	—
RE02-07-1815	02-600441	15–22	QBO	9510	0.511 (UJ)	0.983 (J)	—	0.648 (U)	—	20.2 (U)	0.0538 (J)	5.83 (U)	—	5650	—	—	267	—	4.84 (U)	—	—	0.691 (J)	—	—	—
RE02-07-1818	02-600442	0–0.5	SOIL	—	—	—	—	0.549 (U)	—	—	—	—	—	—	—	—	—	0.179	—	1.17 (J-)	—	—	—	—	—
RE02-07-1821	02-600442	8–12	QAL	—	—	—	—	0.567 (U)	—	36.2 (J)	—	—	—	—	—	—	—	—	—	—	—	1.53 (J)	—	—	—
RE02-07-1820	02-600442	15–20	QBO	8040 (J+)	—	0.922 (U)	27.1	0.593 (U)	—	40.9 (J)	—	4.47 (U)	—	7950	—	—	222	—	2.52	—	—	1.46 (J)	—	6.12	—
RE02-07-1822	02-600443	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6.45	—	9.68	—	—	—	—	—
RE02-07-1823	02-600443	2–4	QAL	—	—	—	—	—	—	27.7 (U)	—	—	—	—	92.2 (J)	—	—	0.978 (J-)	—	—	—	—	—	—	158 (J+)
RE02-07-1824	02-600443	4–8	QAL	—	—	—	—	0.508 (U)	—	45.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	77.4 (J+)
RE02-07-1826	02-600443	10–12.5	QBO	—	—	1.66 (J)	—	0.586 (U)	—	25.1 (U)	—	5.1 (U)	—	7180	—	—	310 (J+)	—	2.39 (U)	2.87 (J-)	—	1.1 (J)	—	14.3	—
RE02-07-1825	02-600443	15–17.5	QBO	8680 (J+)	—	1.2 (J)	53.5 (J+)	0.595 (U)	—	12.7 (U)	—	—	—	7510	—	—	288 (J+)	—	3.3 (U)	1.67 (J-)	—	0.746 (J)	—	8.4	—
RE02-07-1828	02-600444	0–0.5	SOIL	—	—	—	—	0.5 (U)	—	—	—	—	—	—	—	—	—	—	—	1.41 (J+)	—	—	—	—	—
RE02-07-1829	02-600444	7.5–8.5	QAL	—	—	—	—	0.517 (U)	—	—	0.0575 (J)	—	—	—	—	—	—	—	—	—	—	1.87	—	—	—
RE02-07-1830	02-600444	13.5–20.5	QBO	6380	—	1.63 (J)	—	0.603 (U)	—	29.5	0.117 (J)	—	—	6970	—	—	248 (J+)	—	—	—	—	1.89	—	6.17 (J)	—
RE02-07-1833	02-600445	0–0.5	SOIL	—	—	—	—	—	8740	—	—	—	—	—	—	—	—	—	—	0.954 (J-)	—	—	—	—	214
RE02-07-1834	02-600445	7.5–10.5	QAL	—	—	—	—	0.537 (U)	—	—	0.0784 (J)	—	—	—	—	—	—	—	—	—	—	1.78	—	—	—
RE02-07-1835	02-600445	13–18.5	QBO	9550	—	1.32 (J)	—	0.61 (U)	—	10.3	—	—	—	6240	—	—	198 (J+)	—	—	—	—	2.13	—	—	—
RE02-07-1836	02-600445	26–28.5	QBO	4930	0.516 (UJ)	0.801 (J)	—	0.643 (U)	—	15.2	0.111 (J)	—	—	6960	—	—	243 (J+)	—	—	—	—	2.07	—	—	—
RE02-07-1838	02-600446	0–0.5	SOIL	—	—	—	—	0.512 (U)	—	—	—	—	—	—	—	—	—	—	—	1.19 (J+)	—	—	—	—	—
RE02-07-1839	02-600446	7.5–12	QAL	—	—	—	—	0.551 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	2.68	—	—	—
RE02-07-1840	02-600446	13–18	QBO	7930	—	1.24 (J)	49.5	0.516 (U)	—	10.9	0.148	—	—	6640	—	—	210	—	2.18 (J)	—	—	1.55 (U)	—	9.39 (J)	—

Table 6.29-10 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**1900**	**2.6**	**na[b]**	**3.96**	**0.5**	**3700**	**13.5**	**739**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**1**	**4.59**	**40**
Sediment BV[a]				**15400**	**0.83**	**3.98**	**127**	**0.4**	**4420**	**10.5**	**na**	**11.2**	**na**	**13800**	**19.7**	**2370**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**	**19.7**	**60.2**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**na**	**14.7**	**0.5**	**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**na**	**505[d]**	**11.1**	**51,900**	**62.8**	**908,000**	**800**	**na**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**6530**	**1860**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**na**	**281[d]**	**40.2**	**24,800**	**224**	**434,000**	**1110**	**na**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,000**	**70.5**	**na**	**96.6d**	**3.05**	**3130**	**11.1**	**54,800**	**400**	**na**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**394**	**23,500**
RE02-07-1843	02-600447	0–0.5	SOIL	—	—	—	—	0.501 (U)	—	—	—	—	—	—	—	—	—	0.117	—	1.19 (J-)	—	—	—	—	—
RE02-07-1844	02-600447	8.5–13.5	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.58 (U)	—	—	—
RE02-07-1845	02-600447	14.5–18.5	QBO	13800	—	1.84 (U)	53.1	0.612 (U)	—	8.54	0.0495 (J)	—	—	6480	—	—	247	—	2.43 (J)	—	—	1.84 (U)	—	—	—
RE02-07-1848	02-600448	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.283	—	1.28 (J-)	—	—	—	—	—
RE02-07-1849	02-600448	7.5–14	QAL	—	—	—	—	0.524 (U)	—	—	—	—	—	—	—	—	—	—	—	1.22	—	1.57 (U)	—	—	—
RE02-10-21742	02-612345	5–6	QAL	—	1.09 (U)	—	—	0.543 (U)	—	—	—	—	NA	—	44.2	—	—	—	—	NA	NA	—	—	—	92.7
RE02-10-21743	02-612345	15–16	QAL	—	1.11 (U)	—	—	0.557 (U)	—	—	0.316 (J)	—	NA	—	—	—	—	—	—	NA	NA	—	—	—	—
RE02-10-21744	02-612345	25–26	QBO	4480	1.29 (U)	1.27 (U)	—	0.646 (U)	—	3.28	—	—	NA	6390	—	—	271	—	—	NA	NA	1.27 (U)	—	—	—
RE02-10-21745	02-612345	35–36	QBO	—	1.4 (U)	1.34 (U)	—	0.699 (U)	—	5.24	—	—	NA	6290	—	—	279	—	—	NA	NA	1.34 (U)	—	—	—
RE02-10-21746	02-612345	49–50	QBO	—	1.32 (U)	—	—	0.662 (U)	—	4.88	—	—	NA	8580	—	1570 (J-)	355	—	—	NA	NA	1.35 (U)	—	5.75	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 6.29-11
Organic Chemicals Detected at AOC 02-011(a)(ix)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Anthracene	Aroclor-1242	Aroclor-1248	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	Chloroform	Chrysene	Di-n-butylphthalate	Fluoranthene
Industrial SSL[a]				**50,500**	**253,000**	**10.9**	**10.7**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**1830**	**28.4**	**3230**	**91,600**	**33,700**
Recreational SSL[c]				**17,300**	**863,000**	**10.3**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**888**	**1770**	**20.4**	**8880**	**32,800**	**11,500**
Residential SSL[a]				**3480**	**17,400**	**2.43**	**2.43**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**380**	**5.85**	**153**	**6160**	**2320**
RE02-07-1763	02-600431	0–0.5	SOIL	—[d]	0.0164 (J)	—	—	0.232	0.174	0.0779	0.121 (J)	0.109 (J)	—	—	—	NA[e]	0.0806	—	0.107
RE02-07-1764	02-600431	7.5–12	QAL	—	—	—	—	0.01	0.0133	—	—	—	—	—	0.153 (J)	—	—	—	—
RE02-07-1765	02-600431	15–21	QBO	—	—	—	—	0.0244 (J-)	0.0392 (J-)	—	—	—	—	—	0.0894 (J)	—	—	—	—
RE02-07-1768	02-600432	0–0.5	SOIL	0.0134 (J)	0.0877	—	—	0.0142 (J)	0.0241 (J)	0.593	0.433	0.792	0.158	—	—	NA	0.517	—	0.965
RE02-07-1769	02-600432	7.5–14	QAL	—	—	—	—	0.0045	0.0051	0.0172 (J)	0.0937 (J)	0.0151 (J)	—	—	0.0789 (J)	—	0.0145 (J)	—	0.0204 (J)
RE02-07-1770	02-600432	14–19	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-6823	02-600432	24.5–29	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1773	02-600433	0–0.5	SOIL	0.0481	0.0843	—	—	0.222	0.118	0.184	0.237	0.323	0.0995	—	—	NA	0.194	0.0613 (J)	0.292
RE02-07-1778	02-600434	0–0.5	SOIL	0.0163 (J)	0.0267 (J)	—	—	0.0251 (J)	0.0426	0.0588	0.0684	0.0656	0.0522	0.0533	—	NA	0.0699	—	0.0943
RE02-07-1781	02-600434	7.5–16	QAL	—	0.0101 (J)	—	—	0.00563	0.0054	0.0288 (J)	0.0334 (J)	0.0344 (J)	0.0243 (J)	—	—	—	0.035 (J)	—	0.0571
RE02-07-1783	02-600435	0–0.5	SOIL	—	—	—	—	—	0.0235 (J)	0.017 (J)	—	—	—	—	—	NA	0.0133 (J)	—	0.0217 (J)
RE02-07-1784	02-600435	7.5–14.5	QAL	—	—	0.0103 (J-)	—	0.00826	0.0062	0.0142 (J)	—	—	—	—	—	—	—	—	0.0209 (J)
RE02-07-1788	02-600436	0–0.5	SOIL	0.019 (J)	0.0274 (J)	—	—	0.0196 (J)	0.0263 (J)	0.0606	0.0775	0.0908	0.0467	—	—	NA	0.0702	—	0.11
RE02-07-1793	02-600437	0–0.5	SOIL	—	0.011 (J)	—	—	0.0381	0.0466	0.0371	0.0501	0.0493	0.0312 (J)	0.0317 (J)	—	NA	0.0418	—	0.0552
RE02-07-1798	02-600438	0–0.5	SOIL	—	0.0151 (J)	—	—	0.118	0.268	0.07	0.0799	0.106	0.0625	0.0481	—	NA	0.0812	—	0.156
RE02-07-1799	02-600438	7.5–11	QAL	—	—	—	—	0.0035 (J)	0.0067	—	—	—	—	—	—	—	—	—	—
RE02-07-1803	02-600439	0–0.5	SOIL	—	0.0142 (J)	—	—	0.0984	0.194	0.0535	0.0427	0.0624	0.0332 (J)	0.0326 (J)	—	NA	0.0531	—	0.109
RE02-07-1804	02-600439	7.5–14	QAL	—	—	—	—	0.0286	0.0519	0.041	0.0331 (J)	0.0397	—	—	—	—	0.0326 (J)	—	0.0865
RE02-07-1808	02-600440	0–0.5	SOIL	—	—	—	—	—	0.0209 (J)	0.0245 (J)	0.0246 (J)	0.034 (J)	—	0.0129 (J)	—	NA	0.0239 (J)	—	0.033 (J)
RE02-07-1809	02-600440	7.5–14	QAL	—	—	—	—	0.008	0.0071	—	—	—	—	—	—	—	—	—	—
RE02-07-1813	02-600441	0–0.5	SOIL	—	0.0286 (J)	—	0.197	0.138	0.172	0.17	0.168 (J)	0.236 (J)	—	—	—	NA	0.157	—	0.222
RE02-07-1814	02-600441	7.5–8	QAL	—	—	—	—	0.0104	0.0225	—	—	—	—	—	—	—	—	—	—
RE02-07-1816	02-600441	10–15	QAL	—	—	—	—	0.0122 (J)	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1818	02-600442	0–0.5	SOIL	—	—	—	—	0.0177 (J+)	0.0286 (J+)	0.0439	0.05 (J)	0.0868 (J)	0.0155 (J)	—	—	NA	0.0481	—	0.071
RE02-07-1821	02-600442	8–12	QAL	—	—	—	—	0.0089 (J)	0.0062 (J)	—	—	—	—	—	—	—	—	—	—
RE02-07-1820	02-600442	15–20	QBO	—	—	—	—	0.0028 (J)	0.0021 (J)	—	—	—	—	—	—	—	—	—	—
RE02-07-1822	02-600443	0–0.5	SOIL	—	0.0111 (J)	—	—	0.0553	0.145	0.0538	0.0998 (J)	0.0797 (J)	—	—	—	NA	0.0574	—	0.0887
RE02-07-1823	02-600443	2–4	QAL	—	0.0159 (J)	—	—	0.174	0.0721	0.0402 (J)	0.0368 (J)	0.0607 (J)	—	—	—	—	0.0337 (J)	—	0.0427

Table 6.29-11 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Anthracene	Aroclor-1242	Aroclor-1248	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	Chloroform	Chrysene	Di-n-butylphthalate	Fluoranthene
Industrial SSL[a]				**50,500**	**253,000**	**10.9**	**10.7**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**1830**	**28.4**	**3230**	**91,600**	**33,700**
Recreational SSL[c]				**17,300**	**863,000**	**10.3**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**888**	**1770**	**20.4**	**8880**	**32,800**	**11,500**
Residential SSL[a]				**3480**	**17,400**	**2.43**	**2.43**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**380**	**5.85**	**153**	**6160**	**2320**
RE02-07-1824	02-600443	4–8	QAL	—	—	—	—	0.0216 (J-)	0.0161 (J-)	—	—	—	—	—	—	—	—	—	0.0119 (J)
RE02-07-1826	02-600443	10–12.5	QBO	—	—	—	—	0.0061	0.0069	—	—	—	—	—	—	—	—	—	—
RE02-07-1825	02-600443	15–17.5	QBO	—	—	—	—	0.003 (J-)	0.0027 (J-)	—	—	—	—	—	—	—	—	—	—
RE02-07-1828	02-600444	0–0.5	SOIL	—	—	—	—	0.0142 (J)	0.0336 (J)	0.0605	0.0452	0.0626	—	—	—	NA	0.0689	—	0.0687
RE02-07-1829	02-600444	7.5–8.5	QAL	—	—	—	—	0.0165	0.0122	—	—	—	—	—	—	0.000218 (J)	—	0.0736 (J)	—
RE02-07-1830	02-600444	13.5–20.5	QBO	—	—	—	—	0.0026 (J)	0.0028 (J)	—	—	—	—	—	—	—	—	0.0856 (J)	—
RE02-07-1833	02-600445	0–0.5	SOIL	—	—	—	—	0.0504	0.106	0.0173 (J)	0.0155 (J)	0.0142 (J)	—	—	—	NA	0.0115 (J)	0.0446 (J)	0.016 (J)
RE02-07-1835	02-600445	13–18.5	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.102 (J)	—
RE02-07-1838	02-600446	0–0.5	SOIL	—	—	—	—	0.0171 (J)	0.0372	—	—	—	—	—	—	NA	—	—	—
RE02-07-1839	02-600446	7.5–12	QAL	—	—	—	—	0.0084	0.0065	—	—	—	—	—	—	—	—	—	—
RE02-07-1840	02-600446	13–18	QBO	—	—	—	—	0.0066	0.0046	—	—	—	—	—	—	—	—	—	—
RE02-07-1843	02-600447	0–0.5	SOIL	—	0.0144 (J)	—	—	0.0257 (J)	0.0422	0.0599	0.0492	0.0653	—	—	—	NA	0.0535	—	0.0861
RE02-07-1844	02-600447	8.5–13.5	QAL	—	—	—	—	0.0106	0.0131	—	—	—	—	—	—	—	—	—	—
RE02-07-1848	02-600448	0–0.5	SOIL	0.0158 (J)	0.0263 (J)	—	—	0.0175 (J)	0.0215 (J)	0.0648	0.0799	0.0953	0.0488 (J)	0.0335 (J)	—	NA	0.0649	—	0.103
RE02-10-21742	02-612345	5–6	QAL	—	0.0334 (J)	—	—	—	—	0.0634	0.0899	0.0838	0.0756 (J)	0.042	—	NA	0.0616	—	0.109
RE02-10-21743	02-612345	15–16	QAL	—	—	—	—	—	—	—	—	—	—	—	—	NA	—	—	—
RE02-10-21744	02-612345	25–26	QBO	—	—	—	—	—	—	—	—	—	—	—	—	NA	—	—	—
RE02-10-21745	02-612345	35–36	QBO	—	—	—	—	—	—	—	—	—	—	—	—	NA	—	—	—
RE02-10-21746	02-612345	49–50	QBO	—	—	—	—	—	—	—	—	—	—	—	—	NA	—	—	—

Table 6.29-11 (continued)

Sample ID	Location ID	Depth (ft)	Media	Fluorene	Indeno(1,2,3-cd)pyrene	Isopropylbenzene	Isopropyltoluene[4-]	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Toluene	TPH-DRO	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene[1,2-]
Industrial SSL[a]				**33,700**	**32.3**	**14,100**	**14,100[f]**	**5110**	**3370**	**16,800**	**1160**	**25,300**	**61,100**	**3000[g]**	**1800[h]**	**1500[h]**	**3910**
Recreational SSL[c]				**11,500**	**88.8**	**42,100**	**42,100[f]**	**3610**	**1150**	**1930**	**1160**	**8630**	**47,600**	**na**	**5010**	**4830**	**26,000**
Residential SSL[a]				**2320**	**1.53**	**2350**	**2350[f]**	**409**	**232**	**1160**	**1740**	**1740**	**5220**	**1000[g]**	**300[h]**	**270[h]**	**798**
RE02-07-1763	02-600431	0–0.5	SOIL	—	—	NA	NA	NA	—	—	0.0611	0.178	NA	NA	NA	NA	NA
RE02-07-1764	02-600431	7.5–12	QAL	—	—	—	—	—	—	—	—	—	—	NA	—	—	—
RE02-07-1765	02-600431	15–21	QBO	—	—	—	—	—	—	—	—	—	—	NA	—	—	—
RE02-07-1768	02-600432	0–0.5	SOIL	0.0145 (J)	0.145	NA	NA	NA	—	—	0.317	1.3	NA	16.8 (J)	NA	NA	NA
RE02-07-1769	02-600432	7.5–14	QAL	—	—	—	—	—	—	—	0.0216 (J)	0.0252 (J)	—	6.08	—	—	—
RE02-07-1770	02-600432	14–19	QBO	—	—	—	—	—	—	—	—	—	—	567	—	—	—
RE02-07-6823	02-600432	24.5–29	QBO	—	—	—	—	0.00322 (J)	—	—	—	—	—	—	—	—	—
RE02-07-1773	02-600433	0–0.5	SOIL	0.0405	0.107	NA	NA	NA	0.0194 (J)	0.0278 (J)	0.285	0.391	NA	NA	NA	NA	NA
RE02-07-1778	02-600434	0–0.5	SOIL	0.0145 (J)	0.0412	NA	NA	NA	—	0.0125 (J)	0.089	0.122	NA	NA	NA	NA	NA
RE02-07-1781	02-600434	7.5–16	QAL	—	0.0206 (J)	—	—	—	—	—	0.0488	0.0523	—	NA	—	—	—
RE02-07-1783	02-600435	0–0.5	SOIL	—	—	NA	NA	NA	—	—	0.016 (J)	0.0273 (J)	NA	NA	NA	NA	NA
RE02-07-1784	02-600435	7.5–14.5	QAL	—	—	—	0.000534 (J)	—	—	0.0176 (J)	0.0194 (J)	0.0202 (J)	—	NA	0.00329	0.00101 (J)	0.000249 (J)
RE02-07-1788	02-600436	0–0.5	SOIL	0.0141 (J)	0.0376	NA	NA	NA	0.00962 (J)	0.0231 (J)	0.104	0.118	NA	NA	NA	NA	NA
RE02-07-1793	02-600437	0–0.5	SOIL	—	0.0282 (J)	NA	NA	NA	—	—	0.0413	0.0665	NA	NA	NA	NA	NA
RE02-07-1798	02-600438	0–0.5	SOIL	—	0.0494	NA	NA	NA	—	—	0.0577	0.146	NA	NA	NA	NA	NA
RE02-07-1799	02-600438	7.5–11	QAL	—	—	—	—	—	—	—	—	—	—	NA	—	—	—
RE02-07-1803	02-600439	0–0.5	SOIL	—	0.0272 (J)	NA	NA	NA	—	—	0.073	0.11	NA	NA	NA	NA	NA
RE02-07-1804	02-600439	7.5–14	QAL	—	0.0147 (J)	—	—	—	—	—	0.0289 (J)	0.0666	—	NA	—	—	—
RE02-07-1808	02-600440	0–0.5	SOIL	—	—	NA	NA	NA	—	—	0.0267 (J)	0.0366 (J)	NA	NA	NA	NA	NA
RE02-07-1809	02-600440	7.5–14	QAL	—	—	—	—	—	—	—	—	—	—	NA	—	—	—
RE02-07-1813	02-600441	0–0.5	SOIL	—	—	NA	NA	NA	—	—	0.0939	0.368	NA	—	NA	NA	NA
RE02-07-1814	02-600441	7.5–8	QAL	—	—	—	—	—	—	—	—	—	—	2.1 (J)	—	—	—
RE02-07-1816	02-600441	10–15	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1818	02-600442	0–0.5	SOIL	—	—	NA	NA	NA	—	—	0.0438	0.0773	NA	NA	NA	NA	NA
RE02-07-1821	02-600442	8–12	QAL	—	—	—	—	—	—	—	—	—	—	NA	—	—	—
RE02-07-1820	02-600442	15–20	QBO	—	—	—	—	—	—	—	—	—	—	NA	—	—	—
RE02-07-1822	02-600443	0–0.5	SOIL	—	—	NA	NA	NA	—	—	0.0449	0.12	NA	13.8 (J)	NA	NA	NA
RE02-07-1823	02-600443	2–4	QAL	—	—	—	—	—	—	—	0.0379	0.0774 (J)	—	77.3	—	—	—
RE02-07-1824	02-600443	4–8	QAL	—	—	0.000401 (J)	—	—	—	—	—	—	0.000362 (J)	4.33 (J)	—	—	—
RE02-07-1826	02-600443	10–12.5	QBO	—	—	0.00072 (J)	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1825	02-600443	15–17.5	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 6.29-11 (continued)

Sample ID	Location ID	Depth (ft)	Media	Fluorene	Indeno(1,2,3-cd)pyrene	Isopropylbenzene	Isopropyltoluene[4-]	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Toluene	TPH-DRO	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene[1,2-]
Industrial SSL[a]				**33,700**	**32.3**	**14,100**	**14,100[f]**	**5110**	**3370**	**16,800**	**1160**	**25,300**	**61,100**	**3000[g]**	**1800[h]**	**1500[h]**	**3910**
Recreational SSL[c]				**11,500**	**88.8**	**42,100**	**42,100[f]**	**3610**	**1150**	**1930**	**1160**	**8630**	**47,600**	**na**	**5010**	**4830**	**26,000**
Residential SSL[a]				**2320**	**1.53**	**2350**	**2350[f]**	**409**	**232**	**1160**	**1740**	**1740**	**5220**	**1000[g]**	**300[h]**	**270[h]**	**798**
RE02-07-1828	02-600444	0–0.5	SOIL	—	—	NA	NA	NA	—	—	—	0.0954	NA	NA	NA	NA	NA
RE02-07-1829	02-600444	7.5–8.5	QAL	—	—	—	—	—	—	—	—	—	—	NA	—	—	—
RE02-07-1830	02-600444	13.5–20.5	QBO	—	—	—	—	—	—	—	—	—	—	NA	—	—	—
RE02-07-1833	02-600445	0–0.5	SOIL	—	—	NA	NA	NA	—	—	—	0.0203 (J)	NA	NA	NA	NA	NA
RE02-07-1835	02-600445	13–18.5	QBO	—	—	—	—	—	—	—	—	—	—	NA	—	—	—
RE02-07-1838	02-600446	0–0.5	SOIL	—	—	NA	NA	NA	—	—	—	—	NA	NA	NA	NA	NA
RE02-07-1839	02-600446	7.5–12	QAL	—	—	—	—	—	—	—	—	—	—	NA	—	—	—
RE02-07-1840	02-600446	13–18	QBO	—	—	—	—	—	—	—	—	—	—	NA	—	—	—
RE02-07-1843	02-600447	0–0.5	SOIL	—	—	NA	NA	NA	—	—	0.0587	0.13	NA	NA	NA	NA	NA
RE02-07-1844	02-600447	8.5–13.5	QAL	—	—	—	—	—	—	—	—	—	—	NA	—	—	—
RE02-07-1848	02-600448	0–0.5	SOIL	0.0138 (J)	0.0436 (J)	NA	NA	NA	—	—	0.0977	0.109	NA	NA	NA	NA	NA
RE02-10-21742	02-612345	5–6	QAL	—	0.0662 (J)	NA	NA	NA	0.0508	0.0378 (J)	0.102	0.0945	NA	537	NA	NA	NA
RE02-10-21743	02-612345	15–16	QAL	—	—	NA	NA	NA	—	—	—	—	NA	471	NA	NA	NA
RE02-10-21744	02-612345	25–26	QBO	—	—	NA	NA	NA	—	—	—	—	NA	12.7	NA	NA	NA
RE02-10-21745	02-612345	35–36	QBO	—	—	NA	NA	NA	—	—	—	—	NA	33.9	NA	NA	NA
RE02-10-21746	02-612345	49–50	QBO	—	—	NA	NA	NA	—	—	—	—	NA	16.9	NA	NA	NA

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273), unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSLs are from LANL (2017, 602581).

[d] — = Not detected.

[e] NA = Not analyzed.

[f] Isopropylbenzene used as surrogate based on structural similarity.

[g] SSLs for diesel #2 from NMED (2017, 602273).

[h] SSLs are from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables).

Table 6.29-12
Radionuclides Detected or Detected above BVs/FVs at AOC 02-011(a)(ix)

Sample ID	Location ID	Depth (ft)	Media	Cesium-134	Cesium-137	Plutonium-239/240	Tritium	Uranium-234	Uranium-235/236
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**4**	**0.18**
Sediment BV/FV[a]				**na**	**0.9**	**0.068**	**0.093**	**2.59**	**0.2**
Soil BV/FV[a]				**na**	**1.65**	**0.054**	**na**	**2.59**	**0.2**
Industrial SAL[c]				**17**	**41**	**1200**	**2,400,000**	**3100**	**160**
Recreational SAL[c]				**150**	**370**	**1300**	**5,700,000**	**3900**	**1000**
Residential SAL[c]				**5**	**12**	**79**	**1700**	**290**	**42**
CA02-00-0320	02-01150	0–0.5	SED	—[d]	—	1.66	—	—	—
CA02-00-0323	02-01150	2.3–2.7	SED	—	—	0.82	—	2.66	—
RE02-03-51820	02-22349	4–4.5	SOIL	—	—	—	0.0137	—	—
RE02-03-51821	02-22349	5.5–6	SOIL	—	—	0.0358	0.0087	—	—
RE02-03-51856	02-22367	3.5–4	SOIL	—	0.0971	—	0.004	—	—
RE02-03-51857	02-22367	5–5.5	SOIL	—	—	—	0.0353	—	—
RE02-07-1763	02-600431	0–0.5	SOIL	—	—	—	0.0458426	—	—
RE02-07-1769	02-600432	7.5–14	QAL	—	—	—	0.0247832	—	—
RE02-07-1770	02-600432	14–19	QBO	—	—	—	—	—	0.232
RE02-07-6823	02-600432	24.5–29	QBO	—	—	—	0.071641	—	—
RE02-07-1784	02-600435	7.5–14.5	QAL	—	—	—	0.168751	—	—
RE02-07-1785	02-600435	14.5–19	QBO	—	—	—	—	—	0.189
RE02-07-1794	02-600437	7.5–8.8	QAL	—	—	—	0.0674906	—	—
RE02-07-1799	02-600438	7.5–11	QAL	—	—	—	0.133842	—	—
RE02-07-1808	02-600440	0–0.5	SOIL	—	—	—	0.0195434	—	—
RE02-07-1809	02-600440	7.5–14	QAL	—	0.137	—	0.101618	—	—
RE02-07-1816	02-600441	10–15	QAL	—	—	—	—	—	0.261
RE02-07-1820	02-600442	15–20	QBO	—	—	—	0.0513659	—	—
RE02-07-1823	02-600443	2–4	QAL	—	0.202	0.0794	—	—	—
RE02-07-1824	02-600443	4–8	QAL	—	0.0889	—	0.0317071	—	—
RE02-07-1830	02-600444	13.5–20.5	QBO	0.235	—	—	—	—	—
RE02-07-1836	02-600445	26–28.5	QBO	—	—	—	—	—	0.197
RE02-07-1849	02-600448	7.5–14	QAL	—	—	—	0.0402612	—	—
RE02-10-21742	02-612345	5–6	QAL	—	0.135	0.0318	0.0869655	—	—
RE02-10-21743	02-612345	15–16	QAL	—	—	—	0.0291951	—	—
RE02-10-21744	02-612345	25–26	QBO	—	—	—	0.0843243	—	—
RE02-10-21745	02-612345	35–36	QBO	—	—	—	0.0827463	—	—
RE02-10-21746	02-612345	49–50	QBO	—	—	—	0.0907536	—	—

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SALs from LANL (2015, 600929).

[d] — = Not detected.

Table 6.29-13
Samples Collected and Analyses Requested at AOC 02-011(a)(x)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Pesticides	Pesticides/PCBs	Strontium-90	SVOCs	Technetium-99	TPH-DRO	VOCs	Cyanide (Total)
CA02-00-0193	02-01153	0–0.5	SED	—[a]	—	7531R[b]	7531R	—	7531R	7531R	7529R, 7530R	—	—	—	—	7531R	—	—	—	—	—
CA02-00-0198	02-01153	2.2–2.5	SED	—	—	7531R	7531R	—	7531R	7531R	7529R, 7530R	—	—	—	—	7531R	—	—	—	—	—
RE02-03-51814	02-22346	4–4.5	SOIL	—	—	1820S	1820S	1819S	1820S	1820S	1819S	—	—	—	—	1820S	—	1820S	—	—	—
RE02-03-51815	02-22346	5.5–6	SOIL	—	—	1820S	1820S	1819S	1820S	1820S	1819S	—	—	—	—	1820S	—	1820S	—	—	—
RE02-03-51816	02-22347	4–4.5	SOIL	—	—	1820S	1820S	1819S	1820S	1820S	1819S	—	—	—	—	1820S	—	1820S	—	—	—
RE02-03-51817	02-22347	5.5–6	SOIL	—	—	1820S	1820S	1819S	1820S	1820S	1819S	—	—	—	—	1820S	—	1820S	—	—	—
RE02-03-51818	02-22348	5.5–6	SOIL	—	—	1820S	1820S	1819S	1820S	1820S	1819S	—	—	—	—	1820S	—	1820S	—	—	—
RE02-03-51819	02-22348	7–7.5	SOIL	—	—	1820S	1820S	1819S	1820S	1820S	1819S	—	—	—	—	1820S	—	1820S	—	—	—
RE02-03-51858	02-22368	2.5–3	SOIL	—	—	1814S	1814S	1813S	1814S	1814S	1813S	—	—	—	—	1814S	—	1814S	—	—	—
RE02-03-51859	02-22368	4–4.5	SOIL	—	—	1814S	1814S	1813S	1814S	1814S	1813S	—	—	—	—	1814S	—	1814S	—	—	—
RE02-03-51882	02-22380	2.5–3	SOIL	—	—	1814S	1814S	1813S	1814S	1814S	1813S	—	—	—	—	1814S	—	1814S	—	—	—
RE02-03-51883	02-22380	4–4.5	SOIL	—	—	1814S	1814S	1813S	1814S	1814S	1813S	—	—	—	—	1814S	—	1814S	—	—	—
RE02-07-3062	02-600660	0–0.5	SOIL	07-762	07-761	07-762	07-762	07-761	07-762	07-762	07-761	07-760	07-761	—	—	07-762	07-760	—	—	—	07-761
RE02-07-3063	02-600660	4.5–8.5	QAL	07-885	07-885	07-885	07-885	07-885	07-885	07-885	07-885	07-885	07-885	—	—	07-885	07-885	—	—	07-885	07-885
RE02-07-3067	02-600661	0–0.5	SOIL	07-762	07-761	07-762	07-762	07-761	07-762	07-762	07-761	07-760	07-761	—	—	07-762	07-760	—	—	—	07-761
RE02-07-3068	02-600661	4.5–9.5	QAL	07-969	07-969	07-969	07-969	07-969	07-969	07-969	07-969	07-969	07-969	—	—	07-969	07-969	—	—	07-969	07-969
RE02-07-3071	02-600661	11–14.5	QAL	07-969	07-969	07-969	07-969	07-969	07-969	07-969	07-969	07-969	07-969	—	—	07-969	07-969	—	—	07-969	07-969
RE02-07-3070	02-600661	14.5–19.5	QBO	07-969	07-969	07-969	07-969	07-969	07-969	07-969	07-969	07-969	07-969	—	—	07-969	07-969	—	—	07-969	07-969
RE02-07-3069	02-600661	25–30	QBO	07-978	07-978	07-978	07-978	07-978	07-978	07-978	07-978	07-978	07-978	—	—	07-978	07-978	—	—	07-978	07-978
RE02-07-3072	02-600662	0–0.5	SOIL	07-781	07-781	07-781	07-781	07-781	07-781	07-781	07-781	07-781	07-781	—	—	07-781	07-781	—	—	—	07-781
RE02-07-3073	02-600662	4.5–10	QAL	07-919	07-919	07-919	07-919	07-919	07-919	07-919	07-919	07-919	07-919	—	—	07-919	07-919	—	—	07-919	07-919
RE02-07-3075	02-600662	15–20	QBO	07-919	07-919	07-919	07-919	07-919	07-919	07-919	07-919	07-919	07-919	—	—	07-919	07-919	—	—	07-919	07-919
RE02-07-3077	02-600663	0–0.5	SOIL	07-781	07-781	07-781	07-781	07-781	07-781	07-781	07-781	07-781	07-781	—	—	07-781	07-781	—	—	—	07-781
RE02-07-3078	02-600663	4.5–10	QAL	07-1010	07-1010	07-1010	07-1010	07-1010	07-1010	07-1010	07-1010	07-1010	07-1010	—	—	07-1010	07-1010	—	—	07-1010	07-1010
RE02-07-3080	02-600663	14–16	QBO	07-1010	07-1010	07-1010	07-1010	07-1010	07-1010	07-1010	07-1010	07-1010	07-1010	—	—	07-1010	07-1010	—	—	07-1010	07-1010

Table 6.29-13 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Pesticides	Pesticides/PCBs	Strontium-90	SVOCs	Technetium-99	TPH-DRO	VOCs	Cyanide (Total)
RE02-10-22154	02-600664	2–2.2	SOIL	—	—	—	—	—	—	—	—	10-4176	—	—	—	—	—	—	—	—	—
RE02-10-22155	02-600664	4–4.2	SOIL	—	—	—	—	—	—	—	—	10-4176	—	—	—	—	—	—	—	—	—
RE02-07-3083	02-600664	4.5–7	QAL	07-940	07-940	07-940	07-940	07-940	07-940	07-940	07-940	07-940	07-940	—	—	07-940	07-940	—	—	07-940	07-940
RE02-07-3085	02-600664	9.5–14.5	QBO	07-940	07-940	07-940	07-940	07-940	07-940	07-940	07-940	07-940	07-940	—	—	07-940	07-940	—	—	07-940	07-940
RE02-07-6834	02-600664	19.5–24.5	QBO	07-1139	07-1139	07-1139	07-1139	—	07-1139	07-1139	07-1137	07-1137	07-1139	—	—	07-1139	07-1137	—	—	07-1137	07-1139
RE02-07-3087	02-600665	0–0.5	SOIL	07-762	07-761	07-762	07-762	07-761	07-762	07-762	07-761	07-760	07-761	—	—	07-762	07-760	—	07-760	—	07-761
RE02-07-3088	02-600665	4.5–7.5	QAL	07-870	07-870	07-870	07-870	07-870	07-870	07-870	07-870	07-870	07-870	—	—	07-870	07-870	—	07-870	07-870	07-870
RE02-07-3090	02-600665	13.5–18.5	QBO	07-870	07-870	07-870	07-870	07-870	07-870	07-870	07-870	07-870	07-870	—	—	07-870	07-870	—	07-870	07-870	07-870
RE02-07-6835	02-600665	19.5–23.5	QBO	07-1131	07-1131	07-1131	07-1131	—	07-1131	07-1131	07-1131	07-1131	07-1131	—	—	07-1131	07-1131	—	07-1131	07-1131	07-1131
RE02-07-3092	02-600666	0–0.5	SOIL	07-762	07-761	07-762	07-762	07-761	07-762	07-762	07-761	07-760	07-761	—	—	07-762	07-760	—	—	—	07-761
RE02-10-21768	02-612348	5–7	QAL	—	—	10-4264	10-4264	10-4263	10-4264	10-4264	10-4263	10-4263	—	—	—	10-4264	10-4263	—	—	—	—
RE02-10-21769	02-612348	15–16	QAL	—	—	10-4264	10-4264	10-4263	10-4264	10-4264	10-4263	10-4263	—	—	—	10-4264	10-4263	—	—	—	—
RE02-10-21770	02-612348	25–26	QBO	—	—	10-4264	10-4264	10-4263	10-4264	10-4264	10-4263	10-4263	—	—	—	10-4264	10-4263	—	—	—	—
RE02-10-21771	02-612348	35–36	QBO	—	—	10-4264	10-4264	10-4263	10-4264	10-4264	10-4263	10-4263	—	—	—	10-4264	10-4263	—	—	—	—
RE02-10-21772	02-612348	49–50	QBO	—	—	10-4264	10-4264	10-4263	10-4264	10-4264	10-4263	10-4263	—	—	—	10-4264	10-4263	—	—	—	—
RE02-10-22158	02-612459	4–4.2	SOIL	—	—	—	—	—	—	—	—	10-4176	—	—	—	—	—	—	—	—	—
RE02-10-22161	02-612460	4–4.2	SOIL	—	—	—	—	—	—	—	—	10-4190	—	—	—	—	—	—	—	—	—
RE02-10-22164	02-612461	4–4.4	SOIL	—	—	—	—	—	—	—	—	10-4190	—	—	—	—	—	—	—	—	—
RE02-10-22167	02-612462	4–4.2	SOIL	—	—	—	—	—	—	—	—	10-4190	—	—	—	—	—	—	—	—	—
RE02-10-25664	02-612983	7–8	QAL	—	—	11-59	11-59	11-58	11-59	11-59	11-58	11-58	—	—	—	—	11-58	—	—	—	—
RE02-10-25665	02-612983	15–16	QAL	—	—	11-59	11-59	11-58	11-59	11-59	11-58	11-58	—	—	—	—	11-58	—	—	—	—
RE02-10-25666	02-612983	26–27	QBO	—	—	11-59	11-59	11-58	11-59	11-59	11-58	11-58	—	—	—	—	11-58	—	—	—	—
RE02-10-25667	02-612983	35–36	QBO	—	—	11-160	11-160	11-160	11-160	11-160	11-160	11-160	—	—	—	—	11-160	—	—	—	—
RE02-10-25668	02-612983	49–50	QBO	—	—	11-160	11-160	11-160	11-160	11-160	11-160	11-160	—	—	—	—	11-160	—	—	—	—
RE02-10-26101	02-612999	0–0.5	SOIL	—	—	—	—	—	—	—	—	10-4454	—	—	—	—	—	—	—	—	—
RE02-10-26102	02-612999	2–2.2	SOIL	—	—	—	—	—	—	—	—	10-4454	—	—	—	—	—	—	—	—	—
RE02-10-26103	02-613000	0–0.5	SOIL	—	—	—	—	—	—	—	—	10-4454	—	—	—	—	—	—	—	—	—
RE02-10-26104	02-613000	2–2.2	SOIL	—	—	—	—	—	—	—	—	10-4454	—	—	—	—	—	—	—	—	—

[a] — = Analysis not requested.

[b] Analytical request number.

Table 6.29-14
Inorganic Chemicals Detected or Detected above BVs at AOC 02-011(a)(x)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**1900**	**2.6**	**na[b]**	**8.89**	**3.96**	**3700**	**13.5**	**739**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**1**	**4.59**	**40**
Qbt 2, 3, 4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**na**	**3.14**	**4.66**	**14500**	**11.2**	**1690**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**17**	**63.5**
Sediment BV[a]				**15400**	**0.83**	**3.98**	**127**	**0.4**	**4420**	**10.5**	**na**	**4.73**	**11.2**	**13800**	**19.7**	**2370**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**	**19.7**	**60.2**
Soil BV[c]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**na**	**8.64**	**14.7**	**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**na**	**505[d]**	**11.1**	**388**	**51,900**	**908,000**	**800**	**na**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**6530**	**1860**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**na**	**281[d]**	**40.2**	**186**	**24,800**	**434,000**	**1110**	**na**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,000**	**70.5**	**na**	**96.6[d]**	**3.05**	**23.4**	**3130**	**54,800**	**400**	**na**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**394**	**23,500**
CA02-00-0193	02-01153	0–0.5	SED	—[f]	—	—	—	—	—	10.9	NA[g]	—	—	—	45	—	—	0.12 (J-)	—	NA	NA	0.572 (J)	1.1	—	75.6 (J+)
CA02-00-0198	02-01153	2.2–2.5	SED	—	—	—	—	—	—	24	NA	—	13	—	—	—	—	0.12 (J-)	—	NA	NA	0.374 (J)	1.1	—	120 (J+)
RE02-03-51814	02-22346	4–4.5	SOIL	—	—	—	—	0.518 (U)	6190	—	0.162	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—
RE02-03-51815	02-22346	5.5–6	SOIL	—	—	—	—	—	—	—	0.295	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—
RE02-03-51816	02-22347	4–4.5	SOIL	—	—	—	—	—	16660	—	0.476	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—
RE02-03-51817	02-22347	5.5–6	SOIL	—	—	—	—	0.519 (U)	—	—	0.498	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—
RE02-03-51818	02-22348	5.5–6	SOIL	—	—	—	—	—	7380	—	0.39	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—
RE02-03-51819	02-22348	7–7.5	SOIL	—	—	—	—	0.494 (U)	12830	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—
RE02-03-51858	02-22368	2.5–3	SOIL	—	—	—	614 (J+)	—	—	—	—	—	—	—	—	—	—	0.656	—	NA	NA	—	—	—	914 (J-)
RE02-03-51859	02-22368	4–4.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	125 (J-)
RE02-03-51882	02-22380	2.5–3	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	297 (J-)
RE02-07-3062	02-600660	0–0.5	SOIL	—	—	—	—	0.515 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	4.1 (U)	—	—	—
RE02-07-3063	02-600660	4.5–8.5	QAL	—	—	—	968	0.521 (U)	—	21.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-3067	02-600661	0–0.5	SOIL	—	—	—	—	0.514 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	3.77 (U)	—	—	71.5
RE02-07-3068	02-600661	4.5–9.5	QAL	—	—	—	—	0.523 (U)	—	19.9 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-3071	02-600661	11–14.5	QAL	—	—	—	—	0.562 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-3070	02-600661	14.5–19.5	QBO	9080 (J+)	—	0.902 (J)	51.7	0.572 (U)	—	64.8 (J)	—	—	—	7230	—	—	202	—	—	—	—	0.873 (J)	—	6.14	—
RE02-07-3069	02-600661	25–30	QBO	4760 (J+)	0.547 (UJ)	2.04 (U)	—	0.679 (U)	—	4.8	—	—	—	5500	—	—	—	—	—	—	—	2.04 (U)	—	—	—
RE02-07-3072	02-600662	0–0.5	SOIL	—	—	—	—	—	—	—	0.247 (J)	—	—	—	—	—	—	0.19	—	1.13	0.000609 (J)	—	—	—	—
RE02-07-3073	02-600662	4.5–10	QAL	—	—	—	—	0.509 (U)	—	—	0.0384 (J)	—	—	—	—	—	—	—	—	2.35	0.000627 (J)	1.53 (U)	—	—	—
RE02-07-3075	02-600662	15–20	QBO	6300	—	1.48 (J)	—	0.586 (U)	—	8.9	—	—	—	8580	—	—	256	—	—	1.02 (J)	—	1.76 (U)	—	6.6 (J)	—
RE02-07-3077	02-600663	0–0.5	SOIL	—	—	16.9	—	2.54 (U)	—	23.2 (J)	0.693	9.67	52	66400	—	—	—	0.267	—	—	0.00114 (J)	5.71 (U)	—	—	—
RE02-07-3078	02-600663	4.5–10	QAL	—	—	—	—	0.552 (U)	—	—	0.068 (J)	—	—	—	—	—	—	—	—	1.03	0.000634 (J)	—	—	—	—
RE02-07-3080	02-600663	14–16	QBO	8880 (J+)	—	1.07 (U)	55.6	0.607 (U)	—	2.98	0.287	—	—	5620	—	—	334 (J+)	—	2.33	—	—	1.82 (U)	—	—	—
RE02-07-3083	02-600664	4.5–7	QAL	—	—	—	—	0.538 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	56.3
RE02-07-3085	02-600664	9.5–14.5	QBO	7510	—	1.42 (J)	42.7 (J+)	0.546 (U)	—	—	0.0275 (J)	—	—	11600	—	832 (J+)	566 (J+)	—	3.76 (U)	—	—	1.58 (J)	—	8.09	50.2
RE02-07-6834	02-600664	19.5–24.5	QBO	—	—	1.79 (U)	—	0.596 (U)	—	—	NA	—	—	4710	—	—	—	—	—	—	—	5.54	—	—	—

Table 6.29-14 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Hexavalent Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**1900**	**2.6**	**na[b]**	**8.89**	**3.96**	**3700**	**13.5**	**739**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**1**	**4.59**	**40**
Qbt 2, 3, 4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**na**	**3.14**	**4.66**	**14500**	**11.2**	**1690**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**17**	**63.5**
Sediment BV[a]				**15400**	**0.83**	**3.98**	**127**	**0.4**	**4420**	**10.5**	**na**	**4.73**	**11.2**	**13800**	**19.7**	**2370**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**	**19.7**	**60.2**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**na**	**8.64**	**14.7**	**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**na**	**505[d]**	**11.1**	**388**	**51,900**	**908,000**	**800**	**na**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**6530**	**1860**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**na**	**281[d]**	**40.2**	**186**	**24,800**	**434,000**	**1110**	**na**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,000**	**70.5**	**na**	**96.6[d]**	**3.05**	**23.4**	**3130**	**54,800**	**400**	**na**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**394**	**23,500**
RE02-07-3087	02-600665	0–0.5	SOIL	—	—	—	—	0.493 (U)	—	—	—	—	—	—	—	—	—	0.13	—	1.44 (J-)	—	1.71 (U)	—	—	—
RE02-07-3088	02-600665	4.5–7.5	QAL	—	—	—	—	0.528 (U)	—	—	0.353	—	—	—	—	—	—	—	—	—	—	1.58 (U)	—	—	—
RE02-07-3090	02-600665	13.5–18.5	QBO	9380	—	1.66 (J)	30.3	—	—	16.2	0.0717 (J)	—	—	6280	—	—	218	—	—	—	—	1.72 (U)	—	5.25 (J)	—
RE02-07-6835	02-600665	19.5–23.5	QBO	7930	0.531 (UJ)	1.93 (U)	—	0.644 (U)	—	3.61	NA	—	—	5510	—	—	190	—	—	—	—	6.17	—	—	—
RE02-07-3092	02-600666	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	25.9 (J)	—	—	—	—	1.91 (J-)	0.000703 (J)	3.66 (U)	—	—	98.7
RE02-10-21768	02-612348	5–7	QAL	—	1.12 (U)	—	—	0.559 (U)	—	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—
RE02-10-21769	02-612348	15–16	QAL	—	1.16 (U)	—	—	0.579 (U)	—	—	—	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—
RE02-10-21770	02-612348	25–26	QBO	—	1.32 (U)	1.27 (U)	—	0.662 (U)	—	—	—	—	—	5350	—	—	214 (J+)	—	—	NA	NA	1.27 (U)	—	—	—
RE02-10-21771	02-612348	35–36	QBO	—	1.19 (U)	1.26 (U)	—	—	—	3.66	—	—	—	5390	—	—	199 (J+)	—	—	NA	NA	1.26 (U)	—	—	—
RE02-10-21772	02-612348	49–50	QBO	—	1.19 (U)	1.18 (U)	—	0.594 (U)	—	—	—	—	—	5600	—	—	223 (J+)	—	—	NA	NA	1.18 (U)	—	—	—
RE02-10-25664	02-612983	7–8	QAL	—	5.05 (UJ)	—	—	—	—	—	0.395 (J)	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—
RE02-10-25665	02-612983	15–16	QAL	—	1.21 (UJ)	—	—	—	—	—	0.356 (J)	—	—	—	—	—	—	—	—	NA	NA	—	—	—	—
RE02-10-25666	02-612983	26–27	QBO	23800	1.35 (UJ)	—	188 (J+)	0.676 (U)	—	7.22	—	—	—	7700	—	—	259	—	3.52 (J-)	NA	NA	1.29 (UJ)	—	—	—
RE02-10-25667	02-612983	35–36	QBO	9810	1.27 (UJ)	—	—	0.633 (U)	—	—	—	—	—	5980	—	—	—	—	—	NA	NA	1.21 (U)	—	—	—
RE02-10-25668	02-612983	49–50	QBO	7070	1.12 (UJ)	—	—	0.56 (U)	—	—	—	—	—	5990	—	—	—	—	—	NA	NA	1.21 (U)	—	—	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 6.29-15
Organic Chemicals Detected at AOC 02-011(a)(x)

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	Di-n-butylphthalate	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Toluene	TPH-DRO
Industrial SSL[a]				**50,500**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**3230**	**91,600**	**33,700**	**33,700**	**32.3**	**5110**	**3370**	**16,800**	**1160**	**25,300**	**61,100**	**3000[c]**
Recreational SSL[d]				**17,300**	**863,000**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**8880**	**32,800**	**11,500**	**11,500**	**88.8**	**3610**	**1150**	**1930**	**1160**	**8630**	**47,600**	**na[e]**
Residential SSL[a]				**3480**	**17,400**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**153**	**6160**	**2320**	**2320**	**1.53**	**409**	**310**	**1160**	**1740**	**1740**	**5220**	**1000[c]**
RE02-07-3062	02-600660	0–0.5	SOIL	—[f]	—	0.0145 (J)	0.0247 (J+)	—	—	—	—	—	—	—	—	—	NA[g]	—	—	—	—	NA	NA[g]
RE02-07-3067	02-600661	0–0.5	SOIL	0.0824	0.131	0.036	0.0583	0.232	0.262	0.43	0.0952	0.248	—	0.403	0.0662	0.0838	NA	0.0408	0.0861	0.437	0.485	NA	NA
RE02-07-3068	02-600661	4.5–9.5	QAL	—	—	—	—	—	—	—	—	—	0.0381 (J)	—	—	—	—	—	—	—	—	—	NA
RE02-07-3071	02-600661	11–14.5	QAL	—	—	—	—	—	—	—	—	—	0.0417 (J)	—	—	—	—	—	—	—	—	—	NA
RE02-07-3070	02-600661	14.5–19.5	QBO	—	—	—	—	—	—	—	—	—	0.0467 (J)	—	—	—	—	—	—	—	—	—	NA
RE02-07-3072	02-600662	0–0.5	SOIL	—	—	—	0.0254 (J)	—	—	—	—	0.0112 (J)	—	0.0217 (J)	—	—	NA	—	—	0.0122 (J)	0.0184 (J)	NA	NA
RE02-07-3073	02-600662	4.5–10	QAL	—	—	—	0.0025 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00097 (J)	NA
RE02-07-3077	02-600663	0–0.5	SOIL	—	0.00847 (J)	0.0549	0.0414	—	—	—	—	0.0145 (J)	—	0.0296 (J)	—	—	NA	—	0.0123 (J)	0.0277 (J)	0.0286 (J)	NA	NA
RE02-10-22155	02-600664	4–4.2	SOIL	NA	NA	—	0.0016 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-07-3083	02-600664	4.5–7	QAL	—	—	—	0.319	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	NA
RE02-07-3087	02-600665	0–0.5	SOIL	—	—	0.0406	0.0488	—	0.0425	0.0642	—	0.0383	—	0.041	—	—	NA	—	—	0.0282 (J)	0.0428	NA	52.3 (J)
RE02-07-3088	02-600665	4.5–7.5	QAL	—	—	—	0.0024 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-3090	02-600665	13.5–18.5	QBO	—	—	0.005	0.0041	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-6835	02-600665	19.5–23.5	QBO	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00295 (J)	—	—	—	—	—	—
RE02-07-3092	02-600666	0–0.5	SOIL	0.0156 (J)	0.0401	0.0701	0.0944	—	0.221	0.674	0.111	0.34	—	0.362	0.0161 (J)	0.102	NA	—	0.0112 (J)	0.189	0.33	NA	NA
RE02-10-21768	02-612348	5–7	QAL	—	—	0.0103 (J)	0.0049	—	—	—	—	—	—	—	—	—	NA	—	—	—	—	NA	NA
RE02-10-21771	02-612348	35–36	QBO	—	—	—	0.0022 (J)	—	—	—	—	—	—	—	—	—	NA	—	—	—	—	NA	NA
RE02-10-22158	02-612459	4–4.2	SOIL	NA	NA	—	0.0819	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-22161	02-612460	4–4.2	SOIL	NA	NA	—	0.0084	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-25664	02-612983	7–8	QAL	—	—	0.0029 (J)	0.0024 (J)	—	—	—	—	—	—	—	—	—	NA	—	—	—	—	NA	NA
RE02-10-25666	02-612983	26–27	QBO	—	—	0.0061	—	—	—	—	—	—	—	—	—	—	NA	—	—	—	—	NA	NA
RE02-10-26101	02-612999	0–0.5	SOIL	NA	NA	0.0309	0.0623	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26102	02-612999	2–2.2	SOIL	NA	NA	—	0.221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26103	02-613000	0–0.5	SOIL	NA	NA	—	0.635	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-10-26104	02-613000	2–2.2	SOIL	NA	NA	—	0.015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273), unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSLs for diesel #2 from NMED (2017, 602273).

[d] SSLs are from LANL (2017, 602581).

[e] na = Not available.

[f] — = Not detected.

[g] NA = Not analyzed.

Table 6.29-16
Radionuclides Detected or Detected above BVs/FVs at AOC 02-011(a)(x)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Tritium	Uranium-235/236
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**0.18**
Qbt 2, 3, 4 BV[a]				**na**	**na**	**na**	**0.09**
Sediment BV/FV[a]				**0.9**	**0.068**	**0.093**	**0.2**
Soil BV/FV[a]				**1.65**	**0.054**	**na**	**0.2**
Industrial SAL[c]				**41**	**1200**	**2,400,000**	**160**
Recreational SAL[c]				**370**	**1300**	**5,700,000**	**1000**
Residential SAL[c]				**12**	**79**	**1700**	**42**
CA02-00-0193	02-01153	0–0.5	SED	—[d]	1.67 (J-)	0.104333	—
CA02-00-0198	02-01153	2.2–2.5	SED	—	1.15	—	—
RE02-03-51814	02-22346	4–4.5	SOIL	—	—	0.031	—
RE02-03-51815	02-22346	5.5–6	SOIL	—	—	0.0344	—
RE02-03-51816	02-22347	4–4.5	SOIL	—	—	0.0207	—
RE02-03-51817	02-22347	5.5–6	SOIL	0.0415	—	—	—
RE02-03-51818	02-22348	5.5–6	SOIL	—	—	0.0158	—
RE02-03-51819	02-22348	7–7.5	SOIL	—	—	0.0282	—
RE02-03-51858	02-22368	2.5–3	SOIL	0.121	—	—	—
RE02-03-51859	02-22368	4–4.5	SOIL	—	—	0.0542	—
RE02-03-51882	02-22380	2.5–3	SOIL	—	—	0.148	—
RE02-03-51883	02-22380	4–4.5	SOIL	—	—	0.0131	—
RE02-07-3062	02-600660	0–0.5	SOIL	—	0.057	0.00498927	—
RE02-07-3068	02-600661	4.5–9.5	QAL	—	—	0.0194178	—
RE02-07-3073	02-600662	4.5–10	QAL	—	—	0.0166154	—
RE02-07-3077	02-600663	0–0.5	SOIL	—	0.1	0.017719	—
RE02-07-3078	02-600663	4.5–10	QAL	—	—	0.0792273	—
RE02-07-3080	02-600663	14–16	QBO	—	—	0.0570732	—
RE02-07-3083	02-600664	4.5–7	QAL	—	—	0.0422697	—
RE02-07-6834	02-600664	19.5–24.5	QBO	—	—	0.125759	—
RE02-07-3087	02-600665	0–0.5	SOIL	—	0.0783	0.00416427	—
RE02-07-6835	02-600665	19.5–23.5	QBO	—	—	—	0.194
RE02-07-3092	02-600666	0–0.5	SOIL	—	0.785	—	—
RE02-10-21772	02-612348	49–50	QBO	—	—	0.0525806	—
RE02-10-25668	02-612983	49–50	QBO	—	—	0.0499231	—

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SALs from LANL (2015, 600929).

[d] — = Not detected.

Table 6.30-1
Samples Collected and Analyses Requested at AOC 02-011(b)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	Technetium-99	VOCs	Cyanide (Total)
CA02-00-0308	02-01239	0–1	SED	—[a]	—	7460R[b]	7460R	—	7460R	7460R	7458R, 7459R	—	—	7460R	—	—	—	—
CA02-00-0309	02-01239	3–4	SOIL	—	—	7460R	7460R	—	7460R	7460R	7458R, 7459R	—	—	7460R	—	—	—	—
CA02-00-0310	02-01239	6–7	SOIL	—	—	7460R	7460R	—	7460R	7460R	7458R, 7459R	—	—	7460R	—	—	—	—
CA02-00-0311	02-01239	11.5–13	SOIL	—	—	7460R	7460R	—	7460R	7460R	7458R, 7459R	—	—	7460R	—	—	—	—
CA02-00-0312	02-01239	14–15	QBT 3	—	—	7460R	7460R	—	7460R	7460R	7458R, 7459R	—	—	7460R	—	—	—	—
RE02-07-892	02-600211	0–0.5	SED	07-677	07-676	07-677	07-677	07-676	07-677	07-677	07-676	07-675	07-676	07-677	07-675	—	—	07-676
RE02-07-897	02-600212	0–0.5	SED	07-677	07-676	07-677	07-677	07-676	07-677	07-677	07-676	07-675	07-676	07-677	07-675	—	—	07-676
RE02-07-902	02-600213	0–0.5	SED	07-677	07-676	07-677	07-677	07-676	07-677	07-677	07-676	07-675	07-676	07-677	07-675	—	—	07-676
RE02-07-907	02-600214	0–0.5	SED	07-677	07-676	07-677	07-677	07-676	07-677	07-677	07-676	07-675	07-676	07-677	07-675	—	—	07-676
RE02-07-912	02-600215	0–0.5	SOIL	07-677	07-676	07-677	07-677	07-676	07-677	07-677	07-676	07-675	07-676	07-677	07-675	—	—	07-676
RE02-07-913	02-600215	2–2.4	QAL	07-677	07-676	07-677	07-677	07-676	07-677	07-677	07-676	07-675	07-676	07-677	07-675	—	07-675	07-676
RE02-07-914	02-600215	4.5–6.7	QAL	07-861	07-861	07-861	07-861	07-861	07-861	07-861	07-861	07-861	07-861	07-861	07-861	—	07-861	07-861
RE02-07-916	02-600215	9.5–11.4	QAL	07-861	07-861	07-861	07-861	07-861	07-861	07-861	07-861	07-861	07-861	07-861	07-861	—	07-861	07-861
RE02-07-915	02-600215	14.5–16.7	QBO	07-861	07-861	07-861	07-861	07-861	07-861	07-861	07-861	07-861	07-861	07-861	07-861	—	07-861	07-861
RE02-10-21904	02-612389	5–6	QAL	11-122	—	11-122	11-122	—	11-122	11-122	11-122	11-122	—	11-122	11-122	—	—	—
RE02-10-21905	02-612389	18–19	QAL	11-122	—	11-122	11-122	—	11-122	11-122	11-122	11-122	—	11-122	11-122	—	—	—
RE02-10-21906	02-612389	25–27	QBO	11-152	—	11-152	11-152	—	11-152	11-152	11-151	11-151	—	11-152	11-151	—	—	—
RE02-10-21907	02-612389	35–36	QBO	11-152	—	11-152	11-152	—	11-152	11-152	11-151	11-151	—	11-152	11-151	—	—	—
RE02-10-21908	02-612389	49–50	QBO	11-152	—	11-152	11-152	—	11-152	11-152	11-151	11-151	—	11-152	11-151	—	—	—
RE02-10-21911	02-612390	5–6	QAL	10-4513	—	10-4513	10-4513	—	10-4513	10-4513	10-4512	10-4512	—	10-4513	10-4512	—	—	—
RE02-10-21912	02-612390	15–17	QBO	10-4513	—	10-4513	10-4513	—	10-4513	10-4513	10-4512	10-4512	—	10-4513	10-4512	—	—	—
RE02-10-21913	02-612390	26–27	QBO	10-4513	—	10-4513	10-4513	—	10-4513	10-4513	10-4512	10-4512	—	10-4513	10-4512	—	—	—
RE02-10-21914	02-612390	35–36	QBO	10-4513	—	10-4513	10-4513	—	10-4513	10-4513	10-4512	10-4512	—	10-4513	10-4512	—	—	—
RE02-10-21915	02-612390	49–50	QBO	10-4513	—	10-4513	10-4513	—	10-4513	10-4513	10-4512	10-4512	—	10-4513	10-4512	—	—	—

[a] — = Analysis not requested.

[b] Analytical request number.

Table 6.30-2
Inorganic Chemicals Detected or Detected above BVs at AOC 02-011(b)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Cadmium	Chromium	Hexavalent Chromium	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Selenium	Uranium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**0.4**	**2.6**	**na[b]**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**0.3**	**na**	**4.59**	**40**
Qbt 2, 3, 4 BV[a]				**7340**	**0.5**	**2.79**	**1.63**	**7.14**	**na**	**14500**	**11.2**	**482**	**0.1**	**6.58**	**na**	**0.3**	**2.4**	**17**	**63.5**
Sediment BV[a]				**15400**	**0.83**	**3.98**	**0.4**	**10.5**	**na**	**13800**	**19.7**	**543**	**0.1**	**9.38**	**na**	**0.3**	**2.22**	**19.7**	**60.2**
Soil BV[a]				**29200**	**0.83**	**8.17**	**0.4**	**19.3**	**na**	**21500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**1.52**	**1.82**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**1110**	**505[d]**	**11.1**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**6490**	**3880**	**6530**	**1860**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**457**	**281[d]**	**40.2**	**434,000**	**1110**	**14,800**	**186**	**12,400**	**991,000**	**3100**	**1860**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**70.5**	**96.6[d]**	**3.05**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**391**	**234**	**394**	**23,500**
CA02-00-0309	02-01239	3–4	SOIL	—[f]	—	—	—	—	NA[g]	—	—	—	—	—	NA	—	6.83	—	55
CA02-00-0311	02-01239	11.5–13	SOIL	—	—	—	—	37	NA	—	—	—	—	20	NA	—	—	—	—
CA02-00-0312	02-01239	14–15	QBT 3	8100 (J-)	—	—	—	—	NA	—	—	—	—	—	NA	0.32 (U)	—	—	—
RE02-07-892	02-600211	0–0.5	SED	—	—	—	—	—	0.454 (J)	—	21.2	—	0.461 (J-)	—	2.28 (J)	0.845 (J)	NA	—	70.1 (J)
RE02-07-897	02-600212	0–0.5	SED	—	—	—	—	—	0.693 (J)	—	20.8	—	0.193 (J-)	—	2.11 (J)	1.55 (U)	NA	—	64.1 (J)
RE02-07-902	02-600213	0–0.5	SED	—	—	—	—	—	0.602 (J)	—	23.2	—	0.123 (J-)	—	5.02 (J)	1.55 (U)	NA	—	65.2 (J)
RE02-07-907	02-600214	0–0.5	SED	—	—	—	0.503 (U)	—	0.0852 (J)	—	—	—	—	—	1.98 (J)	1.51 (U)	NA	—	64.2 (J)
RE02-07-912	02-600215	0–0.5	SOIL	—	—	—	0.502 (U)	—	0.171 (J)	—	—	—	—	—	—	—	NA	—	—
RE02-07-913	02-600215	2–2.4	QAL	—	—	—	0.512 (U)	—	0.176 (J)	—	—	—	—	—	3.48 (J)	1.54 (U)	NA	—	—
RE02-07-914	02-600215	4.5–6.7	QAL	—	—	—	—	—	—	—	—	—	0.174	—	1.43	2.09	NA	—	52.4
RE02-07-916	02-600215	9.5–11.4	QAL	—	—	—	0.553 (U)	—	0.0804 (J)	—	—	980 (J+)	—	—	—	3.71	NA	—	—
RE02-07-915	02-600215	14.5–16.7	QBO	6720	—	0.64 (J)	0.616 (U)	—	—	5510	—	—	—	2.46 (J+)	—	1.43 (J)	NA	—	—
RE02-10-21904	02-612389	5–6	QAL	—	0.902 (U)	—	—	—	NA	—	—	—	—	—	NA	—	NA	—	—
RE02-10-21905	02-612389	18–19	QAL	—	1.17 (U)	—	0.584 (U)	—	NA	—	—	—	—	—	NA	—	NA	—	—
RE02-10-21906	02-612389	25–27	QBO	—	1.21 (U)	1.26 (U)	0.607 (U)	—	NA	4930	—	—	—	—	NA	1.26 (U)	NA	—	—
RE02-10-21907	02-612389	35–36	QBO	—	1.3 (U)	1.28 (U)	0.65 (U)	—	NA	5450	—	219	—	—	NA	1.28 (U)	NA	—	—
RE02-10-21908	02-612389	49–50	QBO	—	1.29 (U)	1.27 (U)	0.645 (U)	—	NA	5750	—	243	—	—	NA	1.27 (U)	NA	4.6	—
RE02-10-21911	02-612390	5–6	QAL	—	0.941 (U)	—	—	—	NA	—	—	—	—	—	NA	—	NA	—	49.2 (J)
RE02-10-21912	02-612390	15–17	QBO	5810	1.2 (U)	1.14 (U)	0.599 (U)	—	NA	4700	—	—	—	—	NA	1.14 (U)	NA	—	—
RE02-10-21913	02-612390	26–27	QBO	—	1.15 (U)	1.21 (U)	0.573 (U)	—	NA	5230	—	219	—	—	NA	1.21 (U)	NA	—	—
RE02-10-21914	02-612390	35–36	QBO	—	1.27 (U)	1.16 (U)	0.635 (U)	—	NA	5010	—	—	—	—	NA	1.16 (U)	NA	—	—
RE02-10-21915	02-612390	49–50	QBO	—	1.23 (U)	1.24 (U)	0.615 (U)	—	NA	5850	—	—	—	—	NA	1.24 (U)	NA	—	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 6.30-3
Organic Chemicals Detected at AOC 02-011(b)

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	Chrysene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene
Industrial SSL[a]				**50,500**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**1830**	**3230**	**33,700**	**33,700**	**32.3**	**3370**	**16,800**	**1160**	**25,300**
Recreational SSL[c]				**17,300**	**863,000**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**888**	**1770**	**8880**	**11,500**	**11,500**	**88.8**	**1150**	**1930**	**1160**	**8630**
Residential SSL[a]				**3480**	**17,400**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**380**	**153**	**2320**	**2320**	**1.53**	**232**	**1160**	**1740**	**1740**
RE02-07-892	02-600211	0–0.5	SED	—[d]	0.0127 (J)	0.103	0.15	0.0937	0.111 (J)	0.169 (J)	0.0604 (J)	0.0581 (J)	—	0.107	0.171	—	0.051 (J)	—	—	0.0736	0.167
RE02-07-897	02-600212	0–0.5	SED	—	0.0138 (J)	0.153	0.212	0.0843	0.113	0.163	0.085	—	—	0.121	0.205	—	0.0747	—	—	0.093	0.176
RE02-07-902	02-600213	0–0.5	SED	0.0321 (J)	0.0453	0.159	0.191	0.112	0.119 (J)	0.144 (J)	0.0901 (J)	0.0782 (J)	0.137 (J)	0.114	0.19	0.0244 (J)	0.0792 (J)	0.0151 (J)	0.0239 (J)	0.158	0.21
RE02-07-907	02-600214	0–0.5	SED	—	—	0.0043	0.0045	0.0119 (J)	—	0.0143 (J)	—	—	—	—	0.0161 (J)	—	—	—	—	—	0.0136 (J)
RE02-07-912	02-600215	0–0.5	SOIL	—	—	0.0283	0.022	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-913	02-600215	2–2.4	QAL	—	—	0.0194 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-914	02-600215	4.5–6.7	QAL	—	—	0.0248	0.0139	—	—	0.0128 (J)	—	—	—	—	0.0109 (J)	—	—	—	—	—	—
RE02-10-21904	02-612389	5–6	QAL	—	—	0.298 (J)	0.0326 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-10-21911	02-612390	5–6	QAL	—	—	0.0121	0.0086	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0126 (J)

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273), unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSLs are from LANL (2017, 602581).

[d] — = Not detected.

Table 6.30-4
Radionuclides Detected or Detected above BVs/FVs at AOC 02-011(b)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-238	Plutonium-239/240	Strontium-90	Tritium	Uranium-234	Uranium-235/236	Uranium-238
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**na**	**na**	**4**	**0.18**	**3.9**
Qbt 2, 3, 4 BV[a]				**na**	**na**	**na**	**na**	**na**	**1.98**	**0.09**	**1.93**
Sediment BV/FV[a]				**0.9**	**0.006**	**0.068**	**1.04**	**0.093**	**2.59**	**0.2**	**2.29**
Soil BV/FV[a]				**1.65**	**0.023**	**0.054**	**1.31**	**na**	**2.59**	**0.2**	**2.29**
Industrial SAL[c]				**41**	**1300**	**1200**	**2400**	**2,400,000**	**3100**	**160**	**710**
Recreational SAL[c]				**370**	**1400**	**1300**	**4900**	**5,700,000**	**3900**	**1000**	**2800**
Residential SAL[c]				**12**	**84**	**79**	**15**	**1700**	**290**	**42**	**150**
CA02-00-0308	02-01239	0–1	SED	—[d]	—	0.289	—	—	—	—	—
CA02-00-0309	02-01239	3–4	SOIL	16.7	0.0255	4.41	2.46	0.0867606	6.33	0.248 (J-)	6.09
CA02-00-0310	02-01239	6–7	SOIL	0.102	—	0.187	0.741	—	—	—	—
CA02-00-0311	02-01239	11.5–13	SOIL	0.107	—	0.107	—	0.0583937	—	—	—
CA02-00-0312	02-01239	14–15	QBT 3	—	—	—	—	0.0767308	2.51	0.094	2.44
RE02-07-892	02-600211	0–0.5	SED	—	—	0.502	—	—	—	—	—
RE02-07-897	02-600212	0–0.5	SED	—	—	0.605	—	—	—	—	—
RE02-07-902	02-600213	0–0.5	SED	23.3	—	0.845	—	—	—	—	—
RE02-07-907	02-600214	0–0.5	SED	—	—	0.135	—	—	—	—	—
RE02-07-912	02-600215	0–0.5	SOIL	—	—	0.133	—	—	—	—	—
RE02-07-913	02-600215	2–2.4	QAL	6.38	—	0.75	0.563	—	—	—	—
RE02-07-914	02-600215	4.5–6.7	QAL	5.92	—	1.84	0.625	—	3.68	0.274	3.52
RE02-07-915	02-600215	14.5–16.7	QBO	—	—	—	—	—	—	0.224	—
RE02-10-21904	02-612389	5–6	QAL	274	—	0.644	32.8	0.021	—	—	—
RE02-10-21908	02-612389	49–50	QBO	—	—	—	—	—	—	0.194	—
RE02-10-21911	02-612390	5–6	QAL	4.44	—	0.595	0.347	0.0184875	—	—	—
RE02-10-21912	02-612390	15–17	QBO	—	—	0.0171	—	—	—	—	—
RE02-10-21913	02-612390	26–27	QBO	—	—	—	—	0.0472884	—	0.191	—
RE02-10-21914	02-612390	35–36	QBO	—	—	—	—	0.077599	—	—	—
RE02-10-21915	02-612390	49–50	QBO	—	—	—	—	0.121403	—	—	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SALs from LANL (2015, 600929).

[d] — = Not detected.

Table 6.31-1
Samples Collected and Analyses Requested at AOC 02-011(c)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Dioxins/Furans	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
RE02-07-2563	02-600573	0–0.5	SOIL	07-581[a]	07-581	07-601	07-581	07-581	—[b]	07-581	07-581	07-581	07-581	07-581	07-581	07-581	—	07-581
RE02-07-2564	02-600573	4.5–9	QAL	07-787	07-787	07-786	07-787	07-787	—	07-787	07-787	07-787	07-787	07-787	07-787	07-787	07-787	07-787
RE02-07-2565	02-600573	9–16	QAL	07-787	07-787	07-786	07-787	07-787	—	07-787	07-787	07-787	07-787	07-787	07-787	07-787	07-787	07-787
RE02-07-2566	02-600573	16–19.5	QBO	07-787	07-787	07-786	07-787	07-787	—	07-787	07-787	07-787	07-787	07-787	07-787	07-787	07-787	07-787
RE02-10-21752	02-612347	5–6	QAL	—	—	—	10-4733	10-4733	10-4732	10-4733	10-4733	10-4732	10-4732	—	—	10-4732	—	—
RE02-10-21753	02-612347	15–16	QAL	—	—	—	10-4733	10-4733	10-4732	10-4733	10-4733	10-4732	10-4732	—	—	10-4732	—	—
RE02-10-21754	02-612347	25–27	QBO	—	—	—	10-4733	10-4733	10-4732	10-4733	10-4733	10-4732	10-4732	—	—	10-4732	—	—
RE02-10-21755	02-612347	35–36	QBO	—	—	—	10-4733	10-4733	10-4732	10-4733	10-4733	10-4732	10-4732	—	—	10-4732	—	—
RE02-10-21756	02-612347	49–50	QBO	—	—	—	10-4733	10-4733	10-4732	10-4733	10-4733	10-4732	10-4732	—	—	10-4732	—	—

[a] Analytical request number

[b] — = Analysis not requested.

Table 6.31-2
Inorganic Chemicals Detected or Detected above BVs at AOC 02-011(c)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Iron	Manganese	Nitrate	Perchlorate	Selenium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**3700**	**189**	**na[b]**	**na**	**0.3**	**40**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**21500**	**671**	**na**	**na**	**1.52**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**908,000**	**160,000**	**2,080,000**	**908**	**6490**	**1860**
Recreational SSL[d]				**619,000**	**248**	**42.9**	**124,000**	**457**	**434,000**	**14,800**	**991,000**	**434**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,000**	**70.5**	**54,800**	**10,500**	**125,000**	**54.8**	**391**	**23,500**
RE02-07-2563	02-600573	0–0.5	SOIL	—[e]	—	—	—	—	—	—	—	—	—	65.2
RE02-07-2564	02-600573	4.5–9	QAL	—	—	—	—	0.535 (U)	—	—	31.9	0.000559 (J)	1.61 (U)	—
RE02-07-2565	02-600573	9–16	QAL	—	—	—	—	0.529 (U)	—	—	1.84	—	1.7	—
RE02-07-2566	02-600573	16–19.5	QBO	9810	—	0.892 (J)	27.7	0.597 (U)	4910	—	—	—	1.52 (J)	—
RE02-10-21752	02-612347	5–6	QAL	—	0.996 (U)	—	—	—	—	—	NA[f]	NA	—	—
RE02-10-21753	02-612347	15–16	QAL	—	0.962 (U)	—	—	0.481 (U)	—	—	NA	NA	—	—
RE02-10-21754	02-612347	25–27	QBO	—	1.19 (U)	1.21 (U)	—	0.593 (U)	4940	200 (J-)	NA	NA	1.21 (U)	—
RE02-10-21755	02-612347	35–36	QBO	—	1.18 (U)	1.18 (U)	—	0.59 (U)	5850	227 (J-)	NA	NA	1.18 (U)	—
RE02-10-21756	02-612347	49–50	QBO	—	1.24 (U)	1.22 (U)	—	0.622 (U)	5020	232 (J-)	NA	NA	1.22 (U)	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are from LANL (2017, 602581).

[e] — = Not detected or not detected above BV.

[f] NA = Not analyzed.

Table 6.31-3
Organic Chemicals Detected at AOC 02-011(c)

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Di-n-butylphthalate	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-]
Industrial SSL[a]				**11**	**11.1**	**32.3**	**91,600**	**33,700**	**na[b]**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Recreational SSL[c]				**5.53**	**10.3**	**88.8**	**32,800**	**11,500**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Residential SSL[a]				**1.14**	**2.43**	**1.53**	**6160**	**2320**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
RE02-07-2563	02-600573	0–0.5	SOIL	0.0518	0.12	0.0137 (J)	—[d]	0.0143 (J)	0.000532	0.00101	0.000132	0.0000156	0.000422	0.00000376	0.0000163	0.00000815	0.000109	0.00000544	0.00000519
RE02-07-2564	02-600573	4.5–9	QAL	—	—	—	—	—	0.00000225 (J)	0.00000409	0.000000865 (J)	0.000000147 (J)	0.00000203	—	—	—	0.000000436	0.000000102 (J)	0.000000135 (J)
RE02-07-2565	02-600573	9–16	QAL	—	—	—	—	—	0.000000504 (J)	0.00000102	0.000000405 (J)	—	0.000000625	—	—	—	—	0.000000112 (J)	—
RE02-07-2566	02-600573	16–19.5	QBO	—	—	—	0.043 (J)	—	0.000000119 (J)	0.000000119	—	—	—	—	—	—	—	—	—
RE02-10-21752	02-612347	5–6	QAL	—	0.0078 (J)	—	—	—	NA[e]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 6.31-3 (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)	Pyrene	Tetrachlorodibenzodioxin[2,3,7,8-]	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Toluene
Industrial SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**25,300**	**0.000238**	**na**	**0.00243**	**na**	**61,100**
Recreational SSL[c]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**8630**	**0.000297**	**na**	**0.00297**	**na**	**47,600**
Residential SSL[a]				**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**1740**	**0.000049**	**na**	**0.00049**	**na**	**5220**
RE02-07-2563	02-600573	0–0.5	SOIL	0.0000012 (J)	0.00000674	0.000128	0.00536	0.000272 (J)	0.00000119 (J)	0.0000103	0.000000881 (J)	0.00000262	0.0000332	0.0177 (J)	0.000000661	0.00000156	0.00000126	0.00000914	NA
RE02-07-2564	02-600573	4.5–9	QAL	—	0.0000000823 (J)	0.00000103	0.0000162	0.00000154 (J)	—	—	0.0000000726 (J)	0.0000000472 (J)	0.000000288	—	—	—	—	0.000000131	0.000674 (J)
RE02-07-2565	02-600573	9–16	QAL	—	—	0.00000028	0.00000319 (J)	0.000000502 (J)	—	—	—	—	—	—	—	—	0.0000000981 (J)	0.000000167	—
RE02-07-2566	02-600573	16–19.5	QBO	—	—	—	—	0.000000143 (J)	—	—	—	—	—	—	—	—	—	—	—
RE02-10-21752	02-612347	5–6	QAL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273).

[b] na = Not available.

[c] SSLs are from LANL (2017, 602581).

[d] — = Not detected or not detected above BV.

[e] NA = Not analyzed.

Table 6.31-4
Radionuclides Detected or Detected above BVs/FVs at AOC 02-011(c)

Sample ID	Location ID	Depth (ft)	Media	Strontium-90	Tritium
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**
Soil BV/FV[a]				**1.31**	**na**
Industrial SAL[c]				**2400**	**2,400,000**
Recreational SAL[c]				**4900**	**5,700,000**
Residential SAL[c]				**15**	**1700**
RE02-07-2564	02-600573	4.5–9	QAL	—[d]	0.0307778
RE02-07-2565	02-600573	9–16	QAL	0.263	—
RE02-07-2566	02-600573	16–19.5	QBO	—	0.0669512
RE02-10-21753	02-612347	15–16	QAL	NA[e]	0.190605

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SALs from LANL (2015, 600929).

[d] — = Not detected.

[e] NA = Not analyzed.

Table 6.32-1
Samples Collected and Analyses Requested at AOC 02-011(d)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Hexavalent Chromium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
CA02-00-0319	02-01247	0–0.5	SED	—[a]	—	7531R[b]	7531R	—	7531R	7531R	7529R, 7530R	—	—	7531R	—	—	—
CA02-00-0324	02-01248	0–0.5	SED	—	—	7531R	7531R	—	7531R	7531R	7529R, 7530R	—	—	7531R	—	—	—
RE02-07-2571	02-600574	0–0.5	SOIL	07-582	07-582	07-582	07-582	07-582	07-582	07-582	07-582	07-582	07-582	07-582	07-582	—	07-582
RE02-07-2572	02-600574	2–2.5	QAL	07-1026	07-1026	07-1026	07-1026	07-1026	07-1026	07-1026	07-1026	07-1026	07-1026	07-1026	07-1026	07-1026	07-1026
RE02-17-132705	02-600574	3–4	ALLH	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913
RE02-17-132706	02-600574	5–5.1	ALLH	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913
RE02-10-21501	02-612280	5–7	QAL	—	—	10-4812	10-4812	10-4811	10-4812	10-4812	10-4811	10-4810	—	—	—	—	—
RE02-10-21500	02-612280	15–16	QBO	—	—	10-4812	10-4812	10-4811	10-4812	10-4812	10-4811	10-4810	—	—	—	—	—
RE02-10-21495	02-612280	25–27	QBO	—	—	10-4812	10-4812	10-4811	10-4812	10-4812	10-4811	10-4810	—	—	—	—	—
RE02-10-21490	02-612280	35–36	QBO	—	—	10-4812	10-4812	10-4811	10-4812	10-4812	10-4811	10-4810	—	—	—	—	—
RE02-10-21485	02-612280	49–50	QBO	—	—	10-4812	10-4812	10-4811	10-4812	10-4812	10-4811	10-4810	—	—	—	—	—
RE02-17-132684	02-61413	0–1	SOIL	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913
RE02-17-132691	02-61413	2–3	SOIL	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913
RE02-17-132698	02-61413	4–5	SOIL	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913	2017-1913

[a] — = Analysis not requested.

[b] Analytical request number.

Table 6.32-2
Inorganic Chemicals Detected or Detected above BVs at AOC 02-011(d)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Cadmium	Calcium	Chromium	Hexavalent Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**0.4**	**2400**	**2.6**	**na[b]**	**3.96**	**3700**	**13.5**	**189**	**0.1**	**2**	**na**	**na**	**0.3**	**1**	**40**
Sediment BV[a]				**15400**	**0.83**	**3.98**	**0.4**	**4420**	**10.5**	**na**	**11.2**	**13800**	**19.7**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**	**60.2**
Soil BV[a]				**29200**	**0.83**	**8.17**	**0.4**	**6120**	**19.3**	**na**	**14.7**	**21500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**1110**	**na**	**505[d]**	**11.1**	**51,900**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**1860**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**457**	**na**	**281[d]**	**40.2**	**24,800**	**434,000**	**1110**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**70.5**	**na**	**96.6d**	**3.05**	**3130**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**23,500**
CA02-00-0319	02-01247	0–0.5	SED	—[f]	—	8.7	0.69 (J+)	11000	240	NA[g]	41	—	35	—	—	—	NA	NA	—	—	190 (J+)
CA02-00-0324	02-01248	0–0.5	SED	—	—	—	—	—	61	NA	—	—	24	—	—	—	NA	NA	—	1.1	92 (J+)
RE02-07-2571	02-600574	0–0.5	SOIL	—	—	—	—	—	27.1	—	27.7	—	44.4	—	—	—	—	0.00111 (J)	—	—	134
RE02-07-2572	02-600574	2–2.5	QAL	—	—	—	—	—	38.2	0.775	16.3 (J)	—	27.9 (J)	—	—	—	3.32 (J-)	0.000995 (J)	—	—	113
RE02-17-132705	02-600574	3-4	ALLH	—	1.02 (U)	—	—	19400 (J-)	-	0.285 (J)	—	—	—	—	0.151 (J-)	—	2.55	0.00172 (J)	—	—	—
RE02-17-132706	02-600574	5-5.1	ALLH	—	—	—	—	—	—	—	—	—	—	—	—	—	2.1	0.00172 (J)	—	—	—
RE02-10-21500	02-612280	15–16	QBO	8240	1.18 (U)	—	0.589 (U)	—	—	—	—	4950	—	196 (J-)	—	2.49	NA	NA	1.19 (U)	—	—
RE02-10-21495	02-612280	25–27	QBO	—	1.26 (U)	1.25 (U)	0.631 (U)	—	—	—	—	5290	—	200 (J-)	—	—	NA	NA	1.25 (U)	—	—
RE02-10-21490	02-612280	35–36	QBO	—	1.19 (U)	1.26 (U)	0.593 (U)	—	—	—	—	5120	—	253 (J-)	—	—	NA	NA	1.26 (U)	—	—
RE02-10-21485	02-612280	49–50	QBO	—	1.23 (U)	1.25 (U)	0.617 (U)	—	3.39	—	—	5400	—	—	—	—	NA	NA	1.25 (U)	—	—
RE02-17-132684	02-61413	0-1	SOIL	—	0.986 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-17-132691	02-61413	2-3	SOIL	—	1.06 (U)	—	—	—	—	0.164 (J)	—	—	—	—	—	—	0.164 (J)	—	—	—	—
RE02-17-132698	02-61413	4-5	SOIL	—	1.06 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	50.3

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 6.32-3
Organic Chemicals Detected at AOC 02-011(d)

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-]
Industrial SSL[a]				**50,500**	**959,00**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**409,000**
Recreational SSL[c]				**17,300**	**550,000**	**863,000**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**353,000**
Residential SSL[a]				**3480**	**66,300**	**17,400**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**37,300**
RE02-07-2571	02-600574	0–0.5	SOIL	0.0223 (J)	—[d]	0.0286 (J)	0.12 (J+)	0.0831 (J+)	0.082	0.103	0.129	0.0544	—
RE02-07-2572	02-600574	2–2.5	QAL	—	—	—	0.0881 (J+)	0.0665 (J+)	—	—	0.0195 (J)	—	—
RE02-17-132705	02-600574	3-4	ALLH	—	0.00917	—	0.0319	0.0503	0.0254 (J)	0.0277 (J)	0.0328 (J)	0.0166 (J)	0.0024 (J)
RE02-17-132706	02-600574	5-5.1	ALLH	0.0393	—	0.0878	0.0151	0.0212	0.313	0.28	0.401	0.166	—
RE02-10-21501	02-612280	5–7	QAL	NA[e]	NA	NA	0.0438 (J)	0.0286 (J)	NA	NA	NA	NA	—
RE02-17-132684	02-61413	0-1	SOIL	—	—	—	—	0.182	0.0217 (J)	0.0257 (J)	0.0321 (J)	0.0197 (J)	—
RE02-17-132691	02-61413	2-3	SOIL	0.0421	—	0.0512	0.0342	0.0784	0.112	0.141	0.18	0.0723	—
RE02-17-132698	02-61413	4-5	SOIL	0.0217 (J)	—	0.0369	0.00921	0.0115	0.102	0.104	0.139	0.0564	—

Table 6.32-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Isophorone	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene
Industrial SSL[a]				**3230**	**3.23**	**33,700**	**33,700**	**32.3**	**27,000**	**3370**	**16,800**	**1160**	**25,300**
Recreational SSL[c]				**8880**	**8.88**	**11,500**	**11,500**	**88.8**	**26,**	**1150**	**1930**	**1160**	**8630**
Residential SSL[a]				**153**	**0.153**	**2320**	**2320**	**1.53**	**5610**	**232**	**1160**	**1740**	**1740**
RE02-07-2571	02-600574	0–0.5	SOIL	0.0917	—	0.153	0.0181 (J)	0.0482	—	0.00869 (J)	0.0164 (J)	0.13	0.159
RE02-07-2572	02-600574	2–2.5	QAL	0.0116 (J)	—	0.0192 (J)	—	—	—	—	—	0.0121 (J)	0.0192 (J)
RE02-17-132705	02-600574	3-4	ALLH	0.026 (J)	—	—	—	—	—	0.0112 (J)	0.0468	0.0112 (J)	0.051
RE02-17-132706	02-600574	5-5.1	ALLH	0.3	0.0485	0.179	0.145 (J)	0.179	0.145 (J)	0.0112 (J)	0.0468	0.0112 (J)	0.656
RE02-10-21501	02-612280	5–7	QAL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE02-17-132684	02-61413	0-1	SOIL	0.022 (J)	—	0.0287 (J)	—	0.018 (J)	—	0.018 (J)	0.018 (J)	0.0267 (J)	0.0421
RE02-17-132691	02-61413	2-3	SOIL	0.124	—	0.218	0.0372	0.0842	—	0.0842	0.0842	0.316	0.311
RE02-17-132698	02-61413	4-5	SOIL	0.102	—	0.208	0.0181 (J)	0.0635	—	0.0635	0.0635	0.155	0.197

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273), unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSLs are from LANL (2017, 602581).

[d] — = Not detected.

[e] NA = Not analyzed

Table 6.32-4
Radionuclides Detected or Detected above BVs/FVs at AOC 02-011(d)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Cobalt-60	Plutonium-239/240	Tritium	Uranium-234
Sediment BV[a]				**0.9**	**na[b]**	**0.068**	**0.093**	**2.59**
Soil BV[a]				**1.65**	**na**	**0.054**	**na**	**2.59**
Industrial SAL[c]				**41**	**9**	**1200**	**2,400,000**	**3100**
Recreational SAL[c]				**370**	**81**	**1300**	**5,700,000**	**3900**
Residential SAL[c]				**12**	**2.6**	**79**	**1700**	**290**
CA02-00-0319	02-01247	0–0.5	SED	—[d]	0.471	0.608	—	2.66
CA02-00-0324	02-01248	0–0.5	SED	—	0.0702	1.28	—	—
RE02-07-2571	02-600574	0–0.5	SOIL	1.66	2.19	0.397	0.00929508	—
RE02-07-2572	02-600574	2–2.5	QAL	1.1	1.35	0.574 (J-)	—	—
RE02-17-132705	02-600574	3-4	ALLH	0.411	0.19 (J)	0.411	—	—
RE02-17-132706	02-600574	5-5.1	ALLH	0.225	—	0.225	—	—
RE02-10-21501	02-612280	5–7	QAL	0.23	0.139	0.0581	0.217365	—
RE02-17-132691	02-61413	2-3	SOIL	0.34	—	0.0661	—	—
RE02-17-132698	02-61413	4-5	SOIL	0.258	0.119	0.0703	—	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SALs from LANL (2015, 600929).

[d] — = Not detected.

Table 6.34-1
Samples Collected and Analyses Requested at AOC 02-012

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	TPH-DRO	VOCs	Cyanide (Total)
CA02-00-0339	02-01257	3–3.5	FILL	—[a]	—	—	—	—	—	7603R[b]	—	—	—	—	—	—	7604R
CA02-00-0340	02-01257	5–5.5	FILL	—	—	—	—	—	—	7603R	—	—	—	—	—	—	7604R
CA02-00-0341	02-01258	3–3.5	FILL	—	—	—	—	—	—	7603R	—	—	—	—	—	—	7604R
CA02-00-0342	02-01258	5–5.5	FILL	—	—	—	—	—	—	7603R	—	—	—	—	—	—	7604R
CA02-00-0337	02-01265	3–3.5	FILL	—	—	—	—	—	—	7603R	—	—	—	—	—	—	7604R
CA02-00-0338	02-01265	5–5.5	FILL	—	—	—	—	—	—	7603R	—	—	—	—	—	—	7604R
RE02-07-1727	02-600418	0–0.5	SOIL	07-953	07-952	07-953	07-953	07-953	07-953	07-952	—	07-952	07-953	07-951	07-951	—	07-952
RE02-07-1728	02-600418	4.5–9	QAL	07-953	07-952	07-953	07-953	07-953	07-953	07-952	—	07-952	07-953	07-951	07-951	07-951	07-952
RE02-07-1729	02-600418	14–19	QBO	07-953	07-952	07-953	07-953	07-953	07-953	07-952	—	07-952	07-953	07-951	07-951	07-951	07-952
RE02-07-1732	02-600419	0–0.5	SOIL	07-953	07-952	07-953	07-953	07-953	07-953	07-952	—	07-952	07-953	07-951	07-951	—	07-952
RE02-07-1733	02-600419	4.5–9	QAL	07-953	07-952	07-953	07-953	07-953	07-953	07-952	—	07-952	07-953	07-951	07-951	07-951	07-952
RE02-07-1735	02-600419	9–16	QBO	07-953	07-952	07-953	07-953	07-953	07-953	07-952	—	07-952	07-953	07-951	07-951	07-951	07-952
RE02-07-1737	02-600420	0–0.5	SOIL	07-953	07-952	07-953	07-953	07-953	07-953	07-952	—	07-952	07-953	07-951	07-951	—	07-952
RE02-07-1738	02-600420	4.5–9	QAL	07-953	07-952	07-953	07-953	07-953	07-953	07-952	—	07-952	07-953	07-951	07-951	07-951	07-952
RE02-07-1740	02-600420	9–14	QBO	07-953	07-952	07-953	07-953	07-953	07-953	07-952	—	07-952	07-953	07-951	07-951	07-951	07-952
RE02-07-6821	02-600420	14.5–19	QBO	07-1139	07-1139	07-1139	07-1139	07-1139	07-1139	07-1137	—	07-1139	07-1139	07-1137	07-1137	07-1137	07-1139
RE02-07-1893	02-600452	0–0.5	SOIL	07-783	07-783	07-783	07-783	07-783	—	07-783	—	07-783	07-783	07-783	07-783	—	07-783
RE02-07-1894	02-600452	4.5–10	QAL	07-947	07-946	07-947	07-947	07-947	—	07-946	—	07-946	07-947	07-945	07-945	07-945	07-946
RE02-07-1897	02-600452	10–15	QAL	07-947	07-946	07-947	07-947	07-947	—	07-946	—	07-946	07-947	07-945	07-945	07-945	07-946
RE02-07-1896	02-600452	15–20	QBO	07-947	07-946	07-947	07-947	07-947	—	07-946	—	07-946	07-947	07-945	07-945	07-945	07-946
RE02-07-1898	02-600453	0–0.5	SOIL	07-783	07-783	07-783	07-783	07-783	—	07-783	—	07-783	07-783	07-783	07-783	—	07-783
RE02-07-1899	02-600453	4.5–10	QAL	07-947	07-946	07-947	07-947	07-947	—	07-946	—	07-946	07-947	07-945	07-945	07-945	07-946
RE02-07-1901	02-600453	10–20	QBO	07-947	07-946	07-947	07-947	07-947	—	07-946	—	07-946	07-947	07-945	07-945	07-945	07-946
RE02-07-1903	02-600454	0–0.5	SOIL	07-947	07-946	07-947	07-947	07-947	—	07-946	—	07-946	07-947	07-945	07-945	—	07-946
RE02-07-1904	02-600454	4.5–9.5	QAL	07-947	07-946	07-947	07-947	07-947	—	07-946	—	07-946	07-947	07-945	07-945	07-945	07-946
RE02-07-1906	02-600454	9.5–16	QBO	07-947	07-946	07-947	07-947	07-947	—	07-946	—	07-946	07-947	07-945	07-945	07-945	07-946
RE02-07-1908	02-600455	0–0.5	SOIL	07-783	07-783	07-783	07-783	07-783	—	07-783	—	07-783	07-783	07-783	07-783	—	07-783
RE02-07-1909	02-600455	4.5–10	QAL	07-947	07-946	07-947	07-947	07-947	—	07-946	—	07-946	07-947	07-945	07-945	07-945	07-946
RE02-07-1911	02-600455	10–17	QBO	07-947	07-946	07-947	07-947	07-947	—	07-946	—	07-946	07-947	07-945	07-945	07-945	07-946
RE02-07-2075	02-600485	0–0.5	SOIL	07-777	07-777	07-777	07-777	07-777	07-777	07-777	—	07-777	07-777	07-777	07-777	—	07-777
RE02-07-2076	02-600485	4.5–12	QAL	07-843	07-842	07-843	07-843	07-843	07-843	07-842	—	07-842	07-843	07-841	07-841	07-841	07-842
RE02-07-2078	02-600485	14–19	QBO	07-843	07-842	07-843	07-843	07-843	07-843	07-842	—	07-842	07-843	07-841	07-841	07-841	07-842
RE02-07-2080	02-600486	0–0.5	SOIL	07-777	07-777	07-777	07-777	07-777	07-777	07-777	—	07-777	07-777	07-777	07-777	—	07-777
RE02-07-2081	02-600486	4.5–9	QAL	07-849	07-848	07-849	07-849	07-849	07-849	07-848	—	07-848	07-849	07-847	07-847	07-847	07-848
RE02-07-2083	02-600486	16–21	QBO	07-849	07-848	07-849	07-849	07-849	07-849	07-848	—	07-848	07-849	07-847	07-847	07-847	07-848
RE02-07-2085	02-600487	0–0.5	SOIL	07-777	07-777	07-777	07-777	07-777	07-777	07-777	—	07-777	07-777	07-777	07-777	—	07-777

Table 6.34-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	TPH-DRO	VOCs	Cyanide (Total)
RE02-07-2086	02-600487	4.5–7.5	QAL	07-849	07-848	07-849	07-849	07-849	07-849	07-848	—	07-848	07-849	07-847	07-847	07-847	07-848
RE02-07-2088	02-600487	15–19	QBO	07-849	07-848	07-849	07-849	07-849	07-849	07-848	—	07-848	07-849	07-847	07-847	07-847	07-848
RE02-07-2090	02-600488	0–0.5	SOIL	07-777	07-777	07-777	07-777	07-777	07-777	07-777	—	07-777	07-777	07-777	07-777	—	07-777
RE02-07-2091	02-600488	4.5–8	QAL	07-843	07-842	07-843	07-843	07-843	07-843	07-842	—	07-842	07-843	07-841	07-841	07-841	07-842
RE02-07-2093	02-600488	14.5–19	QBO	07-843	07-842	07-843	07-843	07-843	07-843	07-842	—	07-842	07-843	07-841	07-841	07-841	07-842
RE02-10-21859	02-612374	5–6	SOIL	—	—	—	10-4797	10-4797	10-4797	10-4797	10-4797	—	10-4797	10-4797	10-4797	—	—
RE02-10-21860	02-612374	15–16	QBO	—	—	—	10-4797	10-4797	10-4797	10-4797	10-4797	—	10-4797	10-4797	10-4797	—	—
RE02-10-21861	02-612374	25–26	QBO	—	—	—	10-4809	10-4809	10-4809	10-4809	10-4808	—	10-4809	10-4808	10-4808	—	—
RE02-10-21862	02-612374	35–36	QBO	—	—	—	10-4809	10-4809	10-4809	10-4809	10-4808	—	10-4809	10-4808	10-4808	—	—
RE02-10-21863	02-612374	49–50	QBO	—	—	—	10-4809	10-4809	10-4809	10-4809	10-4808	—	10-4809	10-4808	10-4808	—	—

[a] — = Analysis not requested.

[b] Analytical request number.

Table 6.34-2
Inorganic Chemicals Detected or Detected above BVs at AOC 02-012

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Chromium	Copper	Cyanide (Total)	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**2.6**	**3.96**	**0.5**	**3700**	**13.5**	**189**	**0.1**	**2**	**na[b]**	**na**	**0.3**	**4.59**	**40**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**19.3**	**14.7**	**0.5**	**21500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**505[d]**	**51,900**	**62.8**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6530**	**1860**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**281[d]**	**24,800**	**224**	**434,000**	**1110**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,000**	**70.5**	**96.6[d]**	**3130**	**11.1**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**394**	**23,500**
RE02-07-1727	02-600418	0–0.5	SOIL	—[f]	—	—	—	0.883	—	—	—	—	—	—	1.21	—	—	—	—	—	—
RE02-07-1728	02-600418	4.5–9	QAL	—	—	—	—	0.538 (U)	—	—	—	—	—	—	—	—	2.6 (J-)	0.00174 (J)	2.67	—	—
RE02-07-1729	02-600418	14–19	QBO	4000 (J+)	—	1.27 (J)	—	0.568 (U)	6.64 (U)	—	—	4810	—	—	—	—	—	—	0.945 (J)	—	—
RE02-07-1732	02-600419	0–0.5	SOIL	—	—	—	—	0.539 (U)	—	—	—	—	23.4	—	0.201	—	1.22 (J-)	—	—	—	—
RE02-07-1733	02-600419	4.5–9	QAL	—	—	—	—	0.549 (U)	—	—	—	—	—	—	—	—	7.39 (J-)	0.000582 (J)	—	—	—
RE02-07-1735	02-600419	9–16	QBO	5260 (J+)	0.506 (UJ)	1.7 (J)	—	0.63 (U)	7.58 (U)	—	—	6380	—	250	—	—	—	—	1.95	5.76	—
RE02-07-1737	02-600420	0–0.5	SOIL	—	—	—	—	0.528 (U)	—	—	—	—	—	—	0.229	—	—	—	—	—	69.9
RE02-07-1738	02-600420	4.5–9	QAL	—	—	—	—	—	—	—	—	—	—	—	—	—	5.8 (J-)	—	1.73	—	—
RE02-07-1740	02-600420	9–14	QBO	7200 (J+)	—	1.73	47.1 (J)	0.574 (U)	14.8	—	—	5500	—	203	—	2.71 (J)	1.1 (J-)	—	1.93	—	—
RE02-07-6821	02-600420	14.5–19	QBO	5230 (J+)	0.51 (U)	1.94 (U)	—	0.648 (U)	9.68 (J+)	—	—	4840	—	—	—	—	—	—	6.41	—	—

Table 6.34-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Chromium	Copper	Cyanide (Total)	Iron	Lead	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Vanadium	Zinc
Qbt 1g, Qct, Qbo BV[a]				**3560**	**0.5**	**0.56**	**25.7**	**0.4**	**2.6**	**3.96**	**0.5**	**3700**	**13.5**	**189**	**0.1**	**2**	**na[b]**	**na**	**0.3**	**4.59**	**40**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**19.3**	**14.7**	**0.5**	**21500**	**22.3**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**505[d]**	**51,900**	**62.8**	**908,000**	**800**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6530**	**1860**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**281[d]**	**24,800**	**224**	**434,000**	**1110**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,000**	**70.5**	**96.6[d]**	**3130**	**11.1**	**54,800**	**400**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**394**	**23,500**
RE02-07-1893	02-600452	0–0.5	SOIL	—	—	—	—	0.518 (U)	—	—	—	—	—	—	0.194	—	1.27	0.00172 (J)	—	—	52.7
RE02-07-1894	02-600452	4.5–10	QAL	—	—	—	—	0.563 (U)	—	—	—	—	—	—	—	—	1.15 (J+)	—	—	—	—
RE02-07-1897	02-600452	10–15	QAL	—	—	—	—	0.557 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1896	02-600452	15–20	QBO	9570	—	1.56 (J)	39.9	0.573 (U)	3.55 (U)	—	—	7290 (J-)	—	425	—	2.08	—	—	1.57 (J)	—	—
RE02-07-1898	02-600453	0–0.5	SOIL	—	—	—	—	0.499 (U)	—	—	—	—	—	—	—	—	2.39	—	2.1	—	56.9
RE02-07-1899	02-600453	4.5–10	QAL	—	—	—	—	—	—	43	—	—	—	—	—	—	1.8 (J+)	—	—	—	183
RE02-07-1901	02-600453	10–20	QBO	5550	—	1.97	27.6	0.57 (U)	27.1	104	0.69	7830 (J-)	—	300	—	2.78	—	—	1.22 (J)	6.84	56.8
RE02-07-1903	02-600454	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	1.21 (J+)	—	—	—	560
RE02-07-1904	02-600454	4.5–9.5	QAL	—	—	—	—	0.548 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE02-07-1906	02-600454	9.5–16	QBO	9280	—	2.63	92.7	0.574 (U)	4.48 (U)	3.98 (U)	—	8160 (J-)	—	688	—	3.38	—	—	1.64 (J)	6.95	—
RE02-07-1908	02-600455	0–0.5	SOIL	—	—	—	—	0.514 (U)	—	—	—	—	—	—	—	—	—	0.000624 (J)	2.33	—	63.3
RE02-07-1909	02-600455	4.5–10	QAL	—	—	—	—	0.53 (U)	—	—	—	—	—	—	—	—	6.92 (J+)	—	—	—	—
RE02-07-1911	02-600455	10–17	QBO	3870	—	1.21 (J)	—	0.569 (U)	26	4.28 (U)	—	5810 (J-)	—	203	—	2.81	1.64	—	1.44 (J)	—	—
RE02-07-2075	02-600485	0–0.5	SOIL	—	—	—	—	0.496 (U)	—	—	—	—	—	—	4.65 (J)	—	1.33	—	—	—	—
RE02-07-2076	02-600485	4.5–12	QAL	—	—	—	—	—	—	—	—	—	—	—	0.212	—	1.05 (J)	—	—	—	—
RE02-07-2078	02-600485	14–19	QBO	9770	—	1.04 (J)	45.7 (J-)	0.592 (U)	16.7 (J)	4.05	—	6980	—	293 (J)	—	2.55	—	—	1.78 (U)	6.49	—
RE02-07-2080	02-600486	0–0.5	SOIL	—	—	—	—	0.504 (U)	—	—	—	—	—	—	2.49 (J)	—	—	0.000514 (J)	—	—	—
RE02-07-2081	02-600486	4.5–9	QAL	—	—	—	—	0.538 (U)	—	—	—	—	—	—	—	—	—	—	1.61 (U)	—	—
RE02-07-2083	02-600486	16–21	QBO	6820	0.508 (UJ)	0.712 (J)	—	0.619 (U)	3.96	—	—	5720	—	244 (J+)	—	—	—	—	1.86 (U)	—	—
RE02-07-2085	02-600487	0–0.5	SOIL	—	—	—	—	0.493 (U)	—	—	—	—	—	—	0.67 (J)	—	—	—	—	—	—
RE02-07-2086	02-600487	4.5–7.5	QAL	—	—	—	—	0.525 (U)	—	—	—	—	—	—	—	—	0.847 (J-)	—	1.58 (U)	—	—
RE02-07-2088	02-600487	15–19	QBO	8930	—	0.69 (J)	—	0.566 (U)	7.86	—	—	5210 (J)	—	192 (J+)	—	—	—	—	0.689 (J)	—	—
RE02-07-2090	02-600488	0–0.5	SOIL	—	—	—	—	0.503 (U)	35.5 (J)	—	—	—	—	—	0.408 (J)	—	—	—	—	—	—
RE02-07-2091	02-600488	4.5–8	QAL	—	—	—	—	0.525 (U)	—	—	—	—	—	—	—	—	1.04 (J)	—	1.57 (U)	—	—
RE02-07-2093	02-600488	14.5–19	QBO	9800	—	1.78 (J)	39.1 (J-)	0.598 (U)	8.69 (J)	—	—	6840	—	473 (J)	—	2.85	—	—	0.873 (J)	6.72	—
RE02-10-21859	02-612374	5–6	SOIL	—	—	—	—	0.512 (U)	—	—	NA[g]	—	—	—	—	—	NA	NA	—	—	—
RE02-10-21860	02-612374	15–16	QBO	7300	1.37 (U)	0.896 (J)	53.4	0.683 (U)	6.35	—	NA	8890	—	283	—	3.08	NA	NA	1.32 (U)	10.3	—
RE02-10-21861	02-612374	25–26	QBO	—	1.12 (U)	1.29 (U)	—	0.562 (U)	—	—	NA	5560	—	216 (J-)	—	—	NA	NA	1.29 (U)	—	—
RE02-10-21862	02-612374	35–36	QBO	—	—	1.21 (U)	—	0.617 (U)	—	—	NA	5100	—	—	—	—	NA	NA	1.21 (U)	—	—
RE02-10-21863	02-612374	49–50	QBO	—	0.539 (J)	1.25 (U)	—	0.648 (U)	—	—	NA	5890	—	213 (J-)	—	—	NA	NA	1.25 (U)	—	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 6.34-3
Organic Chemicals Detected at AOC 02-012

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	Chloroform	Chrysene	Dibenzofuran	Dichlorobenzene[1,4-]
Industrial SSL[a]				**50,500**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**28.4**	**3230**	**1000[c]**	**6730**
Recreational SSL[d]				**17,300**	**863,000**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**20.4**	**8880**	**489**	**1140**
Residential SSL[a]				**3480**	**17,400**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**5.85**	**153**	**73[c]**	**1290**
RE02-07-1727	02-600418	0–0.5	SOIL	0.0379	0.0533	NA[e]	NA	0.0932	0.0973	0.151	—[f]	NA	0.0938	—	—
RE02-07-1728	02-600418	4.5–9	QAL	—	0.0273 (J)	NA	NA	0.107	0.0963	0.165	0.0508	—	0.115	—	0.000252 (J)
RE02-07-1732	02-600419	0–0.5	SOIL	0.181	0.282	NA	NA	0.477	0.537	0.787	0.186	NA	0.466	0.109 (J)	—
RE02-07-1733	02-600419	4.5–9	QAL	0.152	0.207	NA	NA	0.313	0.345	0.562	0.134	—	0.359	0.108 (J)	—
RE02-07-1735	02-600419	9–16	QBO	—	—	NA	NA	—	—	—	—	—	—	—	—
RE02-07-1737	02-600420	0–0.5	SOIL	0.0287 (J)	0.0481	NA	NA	0.147	0.166	0.271	0.0818	NA	0.141	—	—
RE02-07-1738	02-600420	4.5–9	QAL	0.0443 (J)	0.0846	NA	NA	0.226	0.273	0.502	0.115	—	0.298	—	—
RE02-07-1740	02-600420	9–14	QBO	—	—	NA	NA	—	—	—	—	—	—	—	—
RE02-07-1893	02-600452	0–0.5	SOIL	—	0.00779 (J)	NA	NA	0.044	0.043 (J)	0.0681 (J)	—	NA	0.0491	—	—
RE02-07-1894	02-600452	4.5–10	QAL	—	—	NA	NA	—	—	—	—	—	—	—	—
RE02-07-1897	02-600452	10–15	QAL	—	—	NA	NA	—	—	—	—	—	—	—	—
RE02-07-1896	02-600452	15–20	QBO	—	—	NA	NA	—	—	—	—	—	—	—	—
RE02-07-1898	02-600453	0–0.5	SOIL	—	—	NA	NA	—	0.0216 (J)	0.0406	—	NA	0.024 (J)	—	—
RE02-07-1899	02-600453	4.5–10	QAL	—	0.0157 (J)	NA	NA	0.13	0.123	0.151	0.0642	—	0.129	—	—
RE02-07-1901	02-600453	10–20	QBO	—	—	NA	NA	0.0177 (J)	0.0143 (J)	0.0161 (J)	—	—	0.018 (J)	—	—
RE02-07-1903	02-600454	0–0.5	SOIL	—	0.0105 (J)	NA	NA	0.09	0.103	0.165	0.0647 (J)	NA	0.114	—	—
RE02-07-1908	02-600455	0–0.5	SOIL	0.026 (J)	0.0373	NA	NA	—	0.127	0.229	0.0552	NA	0.112	—	—
RE02-07-1909	02-600455	4.5–10	QAL	—	—	NA	NA	—	—	—	—	—	—	—	—
RE02-07-1911	02-600455	10–17	QBO	—	—	NA	NA	—	—	—	—	—	—	—	—
RE02-07-2075	02-600485	0–0.5	SOIL	0.0371	0.0631	NA	NA	0.161	—	0.253 (J)	—	NA	0.151	—	—
RE02-07-2076	02-600485	4.5–12	QAL	—	0.0334 (J)	NA	NA	0.092	0.164 (J)	0.141 (J)	0.0791 (J)	—	0.0935	—	—
RE02-07-2078	02-600485	14–19	QBO	—	—	NA	NA	—	—	—	—	0.000245 (J)	—	—	—
RE02-07-2080	02-600486	0–0.5	SOIL	0.0238 (J)	0.0644	NA	NA	0.331	0.298 (J)	0.593 (J)	—	NA	0.349	—	—
RE02-07-2081	02-600486	4.5–9	QAL	—	—	NA	NA	0.0142 (J)	—	0.0112 (J)	—	—	—	—	—
RE02-07-2085	02-600487	0–0.5	SOIL	0.0116 (J)	0.0254 (J)	NA	NA	0.162 (J)	—	0.325 (J)	—	NA	0.168 (J)	—	—
RE02-07-2086	02-600487	4.5–7.5	QAL	—	—	NA	NA	0.0289 (J-)	0.0164 (J-)	0.0255 (J-)	—	—	0.025 (J-)	—	—
RE02-07-2088	02-600487	15–19	QBO	—	—	NA	NA	—	—	—	—	—	—	—	—
RE02-07-2090	02-600488	0–0.5	SOIL	0.0761	0.118	NA	NA	0.2	0.244 (J)	0.397 (J)	—	NA	0.193	—	—
RE02-07-2091	02-600488	4.5–8	QAL	—	—	NA	NA	—	—	—	—	—	—	—	—
RE02-07-2093	02-600488	14.5–19	QBO	—	—	NA	NA	—	—	—	—	—	—	—	—
RE02-10-21859	02-612374	5–6	SOIL	—	—	0.0027 (J)	0.0019 (J)	—	—	—	—	NA	—	—	—
RE02-10-21860	02-612374	15–16	QBO	—	—	—	0.0027 (J)	—	—	—	—	NA	—	—	—

Table 6.34-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Di-n-butylphthalate	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	TPH-DRO	Trichloroethene
Industrial SSL[a]				**91,600**	**33,700**	**33,700**	**32.3**	**5110**	**3370**	**16,800**	**1160**	**25,300**	**3000[g]**	**36.1**
Recreational SSL[d]				**32,800**	**11,500**	**11,500**	**88.8**	**3610**	**1150**	**1930**	**1160**	**8630**	**na**	**157**
Residential SSL[a]				**6160**	**2320**	**2320**	**1.53**	**409**	**310**	**1160**	**1740**	**1740**	**1000[g]**	**6.72**
RE02-07-1727	02-600418	0–0.5	SOIL	—	0.201	0.0347 (J)	—	NA	0.0262 (J)	0.0445	0.19	0.225	12.4 (J)	NA
RE02-07-1728	02-600418	4.5–9	QAL	—	0.304	—	—	—	—	—	0.112	0.22	42.4	—
RE02-07-1732	02-600419	0–0.5	SOIL	—	1.03	0.164	0.189	NA	0.0975	0.213	0.977	0.968	18.4	NA
RE02-07-1733	02-600419	4.5–9	QAL	—	0.783	0.144	—	—	0.14	0.381	0.753	0.757	15.5 (J)	—
RE02-07-1735	02-600419	9–16	QBO	—	—	—	—	0.00416 (J)	—	—	—	—	1.82 (J)	—
RE02-07-1737	02-600420	0–0.5	SOIL	—	0.268	0.0214 (J)	—	NA	0.0106 (J)	0.0188 (J)	0.177	0.292	26.7	NA
RE02-07-1738	02-600420	4.5–9	QAL	—	0.59	—	0.101	0.00217 (J)	—	0.0328 (J)	0.296	0.603	30.6 (J)	—
RE02-07-1740	02-600420	9–14	QBO	—	0.0184 (J)	—	—	0.00251 (J)	—	—	—	0.0169 (J)	—	—
RE02-07-1893	02-600452	0–0.5	SOIL	0.0385 (J)	0.103	—	—	NA	—	—	0.0392	0.105	17.3	NA
RE02-07-1894	02-600452	4.5–10	QAL	—	—	—	—	—	—	—	—	—	2.07 (J)	—
RE02-07-1897	02-600452	10–15	QAL	—	—	—	—	0.00249 (J)	—	—	—	—	4.47 (J)	—
RE02-07-1896	02-600452	15–20	QBO	—	—	—	—	—	—	—	—	—	3.36 (J)	—
RE02-07-1898	02-600453	0–0.5	SOIL	0.037 (J)	0.0419	—	—	NA	—	—	0.015 (J)	0.0387	4.91	NA
RE02-07-1899	02-600453	4.5–10	QAL	—	0.157	—	0.0638	—	—	—	0.0284 (J)	0.116	3.91	—
RE02-07-1901	02-600453	10–20	QBO	—	0.0207 (J)	—	—	—	—	—	—	0.0147 (J)	2.13 (J)	—
RE02-07-1903	02-600454	0–0.5	SOIL	—	0.248	—	0.0686 (J)	NA	—	—	0.0678	0.173	—	NA
RE02-07-1908	02-600455	0–0.5	SOIL	—	0.248	0.0194 (J)	0.0562	NA	0.0135 (J)	0.0111 (J)	0.16	0.244	16.7 (J)	NA
RE02-07-1909	02-600455	4.5–10	QAL	—	—	—	—	0.00233 (J)	—	—	—	—	—	—
RE02-07-1911	02-600455	10–17	QBO	—	—	—	—	0.00235 (J)	—	—	—	—	—	—
RE02-07-2075	02-600485	0–0.5	SOIL	—	0.26	0.0314 (J)	—	NA	0.0171 (J)	0.036	0.212	0.41	20.3 (J)	NA
RE02-07-2076	02-600485	4.5–12	QAL	—	0.142	—	0.087 (J)	—	—	0.0147 (J)	0.0803	0.176	9.21	—
RE02-07-2078	02-600485	14–19	QBO	—	—	—	—	—	—	—	—	—	1.72 (J)	—
RE02-07-2080	02-600486	0–0.5	SOIL	0.049 (J)	0.445	0.0171 (J)	—	NA	—	—	0.204	0.7	74.7	NA
RE02-07-2081	02-600486	4.5–9	QAL	0.0678 (J)	0.0156 (J)	—	—	—	—	—	—	0.0147 (J)	1.89 (J)	—
RE02-07-2085	02-600487	0–0.5	SOIL	—	0.203	—	—	NA	—	—	0.0887	0.403 (J)	128	NA
RE02-07-2086	02-600487	4.5–7.5	QAL	—	0.0398 (J-)	—	—	—	—	—	0.0155 (J-)	0.046 (J-)	10.5	0.000635 (J)
RE02-07-2088	02-600487	15–19	QBO	0.0536 (J)	—	—	—	—	—	—	—	—	2.23 (J)	—
RE02-07-2090	02-600488	0–0.5	SOIL	—	0.353	0.0659	0.103 (J)	NA	0.0505	0.173	0.388	0.571	16.8 (J)	NA

Table 6.34-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Di-n-butylphthalate	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Methylene Chloride	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	TPH-DRO	Trichloroethene
Industrial SSL[a]				**91,600**	**33,700**	**33,700**	**32.3**	**5110**	**3370**	**16,800**	**1160**	**25,300**	**3000[g]**	**36.1**
Recreational SSL[d]				**32,800**	**11,500**	**11,500**	**88.8**	**3610**	**1150**	**1930**	**1160**	**8630**	**na**	**157**
Residential SSL[a]				**6160**	**2320**	**2320**	**1.53**	**409**	**310**	**1160**	**1740**	**1740**	**1000[g]**	**6.72**
RE02-07-2091	02-600488	4.5–8	QAL	—	—	—	—	—	—	—	—	—	3.55 (J)	—
RE02-07-2093	02-600488	14.5–19	QBO	—	—	—	—	—	—	—	—	—	1.39 (J)	—
RE02-10-21859	02-612374	5–6	SOIL	—	—	—	—	NA	—	—	—	—	—	NA
RE02-10-21860	02-612374	15–16	QBO	—	—	—	—	NA	—	—	—	—	—	NA

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273), unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSLs are from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables).

[d] SSLs are from LANL (2017, 602581).

[e] NA = Not analyzed.

[f] — = Not detected.

[g] SSLs for diesel #2 from NMED (2017, 602273).

Table 6.34-4
Radionuclides Detected or Detected above BVs/FVs at AOC 02-012

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Plutonium-239/240	Tritium	Uranium-235/236
Qbt 1g, Qct, Qbo BV[a]				**na[b]**	**na**	**na**	**0.18**
Soil BV/FV[a]				**0.013**	**0.054**	**na**	**0.2**
Industrial SAL[c]				**1000**	**1200**	**2,400,000**	**160**
Recreational SAL[c]				**1500**	**1300**	**5,700,000**	**1000**
Residential SAL[c]				**83**	**79**	**1700**	**42**
RE02-07-1728	02-600418	4.5–9	QAL	—[d]	—	0.12736 (J-)	—
RE02-07-1733	02-600419	4.5–9	QAL	—	—	0.445743 (J-)	—
RE02-07-1738	02-600420	4.5–9	QAL	—	0.228 (J-)	0.0320994	—
RE02-07-1894	02-600452	4.5–10	QAL	—	—	0.3182 (J-)	NA[e]
RE02-07-1898	02-600453	0–0.5	SOIL	—	—	0.00970954	NA
RE02-07-1899	02-600453	4.5–10	QAL	0.0987	—	0.19748 (J-)	NA
RE02-07-1904	02-600454	4.5–9.5	QAL	—	—	0.0559978 (J-)	NA
RE02-07-1909	02-600455	4.5–10	QAL	—	—	0.0708144 (J-)	NA
RE02-07-2075	02-600485	0–0.5	SOIL	—	—	0.00772217	—
RE02-07-2076	02-600485	4.5–12	QAL	—	—	0.0205725	—
RE02-07-2080	02-600486	0–0.5	SOIL	—	—	0.00584615	—
RE02-07-2083	02-600486	16–21	QBO	—	—	—	0.193
RE02-07-2090	02-600488	0–0.5	SOIL	—	—	0.00598471	—
RE02-07-2091	02-600488	4.5–8	QAL	—	—	0.0397656	—
RE02-10-21859	02-612374	5–6	SOIL	NA	—	0.362727	—

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SALs from LANL (2015, 600929).

[d] — = Not detected.

[e] NA = Not analyzed.

Table 7.2-1
Samples Collected and Analyses Requested at SWMU 21-006(e) and AOC 21-006(f)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Dioxins/Furans	Gamma-emitting Radionuclides	Tritium	Explosive Compounds	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
RE21-07-6466	21-602919	2–3	SOIL	07-1002[a]	07-1002	—[b]	07-1002	07-1002	—	07-1002	07-1002	07-1002	—	07-1002	07-1002	07-1002	07-1002	07-1002
RE21-07-6467	21-602919	7–8	SOIL	07-1002	07-1002	—	07-1002	07-1002	—	07-1002	07-1002	07-1002	—	07-1002	07-1002	07-1002	07-1002	07-1002
RE21-07-6468	21-602919	12–13	QBT 3	07-1002	07-1002	—	07-1002	07-1002	—	07-1002	07-1002	07-1002	—	07-1002	07-1002	07-1002	07-1002	07-1002
RE21-07-6884	21-602919	12–13	QBT 3	—	—	08-4	—	—	07-1172	—	—	—	07-1172	—	—	—	—	—
RE21-07-6469	21-602920	2–3	QBT 3	07-1119	07-1118	—	07-1119	07-1119	—	07-1119	07-1119	07-1118	—	07-1118	07-1119	07-1117	07-1117	07-1118
RE21-07-6470	21-602920	7–8	QBT 3	07-1119	07-1118	—	07-1119	07-1119	—	07-1119	07-1119	07-1118	—	07-1118	07-1119	07-1117	07-1117	07-1118
RE21-07-6471	21-602920	12–13	QBT 3	07-1119	07-1118	—	07-1119	07-1119	—	07-1119	07-1119	07-1118	—	07-1118	07-1119	07-1117	07-1117	07-1118
RE21-07-6472	21-602921	2–3	QBT 3	07-1119	07-1118	—	07-1119	07-1119	—	07-1119	07-1119	07-1118	—	07-1118	07-1119	07-1117	07-1117	07-1118
RE21-07-6473	21-602921	7–8	QBT 3	07-1119	07-1118	—	07-1119	07-1119	—	07-1119	07-1119	07-1118	—	07-1118	07-1119	07-1117	07-1117	07-1118
RE21-07-6474	21-602921	12–13	QBT 3	07-1119	07-1118	—	07-1119	07-1119	—	07-1119	07-1119	07-1118	—	07-1118	07-1119	07-1117	07-1117	07-1118
RE21-07-6475	21-602922	2–3	QBT 3	07-1119	07-1118	—	07-1119	07-1119	—	07-1119	07-1119	07-1118	—	07-1118	07-1119	07-1117	07-1117	07-1118
RE21-07-6476	21-602922	7–8	QBT 3	07-1119	07-1118	—	07-1119	07-1119	—	07-1119	07-1119	07-1118	—	07-1118	07-1119	07-1117	07-1117	07-1118
RE21-07-6477	21-602922	12–13	QBT 3	07-1119	07-1118	—	07-1119	07-1119	—	07-1119	07-1119	07-1118	—	07-1118	07-1119	07-1117	07-1117	07-1118
RE21-07-6478	21-602923	2–3	QBT 3	07-1119	07-1118	—	07-1119	07-1119	—	07-1119	07-1119	07-1118	—	07-1118	07-1119	07-1117	07-1117	07-1118
RE21-07-6479	21-602923	7–8	QBT 3	07-1119	07-1118	—	07-1119	07-1119	—	07-1119	07-1119	07-1118	—	07-1118	07-1119	07-1117	07-1117	07-1118
RE21-07-6480	21-602923	12–13	QBT 3	07-1119	07-1118	—	07-1119	07-1119	—	07-1119	07-1119	07-1118	—	07-1118	07-1119	07-1117	07-1117	07-1118
RE21-07-6481	21-602924	2–3	QBT 3	07-1122	07-1121	—	07-1122	07-1122	—	07-1122	07-1122	07-1121	—	07-1121	07-1122	07-1120	07-1120	07-1121
RE21-07-6482	21-602924	7–8	QBT 3	07-1122	07-1121	—	07-1122	07-1122	—	07-1122	07-1122	07-1121	—	07-1121	07-1122	07-1120	07-1120	07-1121
RE21-07-6483	21-602924	12–13	QBT 3	07-1122	07-1121	—	07-1122	07-1122	—	07-1122	07-1122	07-1121	—	07-1121	07-1122	07-1120	07-1120	07-1121
RE21-07-6484	21-602925	2–3	QBT 3	07-1129	07-1127	—	07-1129	07-1129	—	07-1129	07-1129	07-1127	—	07-1127	07-1129	07-1128	07-1128	07-1127
RE21-07-6485	21-602925	7–8	QBT 3	07-1129	07-1127	—	07-1129	07-1129	—	07-1129	07-1129	07-1127	—	07-1127	07-1129	07-1128	07-1128	07-1127
RE21-07-6486	21-602925	12–13	QBT 3	07-1129	07-1127	—	07-1129	07-1129	—	07-1129	07-1129	07-1127	—	07-1127	07-1129	07-1128	07-1128	07-1127
RE21-07-6487	21-602926	2–3	QBT 3	07-1129	07-1127	—	07-1129	07-1129	—	07-1129	07-1129	07-1127	—	07-1127	07-1129	07-1128	07-1128	07-1127
RE21-07-6488	21-602926	7–8	QBT 3	07-1129	07-1127	—	07-1129	07-1129	—	07-1129	07-1129	07-1127	—	07-1127	07-1129	07-1128	07-1128	07-1127
RE21-07-6489	21-602926	12–13	QBT 3	07-1129	07-1127	—	07-1129	07-1129	—	07-1129	07-1129	07-1127	—	07-1127	07-1129	07-1128	07-1128	07-1127
RE21-07-6490	21-602927	2–3	SOIL	07-1122	07-1121	—	07-1122	07-1122	—	07-1122	07-1122	07-1121	—	07-1121	07-1122	07-1120	07-1120	07-1121
RE21-07-6491	21-602927	7–8	QBT 3	07-1122	07-1121	—	07-1122	07-1122	—	07-1122	07-1122	07-1121	—	07-1121	07-1122	07-1120	07-1120	07-1121
RE21-07-6492	21-602927	12–13	QBT 3	07-1122	07-1121	—	07-1122	07-1122	—	07-1122	07-1122	07-1121	—	07-1121	07-1122	07-1120	07-1120	07-1121
RE21-07-6493	21-602928	2–3	QBT 3	07-1129	07-1127	—	07-1129	07-1129	—	07-1129	07-1129	07-1127	—	07-1127	07-1129	07-1128	07-1128	07-1127
RE21-07-6494	21-602928	7–8	QBT 3	07-1129	07-1127	—	07-1129	07-1129	—	07-1129	07-1129	07-1127	—	07-1127	07-1129	07-1128	07-1128	07-1127
RE21-07-6495	21-602928	12–13	QBT 3	07-1129	07-1127	—	07-1129	07-1129	—	07-1129	07-1129	07-1127	—	07-1127	07-1129	07-1128	07-1128	07-1127
RE21-07-6496	21-602929	2–3	QBT 3	07-1129	07-1127	—	07-1129	07-1129	—	07-1129	07-1129	07-1127	—	07-1127	07-1129	07-1128	07-1128	07-1127
RE21-07-6497	21-602929	7–8	QBT 3	07-1129	07-1127	—	07-1129	07-1129	—	07-1129	07-1129	07-1127	—	07-1127	07-1129	07-1128	07-1128	07-1127
RE21-07-6498	21-602929	12–13	QBT 3	07-1129	07-1127	—	07-1129	07-1129	—	07-1129	07-1129	07-1127	—	07-1127	07-1129	07-1128	07-1128	07-1127

Table 7.2-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Dioxins/Furans	Gamma-emitting Radionuclides	Tritium	Explosive Compounds	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
RE21-07-6499	21-602930	2–3	QBT 3	07-1122	07-1121	—	07-1122	07-1122	—	07-1122	07-1122	07-1121	—	07-1121	07-1122	07-1120	07-1120	07-1121
RE21-07-6500	21-602930	7–8	QBT 3	07-1122	07-1121	—	07-1122	07-1122	—	07-1122	07-1122	07-1121	—	07-1121	07-1122	07-1120	07-1120	07-1121
RE21-07-6501	21-602930	12–13	QBT 3	07-1122	07-1121	—	07-1122	07-1122	—	07-1122	07-1122	07-1121	—	07-1121	07-1122	07-1120	07-1120	07-1121
RE21-07-6502	21-602931	2–3	QBT 3	07-1129	07-1127	—	07-1129	07-1129	—	07-1129	07-1129	07-1127	—	07-1127	07-1129	07-1128	07-1128	07-1127
RE21-07-6503	21-602931	7–8	QBT 3	07-1129	07-1127	—	07-1129	07-1129	—	07-1129	07-1129	07-1127	—	07-1127	07-1129	07-1128	07-1128	07-1127
RE21-07-6504	21-602931	12–13	QBT 3	07-1129	07-1127	—	07-1129	07-1129	—	07-1129	07-1129	07-1127	—	07-1127	07-1129	07-1128	07-1128	07-1127
RE21-07-6505	21-602932	2–3	QBT 3	07-1129	07-1127	—	07-1129	07-1129	—	07-1129	07-1129	07-1127	—	07-1127	07-1129	07-1128	07-1128	07-1127
RE21-07-6506	21-602932	7–8	QBT 3	07-1129	07-1127	—	07-1129	07-1129	—	07-1129	07-1129	07-1127	—	07-1127	07-1129	07-1128	07-1128	07-1127
RE21-07-6507	21-602932	12–13	QBT 3	07-1129	07-1127	—	07-1129	07-1129	—	07-1129	07-1129	07-1127	—	07-1127	07-1129	07-1128	07-1128	07-1127
RE21-07-6508	21-602933	2–3	QBT 3	07-1122	07-1121	—	07-1122	07-1122	—	07-1122	07-1122	07-1121	—	07-1121	07-1122	07-1120	07-1120	07-1121
RE21-07-6509	21-602933	7–8	QBT 3	07-1122	07-1121	—	07-1122	07-1122	—	07-1122	07-1122	07-1121	—	07-1121	07-1122	07-1120	07-1120	07-1121
RE21-07-6510	21-602933	12–13	QBT 3	07-1122	07-1121	—	07-1122	07-1122	—	07-1122	07-1122	07-1121	—	07-1121	07-1122	07-1120	07-1120	07-1121
MD21-10-21629	21-612318	5–6	QBT 3	—	—	—	—	10-3913	—	10-3913	10-3913	10-3940	10-3940	—	—	—	—	—
MD21-10-21630	21-612318	15–16	QBT 3	—	—	—	—	10-3913	—	10-3913	10-3913	10-3940	10-3940	—	—	—	—	—
MD21-10-21631	21-612318	24–25	QBT 3	—	—	—	—	10-3913	—	10-3913	10-3913	10-3940	10-3940	—	—	—	—	—
MD21-10-21632	21-612319	5–6	QBT 3	—	—	—	—	10-3912	—	10-3912	10-3912	10-3939	10-3939	—	—	—	—	—
MD21-10-21633	21-612319	15–16	QBT 3	—	—	—	—	10-3912	—	10-3912	10-3912	10-3939	10-3939	—	—	—	—	—
MD21-10-21634	21-612319	24–25	QBT 3	—	—	—	—	10-3912	—	10-3912	10-3912	10-3939	10-3939	—	—	—	—	—
MD21-10-21637	21-612320	5–6	QBT 3	10-3885	—	—	—	—	—	10-3885	10-3885	10-3884	10-3883	—	—	—	—	—
MD21-10-21638	21-612320	15–16	QBT 3	10-3885	—	—	—	—	—	10-3885	10-3885	10-3884	10-3883	—	—	—	—	—
MD21-10-21639	21-612320	24–25	QBT 3	10-3885	—	—	—	—	—	10-3885	10-3885	10-3884	10-3883	—	—	—	—	—
MD21-10-21640	21-612321	5–6	QBT 3	10-3912	—	—	—	—	—	10-3912	10-3912	10-3939	10-3939	—	—	—	—	—
MD21-10-21641	21-612321	15–16	QBT 3	10-3912	—	—	—	—	—	10-3912	10-3912	10-3939	10-3939	—	—	—	—	—
MD21-10-21642	21-612321	24–25	QBT 3	10-3912	—	—	—	—	—	10-3912	10-3912	10-3939	10-3939	—	—	—	—	—
MD21-10-21643	21-612322	5–6	QBT 3	10-3912	—	—	—	—	—	10-3912	10-3912	10-3939	10-3939	—	—	—	—	—
MD21-10-21644	21-612322	15–16	QBT 3	10-3912	—	—	—	—	—	10-3912	10-3912	10-3939	10-3939	—	—	—	—	—
MD21-10-21645	21-612322	24–25	QBT 3	10-3912	—	—	—	—	—	10-3912	10-3912	10-3939	10-3939	—	—	—	—	—
MD21-10-21646	21-612323	5–6	QBT 3	10-3885	—	—	—	—	—	10-3885	10-3885	10-3884	10-3883	—	—	—	—	—
MD21-10-21647	21-612323	15–16	QBT 3	10-3885	—	—	—	—	—	10-3885	10-3885	10-3884	10-3883	—	—	—	—	—
MD21-10-21648	21-612323	24–25	QBT 3	10-3885	—	—	—	—	—	10-3885	10-3885	10-3884	10-3883	—	—	—	—	—
MD21-10-21649	21-612324	5–6	FILL	10-3913	—	—	—	—	—	10-3913	10-3913	10-3940	10-3940	—	—	—	—	—
MD21-10-21650	21-612324	15–16	QBT 3	10-3913	—	—	—	—	—	10-3913	10-3913	10-3940	10-3940	—	—	—	—	—
MD21-10-21651	21-612324	24–25	QBT 3	10-3913	—	—	—	—	—	10-3913	10-3913	10-3940	10-3940	—	—	—	—	—

[a] Analytical request number.

[b] — = Analysis not requested.

Table 7.2-2
Inorganic Chemicals Detected or Detected above BVs at SWMU 21-006(e) and AOC 21-006(f)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Selenium	Zinc
Qbt 2, 3, 4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**11.2**	**1690**	**482**	**0.1**	**6.58**	**na[b]**	**0.3**	**63.5**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**na**	**1.52**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**na**	**505[d]**	**388**	**51,900**	**62.8**	**800**	**na**	**160,000**	**389**	**25,700**	**2,080,000**	**6490**	**1860**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**na**	**281[d]**	**186**	**24,800**	**224**	**1110**	**na**	**14,800**	**186**	**12,400**	**991,000**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,000**	**na**	**96.6[d]**	**23.4**	**3130**	**11.1**	**400**	**na**	**10,500**	**23.5**	**1560**	**125,000**	**391**	**23,500**
RE21-07-6466	21-602919	2–3	SOIL	—[f]	0.84 (J-)	—	—	18100	—	—	—	0.55 (U)	22.5	—	—	0.151	—	1.1	—	86 (J-)
RE21-07-6467	21-602919	7–8	SOIL	—	—	—	—	14000	—	—	—	0.56 (U)	22.9	—	—	0.116	—	3.3	—	56 (J-)
RE21-07-6468	21-602919	12–13	QBT 3	—	—	—	51.2	8850	—	—	4.9	0.55 (U)	12.8	—	—	—	—	4	0.55 (U)	—
RE21-07-6469	21-602920	2–3	QBT 3	—	—	—	—	—	—	—	—	0.56 (U)	—	—	—	—	—	—	—	—
RE21-07-6470	21-602920	7–8	QBT 3	—	—	—	—	—	—	—	19.8 (U)	0.55 (U)	—	—	—	—	—	—	0.31 (J)	—
RE21-07-6471	21-602920	12–13	QBT 3	—	—	—	—	—	—	—	5 (U)	0.54 (U)	—	—	—	—	—	—	—	—
RE21-07-6472	21-602921	2–3	QBT 3	—	—	—	—	10700 (J-)	—	—	—	0.56 (U)	—	—	—	—	—	1.6	0.56 (U)	—
RE21-07-6473	21-602921	7–8	QBT 3	—	—	—	—	2970 (J-)	—	—	—	0.55 (U)	—	—	—	—	—	1.5	0.56 (U)	—
RE21-07-6474	21-602921	12–13	QBT 3	—	—	—	—	4200 (J-)	—	—	—	0.54 (U)	—	—	—	—	—	1.8	0.54 (U)	—
RE21-07-6475	21-602922	2–3	QBT 3	—	—	—	—	9290 (J-)	—	—	—	0.55 (U)	—	—	—	—	—	0.78	0.54 (J)	—
RE21-07-6476	21-602922	7–8	QBT 3	—	—	—	—	2490 (J-)	—	—	—	0.55 (U)	11.8 (U)	—	—	—	—	0.81	—	—
RE21-07-6477	21-602922	12–13	QBT 3	—	—	—	—	—	—	—	—	0.55 (U)	21.2 (U)	—	—	—	—	—	0.55 (U)	—
RE21-07-6478	21-602923	2–3	QBT 3	—	—	—	100	18600 (J-)	8.7	—	9 (U)	0.57 (U)	—	1710	—	—	8 (U)	—	0.57 (U)	—
RE21-07-6479	21-602923	7–8	QBT 3	—	—	—	—	6840 (J-)	—	—	7.2 (U)	0.56 (U)	—	—	—	—	—	—	0.56 (U)	—
RE21-07-6480	21-602923	12–13	QBT 3	—	—	—	47.3	7990 (J-)	—	—	5.9 (U)	0.56 (U)	—	—	—	—	—	0.68	0.56 (U)	—
RE21-07-6481	21-602924	2–3	QBT 3	—	—	—	—	4200 (J)	—	—	—	0.56 (UJ)	27.1 (U)	—	—	—	—	1.2	—	—
RE21-07-6482	21-602924	7–8	QBT 3	—	—	—	—	3350 (J)	—	—	—	0.55 (UJ)	21.4 (U)	—	—	—	—	0.61	0.55 (U)	—
RE21-07-6483	21-602924	12–13	QBT 3	—	—	—	—	2310 (J)	—	—	—	0.55 (UJ)	24 (U)	—	—	—	—	1.1	0.55 (U)	—
RE21-07-6484	21-602925	2–3	QBT 3	—	2.9 (J-)	5	103	10300	—	3.5	22.7 (U)	—	23.9 (U)	—	—	—	68.4	—	0.56 (U)	87.6 (U)
RE21-07-6485	21-602925	7–8	QBT 3	—	1.2 (J-)	—	90.1	11600	—	—	6.8 (U)	0.55 (U)	30.9 (J-)	—	—	—	—	—	0.55 (U)	80.7 (U)
RE21-07-6486	21-602925	12–13	QBT 3	—	0.54 (J-)	—	46.3	6180	—	—	—	0.55 (U)	33.4 (J-)	—	—	—	—	—	0.55 (U)	85.8 (U)
RE21-07-6487	21-602926	2–3	QBT 3	—	—	—	77.1	2510	—	—	30.2 (U)	—	—	—	—	—	—	—	0.56 (U)	—
RE21-07-6488	21-602926	7–8	QBT 3	—	—	—	—	4330	—	—	19.9 (U)	—	—	—	—	—	—	—	0.53 (U)	65.5 (U)
RE21-07-6489	21-602926	12–13	QBT 3	—	—	—	—	2860	—	—	15.6 (U)	0.56 (U)	—	—	—	—	—	—	0.56 (U)	—
RE21-07-6490	21-602927	2–3	SOIL	—	—	—	—	7920 (J)	—	—	—	0.57 (UJ)	—	—	—	0.108	—	0.2 (J)	—	63.3 (U)
RE21-07-6491	21-602927	7–8	QBT 3	—	—	—	71.3	7440 (J)	—	—	5 (U)	0.54 (UJ)	17.9 (U)	—	—	—	—	0.4	0.54 (U)	—
RE21-07-6492	21-602927	12–13	QBT 3	—	—	—	—	6780 (J)	—	—	4.9 (U)	0.56 (UJ)	11.3 (U)	—	—	—	—	0.21 (J)	0.56 (U)	—
RE21-07-6493	21-602928	2–3	QBT 3	—	—	—	46.1	—	—	—	—	0.52 (U)	—	—	—	—	—	—	0.52 (U)	—
RE21-07-6494	21-602928	7–8	QBT 3	—	—	—	55	—	—	—	—	—	—	—	—	—	—	—	0.54 (U)	—

Table 7.2-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Selenium	Zinc
Qbt 2, 3, 4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**11.2**	**1690**	**482**	**0.1**	**6.58**	**na[b]**	**0.3**	**63.5**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**na**	**1.52**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**na**	**505[d]**	**388**	**51,900**	**62.8**	**800**	**na**	**160,000**	**389**	**25,700**	**2,080,000**	**6490**	**1860**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**na**	**281[d]**	**186**	**24,800**	**224**	**1110**	**na**	**14,800**	**186**	**12,400**	**991,000**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,000**	**na**	**96.6[d]**	**23.4**	**3130**	**11.1**	**400**	**na**	**10,500**	**23.5**	**1560**	**125,000**	**391**	**23,500**
RE21-07-6495	21-602928	12–13	QBT 3	—	—	—	—	—	—	—	—	0.53 (U)	—	—	—	—	—	—	0.53 (U)	—
RE21-07-6496	21-602929	2–3	QBT 3	10400	—	2.9	528	2940	—	—	6.1 (U)	0.57 (U)	11.6 (U)	2480	—	—	11.1 (U)	—	0.57 (U)	—
RE21-07-6497	21-602929	7–8	QBT 3	—	—	—	85.8	4360	—	—	5.9 (U)	0.55 (U)	11.7 (U)	2070	—	—	—	—	0.55 (U)	—
RE21-07-6498	21-602929	12–13	QBT 3	—	—	—	—	3850	—	—	—	—	—	—	—	—	—	—	0.55 (U)	—
RE21-07-6499	21-602930	2–3	QBT 3	—	—	—	72	3980 (J)	—	—	—	0.56 (UJ)	—	—	—	—	—	—	0.56 (U)	—
RE21-07-6500	21-602930	7–8	QBT 3	—	—	—	—	—	—	—	—	0.55 (UJ)	15.7 (U)	—	—	—	—	—	0.55 (U)	—
RE21-07-6501	21-602930	12–13	QBT 3	—	—	—	—	2250 (J)	—	—	—	0.55 (UJ)	13.9 (U)	—	—	—	—	0.22	0.55 (U)	—
RE21-07-6502	21-602931	2–3	QBT 3	—	—	—	164	3060	—	3.4	—	—	—	—	—	—	—	—	0.55 (U)	—
RE21-07-6503	21-602931	7–8	QBT 3	—	—	—	96.1	4320	—	3.2	5 (U)	0.55 (U)	14.6 (U)	—	497	—	7.9 (U)	—	0.55 (U)	—
RE21-07-6504	21-602931	12–13	QBT 3	—	—	—	53.9	10100	—	—	—	0.53 (U)	—	—	—	—	—	—	0.53 (U)	—
RE21-07-6505	21-602932	2–3	QBT 3	—	—	—	64.3	6610	—	—	—	—	—	—	—	—	—	—	0.56 (U)	—
RE21-07-6506	21-602932	7–8	QBT 3	—	—	—	—	5370	—	—	—	0.55 (U)	15.4 (U)	—	—	—	—	—	0.55 (U)	—
RE21-07-6507	21-602932	12–13	QBT 3	—	—	—	—	7180	—	—	—	—	20.5 (U)	—	—	—	—	—	0.55 (U)	—
RE21-07-6508	21-602933	2–3	QBT 3	—	—	—	62.8	2630 (J)	—	—	—	0.57 (UJ)	11.6 (U)	—	—	—	—	0.26	0.57 (U)	—
RE21-07-6509	21-602933	7–8	QBT 3	—	—	—	54.8	—	—	—	—	0.55 (UJ)	15.2 (U)	—	544	—	8.3 (U)	—	0.56 (U)	—
RE21-07-6510	21-602933	12–13	QBT 3	—	—	—	—	—	—	—	—	0.55 (UJ)	—	—	—	—	—	—	0.55 (U)	—
MD21-10-21629	21-612318	5–6	QBT 3	—	1.02 (U)	3.12	51.7	8830 (J-)	—	—	—	NA[g]	13.4	—	—	—	—	NA	1.07 (U)	—
MD21-10-21630	21-612318	15–16	QBT 3	—	1.04 (U)	—	—	—	—	—	—	NA	—	—	—	—	—	NA	1.03 (U)	—
MD21-10-21631	21-612318	24–25	QBT 3	—	0.995 (U)	—	—	—	—	—	—	NA	—	—	—	—	—	NA	1.01 (U)	—
MD21-10-21632	21-612319	5–6	QBT 3	—	1.08 (U)	—	—	—	—	—	—	NA	—	—	—	—	—	NA	1.09 (U)	—
MD21-10-21633	21-612319	15–16	QBT 3	—	1.16 (U)	—	—	—	—	—	—	NA	—	—	—	—	—	NA	1.13 (U)	—
MD21-10-21634	21-612319	24–25	QBT 3	—	1.11 (U)	—	—	—	7.17 (J)	—	—	NA	—	—	—	—	—	NA	1.12 (U)	—
MD21-10-21637	21-612320	5–6	QBT 3	—	1.1 (UJ)	—	—	—	—	—	—	NA	—	—	—	—	—	NA	1.08 (U)	—
MD21-10-21638	21-612320	15–16	QBT 3	—	1.06 (UJ)	—	—	—	—	—	—	NA	—	—	—	—	—	NA	1.04 (U)	—
MD21-10-21639	21-612320	24–25	QBT 3	—	1.03 (UJ)	—	—	—	—	—	—	NA	—	—	—	—	—	NA	1.02 (U)	—
MD21-10-21640	21-612321	5–6	QBT 3	—	1.08 (U)	—	—	—	—	—	—	NA	—	—	—	—	—	NA	1.05 (U)	—
MD21-10-21641	21-612321	15–16	QBT 3	—	1.06 (U)	—	—	—	—	—	—	NA	—	—	—	—	—	NA	0.979 (U)	—
MD21-10-21642	21-612321	24–25	QBT 3	—	1.04 (U)	—	—	—	—	—	—	NA	—	—	—	—	—	NA	1.03 (U)	—
MD21-10-21643	21-612322	5–6	QBT 3	—	1.07 (U)	—	—	—	—	—	—	NA	74.2	—	664	—	—	NA	1.04 (U)	67.9
MD21-10-21644	21-612322	15–16	QBT 3	—	1.02 (U)	—	—	—	—	—	—	NA	21.5	—	—	—	—	NA	1.05 (U)	—
MD21-10-21645	21-612322	24–25	QBT 3	—	1.03 (U)	—	—	—	—	—	—	NA	12.2	—	—	—	—	NA	0.996 (U)	—

Table 7.2-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Selenium	Zinc
Qbt 2, 3, 4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**11.2**	**1690**	**482**	**0.1**	**6.58**	**na[b]**	**0.3**	**63.5**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**na**	**1.52**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**na**	**505[d]**	**388**	**51,900**	**62.8**	**800**	**na**	**160,000**	**389**	**25,700**	**2,080,000**	**6490**	**1860**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**na**	**281[d]**	**186**	**24,800**	**224**	**1110**	**na**	**14,800**	**186**	**12,400**	**991,000**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,000**	**na**	**96.6[d]**	**23.4**	**3130**	**11.1**	**400**	**na**	**10,500**	**23.5**	**1560**	**125,000**	**391**	**23,500**
MD21-10-21646	21-612323	5–6	QBT 3	—	1.06 (UJ)	—	—	4080	—	—	—	NA	—	—	—	—	—	NA	1.05 (U)	—
MD21-10-21647	21-612323	15–16	QBT 3	—	1 (UJ)	—	—	—	—	—	—	NA	—	—	—	—	—	NA	1.06 (U)	—
MD21-10-21648	21-612323	24–25	QBT 3	—	1.03 (UJ)	—	—	—	—	—	—	NA	—	—	—	—	—	NA	1.05 (U)	—
MD21-10-21649	21-612324	5–6	FILL	—	1.32	—	—	9050 (J-)	—	—	—	NA	—	—	—	—	—	NA	—	63.5
MD21-10-21650	21-612324	15–16	QBT 3	—	1.07 (U)	—	—	—	—	—	—	NA	—	—	—	—	—	NA	1.06 (U)	—
MD21-10-21651	21-612324	24–25	QBT 3	—	1.07 (U)	—	—	—	—	—	—	NA	—	—	—	—	—	NA	1.06 (U)	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 7.2-3
Organic Chemicals Detected at SWMU 21-006(e) and AOC 21-006(f)

Sample ID	Location ID	Depth (ft)	Media	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	Bis(2-ethylhexyl)phthalate	Bromobenzene	Butylbenzene[n-]	Butylbenzene[sec-]	Chrysene	Dichlorobenzene[1,2-]	Dichlorobenzene[1,3-]
Industrial SSL[a]				**959,000**	**253,000**	**10.9**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**1830**	**1800[c]**	**58,000[c]**	**120,000[c]**	**3230**	**12,900**	**12,900[d]**
Recreational SSL[e]				**505,000**	**863,000**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**888**	**1770**	**4260**	**31,000**	**61,900**	**8880**	**38,100**	**36,000**
Residential SSL[a]				**66,300**	**17,400**	**2.43**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**380**	**290[c]**	**3900[c]**	**7800[c]**	**153**	**2140**	**2140[d]**
RE21-07-6466	21-602919	2–3	SOIL	—[f]	—	NA[g]	NA	NA	0.081 (J)	0.081 (J)	0.07 (J)	0.048 (J)	0.066 (J)	0.22 (J)	0.00047 (J)	—	0.00041 (J)	0.12 (J)	—	—
RE21-07-6467	21-602919	7–8	SOIL	0.033	—	NA	NA	NA	—	—	—	—	—	—	—	—	—	0.044 (J)	0.00024 (J)	0.00025 (J)
RE21-07-6468	21-602919	12–13	QBT 3	0.0071 (J)	—	NA	NA	NA	—	—	—	—	—	—	—	—	—	0.044 (J)	—	—
RE21-07-6884	21-602919	12–13	QBT 3	NA	NA	—	0.241	0.185	NA	NA	NA	NA	NA	NA	—	NA	—	NA	NA	NA
RE21-07-6469	21-602920	2–3	QBT 3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—
RE21-07-6472	21-602921	2–3	QBT 3	—	—	NA	NA	NA	0.045 (J)	0.039 (J)	—	—	—	—	—	—	—	0.062 (J)	—	—
RE21-07-6476	21-602922	7–8	QBT 3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—	—	—	0.00041 (J)	0.00038 (J)
RE21-07-6478	21-602923	2–3	QBT 3	—	—	NA	NA	NA	0.053 (J)	0.045 (J)	0.047 (J)	—	0.044 (J)	—	—	—	—	0.071 (J)	—	—
RE21-07-6479	21-602923	7–8	QBT 3	—	—	NA	NA	NA	0.087 (J)	0.077 (J)	0.074 (J)	0.041 (J)	0.069 (J)	—	—	—	—	0.12 (J)	—	—
RE21-07-6480	21-602923	12–13	QBT 3	—	—	NA	NA	NA	0.039 (J)	—	—	—	—	—	—	—	—	0.058 (J)	—	—
RE21-07-6481	21-602924	2–3	QBT 3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—	—	—	0.00035 (J)	0.00033 (J)
RE21-07-6482	21-602924	7–8	QBT 3	—	—	NA	NA	NA	0.042 (J)	0.038 (J)	—	—	0.038 (J)	—	—	—	—	0.052 (J)	—	—
RE21-07-6484	21-602925	2–3	QBT 3	—	—	NA	NA	NA	0.11 (J)	0.11 (J)	0.1 (J)	0.055 (J)	0.1 (J)	0.14 (J)	—	—	—	0.17 (J)	—	—
RE21-07-6485	21-602925	7–8	QBT 3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—	—	0.053 (J)	—	—
RE21-07-6486	21-602925	12–13	QBT 3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—
RE21-07-6487	21-602926	2–3	QBT 3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—
RE21-07-6488	21-602926	7–8	QBT 3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—
RE21-07-6489	21-602926	12–13	QBT 3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—
RE21-07-6491	21-602927	7–8	QBT 3	0.011 (J)	—	NA	NA	NA	—	—	—	—	—	—	—	0.0011 (J)	—	—	—	—
RE21-07-6492	21-602927	12–13	QBT 3	0.009 (J)	—	NA	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—
RE21-07-6493	21-602928	2–3	QBT 3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—
RE21-07-6494	21-602928	7–8	QBT 3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—
RE21-07-6495	21-602928	12–13	QBT 3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—
RE21-07-6498	21-602929	12–13	QBT 3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—
RE21-07-6500	21-602930	7–8	QBT 3	0.016 (J)	—	NA	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—
RE21-07-6502	21-602931	2–3	QBT 3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—
RE21-07-6505	21-602932	2–3	QBT 3	—	0.043 (J)	NA	NA	NA	0.086 (J)	0.056 (J)	0.064 (J)	—	0.069 (J)	—	—	—	—	0.11 (J)	—	—
RE21-07-6507	21-602932	12–13	QBT 3	—	—	NA	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—

Table 7.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	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	Bis(2-ethylhexyl)phthalate	Bromobenzene	Butylbenzene[n-]	Butylbenzene[sec-]	Chrysene	Dichlorobenzene[1,2-]	Dichlorobenzene[1,3-]
Industrial SSL[a]				**959,000**	**253,000**	**10.9**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**1830**	**1800[c]**	**58,000[c]**	**120,000[c]**	**3230**	**12,900**	**12,900[d]**
Recreational SSL[e]				**505,000**	**863,000**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**888**	**1770**	**4260**	**31,000**	**61,900**	**8880**	**38,100**	**36,000**
Residential SSL[a]				**66,300**	**17,400**	**2.43**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**380**	**290[c]**	**3900[c]**	**7800[c]**	**153**	**2140**	**2140[d]**
RE21-07-6509	21-602933	7–8	QBT 3	0.018 (J)	—	NA	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—
RE21-07-6510	21-602933	12–13	QBT 3	0.01 (J)	—	NA	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—
MD21-10-21629	21-612318	5–6	QBT 3	NA	NA	—	0.0446	0.0465	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21632	21-612319	5–6	QBT 3	NA	NA	—	—	0.0076 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21634	21-612319	24–25	QBT 3	NA	NA	—	0.003 (J)	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21639	21-612320	24–25	QBT 3	NA	NA	—	0.0022 (J)	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21641	21-612321	15–16	QBT 3	NA	NA	0.0679	0.0343	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21649	21-612324	5–6	FILL	NA	NA	—	0.14	0.159	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21650	21-612324	15–16	QBT 3	NA	NA	—	0.0075	0.007	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 7.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Dichlorobenzene[1,4-]	Di-n-butylphthalate	Ethylbenzene	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[1,2,3,6,7,8-]	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[1,2,3,4,7,8-]	Hexachlorodibenzofuran[1,2,3,6,7,8-]	Hexachlorodibenzofuran[1,2,3,7,8,9-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]
Industrial SSL[a]				**6730**	**91,600**	**365**	**33,700**	**na[h]**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Recreational SSL[e]				**1140**	**32,800**	**1930**	**11,500**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Residential SSL[a]				**1290**	**6160**	**74.5**	**2320**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
RE21-07-6466	21-602919	2–3	SOIL	—	—	—	0.17 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-07-6467	21-602919	7–8	SOIL	0.00041 (J)	—	0.0016 (J)	0.047 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-07-6468	21-602919	12–13	QBT 3	—	—	—	0.059 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-07-6884	21-602919	12–13	QBT 3	NA	NA	NA	NA	0.0000119	0.0000263	0.00000467	0.00000115 (J)	0.0000118	0.000000705 (J)	0.000000639 (J)	0.00000661	0.00000348 (J)	0.00000102 (J)	0.000000379 (J)	0.000000801 (J)
RE21-07-6469	21-602920	2–3	QBT 3	—	—	—	0.04 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-07-6472	21-602921	2–3	QBT 3	—	—	—	0.098 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-07-6476	21-602922	7–8	QBT 3	0.00049 (J)	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-07-6478	21-602923	2–3	QBT 3	—	—	—	0.11 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-07-6479	21-602923	7–8	QBT 3	—	—	—	0.2 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-07-6480	21-602923	12–13	QBT 3	—	—	—	0.091 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-07-6481	21-602924	2–3	QBT 3	0.0004 (J)	—	—	0.046 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-07-6482	21-602924	7–8	QBT 3	—	—	—	0.097 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-07-6484	21-602925	2–3	QBT 3	—	—	—	0.28 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-07-6485	21-602925	7–8	QBT 3	—	—	—	0.073 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-07-6486	21-602925	12–13	QBT 3	0.00039 (J)	0.5	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-07-6487	21-602926	2–3	QBT 3	—	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-07-6488	21-602926	7–8	QBT 3	—	—	—	0.037 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-07-6489	21-602926	12–13	QBT 3	—	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-07-6491	21-602927	7–8	QBT 3	—	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-07-6492	21-602927	12–13	QBT 3	—	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-07-6493	21-602928	2–3	QBT 3	—	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-07-6494	21-602928	7–8	QBT 3	—	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-07-6495	21-602928	12–13	QBT 3	—	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-07-6498	21-602929	12–13	QBT 3	—	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-07-6500	21-602930	7–8	QBT 3	—	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-07-6502	21-602931	2–3	QBT 3	—	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-07-6505	21-602932	2–3	QBT 3	—	—	—	0.24 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 7.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Dichlorobenzene[1,4-]	Di-n-butylphthalate	Ethylbenzene	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[1,2,3,6,7,8-]	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[1,2,3,4,7,8-]	Hexachlorodibenzofuran[1,2,3,6,7,8-]	Hexachlorodibenzofuran[1,2,3,7,8,9-]	Hexachlorodibenzofuran[2,3,4,6,7,8-]
Industrial SSL[a]				**6730**	**91,600**	**365**	**33,700**	**na[h]**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Recreational SSL[e]				**1140**	**32,800**	**1930**	**11,500**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
Residential SSL[a]				**1290**	**6160**	**74.5**	**2320**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**
RE21-07-6507	21-602932	12–13	QBT 3	—	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-07-6509	21-602933	7–8	QBT 3	—	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-07-6510	21-602933	12–13	QBT 3	—	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21629	21-612318	5–6	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21632	21-612319	5–6	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21634	21-612319	24–25	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21639	21-612320	24–25	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21641	21-612321	15–16	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21649	21-612324	5–6	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21650	21-612324	15–16	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 7.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylene Chloride	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Toluene	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)
Industrial SSL[a]				**na**	**32.3**	**14,100[i]**	**5110**	**na**	**na**	**na**	**na**	**na**	**1160**	**25,300**	**na**	**0.00243**	**na**	**61,100**	**1800[i]**	**1500[i]**	**42,400**
Recreational SSL[e]				**na**	**88.8**	**42,100[i]**	**3610**	**na**	**na**	**na**	**na**	**na**	**1160**	**8630**	**na**	**0.00297**	**na**	**47,600**	**5010**	**4830**	**27800**
Residential SSL[a]				**na**	**1.53**	**2350[i]**	**409**	**na**	**na**	**na**	**na**	**na**	**1740**	**1740**	**na**	**0.00049**	**na**	**5220**	**300[i]**	**270[i]**	**863**
RE21-07-6466	21-602919	2–3	SOIL	NA	0.043 (J)	—	—	NA	NA	NA	NA	NA	0.081 (J)	0.14 (J)	NA	NA	NA	0.0012 (J-)	0.00046 (J-)	—	—
RE21-07-6467	21-602919	7–8	SOIL	NA	—	—	—	NA	NA	NA	NA	NA	—	0.041 (J)	NA	NA	NA	0.0023 (J)	0.00087 (J)	0.00029 (J)	0.0092
RE21-07-6468	21-602919	12–13	QBT 3	NA	—	—	—	NA	NA	NA	NA	NA	—	0.05 (J)	NA	NA	NA	0.0014 (J)	0.00039 (J)	—	—
RE21-07-6884	21-602919	12–13	QBT 3	0.0000125 (J)	NA	NA	NA	0.000104	0.00000763	0.00000335	0.00000282	0.0000201 (J)	NA	NA	0.0000000941	0.00000207	0.00000848	NA	NA	NA	NA
RE21-07-6469	21-602920	2–3	QBT 3	NA	—	—	—	NA	NA	NA	NA	NA	—	—	NA	NA	NA	—	—	—	—
RE21-07-6472	21-602921	2–3	QBT 3	NA	—	—	—	NA	NA	NA	NA	NA	0.06 (J)	0.087 (J)	NA	NA	NA	—	—	—	—
RE21-07-6476	21-602922	7–8	QBT 3	NA	—	—	—	NA	NA	NA	NA	NA	—	—	NA	NA	NA	—	—	—	—
RE21-07-6478	21-602923	2–3	QBT 3	NA	—	—	—	NA	NA	NA	NA	NA	0.052 (J)	0.092 (J)	NA	NA	NA	—	—	—	—
RE21-07-6479	21-602923	7–8	QBT 3	NA	0.039 (J)	—	—	NA	NA	NA	NA	NA	0.098 (J)	0.17 (J)	NA	NA	NA	—	—	—	—
RE21-07-6480	21-602923	12–13	QBT 3	NA	—	—	—	NA	NA	NA	NA	NA	—	0.081 (J)	NA	NA	NA	—	—	—	—
RE21-07-6481	21-602924	2–3	QBT 3	NA	—	—	—	NA	NA	NA	NA	NA	—	—	NA	NA	NA	—	—	—	—
RE21-07-6482	21-602924	7–8	QBT 3	NA	—	—	—	NA	NA	NA	NA	NA	0.067 (J)	0.07 (J)	NA	NA	NA	—	—	—	—
RE21-07-6484	21-602925	2–3	QBT 3	NA	0.051 (J)	—	0.015	NA	NA	NA	NA	NA	0.16 (J)	0.19 (J)	NA	NA	NA	0.0014 (J)	—	—	—
RE21-07-6485	21-602925	7–8	QBT 3	NA	—	—	—	NA	NA	NA	NA	NA	0.041 (J)	0.059 (J)	NA	NA	NA	0.00074 (J)	—	—	—
RE21-07-6486	21-602925	12–13	QBT 3	NA	—	—	—	NA	NA	NA	NA	NA	—	—	NA	NA	NA	0.00057 (J)	—	—	—
RE21-07-6487	21-602926	2–3	QBT 3	NA	—	—	—	NA	NA	NA	NA	NA	—	—	NA	NA	NA	0.00052 (J)	—	—	—
RE21-07-6488	21-602926	7–8	QBT 3	NA	—	—	—	NA	NA	NA	NA	NA	—	—	NA	NA	NA	0.00093 (J-)	0.00043 (J-)	—	—
RE21-07-6489	21-602926	12–13	QBT 3	NA	—	—	—	NA	NA	NA	NA	NA	—	—	NA	NA	NA	—	0.00044 (J)	—	—
RE21-07-6491	21-602927	7–8	QBT 3	NA	—	0.0021 (J)	—	NA	NA	NA	NA	NA	—	—	NA	NA	NA	—	0.0024 (J)	0.0024 (J)	—
RE21-07-6492	21-602927	12–13	QBT 3	NA	—	0.00079 (J)	—	NA	NA	NA	NA	NA	—	—	NA	NA	NA	—	—	0.00034 (J)	—
RE21-07-6493	21-602928	2–3	QBT 3	NA	—	—	—	NA	NA	NA	NA	NA	—	—	NA	NA	NA	0.00075 (J)	—	—	—
RE21-07-6494	21-602928	7–8	QBT 3	NA	—	—	0.01	NA	NA	NA	NA	NA	—	—	NA	NA	NA	0.00026 (J)	—	—	—
RE21-07-6495	21-602928	12–13	QBT 3	NA	—	—	—	NA	NA	NA	NA	NA	—	—	NA	NA	NA	0.0002 (J)	—	—	—
RE21-07-6498	21-602929	12–13	QBT 3	NA	—	—	0.012	NA	NA	NA	NA	NA	—	—	NA	NA	NA	—	—	—	—
RE21-07-6500	21-602930	7–8	QBT 3	NA	—	—	—	NA	NA	NA	NA	NA	—	—	NA	NA	NA	0.00033 (J)	0.00029 (J)	—	—
RE21-07-6502	21-602931	2–3	QBT 3	NA	—	—	0.01	NA	NA	NA	NA	NA	—	—	NA	NA	NA	—	—	—	—
RE21-07-6505	21-602932	2–3	QBT 3	NA	—	—	0.014	NA	NA	NA	NA	NA	0.22 (J)	0.16 (J)	NA	NA	NA	—	—	—	—

Table 7.2-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylene Chloride	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzofuran[1,2,3,7,8-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzodioxins (Total)	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Toluene	Trimethylbenzene[1,2,4-]	Trimethylbenzene[1,3,5-]	Xylene (Total)
Industrial SSL[a]				**na**	**32.3**	**14,100[i]**	**5110**	**na**	**na**	**na**	**na**	**na**	**1160**	**25,300**	**na**	**0.00243**	**na**	**61,100**	**1800[i]**	**1500[i]**	**42,400**
Recreational SSL[e]				**na**	**88.8**	**42,100[i]**	**3610**	**na**	**na**	**na**	**na**	**na**	**1160**	**8630**	**na**	**0.00297**	**na**	**47,600**	**5010**	**4830**	**27800**
Residential SSL[a]				**na**	**1.53**	**2350[i]**	**409**	**na**	**na**	**na**	**na**	**na**	**1740**	**1740**	**na**	**0.00049**	**na**	**5220**	**300[i]**	**270[i]**	**863**
RE21-07-6507	21-602932	12–13	QBT 3	NA	—	—	0.012	NA	NA	NA	NA	NA	—	—	NA	NA	NA	—	—	—	—
RE21-07-6509	21-602933	7–8	QBT 3	NA	—	—	—	NA	NA	NA	NA	NA	—	—	NA	NA	NA	—	—	—	—
RE21-07-6510	21-602933	12–13	QBT 3	NA	—	—	—	NA	NA	NA	NA	NA	—	—	NA	NA	NA	0.00018 (J)	—	—	—
MD21-10-21629	21-612318	5–6	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21632	21-612319	5–6	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21634	21-612319	24–25	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21639	21-612320	24–25	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21641	21-612321	15–16	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21649	21-612324	5–6	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21650	21-612324	15–16	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273), unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSLs are from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables).

[d] Dichlorobenzene[1,2-] used as a surrogate based on structural similarity.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected.

[g] NA = Not analyzed.

[h] na = Not available.

[i] Isopropylbenzene used as a surrogate based on structural similarity.

Table 7.2-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 21-006(e) and AOC 21-006(f)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-134	Cesium-137	Plutonium-238	Plutonium-239/240	Tritium	Uranium-234	Uranium-235/236
Qbt 2, 3, 4 BV[a]				**na**[b]	**na**	**na**	**na**	**na**	**na**	**1.98**	**0.09**
Soil BV/FV[a]				**0.013**	**na**	**1.65**	**0.023**	**0.054**	**na**	**2.59**	**0.2**
Industrial SAL[c]				**1000**	**17**	**41**	**1300**	**1200**	**2,400,000**	**3100**	**160**
Recreational SAL[c]				**1500**	**150**	**370**	**1400**	**1300**	**5,700,000**	**3900**	**1000**
Residential SAL[c]				**83**	**5**	**12**	**84**	**79**	**1700**	**290**	**42**
RE21-07-6466	21-602919	2–3	SOIL	2.93	—[d]	0.269	0.485	66.3	0.74	44.9	1.77
RE21-07-6467	21-602919	7–8	SOIL	2.63	—	0.14	0.349	52.5	2.06	87.3	3.82
RE21-07-6468	21-602919	12–13	QBT 3	1.35 (J-)	—	—	0.151	27.8	0.7	28.7	1.12
RE21-07-6469	21-602920	2–3	QBT 3	—	—	—	—	2.58	—	2.63 (J-)	—
RE21-07-6470	21-602920	7–8	QBT 3	—	—	—	—	0.815	—	—	—
RE21-07-6471	21-602920	12–13	QBT 3	—	—	—	—	1.15	—	—	—
RE21-07-6472	21-602921	2–3	QBT 3	0.419	—	—	0.076	7.32	1.67	3.96	0.188
RE21-07-6473	21-602921	7–8	QBT 3	0.1	—	—	—	1.95	1.63	2	—
RE21-07-6474	21-602921	12–13	QBT 3	0.083	—	—	—	1.74	2.39	2.11	0.105
RE21-07-6475	21-602922	2–3	QBT 3	—	—	—	—	0.447	—	12.9	0.689
RE21-07-6476	21-602922	7–8	QBT 3	—	—	—	—	0.28	—	2.84	0.16
RE21-07-6477	21-602922	12–13	QBT 3	—	—	—	—	0.254	—	—	—
RE21-07-6478	21-602923	2–3	QBT 3	0.574 (J-)	—	—	0.065	10.3	—	5.56 (J-)	—
RE21-07-6479	21-602923	7–8	QBT 3	0.301	—	—	0.067	8.74	—	5.39 (J-)	0.208 (J-)
RE21-07-6480	21-602923	12–13	QBT 3	0.324	—	—	0.081	10.6	—	5.13	0.205
RE21-07-6481	21-602924	2–3	QBT 3	0.101	—	—	—	2.18	—	2.26	0.122
RE21-07-6482	21-602924	7–8	QBT 3	—	0.068	—	—	1.13	—	—	0.132
RE21-07-6483	21-602924	12–13	QBT 3	0.042	—	—	—	1.21	—	—	0.1
RE21-07-6484	21-602925	2–3	QBT 3	6.55	—	—	—	133	—	73.6	3.59
RE21-07-6485	21-602925	7–8	QBT 3	2.05	—	—	—	64.4	—	23.9	1.04
RE21-07-6486	21-602925	12–13	QBT 3	—	—	—	—	33.2	—	17.6	0.83
RE21-07-6487	21-602926	2–3	QBT 3	—	—	—	0.063	7.05	—	6.85	0.316
RE21-07-6488	21-602926	7–8	QBT 3	—	—	—	—	19.2	—	20.3	0.67
RE21-07-6489	21-602926	12–13	QBT 3	—	—	—	—	14.1 (J)	—	8.67	0.265
RE21-07-6490	21-602927	2–3	SOIL	1.4	—	—	0.322	40.6	—	—	—
RE21-07-6491	21-602927	7–8	QBT 3	1.47	—	—	0.332	47.6	—	18.3	0.743
RE21-07-6492	21-602927	12–13	QBT 3	0.56	—	—	0.219	25.2	—	11.5	0.543
RE21-07-6493	21-602928	2–3	QBT 3	—	—	—	—	0.34	—	—	—
RE21-07-6494	21-602928	7–8	QBT 3	—	—	—	—	1.06	—	—	—

Table 7.2-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-134	Cesium-137	Plutonium-238	Plutonium-239/240	Tritium	Uranium-234	Uranium-235/236
Qbt 2, 3, 4 BV[a]				**na[b]**	**na**	**na**	**na**	**na**	**na**	**1.98**	**0.09**
Soil BV/FV[a]				**0.013**	**na**	**1.65**	**0.023**	**0.054**	**na**	**2.59**	**0.2**
Industrial SAL[c]				**1000**	**17**	**41**	**1300**	**1200**	**2,400,000**	**3100**	**160**
Recreational SAL[c]				**1500**	**150**	**370**	**1400**	**1300**	**5,700,000**	**3900**	**1000**
Residential SAL[c]				**83**	**5**	**12**	**84**	**79**	**1700**	**290**	**42**
RE21-07-6495	21-602928	12–13	QBT 3	—	—	—	—	0.122	—	—	—
RE21-07-6496	21-602929	2–3	QBT 3	—	—	—	—	0.329	—	—	—
RE21-07-6497	21-602929	7–8	QBT 3	—	—	—	—	0.446	—	—	—
RE21-07-6498	21-602929	12–13	QBT 3	—	—	—	—	0.314	—	—	—
RE21-07-6499	21-602930	2–3	QBT 3	0.072	—	—	—	2.58	—	4.24	0.167
RE21-07-6500	21-602930	7–8	QBT 3	—	—	—	—	1.6	—	2.76	0.093
RE21-07-6501	21-602930	12–13	QBT 3	0.059	—	—	—	3.27	—	5.95	0.21
RE21-07-6502	21-602931	2–3	QBT 3	—	—	—	—	0.24	—	—	—
RE21-07-6503	21-602931	7–8	QBT 3	—	—	—	—	0.542	—	—	—
RE21-07-6504	21-602931	12–13	QBT 3	—	—	—	—	0.224	—	—	—
RE21-07-6505	21-602932	2–3	QBT 3	—	—	—	—	3.15	—	2.55	0.103
RE21-07-6506	21-602932	7–8	QBT 3	—	—	—	—	1.71	—	2.15	—
RE21-07-6507	21-602932	12–13	QBT 3	—	—	—	—	1.53	—	2.1	—
RE21-07-6509	21-602933	7–8	QBT 3	0.06	—	—	—	—	—	—	—
RE21-07-6510	21-602933	12–13	QBT 3	—	—	—	—	0.039	—	—	—
MD21-10-21629	21-612318	5–6	QBT 3	NA[e]	NA	NA	—	1.87	0.250522	91.3	4.28
MD21-10-21630	21-612318	15–16	QBT 3	NA	NA	NA	—	0.0966	0.489394	26.9	1.59
MD21-10-21631	21-612318	24–25	QBT 3	NA	NA	NA	—	—	0.588562	19.6	0.902
MD21-10-21632	21-612319	5–6	QBT 3	NA	NA	NA	—	0.452	0.0144588	—	—
MD21-10-21633	21-612319	15–16	QBT 3	NA	NA	NA	0.0224	0.088	—	—	0.0943
MD21-10-21634	21-612319	24–25	QBT 3	NA	NA	NA	—	0.0317	—	—	—
MD21-10-21637	21-612320	5–6	QBT 3	—	NA	NA	—	0.0427	NA	—	—
MD21-10-21645	21-612322	24–25	QBT 3	—	NA	NA	0.35	—	NA	—	—
MD21-10-21649	21-612324	5–6	FILL	0.916	NA	NA	0.13	21.5	NA	32	1.56
MD21-10-21650	21-612324	15–16	QBT 3	0.0336	NA	NA	2.32	0.518	NA	4.26	0.193
MD21-10-21651	21-612324	24–25	QBT 3	—	NA	NA	0.0384	0.195	NA	—	—

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SALs from LANL (2015, 600929).

[d] — = Not detected.

[e] NA = Not analyzed.

Table 7.4-1
Samples Collected and Analyses Requested at AOC 21-028(c)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Dioxins/Furans	Gamma-emitting Radionuclides	Tritium	Explosive Compounds	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
RE21-07-5100	21-601066	2–3	SOIL	07-1001[a]	07-1001	—[b]	07-1001	07-1001	—	07-1001	07-1001	07-1001	—	07-1001	07-1001	07-1001	07-1001	07-1001
RE21-07-5101	21-601066	7–8	QBT 3	07-1001	07-1001	—	07-1001	07-1001	—	07-1001	07-1001	07-1001	—	07-1001	07-1001	07-1001	07-1001	07-1001
RE21-07-6384	21-601066	12–13	QBT 3	07-1001	07-1001	—	07-1001	07-1001	—	07-1001	07-1001	07-1001	—	07-1001	07-1001	07-1001	07-1001	07-1001
RE21-07-5102	21-601067	2–3	SOIL	07-1021	07-1020	—	07-1021	07-1021	—	07-1021	07-1021	07-1020	—	07-1020	07-1021	07-1019	07-1019	07-1020
RE21-07-5103	21-601067	7–8	SOIL	07-1021	07-1020	—	07-1021	07-1021	—	07-1021	07-1021	07-1020	—	07-1020	07-1021	07-1019	07-1019	07-1020
RE21-07-6388	21-601067	12–13	QBT 3	07-1021	07-1020	—	07-1021	07-1021	—	07-1021	07-1021	07-1020	—	07-1020	07-1021	07-1019	07-1019	07-1020
RE21-07-5104	21-601068	2–3	SOIL	07-1021	07-1020	—	07-1021	07-1021	—	07-1021	07-1021	07-1020	—	07-1020	07-1021	07-1019	07-1019	07-1020
RE21-07-5105	21-601068	7–8	QBT 3	07-1021	07-1020	—	07-1021	07-1021	—	07-1021	07-1021	07-1020	—	07-1020	07-1021	07-1019	07-1019	07-1020
RE21-07-6377	21-601068	12–13	QBT 3	07-1021	07-1020	—	07-1021	07-1021	—	07-1021	07-1021	07-1020	—	07-1020	07-1021	07-1019	07-1019	07-1020
RE21-07-5106	21-601069	2–3	SOIL	07-1021	07-1020	—	07-1021	07-1021	—	07-1021	07-1021	07-1020	—	07-1020	07-1021	07-1019	07-1019	07-1020
RE21-07-5107	21-601069	7–8	QBT 3	07-1021	07-1020	—	07-1021	07-1021	—	07-1021	07-1021	07-1020	—	07-1020	07-1021	07-1019	07-1019	07-1020
RE21-07-6376	21-601069	12–13	QBT 3	07-1021	07-1020	—	07-1021	07-1021	—	07-1021	07-1021	07-1020	—	07-1020	07-1021	07-1019	07-1019	07-1020
RE21-07-5108	21-601070	2–3	SOIL	07-1021	07-1020	—	07-1021	07-1021	—	07-1021	07-1021	07-1020	—	07-1020	07-1021	07-1019	07-1019	07-1020
RE21-07-5146	21-601070	2–3	SOIL	—	—	08-5	—	—	07-1171	—	—	—	07-1171	—	—	—	—	—
RE21-07-5109	21-601070	7–8	QBT 3	07-1021	07-1020	—	07-1021	07-1021	—	07-1021	07-1021	07-1020	—	07-1020	07-1021	07-1019	07-1019	07-1020
RE21-07-6394	21-601070	12–13	QBT 3	07-1021	07-1020	—	07-1021	07-1021	—	07-1021	07-1021	07-1020	—	07-1020	07-1021	07-1019	07-1019	07-1020
RE21-07-5110	21-601071	2–3	SOIL	07-1044	07-1043	—	07-1044	07-1044	—	07-1044	07-1044	07-1043	—	07-1043	07-1044	07-1042	07-1042	07-1043
RE21-07-5111	21-601071	7–8	QBT 3	07-1044	07-1043	—	07-1044	07-1044	—	07-1044	07-1044	07-1043	—	07-1043	07-1044	07-1042	07-1042	07-1043
RE21-07-6383	21-601071	12–13	QBT 3	07-1044	07-1043	—	07-1044	07-1044	—	07-1044	07-1044	07-1043	—	07-1043	07-1044	07-1042	07-1042	07-1043
RE21-07-5112	21-601072	2–3	SOIL	07-1044	07-1043	—	07-1044	07-1044	—	07-1044	07-1044	07-1043	—	07-1043	07-1044	07-1042	07-1042	07-1043
RE21-07-5113	21-601072	7–8	QBT 3	07-1044	07-1043	—	07-1044	07-1044	—	07-1044	07-1044	07-1043	—	07-1043	07-1044	07-1042	07-1042	07-1043
RE21-07-6378	21-601072	12–13	QBT 3	07-1044	07-1043	—	07-1044	07-1044	—	07-1044	07-1044	07-1043	—	07-1043	07-1044	07-1042	07-1042	07-1043
RE21-07-5114	21-601073	2–3	QBT 3	07-1044	07-1043	—	07-1044	07-1044	—	07-1044	07-1044	07-1043	—	07-1043	07-1044	07-1042	07-1042	07-1043
RE21-07-5115	21-601073	7–8	QBT 3	07-1044	07-1043	—	07-1044	07-1044	—	07-1044	07-1044	07-1043	—	07-1043	07-1044	07-1042	07-1042	07-1043
RE21-07-6393	21-601073	12–13	QBT 3	07-1044	07-1043	—	07-1044	07-1044	—	07-1044	07-1044	07-1043	—	07-1043	07-1044	07-1042	07-1042	07-1043
RE21-07-5116	21-601074	2–3	QBT 3	07-1067	07-1066	—	07-1067	07-1067	—	07-1067	07-1067	07-1066	—	07-1066	07-1067	07-1065	07-1065	07-1066
RE21-07-5117	21-601074	7–8	QBT 3	07-1067	07-1066	—	07-1067	07-1067	—	07-1067	07-1067	07-1066	—	07-1066	07-1067	07-1065	07-1065	07-1066
RE21-07-6387	21-601074	12–13	QBT 3	07-1067	07-1066	—	07-1067	07-1067	—	07-1067	07-1067	07-1066	—	07-1066	07-1067	07-1065	07-1065	07-1066
RE21-07-5118	21-601075	2–3	QBT 3	07-1067	07-1066	—	07-1067	07-1067	—	07-1067	07-1067	07-1066	—	07-1066	07-1067	07-1065	07-1065	07-1066

Table 7.4-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Dioxins/Furans	Gamma-emitting Radionuclides	Tritium	Explosive Compounds	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
RE21-07-5119	21-601075	7–8	QBT 3	07-1067	07-1066	—	07-1067	07-1067	—	07-1067	07-1067	07-1066	—	07-1066	07-1067	07-1065	07-1065	07-1066
RE21-07-6390	21-601075	12–13	QBT 3	07-1067	07-1066	—	07-1067	07-1067	—	07-1067	07-1067	07-1066	—	07-1066	07-1067	07-1065	07-1065	07-1066
RE21-07-5120	21-601076	2–3	SOIL	07-1067	07-1066	—	07-1067	07-1067	—	07-1067	07-1067	07-1066	—	07-1066	07-1067	07-1065	07-1065	07-1066
RE21-07-5121	21-601076	7–8	QBT 3	07-1067	07-1066	—	07-1067	07-1067	—	07-1067	07-1067	07-1066	—	07-1066	07-1067	07-1065	07-1065	07-1066
RE21-07-6382	21-601076	12–13	QBT 3	07-1067	07-1066	—	07-1067	07-1067	—	07-1067	07-1067	07-1066	—	07-1066	07-1067	07-1065	07-1065	07-1066
RE21-07-5122	21-601077	2–3	QBT 3	07-1067	07-1066	—	07-1067	07-1067	—	07-1067	07-1067	07-1066	—	07-1066	07-1067	07-1065	07-1065	07-1066
RE21-07-5123	21-601077	7–8	QBT 3	07-1067	07-1066	—	07-1067	07-1067	—	07-1067	07-1067	07-1066	—	07-1066	07-1067	07-1065	07-1065	07-1066
RE21-07-6395	21-601077	12–13	QBT 3	07-1067	07-1066	—	07-1067	07-1067	—	07-1067	07-1067	07-1066	—	07-1066	07-1067	07-1065	07-1065	07-1066
RE21-07-5124	21-601078	2–3	SOIL	07-1067	07-1066	—	07-1067	07-1067	—	07-1067	07-1067	07-1066	—	07-1066	07-1067	07-1065	07-1065	07-1066
RE21-07-5125	21-601078	7–8	QBT 3	07-1067	07-1066	—	07-1067	07-1067	—	07-1067	07-1067	07-1066	—	07-1066	07-1067	07-1065	07-1065	07-1066
RE21-07-6389	21-601078	12–13	QBT 3	07-1067	07-1066	—	07-1067	07-1067	—	07-1067	07-1067	07-1066	—	07-1066	07-1067	07-1065	07-1065	07-1066
RE21-07-5126	21-601079	2–3	QBT 3	07-1095	07-1094	—	07-1095	07-1095	—	07-1095	07-1095	07-1094	—	07-1094	07-1095	07-1093	07-1093	07-1094
RE21-07-5127	21-601079	7–8	QBT 3	07-1095	07-1094	—	07-1095	07-1095	—	07-1095	07-1095	07-1094	—	07-1094	07-1095	07-1093	07-1093	07-1094
RE21-07-6381	21-601079	12–13	QBT 3	07-1095	07-1094	—	07-1095	07-1095	—	07-1095	07-1095	07-1094	—	07-1094	07-1095	07-1093	07-1093	07-1094
RE21-07-5128	21-601080	2–3	QBT 3	07-1095	07-1094	—	07-1095	07-1095	—	07-1095	07-1095	07-1094	—	07-1094	07-1095	07-1093	07-1093	07-1094
RE21-07-5129	21-601080	7–8	QBT 3	07-1095	07-1094	—	07-1095	07-1095	—	07-1095	07-1095	07-1094	—	07-1094	07-1095	07-1093	07-1093	07-1094
RE21-07-6391	21-601080	12–13	QBT 3	07-1095	07-1094	—	07-1095	07-1095	—	07-1095	07-1095	07-1094	—	07-1094	07-1095	07-1093	07-1093	07-1094
RE21-07-5130	21-601081	2–3	SOIL	07-1095	07-1094	—	07-1095	07-1095	—	07-1095	07-1095	07-1094	—	07-1094	07-1095	07-1093	07-1093	07-1094
RE21-07-5131	21-601081	7–8	QBT 3	07-1095	07-1094	—	07-1095	07-1095	—	07-1095	07-1095	07-1094	—	07-1094	07-1095	07-1093	07-1093	07-1094
RE21-07-6392	21-601081	12–13	QBT 3	07-1095	07-1094	—	07-1095	07-1095	—	07-1095	07-1095	07-1094	—	07-1094	07-1095	07-1093	07-1093	07-1094
RE21-07-5132	21-601082	2–3	SOIL	07-1095	07-1094	—	07-1095	07-1095	—	07-1095	07-1095	07-1094	—	07-1094	07-1095	07-1093	07-1093	07-1094
RE21-07-5133	21-601082	7–8	QBT 3	07-1095	07-1094	—	07-1095	07-1095	—	07-1095	07-1095	07-1094	—	07-1094	07-1095	07-1093	07-1093	07-1094
RE21-07-6385	21-601082	12–13	QBT 3	07-1095	07-1094	—	07-1095	07-1095	—	07-1095	07-1095	07-1094	—	07-1094	07-1095	07-1093	07-1093	07-1094
MD21-10-21680	21-612329	5–6	QBT 3	—	—	—	—	—	—	11-201	—	11-201	11-201	—	—	—	—	—
MD21-10-21681	21-612329	15–16	QBT 3	—	—	—	—	—	—	11-201	—	11-201	11-201	—	—	—	—	—
MD21-10-21682	21-612329	24–25	QBT 3	—	—	—	—	—	—	11-201	—	11-201	11-201	—	—	—	—	—
MD21-10-21685	21-612330	5–6	QBT 3	11-187	—	—	—	—	—	11-187	—	11-187	11-187	—	—	—	—	—
MD21-10-21686	21-612330	15–16	QBT 3	11-187	—	—	—	—	—	11-187	—	11-187	11-187	—	—	—	—	—
MD21-10-21687	21-612330	24–25	QBT 3	11-187	—	—	—	—	—	11-187	—	11-187	11-187	—	—	—	—	—
MD21-10-21688	21-612331	5–6	QBT 3	11-226	—	—	—	—	—	11-226	—	11-225	11-224	—	—	—	—	—
MD21-10-21689	21-612331	15–16	QBT 3	11-226	—	—	—	—	—	11-226	—	11-225	11-224	—	—	—	—	—
MD21-10-21690	21-612331	24–25	QBT 3	11-226	—	—	—	—	—	11-226	—	11-225	11-224	—	—	—	—	—
MD21-10-21691	21-612332	5–6	QBT 3	11-226	—	—	—	—	—	11-226	—	11-225	11-224	—	—	—	—	—
MD21-10-21692	21-612332	15–16	QBT 3	11-226	—	—	—	—	—	11-226	—	11-225	11-224	—	—	—	—	—

Table 7.4-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Dioxins/Furans	Gamma-emitting Radionuclides	Tritium	Explosive Compounds	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
MD21-10-21693	21-612332	24–25	QBT 3	11-226	—	—	—	—	—	11-226	—	11-225	11-224	—	—	—	—	—
MD21-10-21694	21-612333	5–6	QBT 3	11-226	—	—	—	—	—	11-226	—	11-225	11-224	—	—	—	—	—
MD21-10-21695	21-612333	15–16	QBT 3	11-226	—	—	—	—	—	11-226	—	11-225	11-224	—	—	—	—	—
MD21-10-21696	21-612333	24–25	QBT 3	11-233	—	—	—	—	—	11-233	—	11-233	11-233	—	—	—	—	—
MD21-10-21697	21-612334	5–6	QBT 3	11-233	—	—	—	—	—	11-233	—	11-233	11-233	—	—	—	—	—
MD21-10-21698	21-612334	15–16	QBT 3	11-233	—	—	—	—	—	11-233	—	11-233	11-233	—	—	—	—	—
MD21-10-21699	21-612334	24–25	QBT 3	11-233	—	—	—	—	—	11-233	—	11-233	11-233	—	—	—	—	—
MD21-10-21700	21-612335	5–6	QBT 3	11-233	—	—	—	—	—	11-233	—	11-233	11-233	—	—	—	—	—
MD21-10-21701	21-612335	15–16	QBT 3	11-233	—	—	—	—	—	11-233	—	11-233	11-233	—	—	—	—	—
MD21-10-21702	21-612335	24–25	QBT 3	11-233	—	—	—	—	—	11-233	—	11-233	11-233	—	—	—	—	—
MD21-10-21703	21-612336	5–6	SOIL	11-248	—	—	—	—	—	11-248	—	11-248	11-248	—	—	—	—	—
MD21-10-21704	21-612336	15–16	QBT 3	11-248	—	—	—	—	—	11-248	—	11-248	11-248	—	—	—	—	—
MD21-10-21705	21-612336	24–25	QBT 3	11-248	—	—	—	—	—	11-248	—	11-248	11-248	—	—	—	—	—
MD21-10-21706	21-612337	5–6	QBT 3	11-296	—	—	—	—	—	11-296	—	11-295	11-294	—	—	—	—	—
MD21-10-21707	21-612337	15–16	QBT 3	11-296	—	—	—	—	—	11-296	—	11-295	11-294	—	—	—	—	—
MD21-10-21708	21-612337	24–25	QBT 3	11-296	—	—	—	—	—	11-296	—	11-295	11-294	—	—	—	—	—
MD21-10-21709	21-612338	5–6	QBT 3	11-259	—	—	—	—	—	11-259	—	11-259	11-259	—	—	—	—	—
MD21-10-21710	21-612338	15–16	QBT 3	11-259	—	—	—	—	—	11-259	—	11-259	11-259	—	—	—	—	—
MD21-10-21711	21-612338	24–25	QBT 3	11-259	—	—	—	—	—	11-259	—	11-259	11-259	—	—	—	—	—
MD21-10-21712	21-612339	5–6	QBT 3	11-273	—	—	—	—	—	11-273	—	11-272	11-271	—	—	—	—	—
MD21-10-21713	21-612339	15–16	QBT 3	11-273	—	—	—	—	—	11-273	—	11-272	11-271	—	—	—	—	—
MD21-10-21714	21-612339	24–25	QBT 3	11-273	—	—	—	—	—	11-273	—	11-272	11-271	—	—	—	—	—
MD21-10-21715	21-612340	5–6	QBT 3	11-273	—	—	—	—	—	11-273	—	11-272	11-271	—	—	—	—	—
MD21-10-21716	21-612340	15–16	QBT 3	11-273	—	—	—	—	—	11-273	—	11-272	11-271	—	—	—	—	—
MD21-10-21717	21-612340	24–25	QBT 3	11-273	—	—	—	—	—	11-273	—	11-272	11-271	—	—	—	—	—
MD21-10-21718	21-612341	5–6	QBT 3	11-273	—	—	—	—	—	11-273	—	11-272	11-271	—	—	—	—	—
MD21-10-21719	21-612341	15–16	QBT 3	11-273	—	—	—	—	—	11-273	—	11-272	11-271	—	—	—	—	—
MD21-10-21720	21-612341	24–25	QBT 3	11-273	—	—	—	—	—	11-273	—	11-272	11-271	—	—	—	—	—
MD21-10-21721	21-612342	5–6	QBT 3	11-296	—	—	—	—	—	11-296	—	11-295	11-294	—	—	—	—	—
MD21-10-21722	21-612342	15–16	QBT 3	11-296	—	—	—	—	—	11-296	—	11-295	11-294	—	—	—	—	—
MD21-10-21723	21-612342	24–25	QBT 3	11-296	—	—	—	—	—	11-296	—	11-295	11-294	—	—	—	—	—

[a] Analytical request number.

[b] — = Analysis not requested.

Table 7.4-2
Inorganic Chemicals Detected or Detected above BVs at AOC 21-028(c)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Vanadium	Zinc
Qbt 2, 3, 4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**14500**	**11.2**	**1690**	**482**	**0.1**	**6.58**	**na[b]**	**na**	**0.3**	**1**	**17**	**63.5**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**na**	**505[d]**	**388**	**51,900**	**62.8**	**908,000**	**800**	**na**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**6530**	**1860**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**na**	**281[d]**	**186**	**24,800**	**224**	**434,000**	**1110**	**na**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,000**	**70.5**	**na**	**96.6[d]**	**23.4**	**3130**	**11.1**	**54,800**	**400**	**na**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**394**	**23,500**
RE21-07-5100	21-601066	2–3	SOIL	—[f]	—	—	—	—	40700	—	—	—	0.59 (U)	—	—	—	—	—	—	0.2 (J)	—	—	—	—	—
RE21-07-5101	21-601066	7–8	QBT 3	—	—	3.1	124 (J)	—	18200	7.2	—	—	0.58 (U)	—	—	1730	—	—	—	0.44	—	0.58 (U)	—	—	—
RE21-07-6384	21-601066	12–13	QBT 3	—	—	—	56.8 (J)	—	12100	—	—	—	0.56 (U)	—	—	—	—	—	—	0.35	—	0.56 (U)	—	—	—
RE21-07-5102	21-601067	2–3	SOIL	—	1.4 (J-)	—	—	—	31000	—	—	—	0.57 (U)	—	22.4	—	—	0.199	—	—	—	—	—	41.7 (J-)	59.7 (U)
RE21-07-5103	21-601067	7–8	SOIL	—	—	—	—	—	—	—	—	—	0.59 (U)	—	—	—	—	—	—	0.91	—	—	—	—	—
RE21-07-6388	21-601067	12–13	QBT 3	8440	—	—	79.3	—	4270	—	—	—	0.57 (U)	—	—	—	—	—	—	0.73	—	0.57 (UJ)	—	—	—
RE21-07-5104	21-601068	2–3	SOIL	—	1.8 (J-)	—	—	—	20800	—	—	—	0.53 (U)	—	—	—	—	0.178	—	—	0.0089	—	—	—	91.3 (U)
RE21-07-5105	21-601068	7–8	QBT 3	—	0.84 (J-)	—	88.7	—	20800	8.4 (J-)	—	62.4 (J-)	0.55 (U)	—	—	—	—	—	—	0.66	0.005 (J)	0.55 (UJ)	—	—	—
RE21-07-6377	21-601068	12–13	QBT 3	—	0.99 (J-)	—	84.3	—	12300	—	—	52.6 (J-)	0.54 (U)	—	14.6 (U)	—	—	—	—	0.49	0.0046 (J)	0.54 (UJ)	—	—	69.1 (U)
RE21-07-5106	21-601069	2–3	SOIL	—	—	—	—	—	22400	—	—	—	0.57 (U)	—	—	—	—	0.218	—	1.7	0.0096	—	—	—	—
RE21-07-5107	21-601069	7–8	QBT 3	—	—	—	73.1	—	15000	12.7 (J-)	—	11.5 (U)	0.55 (U)	—	—	—	—	—	7.4 (U)	1.1	0.0053 (J)	0.55 (UJ)	—	—	—
RE21-07-6376	21-601069	12–13	QBT 3	—	—	—	—	—	3750	—	—	—	0.54 (U)	—	—	—	—	—	—	0.54	0.0029 (J)	—	—	—	—
RE21-07-5108	21-601070	2–3	SOIL	—	0.91 (J-)	—	—	—	37800	—	—	—	0.54 (U)	—	—	—	—	0.18	—	0.63	0.0027 (J)	—	—	41.4 (J-)	60.9 (U)
RE21-07-5109	21-601070	7–8	QBT 3	—	0.73 (J-)	—	105	—	4970	8.1 (J-)	—	5.9 (U)	0.6 (U)	—	16.7 (U)	—	—	—	8.8 (U)	0.18 (J)	—	0.6 (UJ)	—	—	—
RE21-07-6394	21-601070	12–13	QBT 3	7910	1.3 (J-)	—	69.2	—	3600	—	—	—	0.57 (U)	—	—	—	—	—	—	—	—	0.57 (UJ)	—	—	—
RE21-07-5110	21-601071	2–3	SOIL	—	1.2 (J-)	—	—	—	24700 (J+)	—	—	—	0.54 (U)	—	—	—	—	0.401	—	0.14 (J)	—	—	—	—	64.8 (U)
RE21-07-5111	21-601071	7–8	QBT 3	—	—	—	—	—	9890 (J+)	—	—	31.1 (U)	0.55 (U)	—	15.1 (U)	—	—	0.117	—	0.25	—	0.55 (UJ)	—	—	—
RE21-07-6383	21-601071	12–13	QBT 3	—	—	—	—	—	5700 (J+)	—	—	—	—	—	—	—	—	—	—	—	—	0.53 (UJ)	—	—	—
RE21-07-5112	21-601072	2–3	SOIL	—	2.3 (J-)	—	—	—	28900 (J+)	—	—	15.8 (U)	0.54 (U)	—	27.7 (U)	—	—	0.432	—	0.11 (J)	—	—	—	60.6	79.3 (U)
RE21-07-5113	21-601072	7–8	QBT 3	—	0.52 (J-)	—	—	—	7800 (J+)	10.9	—	—	0.56 (U)	—	—	—	—	0.124	—	0.35	—	0.56 (UJ)	—	17.3	—
RE21-07-6378	21-601072	12–13	QBT 3	—	0.97 (J-)	—	—	—	24300 (J+)	12.4	—	5.6 (U)	0.6 (U)	—	12.8 (U)	—	—	0.211	7.2 (U)	0.36	—	0.55 (UJ)	—	40.8	—
RE21-07-5114	21-601073	2–3	QBT 3	10400 (J)	—	—	—	—	8320 (J+)	7.9 (J)	3.9 (J)	—	0.56 (U)	—	—	1850 (J)	—	—	7.2 (U)	—	—	0.56 (UJ)	—	—	—
RE21-07-5115	21-601073	7–8	QBT 3	—	—	—	—	—	4000 (J+)	8.1	—	—	0.54 (U)	—	—	—	—	—	—	—	—	—	—	—	—
RE21-07-6393	21-601073	12–13	QBT 3	—	—	—	—	—	3250 (J+)	7.2	—	—	—	—	—	—	—	—	—	—	—	0.54 (UJ)	—	—	—
RE21-07-5116	21-601074	2–3	QBT 3	7440	0.52 (J-)	—	136	—	8830	—	3.5	5.5 (U)	—	—	15.3 (U)	—	—	0.214	7 (U)	0.55	—	0.55 (UJ)	—	—	—
RE21-07-5117	21-601074	7–8	QBT 3	—	0.83 (J-)	—	52.8	—	7060	—	—	—	—	—	—	—	—	—	—	0.21	—	0.53 (UJ)	—	—	—
RE21-07-6387	21-601074	12–13	QBT 3	—	—	—	—	—	2250	—	—	—	—	—	—	—	—	—	—	0.33	—	0.54 (UJ)	—	—	—
RE21-07-5118	21-601075	2–3	QBT 3	—	1.1 (J-)	—	111	—	25500	9.3	—	5.3 (U)	—	—	15.8 (U)	1880	—	0.258	7.7 (U)	0.18 (J)	—	0.57 (UJ)	—	25.1	—
RE21-07-5119	21-601075	7–8	QBT 3	—	2 (J-)	—	64.2	—	7630	9.5	—	—	—	—	11.3 (U)	—	—	—	—	—	—	0.57 (UJ)	—	—	—

Table 7.4-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Vanadium	Zinc
Qbt 2, 3, 4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**14500**	**11.2**	**1690**	**482**	**0.1**	**6.58**	**na[b]**	**na**	**0.3**	**1**	**17**	**63.5**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**na**	**505[d]**	**388**	**51,900**	**62.8**	**908,000**	**800**	**na**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**6530**	**1860**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**na**	**281[d]**	**186**	**24,800**	**224**	**434,000**	**1110**	**na**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,000**	**70.5**	**na**	**96.6[d]**	**23.4**	**3130**	**11.1**	**54,800**	**400**	**na**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**394**	**23,500**
RE21-07-6390	21-601075	12–13	QBT 3	—	0.53 (J-)	—	—	—	5370	7.7	—	—	—	—	—	—	—	—	—	0.17 (J)	—	0.54 (UJ)	—	—	—
RE21-07-5120	21-601076	2–3	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0025 (J)	—	—	—	—
RE21-07-5121	21-601076	7–8	QBT 3	—	—	—	—	—	—	9.2	—	—	—	—	—	—	—	—	—	—	—	0.55 (UJ)	—	—	—
RE21-07-6382	21-601076	12–13	QBT 3	—	—	—	—	—	2290	—	—	—	—	—	—	—	—	—	—	—	—	0.54 (UJ)	—	—	—
RE21-07-5122	21-601077	2–3	QBT 3	—	1.4 (J-)	—	88.4	—	24200	15.2	3.8	6 (U)	—	—	21 (U)	—	—	0.386	7.3 (U)	0.15 (J)	—	0.55 (UJ)	—	52.4	137 (U)
RE21-07-5123	21-601077	7–8	QBT 3	—	0.66 (J-)	—	—	—	10300	14	—	—	—	—	11.3 (U)	—	—	0.202	8.8 (U)	0.41	—	0.56 (UJ)	—	21.5	—
RE21-07-6395	21-601077	12–13	QBT 3	—	0.7 (J-)	—	—	—	7500	—	—	—	—	—	—	—	—	0.12	—	0.27	—	0.55 (UJ)	—	—	—
RE21-07-5124	21-601078	2–3	SOIL	—	—	—	—	—	31200	—	—	—	—	—	28.4	—	—	0.576	—	—	—	—	—	—	118 (U)
RE21-07-5125	21-601078	7–8	QBT 3	—	—	—	47	—	6310	9.7	—	—	—	—	—	—	—	0.128	—	—	—	0.56 (UJ)	—	—	—
RE21-07-6389	21-601078	12–13	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.36	—	0.56 (UJ)	—	—	—
RE21-07-5126	21-601079	2–3	QBT 3	—	—	—	110 (J-)	—	46200	11.7 (J-)	—	10 (U)	0.56 (U)	—	—	1710	—	0.163 (J)	8.8 (U)	0.59	0.0026 (J)	0.56 (U)	—	25.6 (J+)	—
RE21-07-5127	21-601079	7–8	QBT 3	—	0.77 (J-)	—	51.6 (J-)	—	13600	11.6 (J-)	—	—	0.56 (U)	—	—	—	—	1.31 (J)	—	0.65	0.0031 (J)	0.56 (U)	—	—	—
RE21-07-6381	21-601079	12–13	QBT 3	—	1 (J-)	—	—	—	8350	11.7 (J-)	—	—	0.56 (U)	—	—	—	—	0.684 (J)	—	1	—	0.56 (U)	1.3	—	—
RE21-07-5128	21-601080	2–3	QBT 3	—	1.2 (J-)	—	142 (J-)	—	21500	9.1 (J-)	—	7 (U)	0.57 (U)	—	20.6 (U)	1870	—	0.267 (J)	7.7 (U)	0.36	—	0.57 (U)	—	21.4 (J+)	66.9 (U)
RE21-07-5129	21-601080	7–8	QBT 3	—	0.63 (J-)	—	62.3 (J-)	—	11000	10.1 (J-)	—	—	0.56 (U)	—	—	—	—	0.418 (J)	—	1	—	0.56 (U)	—	—	—
RE21-07-6391	21-601080	12–13	QBT 3	—	—	—	—	—	3510	—	—	—	0.55 (U)	—	—	—	—	0.13 (J)	—	—	—	—	—	—	—
RE21-07-5130	21-601081	2–3	SOIL	—	1.1 (J-)	—	—	—	13500	—	—	—	—	—	—	—	—	—	—	0.39	—	—	—	—	52.1 (U)
RE21-07-5131	21-601081	7–8	QBT 3	—	1.5 (J-)	—	46.3 (J-)	—	9530	7.8 (J-)	—	29.5 (U)	—	24700	25 (U)	—	—	0.361 (J)	7.3 (U)	0.49	—	0.56 (U)	—	—	—
RE21-07-6392	21-601081	12–13	QBT 3	—	0.62 (J-)	—	—	—	7240	12.2 (J-)	—	—	0.56 (U)	—	—	—	—	—	—	0.85	—	0.56 (U)	—	—	—
RE21-07-5132	21-601082	2–3	SOIL	—	—	—	—	—	36100	—	—	—	0.55 (U)	—	—	—	—	0.339 (J)	—	0.54	0.007	—	—	86.3 (J+)	50.9 (U)
RE21-07-5133	21-601082	7–8	QBT 3	—	0.75 (J-)	—	97.9 (J-)	—	13000	17 (J-)	—	6.7 (U)	—	—	11.7 (U)	—	—	—	—	0.7	0.0041 (J)	0.56 (U)	—	—	—
RE21-07-6385	21-601082	12–13	QBT 3	—	—	—	—	—	5640	—	—	—	0.58 (U)	—	—	—	—	0.236 (J)	—	0.59	0.0034 (J)	0.58 (U)	—	—	—
MD21-10-21680	21-612329	5–6	QBT 3	—	1.09 (U)	—	88.8	—	26800	—	—	—	NA[g]	—	—	—	—	—	—	NA	NA	1.09 (U)	—	—	—
MD21-10-21681	21-612329	15–16	QBT 3	—	1.09 (U)	5.04	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	1.07 (U)	—	—	—
MD21-10-21682	21-612329	24–25	QBT 3	—	1.01 (U)	—	—	—	—	—	—	—	NA	—	28.2 (J)	—	—	—	—	NA	NA	1 (U)	—	—	—
MD21-10-21685	21-612330	5–6	QBT 3	—	1.08 (U)	—	—	—	11100	—	—	—	NA	—	—	—	—	—	—	NA	NA	1.08 (U)	—	—	—
MD21-10-21686	21-612330	15–16	QBT 3	—	1.06 (U)	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	1.04 (U)	—	—	—
MD21-10-21687	21-612330	24–25	QBT 3	—	1.05 (U)	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	1.02 (U)	—	—	—
MD21-10-21688	21-612331	5–6	QBT 3	—	1.06 (U)	—	—	—	—	—	—	—	NA	—	—	—	—	0.186	—	NA	NA	1.09 (UJ)	—	—	—
MD21-10-21689	21-612331	15–16	QBT 3	—	1.06 (U)	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	1.03 (UJ)	—	—	—
MD21-10-21690	21-612331	24–25	QBT 3	—	1.06 (U)	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	1.03 (UJ)	—	—	—

Table 7.4-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Vanadium	Zinc
Qbt 2, 3, 4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**14500**	**11.2**	**1690**	**482**	**0.1**	**6.58**	**na[b]**	**na**	**0.3**	**1**	**17**	**63.5**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**na**	**505[d]**	**388**	**51,900**	**62.8**	**908,000**	**800**	**na**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**6530**	**1860**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**na**	**281[d]**	**186**	**24,800**	**224**	**434,000**	**1110**	**na**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,000**	**70.5**	**na**	**96.6[d]**	**23.4**	**3130**	**11.1**	**54,800**	**400**	**na**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**394**	**23,500**
MD21-10-21691	21-612332	5–6	QBT 3	—	1.07 (U)	—	—	—	4050	—	—	—	NA	—	—	—	—	—	—	NA	NA	1.07 (UJ)	—	—	—
MD21-10-21692	21-612332	15–16	QBT 3	—	1.01 (U)	—	89.1	—	—	7.42	—	7.19	NA	—	12.9	2340	625	—	—	NA	NA	0.986 (UJ)	—	—	95
MD21-10-21693	21-612332	24–25	QBT 3	—	1.01 (U)	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	1.04 (UJ)	—	—	—
MD21-10-21694	21-612333	5–6	QBT 3	—	1.06 (U)	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	1.08 (UJ)	—	—	—
MD21-10-21695	21-612333	15–16	QBT 3	—	1.09 (U)	—	47.1	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	1.08 (UJ)	—	—	—
MD21-10-21696	21-612333	24–25	QBT 3	—	1.08 (U)	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	1.08 (UJ)	—	—	—
MD21-10-21697	21-612334	5–6	QBT 3	—	1.08 (U)	—	—	—	5190	15.8	—	—	NA	—	—	—	—	0.235	—	NA	NA	1.09 (UJ)	—	—	—
MD21-10-21698	21-612334	15–16	QBT 3	—	1.03 (U)	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	1.06 (UJ)	—	—	—
MD21-10-21699	21-612334	24–25	QBT 3	—	1.06 (U)	6.06 (J-)	—	—	—	—	—	—	NA	—	20.6	—	—	—	—	NA	NA	1.07 (UJ)	—	—	—
MD21-10-21700	21-612335	5–6	QBT 3	—	—	—	—	—	4650	—	—	—	NA	—	—	—	—	0.23	—	NA	NA	1.09 (UJ)	—	—	—
MD21-10-21701	21-612335	15–16	QBT 3	—	1.07 (U)	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	1.07 (UJ)	—	—	—
MD21-10-21702	21-612335	24–25	QBT 3	—	1 (U)	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	0.996 (UJ)	—	—	—
MD21-10-21703	21-612336	5–6	SOIL	—	—	—	—	0.599 (U)	22400	—	—	—	NA	—	—	—	—	—	—	NA	NA	—	—	—	—
MD21-10-21704	21-612336	15–16	QBT 3	—	1.06 (U)	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	1.05 (UJ)	—	—	—
MD21-10-21705	21-612336	24–25	QBT 3	—	1.05 (U)	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	1 (UJ)	—	—	—
MD21-10-21706	21-612337	5–6	QBT 3	—	1.02 (U)	—	49.1	—	2510 (J+)	—	—	5.89	NA	—	165 (J+)	—	—	—	8.22 (J+)	NA	NA	1.05 (U)	—	—	—
MD21-10-21707	21-612337	15–16	QBT 3	—	1.04 (U)	—	—	—	—	7.62	—	6.82	NA	—	46.8 (J+)	—	—	—	—	NA	NA	1.02 (U)	—	—	—
MD21-10-21708	21-612337	24–25	QBT 3	—	0.995 (U)	—	—	—	—	—	—	—	NA	—	35.4 (J+)	—	—	—	—	NA	NA	1.05 (U)	—	—	—
MD21-10-21709	21-612338	5–6	QBT 3	—	1.08 (U)	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	1.06 (U)	—	—	—
MD21-10-21710	21-612338	15–16	QBT 3	—	1.07 (U)	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	1.07 (U)	—	—	—
MD21-10-21711	21-612338	24–25	QBT 3	—	1.02 (U)	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	1.06 (U)	—	—	—
MD21-10-21712	21-612339	5–6	QBT 3	—	0.877 (J)	—	—	—	2660 (J+)	—	—	—	NA	—	—	—	—	—	—	NA	NA	0.973 (U)	—	—	—
MD21-10-21713	21-612339	15–16	QBT 3	—	1.06 (U)	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	1.06 (U)	—	—	—
MD21-10-21714	21-612339	24–25	QBT 3	—	0.989	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	1.03 (U)	—	—	—
MD21-10-21715	21-612340	5–6	QBT 3	—	0.597 (J)	—	—	—	3850 (J+)	—	—	—	NA	—	—	—	—	—	—	NA	NA	1.04 (U)	—	—	—
MD21-10-21716	21-612340	15–16	QBT 3	—	0.999 (U)	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	1.05 (U)	—	—	—
MD21-10-21717	21-612340	24–25	QBT 3	—	—	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	1.01 (U)	—	—	—
MD21-10-21718	21-612341	5–6	QBT 3	—	5.28	—	77.8	—	22400 (J+)	9.87	—	13.3	NA	—	13.1	—	—	0.103	—	NA	NA	1.09 (U)	—	26.5	163
MD21-10-21719	21-612341	15–16	QBT 3	—	1.07 (U)	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	1.07 (U)	—	—	—
MD21-10-21720	21-612341	24–25	QBT 3	—	1.04 (U)	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	1.02 (U)	—	—	—
MD21-10-21721	21-612342	5–6	QBT 3	—	0.966 (U)	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	0.914 (U)	—	—	—

Table 7.4-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Vanadium	Zinc
Qbt 2, 3, 4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**14500**	**11.2**	**1690**	**482**	**0.1**	**6.58**	**na**[b]	**na**	**0.3**	**1**	**17**	**63.5**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**0.5**	**21500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**na**	**na**	**1.52**	**1**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**1110**	**na**	**505**[d]	**388**	**51,900**	**62.8**	**908,000**	**800**	**na**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**6530**	**1860**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**457**	**na**	**281**[d]	**186**	**24,800**	**224**	**434,000**	**1110**	**na**	**14,800**	**186**	**12,400**	**991,000**	**434**	**3100**	**3100**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,000**	**70.5**	**na**	**96.6**[d]	**23.4**	**3130**	**11.1**	**54,800**	**400**	**na**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**394**	**23,500**
MD21-10-21722	21-612342	15–16	QBT 3	—	1.03 (U)	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	1.05 (U)	—	—	—
MD21-10-21723	21-612342	24–25	QBT 3	—	0.954 (U)	—	—	—	—	—	—	—	NA	—	—	—	—	—	—	NA	NA	1.02 (U)	—	—	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 7.4-3
Organic Chemicals Detected at AOC 21-028(c)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Anthracene	Aroclor-1242	Aroclor-1248	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	Bromobenzene	Butylbenzylphthalate
Industrial SSL[a]				**959,000**	**253,000**	**10.9**	**10.7**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300**[b]	**323**	**3,300,000**[c]	**1830**	**1800**	**12,000**[c]
Recreational SSL[d]				**505,000**	**863,000**	**10.3**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630**[b]	**888**	**1,310,000**	**1770**	**4620**	**13,100**
Residential SSL[a]				**66,300**	**17,400**	**2.43**	**2.43**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740**[b]	**15.3**	**250,000**[c]	**380**	**290**	**2900**[c]
RE21-07-5100	21-601066	2–3	SOIL	—[e]	—	NA[f]	NA	NA	NA	—	—	—	—	—	—	—	—	—
RE21-07-5101	21-601066	7–8	QBT 3	0.0045 (J-)	—	NA	NA	NA	NA	—	—	—	—	—	—	—	—	—
RE21-07-6384	21-601066	12–13	QBT 3	—	—	NA	NA	NA	NA	0.039 (J)	—	—	—	—	—	—	—	—
RE21-07-5102	21-601067	2–3	SOIL	—	—	NA	NA	NA	NA	0.062 (J)	0.058 (J)	0.065 (J)	0.05 (J)	0.059 (J)	—	0.22 (J)	—	—
RE21-07-5103	21-601067	7–8	SOIL	—	—	NA	NA	NA	NA	—	—	—	—	—	—	—	—	—
RE21-07-5104	21-601068	2–3	SOIL	—	—	NA	NA	NA	NA	0.11 (J)	0.094 (J)	0.099 (J)	0.058 (J)	0.086 (J)	—	0.11 (J)	—	—
RE21-07-5105	21-601068	7–8	QBT 3	—	—	NA	NA	NA	NA	0.046 (J)	0.047 (J)	0.046 (J)	—	0.042 (J)	—	0.056 (J)	—	—
RE21-07-6377	21-601068	12–13	QBT 3	—	—	NA	NA	NA	NA	0.11 (J)	0.1 (J)	0.1 (J)	0.063 (J)	0.097 (J)	—	—	—	—

Table 7.4-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Anthracene	Aroclor-1242	Aroclor-1248	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	Bromobenzene	Butylbenzylphthalate
Industrial SSL[a]				**959,000**	**253,000**	**10.9**	**10.7**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**3,300,000[c]**	**1830**	**1800**	**12,000[c]**
Recreational SSL[d]				**505,000**	**863,000**	**10.3**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**888**	**1,310,000**	**1770**	**4620**	**13,100**
Residential SSL[a]				**66,300**	**17,400**	**2.43**	**2.43**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**250,000[c]**	**380**	**290**	**2900[c]**
RE21-07-5106	21-601069	2–3	SOIL	—	—	NA	NA	NA	NA	0.034 (J)	0.036 (J)	0.035 (J)	—	0.036 (J)	—	—	—	—
RE21-07-6376	21-601069	12–13	QBT 3	—	—	NA	NA	NA	NA	—	—	—	—	—	—	—	—	—
RE21-07-5108	21-601070	2–3	SOIL	—	—	NA	NA	NA	NA	0.092 (J)	0.093 (J)	0.089 (J)	0.074 (J)	0.083 (J)	—	—	—	—
RE21-07-5146	21-601070	2–3	SOIL	NA	NA	—	—	0.0808 (J)	0.0219	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE21-07-6394	21-601070	12–13	QBT 3	—	—	NA	NA	NA	NA	0.063 (J)	0.07 (J)	0.058 (J)	0.047 (J)	0.061 (J)	—	0.043 (J)	—	—
RE21-07-5110	21-601071	2–3	SOIL	—	—	NA	NA	NA	NA	0.046 (J)	0.047 (J)	0.047 (J)	—	0.05 (J)	—	0.061 (J)	—	—
RE21-07-5111	21-601071	7–8	QBT 3	—	—	NA	NA	NA	NA	—	—	—	—	—	—	—	—	—
RE21-07-6383	21-601071	12–13	QBT 3	—	—	NA	NA	NA	NA	—	—	—	—	—	—	—	—	—
RE21-07-5112	21-601072	2–3	SOIL	—	—	NA	NA	NA	NA	0.077 (J)	0.074 (J)	0.072 (J)	0.038 (J)	0.071 (J)	—	0.27 (J)	—	—
RE21-07-5113	21-601072	7–8	QBT 3	—	—	NA	NA	NA	NA	—	—	—	—	—	—	0.041 (J)	—	—
RE21-07-6378	21-601072	12–13	QBT 3	—	—	NA	NA	NA	NA	—	—	—	—	—	—	0.11 (J)	—	—
RE21-07-5114	21-601073	2–3	QBT 3	—	—	NA	NA	NA	NA	—	0.045 (J)	0.041 (J)	0.043 (J)	0.038 (J)	—	—	—	—
RE21-07-6393	21-601073	12–13	QBT 3	—	—	NA	NA	NA	NA	0.043 (J)	—	0.036 (J)	—	—	—	—	—	—
RE21-07-5116	21-601074	2–3	QBT 3	—	—	NA	NA	NA	NA	0.037 (J)	—	—	—	—	—	—	—	—
RE21-07-5118	21-601075	2–3	QBT 3	—	—	NA	NA	NA	NA	0.049 (J)	0.049 (J)	0.046 (J)	—	0.046 (J)	—	0.089 (J)	—	—
RE21-07-5119	21-601075	7–8	QBT 3	0.011 (J)	—	NA	NA	NA	NA	—	—	—	—	—	—	—	—	—
RE21-07-6390	21-601075	12–13	QBT 3	0.013 (J-)	—	NA	NA	NA	NA	—	—	—	—	—	—	—	—	—
RE21-07-5122	21-601077	2–3	QBT 3	0.012 (J-)	—	NA	NA	NA	NA	0.079 (J)	0.064 (J)	0.066 (J)	0.038 (J)	0.068 (J)	—	0.073 (J)	—	—
RE21-07-5123	21-601077	7–8	QBT 3	0.009 (J-)	—	NA	NA	NA	NA	—	—	—	—	—	—	—	—	—
RE21-07-6395	21-601077	12–13	QBT 3	—	—	NA	NA	NA	NA	—	—	—	—	—	—	—	—	—
RE21-07-5124	21-601078	2–3	SOIL	—	—	NA	NA	NA	NA	—	—	—	—	—	0.4 (J)	—	—	—
RE21-07-5125	21-601078	7–8	QBT 3	0.019 (J-)	—	NA	NA	NA	NA	—	—	—	—	—	—	—	0.00053 (J-)	—
RE21-07-5126	21-601079	2–3	QBT 3	0.016 (J)	—	NA	NA	NA	NA	0.092 (J-)	0.074 (J-)	0.062 (J-)	0.055 (J-)	0.062 (J-)	—	0.2 (J-)	—	0.038 (J-)
RE21-07-5127	21-601079	7–8	QBT 3	0.013 (J)	—	NA	NA	NA	NA	0.077 (J)	0.07 (J)	0.07 (J)	—	0.067 (J)	—	0.067 (J)	—	—
RE21-07-6381	21-601079	12–13	QBT 3	0.017 (J)	—	NA	NA	NA	NA	—	—	—	—	—	—	—	—	—
RE21-07-5128	21-601080	2–3	QBT 3	0.013 (J)	—	NA	NA	NA	NA	0.096 (J-)	0.089 (J-)	0.08 (J-)	0.075 (J-)	0.07 (J-)	—	—	—	0.042 (J-)
RE21-07-5129	21-601080	7–8	QBT 3	0.022 (J)	—	NA	NA	NA	NA	0.064 (J)	0.057 (J)	0.046 (J)	0.04 (J)	0.05 (J)	—	—	—	—
RE21-07-6391	21-601080	12–13	QBT 3	0.0095 (J)	—	NA	NA	NA	NA	—	—	—	—	—	—	—	—	—
RE21-07-5130	21-601081	2–3	SOIL	0.018 (J)	—	NA	NA	NA	NA	—	—	—	—	—	—	—	—	—
RE21-07-5131	21-601081	7–8	QBT 3	0.012 (J)	0.048 (J)	NA	NA	NA	NA	0.13 (J)	0.12 (J)	0.097 (J)	0.1 (J)	0.11 (J)	—	0.065 (J)	—	0.041 (J)
RE21-07-6392	21-601081	12–13	QBT 3	—	—	NA	NA	NA	NA	—	—	—	—	—	—	—	—	—

Table 7.4-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Anthracene	Aroclor-1242	Aroclor-1248	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	Bromobenzene	Butylbenzylphthalate
Industrial SSL[a]				**959,000**	**253,000**	**10.9**	**10.7**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**3,300,000[c]**	**1830**	**1800**	**12,000[c]**
Recreational SSL[d]				**505,000**	**863,000**	**10.3**	**10.3**	**5.53**	**10.3**	**88.8**	**8.88**	**88.8**	**8630[b]**	**888**	**1,310,000**	**1770**	**4620**	**13,100**
Residential SSL[a]				**66,300**	**17,400**	**2.43**	**2.43**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**250,000[c]**	**380**	**290**	**2900[c]**
RE21-07-5132	21-601082	2–3	SOIL	0.012 (J)	—	NA	NA	NA	NA	0.044 (J)	0.039 (J)	—	—	0.04 (J)	—	—	—	—
RE21-07-5133	21-601082	7–8	QBT 3	0.026 (J)	—	NA	NA	NA	NA	—	—	—	—	—	—	0.043 (J)	—	—
RE21-07-6385	21-601082	12–13	QBT 3	0.016 (J)	—	NA	NA	NA	NA	—	—	—	—	—	—	—	—	—
MD21-10-21680	21-612329	5–6	QBT 3	NA	NA	—	—	0.0472	0.0173	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21681	21-612329	15–16	QBT 3	NA	NA	—	—	0.0028 (J)	—	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21685	21-612330	5–6	QBT 3	NA	NA	—	—	0.0451	0.0264	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21686	21-612330	15–16	QBT 3	NA	NA	—	—	0.0052	0.0028 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21688	21-612331	5–6	QBT 3	NA	NA	—	—	0.0272	—	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21689	21-612331	15–16	QBT 3	NA	NA	—	—	0.004	—	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21691	21-612332	5–6	QBT 3	NA	NA	—	—	0.183	—	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21692	21-612332	15–16	QBT 3	NA	NA	—	—	0.0019 (J)	—	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21697	21-612334	5–6	QBT 3	NA	NA	—	—	0.0225	0.0032 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21700	21-612335	5–6	QBT 3	NA	NA	0.0659	—	0.158	0.0166 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21701	21-612335	15–16	QBT 3	NA	NA	—	—	0.0643	0.0068 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21703	21-612336	5–6	SOIL	NA	NA	—	—	0.273	0.0264 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21706	21-612337	5–6	QBT 3	NA	NA	—	—	0.073	0.0091	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21707	21-612337	15–16	QBT 3	NA	NA	—	—	0.0019 (J)	—	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21709	21-612338	5–6	QBT 3	NA	NA	—	—	0.0172	0.0039	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21710	21-612338	15–16	QBT 3	NA	NA	—	—	0.0019 (J)	—	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21712	21-612339	5–6	QBT 3	NA	NA	—	—	0.0972	0.0109	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21713	21-612339	15–16	QBT 3	NA	NA	—	—	0.0092 (J)	—	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21715	21-612340	5–6	QBT 3	NA	NA	—	0.01	0.0224	0.0037	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21716	21-612340	15–16	QBT 3	NA	NA	—	—	0.0324	—	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21718	21-612341	5–6	QBT 3	NA	NA	—	—	0.0086	0.0027 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21719	21-612341	15–16	QBT 3	NA	NA	—	—	0.002 (J)	0.002 (J)	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21721	21-612342	5–6	QBT 3	NA	NA	—	0.0028 (J)	0.0024 (J)	—	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 7.4-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Chrysene	Dichlorobenzene[1,2-]	Dichlorobenzene[1,3-]	Ethylbenzene	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)	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene
Industrial SSL[a]				**3230**	**12,900**	**12,900**[g]	**365**	**33,700**	**na**[h]	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**32.3**
Recreational SSL[d]				**8880**	**38,100**	**36,000**	**1930**	**11,500**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**88.8**
Residential SSL[a]				**153**	**2140**	**2140**[g]	**74.5**	**2320**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**1.53**
RE21-07-5100	21-601066	2–3	SOIL	—	—	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	—
RE21-07-5101	21-601066	7–8	QBT 3	—	—	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	—
RE21-07-6384	21-601066	12–13	QBT 3	0.057 (J)	—	—	—	0.075 (J)	NA	NA	NA	NA	NA	NA	NA	NA	—
RE21-07-5102	21-601067	2–3	SOIL	0.1 (J)	—	—	—	0.14 (J)	NA	NA	NA	NA	NA	NA	NA	NA	0.043 (J)
RE21-07-5103	21-601067	7–8	SOIL	—	—	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	—
RE21-07-5104	21-601068	2–3	SOIL	0.17 (J)	—	—	—	0.25 (J)	NA	NA	NA	NA	NA	NA	NA	NA	0.052 (J)
RE21-07-5105	21-601068	7–8	QBT 3	0.067 (J)	—	—	—	0.099 (J)	NA	NA	NA	NA	NA	NA	NA	NA	—
RE21-07-6377	21-601068	12–13	QBT 3	0.15 (J)	—	—	—	0.16 (J)	NA	NA	NA	NA	NA	NA	NA	NA	0.052 (J)
RE21-07-5106	21-601069	2–3	SOIL	0.055 (J)	—	—	—	0.073 (J)	NA	NA	NA	NA	NA	NA	NA	NA	—
RE21-07-6376	21-601069	12–13	QBT 3	—	—	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	—
RE21-07-5108	21-601070	2–3	SOIL	0.14 (J)	—	—	—	0.23 (J)	NA	NA	NA	NA	NA	NA	NA	NA	0.056 (J)
RE21-07-5146	21-601070	2–3	SOIL	NA	NA	NA	NA	NA	0.00000851	0.0000179	0.00000338	0.000000331 (J)	0.00000703	0.00000144	0.000000239 (J)	0.00000397 (J)	NA
RE21-07-6394	21-601070	12–13	QBT 3	0.093 (J)	—	—	—	0.13 (J)	NA	NA	NA	NA	NA	NA	NA	NA	0.047 (J)
RE21-07-5110	21-601071	2–3	SOIL	0.079 (J)	—	—	—	0.11 (J)	NA	NA	NA	NA	NA	NA	NA	NA	—
RE21-07-5111	21-601071	7–8	QBT 3	0.037 (J)	—	—	—	0.049 (J)	NA	NA	NA	NA	NA	NA	NA	NA	—
RE21-07-6383	21-601071	12–13	QBT 3	—	—	—	0.001 (J-)	—	NA	NA	NA	NA	NA	NA	NA	NA	—
RE21-07-5112	21-601072	2–3	SOIL	0.13 (J)	—	—	0.00036 (J-)	0.18 (J)	NA	NA	NA	NA	NA	NA	NA	NA	—
RE21-07-5113	21-601072	7–8	QBT 3	0.039 (J)	—	—	—	0.047 (J)	NA	NA	NA	NA	NA	NA	NA	NA	—
RE21-07-6378	21-601072	12–13	QBT 3	0.053 (J)	—	—	—	0.071 (J)	NA	NA	NA	NA	NA	NA	NA	NA	—
RE21-07-5114	21-601073	2–3	QBT 3	0.047 (J)	—	—	—	0.039 (J)	NA	NA	NA	NA	NA	NA	NA	NA	—
RE21-07-6393	21-601073	12–13	QBT 3	0.059 (J)	—	—	—	0.1 (J)	NA	NA	NA	NA	NA	NA	NA	NA	—
RE21-07-5116	21-601074	2–3	QBT 3	0.052 (J)	—	—	—	0.075 (J)	NA	NA	NA	NA	NA	NA	NA	NA	—
RE21-07-5118	21-601075	2–3	QBT 3	0.081 (J)	—	—	—	0.12 (J)	NA	NA	NA	NA	NA	NA	NA	NA	—
RE21-07-5119	21-601075	7–8	QBT 3	0.042 (J)	—	—	—	0.059 (J)	NA	NA	NA	NA	NA	NA	NA	NA	—
RE21-07-6390	21-601075	12–13	QBT 3	—	—	—	0.00022 (J-)	—	NA	NA	NA	NA	NA	NA	NA	NA	—
RE21-07-5122	21-601077	2–3	QBT 3	0.13 (J)	—	—	—	0.17 (J)	NA	NA	NA	NA	NA	NA	NA	NA	—
RE21-07-5123	21-601077	7–8	QBT 3	0.046 (J)	—	—	—	0.065 (J)	NA	NA	NA	NA	NA	NA	NA	NA	—

Table 7.4-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Chrysene	Dichlorobenzene[1,2-]	Dichlorobenzene[1,3-]	Ethylbenzene	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)	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene
Industrial SSL[a]				**3230**	**12,900**	**12,900[g]**	**365**	**33,700**	**na[h]**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**32.3**
Recreational SSL[d]				**8880**	**38,100**	**36,000**	**1930**	**11,500**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**88.8**
Residential SSL[a]				**153**	**2140**	**2140[g]**	**74.5**	**2320**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**1.53**
RE21-07-6395	21-601077	12–13	QBT 3	0.046 (J)	—	—	—	0.074 (J)	NA	NA	NA	NA	NA	NA	NA	NA	—
RE21-07-5124	21-601078	2–3	SOIL	0.042 (J)	—	—	—	0.055 (J)	NA	NA	NA	NA	NA	NA	NA	NA	—
RE21-07-5125	21-601078	7–8	QBT 3	—	0.00054 (J-)	0.00049 (J-)	0.00027 (J-)	—	NA	NA	NA	NA	NA	NA	NA	NA	—
RE21-07-5126	21-601079	2–3	QBT 3	0.12 (J-)	—	—	—	0.2 (J-)	NA	NA	NA	NA	NA	NA	NA	NA	0.05 (J-)
RE21-07-5127	21-601079	7–8	QBT 3	0.12 (J)	—	—	—	0.19 (J)	NA	NA	NA	NA	NA	NA	NA	NA	0.037 (J)
RE21-07-6381	21-601079	12–13	QBT 3	—	—	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	—
RE21-07-5128	21-601080	2–3	QBT 3	0.15 (J-)	—	—	—	0.19 (J-)	NA	NA	NA	NA	NA	NA	NA	NA	0.072 (J-)
RE21-07-5129	21-601080	7–8	QBT 3	0.099 (J)	—	—	—	0.12 (J)	NA	NA	NA	NA	NA	NA	NA	NA	—
RE21-07-6391	21-601080	12–13	QBT 3	—	—	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	—
RE21-07-5130	21-601081	2–3	SOIL	—	—	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	—
RE21-07-5131	21-601081	7–8	QBT 3	0.19 (J+)	0.00049 (J)	—	—	0.29 (J)	NA	NA	NA	NA	NA	NA	NA	NA	0.098 (J)
RE21-07-6392	21-601081	12–13	QBT 3	0.045 (J)	—	—	—	0.06 (J)	NA	NA	NA	NA	NA	NA	NA	NA	—
RE21-07-5132	21-601082	2–3	SOIL	0.063 (J)	—	—	—	0.099 (J)	NA	NA	NA	NA	NA	NA	NA	NA	—
RE21-07-5133	21-601082	7–8	QBT 3	0.039 (J+)	—	—	—	0.054 (J)	NA	NA	NA	NA	NA	NA	NA	NA	—
RE21-07-6385	21-601082	12–13	QBT 3	—	—	—	—	—	NA	NA	NA	NA	NA	NA	NA	NA	—
MD21-10-21680	21-612329	5–6	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21681	21-612329	15–16	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21685	21-612330	5–6	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21686	21-612330	15–16	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21688	21-612331	5–6	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21689	21-612331	15–16	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21691	21-612332	5–6	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21692	21-612332	15–16	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21697	21-612334	5–6	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21700	21-612335	5–6	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21701	21-612335	15–16	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21703	21-612336	5–6	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 7.4-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Chrysene	Dichlorobenzene[1,2-]	Dichlorobenzene[1,3-]	Ethylbenzene	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)	Hexachlorodibenzodioxins (Total)	Hexachlorodibenzofuran[2,3,4,6,7,8-]	Hexachlorodibenzofurans (Total)	Indeno(1,2,3-cd)pyrene
Industrial SSL[a]				**3230**	**12,900**	**12,900[g]**	**365**	**33,700**	**na[h]**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**32.3**
Recreational SSL[d]				**8880**	**38,100**	**36,000**	**1930**	**11,500**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**88.8**
Residential SSL[a]				**153**	**2140**	**2140[g]**	**74.5**	**2320**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**1.53**
MD21-10-21706	21-612337	5–6	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21707	21-612337	15–16	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21709	21-612338	5–6	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21710	21-612338	15–16	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21712	21-612339	5–6	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21713	21-612339	15–16	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21715	21-612340	5–6	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21716	21-612340	15–16	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21718	21-612341	5–6	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21719	21-612341	15–16	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21721	21-612342	5–6	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 7.4-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Isopropyltoluene[4-]	Methylene Chloride	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Tetrachloroethene	Toluene	Trimethylbenzene[1,2,4-]	Xylene (Total)
Industrial SSL[a]				**14,100[i]**	**5110**	**na**	**na**	**na**	**na**	**1160**	**25,300**	**0.00243**	**na**	**1640**	**61,100**	**1800[c]**	**42,400**
Recreational SSL[d]				**42,100[i]**	**3610**	**na**	**na**	**na**	**na**	**1160**	**8630**	**0.00297**	**na**	**2240**	**47,600**	**5010**	**27800**
Residential SSL[a]				**2350[i]**	**409**	**na**	**na**	**na**	**na**	**1740**	**1740**	**0.00049**	**na**	**110**	**5220**	**300[c]**	**863**
RE21-07-5100	21-601066	2–3	SOIL	—	—	NA	NA	NA	NA	—	—	NA	NA	—	—	0.00038 (J)	—
RE21-07-5101	21-601066	7–8	QBT 3	—	—	NA	NA	NA	NA	—	—	NA	NA	—	0.0003 (J-)	—	—
RE21-07-6384	21-601066	12–13	QBT 3	—	—	NA	NA	NA	NA	0.047 (J)	0.063 (J)	NA	NA	—	0.00055 (J-)	0.00029 (J-)	—
RE21-07-5102	21-601067	2–3	SOIL	—	—	NA	NA	NA	NA	0.059 (J)	0.097 (J)	NA	NA	—	—	—	—
RE21-07-5103	21-601067	7–8	SOIL	—	—	NA	NA	NA	NA	—	—	NA	NA	0.0014 (J)	0.00021 (J)	—	—
RE21-07-5104	21-601068	2–3	SOIL	—	—	NA	NA	NA	NA	0.15 (J)	0.18 (J)	NA	NA	0.00081 (J-)	0.00039 (J-)	—	—
RE21-07-5105	21-601068	7–8	QBT 3	—	—	NA	NA	NA	NA	0.06 (J)	0.071 (J)	NA	NA	—	0.00027 (J-)	—	—
RE21-07-6377	21-601068	12–13	QBT 3	—	0.0043 (J-)	NA	NA	NA	NA	—	0.14 (J)	NA	NA	—	—	0.00035 (J)	—
RE21-07-5106	21-601069	2–3	SOIL	—	—	NA	NA	NA	NA	0.04 (J)	0.052 (J)	NA	NA	—	0.00028 (J-)	0.00031 (J-)	—
RE21-07-6376	21-601069	12–13	QBT 3	—	—	NA	NA	NA	NA	—	—	NA	NA	—	—	0.00025 (J)	—
RE21-07-5108	21-601070	2–3	SOIL	0.0041 (J-)	—	NA	NA	NA	NA	0.12 (J)	0.16 (J)	NA	NA	—	—	0.00038 (J-)	—
RE21-07-5146	21-601070	2–3	SOIL	NA	NA	0.0000852	0.00000411 (J)	0.000000362 (J)	0.00000276 (J)	NA	NA	0.000000312 (J)	0.00000121	NA	NA	NA	NA
RE21-07-6394	21-601070	12–13	QBT 3	0.0097	—	NA	NA	NA	NA	0.073 (J)	0.11 (J)	NA	NA	0.0012 (J)	—	0.0004 (J)	—
RE21-07-5110	21-601071	2–3	SOIL	—	—	NA	NA	NA	NA	0.045 (J)	0.08 (J)	NA	NA	—	0.00077 (J+)	—	—
RE21-07-5111	21-601071	7–8	QBT 3	—	—	NA	NA	NA	NA	—	0.038 (J)	NA	NA	—	—	—	—
RE21-07-6383	21-601071	12–13	QBT 3	—	—	NA	NA	NA	NA	—	—	NA	NA	—	0.00079 (J-)	0.00043 (J)	0.0071 (J-)
RE21-07-5112	21-601072	2–3	SOIL	—	—	NA	NA	NA	NA	0.091 (J)	0.14 (J)	NA	NA	—	0.00074 (J-)	0.00039 (J-)	—
RE21-07-5113	21-601072	7–8	QBT 3	—	—	NA	NA	NA	NA	—	—	NA	NA	—	—	0.00041 (J-)	—
RE21-07-6378	21-601072	12–13	QBT 3	—	—	NA	NA	NA	NA	—	0.053 (J)	NA	NA	—	—	—	—
RE21-07-5114	21-601073	2–3	QBT 3	—	—	NA	NA	NA	NA	—	0.041 (J)	NA	NA	—	—	—	—
RE21-07-6393	21-601073	12–13	QBT 3	—	—	NA	NA	NA	NA	0.05 (J)	0.078 (J)	NA	NA	—	—	—	—
RE21-07-5116	21-601074	2–3	QBT 3	—	—	NA	NA	NA	NA	0.039 (J)	0.062 (J)	NA	NA	—	0.00069 (J)	0.00046 (J)	—
RE21-07-5118	21-601075	2–3	QBT 3	—	—	NA	NA	NA	NA	0.05 (J)	0.1 (J)	NA	NA	—	0.0017 (J)	—	—
RE21-07-5119	21-601075	7–8	QBT 3	—	—	NA	NA	NA	NA	—	0.045 (J)	NA	NA	—	—	—	—
RE21-07-6390	21-601075	12–13	QBT 3	—	—	NA	NA	NA	NA	—	—	NA	NA	—	0.00051 (J-)	0.00042 (J-)	—
RE21-07-5122	21-601077	2–3	QBT 3	—	—	NA	NA	NA	NA	0.084 (J)	0.13 (J)	NA	NA	—	0.00072 (J-)	—	—
RE21-07-5123	21-601077	7–8	QBT 3	—	—	NA	NA	NA	NA	—	0.05 (J)	NA	NA	—	0.00061 (J-)	—	—

Table 7.4-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Isopropyltoluene[4-]	Methylene Chloride	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Tetrachloroethene	Toluene	Trimethylbenzene[1,2,4-]	Xylene (Total)
Industrial SSL[a]				**14,100[i]**	**5110**	**na**	**na**	**na**	**na**	**1160**	**25,300**	**0.00243**	**na**	**1640**	**61,100**	**1800[c]**	**42,400**
Recreational SSL[d]				**42,100[i]**	**3610**	**na**	**na**	**na**	**na**	**1160**	**8630**	**0.00297**	**na**	**2240**	**47,600**	**5010**	**27800**
Residential SSL[a]				**2350[i]**	**409**	**na**	**na**	**na**	**na**	**1740**	**1740**	**0.00049**	**na**	**110**	**5220**	**300[c]**	**863**
RE21-07-6395	21-601077	12–13	QBT 3	—	—	NA	NA	NA	NA	0.045 (J)	0.062 (J)	NA	NA	—	—	—	—
RE21-07-5124	21-601078	2–3	SOIL	—	—	NA	NA	NA	NA	—	0.044 (J)	NA	NA	—	—	0.0005 (J)	—
RE21-07-5125	21-601078	7–8	QBT 3	0.00028 (J-)	—	NA	NA	NA	NA	—	—	NA	NA	—	0.00041 (J-)	0.00068 (J-)	—
RE21-07-5126	21-601079	2–3	QBT 3	—	0.011 (J-)	NA	NA	NA	NA	0.16 (J-)	0.2 (J-)	NA	NA	—	0.00031 (J-)	—	—
RE21-07-5127	21-601079	7–8	QBT 3	—	0.0034 (J-)	NA	NA	NA	NA	0.084 (J)	0.15 (J)	NA	NA	—	0.00024 (J-)	—	—
RE21-07-6381	21-601079	12–13	QBT 3	—	0.01 (J-)	NA	NA	NA	NA	—	—	NA	NA	—	0.00021 (J-)	—	—
RE21-07-5128	21-601080	2–3	QBT 3	—	0.013	NA	NA	NA	NA	0.1 (J-)	0.19 (J-)	NA	NA	—	0.00078 (J)	—	—
RE21-07-5129	21-601080	7–8	QBT 3	—	0.011	NA	NA	NA	NA	0.064 (J)	0.12 (J)	NA	NA	—	0.00036 (J)	—	—
RE21-07-6391	21-601080	12–13	QBT 3	—	0.0071	NA	NA	NA	NA	—	—	NA	NA	—	—	—	—
RE21-07-5130	21-601081	2–3	SOIL	—	0.011	NA	NA	NA	NA	—	—	NA	NA	—	0.00055 (J)	—	—
RE21-07-5131	21-601081	7–8	QBT 3	—	0.0033 (J)	NA	NA	NA	NA	0.2 (J)	0.29 (J)	NA	NA	—	0.00083 (J)	—	—
RE21-07-6392	21-601081	12–13	QBT 3	—	—	NA	NA	NA	NA	—	0.048 (J)	NA	NA	—	—	—	—
RE21-07-5132	21-601082	2–3	SOIL	—	0.011 (J-)	NA	NA	NA	NA	0.048 (J)	0.08 (J)	NA	NA	—	0.00024 (J-)	—	—
RE21-07-5133	21-601082	7–8	QBT 3	—	—	NA	NA	NA	NA	0.041 (J)	0.057 (J)	NA	NA	—	0.00028 (J)	—	—
RE21-07-6385	21-601082	12–13	QBT 3	—	0.0098 (J-)	NA	NA	NA	NA	—	—	NA	NA	—	0.00022 (J-)	—	—
MD21-10-21680	21-612329	5–6	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21681	21-612329	15–16	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21685	21-612330	5–6	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21686	21-612330	15–16	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21688	21-612331	5–6	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21689	21-612331	15–16	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21691	21-612332	5–6	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21692	21-612332	15–16	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21697	21-612334	5–6	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21700	21-612335	5–6	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21701	21-612335	15–16	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21703	21-612336	5–6	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 7.4-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Isopropyltoluene[4-]	Methylene Chloride	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	Pentachlorodibenzofuran[2,3,4,7,8-]	Pentachlorodibenzofurans (Totals)	Phenanthrene	Pyrene	Tetrachlorodibenzofuran[2,3,7,8-]	Tetrachlorodibenzofurans (Totals)	Tetrachloroethene	Toluene	Trimethylbenzene[1,2,4-]	Xylene (Total)
Industrial SSL[a]				**14,100[i]**	**5110**	**na**	**na**	**na**	**na**	**1160**	**25,300**	**0.00243**	**na**	**1640**	**61,100**	**1800[c]**	**42,400**
Recreational SSL[d]				**42,100[i]**	**3610**	**na**	**na**	**na**	**na**	**1160**	**8630**	**0.00297**	**na**	**2240**	**47,600**	**5010**	**27800**
Residential SSL[a]				**2350[i]**	**409**	**na**	**na**	**na**	**na**	**1740**	**1740**	**0.00049**	**na**	**110**	**5220**	**300[c]**	**863**
MD21-10-21706	21-612337	5–6	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21707	21-612337	15–16	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21709	21-612338	5–6	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21710	21-612338	15–16	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21712	21-612339	5–6	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21713	21-612339	15–16	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21715	21-612340	5–6	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21716	21-612340	15–16	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21718	21-612341	5–6	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21719	21-612341	15–16	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MD21-10-21721	21-612342	5–6	QBT 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273), unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSLs are from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables).

[d] SSLs are from LANL (2017, 602581).

[e] — = Not detected.

[f] NA = Not analyzed.

[g] Dichlorobenzene[1,2-] used as a surrogate based on structural similarity.

[h] na = Not available.

[i] Isopropylbenzene used as a surrogate based on structural similarity.

Table 7.4-4
Radionuclides Detected or Detected above BVs/FVs at AOC 21-028(c)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/240	Tritium	Uranium-234	Uranium-235/236
Qbt 2, 3, 4 BV[a]				**na**[b]	**na**	**na**	**na**	**na**	**1.98**	**0.09**
Soil BV/FV[a]				**0.013**	**1.65**	**0.023**	**0.054**	**na**	**2.59**	**0.2**
Industrial SAL[c]				**1000**	**41**	**1300**	**1200**	**2,400,000**	**3100**	**160**
Recreational SAL[c]				**1500**	**370**	**1400**	**1300**	**5,700,000**	**3900**	**1000**
Residential SAL[c]				**83**	**12**	**84**	**79**	**1700**	**290**	**42**
RE21-07-5100	21-601066	2–3	SOIL	—[d]	—	0.038 (J)	0.424	—	—	—
RE21-07-5101	21-601066	7–8	QBT 3	—	—	0.121 (J)	0.317	—	—	—
RE21-07-6384	21-601066	12–13	QBT 3	—	—	0.178 (J)	0.72	—	—	—
RE21-07-5102	21-601067	2–3	SOIL	0.151 (J-)	—	0.216	2.03	—	2.91	—
RE21-07-5103	21-601067	7–8	SOIL	—	—	0.069	1.34	—	—	—
RE21-07-6388	21-601067	12–13	QBT 3	—	—	0.0315	0.351	—	—	—
RE21-07-5104	21-601068	2–3	SOIL	1.71 (J-)	0.173	0.591	10.7	0.193	—	—
RE21-07-5105	21-601068	7–8	QBT 3	0.168	—	0.204	2.79	—	—	—
RE21-07-6377	21-601068	12–13	QBT 3	0.135 (J-)	—	0.153	1.94	—	—	—
RE21-07-5106	21-601069	2–3	SOIL	0.279 (J-)	0.225	0.329	2.24	—	—	—
RE21-07-5107	21-601069	7–8	QBT 3	0.085 (J-)	—	0.24	0.962	—	—	—
RE21-07-6376	21-601069	12–13	QBT 3	—	—	0.088	0.346	—	—	—
RE21-07-5108	21-601070	2–3	SOIL	0.4 (J-)	—	0.631	5.2	—	—	—
RE21-07-5109	21-601070	7–8	QBT 3	0.174 (J-)	—	0.102	1.04	—	—	0.092
RE21-07-6394	21-601070	12–13	QBT 3	0.264 (J-)	—	0.142	2.96	—	—	—
RE21-07-5110	21-601071	2–3	SOIL	0.093	—	0.889	2.73	—	—	—
RE21-07-5111	21-601071	7–8	QBT 3	—	—	0.258	0.95	—	—	—
RE21-07-6383	21-601071	12–13	QBT 3	—	—	0.316	0.385	—	—	—
RE21-07-5112	21-601072	2–3	SOIL	—	—	1.17	3.22	—	4.91	—
RE21-07-5113	21-601072	7–8	QBT 3	0.391	—	0.299	0.863	—	—	—
RE21-07-6378	21-601072	12–13	QBT 3	0.089	—	0.677	1.04	—	—	—
RE21-07-5115	21-601073	7–8	QBT 3	0.106	—	—	—	—	—	—
RE21-07-6393	21-601073	12–13	QBT 3	—	—	—	0.147	—	—	—
RE21-07-5116	21-601074	2–3	QBT 3	0.192 (J)	—	0.243 (J)	1.65 (J)	—	—	—
RE21-07-5117	21-601074	7–8	QBT 3	0.1 (J)	—	0.073 (J)	0.681 (J)	—	—	—
RE21-07-6387	21-601074	12–13	QBT 3	—	—	—	0.442 (J)	—	—	—

Table 7.4-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/240	Tritium	Uranium-234	Uranium-235/236
Qbt 2, 3, 4 BV[a]				**na[b]**	**na**	**na**	**na**	**na**	**1.98**	**0.09**
Soil BV/FV[a]				**0.013**	**1.65**	**0.023**	**0.054**	**na**	**2.59**	**0.2**
Industrial SAL[c]				**1000**	**41**	**1300**	**1200**	**2,400,000**	**3100**	**160**
Recreational SAL[c]				**1500**	**370**	**1400**	**1300**	**5,700,000**	**3900**	**1000**
Residential SAL[c]				**83**	**12**	**84**	**79**	**1700**	**290**	**42**
RE21-07-5118	21-601075	2–3	QBT 3	0.265 (J)	—	0.61 (J)	1.86 (J)	—	—	—
RE21-07-5119	21-601075	7–8	QBT 3	0.101 (J)	—	0.222 (J)	0.663 (J)	—	—	—
RE21-07-6390	21-601075	12–13	QBT 3	—	—	0.127 (J)	0.301 (J)	—	—	—
RE21-07-5120	21-601076	2–3	SOIL	0.084 (J)	—	0.115 (J)	0.66 (J)	—	—	—
RE21-07-5121	21-601076	7–8	QBT 3	—	—	0.045 (J)	0.196 (J)	—	—	—
RE21-07-6382	21-601076	12–13	QBT 3	—	—	0.038 (J)	0.172 (J)	—	—	—
RE21-07-5122	21-601077	2–3	QBT 3	1.1 (J-)	—	6.52 (J)	11.9 (J)	—	—	—
RE21-07-5123	21-601077	7–8	QBT 3	2.06 (J)	—	0.831 (J)	4.59 (J)	—	—	—
RE21-07-6395	21-601077	12–13	QBT 3	0.159 (J)	—	0.349 (J)	2.2 (J)	—	—	—
RE21-07-5124	21-601078	2–3	SOIL	0.32 (J)	—	0.519 (J)	3.14 (J)	—	—	—
RE21-07-5125	21-601078	7–8	QBT 3	0.12 (J)	—	0.225 (J)	1.4 (J)	—	—	—
RE21-07-6389	21-601078	12–13	QBT 3	0.158 (J)	—	0.18 (J)	3.02 (J)	—	—	—
RE21-07-5126	21-601079	2–3	QBT 3	0.482	—	0.691	2.82	—	—	—
RE21-07-5127	21-601079	7–8	QBT 3	2.63	—	2.69	12.5	—	2.02	—
RE21-07-6381	21-601079	12–13	QBT 3	3.68	—	2.58	13.7	—	3.12	—
RE21-07-5128	21-601080	2–3	QBT 3	2.03	—	14.4	15.4	—	—	—
RE21-07-5129	21-601080	7–8	QBT 3	1.33	—	0.95	8.86	—	—	—
RE21-07-6391	21-601080	12–13	QBT 3	0.288	—	0.222	3.86	—	—	—
RE21-07-5130	21-601081	2–3	SOIL	1.57	—	0.84	11.8	0.238	—	—
RE21-07-5131	21-601081	7–8	QBT 3	0.69	—	0.463	13.8	—	—	—
RE21-07-6392	21-601081	12–13	QBT 3	0.368	—	0.256	3.06	0.301	—	—
RE21-07-5132	21-601082	2–3	SOIL	2.73	—	1.83	28.4	—	—	—
RE21-07-5133	21-601082	7–8	QBT 3	1.41	—	0.568	3.16	—	2.25	0.128
RE21-07-6385	21-601082	12–13	QBT 3	0.369	—	0.223	1.85	0.21	—	0.127
MD21-10-21680	21-612329	5–6	QBT 3	NA[e]	NA	0.337	1.47	NA	NA	NA
MD21-10-21681	21-612329	15–16	QBT 3	NA	NA	—	0.029	NA	NA	NA
MD21-10-21685	21-612330	5–6	QBT 3	0.224	NA	0.21 (J-)	4.77 (J-)	NA	NA	NA
MD21-10-21686	21-612330	15–16	QBT 3	—	NA	—	0.129	NA	NA	NA
MD21-10-21688	21-612331	5–6	QBT 3	0.102	NA	0.125	1.36	NA	NA	NA
MD21-10-21689	21-612331	15–16	QBT 3	—	NA	0.0146	0.619	NA	NA	NA
MD21-10-21690	21-612331	24–25	QBT 3	0.317	NA	—	22.8	NA	NA	NA

Table 7.4-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Cesium-137	Plutonium-238	Plutonium-239/240	Tritium	Uranium-234	Uranium-235/236
Qbt 2, 3, 4 BV[a]				**na[b]**	**na**	**na**	**na**	**na**	**1.98**	**0.09**
Soil BV/FV[a]				**0.013**	**1.65**	**0.023**	**0.054**	**na**	**2.59**	**0.2**
Industrial SAL[c]				**1000**	**41**	**1300**	**1200**	**2,400,000**	**3100**	**160**
Recreational SAL[c]				**1500**	**370**	**1400**	**1300**	**5,700,000**	**3900**	**1000**
Residential SAL[c]				**83**	**12**	**84**	**79**	**1700**	**290**	**42**
MD21-10-21691	21-612332	5–6	QBT 3	0.268	NA	0.0835	1.17	NA	NA	NA
MD21-10-21692	21-612332	15–16	QBT 3	—	NA	—	0.0325	NA	NA	NA
MD21-10-21693	21-612332	24–25	QBT 3	0.056	NA	—	2.68	NA	NA	NA
MD21-10-21694	21-612333	5–6	QBT 3	0.207	NA	0.115	1.27	NA	NA	NA
MD21-10-21695	21-612333	15–16	QBT 3	—	NA	—	0.0253	NA	NA	NA
MD21-10-21697	21-612334	5–6	QBT 3	0.168	NA	0.0702	5.87	NA	NA	NA
MD21-10-21698	21-612334	15–16	QBT 3	0.0458	NA	—	0.0561	NA	NA	NA
MD21-10-21699	21-612334	24–25	QBT 3	—	NA	—	0.0231	NA	NA	NA
MD21-10-21700	21-612335	5–6	QBT 3	0.214	NA	0.119	1.83	NA	NA	NA
MD21-10-21701	21-612335	15–16	QBT 3	0.0366	NA	0.017	0.346	NA	NA	NA
MD21-10-21702	21-612335	24–25	QBT 3	—	NA	—	0.0266	NA	NA	NA
MD21-10-21703	21-612336	5–6	SOIL	0.0864	NA	0.106	0.711	NA	NA	NA
MD21-10-21706	21-612337	5–6	QBT 3	0.346	NA	6	1.94	NA	NA	NA
MD21-10-21707	21-612337	15–16	QBT 3	1.31	NA	—	0.162	NA	NA	NA
MD21-10-21708	21-612337	24–25	QBT 3	0.07	NA	—	0.144	NA	NA	NA
MD21-10-21709	21-612338	5–6	QBT 3	—	NA	—	0.0499	NA	NA	NA
MD21-10-21710	21-612338	15–16	QBT 3	—	NA	—	0.0167	NA	NA	NA
MD21-10-21712	21-612339	5–6	QBT 3	0.139	NA	0.217	2.93	NA	NA	NA
MD21-10-21713	21-612339	15–16	QBT 3	—	NA	—	0.0895	NA	NA	NA
MD21-10-21715	21-612340	5–6	QBT 3	0.0879	NA	0.0586	0.975	NA	NA	NA
MD21-10-21716	21-612340	15–16	QBT 3	—	NA	—	0.0193	NA	NA	NA
MD21-10-21718	21-612341	5–6	QBT 3	0.273	NA	1.48	3.02	NA	NA	NA
MD21-10-21719	21-612341	15–16	QBT 3	0.0211	NA	—	0.125	NA	NA	NA
MD21-10-21721	21-612342	5–6	QBT 3	0.0352	NA	—	0.202	NA	NA	NA
MD21-10-21723	21-612342	24–25	QBT 3	0.127	NA	0.0157	5.16	NA	NA	NA

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SALs from LANL (2015, 600929).

[d] — = Not detected.

[e] NA = Not analyzed.

Table 8.2-1
Samples Collected and Analyses Requested at SWMU 26-001

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Explosive Compounds	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
RE26-07-3522	26-600777	0.8–1.9	QBT 3	07-1155[a]	07-1154	07-1155	07-1155	07-1153	07-1155	07-1155	07-1154	07-1153	07-1154	07-1155	07-1153	07-1153	07-1154
RE26-07-3523	26-600777	2.8–3.4	QBT 3	07-1155	07-1154	07-1155	07-1155	07-1153	07-1155	07-1155	07-1154	07-1153	07-1154	07-1155	07-1153	07-1153	07-1154
RE26-07-3519	26-600778	2.5–3.1	QBT 3	07-1155	07-1154	07-1155	07-1155	07-1153	07-1155	07-1155	07-1154	07-1153	07-1154	07-1155	07-1153	07-1153	07-1154
RE26-07-3525	26-600779	0.5–1.4	QBT 3	08-30	08-29	08-30	08-30	08-28	08-30	08-30	08-29	08-28	08-29	08-30	08-28	08-28	08-29
RE26-07-3526	26-600779	2.5–2.9	QBT 3	08-30	08-29	08-30	08-30	08-28	08-30	08-30	08-29	08-28	08-29	08-30	08-28	08-28	08-29
RE26-07-3531	26-600781	0.8–1.6	QBT 3	08-30	08-29	08-30	08-30	08-28	08-30	08-30	08-29	08-28	08-29	08-30	08-28	08-28	08-29
RE26-07-3532	26-600781	2.8–3.4	QBT 3	08-30	08-29	08-30	08-30	08-28	08-30	08-30	08-29	08-28	08-29	08-30	08-28	08-28	08-29
RE26-07-3533	26-600781	4.8–5.8	QBT 3	08-30	08-29	08-30	08-30	08-28	08-30	08-30	08-29	08-28	08-29	08-30	08-28	08-28	08-29
RE26-07-3537	26-600783	1–2.5	QBT 3	07-1155	07-1154	07-1155	07-1155	07-1153	07-1155	07-1155	07-1154	07-1153	07-1154	07-1155	07-1153	07-1153	07-1154
RE26-07-3538	26-600783	3.5–4.5	QBT 3	07-1155	07-1154	07-1155	07-1155	07-1153	07-1155	07-1155	07-1154	07-1153	07-1154	07-1155	07-1153	07-1153	07-1154
RE26-07-3539	26-600783	5.5–6.1	QBT 3	07-1155	07-1154	07-1155	07-1155	07-1153	07-1155	07-1155	07-1154	07-1153	07-1154	07-1155	07-1153	07-1153	07-1154
RE26-07-3540	26-600784	0.7–1.3	QBT 3	08-30	08-29	08-30	08-30	08-28	08-30	08-30	08-29	08-28	08-29	08-30	08-28	08-28	08-29
RE26-07-3541	26-600784	2.7–3.3	QBT 3	08-30	08-29	08-30	08-30	08-28	08-30	08-30	08-29	08-28	08-29	08-30	08-28	08-28	08-29
RE26-07-3543	26-600785	0.8–1.3	QBT 3	08-30	08-29	08-30	08-30	08-28	08-30	08-30	08-29	08-28	08-29	08-30	08-28	—	08-29
RE26-07-3544	26-600785	2–3.3	QBT 3	08-30	08-29	08-30	08-30	08-28	08-30	08-30	08-29	08-28	08-29	08-30	08-28	08-28	08-29
RE26-07-3545	26-600785	4.8–5.3	QBT 3	08-30	08-29	08-30	08-30	08-28	08-30	08-30	08-29	08-28	08-29	08-30	08-28	08-28	08-29
RE26-07-3546	26-600786	0.5–1.2	QBT 3	08-30	08-29	08-30	08-30	08-28	08-30	08-30	08-29	08-28	08-29	08-30	08-28	08-28	08-29
RE26-07-3549	26-600787	0.7–1.2	QBT 3	08-30	08-29	08-30	08-30	08-28	08-30	08-30	08-29	08-28	08-29	08-30	08-28	—	08-29
RE26-07-3550	26-600787	2.7–3.2	QBT 3	08-30	08-29	08-30	08-30	08-28	08-30	08-30	08-29	08-28	08-29	08-30	08-28	08-28	08-29
RE26-07-3552	26-600788	0.7–1.2	QBT 3	08-30	08-29	08-30	08-30	08-28	08-30	08-30	08-29	08-28	08-29	08-30	08-28	08-28	08-29
RE26-07-3553	26-600788	2.7–3.2	QBT 3	08-30	08-29	08-30	08-30	08-28	08-30	08-30	08-29	08-28	08-29	08-30	08-28	08-28	08-29
RE26-07-3554	26-600788	4.7–5.2	QBT 3	08-30	08-29	08-30	08-30	08-28	08-30	08-30	08-29	08-28	08-29	08-30	08-28	08-28	08-29
RE26-07-3555	26-600789	0.5–1	QBT 3	08-30	08-29	08-30	08-30	08-28	08-30	08-30	08-29	08-28	08-29	08-30	08-28	08-28	08-29
RE26-07-3556	26-600789	2.5–3	QBT 3	08-30	08-29	08-30	08-30	08-28	08-30	08-30	08-29	08-28	08-29	08-30	08-28	08-28	08-29
RE26-07-3557	26-600789	4.5–5	QBT 3	08-30	08-29	08-30	08-30	08-28	08-30	08-30	08-29	08-28	08-29	08-30	08-28	08-28	08-29
RE26-07-3558	26-600790	0.7–1.2	QBT 3	08-30	08-29	08-30	08-30	08-28	08-30	08-30	08-29	08-28	08-29	08-30	08-28	08-28	08-29
RE26-07-3559	26-600790	2.7–3.2	QBT 3	08-30	08-29	08-30	08-30	08-28	08-30	08-30	08-29	08-28	08-29	08-30	08-28	08-28	08-29
RE26-07-3561	26-600791	0.5–1	QBT 3	08-30	08-29	08-30	08-30	08-28	08-30	08-30	08-29	08-28	08-29	08-30	08-28	08-28	08-29
RE26-07-3562	26-600791	2.5–3.2	QBT 3	08-30	08-29	08-30	08-30	08-28	08-30	08-30	08-29	08-28	08-29	08-30	08-28	08-28	08-29
RE26-07-3564	26-600792	0.5–2	QBT 3	08-30	08-29	08-30	08-30	08-28	08-30	08-30	08-29	08-28	08-29	08-30	08-28	08-28	08-29
RE26-07-3565	26-600792	2.5–3.2	QBT 3	08-30	08-29	08-30	08-30	08-28	08-30	08-30	08-29	08-28	08-29	08-30	08-28	08-28	08-29
RE26-10-21541	26-612296	0–0.5	SOIL	—[b]	10-3809	10-3809	—	—	—	—	10-3809	—	—	—	—	—	—
RE26-10-21542	26-612296	5–6	QBT 3	—	10-3809	10-3809	—	—	—	—	10-3809	—	—	—	—	—	—
RE26-10-21543	26-612296	9–10	QBT 3	—	10-3809	10-3809	—	—	—	—	10-3809	—	—	—	—	—	—

Table 8.2-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Explosive Compounds	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
RE26-10-21544	26-612297	0–0.5	SOIL	—	10-3828	10-3828	—	—	—	—	10-3828	—	—	—	—	—	—
RE26-10-21545	26-612297	5–6	SOIL	—	10-3828	10-3828	—	—	—	—	10-3828	—	—	—	—	—	—
RE26-10-21546	26-612297	9–10	QBT 3	—	10-3886	10-3886	—	—	—	—	10-3886	—	—	—	—	—	—
RE26-10-21547	26-612298	0–0.5	SOIL	—	10-3828	10-3828	—	—	—	—	10-3828	—	—	—	—	—	—
RE26-10-21548	26-612298	5–6	QBT 3	—	10-3828	10-3828	—	—	—	—	10-3828	—	—	—	—	—	—
RE26-10-21549	26-612298	9–10	QBT 3	—	10-3828	10-3828	—	—	—	—	10-3828	—	—	—	—	—	—
RE26-10-21550	26-612299	0–0.5	SOIL	—	10-3886	10-3886	—	—	—	—	10-3886	—	—	—	—	—	—
RE26-10-21551	26-612299	5–6	QBT 3	—	10-3937	10-3937	—	—	—	—	10-3937	—	—	—	—	—	—
RE26-10-21552	26-612299	9–10	QBT 3	—	10-3937	10-3937	—	—	—	—	10-3937	—	—	—	—	—	—
RE26-10-21553	26-612300	0–0.5	SOIL	—	10-3886	10-3886	—	—	—	—	10-3886	—	—	—	—	—	—
RE26-10-21554	26-612300	5–6	QBT 3	—	10-3886	10-3886	—	—	—	—	10-3886	—	—	—	—	—	—
RE26-10-21555	26-612300	6–6.6	QBT 3	—	10-3886	10-3886	—	—	—	—	10-3886	—	—	—	—	—	—
RE26-10-21556	26-612301	0–0.5	SOIL	—	10-3886	10-3886	—	—	—	—	10-3886	—	—	—	—	—	—
RE26-10-21557	26-612301	5–6	QBT 3	—	10-3937	10-3937	—	—	—	—	10-3937	—	—	—	—	—	—
RE26-10-21558	26-612301	9–10	QBT 3	—	10-3937	10-3937	—	—	—	—	10-3937	—	—	—	—	—	—
RE26-10-21559	26-612302	0–0.5	SOIL	—	10-3886	10-3886	—	—	—	—	10-3886	—	—	—	—	—	—
RE26-10-21560	26-612302	5–6	QBT 3	—	10-3937	10-3937	—	—	—	—	10-3937	—	—	—	—	—	—
RE26-10-21561	26-612302	9–10	QBT 3	—	10-3937	10-3937	—	—	—	—	10-3937	—	—	—	—	—	—

[a] Analytical request number.

[b] — = Analysis not requested.

Table 8.2-2
Inorganic Chemicals Detected or Detected above BVs at SWMU 26-001

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Lead	Magnesium	Manganese	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Thallium	Vanadium	Zinc
Qbt 2, 3, 4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**11.2**	**1690**	**482**	**6.58**	**na[b]**	**na**	**3500**	**0.3**	**1.1**	**17**	**63.5**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**na**	**22.3**	**4610**	**671**	**15.4**	**na**	**na**	**3460**	**1.52**	**0.73**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**2580**	**1110**	**na**	**505[d]**	**388**	**51,900**	**62.8**	**800**	**na**	**160,000**	**25,700**	**2,080,000**	**908**	**na**	**6490**	**13**	**6530**	**1860**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**1240**	**457**	**na**	**281[d]**	**186**	**24,800**	**224**	**1110**	**na**	**14,800**	**12,400**	**991,000**	**434**	**na**	**3100**	**6.19**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,000**	**156**	**70.5**	**na**	**96.6[d]**	**23.4**	**3130**	**11.1**	**400**	**na**	**10,500**	**1560**	**125,000**	**54.8**	**na**	**391**	**0.782**	**394**	**23,500**
RE26-07-3522	26-600777	0.8–1.9	QBT 3	—[f]	—	3.45	84.4	—	—	15100	—	—	—	—	—	—	—	—	2.92	—	—	11.4	—	—	—
RE26-07-3523	26-600777	2.8–3.4	QBT 3	—	—	3.31	72.2	—	—	15500	—	—	—	—	—	—	—	—	15.9	0.000676 (J)	—	9.74	—	—	—
RE26-07-3519	26-600778	2.5–3.1	QBT 3	—	—	—	55.9	—	—	6640	—	—	—	—	—	—	—	—	50.6	0.00148 (J)	—	6.46	—	—	—
RE26-07-3525	26-600779	0.5–1.4	QBT 3	—	—	2.88	60.5	—	—	—	—	—	—	—	—	—	—	—	3.35	—	—	9.59	—	—	—
RE26-07-3526	26-600779	2.5–2.9	QBT 3	—	—	—	—	—	—	—	7.88 (J)	—	—	—	—	—	—	—	2.43	—	—	6.69	—	—	—
RE26-07-3531	26-600781	0.8–1.6	QBT 3	—	—	—	—	—	—	3710	—	—	—	—	—	—	—	—	1.04	—	—	6.93	—	—	—
RE26-07-3532	26-600781	2.8–3.4	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.69	0.00122 (J)	—	4.91	—	—	—
RE26-07-3533	26-600781	4.8–5.8	QBT 3	—	—	—	—	—	—	3690	—	—	—	—	—	—	—	—	1.67	0.0019 (J)	—	5.08	—	—	—
RE26-07-3537	26-600783	1–2.5	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4.15	—	—	5.55	—	—	—
RE26-07-3538	26-600783	3.5–4.5	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.42	—	—	4.06	—	—	—
RE26-07-3539	26-600783	5.5–6.1	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.885 (J)	—	—	4.1	—	—	—
RE26-07-3540	26-600784	0.7–1.3	QBT 3	—	—	3.85	87.4	—	—	7680	—	—	—	—	—	—	—	—	1.18	0.00066 (J)	—	10.8	—	—	—
RE26-07-3541	26-600784	2.7–3.3	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.979 (J)	—	—	6.04	—	—	—
RE26-07-3543	26-600785	0.8–1.3	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.18	—	—	5.44	—	—	—
RE26-07-3544	26-600785	2–3.3	QBT 3	—	—	—	—	—	—	2520	—	—	—	—	—	—	—	—	1.09	—	—	4.64	—	—	—
RE26-07-3545	26-600785	4.8–5.3	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4.39	—	—	—
RE26-07-3546	26-600786	0.5–1.2	QBT 3	—	—	—	—	—	—	3810	—	—	—	—	—	—	—	—	1.55	—	—	4.1	—	—	—
RE26-07-3549	26-600787	0.7–1.2	QBT 3	—	—	—	—	—	—	2430	—	—	—	—	—	—	—	—	1.31	—	—	5.08	—	—	—
RE26-07-3550	26-600787	2.7–3.2	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4.53	—	—	—
RE26-07-3552	26-600788	0.7–1.2	QBT 3	—	—	—	69.6	—	—	8260	—	—	—	—	—	—	—	—	1.11	—	—	9.02	—	—	—
RE26-07-3553	26-600788	2.7–3.2	QBT 3	—	—	—	—	—	—	3250	—	—	—	—	—	—	—	—	1.52	—	—	6.83	—	—	—
RE26-07-3554	26-600788	4.7–5.2	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.3	—	—	3.5	—	—	—
RE26-07-3555	26-600789	0.5–1	QBT 3	—	—	3.09	75	—	—	—	—	3.74	—	—	—	—	—	—	—	0.0012 (J)	—	11	—	—	—
RE26-07-3556	26-600789	2.5–3	QBT 3	—	—	—	65.4	—	—	2910	7.49 (J)	3.33	—	0.604	—	—	—	—	1.24	—	—	9.68	—	—	—
RE26-07-3557	26-600789	4.5–5	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.971 (J)	—	—	5.6	—	—	—
RE26-07-3558	26-600790	0.7–1.2	QBT 3	—	—	—	—	—	—	5170 (J-)	—	—	—	0.74	—	—	—	—	1.39	0.000894 (J)	—	7.65	—	—	—
RE26-07-3559	26-600790	2.7–3.2	QBT 3	—	—	—	—	—	—	3280 (J-)	9.25	—	—	—	—	—	—	—	1.21	0.000731 (J)	—	5.15	—	—	—
RE26-07-3561	26-600791	0.5–1	QBT 3	—	—	—	—	—	—	4990 (J-)	—	—	—	—	—	—	—	—	1.61	—	—	4.42	—	—	—
RE26-07-3562	26-600791	2.5–3.2	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.978 (J)	—	—	3.12	—	—	—
RE26-07-3564	26-600792	0.5–2	QBT 3	—	—	3.5	—	—	—	9510 (J-)	—	—	—	—	—	—	—	—	1.26	—	—	4.83	—	—	—

Table 8.2-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Lead	Magnesium	Manganese	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Thallium	Vanadium	Zinc
Qbt 2, 3, 4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**11.2**	**1690**	**482**	**6.58**	**na[b]**	**na**	**3500**	**0.3**	**1.1**	**17**	**63.5**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**na**	**22.3**	**4610**	**671**	**15.4**	**na**	**na**	**3460**	**1.52**	**0.73**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**2580**	**1110**	**na**	**505[d]**	**388**	**51,900**	**62.8**	**800**	**na**	**160,000**	**25,700**	**2,080,000**	**908**	**na**	**6490**	**13**	**6530**	**1860**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**1240**	**457**	**na**	**281[d]**	**186**	**24,800**	**224**	**1110**	**na**	**14,800**	**12,400**	**991,000**	**434**	**na**	**3100**	**6.19**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,000**	**156**	**70.5**	**na**	**96.6[d]**	**23.4**	**3130**	**11.1**	**400**	**na**	**10,500**	**1560**	**125,000**	**54.8**	**na**	**391**	**0.782**	**394**	**23,500**
RE26-07-3565	26-600792	2.5–3.2	QBT 3	—	—	—	—	—	—	2980 (J-)	—	—	—	—	—	—	—	—	—	—	—	3.04	—	—	—
RE26-10-21541	26-612296	0–0.5	SOIL	—	—	—	—	—	—	13700	—	—	—	NA[g]	—	—	—	—	7.3	NA	—	1.8	—	—	—
RE26-10-21542	26-612296	5–6	QBT 3	—	—	—	—	—	—	7600	9.9	—	—	NA	—	—	—	—	0.87	NA	—	1.7	—	—	—
RE26-10-21543	26-612296	9–10	QBT 3	—	—	—	—	—	—	2700	11.2	—	—	NA	—	—	—	—	1.2	NA	—	1.5	—	—	—
RE26-10-21544	26-612297	0–0.5	SOIL	—	—	—	—	—	—	10400	—	—	—	NA	—	—	—	—	2	NA	—	—	—	—	—
RE26-10-21545	26-612297	5–6	SOIL	—	8.1	—	—	—	—	17200	—	—	—	NA	—	—	—	—	1.1	NA	—	1.8	—	—	—
RE26-10-21546	26-612297	9–10	QBT 3	7570	11.9	—	137	—	—	13400	—	3.5	6.9	NA	13.7 (J-)	1780	—	6.8	3.5	NA	—	1.6	—	—	—
RE26-10-21547	26-612298	0–0.5	SOIL	—	—	—	—	—	—	11600	—	—	—	NA	—	—	—	—	3.5	NA	—	1.8	—	—	—
RE26-10-21548	26-612298	5–6	QBT 3	—	—	—	—	—	—	2760	—	—	—	NA	—	—	—	—	12.1	NA	—	2.2	—	—	—
RE26-10-21549	26-612298	9–10	QBT 3	—	—	—	—	—	—	—	—	—	—	NA	—	—	—	—	7.4	NA	—	2.3	—	—	—
RE26-10-21550	26-612299	0–0.5	SOIL	—	—	—	—	—	—	6420	—	—	—	NA	—	—	—	—	3.3	NA	—	—	—	—	—
RE26-10-21551	26-612299	5–6	QBT 3	—	—	—	—	—	—	2880	—	—	—	NA	—	—	—	—	0.19 (J)	NA	—	1.5	—	—	—
RE26-10-21552	26-612299	9–10	QBT 3	—	—	—	—	—	—	—	—	—	—	NA	—	—	—	—	0.22	NA	—	1.2	—	—	—
RE26-10-21553	26-612300	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	NA	—	—	—	—	2.5	NA	—	—	—	—	—
RE26-10-21554	26-612300	5–6	QBT 3	—	—	—	—	1.3	—	20900	—	—	6.6	NA	—	2980	—	6.6	0.27	NA	—	5.4	—	—	—
RE26-10-21555	26-612300	6–6.6	QBT 3	—	—	—	—	1.3	—	16600	10.4	—	8.1	NA	—	2850	—	8.9	0.44	NA	—	5.3	—	—	—
RE26-10-21556	26-612301	0–0.5	SOIL	—	—	—	—	—	—	6690	—	—	—	NA	—	—	—	—	2.5	NA	—	1.8	—	—	—
RE26-10-21557	26-612301	5–6	QBT 3	—	—	—	—	—	—	2810	16.8 (J)	—	10.7 (J)	NA	—	—	—	10.7 (J)	0.77	NA	—	2.6	—	—	—
RE26-10-21558	26-612301	9–10	QBT 3	—	—	—	—	—	—	—	9.7 (J)	—	12 (J)	NA	—	—	—	7.5 (J)	0.58	NA	—	1.6	—	—	—
RE26-10-21559	26-612302	0–0.5	SOIL	—	15.5	—	—	—	—	—	—	—	—	NA	—	—	—	—	4.3	NA	—	—	—	—	—
RE26-10-21560	26-612302	5–6	QBT 3	—	—	—	—	—	—	—	—	—	6.4 (J)	NA	—	—	—	—	0.15 (J)	NA	—	1.4	—	—	—
RE26-10-21561	26-612302	9–10	QBT 3	—	—	—	—	—	—	4320	—	—	6.9 (J)	NA	—	—	—	—	0.54	NA	—	1.7	—	—	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 8.2-3
Organic Chemicals Detected at SWMU 26-001

Sample ID	Location ID	Depth (ft)	Media	Acetone	Aroclor-1248	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Chrysene	Fluoranthene	Hexanone[2-]	Isopropyltoluene[4-]	Phenanthrene	Pyrene	Toluene
Industrial SSL[a]				**959,000**	**10.7**	**11.1**	**32.3**	**23.6**	**32.3**	**3230**	**33,700**	**1300[b]**	**14,100[c]**	**1160**	**25,300**	**61,100**
Recreational SSL[d]				**505,000**	**10.3**	**10.3**	**88.8**	**8.88**	**88.8**	**8880**	**11,500**	**2870**	**42,100[c]**	**1160**	**8630**	**47,600**
Residential SSL[a]				**66,300**	**2.43**	**2.43**	**1.53**	**1.12**	**1.53**	**153**	**2320**	**200[b]**	**2350[d]**	**1740**	**1740**	**5220**
RE26-07-3519	26-600778	2.5–3.1	QBT 3	—[e]	—	—	—	—	—	—	—	—	—	—	—	0.000696 (J)
RE26-07-3525	26-600779	0.5–1.4	QBT 3	—	0.073	—	—	—	—	—	—	—	—	—	—	0.0012
RE26-07-3526	26-600779	2.5–2.9	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	0.000479 (J)
RE26-07-3531	26-600781	0.8–1.6	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	0.000823 (J)
RE26-07-3532	26-600781	2.8–3.4	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	0.000344 (J)
RE26-07-3537	26-600783	1–2.5	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	0.00087 (J)
RE26-07-3540	26-600784	0.7–1.3	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	0.00034 (J)
RE26-07-3550	26-600787	2.7–3.2	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	0.00048 (J)
RE26-07-3552	26-600788	0.7–1.2	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	0.000428 (J)
RE26-07-3553	26-600788	2.7–3.2	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	0.00123
RE26-07-3555	26-600789	0.5–1	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	0.000536 (J)
RE26-07-3556	26-600789	2.5–3	QBT 3	—	—	—	—	—	—	—	—	—	0.00237	—	—	0.000721 (J)
RE26-07-3558	26-600790	0.7–1.2	QBT 3	—	—	—	0.0106 (J)	—	—	0.0104 (J)	0.0114 (J)	—	—	—	0.0105 (J)	0.00118
RE26-07-3559	26-600790	2.7–3.2	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	0.000336 (J)

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273), unless otherwise noted.

[b] SSLs are from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables).

[c] Isopropylbenzene used as a surrogate based on structural similarity.

[d] SSLs are from LANL (2017, 602581).

[e] — = Not detected.

Table 8.2-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 26-001

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-238	Plutonium-239/240	Strontium-90	Tritium	Uranium-234	Uranium-235/236	Uranium-238
Qbt 2, 3, 4 BV[a]				**na**[b]	**na**	**na**	**na**	**na**	**1.98**	**0.09**	**1.93**
Industrial SAL[c]				**41**	**1300**	**1200**	**2400**	**2,400,000**	**3100**	**160**	**710**
Recreational SAL[c]				**370**	**1400**	**1300**	**4900**	**5,700,000**	**3900**	**1000**	**2800**
Residential SAL[c]				**12**	**84**	**79**	**15**	**1700**	**290**	**42**	**150**
RE26-07-3522	26-600777	0.8–1.9	QBT 3	—[d]	—	—	—	0.442916	—	—	—
RE26-07-3523	26-600777	2.8–3.4	QBT 3	—	—	—	—	0.0973961	—	—	—
RE26-07-3519	26-600778	2.5–3.1	QBT 3	—	—	—	—	0.0125885	—	—	—
RE26-07-3525	26-600779	0.5–1.4	QBT 3	—	—	—	—	0.00547492	—	—	—
RE26-07-3531	26-600781	0.8–1.6	QBT 3	0.243	—	—	—	—	—	—	—
RE26-07-3532	26-600781	2.8–3.4	QBT 3	—	—	—	—	0.00916236	—	0.0993	—
RE26-07-3537	26-600783	1–2.5	QBT 3	—	1.43	0.154	—	—	—	—	—
RE26-07-3540	26-600784	0.7–1.3	QBT 3	—	—	—	—	0.0488085	—	—	—
RE26-07-3541	26-600784	2.7–3.3	QBT 3	—	—	—	—	—	—	0.102	—
RE26-07-3543	26-600785	0.8–1.3	QBT 3	—	—	—	—	—	—	0.139	—
RE26-07-3546	26-600786	0.5–1.2	QBT 3	—	—	—	—	0.04224	—	0.0977	—
RE26-07-3549	26-600787	0.7–1.2	QBT 3	0.36	—	—	—	0.0366175	—	0.0983	—
RE26-07-3550	26-600787	2.7–3.2	QBT 3	—	—	—	—	—	—	0.106	—
RE26-07-3552	26-600788	0.7–1.2	QBT 3	—	—	—	—	0.00940406	—	—	—
RE26-07-3555	26-600789	0.5–1	QBT 3	0.177	—	—	—	0.0129471	—	—	—
RE26-07-3556	26-600789	2.5–3	QBT 3	—	—	—	—	0.0408419	—	—	—
RE26-07-3558	26-600790	0.7–1.2	QBT 3	0.164	—	—	—	0.0160767	—	—	—
RE26-07-3561	26-600791	0.5–1	QBT 3	0.224	—	—	0.164	—	—	—	—
RE26-07-3562	26-600791	2.5–3.2	QBT 3	—	—	—	—	—	—	0.173	—

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SALs from LANL (2015, 600929).

[d] — = Not detected.

Table 8.3-1
Samples Collected and Analyses Requested at SWMU 26-002(a)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Explosive Compounds	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
RE26-08-7047	26-600910	3.5–5.5	QBT 3	08-54[a]	08-53	08-54	08-54	08-52	08-54	08-54	08-53	08-52	08-53	08-54	08-52	08-52	08-53
RE26-08-7048	26-600910	5.5–8.5	QBT 3	08-54	08-53	08-54	08-54	08-52	08-54	08-54	08-53	08-52	08-53	08-54	08-52	08-52	08-53
RE26-08-7049	26-600910	8.5–11	QBT 3	08-54	08-53	08-54	08-54	08-52	08-54	08-54	08-53	08-52	08-53	08-54	08-52	08-52	08-53
RE26-08-7044	26-600911	0.5–3.5	QBT 3	08-54	08-53	08-54	08-54	08-52	08-54	08-54	08-53	08-52	08-53	08-54	08-52	08-52	08-53
RE26-08-7045	26-600911	3.5–5.5	QBT 3	08-54	08-53	08-54	08-54	08-52	08-54	08-54	08-53	08-52	08-53	08-54	08-52	08-52	08-53
RE26-08-7046	26-600911	5.5–8.5	QBT 3	08-54	08-53	08-54	08-54	08-52	08-54	08-54	08-53	08-52	08-53	08-54	08-52	08-52	08-53
RE26-08-7041	26-600912	0.8–3.5	QBT 3	08-54	08-53	08-54	08-54	08-52	08-54	08-54	08-53	08-52	08-53	08-54	08-52	08-52	08-53
RE26-08-7042	26-600912	3.5–5.5	QBT 3	08-54	08-53	08-54	08-54	08-52	08-54	08-54	08-53	08-52	08-53	08-54	08-52	08-52	08-53
RE26-08-7043	26-600912	5.5–11	QBT 3	08-54	08-53	08-54	08-54	08-52	08-54	08-54	08-53	08-52	08-53	08-54	08-52	08-52	08-53
RE26-08-7038	26-600913	0.5–3.5	QBT 3	08-54	08-53	08-54	08-54	08-52	08-54	08-54	08-53	08-52	08-53	08-54	08-52	08-52	08-53
RE26-08-7039	26-600913	3.5–5.5	QBT 3	08-54	08-53	08-54	08-54	08-52	08-54	08-54	08-53	08-52	08-53	08-54	08-52	08-52	08-53
RE26-08-7040	26-600913	5.5–8.5	QBT 3	08-54	08-53	08-54	08-54	08-52	08-54	08-54	08-53	08-52	08-53	08-54	08-52	08-52	08-53
RE26-08-7035	26-600914	0.5–2.7	QBT 3	08-54	08-53	08-54	08-54	08-52	08-54	08-54	08-53	08-52	08-53	08-54	08-52	08-52	08-53
RE26-08-7036	26-600914	3.5–6	QBT 3	08-54	08-53	08-54	08-54	08-52	08-54	08-54	08-53	08-52	08-53	08-54	08-52	08-52	08-53
RE26-08-7037	26-600914	6–8.5	QBT 3	08-54	08-53	08-54	08-54	08-52	08-54	08-54	08-53	08-52	08-53	08-54	08-52	08-52	08-53
RE26-07-4215	26-600915	1.5–2	QBT 3	08-27	08-26	08-27	08-27	08-25	08-27	08-27	08-26	08-25	08-26	08-27	08-25	08-25	08-26
RE26-07-4216	26-600915	3.5–4.5	QBT 3	08-33	08-32	08-33	08-33	08-31	08-33	08-33	08-32	08-31	08-32	08-33	08-31	08-31	08-32
RE26-07-4217	26-600915	6–7.5	QBT 3	08-33	08-32	08-33	08-33	08-31	08-33	08-33	08-32	08-31	08-32	08-33	08-31	08-31	08-32
RE26-07-4218	26-600916	1–3.5	QBT 3	08-40	08-41	08-40	08-40	08-39	08-40	08-40	08-41	08-39	08-41	08-40	08-39	08-39	08-41
RE26-07-4219	26-600916	3.5–5.5	QBT 3	08-40	08-41	08-40	08-40	08-39	08-40	08-40	08-41	08-39	08-41	08-40	08-39	08-39	08-41
RE26-07-4220	26-600916	5.5–9.5	QBT 3	08-40	08-41	08-40	08-40	08-39	08-40	08-40	08-41	08-39	08-41	08-40	08-39	08-39	08-41
RE26-07-4221	26-600917	0–2.5	QBT 3	08-40	08-41	08-40	08-40	08-39	08-40	08-40	08-41	08-39	08-41	08-40	08-39	08-39	08-41
RE26-07-4222	26-600917	2.5–5	QBT 3	08-40	08-41	08-40	08-40	08-39	08-40	08-40	08-41	08-39	08-41	08-40	08-39	08-39	08-41
RE26-07-4223	26-600917	5–9	QBT 3	08-40	08-41	08-40	08-40	08-39	08-40	08-40	08-41	08-39	08-41	08-40	08-39	08-39	08-41
RE26-07-4224	26-600918	2.1–2.6	QBT 3	08-27	08-26	08-27	08-27	08-25	08-27	08-27	08-26	08-25	08-26	08-27	08-25	08-25	08-26
RE26-07-4225	26-600918	4.1–5.6	QBT 3	08-33	08-32	08-33	08-33	08-31	08-33	08-33	08-32	08-31	08-32	08-33	08-31	08-31	08-32
RE26-07-4226	26-600918	6.6–13.5	QBT 3	08-33	08-32	08-33	08-33	08-31	08-33	08-33	08-32	08-31	08-32	08-33	08-31	08-31	08-32
RE26-07-4227	26-600919	2.6–3.1	QBT 3	08-27	08-26	08-27	08-27	08-25	08-27	08-27	08-26	08-25	08-26	08-27	08-25	08-25	08-26
RE26-07-4228	26-600919	4.6–7	QBT 3	08-33	08-32	08-33	08-33	08-31	08-33	08-33	08-32	08-31	08-32	08-33	08-31	08-31	08-32
RE26-07-4229	26-600919	8–10.2	QBT 3	08-33	08-32	08-33	08-33	08-31	08-33	08-33	08-32	08-31	08-32	08-33	08-31	08-31	08-32
RE26-07-4230	26-600920	2.5–3	QBT 3	08-27	08-26	08-27	08-27	08-25	08-27	08-27	08-26	08-25	08-26	08-27	08-25	08-25	08-26
RE26-07-4231	26-600920	3.5–5	QBT 3	08-27	08-26	08-27	08-27	08-25	08-27	08-27	08-26	08-25	08-26	08-27	08-25	08-25	08-26
RE26-07-4232	26-600920	7–9	QBT 3	08-33	08-32	08-33	08-33	08-31	08-33	08-33	08-32	08-31	08-32	08-33	08-31	08-31	08-32
RE26-07-4233	26-600921	0.9–2.1	QBT 3	08-22	08-21	08-22	08-22	08-20	08-22	08-22	08-21	08-20	08-21	08-22	08-20	08-20	08-21

Table 8.3-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Explosive Compounds	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
RE26-07-4234	26-600921	2.9–3.5	QBT 3	08-22	08-21	08-22	08-22	08-20	08-22	08-22	08-21	08-20	08-21	08-22	08-20	08-20	08-21
RE26-07-4236	26-600922	1–1.8	QBT 3	08-22	08-21	08-22	08-22	08-20	08-22	08-22	08-21	08-20	08-21	08-22	08-20	08-20	08-21
RE26-10-21535	26-612294	0–0.5	SOIL	—[b]	10-3802	10-3802	—	—	—	—	10-3802	—	—	—	—	—	—
RE26-10-21536	26-612294	5–6	QBT 3	—	10-3802	10-3802	—	—	—	—	10-3802	—	—	—	—	—	—
RE26-10-21537	26-612294	9–10	QBT 3	—	10-3802	10-3802	—	—	—	—	10-3802	—	—	—	—	—	—
RE26-10-21566	26-612303	0–0.5	SOIL	—	—	—	—	—	—	—	10-3776	—	—	—	—	—	—
RE26-10-21567	26-612303	5–6	QBT 3	—	—	—	—	—	—	—	10-3776	—	—	—	—	—	—
RE26-10-21568	26-612303	15–16	QBT 3	—	—	—	—	—	—	—	10-3776	—	—	—	—	—	—
RE26-10-21569	26-612303	24–25	QBT 3	—	—	—	—	—	—	—	10-3776	—	—	—	—	—	—
RE26-10-21570	26-612304	0–0.5	SOIL	—	—	—	—	—	—	—	10-3776	—	—	—	—	—	—
RE26-10-21571	26-612304	5–6	QBT 3	—	—	—	—	—	—	—	10-3776	—	—	—	—	—	—
RE26-10-21572	26-612304	15–16	QBT 3	—	—	—	—	—	—	—	10-3776	—	—	—	—	—	—
RE26-10-21573	26-612304	24–25	QBT 3	—	—	—	—	—	—	—	10-3776	—	—	—	—	—	—
RE26-10-21574	26-612305	0–0.5	SOIL	—	—	—	—	—	—	—	10-3776	—	—	—	—	—	—
RE26-10-21575	26-612305	5–6	QBT 3	—	—	—	—	—	—	—	10-3802	—	—	—	—	—	—
RE26-10-21576	26-612305	15–16	QBT 3	—	—	—	—	—	—	—	10-3802	—	—	—	—	—	—
RE26-10-21577	26-612305	24–25	QBT 3	—	—	—	—	—	—	—	10-3802	—	—	—	—	—	—

[a] Analytical request number.

[b] — = Analysis not requested.

Table 8.3-2
Inorganic Chemicals Detected or Detected above BVs at SWMU 26-002(a)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Lead	Magnesium	Manganese	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Thallium	Vanadium	Zinc
Qbt 2, 3, 4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**11.2**	**1690**	**482**	**6.58**	**na[b]**	**na**	**3500**	**0.3**	**1.1**	**17**	**63.5**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**na**	**22.3**	**4610**	**671**	**15.4**	**na**	**na**	**3460**	**1.52**	**0.73**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**2580**	**1110**	**na**	**505[d]**	**388**	**51,900**	**62.8**	**800**	**na**	**160,000**	**25,700**	**2,080,000**	**908**	**na**	**6490**	**13**	**6530**	**1860**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**1240**	**457**	**na**	**281[d]**	**186**	**24,800**	**224**	**1110**	**na**	**14,800**	**12,400**	**991,000**	**434**	**na**	**3100**	**6.19**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,000**	**156**	**70.5**	**na**	**96.6[d]**	**23.4**	**3130**	**11.1**	**400**	**na**	**10,500**	**1560**	**125,000**	**54.8**	**na**	**391**	**0.782**	**394**	**23,500**
RE26-08-7047	26-600910	3.5–5.5	QBT 3	—[f]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9.21	—	—	—
RE26-08-7048	26-600910	5.5–8.5	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7.28	—	—	—
RE26-08-7049	26-600910	8.5–11	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7.28	—	—	—
RE26-08-7044	26-600911	0.5–3.5	QBT 3	—	—	4.28	68.2	—	—	9870 (J+)	7.93 (J)	—	5.83	—	—	—	—	7.45	—	—	—	12.1	—	—	—
RE26-08-7045	26-600911	3.5–5.5	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6.37	—	—	—
RE26-08-7046	26-600911	5.5–8.5	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6.42	—	—	—
RE26-08-7041	26-600912	0.8–3.5	QBT 3	—	—	—	—	—	—	4050 (J+)	—	—	—	—	—	—	—	—	0.75 (J)	—	—	9.15	—	—	—
RE26-08-7042	26-600912	3.5–5.5	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6.12	—	—	—
RE26-08-7043	26-600912	5.5–11	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7.34	—	—	—
RE26-08-7038	26-600913	0.5–3.5	QBT 3	—	—	3.58	61.6	—	—	3840 (J+)	—	—	—	—	—	—	—	7.3	1.61	0.000665 (J)	—	10.8	—	—	—
RE26-08-7039	26-600913	3.5–5.5	QBT 3	—	—	3.87	—	—	—	—	—	—	—	—	—	—	881	—	—	0.000732 (J)	—	9.74	—	—	72.5
RE26-08-7040	26-600913	5.5–8.5	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7.05	—	—	—
RE26-08-7035	26-600914	0.5–2.7	QBT 3	—	—	3.41	—	—	—	7570 (J+)	—	—	—	—	—	—	—	—	—	—	—	8.13	—	—	—
RE26-08-7036	26-600914	3.5–6	QBT 3	—	—	3.54	—	—	—	6680 (J+)	—	—	—	—	—	—	—	—	—	—	—	8.66	—	—	—
RE26-08-7037	26-600914	6–8.5	QBT 3	—	—	3.48	—	—	—	7520 (J+)	7.35 (J)	—	—	—	—	—	—	—	—	—	—	9.56	—	—	—
RE26-07-4215	26-600915	1.5–2	QBT 3	—	0.627 (J-)	4.04	102	—	—	13300 (J-)	—	—	6.33	—	12.6	1770 (J+)	—	7.44 (U)	1.07 (J)	0.000863 (J+)	—	13.3	—	—	—
RE26-07-4216	26-600915	3.5–4.5	QBT 3	—	—	3.07	49.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9.55	—	—	—
RE26-07-4217	26-600915	6–7.5	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7.87	—	—	—
RE26-07-4218	26-600916	1–3.5	QBT 3	—	—	5.45	107	—	—	30400	—	—	5.53	—	—	1750 (J+)	—	8.44	0.889 (J)	0.00079 (J)	—	16.3	—	—	—
RE26-07-4219	26-600916	3.5–5.5	QBT 3	—	—	3.73	—	—	—	—	8.03 (U)	—	—	—	—	—	492	—	7.43	—	—	7.63	—	—	—
RE26-07-4220	26-600916	5.5–9.5	QBT 3	—	—	4.12	58.5	—	—	4270	—	—	5.52	—	17.6	1730 (J+)	—	—	7.12	—	—	12.7	—	—	—
RE26-07-4221	26-600917	0–2.5	QBT 3	—	—	8.34	102	—	—	26800	—	—	—	—	—	2040 (J+)	—	—	5.52	0.000656 (J)	—	15.4	—	22.4	—
RE26-07-4222	26-600917	2.5–5	QBT 3	—	—	3.41	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6.47	—	—	—
RE26-07-4223	26-600917	5–9	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5.06	—	—	—
RE26-07-4224	26-600918	2.1–2.6	QBT 3	—	—	3.22	89.9	—	—	8370 (J-)	—	—	—	—	—	—	—	—	—	—	—	9.96	—	—	—
RE26-07-4225	26-600918	4.1–5.6	QBT 3	—	—	3.65	—	—	—	—	8.72	—	—	—	—	—	—	—	—	—	—	9.28	—	—	—
RE26-07-4226	26-600918	6.6–13.5	QBT 3	—	—	—	—	—	—	—	7.89	—	—	—	—	—	—	—	—	—	—	6.62	—	—	—
RE26-07-4227	26-600919	2.6–3.1	QBT 3	—	—	3.87	112	—	—	11200 (J-)	—	—	5.95	—	11.3	—	—	7.63 (U)	2.29	0.00191 (J+)	—	12.3	—	—	—
RE26-07-4228	26-600919	4.6–7	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5.97	—	—	—

Table 8.3-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Lead	Magnesium	Manganese	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Thallium	Vanadium	Zinc
Qbt 2, 3, 4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**11.2**	**1690**	**482**	**6.58**	**na[b]**	**na**	**3500**	**0.3**	**1.1**	**17**	**63.5**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**na**	**22.3**	**4610**	**671**	**15.4**	**na**	**na**	**3460**	**1.52**	**0.73**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**2580**	**1110**	**na**	**505[d]**	**388**	**51,900**	**62.8**	**800**	**na**	**160,000**	**25,700**	**2,080,000**	**908**	**na**	**6490**	**13**	**6530**	**1860**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**1240**	**457**	**na**	**281[d]**	**186**	**24,800**	**224**	**1110**	**na**	**14,800**	**12,400**	**991,000**	**434**	**na**	**3100**	**6.19**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,000**	**156**	**70.5**	**na**	**96.6[d]**	**23.4**	**3130**	**11.1**	**400**	**na**	**10,500**	**1560**	**125,000**	**54.8**	**na**	**391**	**0.782**	**394**	**23,500**
RE26-07-4229	26-600919	8–10.2	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6.15	—	—	—
RE26-07-4230	26-600920	2.5–3	QBT 3	—	—	3.33	148	—	—	12300 (J-)	—	3.8	9.74	—	—	1940 (J+)	—	12.1 (U)	2.06	—	—	15.1	—	18.2	—
RE26-07-4231	26-600920	3.5–5	QBT 3	—	—	6.75	—	—	—	—	7.49 (U)	—	—	—	—	—	—	—	—	—	—	5.02	—	—	—
RE26-07-4232	26-600920	7–9	QBT 3	—	—	2.96	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8.23	—	—	—
RE26-07-4233	26-600921	0.9–2.1	QBT 3	—	—	4.45	75.4	—	—	17000	—	—	—	—	—	—	—	—	3.85	—	—	8.27 (J)	—	—	—
RE26-07-4234	26-600921	2.9–3.5	QBT 3	—	—	4.47	75.9	—	1.71 (J)	17900	24.9 (J-)	—	5.37 (J)	—	—	—	—	—	3.51	—	—	13.6 (J)	—	—	—
RE26-07-4236	26-600922	1–1.8	QBT 3	—	—	3.81	56.3	—	—	7170	8.95 (J-)	—	—	—	—	—	—	—	6.47	—	—	6.05 (J)	—	—	—
RE26-10-21535	26-612294	0–0.5	SOIL	—	—	—	—	—	—	—	26.6	—	—	NA[g]	—	—	—	—	0.78	NA	—	—	1.066 (U)	—	—
RE26-10-21536	26-612294	5–6	QBT 3	—	—	—	—	—	—	3400	14.3	—	—	NA	—	—	—	8.1	0.17 (J)	NA	—	1.6	—	—	—
RE26-10-21537	26-612294	9–10	QBT 3	—	—	—	—	—	—	2600	48.9	—	—	NA	—	—	—	22.6	0.18 (J)	NA	—	1.6	—	—	—
RE26-10-21566	26-612303	0–0.5	SOIL	—	1.03 (U)	—	—	—	0.513 (U)	27100	—	—	—	NA	—	5420 (J+)	—	—	NA	NA	3490 (J+)	—	—	—	—
RE26-10-21567	26-612303	5–6	QBT 3	—	1.02 (U)	—	—	—	—	2680	—	—	—	NA	—	—	—	—	NA	NA	—	1.03 (U)	—	—	—
RE26-10-21568	26-612303	15–16	QBT 3	—	1.01 (U)	—	—	—	—	—	—	—	—	NA	—	—	—	—	NA	NA	—	1.01 (U)	—	—	—
RE26-10-21569	26-612303	24–25	QBT 3	—	1.04 (U)	—	—	—	—	—	—	—	—	NA	—	—	—	—	NA	NA	—	1.04 (U)	—	—	—
RE26-10-21570	26-612304	0–0.5	SOIL	—	0.993 (U)	—	—	—	—	—	—	—	—	NA	—	—	—	—	NA	NA	—	—	—	—	—
RE26-10-21571	26-612304	5–6	QBT 3	—	1.02 (U)	—	—	—	—	—	—	—	—	NA	—	—	—	—	NA	NA	—	1.01 (U)	—	—	—
RE26-10-21572	26-612304	15–16	QBT 3	—	1.02 (U)	—	—	—	—	—	—	—	—	NA	—	—	—	—	NA	NA	—	1.01 (U)	—	—	—
RE26-10-21573	26-612304	24–25	QBT 3	—	1.02 (U)	—	—	—	—	—	—	—	—	NA	—	—	—	—	NA	NA	—	1.01 (U)	—	—	—
RE26-10-21574	26-612305	0–0.5	SOIL	—	1.01 (U)	—	—	—	0.506 (U)	29600	—	—	—	NA	—	—	—	—	NA	NA	—	—	—	—	—
RE26-10-21575	26-612305	5–6	QBT 3	—	—	—	—	—	—	—	19.7	—	—	NA	—	—	—	10.3	NA	NA	—	1.7	—	—	—
RE26-10-21576	26-612305	15–16	QBT 3	—	—	—	—	—	—	—	14.8	—	—	NA	—	—	—	7.4	NA	NA	—	1.4	—	—	—
RE26-10-21577	26-612305	24–25	QBT 3	—	—	—	—	—	—	—	—	—	—	NA	—	—	—	—	NA	NA	—	1.3	—	—	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 8.3-3
Organic Chemicals Detected at SWMU 26-002(a)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Aroclor-1248	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Chrysene	Fluoranthene	Hexanone[2-]	Isopropyltoluene[4-]	Phenanthrene	Pyrene	Toluene
Industrial SSL[a]				**959,000**	**10.7**	**11.1**	**32.3**	**23.6**	**32.3**	**3230**	**33,700**	**1300[b]**	**14,100[c]**	**1160**	**25,300**	**61,100**
Recreational SSL[d]				**505,000**	**10.3**	**10.3**	**88.8**	**8.88**	**88.8**	**8880**	**11,500**	**2870**	**42,100[c]**	**1160**	**8630**	**47,600**
Residential SSL[a]				**66,300**	**2.43**	**2.43**	**1.53**	**1.12**	**1.53**	**153**	**2320**	**200[b]**	**2350[c]**	**1740**	**1740**	**5220**
RE26-08-7047	26-600910	3.5–5.5	QBT 3	—[e]	—	—	—	—	—	—	—	0.00163 (J+)	—	—	—	—
RE26-08-7044	26-600911	0.5–3.5	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	0.000377 (J)
RE26-08-7041	26-600912	0.8–3.5	QBT 3	—	—	—	0.0405	0.0262 (J)	0.0489	0.0216 (J)	0.0647	—	—	0.0334 (J)	0.0454	—
RE26-07-4215	26-600915	1.5–2	QBT 3	—	—	—	—	—	—	—	0.0128 (J)	—	—	—	0.0166 (J)	0.000989 (J)
RE26-07-4216	26-600915	3.5–4.5	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	0.000398 (J)
RE26-07-4217	26-600915	6–7.5	QBT 3	—	—	—	—	—	—	—	—	0.00218 (J)	—	—	—	—
RE26-07-4224	26-600918	2.1–2.6	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	0.000498 (J)
RE26-07-4227	26-600919	2.6–3.1	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	0.00182
RE26-07-4230	26-600920	2.5–3	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	0.00524
RE26-07-4234	26-600921	2.9–3.5	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	0.00073 (J+)
RE26-07-4236	26-600922	1–1.8	QBT 3	—	—	0.0041 (J)	—	—	—	—	—	—	—	—	—	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273), unless otherwise noted.

[b] SSLs are from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables).

[c] Isopropylbenzene used as a surrogate based on structural similarity.

[d] SSLs are from LANL (2017, 602581).

[e] — = Not detected.

Table 8.3-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 26-002(a)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-238	Plutonium-239/240	Strontium-90	Tritium	Uranium-234	Uranium-235/236	Uranium-238
Qbt 2, 3, 4 BV[a]				**na[b]**	**na**	**na**	**na**	**na**	**1.98**	**0.09**	**1.93**
Industrial SAL[c]				**41**	**1300**	**1200**	**2400**	**2,400,000**	**3100**	**160**	**710**
Recreational SAL[c]				**370**	**1400**	**1300**	**4900**	**5,700,000**	**3900**	**1000**	**2800**
Residential SAL[c]				**12**	**84**	**79**	**15**	**1700**	**290**	**42**	**150**
RE26-08-7047	26-600910	3.5–5.5	QBT 3	—[d]	—	—	—	0.0639466	—	0.112	—
RE26-08-7048	26-600910	5.5–8.5	QBT 3	—	—	—	—	0.108985	—	0.0933	—
RE26-08-7049	26-600910	8.5–11	QBT 3	—	—	—	—	0.39062	—	0.0927	—
RE26-08-7045	26-600911	3.5–5.5	QBT 3	—	—	—	—	—	—	0.111	—
RE26-08-7038	26-600913	0.5–3.5	QBT 3	—	—	—	—	—	—	0.0918	—
RE26-08-7039	26-600913	3.5–5.5	QBT 3	—	—	—	—	0.0232274	—	0.101	—
RE26-08-7040	26-600913	5.5–8.5	QBT 3	—	—	—	—	0.0236356	—	0.0911	—
RE26-08-7036	26-600914	3.5–6	QBT 3	—	—	—	—	—	—	0.128	—
RE26-07-4215	26-600915	1.5–2	QBT 3	—	—	—	—	0.0573405	—	—	—
RE26-07-4216	26-600915	3.5–4.5	QBT 3	—	—	—	—	0.0618511	—	—	—
RE26-07-4217	26-600915	6–7.5	QBT 3	—	—	—	—	0.16949	—	—	—
RE26-07-4218	26-600916	1–3.5	QBT 3	—	—	—	—	0.0275419	—	—	—
RE26-07-4219	26-600916	3.5–5.5	QBT 3	—	—	—	—	0.0520392	—	—	—
RE26-07-4220	26-600916	5.5–9.5	QBT 3	—	—	—	—	0.280074	—	—	—
RE26-07-4221	26-600917	0–2.5	QBT 3	0.189	—	—	—	0.0224571	—	—	—
RE26-07-4222	26-600917	2.5–5	QBT 3	—	—	—	—	0.0212409	—	—	—
RE26-07-4224	26-600918	2.1–2.6	QBT 3	—	—	—	—	0.0209038	—	0.0945	—
RE26-07-4225	26-600918	4.1–5.6	QBT 3	—	—	—	0.13	0.0345999	—	—	—
RE26-07-4226	26-600918	6.6–13.5	QBT 3	—	—	—	—	0.507251	—	—	—
RE26-07-4227	26-600919	2.6–3.1	QBT 3	—	—	—	—	0.157226	—	—	—
RE26-07-4228	26-600919	4.6–7	QBT 3	—	—	—	—	0.0136797	—	—	—
RE26-07-4229	26-600919	8–10.2	QBT 3	—	—	—	—	0.0519242	—	—	—
RE26-07-4230	26-600920	2.5–3	QBT 3	—	—	—	—	0.0502996	—	—	—
RE26-07-4231	26-600920	3.5–5	QBT 3	—	—	—	—	0.0469744	—	—	—
RE26-07-4232	26-600920	7–9	QBT 3	—	—	—	—	0.0244345	—	—	—
RE26-07-4233	26-600921	0.9–2.1	QBT 3	0.311	—	—	—	0.0167871	—	—	—
RE26-07-4234	26-600921	2.9–3.5	QBT 3	—	—	—	—	0.038172	—	—	—
RE26-07-4236	26-600922	1–1.8	QBT 3	0.415	—	0.0769 (J)	—	—	—	—	—

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SALs from LANL (2015, 600929).

[d] — = Not detected.

Table 8.4-1
Samples Collected and Analyses Requested at SWMU 26-002(b)

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Explosive Compounds	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
RE26-07-4239	26-600923	1.2–1.7	QBT 3	08-22[a]	08-21	08-22	08-22	08-20	08-22	08-22	08-21	08-20	08-21	08-22	08-20	08-20	08-21
RE26-08-7032	26-600924	0.5–3	QBT 3	08-54	08-53	08-54	08-54	08-52	08-54	08-54	08-53	08-52	08-53	08-54	08-52	08-52	08-53
RE26-08-7033	26-600924	3.5–5.5	QBT 3	08-54	08-53	08-54	08-54	08-52	08-54	08-54	08-53	08-52	08-53	08-54	08-52	08-52	08-53
RE26-08-7034	26-600924	5.5–11	QBT 3	08-54	08-53	08-54	08-54	08-52	08-54	08-54	08-53	08-52	08-53	08-54	08-52	08-52	08-53
RE26-07-4245	26-600925	0.5–3	QBT 3	08-49	08-48	08-49	08-49	08-47	08-49	08-49	08-48	08-47	08-48	08-49	08-47	08-47	08-48
RE26-07-4246	26-600925	3–5.5	QBT 3	08-49	08-48	08-49	08-49	08-47	08-49	08-49	08-48	08-47	08-48	08-49	08-47	08-47	08-48
RE26-07-4247	26-600925	5.5–8	QBT 3	08-49	08-48	08-49	08-49	08-47	08-49	08-49	08-48	08-47	08-48	08-49	08-47	08-47	08-48
RE26-10-21578	26-612306	0–0.5	SOIL	—[b]	—	—	—	—	—	—	10-3802	—	—	—	—	—	—
RE26-10-21579	26-612306	5–6	QBT 3	—	—	—	—	—	—	—	10-3802	—	—	—	—	—	—
RE26-10-21580	26-612306	15–16	QBT 3	—	—	—	—	—	—	—	10-3802	—	—	—	—	—	—
RE26-10-21581	26-612306	24–25	QBT 3	—	—	—	—	—	—	—	10-3802	—	—	—	—	—	—

[a] Analytical request number.

[b] — = Analysis not requested.

Table 8.4-2
Inorganic Chemicals Detected or Detected above BVs at SWMU 26-002(b)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Lead	Magnesium	Manganese	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Thallium	Vanadium	Zinc
Qbt 2, 3, 4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**11.2**	**1690**	**482**	**6.58**	**na[b]**	**na**	**3500**	**0.3**	**1.1**	**17**	**63.5**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**na**	**22.3**	**4610**	**671**	**15.4**	**na**	**na**	**3460**	**1.52**	**0.73**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**2580**	**1110**	**na**	**505[d]**	**388**	**51,900**	**62.8**	**800**	**na**	**160,000**	**25,700**	**2,080,000**	**908**	**na**	**6490**	**13**	**6530**	**1860**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**1240**	**457**	**na**	**281[d]**	**186**	**24,800**	**224**	**1110**	**na**	**14,800**	**12,400**	**991,000**	**434**	**na**	**3100**	**6.19**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,000**	**156**	**70.5**	**na**	**96.6[d]**	**23.4**	**3130**	**11.1**	**400**	**na**	**10,500**	**1560**	**125,000**	**54.8**	**na**	**391**	**0.782**	**394**	**23,500**
RE26-07-4239	26-600923	1.2–1.7	QBT 3	—[f]	—	3.39	72.8	—	—	10400	7.93 (J-)	—	—	0.531	17.4	—	—	—	4.14	0.00131 (J)	—	7.55 (J)	—	—	—
RE26-08-7032	26-600924	0.5–3	QBT 3	—	—	4.27	95	—	—	28100 (J+)	—	—	—	—	—	—	533	7.62	—	—	—	17	—	—	—
RE26-08-7033	26-600924	3.5–5.5	QBT 3	—	—	—	—	—	—	3240 (J+)	9.7 (J)	—	—	—	—	—	—	—	—	—	—	7.82	—	—	—
RE26-08-7034	26-600924	5.5–11	QBT 3	—	—	—	—	—	—	—	—	—	—	—	94.1	—	—	—	—	—	—	6.48	1.27 (U)	—	—
RE26-07-4245	26-600925	0.5–3	QBT 3	—	—	—	54.9	—	—	11000 (J)	—	—	—	—	—	1840	—	—	0.819 (J)	0.0014 (J)	—	1.59 (U)	—	—	—
RE26-07-4246	26-600925	3–5.5	QBT 3	—	—	—	—	—	—	2220 (J)	16.7 (U)	—	—	—	—	—	—	—	—	—	—	1.49 (U)	—	—	—
RE26-07-4247	26-600925	5.5–8	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.62 (J)	—	—	—
RE26-10-21578	26-612306	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	NA[g]	39.2	—	—	—	NA	NA	—	—	—	—	—
RE26-10-21579	26-612306	5–6	QBT 3	—	—	—	—	—	—	12300	—	—	—	NA	—	—	—	—	NA	NA	—	1.9	—	—	—
RE26-10-21580	26-612306	15–16	QBT 3	—	—	—	—	—	—	—	—	—	—	NA	—	—	—	—	NA	NA	—	1.5	—	—	—
RE26-10-21581	26-612306	24–25	QBT 3	—	—	—	—	—	—	—	12.9	—	—	NA	—	—	—	6.6	NA	NA	—	1.7	—	—	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 8.4-3
Organic Chemicals Detected at SWMU 26-002(b)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Aroclor-1260	Toluene
Industrial SSL[a]				**959,000**	**11.1**	**61,100**
Recreational SSL[b]				**505,000**	**10.3**	**47,600**
Residential SSL[a]				**66,300**	**2.43**	**5220**
RE26-07-4239	26-600923	1.2–1.7	QBT 3	0.00331 (J)	0.0073 (J)	0.000579 (J+)

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.
[a] SSLs are from NMED (2017, 602273), unless otherwise noted.
[b] SSLs are from LANL (2017, 602581).

Table 8.4-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 26-002(b)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-238	Plutonium-239/240	Strontium-90	Tritium	Uranium-234	Uranium-235/236	Uranium-238
Qbt 2, 3, 4 BV[a]				**na[b]**	**na**	**na**	**na**	**na**	**1.98**	**0.09**	**1.93**
Industrial SAL[c]				**41**	**1300**	**1200**	**2400**	**2,400,000**	**3100**	**160**	**710**
Recreational SAL[c]				**370**	**1400**	**1300**	**4900**	**5,700,000**	**3900**	**1000**	**2800**
Residential SAL[c]				**12**	**84**	**79**	**15**	**1700**	**290**	**42**	**150**
RE26-07-4239	26-600923	1.2–1.7	QBT 3	0.2	—[d]	—	—	0.0188317	—	—	—
RE26-08-7032	26-600924	0.5–3	QBT 3	—	—	—	—	0.0173553	—	—	—
RE26-08-7033	26-600924	3.5–5.5	QBT 3	—	—	—	—	0.0143531	—	—	—
RE26-08-7034	26-600924	5.5–11	QBT 3	—	—	—	—	0.00634808	—	—	—
RE26-07-4245	26-600925	0.5–3	QBT 3	—	—	—	—	—	2.65	0.187	2.61
RE26-07-4247	26-600925	5.5–8	QBT 3	—	—	—	—	0.0232763	—	0.0919	—

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.
[a] BVs/FVs are from LANL (1998, 059730).
[b] na = Not available.
[c] SALs from LANL (2015, 600929).
[d] — = Not detected.

Table 8.5-1
Samples Collected and Analyses Requested at SWMU 26-003

Sample ID	Location ID	Depth (ft)	Media	Americium-241	Nitrate	Gamma-emitting Radionuclides	Tritium	Explosive Compounds	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	Perchlorate	Strontium-90	SVOCs	VOCs	Cyanide (Total)
RE26-07-3507	26-600773	3.1–5	QBT 3	08-37[a]	08-36	08-37	08-37	08-35	08-37	08-37	08-36	08-35	08-36	08-37	08-35	08-35	08-36
RE26-07-3508	26-600773	5.1–7.1	QBT 3	08-37	08-36	08-37	08-37	08-35	08-37	08-37	08-36	08-35	08-36	08-37	08-35	08-35	08-36
RE26-07-3509	26-600773	7.5–9	QBT 3	08-37	08-36	08-37	08-37	08-35	08-37	08-37	08-36	08-35	08-36	08-37	08-35	08-35	08-36
RE26-07-3510	26-600774	3.1–5.1	QBT 3	08-37	08-36	08-37	08-37	08-35	08-37	08-37	08-36	08-35	08-36	08-37	08-35	08-35	08-36
RE26-07-3511	26-600774	5.1–7	QBT 3	08-37	08-36	08-37	08-37	08-35	08-37	08-37	08-36	08-35	08-36	08-37	08-35	08-35	08-36
RE26-07-3512	26-600774	7.6–9	QBT 3	08-37	08-36	08-37	08-37	08-35	08-37	08-37	08-36	08-35	08-36	08-37	08-35	08-35	08-36
RE26-07-3513	26-600775	0.5–1.5	QBT 3	08-37	08-36	08-37	08-37	08-35	08-37	08-37	08-36	08-35	08-36	08-37	08-35	08-35	08-36
RE26-07-3514	26-600775	2.5–3	QBT 3	08-37	08-36	08-37	08-37	08-35	08-37	08-37	08-36	08-35	08-36	08-37	08-35	08-35	08-36
RE26-07-3516	26-600776	0.6–1.1	QBT 3	08-37	08-36	08-37	08-37	08-35	08-37	08-37	08-36	08-35	08-36	08-37	08-35	08-35	08-36
RE26-07-3517	26-600776	2.6–3.1	QBT 3	08-37	08-36	08-37	08-37	08-35	08-37	08-37	08-36	08-35	08-36	08-37	08-35	08-35	08-36
RE26-07-3528	26-600780	0.7–1.2	QBT 3	08-30	08-29	08-30	08-30	08-28	08-30	08-30	08-29	08-28	08-29	08-30	08-28	08-28	08-29
RE26-07-3529	26-600780	3.2–3.9	QBT 3	08-30	08-29	08-30	08-30	08-28	08-30	08-30	08-29	08-28	08-29	08-30	08-28	08-28	08-29
RE26-07-4248	26-600926	0.8–1.4	QBT 3	08-38	08-38	08-38	08-38	08-38	08-38	08-38	08-38	08-38	08-38	08-38	08-38	08-38	08-38
RE26-07-4249	26-600926	2.8–3.2	QBT 3	08-38	08-38	08-38	08-38	08-38	08-38	08-38	08-38	08-38	08-38	08-38	08-38	08-38	08-38
RE26-07-4251	26-600927	2–3	QBT 3	08-38	08-38	08-38	08-38	08-38	08-38	08-38	08-38	08-38	08-38	08-38	08-38	08-38	08-38
RE26-07-4254	26-600928	0–2.5	QBT 3	08-49	08-48	08-49	08-49	08-47	08-49	08-49	08-48	08-47	08-48	08-49	08-47	08-47	08-48
RE26-07-4255	26-600928	2.5–4.5	QBT 3	08-49	08-48	08-49	08-49	08-47	08-49	08-49	08-48	08-47	08-48	08-49	08-47	08-47	08-48
RE26-07-4256	26-600928	4.5–6.9	QBT 3	08-49	08-48	08-49	08-49	08-47	08-49	08-49	08-48	08-47	08-48	08-49	08-47	08-47	08-48
RE26-07-4257	26-600929	2.5–4.7	QBT 3	08-40	08-41	08-40	08-40	08-39	08-40	08-40	08-41	08-39	08-41	08-40	08-39	08-39	08-41
RE26-07-4258	26-600929	4.5–7	QBT 3	08-40	08-41	08-40	08-40	08-39	08-40	08-40	08-41	08-39	08-41	08-40	08-39	08-39	08-41
RE26-07-4259	26-600929	7–10.8	QBT 3	08-40	08-41	08-40	08-40	08-39	08-40	08-40	08-41	08-39	08-41	08-40	08-39	08-39	08-41
RE26-10-21538	26-612295	0–0.5	SOIL	—[b]	10-3809	10-3809	—	—	—	—	10-3809	—	—	—	—	—	—
RE26-10-21539	26-612295	5–6	QBT 3	—	10-3809	10-3809	—	—	—	—	10-3809	—	—	—	—	—	—
RE26-10-21540	26-612295	9–10	QBT 3	—	10-3809	10-3809	—	—	—	—	10-3809	—	—	—	—	—	—

[a] Analytical request number.

[b] — = Analysis not requested.

Table 8.5-2
Inorganic Chemicals Detected or Detected above BVs at SWMU 26-003

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Cyanide (Total)	Lead	Magnesium	Manganese	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Thallium	Vanadium	Zinc
Qbt 2, 3, 4 BV[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**0.5**	**11.2**	**1690**	**482**	**6.58**	**na**[b]	**na**	**3500**	**0.3**	**1.1**	**17**	**63.5**
Soil BV[a]				**29200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**na**	**22.3**	**4610**	**671**	**15.4**	**na**	**na**	**3460**	**1.52**	**0.73**	**39.6**	**48.8**
Industrial SSL[c]				**1,290,000**	**519**	**35.9**	**255,000**	**2580**	**1110**	**na**	**505**[d]	**388**	**51,900**	**62.8**	**800**	**na**	**160,000**	**25,700**	**2,080,000**	**908**	**na**	**6490**	**13**	**6530**	**1860**
Recreational SSL[e]				**619,000**	**248**	**42.9**	**124,000**	**1240**	**457**	**na**	**281**[d]	**186**	**24,800**	**224**	**1110**	**na**	**14,800**	**12,400**	**991,000**	**434**	**na**	**3100**	**6.19**	**3100**	**186,000**
Residential SSL[c]				**78,000**	**31.3**	**7.07**	**15,000**	**156**	**70.5**	**na**	**96.6**[d]	**23.4**	**3130**	**11.1**	**400**	**na**	**10,500**	**1560**	**125,000**	**54.8**	**na**	**391**	**0.782**	**394**	**23,500**
RE26-07-3507	26-600773	3.1–5	QBT 3	—[f]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5.44	—	—	—
RE26-07-3508	26-600773	5.1–7.1	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.662 (J-)	—	—	5.51	—	—	—
RE26-07-3509	26-600773	7.5–9	QBT 3	—	—	—	—	—	—	—	34.4	—	6.84	—	—	—	—	—	—	—	—	7.18	—	—	—
RE26-07-3510	26-600774	3.1–5.1	QBT 3	—	—	6.48	—	—	—	10600 (J+)	—	—	—	—	—	1770 (J+)	—	—	0.716 (J-)	0.00169 (J)	—	10.1	—	22.8 (J)	—
RE26-07-3511	26-600774	5.1–7	QBT 3	—	—	6.02	46.3	—	—	18400 (J+)	10.7 (U)	—	—	—	—	—	—	—	—	0.000947 (J)	—	15.7	—	—	—
RE26-07-3512	26-600774	7.6–9	QBT 3	—	—	3.74	—	—	—	4150 (J+)	12.9 (U)	—	—	—	—	—	—	—	—	0.000521 (J)	—	6.36	—	—	—
RE26-07-3513	26-600775	0.5–1.5	QBT 3	—	—	4.47	72.2	—	—	18700 (J+)	—	—	—	—	—	—	—	—	4.41 (J-)	0.000539 (J)	—	10.5	—	—	—
RE26-07-3514	26-600775	2.5–3	QBT 3	—	—	4.1	—	—	—	8160 (J+)	—	—	—	—	—	—	—	—	2.59 (J-)	—	—	7.7	—	—	—
RE26-07-3516	26-600776	0.6–1.1	QBT 3	—	—	4.8	76.5	—	—	10400 (J+)	—	—	5.63	—	13.6	—	—	—	3.21 (J-)	0.00194 (J)	—	13.9	—	—	—
RE26-07-3517	26-600776	2.6–3.1	QBT 3	—	—	4.64	54.3	—	—	16000 (J+)	—	—	—	—	—	—	—	—	—	0.000777 (J)	—	12.6	—	—	—
RE26-07-3528	26-600780	0.7–1.2	QBT 3	—	—	2.85	—	—	—	5310	—	—	—	—	—	—	—	—	4.28	—	—	6.85	—	—	—
RE26-07-3529	26-600780	3.2–3.9	QBT 3	—	—	—	—	—	—	4690	—	—	—	—	—	—	—	—	25.2	0.0038	—	7.35	—	—	—
RE26-07-4248	26-600926	0.8–1.4	QBT 3	—	—	4.18	81.8	—	—	6130	—	—	6.75	—	12.1	—	—	—	4.5 (J-)	—	—	9.05	—	—	—
RE26-07-4249	26-600926	2.8–3.2	QBT 3	—	—	—	—	—	—	—	14.6	—	—	—	—	—	—	—	1.23 (J-)	—	—	5.61	—	—	—
RE26-07-4251	26-600927	2–3	QBT 3	—	—	4.48	194	—	—	23900	—	—	6.68	—	—	1950 (J+)	—	—	5.52 (J-)	0.00141 (J)	—	14.9	—	—	—
RE26-07-4254	26-600928	0–2.5	QBT 3	—	—	4.31	79.1	—	—	18500 (J)	18.8 (J)	—	5.66 (J)	—	—	—	—	—	—	—	—	0.616 (J)	—	—	—
RE26-07-4255	26-600928	2.5–4.5	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.52 (U)	—	—	—
RE26-07-4256	26-600928	4.5–6.9	QBT 3	—	—	—	—	—	—	5300 (J)	11.5 (U)	—	—	—	—	—	—	—	—	—	—	1.48 (U)	—	—	—
RE26-07-4257	26-600929	2.5–4.7	QBT 3	—	—	4.27	—	—	—	7060	—	—	—	—	—	—	—	—	2.58	—	—	6.46	—	—	—
RE26-07-4258	26-600929	4.5–7	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6.01	—	—	—
RE26-07-4259	26-600929	7–10.8	QBT 3	—	—	—	—	—	—	—	—	—	—	1.86	—	—	—	—	1.03	—	—	5.78	—	—	—
RE26-10-21538	26-612295	0–0.5	SOIL	—	—	—	—	—	—	17200	—	—	—	NA[g]	27.8	—	—	—	2.6	NA	—	2.3	—	—	—
RE26-10-21539	26-612295	5–6	QBT 3	—	—	—	—	—	—	—	—	—	—	NA	—	—	—	—	1.3	NA	—	1.6	—	—	—
RE26-10-21540	26-612295	9–10	QBT 3	—	—	—	—	—	—	—	—	—	—	NA	—	—	—	—	0.69	NA	—	1.4	—	—	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs are from NMED (2017, 602273), unless otherwise noted.

[d] SSLs are for total chromium.

[e] SSLs are from LANL (2017, 602581).

[f] — = Not detected or not detected above BV.

[g] NA = Not analyzed.

Table 8.5-3
Organic Chemicals Detected at SWMU 26-003

Sample ID	Location ID	Depth (ft)	Media	Acetone	Aroclor-1248	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Chrysene	Fluoranthene	Hexanone[2-]	Isopropyltoluene[4-]	Phenanthrene	Pyrene	Toluene
Industrial SSL[a]				**959,000**	**10.7**	**11.1**	**32.3**	**23.6**	**32.3**	**3230**	**33,700**	**1300[b]**	**14,100[c]**	**1160**	**25,300**	**61,100**
Recreational SSL[d]				**505,000**	**10.3**	**10.3**	**88.8**	**8.88**	**88.8**	**8880**	**11,500**	**2870**	**42,100[d]**	**1160**	**8630**	**47,600**
Residential SSL[a]				**66,300**	**2.43**	**2.43**	**1.53**	**1.12**	**1.53**	**153**	**2320**	**200[b]**	**2350[d]**	**1740**	**1740**	**5220**
RE26-07-3511	26-600774	5.1–7	QBT 3	—[e]	0.0301	—	—	—	—	—	—	—	0.000896 (J)	—	—	—
RE26-07-3513	26-600775	0.5–1.5	QBT 3	0.00452 (J)	—	—	—	—	—	—	—	—	—	—	—	—
RE26-07-3516	26-600776	0.6–1.1	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	0.000676 (J+)
RE26-07-3517	26-600776	2.6–3.1	QBT 3	0.00596 (J)	—	—	—	—	—	—	—	—	—	—	—	0.000915 (J)
RE26-07-3528	26-600780	0.7–1.2	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	0.000485 (J)
RE26-07-3529	26-600780	3.2–3.9	QBT 3	—	—	—	—	—	—	—	—	—	—	—	—	0.000818 (J)
RE26-07-4248	26-600926	0.8–1.4	QBT 3	—	—	0.0513	—	—	0.0123 (J)	—	0.013 (J)	—	—	—	—	—
RE26-07-4249	26-600926	2.8–3.2	QBT 3	—	—	0.0108	—	—	—	—	—	—	—	—	—	—
RE26-07-4251	26-600927	2–3	QBT 3	—	—	0.0053	—	—	—	—	—	—	—	—	—	—

Notes: Results are in mg/kg. Data qualifiers are defined in Appendix A.

[a] SSLs are from NMED (2017, 602273), unless otherwise noted.

[b] SSLs are from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables).

[c] Isopropylbenzene used as a surrogate based on structural similarity.

[d] SSLs are from LANL (2017, 602581).

[e] — = Not detected.

Table 8.5-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 26-003

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-238	Plutonium-239/240	Strontium-90	Tritium	Uranium-234	Uranium-235/236	Uranium-238
Qbt 2, 3, 4 BV[a]				**na[b]**	**na**	**na**	**na**	**na**	**1.98**	**0.09**	**1.93**
Industrial SAL[c]				**41**	**1300**	**1200**	**2400**	**2,400,000**	**3100**	**160**	**710**
Recreational SAL[c]				**370**	**1400**	**1300**	**4900**	**5,700,000**	**3900**	**1000**	**2800**
Residential SAL[c]				**12**	**84**	**79**	**15**	**1700**	**290**	**42**	**150**
RE26-07-3507	26-600773	3.1–5	QBT 3	—[d]	—	—	—	0.0374977	—	—	—
RE26-07-3508	26-600773	5.1–7.1	QBT 3	—	—	—	—	—	—	0.0921	—
RE26-07-3510	26-600774	3.1–5.1	QBT 3	—	—	—	—	0.273009	2.51	0.125	2.54
RE26-07-3513	26-600775	0.5–1.5	QBT 3	—	—	—	—	0.17849	—	—	—
RE26-07-3516	26-600776	0.6–1.1	QBT 3	0.514	—	0.0269 (J-)	—	—	—	—	—
RE26-07-3517	26-600776	2.6–3.1	QBT 3	—	—	—	—	0.0890857	—	—	—
RE26-07-4248	26-600926	0.8–1.4	QBT 3	—	—	—	—	0.100239	—	—	—
RE26-07-4249	26-600926	2.8–3.2	QBT 3	—	—	—	—	0.00832311	—	0.124	—
RE26-07-4251	26-600927	2–3	QBT 3	0.281	—	—	—	0.082043	—	—	—
RE26-07-4255	26-600928	2.5–4.5	QBT 3	—	—	—	—	0.00733878	—	—	—
RE26-07-4256	26-600928	4.5–6.9	QBT 3	—	—	—	—	0.00826904	—	0.107	—
RE26-07-4257	26-600929	2.5–4.7	QBT 3	—	—	—	—	0.0424488	—	—	—
RE26-07-4258	26-600929	4.5–7	QBT 3	—	—	—	—	0.0538452	—	—	—
RE26-07-4259	26-600929	7–10.8	QBT 3	—	—	—	—	—	—	0.0977	—

Notes: Results are in pCi/g. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SALs from LANL (2015, 600929).

[d] — = Not detected.

Table 10.1-1
Summary of Investigation Results and Recommendations

SWMU/AOC	Site Description	Extent Defined?	Potential Unacceptable Risk/Dose?	Recommendations
TA-02				
AOC 02-003(a)	Soil contamination from stack-gas valve house and gaseous effluent line	Yes	Yes (residential – dose only)	Corrective action complete without controls
AOC 02-003(b)	Soil contamination at condensate trap and line 119	Yes	No	Corrective action complete without controls
AOC 02-003(c)	Soil contamination at gaseous effluent delay tanks	Yes	Yes (residential)	Corrective action complete with controls
AOC 02-003(d)	Soil contamination at site of upper part of line 119 and temporary vent line	Yes	No	Corrective action complete without controls
AOC 02-003(e)	Soil contamination	Yes	Yes (residential)	Corrective action complete with controls
AOC 02-004(a)	Former reactor facility	Yes	No	Corrective action complete without controls
AOC 02-004(b) AOC 02-004(c) AOC 02-004(d)	Former storage tanks for effluent from OWR and equipment building	Yes	No	Corrective action complete without controls
AOC 02-004(e)	Former acid pit/transfer sump	Yes	No	Corrective action complete without controls
AOC 02-004(f)	Former equipment building and acid waste line to TA-50	Yes	No	Corrective action complete without controls
AOC 02-004(g)	Soil contamination	Yes	No	Corrective action complete without controls
SWMU 02-005	Soil contamination	Yes	No	Corrective action complete without controls
SWMU 02-006(a)	Former French drain	Yes	No	Corrective action complete without controls
SWMU 02-006(b)	Former acid waste line, laboratory effluent	Yes	Yes (residential)	Corrective action complete with controls
AOC 02-006(c)	Former drainline from offices, restrooms, control room	Yes	No	Corrective action complete without controls
AOC 02-006(d)	Duplicate of AOC 02-006(c)	n/a	n/a	Corrective action complete without controls
AOC 02-006(e)	Former sump for reactor room floor drains and mezzanine	Yes	No	Corrective action complete without controls
SWMU 02-007	Septic system for floor drains in OWR building and chemical shack	Yes	No	Corrective action complete without controls
SWMU 02-008(a)	Outfall	Yes	No	Corrective action complete without controls
AOC 02-008(c)	Outfall for seepage into basement of OWR building	Yes	No	Corrective action complete without controls
SWMU 02-009(a)	Soil contamination	Yes	No	Corrective action complete without controls
SWMU 02-009(b)	Soil contamination	Yes	No	Corrective action complete without controls
SWMU 02-009(c)	Soil contamination	Yes	Yes (residential – dose only)	Corrective action complete without controls
AOC 02-009(d)	Soil contamination	Yes	Yes (residential – dose only)	Corrective action complete without controls
AOC 02-009(e)	Duplicate of SWMU 02-009(c)	n/a*	n/a	Corrective action complete without controls
AOC 02-010	Soil contamination	Yes	No	Corrective action complete without controls
AOC 02-011(a)	Storm drains, outfalls	Yes	No	Corrective action complete without controls
AOC 02-011(b)	Former drainlines from stack-gas valve house	Yes	No	Corrective action complete without controls
AOC 02-011(c)	Storm drain	Yes	No	Corrective action complete without controls
AOC 02-011(d)	Outfall from equipment building	Yes	Yes (residential)	Corrective action complete with controls
AOC 02-011(e)	Duplicate of SWMU 02-008(a)	n/a	n/a	Corrective action complete without controls
AOC 02-012	Soil contamination	Yes	No	Corrective action complete without controls
SWMU 02-014	Former transformer stations	Yes	Yes	Soil removal and confirmatory sampling
TA-21				
SWMU 21-006(e)	Seepage pit	Yes	No	Corrective action complete without controls
AOC 21-006(f)	Seepage pit	Yes	No	Corrective action complete without controls
AOC 21-028(c)	Storage areas	Yes	No	Corrective action complete without controls
TA-26				
SWMU 26-001	Surface disposal site	Yes	No	Corrective action complete without controls
SWMU 26-002(a)	Soil contamination	Yes	No	Corrective action complete without controls
SWMU 26-002(b)	Drainline	Yes	No	Corrective action complete without controls
SWMU 26-003	Septic tank	Yes	No	Corrective action complete without controls

* n/a = Not applicable.

Appendix A

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

A-1.0 ACRONYMS AND ABBREVIATIONS

AE	assessment endpoints
AK	acceptable knowledge
ALARA	as low as reasonably achievable
AOC	area of concern
ASTM	American Society for Testing and Materials
ATSDR	Agency for Toxic Substances and Disease Registry
AUF	area use factor
bgs	below ground surface
BV	background value
CCV	continuing calibration verification
CMP	corrugated metal pipe
COC	chain of custody
Consent Order	Compliance Order on Consent
COPEC	chemical of potential ecological concern
COPC	chemical of potential concern
DAF	dilution attenuation factor
D&D	decontamination and decommissioning
DGPS	differential global-positioning system
DL	detection limit
DOE	Department of Energy (U.S.)
dpm	disintegrations per minute
DRO	diesel range organics
Eh	oxidation-reduction potential
EPA	Environmental Protection Agency U.S.
EPC	exposure point concentration
EQL	estimated quantitation limit
ESL	ecological screening level
FV	fallout value
HE	high explosives
HI	hazard index
HQ	hazard quotient
HR	home range

HYPO	high power (reactor)
ICS	interference check sample
ICV	initial calibration verification
I.D.	inside diameter
IDW	investigation-derived waste
IS	internal standard
K_d	soil-water partition coefficient
K_{oc}	organic carbon-water partition coefficient
K_{ow}	octanol-water partition coefficient
LANL	Los Alamos National Laboratory
LANS	Los Alamos National Security, LLC
LAL	lower acceptance limit
LCS	laboratory control sample
LLW	low-level waste
LOAEL	lowest observed adverse effect level
LOPO	low power (reactor)
MDA	material disposal area
MDC	minimum detectable concentration
MDL	method detection limit
mmHg	millimeters of mercury
MS	matrix spike
MSW	municipal solid waste
N3B	Newport News Nuclear BWXT – Los Alamos, LLC
NMED	New Mexico Environment Department
NOAEL	no observed adverse effect level
NPDES	National Pollutant Discharge Elimination System
OU	operable unit
OWR	Omega West Reactor
%R	percent recovery
%RSD	percent relative standard deviation
PAH	polycyclic aromatic hydrocarbon
PAUF	population area use factor
PCB	polychlorinated biphenyl
PID	photoionization detector

QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
RCT	radiation control technician
RESRAD	residual radioactive (model)
RfD	reference dose
RFI	RCRA facility investigation
RL	reporting limit
RPD	relative percent difference
RSRL	regional statistical reference level
SAL	screening action level
SCL	sample collection log
SF	slope factor
SMO	Sample Management Office
SOP	standard operating procedure
SOW	statement of work
SSL	soil screening level
SUPO	super power (reactor)
SVOC	semivolatile organic compound
SWMU	solid waste management unit
T&E	threatened and endangered
TA	technical area
TAL	target analyte list
TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin
TPH	total petroleum hydrocarbons
TPU	total propagated uncertainty
TRV	toxicity reference value
UAL	upper acceptance limit
UCL	upper confidence limit
UST	underground storage tank
UTL	upper tolerance limit
VCP	vitrified clay pipe
VOC	volatile organic compound
WBR	water boiler reactor

WCSF waste characterization strategy form

A-2.0 METRIC CONVERSION TABLE

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

A-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 2010 Phase II investigation and supplemental 2017 sampling at the Middle Los Alamos Canyon Aggregate Area at Los Alamos National Laboratory (LANL or the Laboratory). Table B-1.0-1 summarizes the field investigation methods, and the following sections provide more detailed descriptions of these methods. All activities were conducted in accordance with approved subcontractor procedures that are technically equivalent to the Laboratory standard operating procedures (SOPs) listed in Table B-1.0-2.

B-2.0 EXPLORATORY DRILLING CHARACTERIZATION

No exploratory drilling characterization was conducted during the 2010 Phase II investigation and supplemental 2017 sampling. 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 organic vapors was performed as necessary for health and safety purposes. Field screening for radioactivity was performed on every sample submitted to the Laboratory Sample Management Office (SMO). Field-screening results for all investigation activities are described in section 3.2-2 and are presented in Table 3.2-2 of the investigation report.

B-3.1 Field Screening for Organic Vapors

Field screening for organic vapors was conducted for all samples, except when the sampling media was saturated. Screening was conducted using a MiniRAE 2000 photoionization detector (PID) equipped with an 11.7-electron volt lamp. Screening was performed in accordance with the manufacturer’s specifications and SOP-06.33, “Headspace Vapor Screening with a Photo Ionization Detector.” Screening was performed on each sample collected, and screening measurements were recorded on the field sample collection logs (SCLs), provided on DVD in Appendix F. The field-screening results are presented in Table 3.2-2 of the 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 radiation 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 to detect alpha emissions. The operational range varies from trace emissions to 1 million disintegrations per minute. Screening measurements were recorded on the SCLs and are provided on DVD in Appendix F. The screening results are presented in Table 3.2-2 of the 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. The RCT calibrated the Eberline E-600 instrument 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 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 RCT calibrated the Eberline E-600 daily 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 Phase II investigation work plan (LANL 2009, 105073; NMED 2009, 105595).

B-5.1 Surface Sampling Methods

Surface samples were collected in Technical Area 02 (TA-02) and TA-26 using either hand-auger or spade-and-scoop methods. Surface samples were collected in accordance with approved subcontractor procedures technically equivalent to SOP-06.10, “Hand Auger and Thin-Wall Tube Sampler,” or SOP-06.09, “Spade and Scoop Method for the Collection of Soil Samples.” A hand auger or spade and scoop was used to collect material in approximately 6-in. increments. The samples were transferred to sterile sample collection jars or bags. Samples were preserved using coolers to maintain the required temperature and chemical preservatives such as nitric acid in accordance with an approved subcontractor procedure technically equivalent to SOP-5056, “Sample Containers and Preservation.”

Samples were appropriately labeled, sealed with custody seals, and documented before transporting to the SMO. Samples were managed according to approved subcontractor procedures technically equivalent to SOP-5057, “Handling, Packaging, and Transporting Field Samples,” and SOP-5058, “Sample Control and Field Documentation.”

Sample collection tools were decontaminated (section B-5.7) 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

Borehole logs were completed for all boreholes drilled at TA-02, TA-21, TA-26, and TA-61 with a hollow-stem auger drill rig. During drilling, all boreholes were continuously cored and logged in 2.5-ft intervals. Information recorded in field boring logs included footage and percent recovery, lithology and depths of lithologic contacts, depth of samples collected, field screening results, core descriptions, and other relevant observations. The borehole logs are provided on CD in Appendix C.

B-5.3 Subsurface Tuff Sampling Methods

Subsurface samples were collected using approved subcontractor procedures technically equivalent to SOP-06.10, “Hand Auger and Thin-Wall Tube Sampler,” or SOP-06.26, “Core Barrel Sampling for Subsurface Earth Materials.” Borehole samples were collected in a stainless-steel split-spoon core-barrel sampler that retrieved core in 2.5-ft intervals. The samples collected, listed by borehole and depth, are provided in tables for each site discussed in the investigation report.

Core retrieved from the subsurface was field screened for organic vapors, visually inspected, and logged. Following inspection, samples for volatile organic compound (VOC) analysis were collected immediately to minimize the loss of subsurface VOCs during the sample collection process. After collection of the VOC samples, the 2.5-ft core section to be sampled was removed from the core barrel and placed in a stainless-steel bowl. The material was crushed, if necessary, with a decontaminated rock hammer and stainless-steel spoon to allow core material to fit into sample containers. The samples for the remaining analytical suites were transferred to sterile sample collection jars or bags for transport to the SMO.

The tools used to collect samples were decontaminated (section B-5.7) immediately before each sample was collected in accordance with an approved subcontractor procedure technically equivalent to SOP-5061, “Field Decontamination of Equipment.”

If alluvial or shallow groundwater was encountered during drilling of characterization holes, the saturated interval was sealed using a temporary surface casing or other appropriate technique to allow continuation of the hole without transporting water into the deeper intervals. If sampling was not possible because of saturated conditions, the planned samples were collected at the first practicable depth below the saturated zone.

B-5.4 Quality Control Samples

Quality control samples were collected in accordance with an approved subcontractor procedure technically equivalent to SOP-5059, “Field Quality Control Samples.” The quality control 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, hexavalent chromium, perchlorate, and total cyanide) and were collected from sampling equipment at a frequency of at least 1 rinsate sample for every 10 solid samples.

Field trip blanks also were collected at a frequency of one per day 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-5.5 Sample Documentation and Handling

Field personnel completed an SCL 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 accepted custody of the samples.

B-5.6 Borehole Abandonment

All boreholes were abandoned in accordance with an approved subcontractor procedure technically equivalent to SOP-5034, “Monitoring Well and RFI Borehole Abandonment,” by filling the boreholes with bentonite chips up to 2.0–3.0 ft from the ground surface. The chips were hydrated and clean soil placed on top. Pavement was patched as necessary depending on existing site conditions. All cuttings were managed as investigation-derived waste (IDW), as described in Appendix D.

B-5.7 Decontamination of Sampling Equipment

The split-spoon core barrels and all other sampling equipment that came (or could have come) in contact with sample material were decontaminated after each core was retrieved and logged. Decontamination included wiping the equipment with Fantastik and paper towels. 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-5.8 Site Demobilization and Restoration

The first drill rig was demobilized from the site on October 12, 2010, and the second drill rig was demobilized from the site on November 10, 2011. 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 were dismantled and returned to preinvestigation conditions. All excavated and disturbed areas will be regraded and reseeded with native grass mix.

B-6.0 SOIL REMEDIATION

At TA-02, the approved Phase II investigation work plan identified 15 locations for soil remediation. The work plan and New Mexico Environment Department (NMED) approval (LANL 2009, 105073; NMED 2009, 105595) provided guidelines for soil remediation, including extending excavations and collecting additional confirmation samples if required.

B-6.1 Target Cleanup Levels

At 11 of the 15 soil remediation locations, an elevated detection of polychlorinated biphenyls (PCBs) during the 2007 Phase I investigation was driving remediation. The target cleanup level for PCBs is 1 mg/kg. At two locations, remediation activities targeted cesium-137, at one location, remediation activities targeted polycyclic aromatic hydrocarbons (PAHs), and at one location remediation activities targeted semivolatile organic compounds. Target cleanup levels for cesium-137 and PAHs were industrial soil screening levels (SSLs).

B-6.2 Preexcavation Sampling

Where possible, preexcavation samples were collected and analyzed for the target analyte(s) to define lateral and vertical extent before remediation began. Preexcavation sampling locations were offset 4 ft to the north, south, east, and west from the proposed remediation location to define lateral extent, per the approved Phase II investigation work plan (LANL 2009, 105073; NMED 2009, 105595). Preexcavation samples were also collected at depth to define vertical extent and were submitted for fixed-laboratory analysis of the target analyte(s) on a 48-hr turnaround schedule. If a preexcavation result was greater than the cleanup level specified in the approved Phase II investigation work plan (LANL 2009, 105073), additional samples were collected at offset locations or at deeper depths, as appropriate. If a preexcavation result was less than the proposed cleanup level, the sample became a confirmation sample and the excavation was defined in that direction or depth.

B-6.3 Excavation

A backhoe or small track mounted excavator was used to remove environmental media exceeding target cleanup levels, and the media was managed as IDW in compliance with an approved waste characterization strategy form (WCSF) (see section B-8.0). If required, additional confirmation samples were collected. Following remediation, the excavated area was backfilled with clean fill, compacted, and revegetated as described above in section B-5.8.

B-6.4 Decontamination of Excavation Equipment

Decontamination activities were performed in accordance with an approved subcontractor procedure technically equivalent to SOP-5061, "Field Decontamination of Equipment." Residual material adhering to equipment was removed using dry decontamination methods such as the use of wire brushes and scrapers. All decontaminated equipment was surveyed by an RCT before it was released from the site. PCB swipe samples were collected from the tires and bucket of equipment used for remediation of PCB contamination to ensure it met release criteria. Additional decontamination and swipe sampling was conducted, if necessary, before equipment was removed from the site.

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 investigation report.

B-8.0 IDW STORAGE AND DISPOSAL

All IDW generated during the field investigation was managed in accordance with SOP-5238, "Characterization and Management of Environmental Program Waste." This procedure incorporates the requirements of all applicable U.S. Environmental Protection Agency (EPA) and NMED regulations, U.S. Department of Energy orders, and Laboratory implementation requirements. IDW was also managed in accordance with the approved WCSF and the IDW management appendix of the approved Phase II investigation work plan (LANL 2009, 105073; NMED 2009, 105595). Details of IDW management for the Phase II investigation are presented in Appendix D.

B-9.0 DEVIATIONS FROM THE WORK PLAN

Implementation of Phase II activities resulted in the following deviations from the approved Phase II investigation work plan:

- At approximately 12 ft below ground surface at location 02-612435 (work plan location 22), a fuel-oil odor was detected in the borehole cuttings. Therefore, the analytical suite for all subsequent samples collected at location 02-612435 included total petroleum hydrocarbons-diesel range organics.
- Because of safety concerns, location 02-612983 (work plan location 29) was moved 20 ft northwest and supplemented by additional samples collected from location 02-612982 (20 ft northeast).
- Because of the presence of large rocks, concrete, or borehole/hand-auger refusal, several sampling locations were moved from the planned locations. Actual locations were resurveyed and coordinates uploaded to the Sample Management Database. Table B-9.0-1 presents the sampling locations that were moved a significant distance from the proposed location and explains the reason for the move.

- Following six rounds of step-out sampling at location 02-600449 (work plan location 11), the lateral and vertical extent of PCB contamination were still not defined. Remediation activities for location 02-600449 were not completed because of the unanticipated magnitude of the excavation. Further sampling and remediation are proposed as part of the Phase III investigation.
- Because of safety concerns and practicability, remediation activities could not be performed at location 02-600561 (work plan location 60), which is on a steep, rocky slope inaccessible by mechanized equipment. Instead, additional step-out sampling was performed to define the extent of PCB contamination and ensure recreational SSLs were not exceeded at this location. Although regular recreational use of this site is unlikely given the steepness of the slope, it is the only potential land use. In addition, this location is situated in a small side drainage that appears to be the source of contamination in the area. Based on the distribution of Aroclor-1260 (i.e., higher concentrations to the north), it appears that contamination is not coming from TA-02. The lateral and vertical extent of PCBs are defined, the recreational SSLs are not exceeded, and the site will be proposed for stabilization to mitigate potential storm water migration in the Phase III investigation work plan.

B-10.0 REFERENCES

The following reference list includes all documents cited in this report. Parenthetical information following each reference provides the author(s), publication date, and ERID, ESHID, or EMID. This information is also included in text citations. ERIDs were assigned by the Laboratory's Associate Directorate for Environmental Management (IDs through 599999); ESHIDs were assigned by the Laboratory's Associate Directorate for Environment, Safety, and Health (IDs 600000 through 699999); and EMIDs are assigned by Newport News Nuclear BWXT – Los Alamos, LLC (N3B) (IDs 700000 and above). IDs are used to locate documents in N3B's Records Management System and in the Master Reference Set. The NMED Hazardous Waste Bureau and N3B maintain copies of the Master Reference Set. The set ensures that NMED has the references to review documents. The set is updated when new references are cited in documents.

LANL (Los Alamos National Laboratory), February 2009. "Phase II Investigation Work Plan for Middle Los Alamos Canyon Aggregate Area, Revision 1," Los Alamos National Laboratory document LA-UR-09-1206, Los Alamos, New Mexico. (LANL 2009, 105073)

NMED (New Mexico Environment Department), March 25, 2009. "Approval, Middle Los Alamos Canyon Aggregate Area Phase II Work Plan, Revision 1," New Mexico Environment Department letter to D. Gregory (DOE LASO) and D. McInroy (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2009, 105595)

Table B-1.0-1
Summary of Field Investigation Methods

Method	Summary
Spade and Scoop Collection of Soil Samples	This method was used to collect shallow (i.e., approximately 0–12 in.) soil or sediment samples. The spade-and-scoop method involved digging a hole to the desired depth, as prescribed in the approved work plan, and collecting a discrete grab sample. Each sample was placed in a clean stainless-steel bowl for transfer into various sample containers.
Hand Auger Sampling	This method is typically used for sampling soil or sediment at depths of less than 10–15 ft, but in some cases may be used to collect samples of weathered or nonwelded tuff. The method involves hand-turning a stainless-steel bucket auger (typically 3–4 in. inside diameter [I.D.]), creating a vertical hole that can be advanced to the desired sampling depth. When the desired depth was reached, the auger was decontaminated before advancing the hole through the sampling depth. The sample material was transferred from the auger bucket to a stainless-steel sampling bowl before the various required sample containers were filled.
Split-Spoon Core-Barrel Sampling	In this method, a stainless-steel core barrel (typically 4 in. I.D., 2.5 ft long) is advanced using a powered drilling rig. The core barrel extracts a continuous length of soil and/or rock that can be examined as a unit. The split-spoon core barrel is a cylindrical barrel split lengthwise so the two halves can be separated to expose the core sample. Once extracted, the section of core was screened for radioactivity and organic vapors and described in a geologic log. A portion of the core was then collected as a discrete sample from the desired depth.
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, 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 them to ensure 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 to ship the samples to the analytical laboratories.
Sample Control and Field Documentation	The collection, screening, and transport of samples were documented on standard forms generated by the SMO. These included SCLs 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. SCLs were completed and signed to verify that the samples were not left unattended.
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.

Table B-1.0-1 (continued)

Method	Summary
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 with ice in insulated containers 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 Plane 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 was managed, characterized, and stored in accordance with an approved WCSF that documented the 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 deterioration of containers. A waste storage area was established before waste was generated. Waste storage areas were located in controlled areas of the Laboratory to prevent unauthorized personnel from inadvertently adding or managing wastes. 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 Conducted at Middle Los Alamos Canyon Aggregate Area

SOP-5018, "Integrated Fieldwork Planning and Authorization"
SOP-5028, "Coordinating and Evaluating Geodetic Surveys"
SOP-5034, "Monitor Well and RFI Borehole Abandonment"
SOP-5055, "General Instructions for Field Investigations"
SOP-5056, "Sample Containers and Preservation"
SOP-5057, "Handling, Packaging, and Transporting Field Samples"
SOP-5058, "Sample Control and Field Documentation"
SOP-5059, "Field Quality Control Samples"
SOP-5061, "Field Decontamination of Equipment"
SOP-5181, "Notebook and Logbook Documentation for Environmental Directorate Technical and Field Activities"
SOP-01.12, "Field Site Closeout Checklist"
SOP-5238, "Characterization and Management of Environmental Program Waste"
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 Photo Ionization Detector"
EP-DIR-QAP-0001, "Quality Assurance Plan for the Environmental Programs"

Note: Procedures used were approved subcontractor procedures technically equivalent to the procedures listed.

Table B-9.0-1
Summary of Sampling Deviations from the Approved Work Plan

SWMU/AOC	Work Plan Location	Sampling Location	Description of Deviation
02-004(a,f), 02-011(a)(iv)	19	02-612346	Moved 2 ft east because of a culvert
02-011(a)(x), 02-008(c)(ii)	29	02-612983	Moved 15 ft northwest because of the proximity to drainage
02-003(c), 02-009(c)	36	02-612420	Moved 2 ft southeast because of a large boulder
02-009(a)	37	02-612421	Moved 7 ft west because of a large boulder and tree
02-006(c), 02-011(a)(ix)	22	02-612345	Moved 1 ft north because of refusal
TA-02 core area	43	02-612409	Moved 1 ft north because of refusal
TA-02 core area	47	02-612413	Moved 5 ft north because of refusal
02-005	60	02-600561	Moved 1 ft west because of refusal
02-006(a)	1	02-612651	Moved 12 ft east because of overhead utility
02-006(a)	5	02-612650	Moved 18 ft west because of overhead utility
02-006(a)	8	02-612649	Moved 8 ft east because of overhead utility
02-006(a)	9	02-612642	Moved 3 ft south because of underground utility
02-006(a)	13	02-612648	Moved 18 ft west because of overhead utility
21-028(c)	2	21-612336	Moved 5 ft southwest because of refusal
21-028(c)	3	21-612342	Moved 5 ft southeast because of underground utility
21-028(c)	5	21-612337	Moved 5 ft west because of underground utility

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 Phase II investigation work plan for the Middle Los Alamos Canyon Aggregate Area of Los Alamos National Laboratory (the Laboratory). In general, IDW generated during the field investigation was managed in accordance with Standard Operating Procedure (SOP) 5238, "Characterization and Management of Environmental Program Waste." This procedure incorporates the requirements of applicable U.S. Environmental Protection Agency (EPA) and New Mexico Environment Department (NMED) regulations, U.S. Department of Energy 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. All available waste documentation, including WCSFs, WCSF amendments, and waste profile forms are provided in 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" (LANL 2008, 104174).

D-2.0 WASTE STREAMS

The IDW streams generated and managed during the investigation 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: Drill Cuttings (IDW)—Drill cuttings consisted of sediment, soil, and rock removed during investigative sampling activities. Approximately 57 yd^3 of drill cuttings was generated during this investigation and stored in 1-yd^3 wrangler bags, 55-gal. drums, or 20-yd^3 bins. All wrangler bags and bins were directly sampled. Approximately 38 yd^3 of cuttings will be land-applied as they meet the criteria in ENV-RCRA-QP-011.2, "Land Application of Drill Cuttings." Approximately 19 yd^3 of cuttings could not be land-applied as they are low-level waste (LLW) and were used as attic cover at Technical Area 54 (TA-54).

- WCSF Waste Stream #2: Contact Waste—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), used wrangler bags, 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 2 yd^3 of contact waste was generated and was recycled through the Laboratory's Green Is Clean program.
- WCSF Waste Streams #3 and #6—No decontamination fluids (waste stream #3) or petroleum-contaminated soils (waste stream #6) were generated.
- WCSF Waste Stream #4: Excavated Media and Debris—Contaminated soil and tuff were excavated from the TA-02 core area to remove soil that exceeded cleanup objectives. The total amount of excavated environmental media removed was approximately 126 yd^3. These media are nonhazardous, LLW and were used as attic cover at TA-54.
- WCSF Waste Stream #5—Municipal solid waste (MSW) consisted of noncontact trash and debris and empty sample preservation containers. Approximately 2 yd^3 of waste was generated and was determined to be nonhazardous, nonradioactive MSW. It was stored in plastic-lined trash cans and disposed of at the Los Alamos County landfill.
- WCSF Waste Stream #7: Returned or Excess Samples—This waste stream consisted of soil and tuff samples returned from an analytical laboratory. Approximately 0.5 yd^3 of material was generated from this activity. These materials were placed into the same containers as the environmental media from which they were taken.

D-3.0 REFERENCE

The following reference list includes documents cited in this appendix. Parenthetical information following each reference provides the author(s), publication date, and ERID, ESHID, or EMID. This information is also included in text citations. ERIDs were assigned by the Laboratory's Associate Directorate for Environmental Management (IDs through 599999); ESHIDs were assigned by the Laboratory's Associate Directorate for Environment, Safety, and Health (IDs 600000 through 699999); and EMIDs are assigned by Newport News Nuclear BWXT – Los Alamos, LLC (N3B) (IDs 700000 and above). IDs are used to locate documents in N3B's Records Management System and in the Master Reference Set. The NMED Hazardous Waste Bureau and N3B maintain copies of the Master Reference Set. The set ensures that NMED has the references to review documents. The set is updated when new references are cited in documents.

LANL (Los Alamos National Laboratory), November 2008. "Los Alamos National Laboratory Hazardous Waste Minimization Report," Los Alamos National Laboratory document LA-UR-08-7274, Los Alamos, New Mexico. (LANL 2008, 104174)

Table D-2.0-1
Summary of IDW Generation and Management

WCSF Waste Stream #	Waste Stream	Waste Type	Volume	Characterization Method	On-Site Management	Disposition
1	Drill cuttings	Reusable material, Industrial, LLW	57 yd^3	Direct sampling and use of environmental samples	1-yd^3 wrangler bags, 55-gal. drums, and 20-yd^3 rolloff bins	TA-54
2	Contact waste	Industrial	2 yd^3	AK and analytical results of site characterization	20-yd^3 rolloff bins	Green Is Clean program
4	Excavated media and debris	LLW	126 yd^3	Data from 2007 investigation augmented by additional solid waste management unit sampling per the WCSF	20-yd^3 rolloff bins, 1-yd^3 wrangler bags	TA-54
5	Municipal solid waste	MSW	2 yd^3	AK	Plastic bags	Municipal landfill
7	Returned or excess samples	See waste stream #1	0.5 yd^3	See waste stream #1	See waste stream #1	See waste stream #1

Attachment D-1

Waste Documentation
(on CD included with this document)

Appendix E

Analytical Program

E-1.0 INTRODUCTION

This appendix discusses the analytical methods and data-quality review for samples collected during investigations at the Middle Los Alamos Canyon Aggregate Area at Los Alamos National Laboratory (LANL or the Laboratory). Additionally, this appendix gives a summary of 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; LANL 2008, 109962). 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, 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; LANL 2008, 109962). Other QC factors, such as sample preservation and holding times, were also assessed in accordance with the requirements outlined in Standard Operating Procedure (SOP) 5056, “Sample Containers and Preservation.”

The following SOPs were used for data validation:

- SOP-5161, “Routine Validation of Volatile Organic Compound (VOC) Analytical Data”
- SOP-5162, “Routine Validation of Semivolatile Organic Compound (SVOC) Analytical Data”
- SOP-5163, “Routine Validation of Organochlorine Pesticide (PEST) and Polychlorinated Biphenyl (PCB) Analytical Data”
- SOP-5164, “Routine Validation of High Explosive (HE) Analytical Data”
- SOP-5165, “Routine Validation of Metals Analytical Data”
- SOP-5166, “Routine Validation of Gamma Spectroscopy, Chemical Separation Alpha Spectrometry, Gas Proportional Counting, and Liquid Scintillation Analytical Data”
- SOP-5168, “Routine Validation of LC/MS/MS High Explosive Analytical Data”
- SOP-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 (referred to by a request number), 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 forms (COCs) are provided in Appendix F (on DVDs included with this document). The analytical data, instrument printouts, and data validation reports are provided in Appendix F.

E-2.0 ANALYTICAL DATA ORGANIZATION

Historical data evaluated in this report were collected during Resource Conservation and Recovery Act facility investigations, other corrective actions, and other investigations. All historical investigation samples were submitted to and analyzed by approved off-site laboratories. These data are determined to be of sufficient quality for decision-making purposes and have been reviewed and revalidated to current QA standards.

E-3.0 INORGANIC CHEMICAL ANALYSES

A total of 1867 samples (plus 212 field duplicates) collected within the Middle Los Alamos Canyon Aggregate Area were analyzed for inorganic chemicals. A total of 1783 samples (plus 202 field duplicates) were analyzed for target analyte list (TAL) metals; 1213 samples (plus 144 field duplicates) were analyzed for nitrate; 1209 samples (plus 143 field duplicates) were analyzed for perchlorate; 1262 samples (plus 149 field duplicates) were analyzed for total cyanide; and 570 samples (plus 58 field duplicates) were analyzed for hexavalent chromium. The analytical methods used for inorganic chemicals are listed in Table E-1.0-1.

Tables in the investigation report summarize all samples collected and the analyses requested for the investigation of the sites within the Middle Los Alamos Canyon Aggregate Area. All analyses conducted during the investigation are presented in Appendix F (on DVDs included with this document).

E-3.1 Inorganic Chemical QA/QC Samples

QA/QC samples are used to produce measures of the reliability of the data. 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, this investigation included analyses of LCSs, preparation blanks, MSs, laboratory duplicate samples, interference check samples (ICSs), and serial dilution samples. Each of these QA/QC sample types is defined in the analytical services SOWs (LANL 1995, 049738; LANL 2000, 071233; LANL 2008, 109962) and is described briefly in the paragraphs below.

The LCS serves as a monitor of the overall performance of each step during the analysis, including sample digestion. For inorganic chemicals in soil or tuff, LCS percent recoveries (%R) should fall within the control limits of 75% to 125% (LANL 1995, 049738; LANL 2000, 071233; LANL 2008, 109962).

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% to 125%, inclusive, for all spiked analytes (LANL 1995, 049738; LANL 2000, 071233; LANL 2008, 109962).

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; LANL 2008, 109962).

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% to 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%.

E-3.2 Data Quality Results for Inorganic Chemicals

The majority of the analytical results for inorganic chemicals were either not assigned a qualifier or qualified as not detected (U) because the analytes were not detected by the respective analytical methods. These data do not have any quality issues associated with the values presented.

A total of 3627 TAL metals results, 235 cyanide results, 201 perchlorate results, 102 hexavalent chromium results, and 56 nitrate results were qualified as estimated (J) because the analytical laboratory qualified the detected result as estimated.

Two hexavalent chromium results were qualified as estimated (J) because the validator identified quality deficiencies in the reported data that required qualification.

Fourteen hexavalent chromium results and six perchlorate results were qualified as estimated not detected (UJ) because the validator identified quality deficiencies in the reported data that required qualification.

E-3.2.1 Maintenance of COC

SCL/COC forms were maintained properly for all samples analyzed for inorganic chemicals (see Appendix F, on DVDs included with this document).

E-3.2.2 Sample Documentation

All samples analyzed for inorganic chemicals were properly documented on SCL/COC forms in the field (see Appendix F, on DVDs included with this document).

E-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.

E-3.2.4 Sample Preservation

Preservation criteria were met for all samples analyzed for inorganic chemicals.

E-3.2.5 Holding Times

Fourteen nitrate results were qualified as estimated and biased low (J-) because the extraction/analytical holding time was exceeded by less than 2 times the applicable holding time.

Thirteen nitrate results and 13 cyanide results were qualified as estimated not detected (UJ) because the extraction/analytical holding time was exceeded by less than 2 times the applicable holding time.

E-3.2.6 ICVs and CCVs

Eleven perchlorate results were qualified as estimated and biased low (J-) because the associated ICV or CCV was recovered below the lower warning limit but was greater than the lower acceptance limit (LAL).

Sixty-one perchlorate results were qualified as estimated not detected (UJ) because the associated ICV or CCV was recovered below the lower warning limit but was greater than the LAL.

Eight TAL metals results and four nitrate results were qualified as estimated and biased high (J+) because the associated ICV or CCV was recovered above the upper warning limit but was less than or equal to the upper acceptance limit (UAL).

E-3.2.7 Interference Check Sample and/or Serial Dilutions

Twenty-five perchlorate results were qualified as estimated and biased high (J+) because the associated ICS was recovered above the UAL.

Forty-four TAL metals results were qualified as estimated (J) because the serial dilution sample RPD exceeded criteria.

One TAL metals result was 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.

E-3.2.8 Laboratory Duplicate Samples

A total of 223 TAL metals results were qualified as estimated (J) because the sample and the duplicate sample results were greater than 5 times the reporting limit (RL) and the duplicate RPD was greater than 35%.

One TAL metals result was qualified as estimated not detected (UJ) because the duplicate sample was analyzed on a sample not collected on-site.

A total of 1416 TAL metals results and 11 nitrate results were qualified as estimated (J) because the duplicate results exceeded the RPD requirements.

Thirteen TAL metals results and four nitrate results were qualified as estimated not detected (UJ) because the duplicate results exceeded the RPD requirements.

A total of 127 TAL metals results were qualified as estimated (J) because either the sample results or the duplicate sample results or both were greater than or equal to 5 times the RL, and the difference between the samples was greater than 2 times the RL.

One TAL metals result and one cyanide result were qualified as estimated not detected (UJ) because either the sample results or the duplicate sample results or both were greater than or equal to 5 times the RL, and the difference between the samples was greater than 2 times the RL.

E-3.2.9 Blanks

A total of 244 TAL metals results and 2 cyanide results were qualified as not detected (U) because the sample results were less than 5 times the concentration of the related analytes in the equipment rinsate blank.

A total of 2836 TAL metals results, 69 cyanide results, 23 hexavalent chromium results, and 1 perchlorate result were qualified as not detected (U) because the sample result was less than 5 times the concentration of the related analyte in the method blank.

A total of 180 TAL metals results were qualified as estimated (J) because the analyte was identified in the method blank but was greater than 5 times the RL.

A total of 107 TAL metals results were qualified as not detected (U) because the sample result was less than or equal to 5 times the concentration of the related analyte in the initial calibration blank/continuous calibration blank.

E-3.2.10 MS Samples

A total of 597 TAL metals results, 135 nitrate results, 25 hexavalent chromium results, 14 perchlorate results, and 1 cyanide result were qualified as estimated and biased low (J-) because the MS %R value was less than the LAL but greater than 30%.

A total of 951 TAL metals results, 134 nitrate results, 25 hexavalent chromium results, 18 perchlorate results, and 5 cyanide results were qualified as estimated not detected (UJ) because the MS %R value was less than the LAL but greater than 30%.

Seventeen TAL metals results were qualified as estimated (J) because there were insufficient samples for an MS to be analyzed on a field sample.

Eleven TAL metals results were qualified as estimated not detected (UJ) because there were insufficient samples for an MS to be analyzed on a field sample.

A total of 1234 TAL metals results and 10 nitrate results were qualified as estimated and biased high (J+) because the analyte was recovered above the UAL but less than 150% of the associated MS sample.

A total of 1127 TAL metals results were qualified as estimated and biased high (J+) because the analyte was recovered above 150% in the associated MS sample.

Seven TAL metals results were qualified as estimated not detected (UJ) because the analyte was recovered above 150% in the associated MS sample.

A total of 114 TAL metals results, 17 hexavalent chromium results, and 2 cyanide results were qualified as estimated not detected (UJ) because the associated MS recovery was less than the LAL but greater than 10%.

A total of 218 TAL metals results were qualified as estimated and biased low (J-) because the associated MS recovery was less than the LAL but greater than 10%.

A total of 770 TAL metals results were qualified as estimated and biased high (J+) because the associated MS recovery was greater than the UAL.

Twenty-one TAL metals results were qualified as estimated not detected (UJ) because the associated MS recovery was greater than the UAL.

E-3.2.11 LCS Recoveries

Five TAL metals results were qualified as estimated and biased low (J-) because the LCS %R was less than the LAL but greater than 10%.

Sixteen TAL metals results were qualified as estimated not detected (UJ) because the LCS %R was less than the LAL but greater than 10%.

Forty-nine TAL metals results, three cyanide results, and one perchlorate result were qualified as estimated and biased high (J+) because the associated LCS was recovered above the upper warning limit.

Sixty-three TAL metals results and one perchlorate result were qualified as estimated and biased low (J-) because the associated LCS was recovered below the lower warning limit but greater than or equal to the LAL.

Three TAL metals results and two perchlorate results were qualified as estimated not detected (UJ) because the associated LCS was recovered below the lower warning limit but greater than or equal to the LAL.

E-3.2.12 Detection Limits

A total of 551 TAL metals results, 10 hexavalent chromium results, and 1 perchlorate result were qualified as estimated (J) because the sample result was reported as detected between the instrument detection limit and the estimated detection limit.

E-3.2.13 Rejected Results

A total of 307 TAL metals results, 52 hexavalent chromium results, 18 nitrate results, 15 perchlorate results, and 7 cyanide results were qualified as rejected (R) because the MS %R value was less than 30%.

One nitrate result was qualified as rejected (R) because the extraction holding time was exceeded by more than 2 times the acceptable holding time.

Eight TAL metals results, eight hexavalent chromium results, and three cyanide results were qualified as rejected (R) because the associated MS recovery was less than 10%.

The rejected data were not used to determine the nature and extent of contamination or to assess the potential human and ecological risks. However, sufficient data of good quality are available to characterize the site(s) and conduct the risk assessments. The results of other qualified data were used as reported and do not affect the usability of the sampling results.

E-4.0 ORGANIC CHEMICAL ANALYSES

A total of 1709 samples (plus 114 field duplicates) collected within the Middle Los Alamos Canyon Aggregate Area were analyzed for organic chemicals. A total of 857 samples (plus 114 field duplicates) were analyzed for volatile organic compounds (VOCs); 1441 samples (plus 160 field duplicates) were analyzed for semivolatile organic compounds (SVOCs); 1375 samples (plus 161 field duplicates) were analyzed for polychlorinated biphenyls (PCBs); 177 samples (plus 32 field duplicates) were analyzed for dioxins and furans; 4 samples were analyzed for pesticides; 146 samples (plus 18 field duplicates) were analyzed for total petroleum hydrocarbon (TPH) diesel range organics (DRO); and 97 samples (plus 8 field duplicates) were analyzed for explosive compounds. All QC procedures were followed as required by the analytical laboratory SOWs (LANL 1995, 049738; LANL 2000, 071233; LANL 2008, 109962). The analytical methods used for organic chemicals are listed in Table E-1.0-1.

Tables within the investigation report summarize all samples collected from the Middle Los Alamos Canyon Aggregate Area and the analyses requested. All organic chemical results are provided on DVDs in Appendix F.

E-4.1 Organic Chemical QA/QC Samples

QA/QC samples are used to produce measures of the reliability of the data. 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 organic chemical analyses, this investigation included calibration verifications and the analysis of LCSs, method blanks, MSs, surrogates, and internal standards (ISs). Each of these QA/QC sample types is defined in the analytical services SOWs (LANL 1995, 049738; LANL 2000, 071233; LANL 2008, 109962) 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.

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 LAL and UAL.

A surrogate compound (surrogate) is an organic compound used in the analyses of target analytes that is similar in composition and behavior to the target analytes but 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 %R for ISs should be within the range of 50% to 200%.

E-4.2 Data Quality Results for Organic Chemicals

The majority of the analytical results for organic chemicals were either not assigned a qualifier or qualified as not detected (U) because the analytes were not detected by the respective analytical methods. These data do not have any quality issues associated with the values presented.

A total of 1560 SVOC results, 678 dioxin/furan results, 276 PCB results, 254 VOC results, and 57 TPH-DRO results were qualified as estimated (J) because the analytical laboratory qualified the detected result as estimated.

Forty-three dioxin/furan results were qualified as estimated (J) because the validator identified quality deficiencies in the reported data that required qualification.

E-4.2.1 Maintenance of COC

SCL/COC forms were maintained properly for all samples analyzed for organic chemicals (see Appendix F, on DVDs included with this document).

E-4.2.2 Sample Documentation

All samples analyzed for organic chemicals were properly documented on the SCL in the field (see Appendix F, on DVDs included with this document).

E-4.2.3 Sample Dilutions

Some samples were diluted for organic chemical analyses. No qualifiers were applied to any organic chemical sample results because of dilutions.

E-4.2.4 Sample Preservation

Preservation criteria were met for all samples analyzed for organic chemicals.

E-4.2.5 Holding Times

Thirty-four SVOC results, 21 PCB results, and 16 VOC results were qualified as estimated and biased low (J-) because the extraction/analytical holding time was exceeded by less than 2 times the published method holding times.

A total of 1068 SVOC results, 222 VOC results, and 77 PCB results were qualified as estimated not detected (UJ) because the extraction/analytical holding time was exceeded by less than 2 times the published method holding times.

E-4.2.6 ICVs and CCVs

Three SVOC results and three PCB results were qualified as estimated (J) because the ICV and/or CCV were recovered outside the method-specific limits.

A total of 729 SVOC results were qualified as estimated not detected (UJ) because the ICV and/or CCV were recovered outside the method-specific limits.

A total of 118 SVOC results were qualified as estimated (J) because the ICV and/or CCV were not analyzed at the appropriate method frequency.

A total of 530 SVOC results were qualified as estimated not detected (UJ) because the ICV and/or CCV were not analyzed at the appropriate method frequency.

A total of 4018 SVOC results, 1874 VOC results, 239 high explosives (HE) results, and 60 PCB results were qualified as estimated not detected (UJ) because the initial calibration curve exceeded the percent relative standard deviation (%RSD) criteria and/or the associated multipoint calibration correlation coefficient was less than 0.995.

Thirty SVOC results, 24 VOC results, and 22 PCB results were qualified as estimated (J) because the initial calibration curve exceeded the %RSD criteria and/or the associated multipoint calibration correlation coefficient was less than 0.995.

E-4.2.7 Surrogate Recoveries

Twenty-four VOC results, 22 SVOC results, 18 PCB results, and 3 dioxin/furan results were qualified as estimated and biased low (J-) because the surrogate recovery percentage was less than the LAL but greater than or equal to 10%.

Ten PCB results were qualified as estimated and biased high (J+) because the associated surrogate recovery was greater than the UAL.

Twelve VOC results were qualified as estimated and biased high (J+) because the associated surrogate recovery was greater than the UAL.

A total of 629 VOC results and 149 PCB results were qualified as estimated not detected (UJ) because the associated surrogate recovery was less than the LAL but greater than or equal to 10%.

A total of 289 SVOC results were qualified as estimated not detected (UJ) because at least 2 sample surrogate recoveries in the same fraction were less than the LAL but greater than 10%.

Fifty-one SVOC results were qualified as estimated not detected (UJ) because at least one surrogate was greater than the UAL and one surrogate was less than the LAL.

Nine VOC results were qualified as estimated and biased low (J-) because one surrogate recovery percentage was less than 10%.

One SVOC result was qualified as estimated and biased low (J-) because one sample surrogate recovery was less than 10%.

E-4.2.8 IS Responses

A total of 1335 SVOC results and 187 VOC results were qualified as estimated not detected (UJ) because the %R of the associated IS area counts was between 10% and 50% when compared with the area counts in the applicable continuing calibration standard.

A total of 282 SVOC results and 6 VOC results were qualified as estimated (J) because the %R of the associated IS area counts was between 10% and 50% when compared with the area counts in the applicable continuing calibration standard.

Six SVOC results were qualified as estimated (J) because the quantitating IS area count was less than 10% of the expected value.

Eight SVOC results were qualified as estimated not detected (UJ) because the quantitating IS area count was less than 50% but greater than 10% relative to the previous continuing calibration.

Seven SVOC results and one VOC result were qualified as estimated (J) because the associated IS area count was greater than 200% of the previous continuing calibration standard.

Forty-two SVOC results were qualified as estimated not detected (UJ) because the associated IS area count was greater than 200% of the previous continuing calibration standard.

Twenty-two SVOC results were qualified as estimated (J) because the %R of the associated IS area counts was either less than 50% or greater than 200% when compared with the area counts in the applicable continuing calibration standard.

Seventy-three SVOC results and 11 VOC results were qualified as estimated not detected (UJ) because the mass spectrum did not meet specifications.

E-4.2.9 Blanks

Seventy-five dioxin/furan results, seven PCB results, and one VOC result were qualified as estimated (J) because the sample concentration was greater than 5 times the amount in the method blank.

Seventy SVOC results, four dioxin/furan results, six TPH-DRO results, and three PCB results were qualified as not detected (U) because the sample result was less than 5 times the concentration of the related analyte in the method blank.

A total of 198 VOC results were qualified as not detected (U) because the associated sample concentration was less than 5 times/10 times the amount in the method blank.

E-4.2.10 MS Samples

Three TPH-DRO results were qualified as estimated not detected (UJ) because the MS/matrix spike duplicate %R was greater than or equal to 10% but less than 70%.

E-4.2.11 Laboratory Duplicate Samples

Laboratory duplicates collected for organic chemical analyses indicated acceptable precision for all samples.

E-4.2.12 LCS Recoveries

A total of 193 VOC results, 171 SVOC results, 67 PCB results, and 18 HE results were qualified as estimated not detected (UJ) because the associated LCS recovery was less than the LAL but greater than 10%.

Ten PCB results were qualified as estimated and biased low (J-) because the LCS %R was less than 70% but greater than or equal to 10%.

One SVOC result was qualified as estimated and biased high (J+) because the LCS %R was greater than the UAL.

One SVOC result was qualified as estimated and biased low (J-) because the LCS %R was less than the LAL but greater than 10%.

Two SVOC results and two VOC results were qualified as estimated and biased high (J+) because the LCS %R was greater than the UAL.

Thirty-three SVOC results were qualified as estimated not detected (UJ) because the LCS %R was less than the LAL but greater than 10%.

E-4.2.13 Rejected Data

A total of 413 VOC results and 136 SVOC results were qualified as rejected (R) because the sample surrogate recovery was less than 10%.

A total of 206 SVOC results were qualified as rejected (R) because the extraction holding time was exceeded by 2 times the method-published holding-time requirements.

Sixty-three SVOC results were qualified as rejected (R) because the results were not analyzed with a valid 5-point calibration curve and/or a standard at the reporting limit.

Twenty-one SVOC results and three VOC results were qualified as rejected (R) because the affected analytes were analyzed with a relative response factor of less than 0.05 in the initial calibration and/or CCV.

Six TPH-DRO results were qualified as rejected (R) because the validator identified quality deficiencies in the reported data that required qualification.

The rejected data were not used to characterize the nature and extent of contamination or assess the potential human and ecological risks. However, sufficient data of good quality are available to characterize the site(s) and conduct the risk assessments. The results of other qualified data were used as reported and do not affect the usability of the sampling results.

E-5.0 RADIONUCLIDE ANALYSES

A total of 1833 samples (plus 203 field duplicates) collected within the Middle Los Alamos Canyon Aggregate Area were analyzed for radionuclides. A total of 1380 samples (plus 165 field duplicates) were analyzed for americium-241; 1683 samples (plus 185 field duplicates) were analyzed for gamma-emitting radionuclides; 1701 samples (plus 189 field duplicates) were analyzed for isotopic plutonium; 1624 samples (plus 181 field duplicates) were analyzed for isotopic uranium; 1720 samples (plus 192 field duplicates) were analyzed for tritium; 1567 samples (plus 173 field duplicates) were analyzed for strontium-90; and 85 samples (plus 5 field duplicates) were analyzed for technetium-99. The analytical methods used for radionuclides are listed in Table E-1.0-1.

Tables in the investigation report summarize all samples collected from the Middle Los Alamos Canyon Aggregate Area and the analyses requested. All radionuclide results are provided on DVDs (Appendix F).

E-5.1 Radionuclide QA/QC Samples

To assess the accuracy and precision of radionuclide analyses, this investigation included analyses of LCSs, method blanks, MS samples, laboratory duplicate samples, and tracers. Each of these QA/QC sample types is defined in the analytical services SOWs (LANL 1995, 049738; LANL 2000, 071233; LANL 2008, 109962) and is described briefly in the paragraphs below.

The LCS serves as a monitor of the overall performance of each step during the analysis, including sample digestion. For radionuclides in soil or tuff, LCS %R should fall between the control limits of 80% and 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 minimum detectable concentration (MDC).

MS samples assess the accuracy of radionuclide 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% to 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; LANL 2008, 109962).

E-5.2 Data Quality Results for Radionuclides

Approximately one-third (6403) of the analytical results for radionuclides either were not assigned a qualifier or were qualified as not detected (U) because the analytes were not detected by the respective analytical methods. These data do not have any quality issues associated with the values presented.

All procedures were followed as required by the analytical services SOWs (LANL 1995, 049738; LANL 2000, 071233; LANL 2008, 109962). The majority of results (11,604) were qualified as not detected (U) because the associated sample concentration was less than or equal to the MDC. A total of 208 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 (TPU). This data qualification is related to detection status only, not to the quality of the data.

E-5.2.1 Maintenance of COC

SCL/COC forms were maintained properly for all samples (see Appendix F, on DVDs included with this document).

E-5.2.2 Sample Documentation

All samples were properly documented on the SCL/COC forms in the field (see Appendix F, on DVDs included with this document).

E-5.2.3 Sample Dilutions

Some samples were diluted for radionuclide analyses. No qualifiers were applied to any radionuclide sample results because of dilutions.

E-5.2.4 Sample Preservation

Preservation criteria were met for all samples analyzed for radionuclides.

E-5.2.5 Holding Times

Holding-time criteria were met for all samples analyzed for radionuclides.

E-5.2.6 Method Blanks

Seven americium-241 results were qualified as not detected (U) because the sample results were less than or equal to 5 times the concentration of the analyte in the method blank.

E-5.2.7 MS Samples

Six strontium-90 results were qualified as estimated not detected (UJ) because the MS recovery was less than the LAL but greater than 10%.

Four strontium-90 results were qualified as estimated and biased low (J-) because the associated MS recovery was less than the LAL but greater than 10%.

Three tritium results were qualified as estimated and biased high (J+) because the MS recovery was greater than the UAL.

E-5.2.8 Tracer Recoveries

Seventeen isotopic uranium results, 11 americium-241 results, and 2 isotopic plutonium results were qualified as estimated and biased low (J-) because the tracer %R was less than 30% but greater than 10%.

Nine americium-241 results, seven isotopic uranium results, and four isotopic plutonium results were qualified as estimated not detected (UJ) because the tracer %R was less than 30% but greater than 10%.

Three isotopic uranium results and two isotopic plutonium results were qualified as estimated and biased low (J-) because the tracer recovery was less than the LAL but greater than or equal to 10%.

Four isotopic plutonium results were qualified as estimated not detected (UJ) because the tracer recovery was less than the LAL but greater than or equal to 10%.

Three isotopic uranium results and one isotopic plutonium result were qualified as estimated and biased high (J+) because the tracer recovery was greater than the UAL.

E-5.2.9 LCS Recoveries

Ninety-nine isotopic uranium results, 33 isotopic plutonium results, 11 strontium-90 results, and 8 tritium results were qualified as estimated and biased low (J-) because the associated LCS recovery was less than the LAL but greater than 10%.

Five cesium-137 results, four isotopic plutonium results, and one strontium-90 result were qualified as estimated and biased high (J+) because the associated analyte in the LCS was recovered above the UAL.

A total of 287 isotopic plutonium results, 10 tritium results, 7 strontium-90 results, and 2 isotopic uranium results were qualified as estimated not detected (UJ) because the LCS recovery was less than the LAL but greater than 10%.

One cesium-137 result was qualified as estimated and biased high (J+) because the LCS %R was greater than the UAL.

E-5.2.10 Laboratory Duplicate Sample Recoveries

Thirty-three isotopic plutonium results and 10 americium-241 results were qualified as estimated (J) because the duplicate error ratio was greater than 2.0.

One isotopic plutonium result was qualified as estimated (J) because the duplicate information was missing.

One isotopic plutonium result was qualified as estimated not detected (UJ) because the duplicate information was missing.

E-5.2.11 Rejected Data

A total of 454 cesium-134 results, 118 cesium-137 results, 34 cobalt-60 results, 6 sodium-22 results, 2 strontium-90 results, and 1 isotopic uranium result were qualified as rejected (R) because spectral interference prevented positive identification of the analytes.

A total of 129 cesium-134 results, 2 cesium-137 results, 1 cobalt-60 result, and 1 sodium-22 result were qualified as rejected (R) because the MDC and/or TPU documentation was missing.

Three isotopic uranium results were qualified as rejected (R) because the tracer recovery was less than 10%.

Three cesium-134 results, three sodium-22 results, three technetium-99 results, two cobalt-60 results, one cesium-137 result, and one isotopic plutonium result were qualified as rejected (R) because the validator identified quality deficiencies in the reported data that required qualification.

The rejected data were not used to determine the nature and extent of contamination or to assess the potential human and ecological risks. However, sufficient data of good quality are available to characterize the site(s) and conduct the risk assessments. The results of other qualified data were used as reported and do not affect the usability of the sampling results.

E-6.0 REFERENCES

The following reference list includes documents cited in this appendix. Parenthetical information following each reference provides the author(s), publication date, and ERID, ESHID, or EMID. This information is also included in text citations. ERIDs were assigned by the Laboratory's Associate Directorate for Environmental Management (IDs through 599999); ESHIDs were assigned by the Laboratory's Associate Directorate for Environment, Safety, and Health (IDs 600000 through 699999); and EMIDs are assigned by Newport News Nuclear BWXT – Los Alamos, LLC (N3B) (IDs 700000 and above). IDs are used to locate documents in N3B's Records Management System and in the Master Reference Set. The NMED Hazardous Waste Bureau and N3B maintain copies of the Master Reference Set. The set ensures that NMED has the references to review documents. The set is updated when new references are cited in documents.

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)

LANL (Los Alamos National Laboratory), June 30, 2008. "Exhibit "D" Scope of Work and Technical Specifications, Analytical Laboratory Services for General Inorganic, Organic, Radiochemical, Asbestos, Low-Level Tritium, Particle Analysis, Bioassay, Dissolved Organic Carbon Fractionation, and PCB Congeners," Los Alamos National Laboratory document RFP No. 63639-RFP-08, Los Alamos, New Mexico. (LANL 2008, 109962)

Table E-1.0-1
Inorganic Chemical, Organic Chemical, and Radionuclide Analytical Methods for Samples Collected in the Middle Los Alamos Canyon Aggregate Area

Analytical Method	Analytical Description	Analytical Suite
Inorganic Chemicals		
EPA 300.0	Ion chromatography	Anions (nitrate)
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, uranium, 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, 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-846:7471A	Cold vapor atomic absorption	Mercury
Organic Chemicals		
EPA SW-846: 8082	Gas chromatography	PCBs
EPA SW-846:8240 EPA SW-846:8260 EPA SW-846:8260B	Gas chromatography-mass spectrometry	VOCs
EPA SW-846:8270C	Gas chromatography-mass spectrometry	SVOCs
EPA SW-846:8290	High-resolution gas chromatography/high-resolution mass spectrometry	Dioxins/furans
EPA SW-846: 8321A _MOD	High performance liquid chromatography	Explosive compounds
EPA SW-846:8081A	Gas chromatography	Pesticides
EPA SW-846:8080	Gas chromatography	Pesticides/PCBs
EPA SW-846:8015M_EXTRACTABLE	Gas chromatography /flame ionization detector	TPH-DRO
EPA:418.1	Infrared spectrophotometry	TPH unknown range; Total recoverable petroleum hydrocarbons
Radionuclides		
EPA 901.1	Gamma spectroscopy	Americium-241, cesium-134, cesium-137, cobalt-60, europium-152, ruthenium-106, sodium-22, uranium-235
HASL Method 300:ISOPU HASL Method 300:ISOU	Chemical separation alpha spectrometry	Isotopic plutonium Isotopic uranium
EPA 905.0	Gas proportional counting	Strontium-90
EPA 906.0	Liquid scintillation	Tritium

Appendix F

Analytical Suites and Results and Analytical Reports
(on DVDs included with this document)

Appendix G

Box Plots and Statistical Results

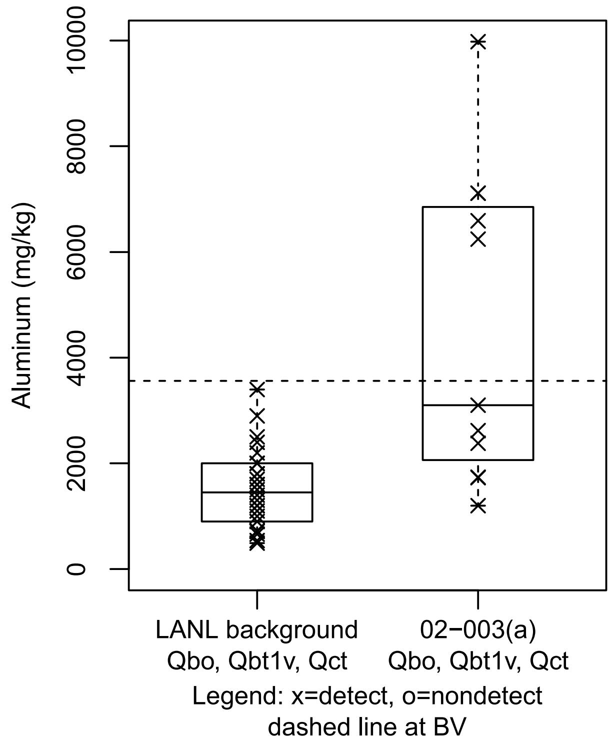

Figure G-1 Box plot for aluminum in Qbo at AOC 02-003(a)

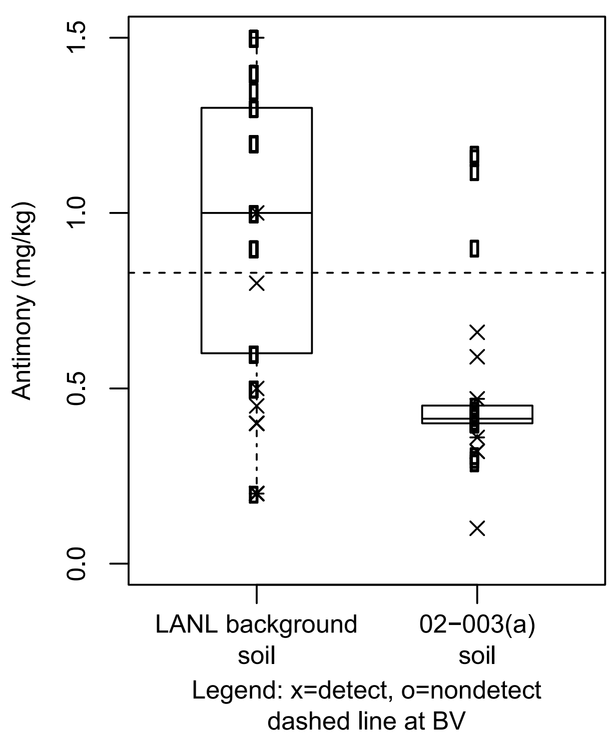

Figure G-2 Box plot for antimony in soil at AOC 02-003(a)

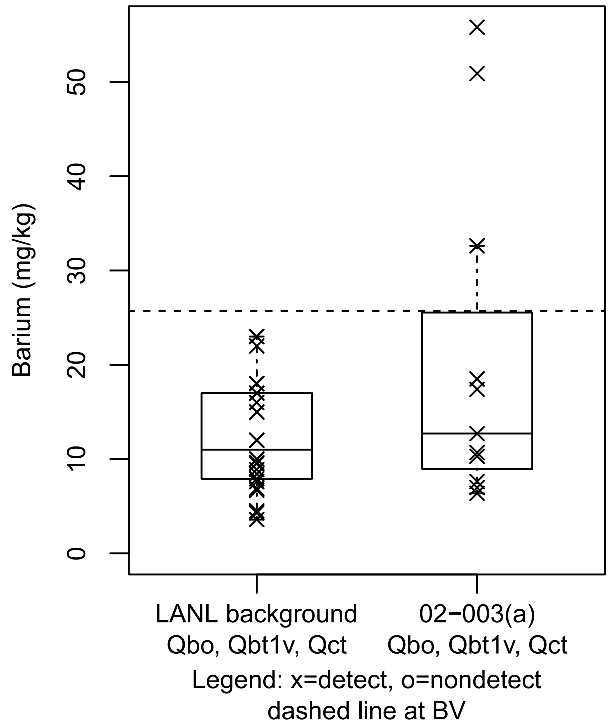

Figure G-3 Box plot for barium in Qbo at AOC 02-003(a)

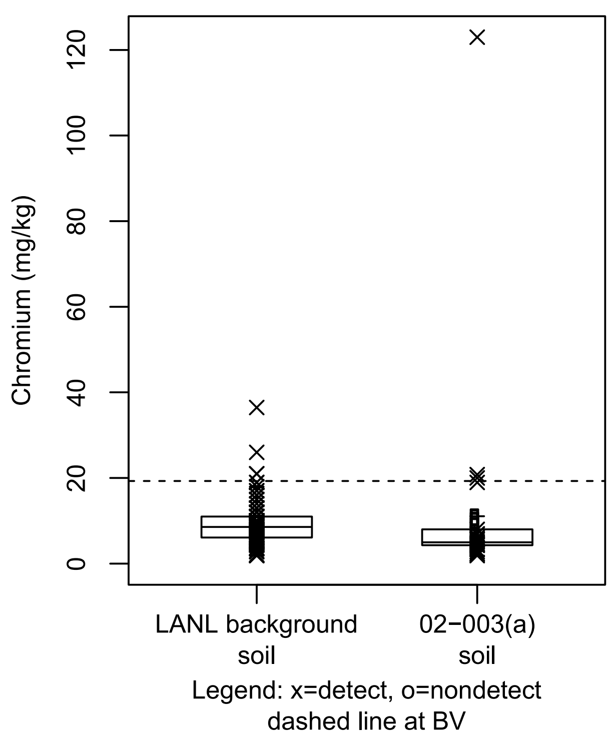

Figure G-4 Box plot for chromium in soil at AOC 02-003(a)

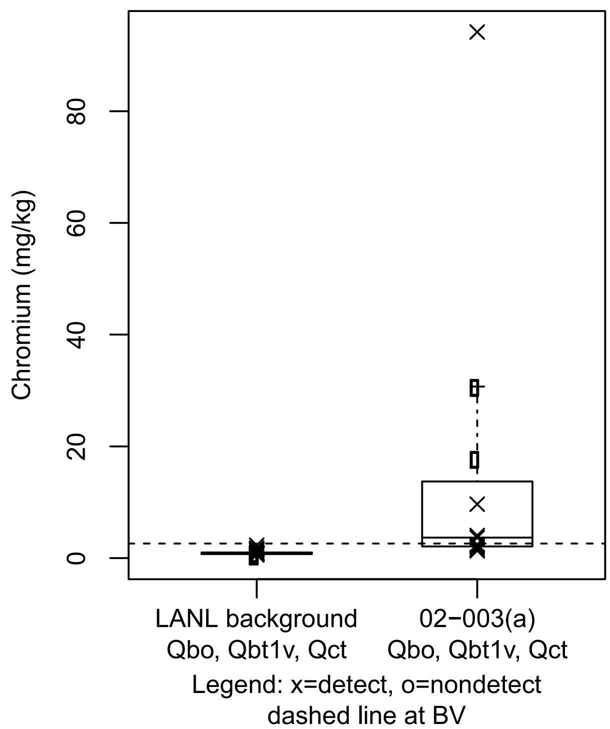

Figure G-5 **Box plot for chromium in Qbo at AOC 02-003(a)**

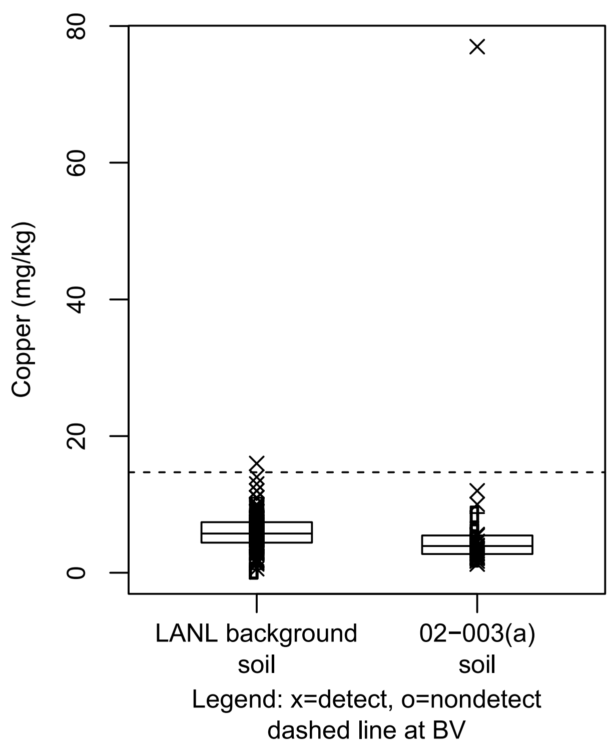

Figure G-6 **Box plot for copper in soil at AOC 02-003(a)**

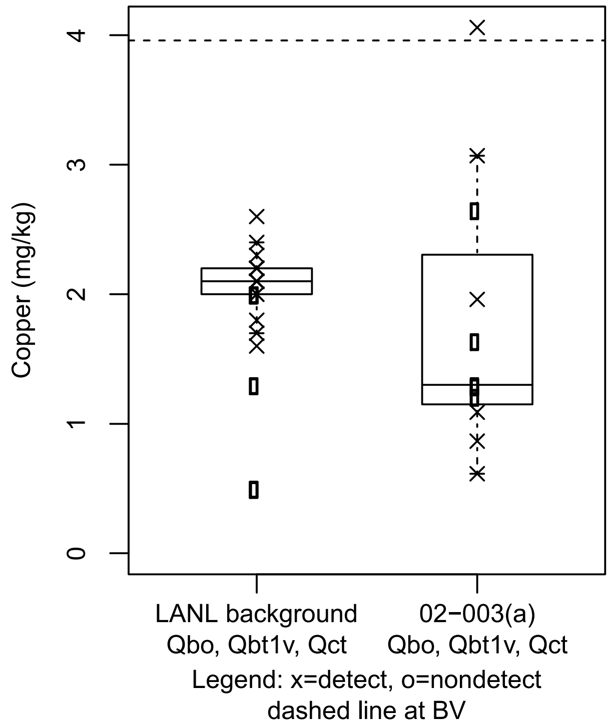

Figure G-7 Box plot for copper in tuff at AOC 02-003(a)

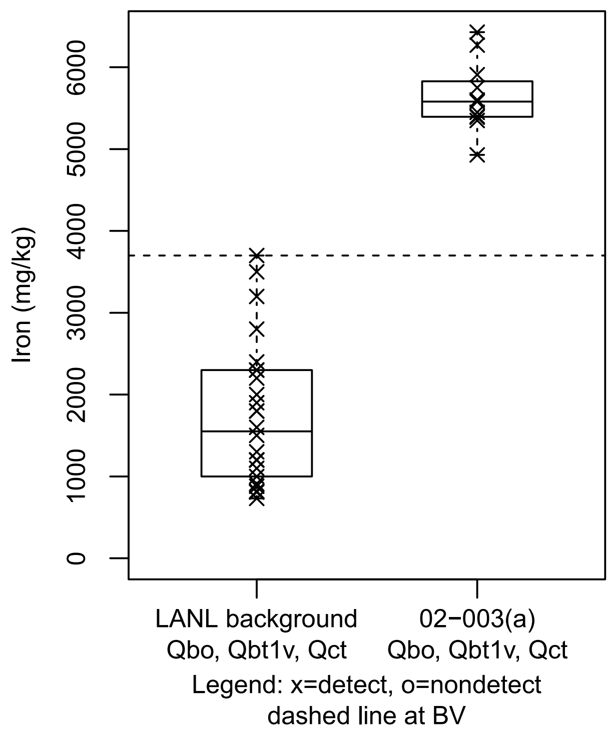

Figure G-8 Box plot for iron in tuff at AOC 02-003(a)

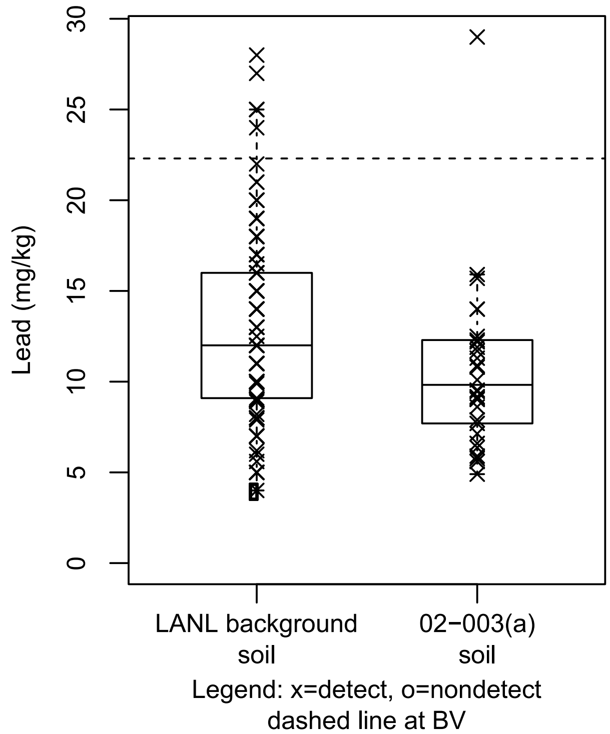

Figure G-9 Box plot for lead in soil at AOC 02-003(a)

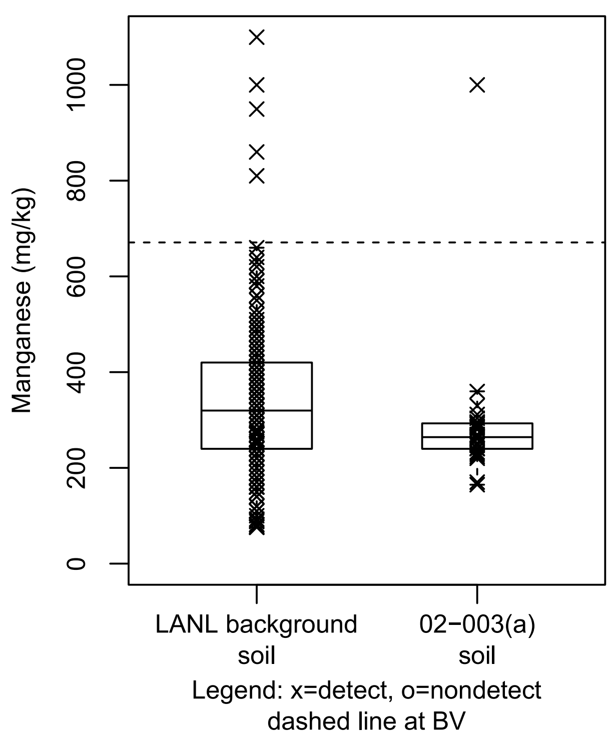

Figure G-10 Box plot for manganese in soil at AOC 02-003(a)

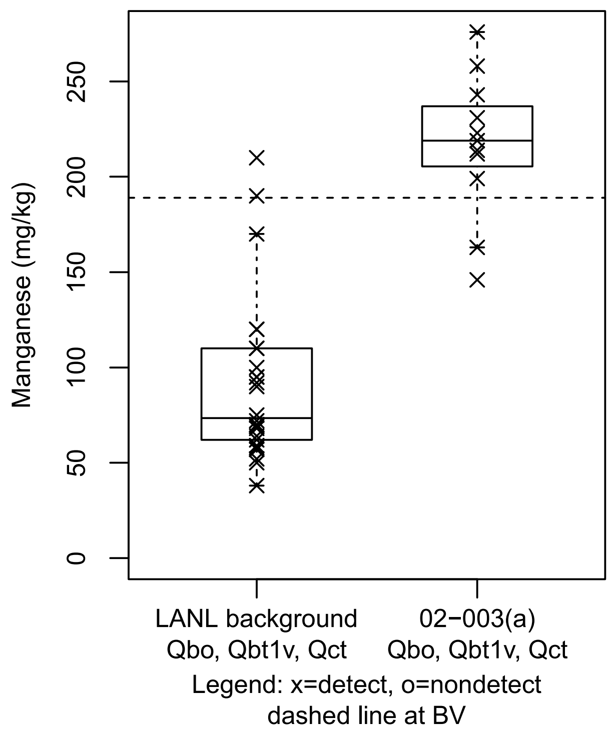

Figure G-11 Box plot for manganese in tuff at AOC 02-003(a)

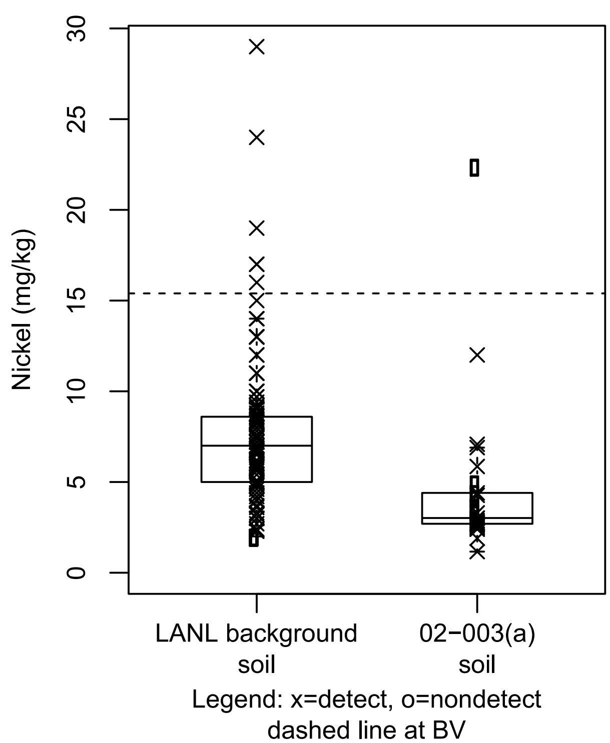

Figure G-12 Box plot for nickel in soil at AOC 02-003(a)

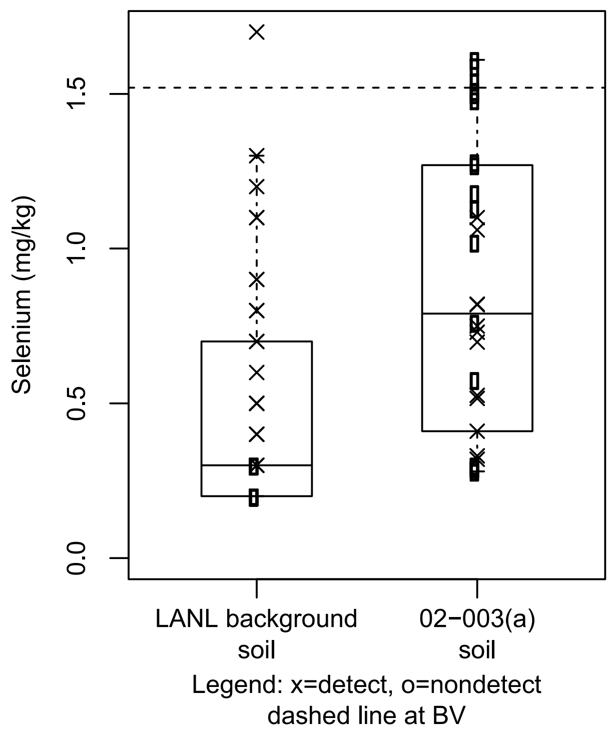

Figure G-13 Box plot for selenium in soil at AOC 02-003(a)

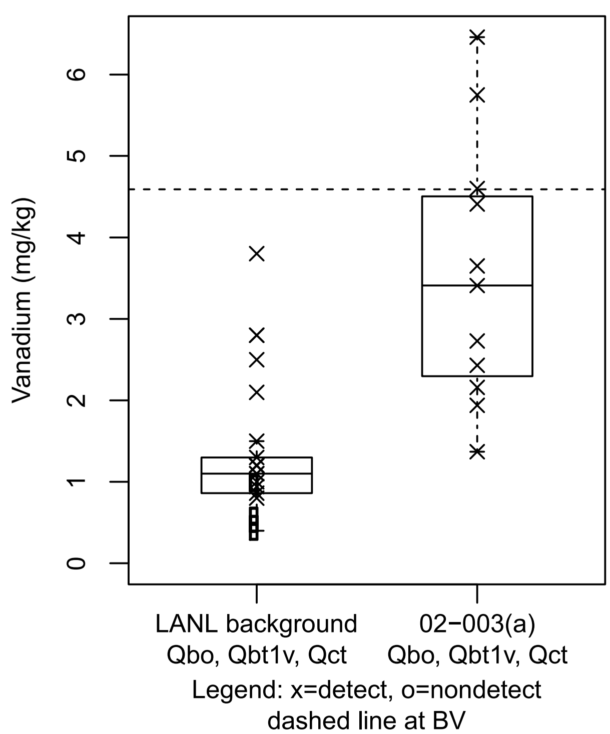

Figure G-14 Box plot for vanadium in Qbo at AOC 02-003(a)

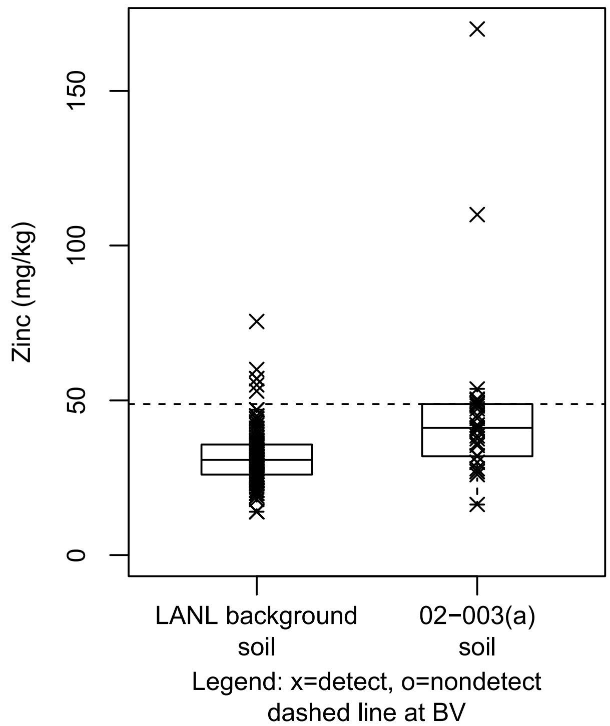

Figure G-15 Box plot for zinc in soil at AOC 02-003(a)

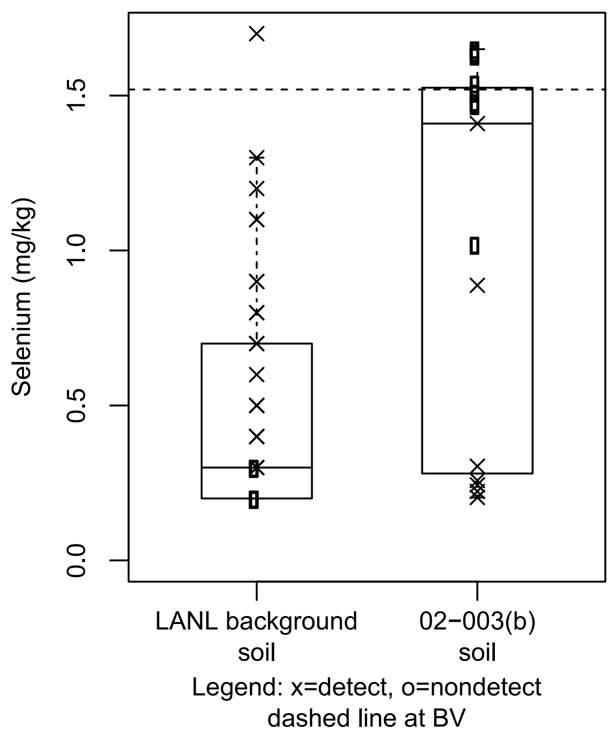

Figure G-16 Box plot for selenium in soil at AOC 02-003(b)

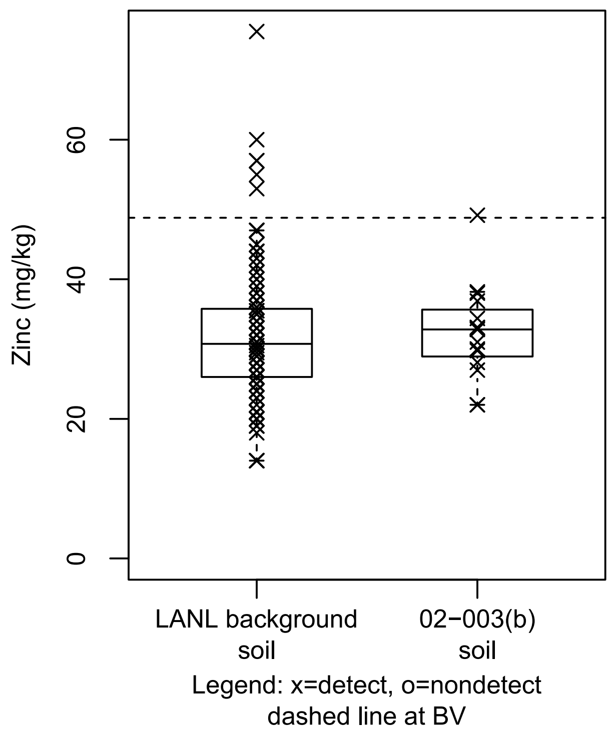

Figure G-17 Box plot for zinc in soil at AOC 02-003(b)

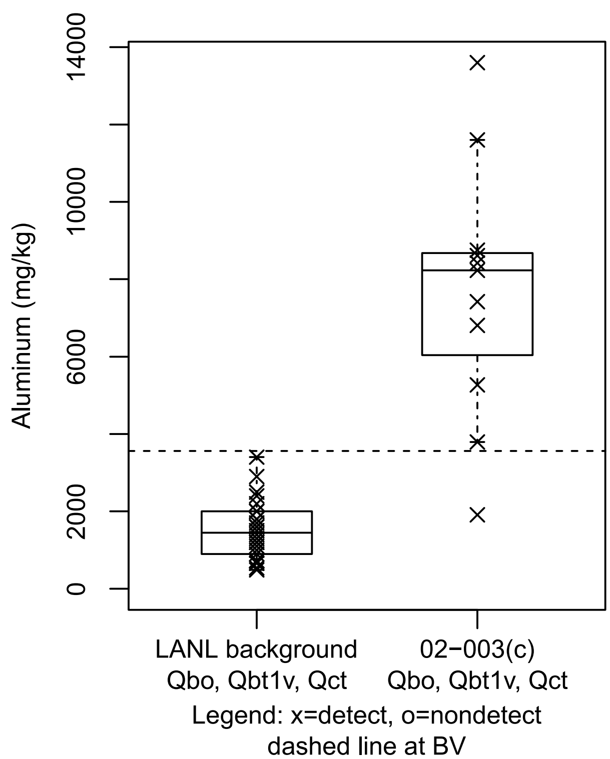

Figure G-18 Box plot for aluminum in Qbo at AOC 02-003(c)

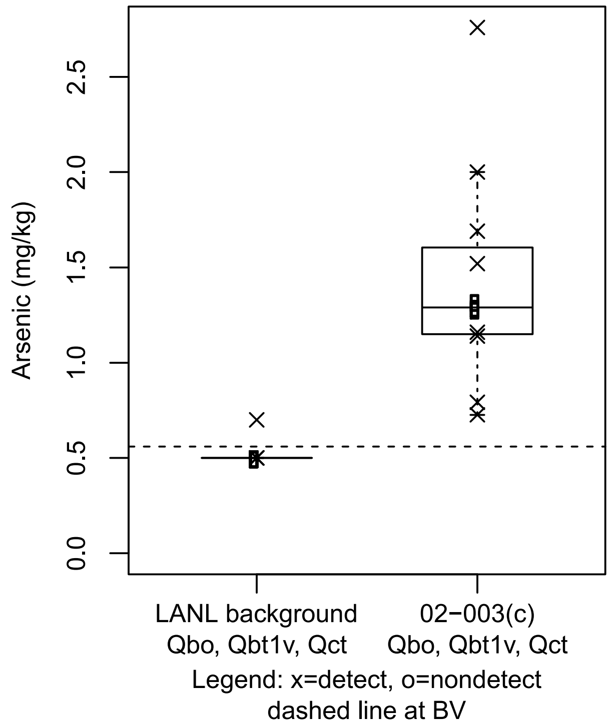

Figure G-19 Box plot for arsenic in Qbo at AOC 02-003(c)

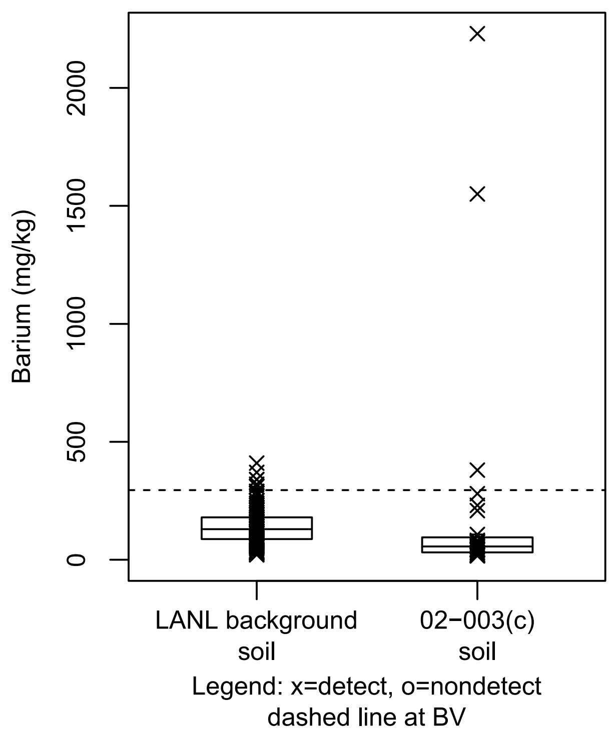

Figure G-20 Box plot for barium in soil at AOC 02-003(c)

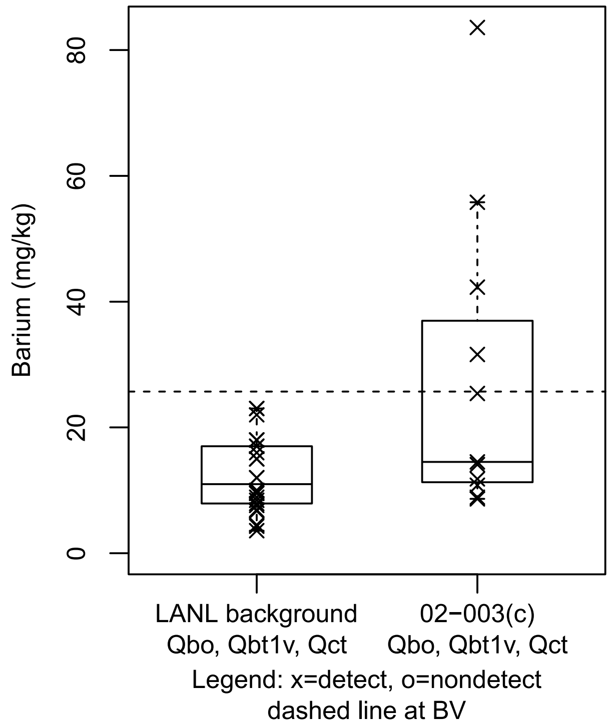

Figure G-21 Box plot for barium in Qbo at AOC 02-003(c)

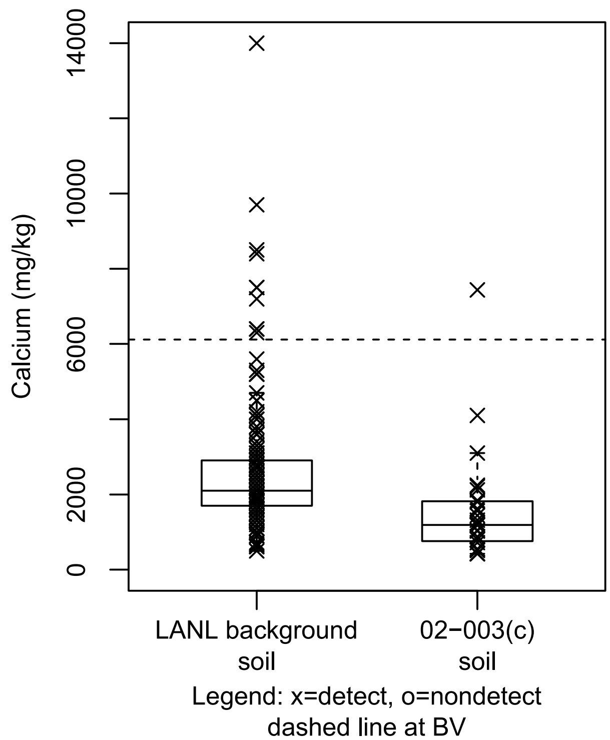

Figure G-22 Box plot for calcium in soil at AOC 02-003(c)

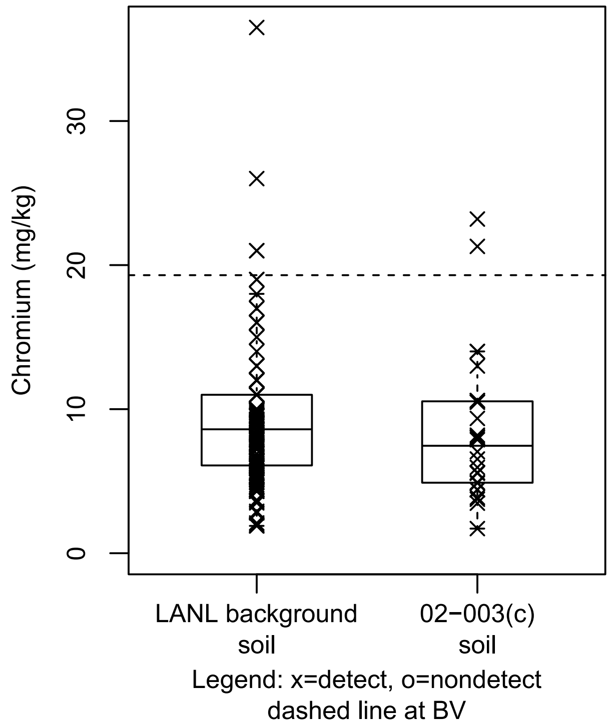

Figure G-23 Box plot for chromium in soil at AOC 02-003(c)

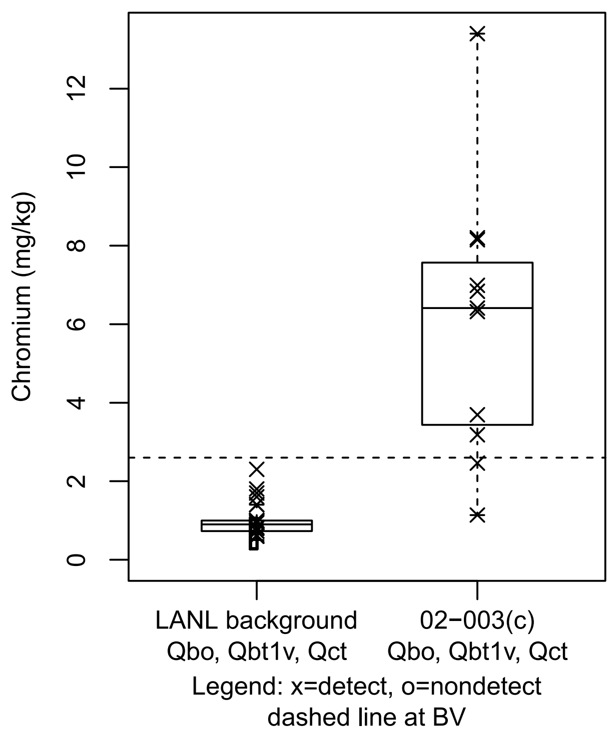

Figure G-24 Box plot for chromium in Qbo at AOC 02-003(c)

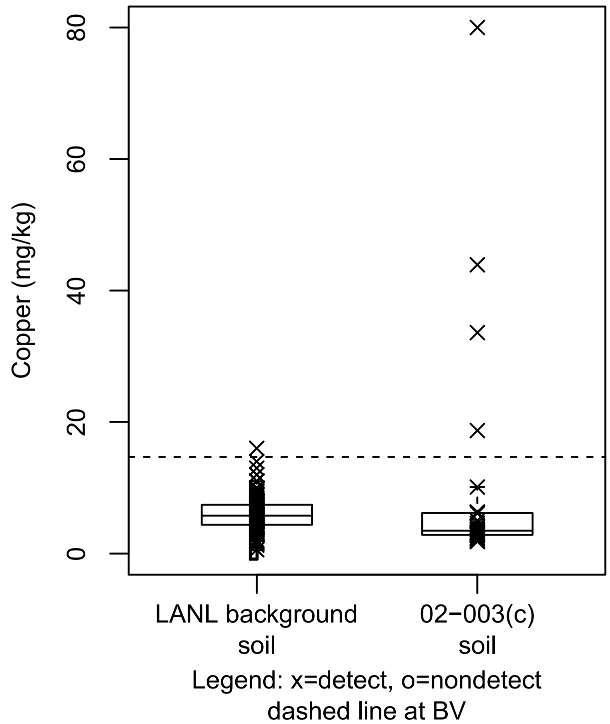

Figure G-25 Box plot for copper in soil at AOC 02-003(c)

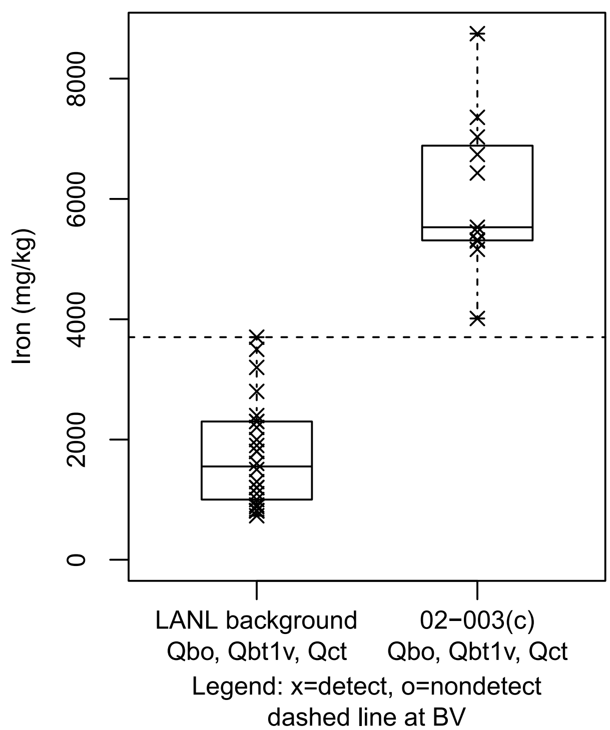

Figure G-26 Box plot for iron in Qbo at AOC 02-003(c)

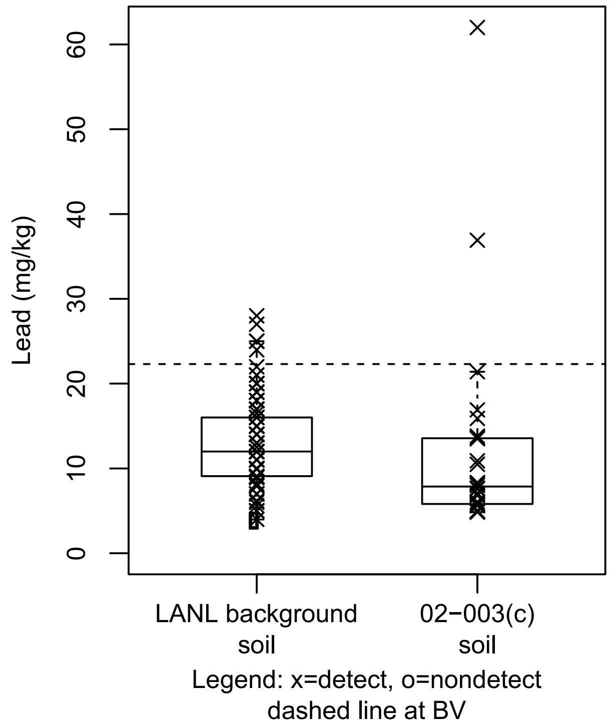

Figure G-27 Box plot for lead in soil at AOC 02-003(c)

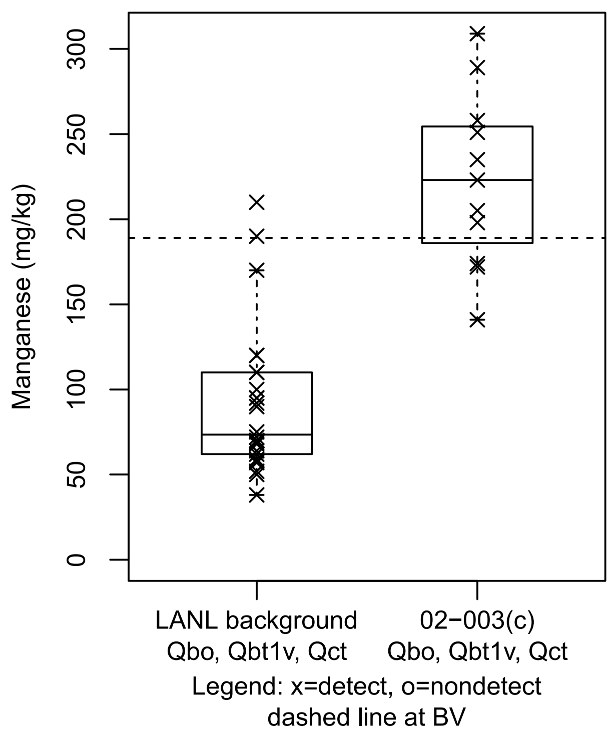

Figure G-28 Box plot for manganese in Qbo at AOC 02-003(c)

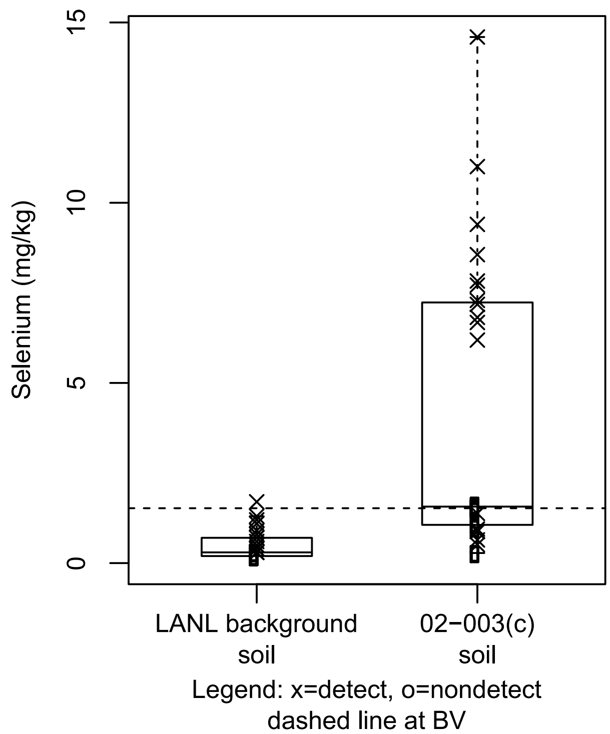

Figure G-29 Box plot for selenium in soil at AOC 02-003(c)

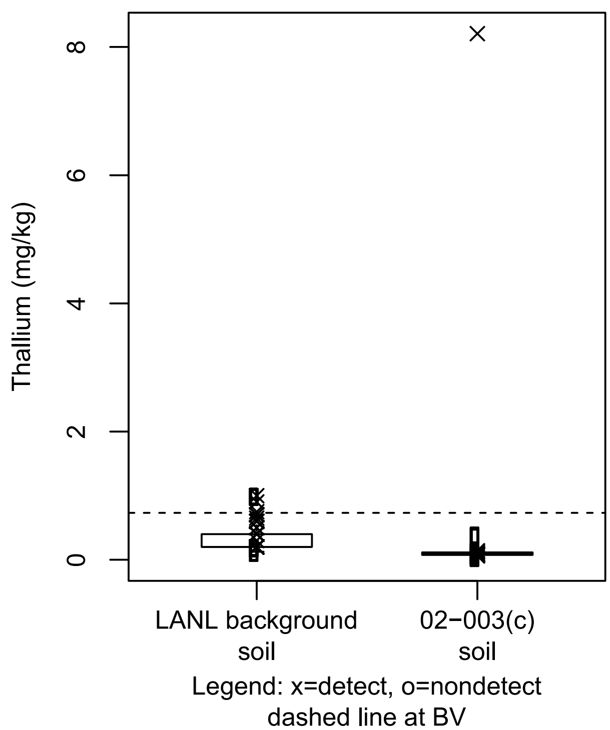

Figure G-30 Box plot for thallium in soil at AOC 02-003(c)

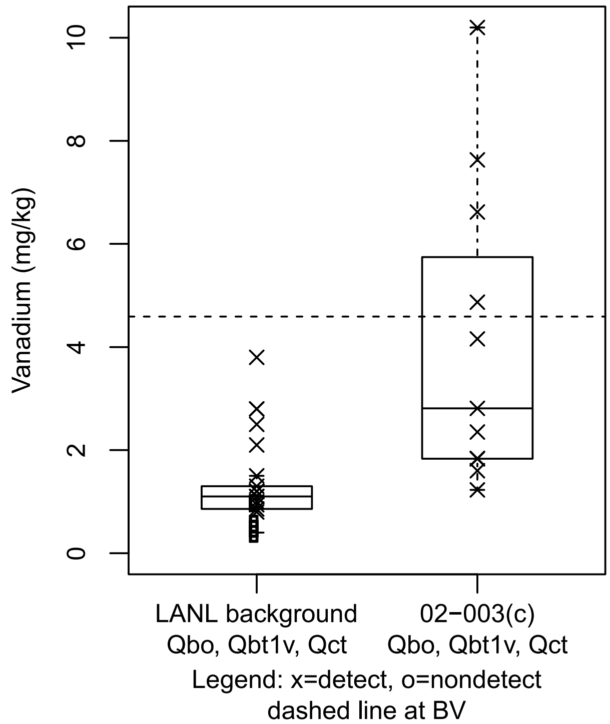

Figure G-31 Box plot for vanadium in Qbo at AOC 02-003(c)

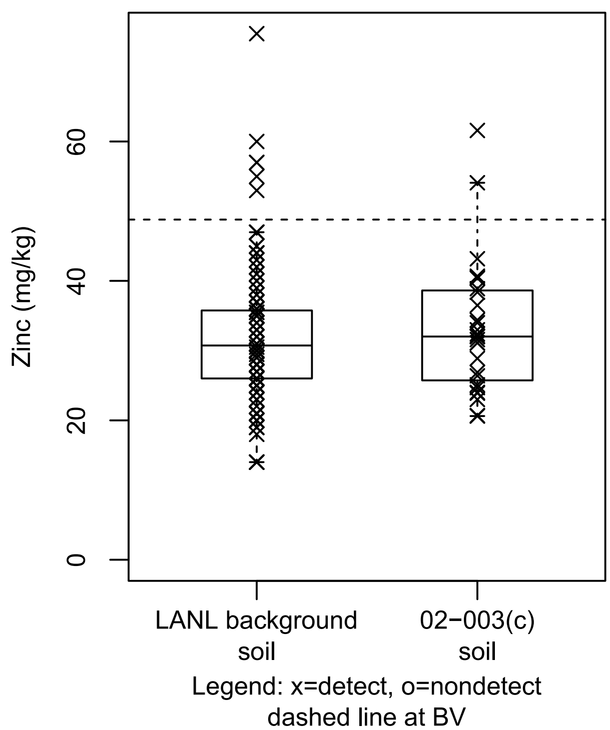

Figure G-32 Box plot for zinc in soil at AOC 02-003(c)

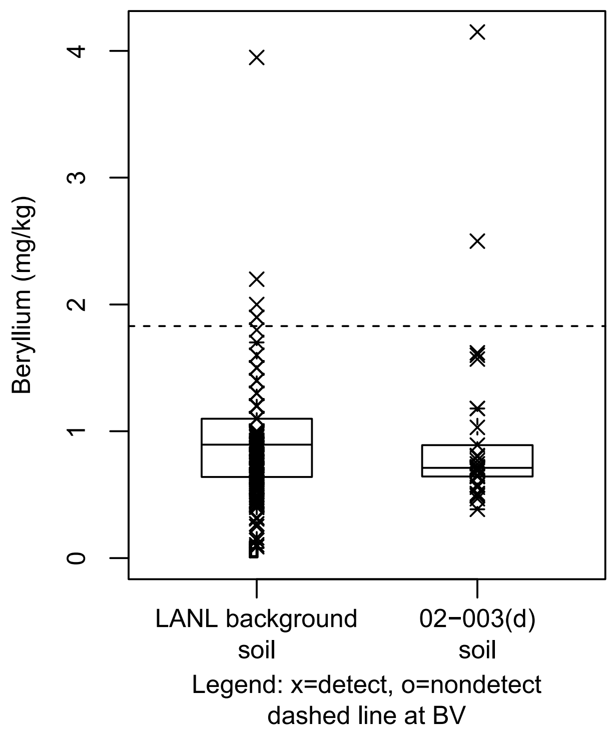

Figure G-33 Box plot for beryllium in soil at AOC 02-003(d)

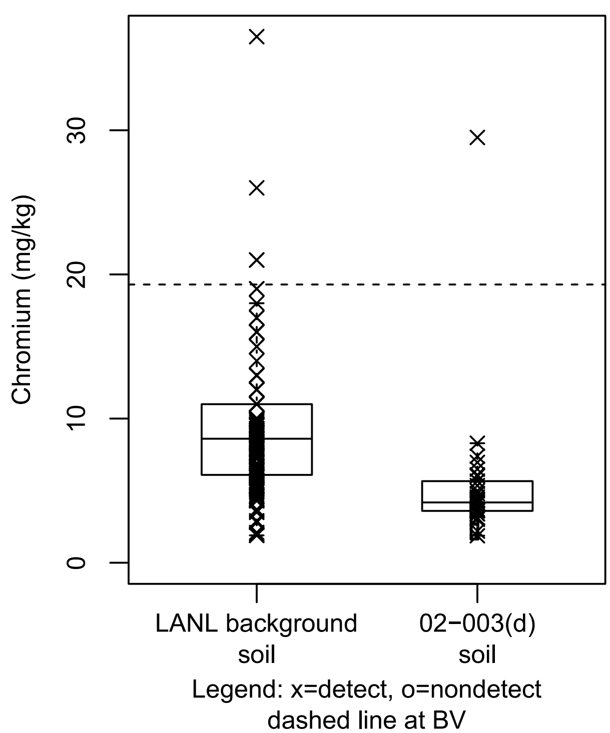

Figure G-34 Box plot for chromium in soil at AOC 02-003(d)

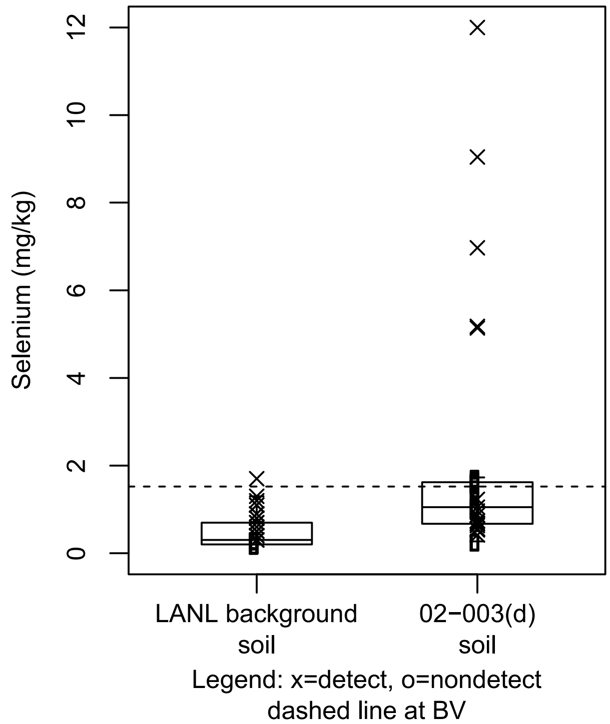

Figure G-35 Box plot for selenium in soil at AOC 02-003(d)

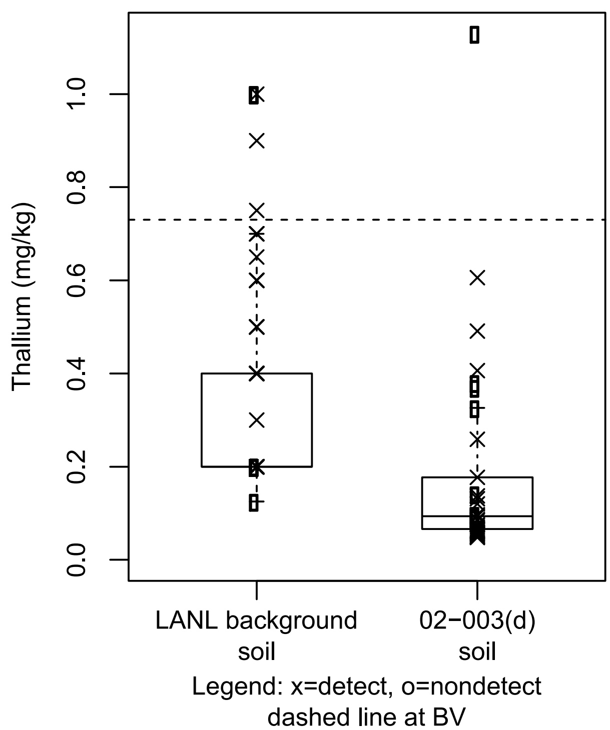

Figure G-36 Box plot for thallium in soil at AOC 02-003(d)

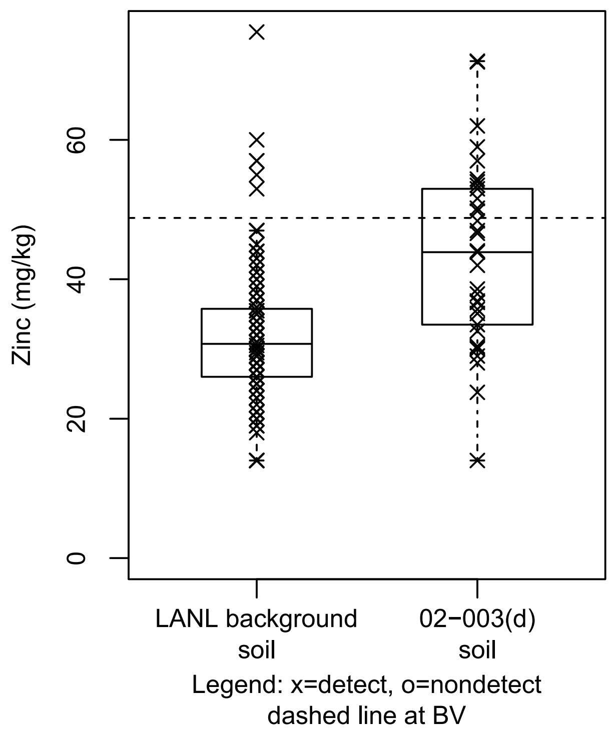

Figure G-37 Box plot for zinc in soil at AOC 02-003(d)

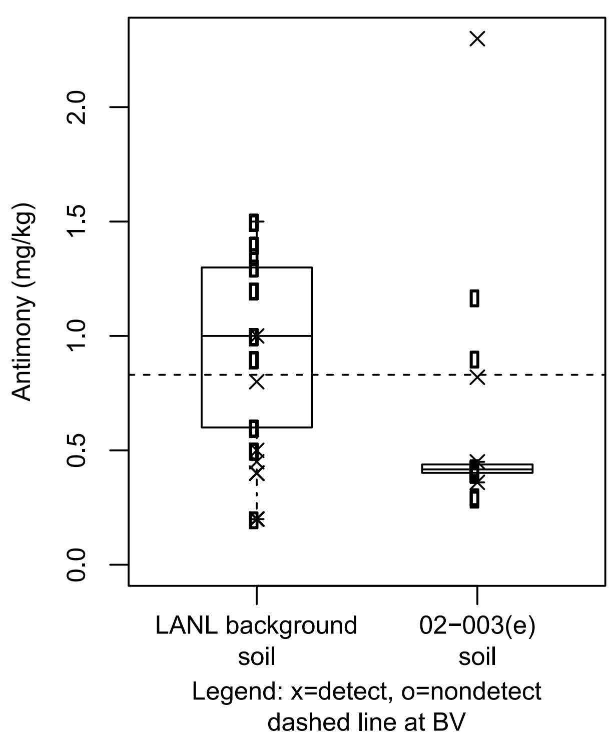

Figure G-38 Box plot for antimony in soil at AOC 02-003(e)

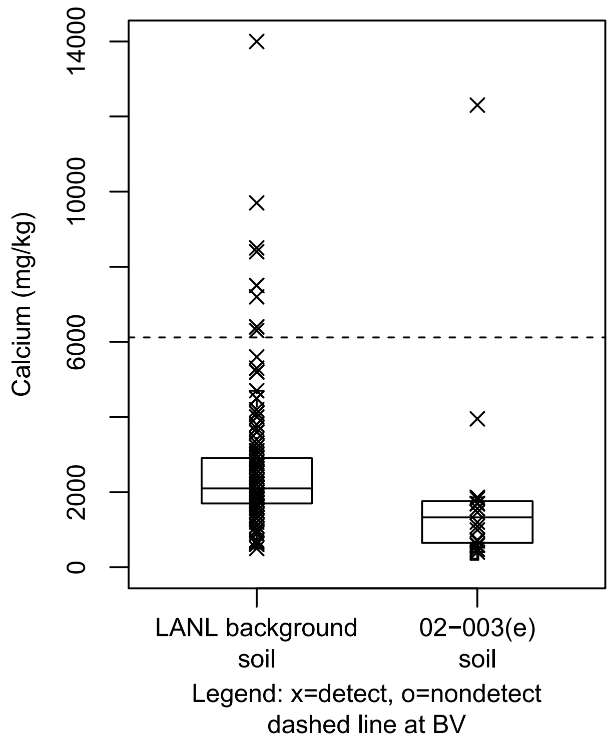

Figure G-39 Box plot for calcium in soil at AOC 02-003(e)

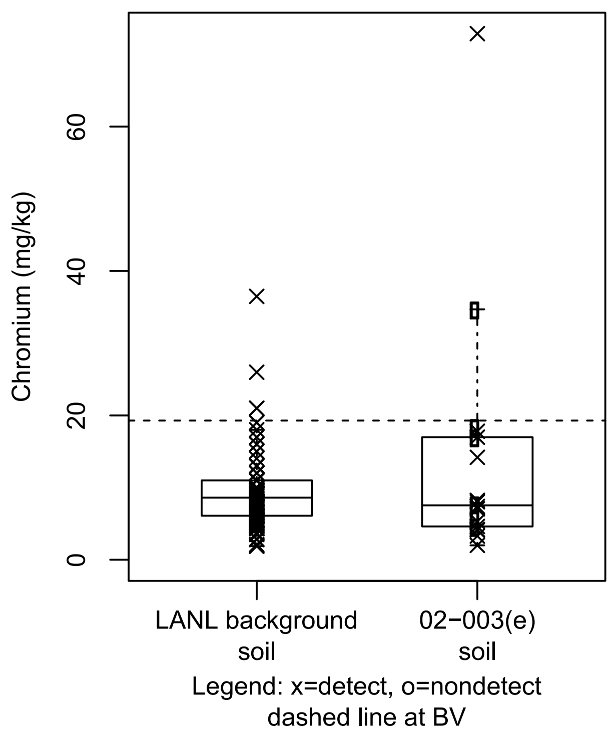

Figure G-40 Box plot for chromium in soil at AOC 02-003(e)

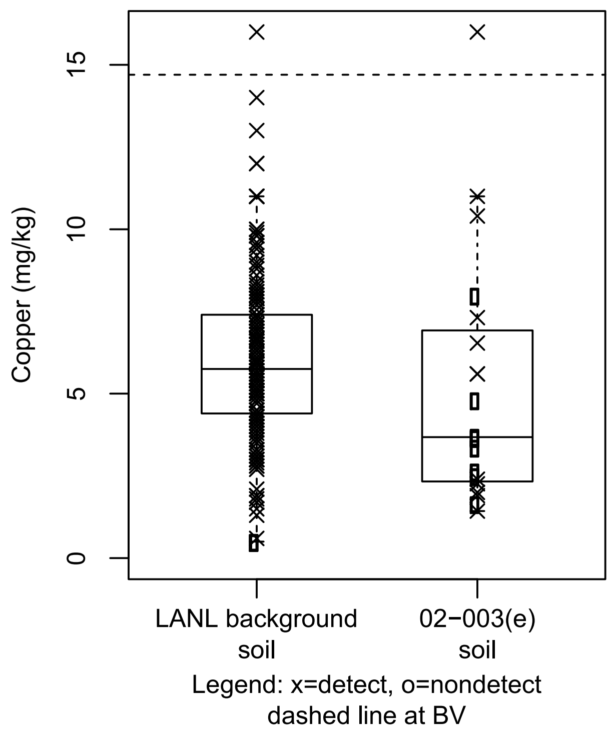

Figure G-41 Box plot for copper in soil at AOC 02-003(e)

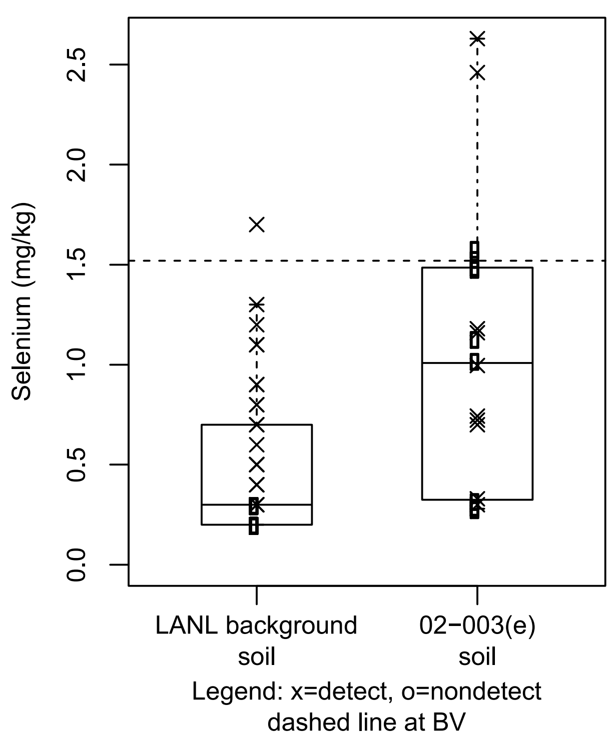

Figure G-42 Box plot for selenium in soil at AOC 02-003(e)

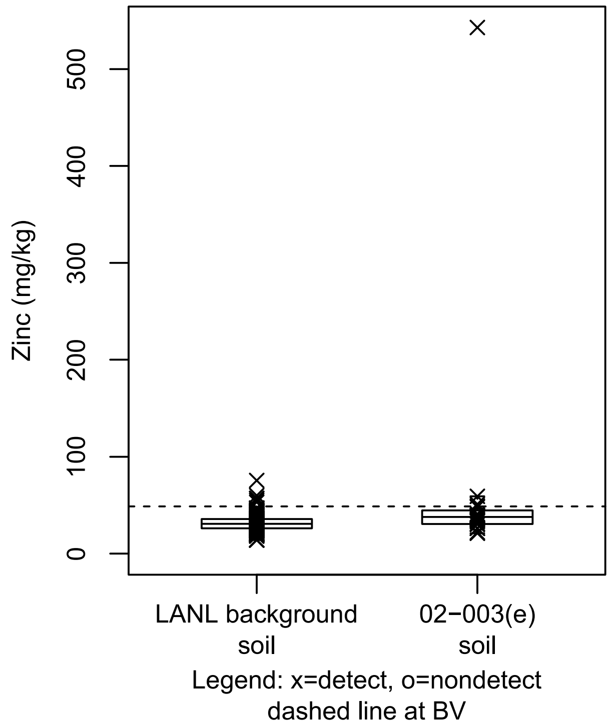

Figure G-43 Box plot for zinc in soil at AOC 02-003(e)

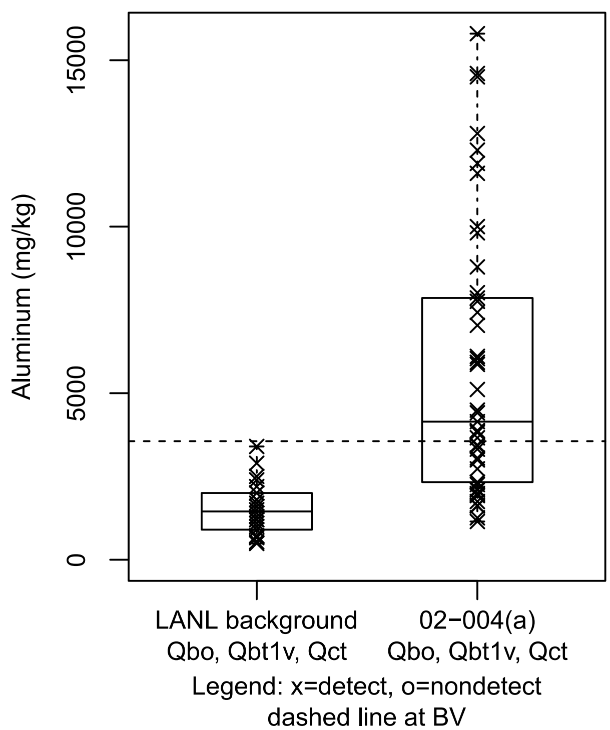

Figure G-44 Box plot for aluminum in Qbo at AOC 02-004(a)

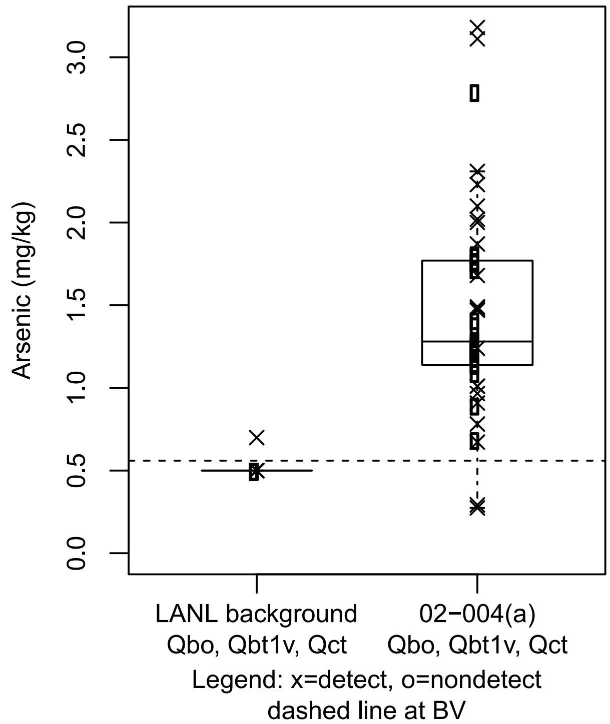

Figure G-45 Box plot for arsenic in Qbo at AOC 02-004(a)

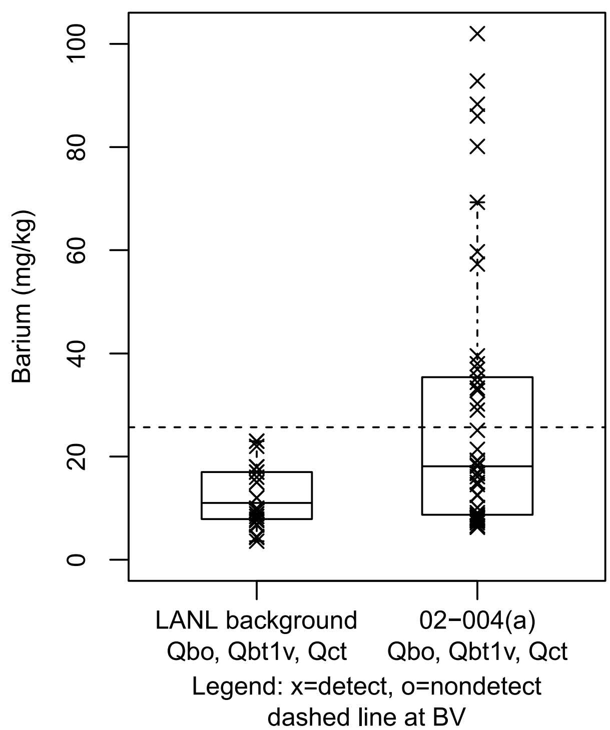

Figure G-46 Box plot for barium in Qbo at AOC 02-004(a)

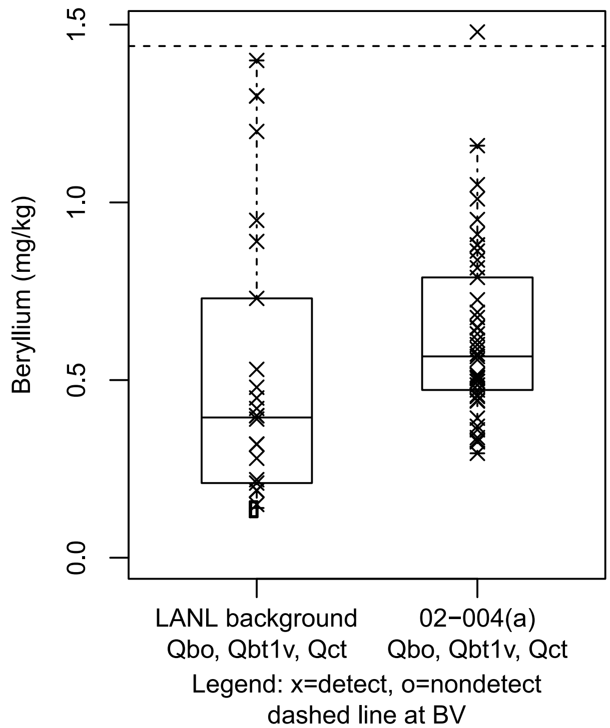

Figure G-47 Box plot for beryllium in Qbo at AOC 02-004(a)

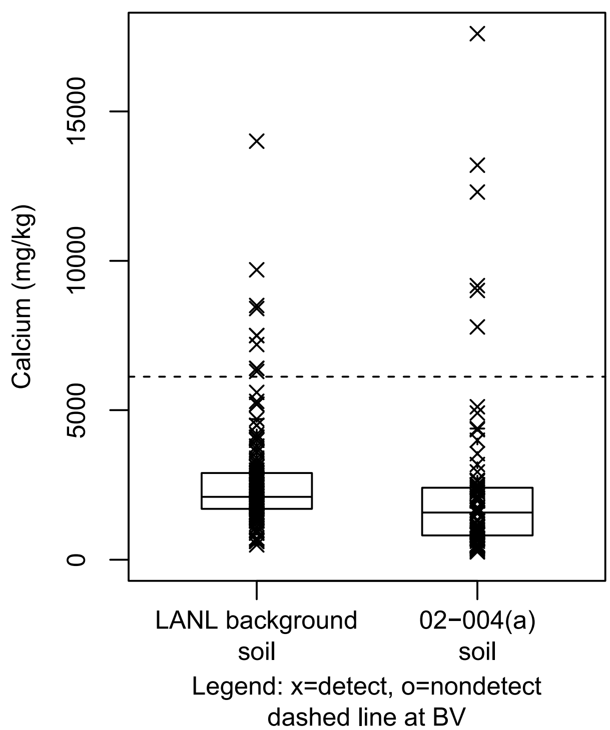

Figure G-48 Box plot for calcium in soil AOC 02-004(a)

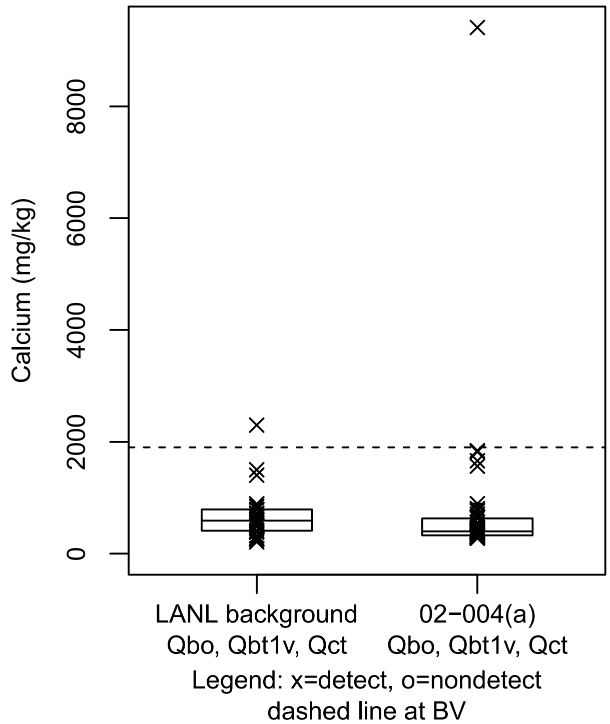

Figure G-49 Box plot for calcium in Qbo at AOC 02-004(a)

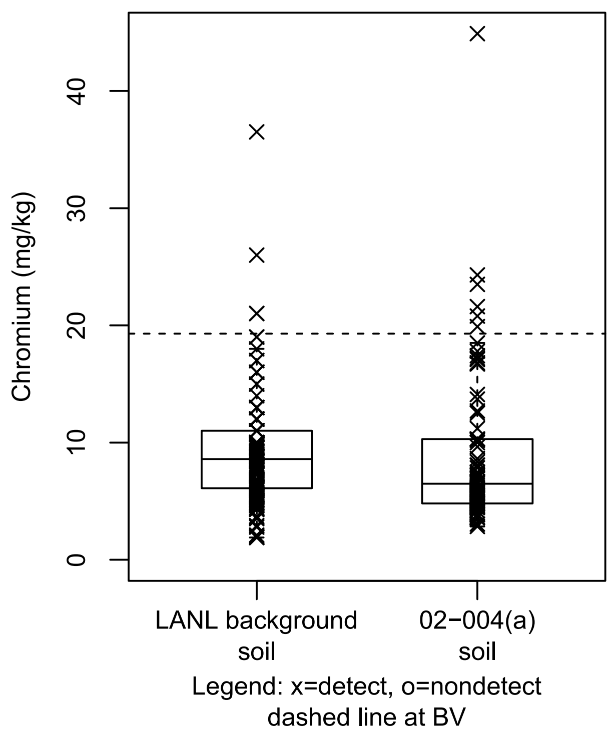

Figure G-50 Box plot for chromium in soil at AOC 02-004(a)

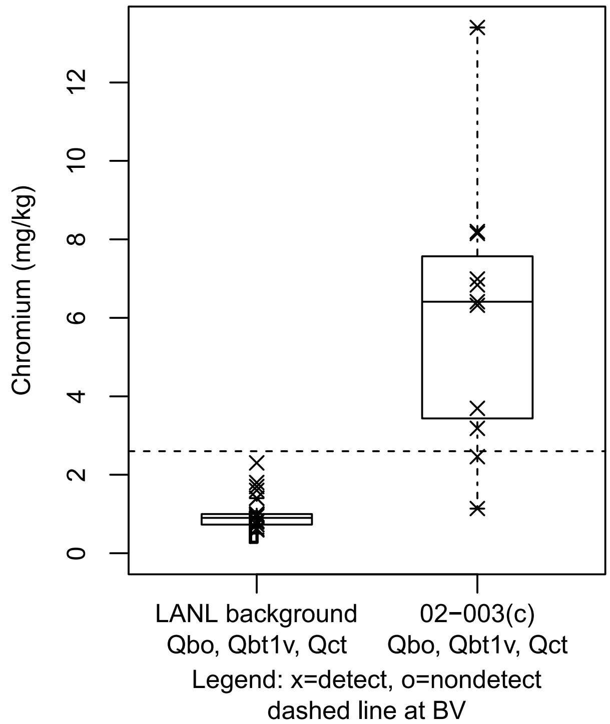

Figure G-51 Box plot for chromium in Qbo at AOC 02-004(a)

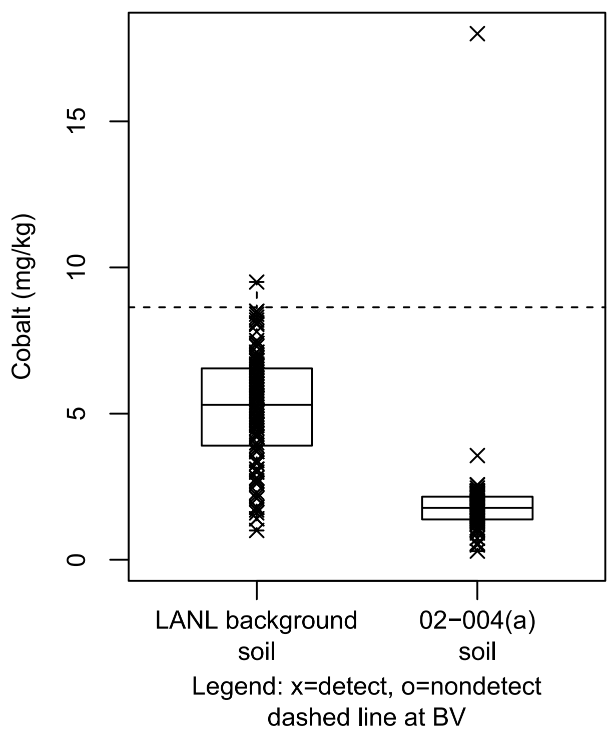

Figure G-52 Box plot for cobalt in soil at AOC 02-004(a)

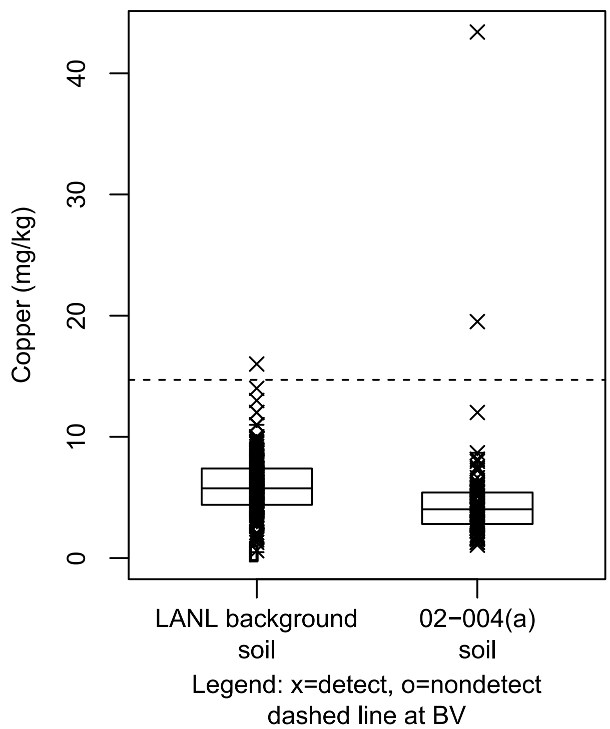

Figure G-53 Box plot for copper in soil at AOC 02-004(a)

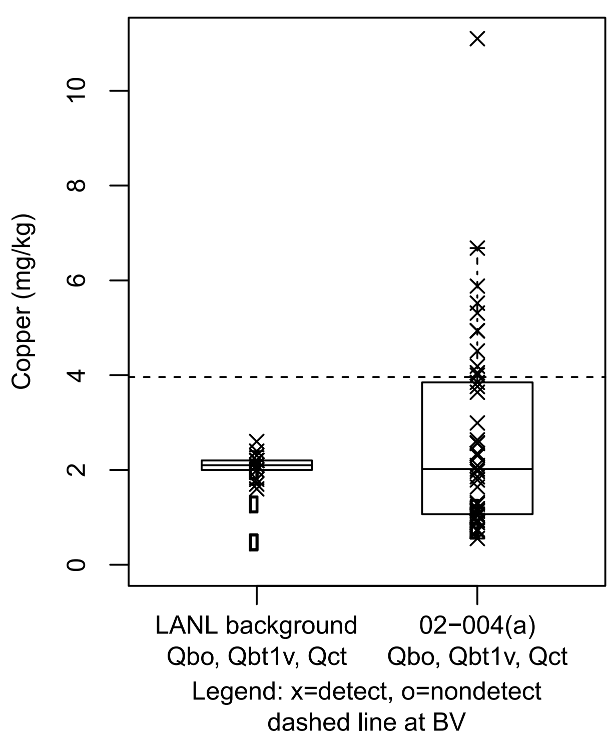

Figure G-54 Box plot for copper in Qbo at AOC 02-004(a)

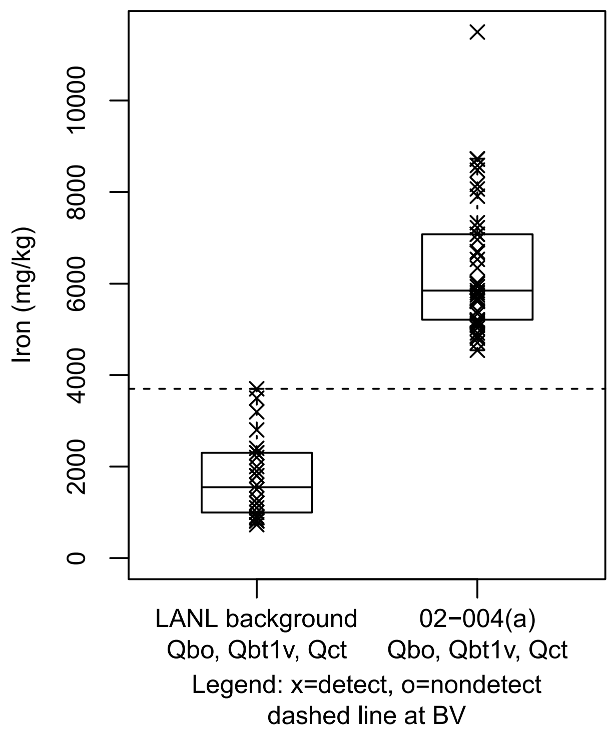

Figure G-55 Box plot for iron in Qbo at AOC 02-004(a)

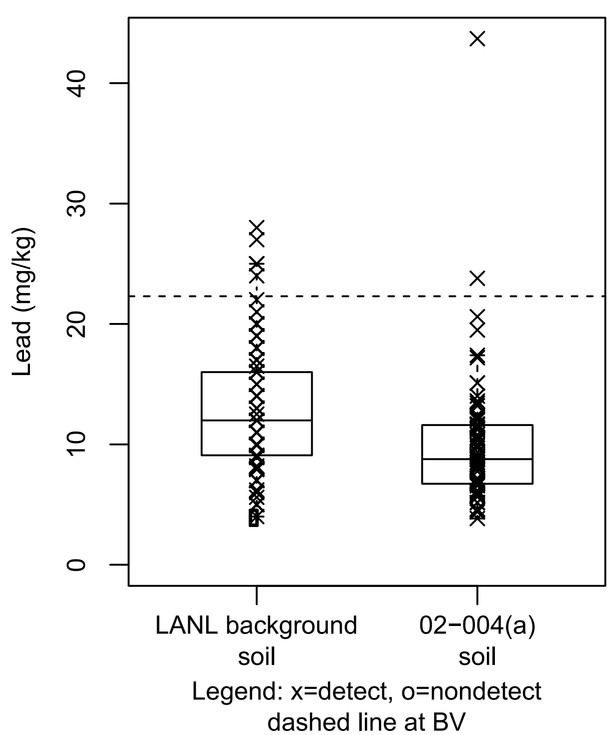

Figure G-56 Box plot for lead in soil at AOC 02-004(a)

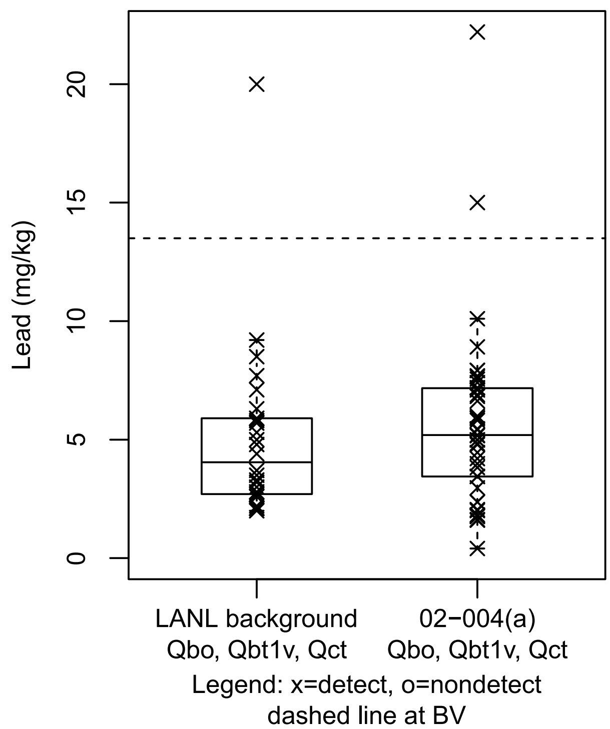

Figure G-57 Box plot for lead in Qbo at AOC 02-004(a)

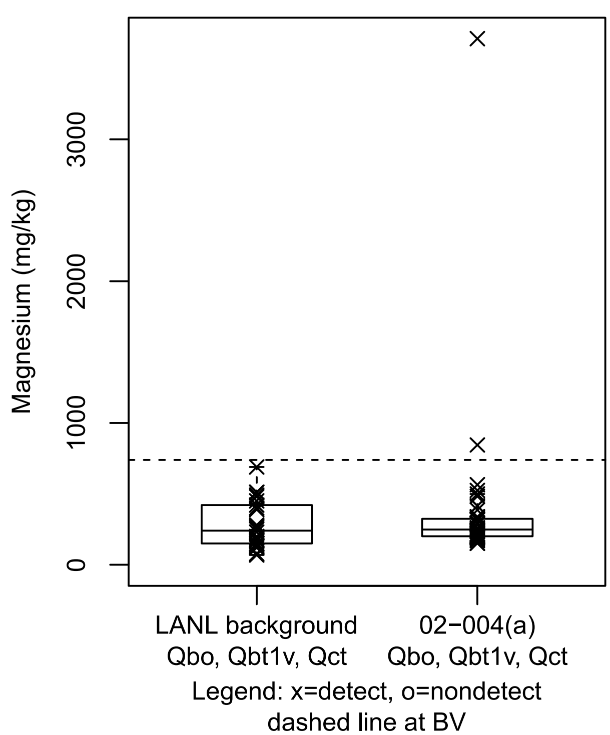

Figure G-58 Box plot for magnesium in Qbo at AOC 02-004(a)

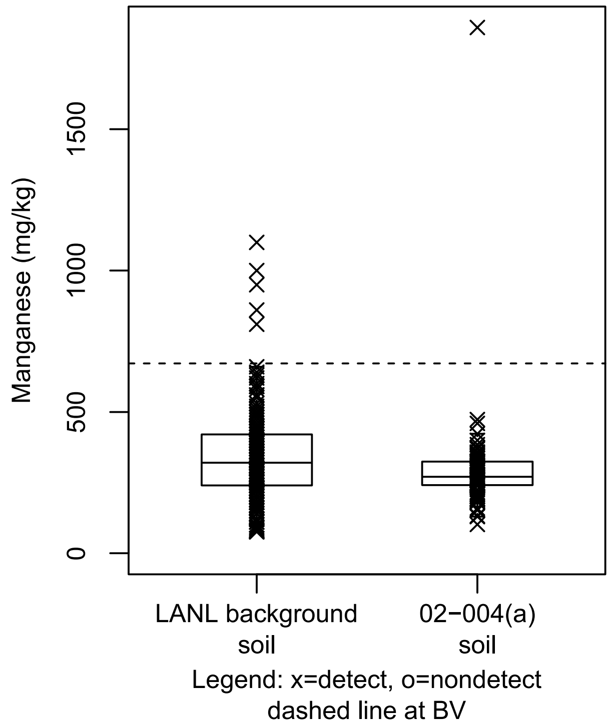

Figure G-59 Box plot for manganese in soil at AOC 02-004(a)

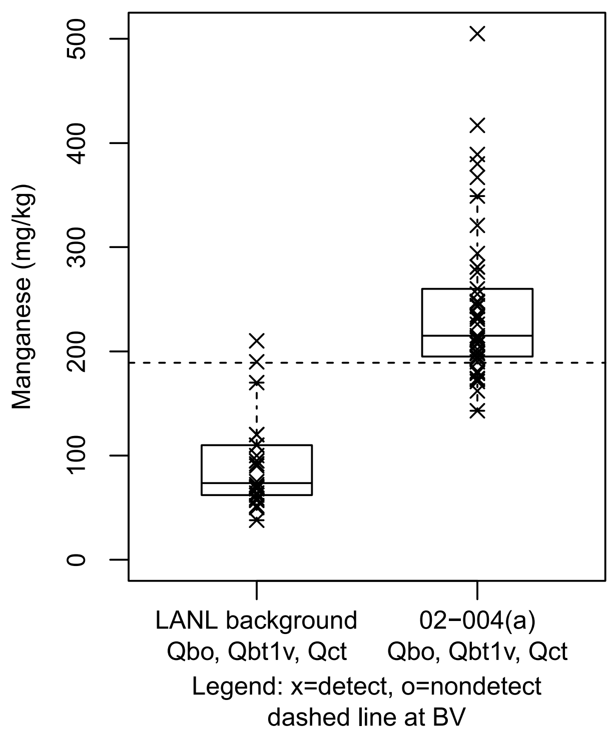

Figure G-60 Box plot for manganese in Qbo at AOC 02-004(a)

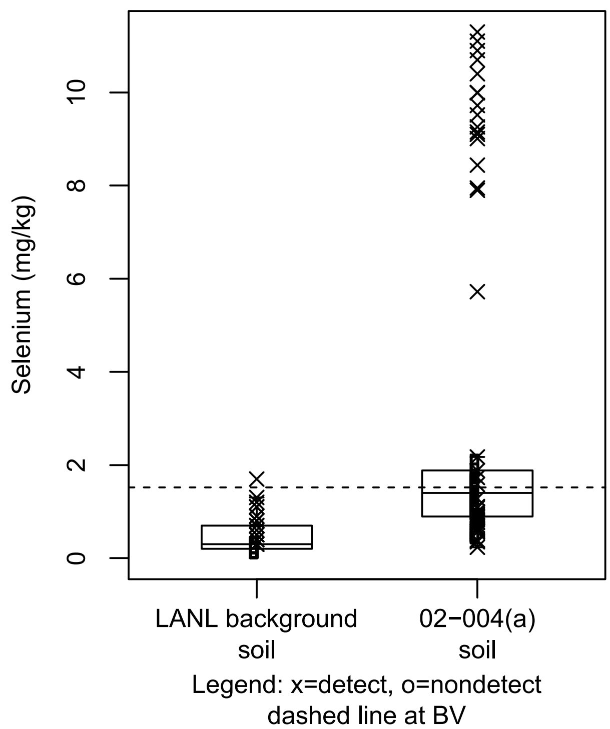

Figure G-61 Box plot for selenium in soil at AOC 02-004(a)

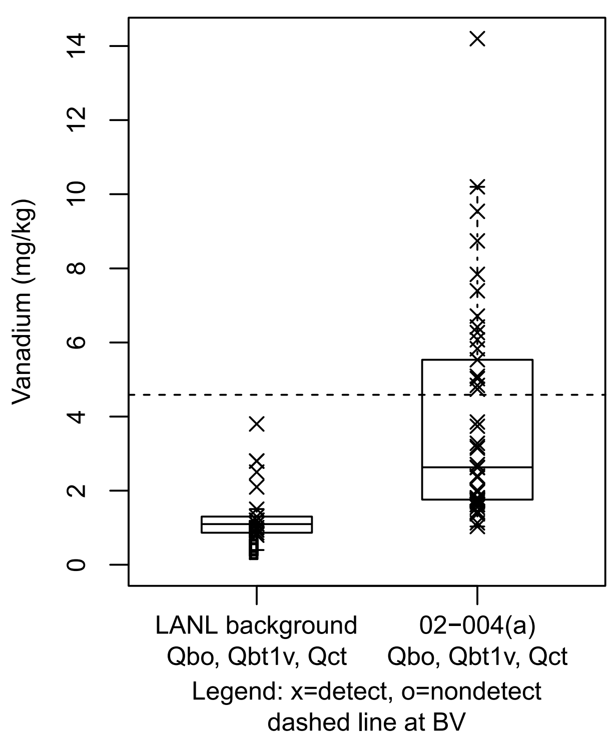

Figure G-62 Box plot for vanadium in Qbo at AOC 02-004(a)

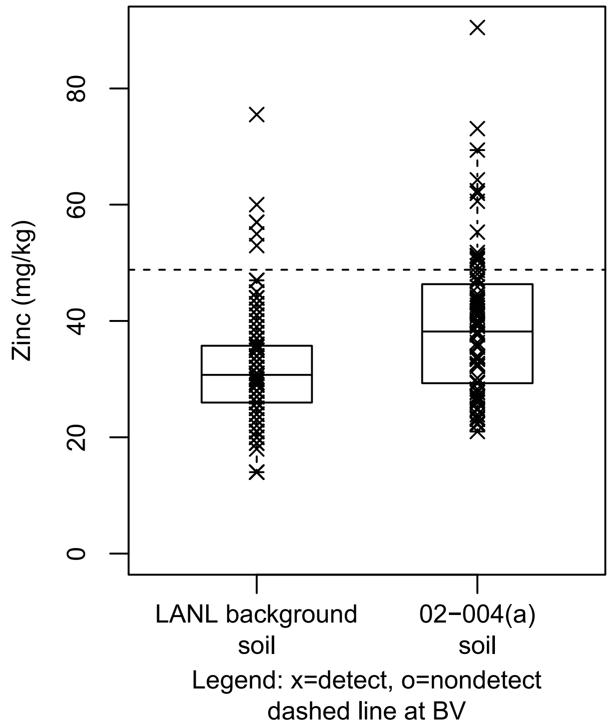

Figure G-63 Box plot for zinc in soil at AOC 02-004(a)

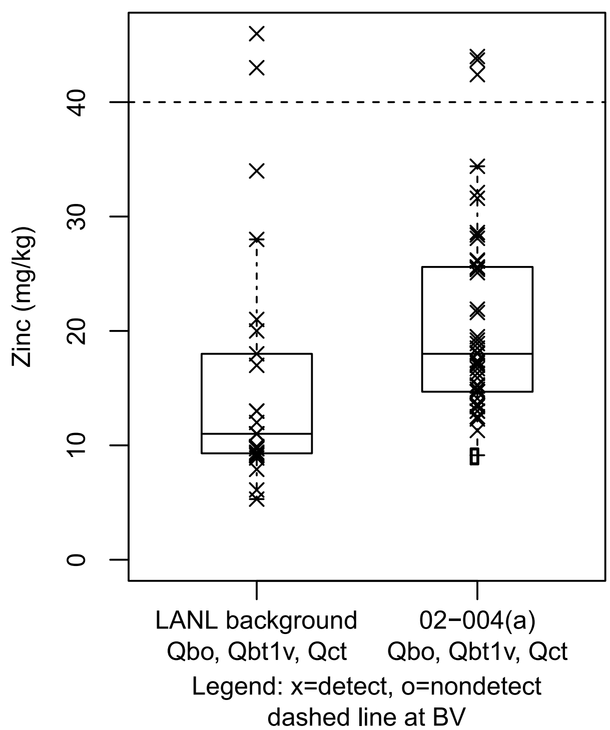

Figure G-64 Box plot for zinc in Qbo at AOC 02-004(a)

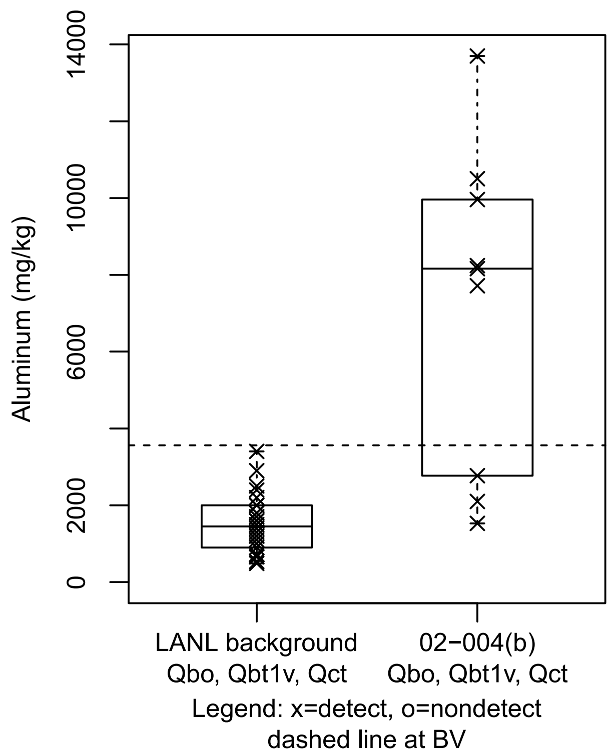

Figure G-65 Box plot for aluminum in Qbo at AOC 02-004(b)

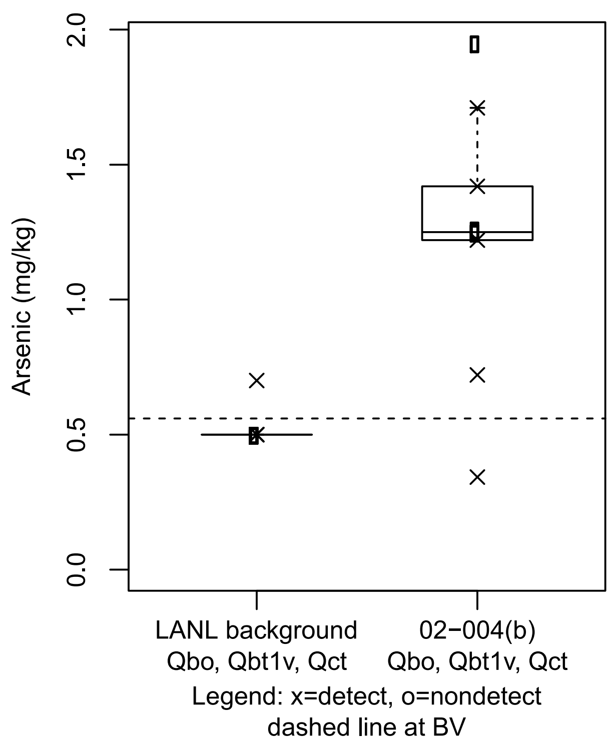

Figure G-66 Box plot for arsenic in Qbo at AOC 02-004(b)

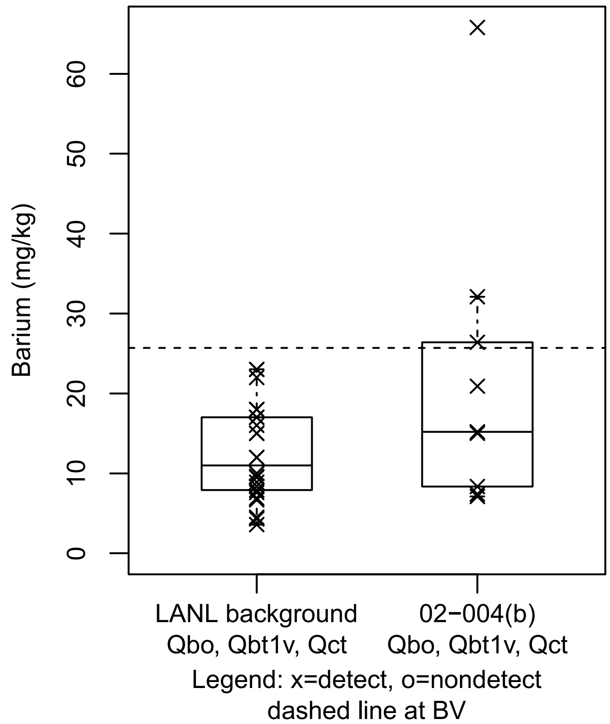

Figure G-67 Box plot for barium in Qbo at AOC 02-004(b)

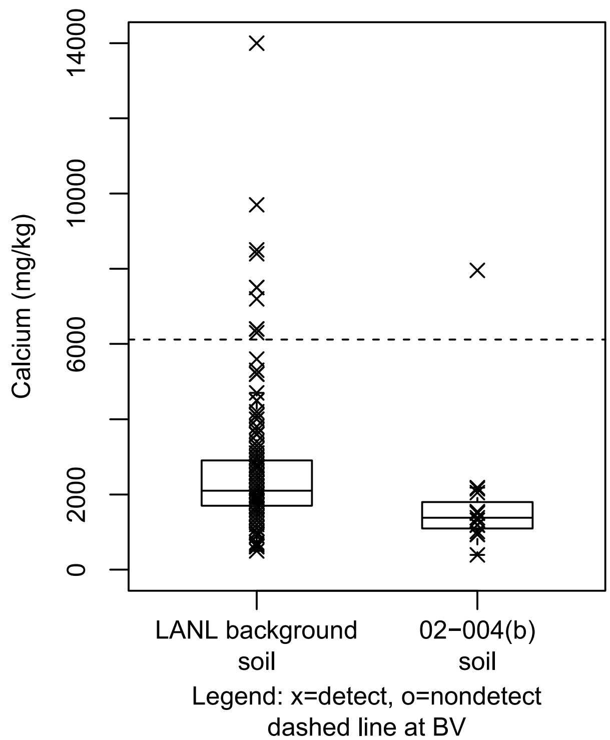

Figure G-68 Box plot for calcium in soil at AOC 02-004(b)

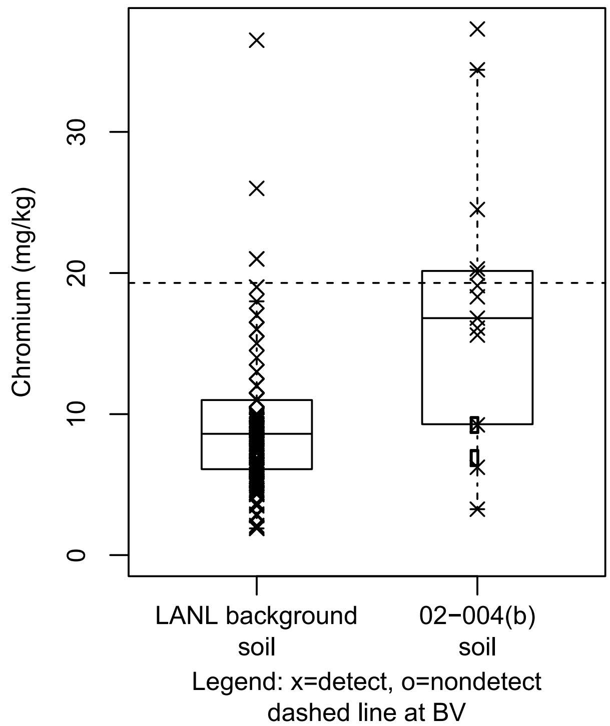

Figure G-69 Box plot for chromium in soil at AOC 02-004(b)

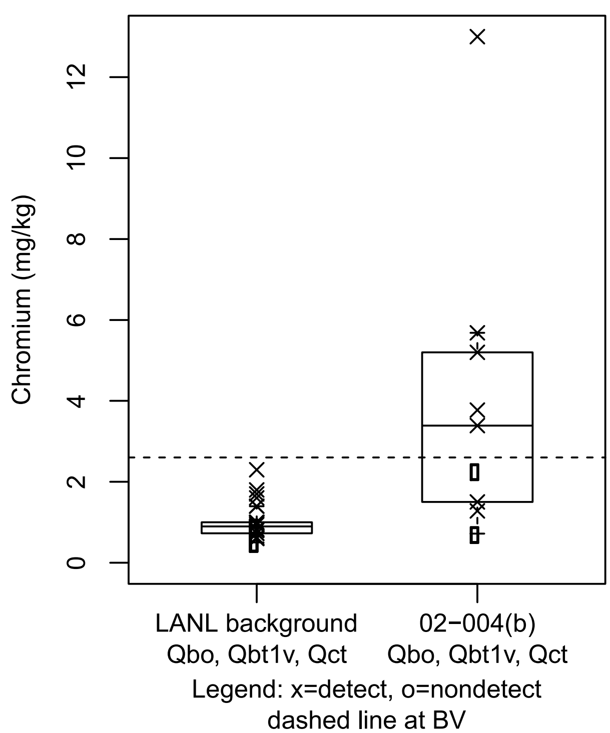

Figure G-70 Box plot for chromium in Qbo at AOC 02-004(b)

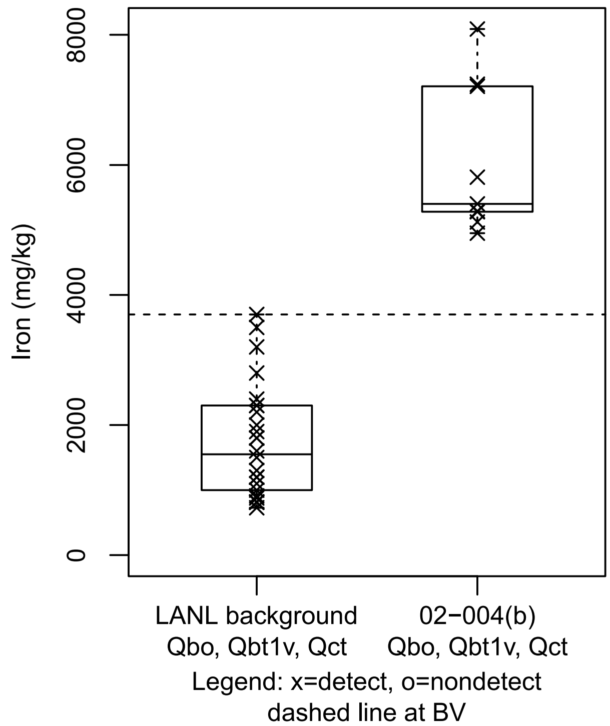

Figure G-71 Box plot for iron in Qbo at AOC 02-004(b)

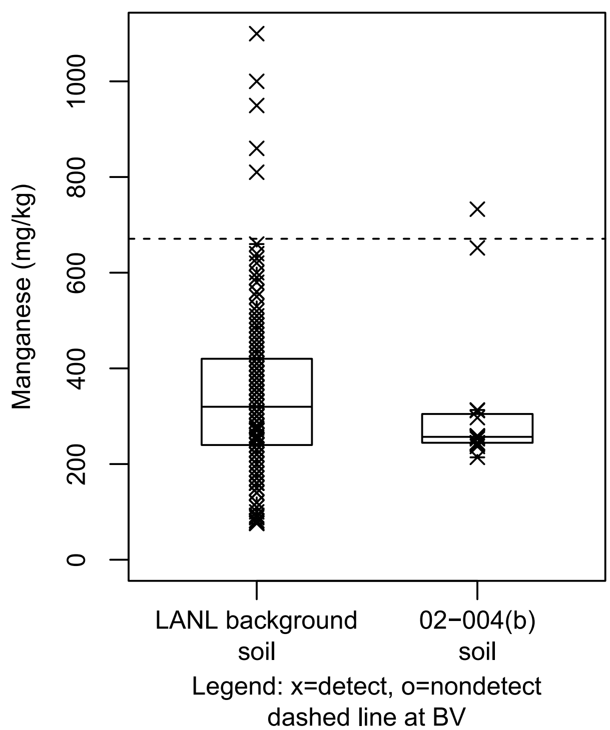

Figure G-72 Box plot for manganese in soil at AOC 02-004(b)

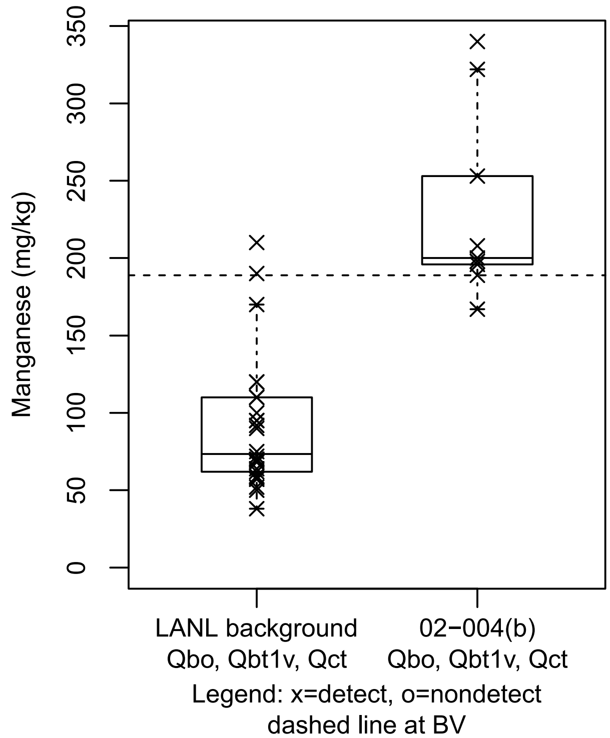

Figure G-73 Box plot for manganese in Qbo at AOC 02-004(b)

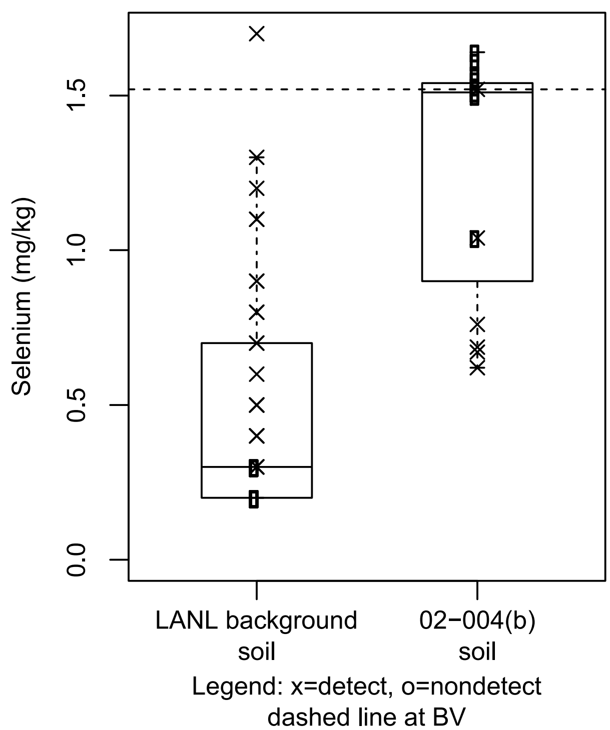

Figure G-74 Box plot for selenium in soil at AOC 02-004(b)

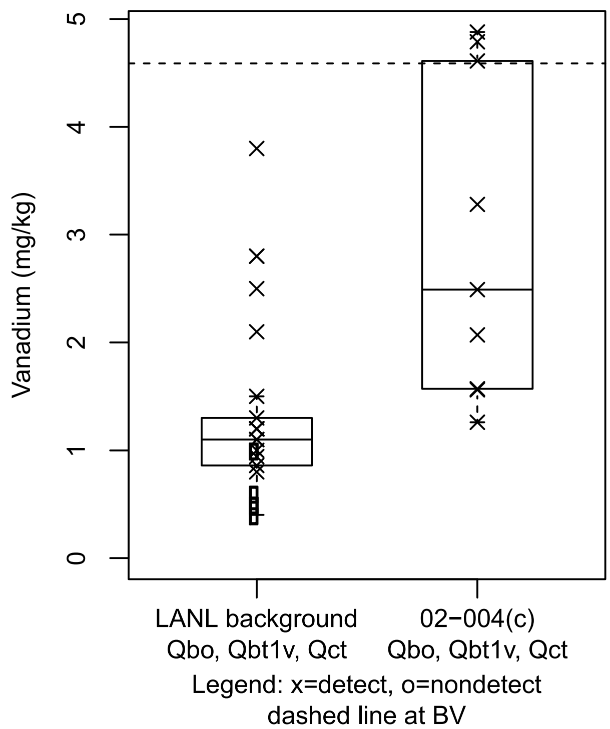

Figure G-75 Box plot for vanadium in Qbo at AOC 02-004(b)

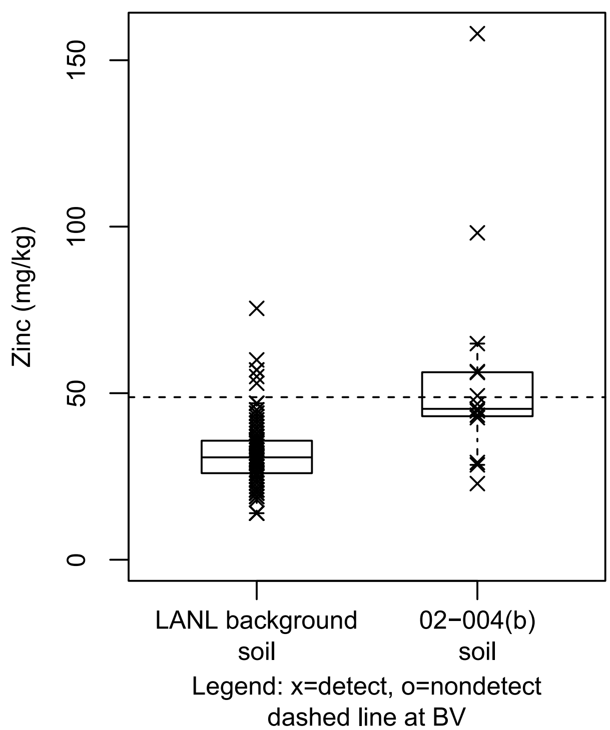

Figure G-76 Box plot for zinc in soil at AOC 02-004(b)

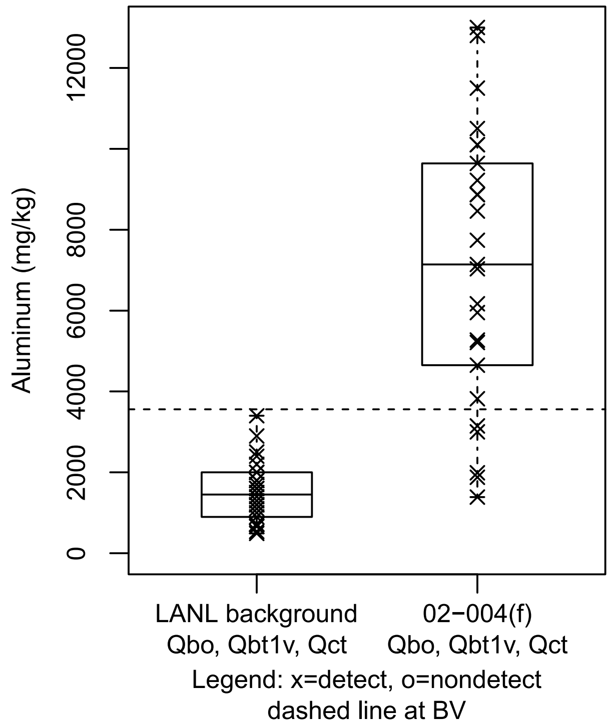

Figure G-77 Box plot for aluminum in Qbo at AOC 02-004(f)

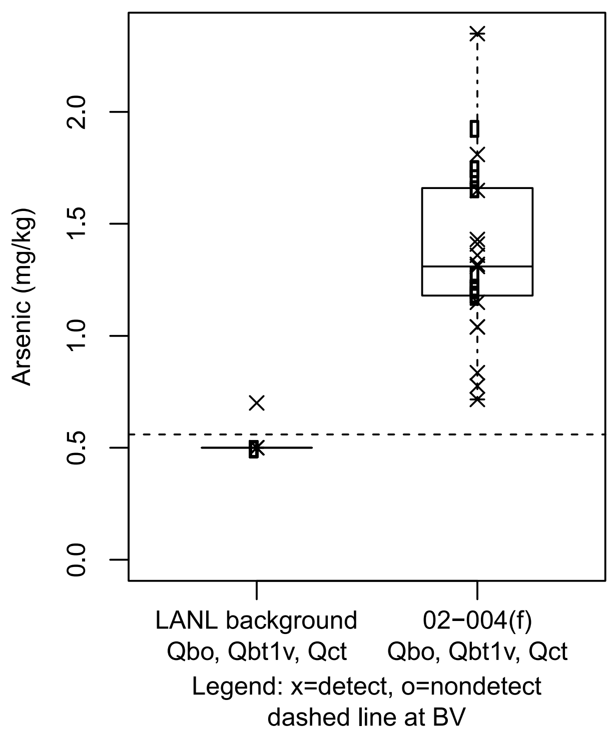

Figure G-78 Box plot for arsenic in Qbo at AOC 02-004(f)

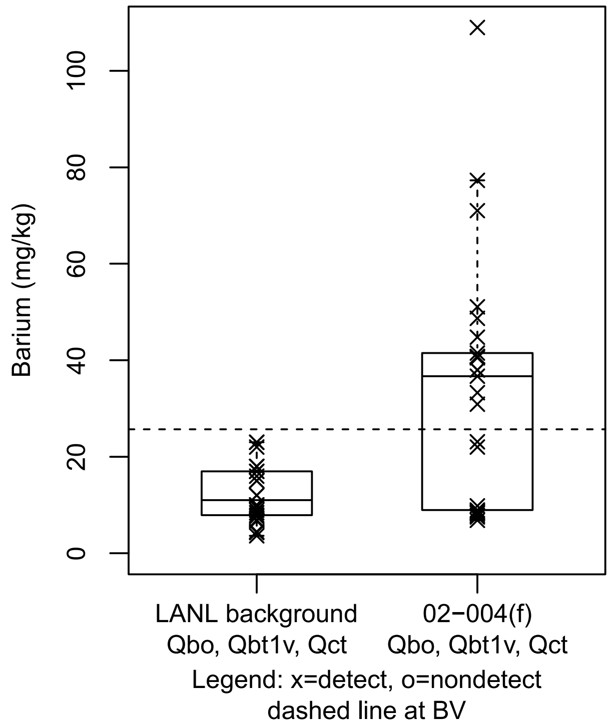

Figure G-79 Box plot for barium in Qbo at AOC 02-004(f)

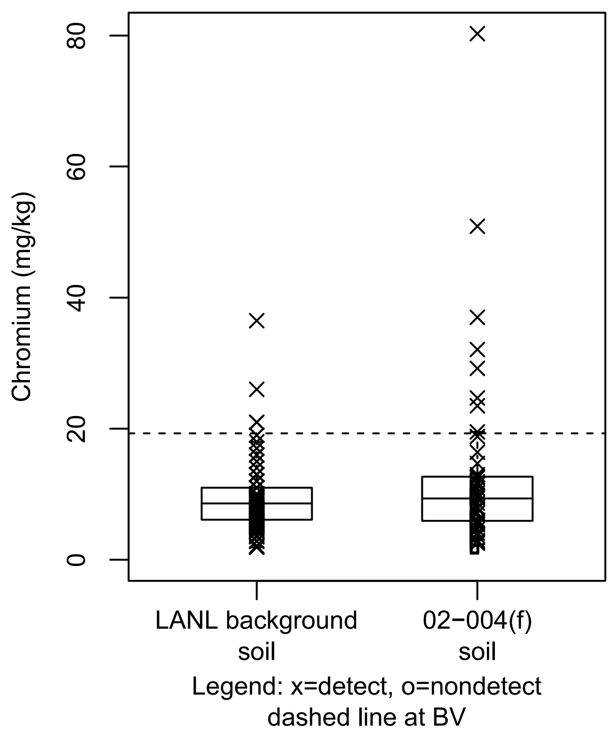

Figure G-80 Box plot for chromium in soil at AOC 02-004(f)

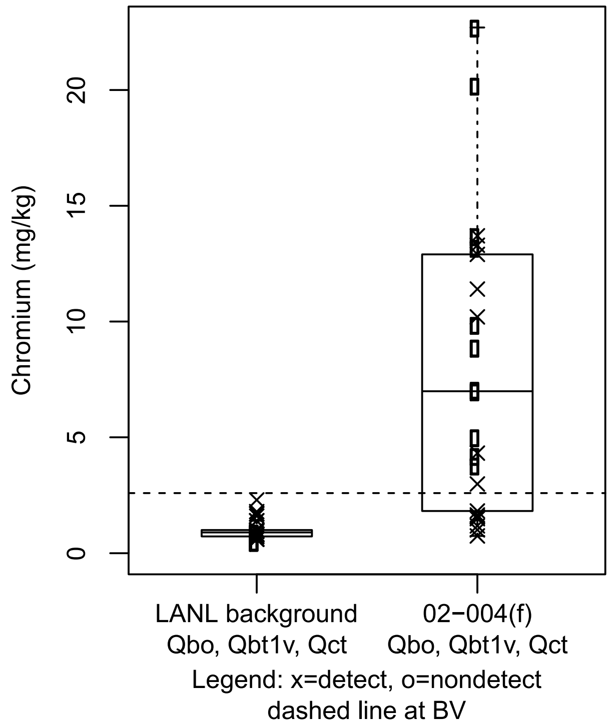

Figure G-81 Box plot for chromium in Qbo at AOC 02-004(f)

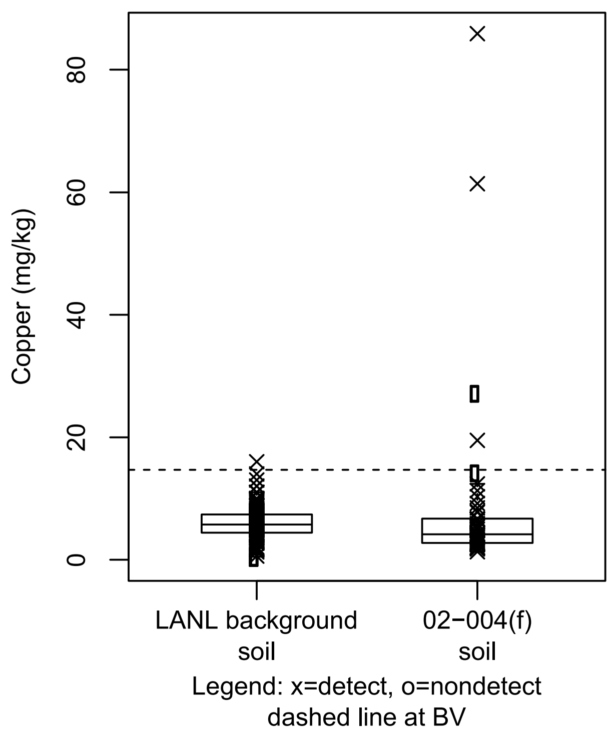

Figure G-82 Box plot for copper in soil at AOC 02-004(f)

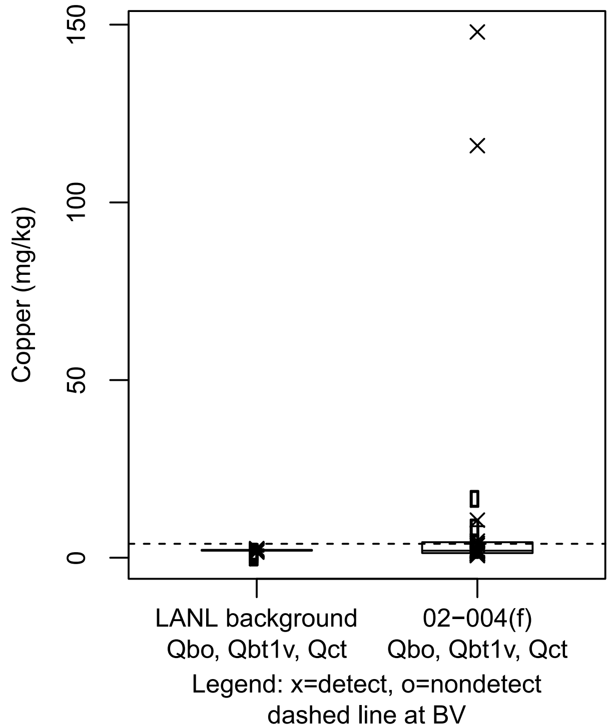

Figure G-83 Box plot for copper in Qbo at AOC 02-004(f)

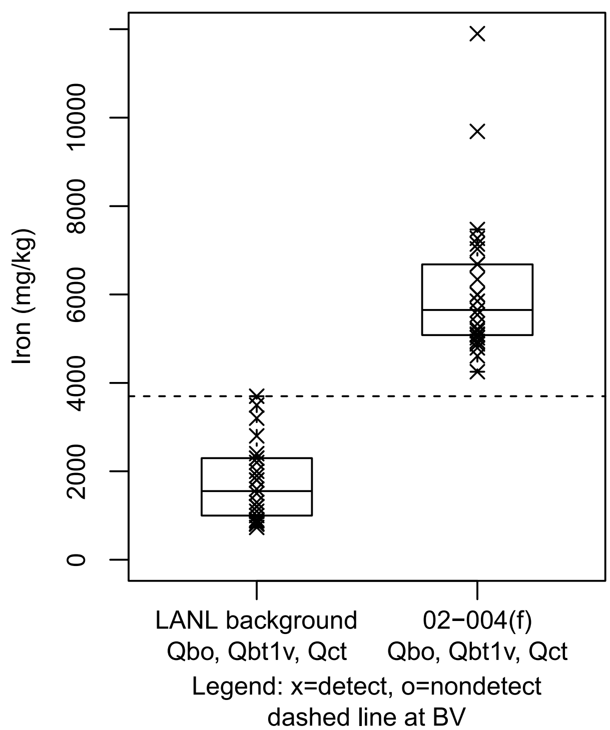

Figure G-84 Box plot for iron in Qbo at AOC 02-004(f)

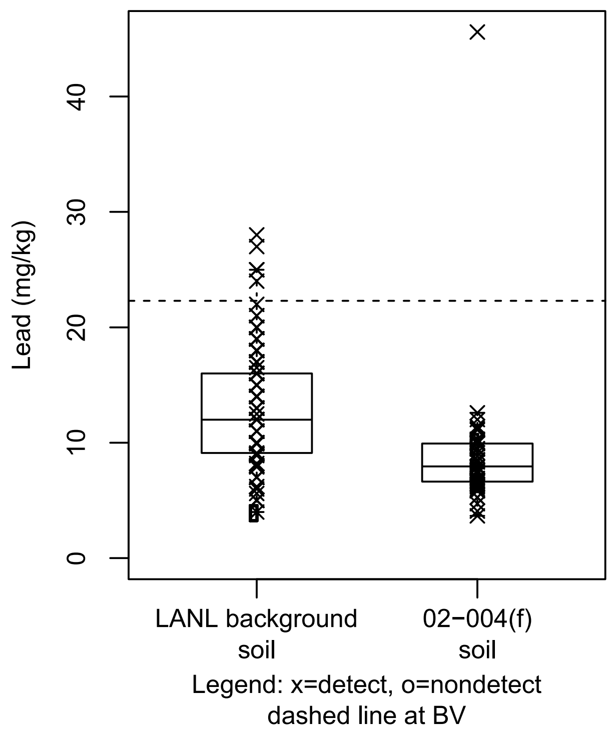

Figure G-85 Box plot for lead in soil at AOC 02-004(f)

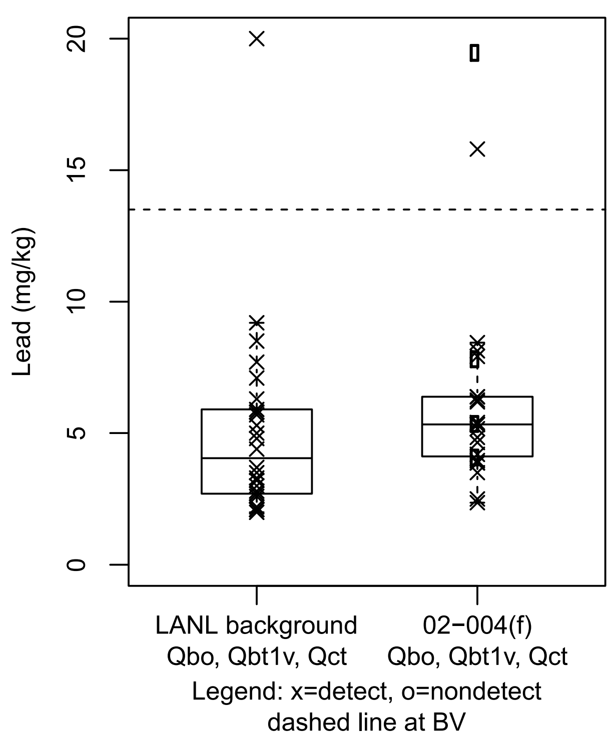

Figure G-86 Box plot for lead in Qbo at AOC 02-004(f)

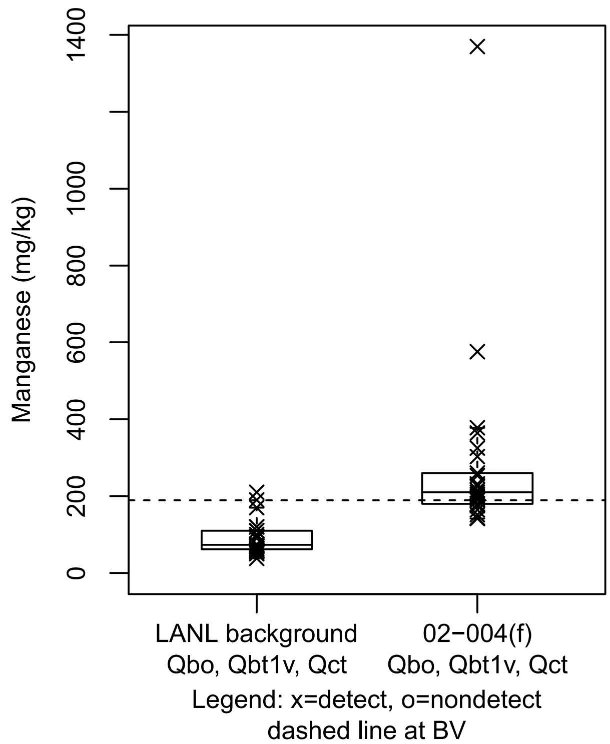

Figure G-87 Box plot for manganese in Qbo at AOC 02-004(f)

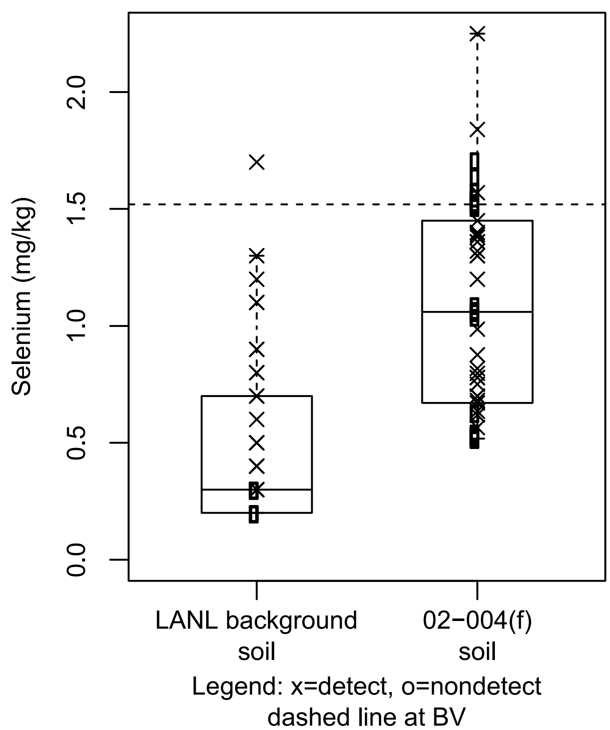

Figure G-88 Box plot for selenium in soil at AOC 02-004(f)

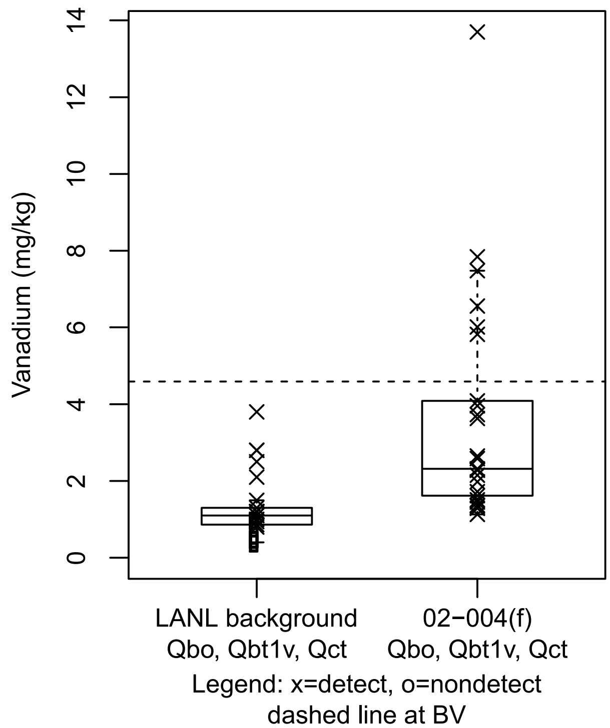

Figure G-89 Box plot for vanadium in Qbo at AOC 02-004(f)

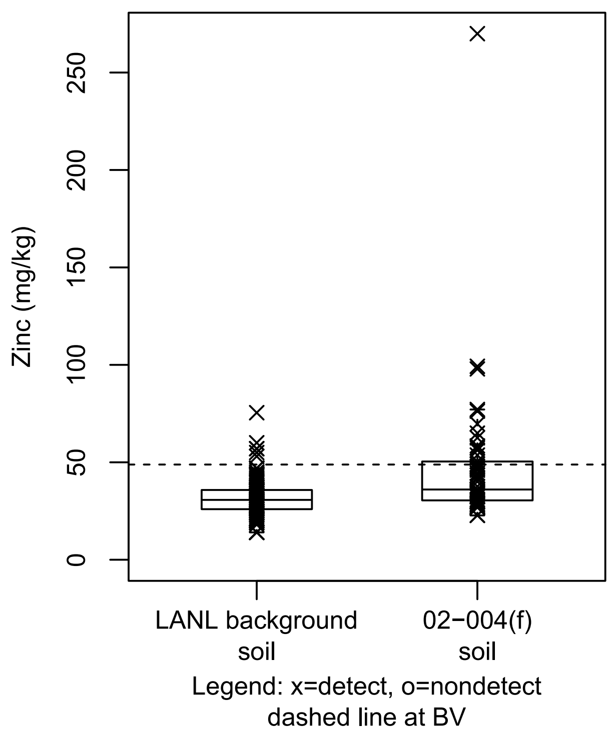

Figure G-90 Box plot for zinc in soil at AOC 02-004(f)

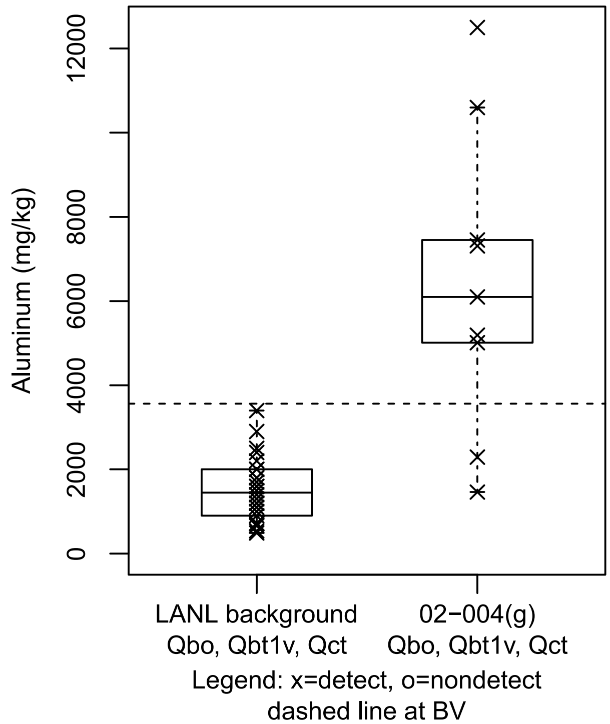

Figure G-91 Box plot for aluminum in Qbo at AOC 02-004(g)

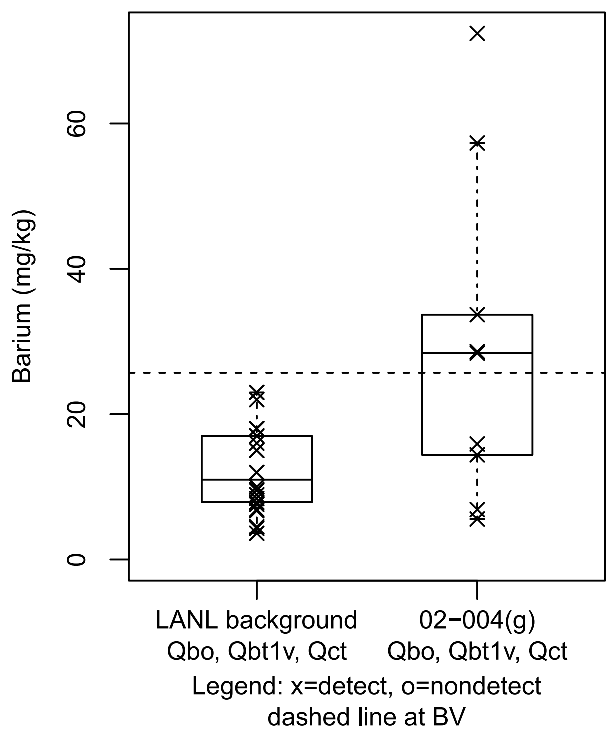

Figure G-92 Box plot for barium in Qbo at AOC 02-004(g)

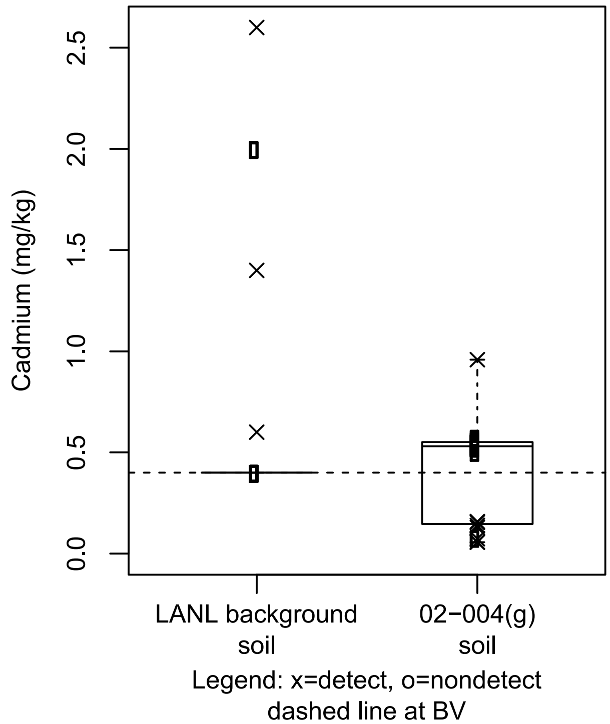

Figure G-93 Box plot for cadmium in soil at AOC 02-004(g)

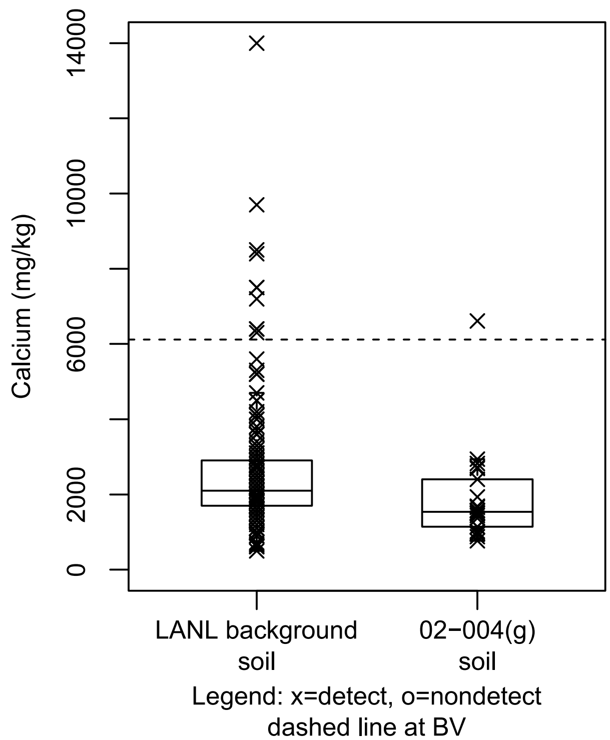

Figure G-94 Box plot for calcium in soil at AOC 02-004(g)

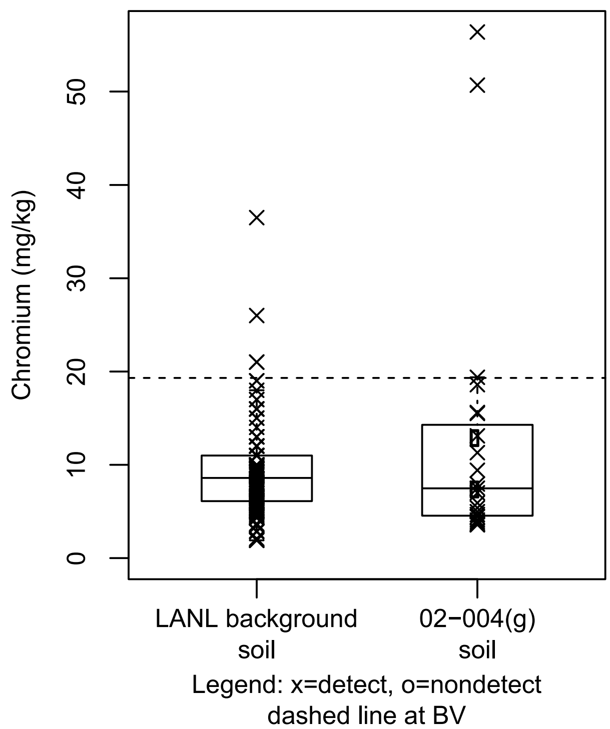

Figure G-95 Box plot for chromium in soil at AOC 02-004(g)

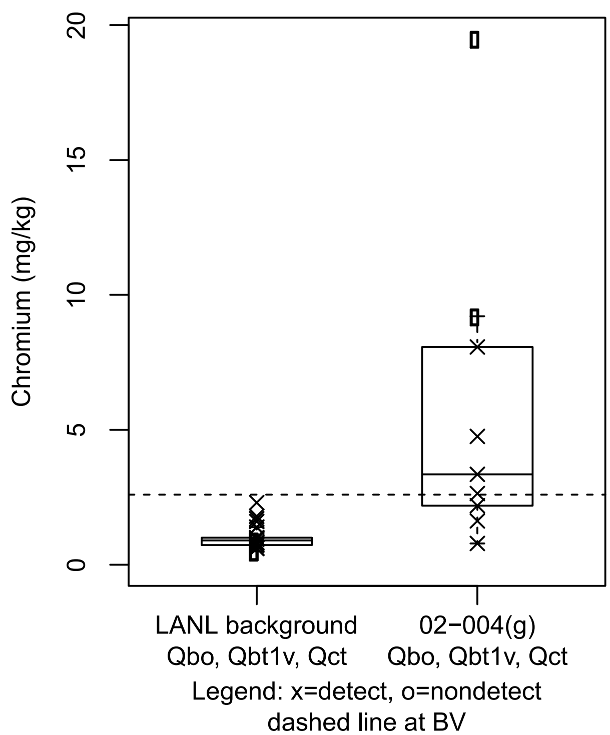

Figure G-96 Box plot for chromium in Qbo at AOC 02-004(g)

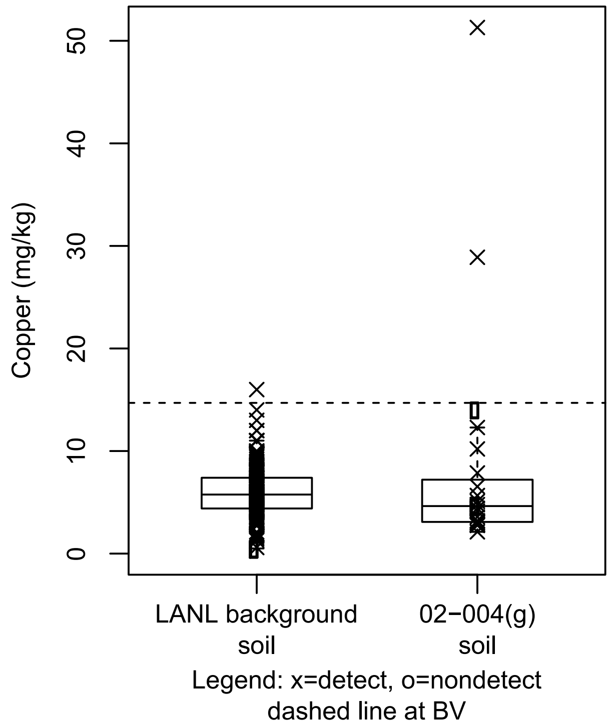

Figure G-97 Box plot for copper in soil at AOC 02-004(g)

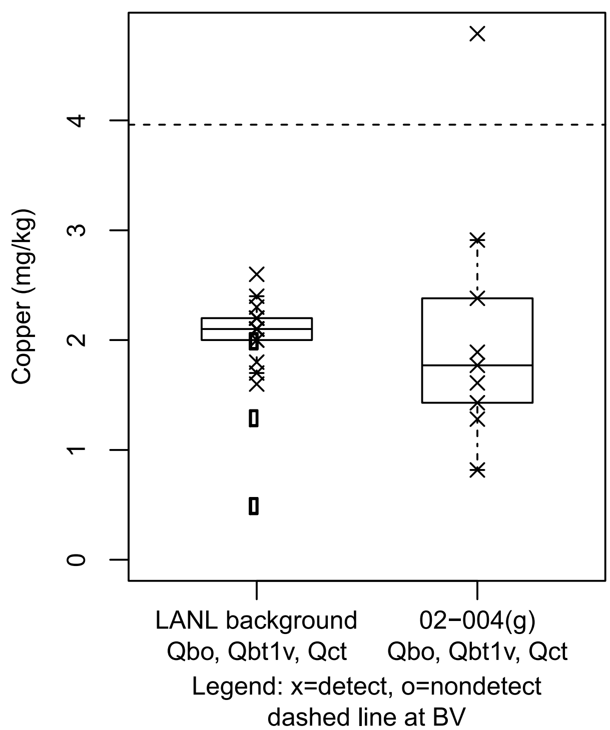

Figure G-98 Box plot for copper in Qbo at AOC 02-004(g)

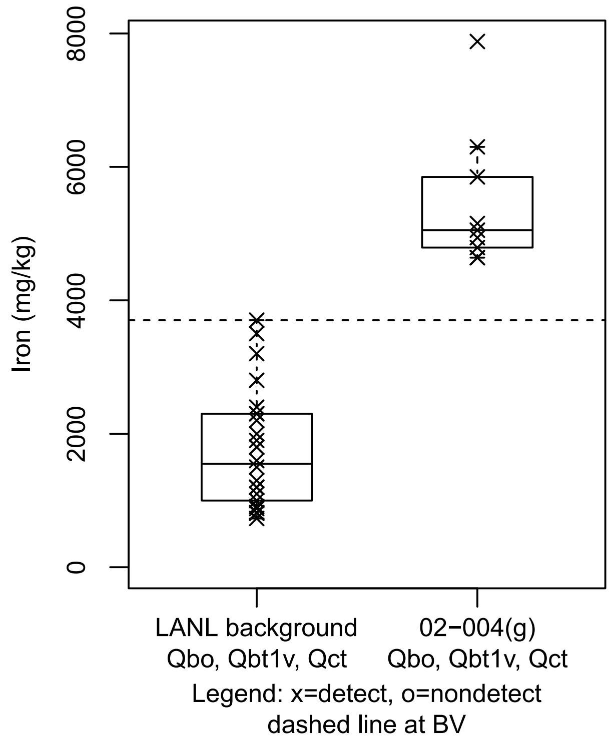

Figure G-99 Box plot for iron in Qbo at AOC 02-004(g)

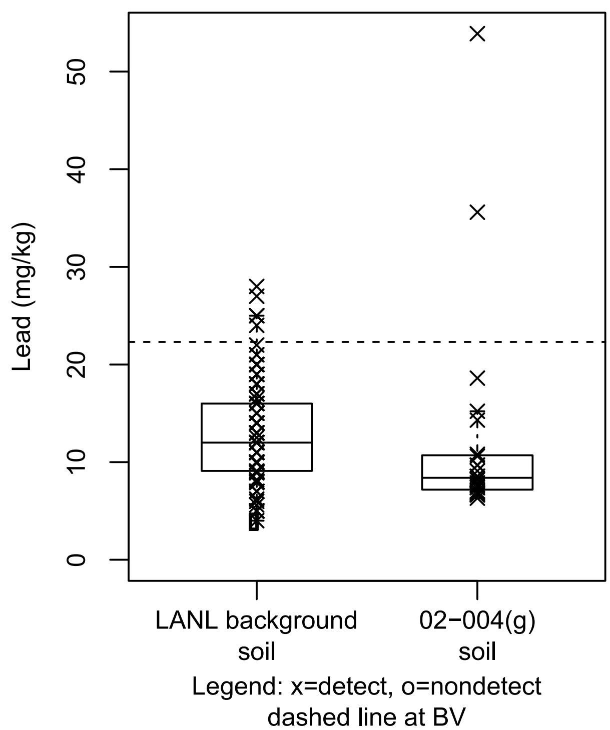

Figure G-100 Box plot for lead in soil at AOC 02-004(g)

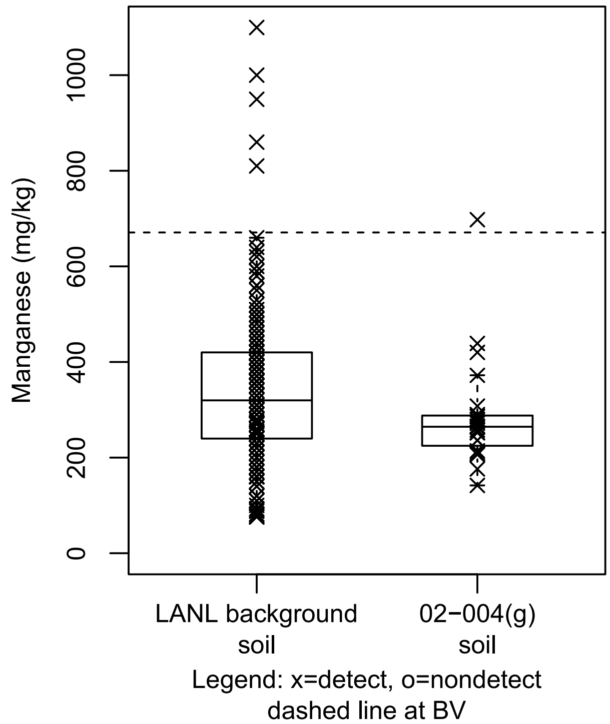

Figure G-101 Box plot for manganese in soil at AOC 02-004(g)

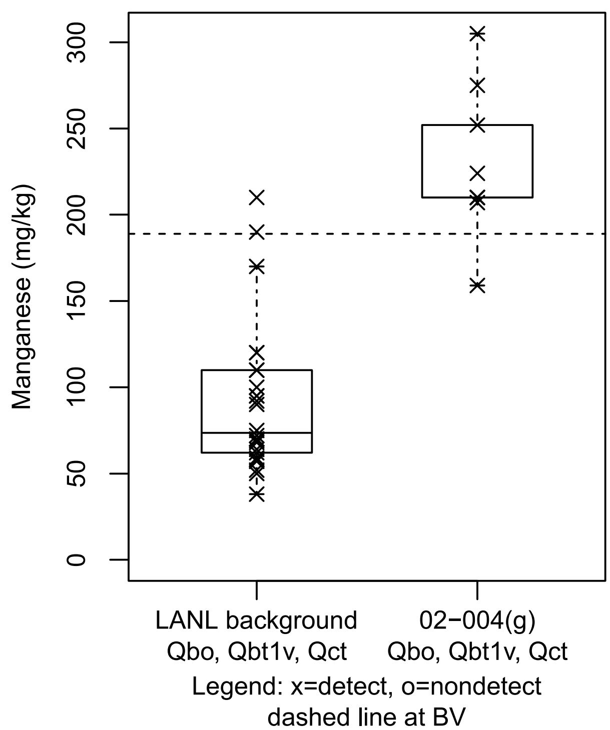

Figure G-102 Box plot for manganese in Qbo at AOC 02-004(g)

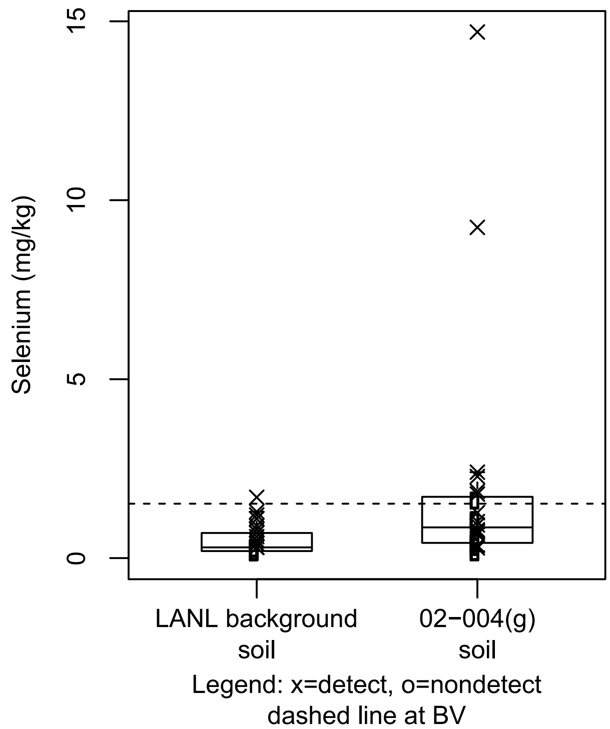

Figure G-103   Box plot for selenium in soil at AOC 02-004(g)

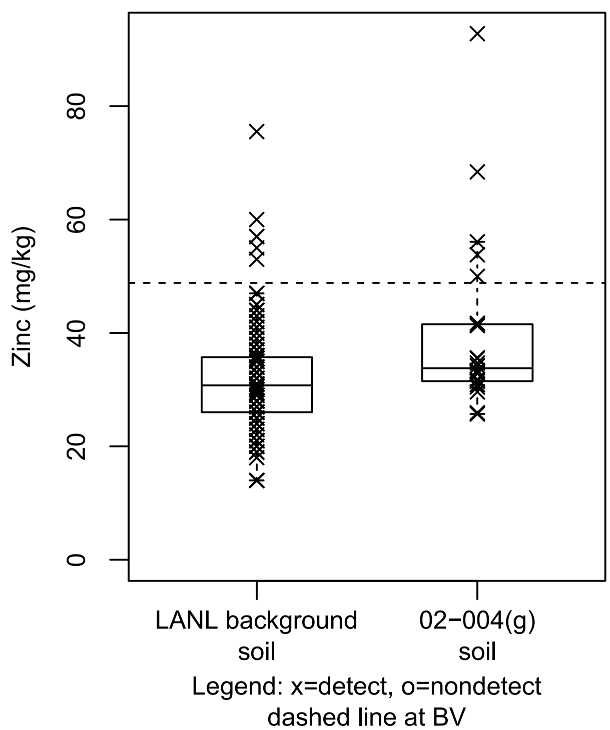

Figure G-104   Box plot for zinc in soil at AOC 02-004(g)

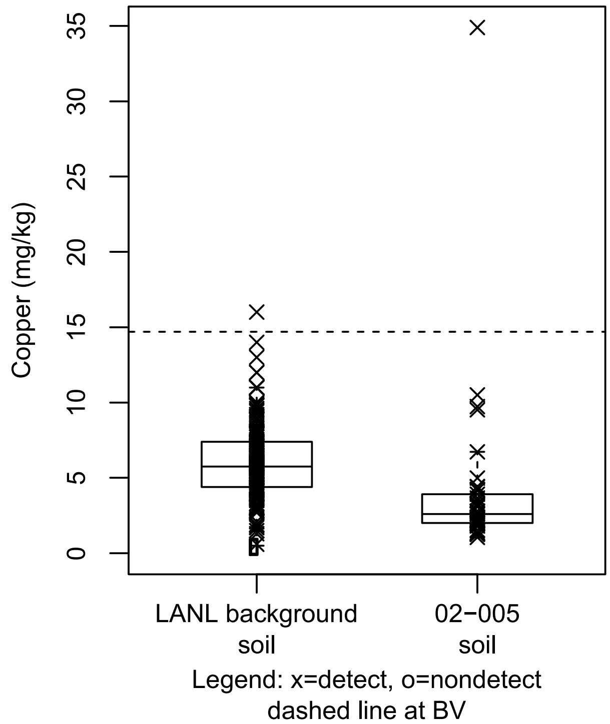

Figure G-105 Box plot for copper in soil at SWMU 02-005

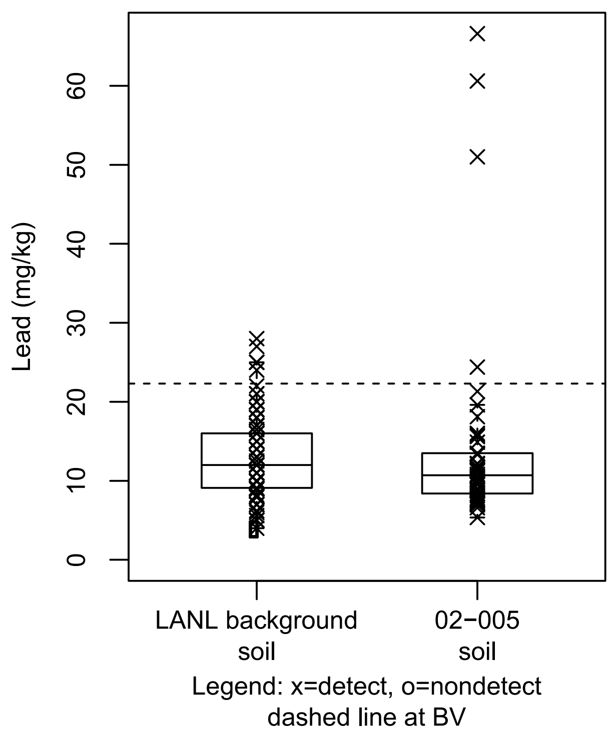

Figure G-106 Box plot for lead in soil at SWMU 02-005

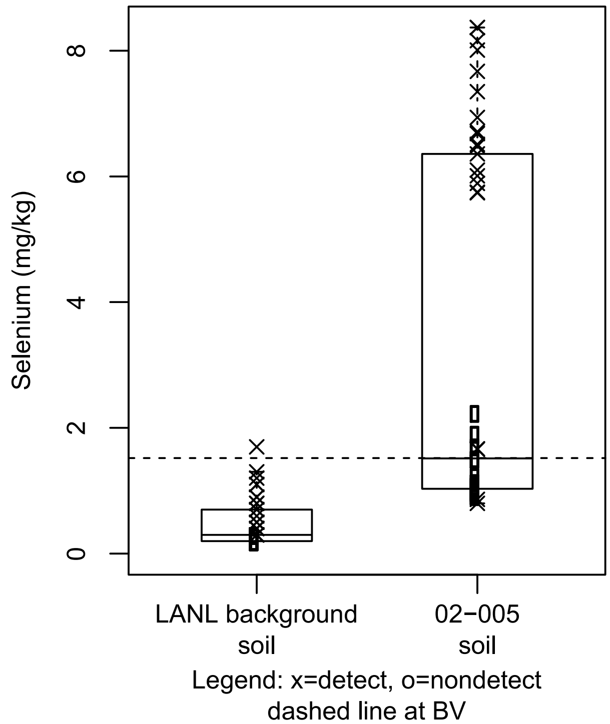

Figure G-107 Box plot for selenium in soil at SWMU 02-005

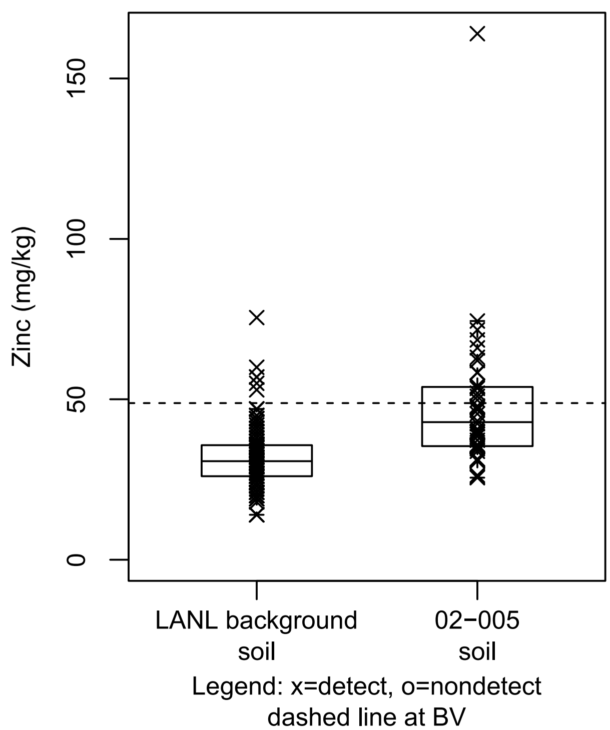

Figure G-108 Box plot for zinc in soil at SWMU 02-005

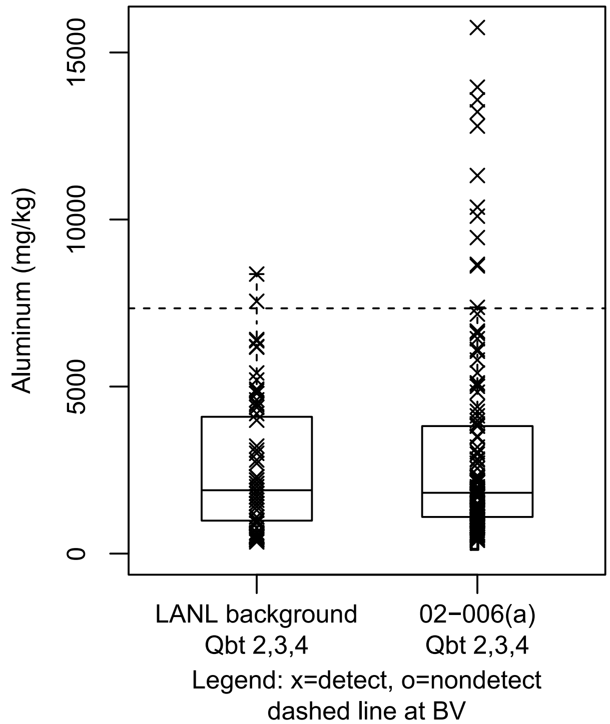

Figure G-109 Box plot for aluminum in Qbt 3 at SWMU 02-006(a)

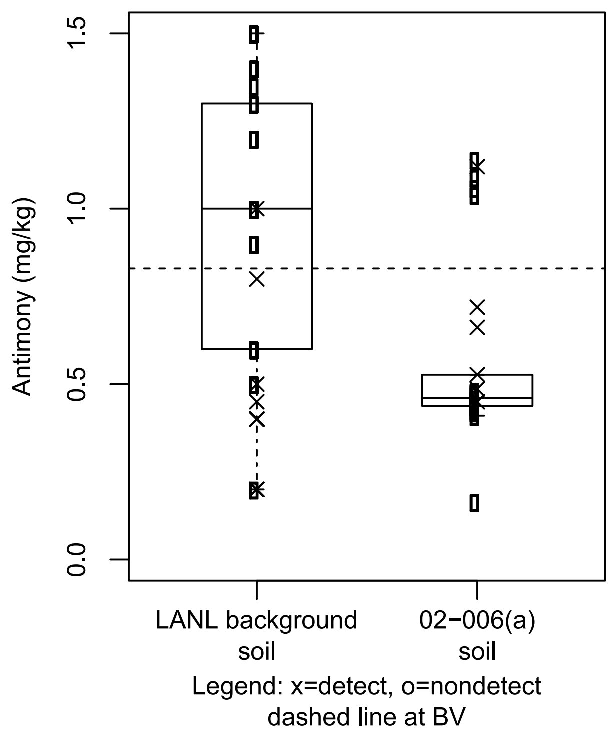

Figure G-110 Box plot for antimony in soil at SWMU 02-006(a)

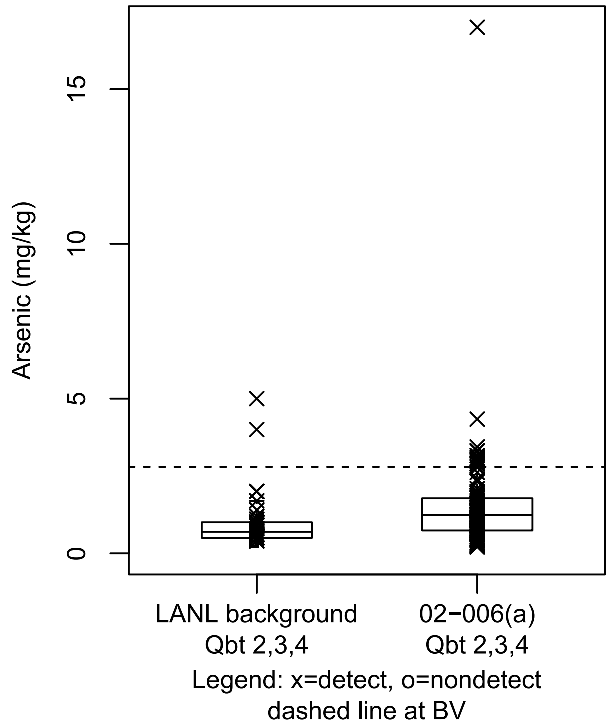

Figure G-111 Box plot for arsenic in Qbt 3 at SWMU 02-006(a)

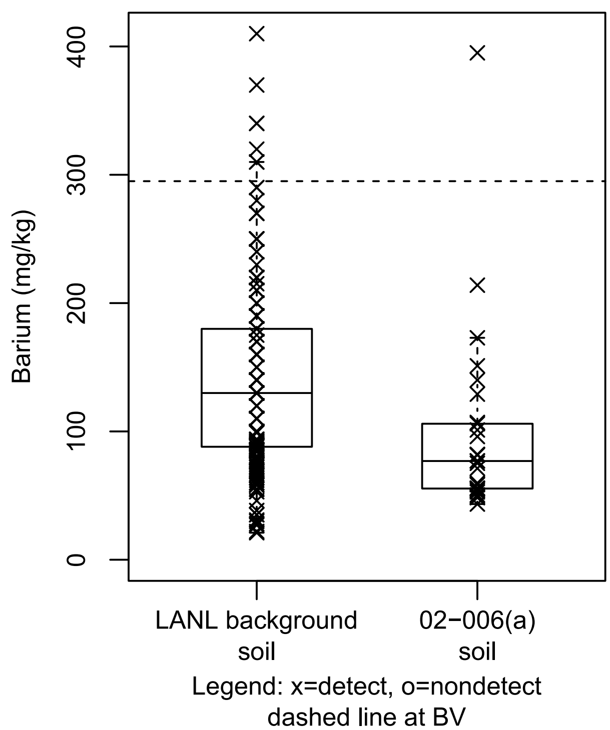

Figure G-112 Box plot for barium in soil at SWMU 02-006(a)

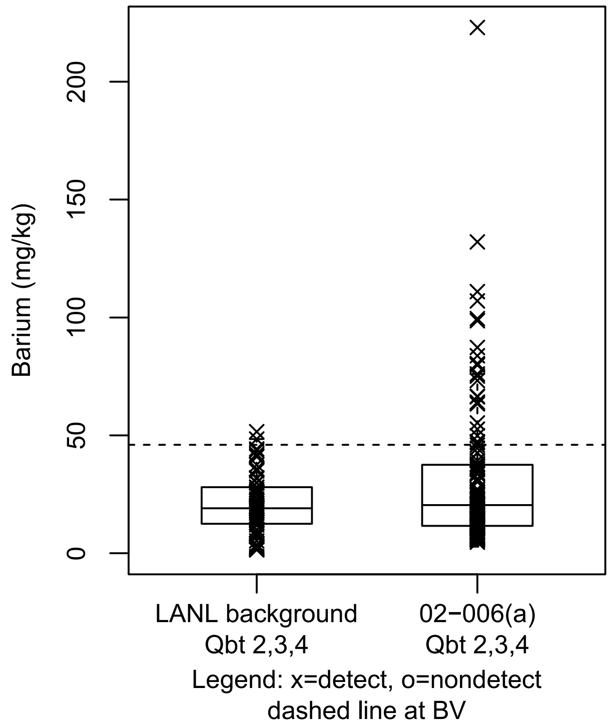

Figure G-113 Box plot for barium in Qbt 3 at SWMU 02-006(a)

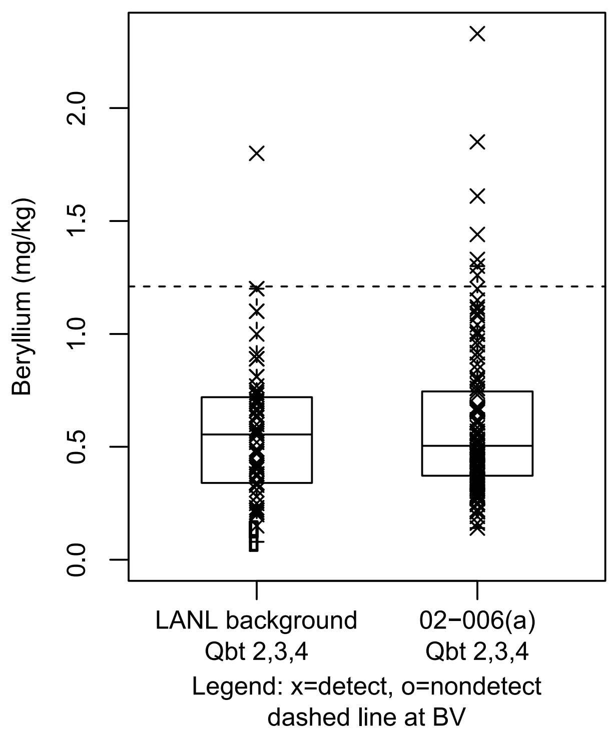

Figure G-114 Box plot for beryllium in Qbt 3 at SWMU 02-006(a)

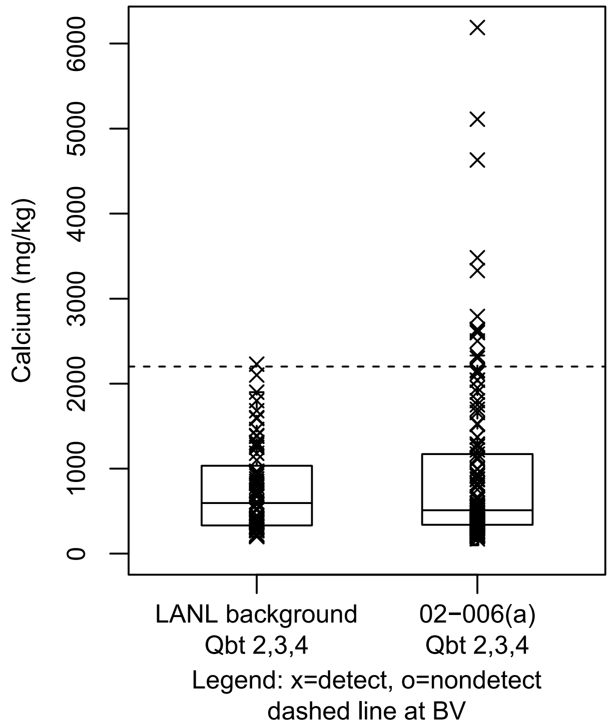

Figure G-115 Box plot for calcium in Qbt 3 at SWMU 02-006(a)

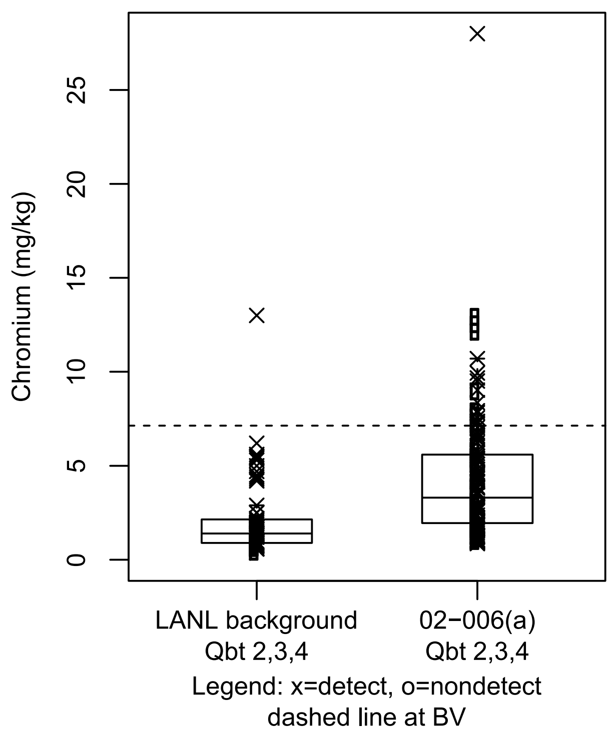

Figure G-116 Box plot for chromium in Qbt 3 at SWMU 02-006(a)

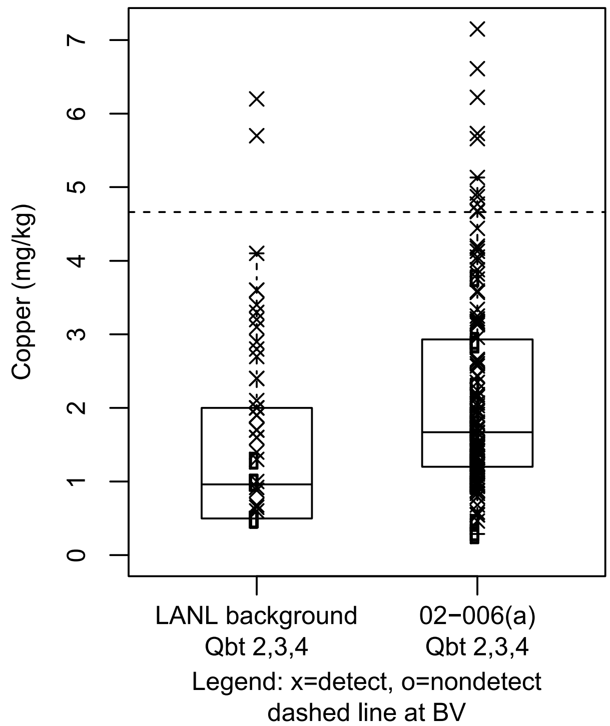

Figure G-117 Box plot for copper in Qbt 3 at SWMU 02-006(a)

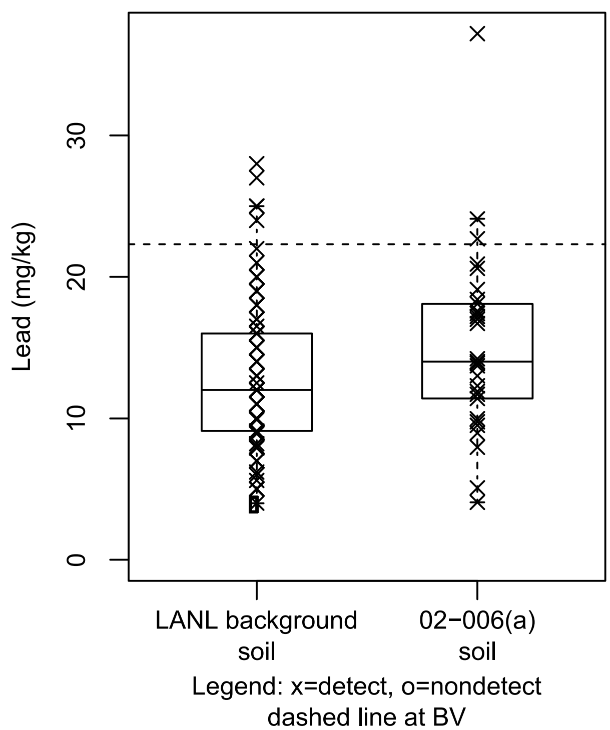

Figure G-118 Box plot for lead in soil at SWMU 02-006(a)

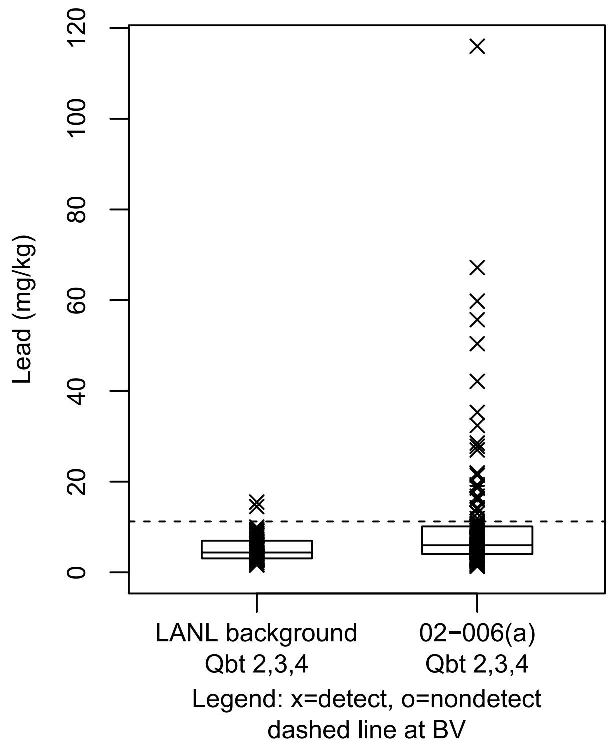

Figure G-119 Box plot for lead in Qbt 3 at SWMU 02-006(a)

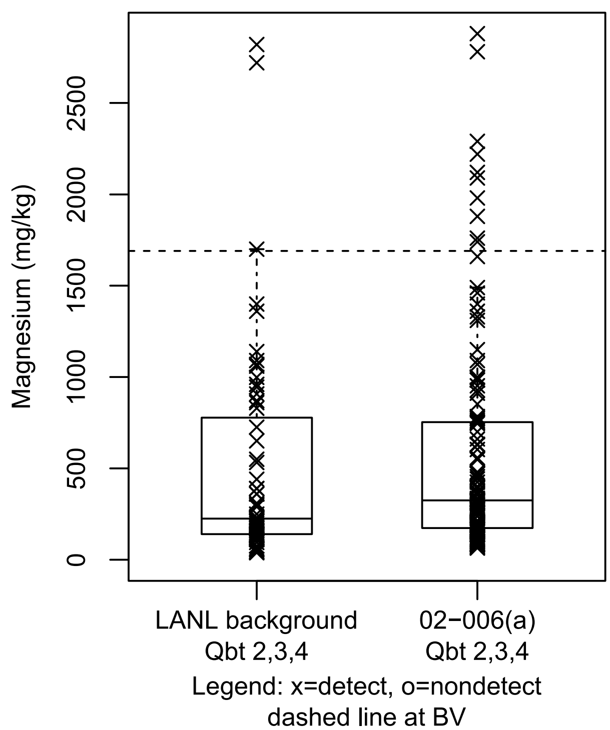

Figure G-120 Box plot for magnesium in Qbt 3 at SWMU 02-006(a)

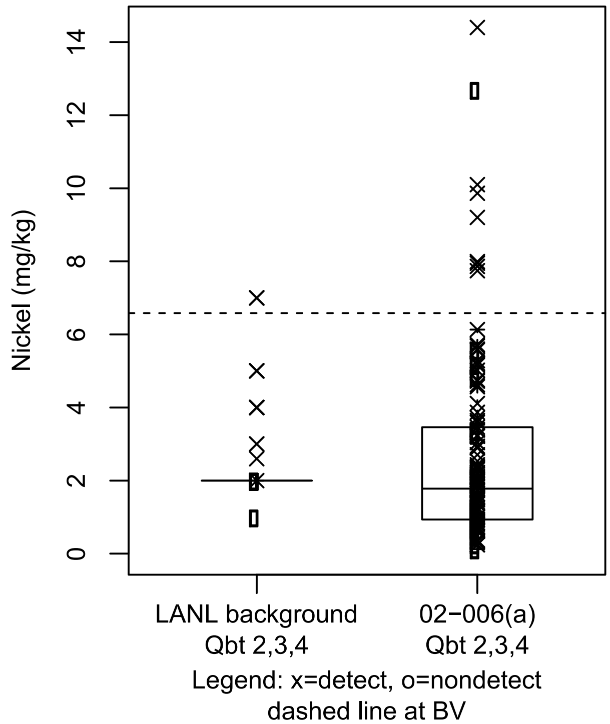

Figure G-121 Box plot for nickel in Qbt 3 at SWMU 02-006(a)

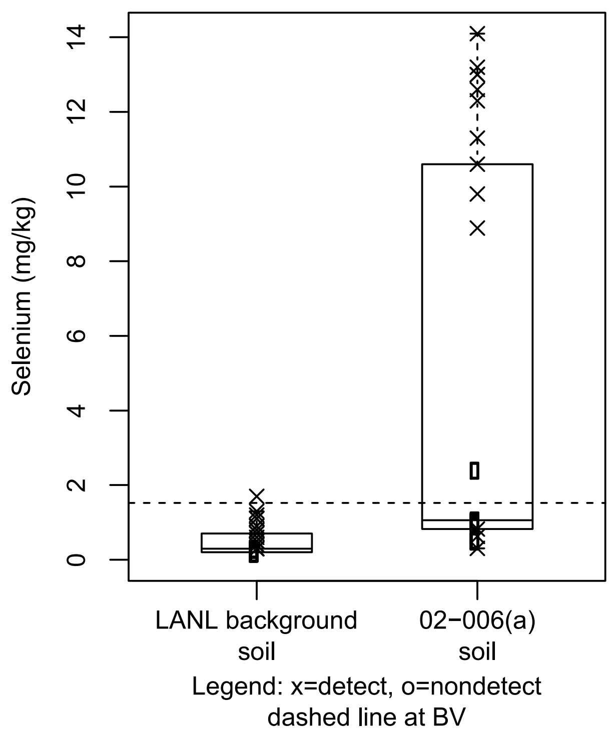

Figure G-122 Box plot for selenium in soil at SWMU 02-006(a)

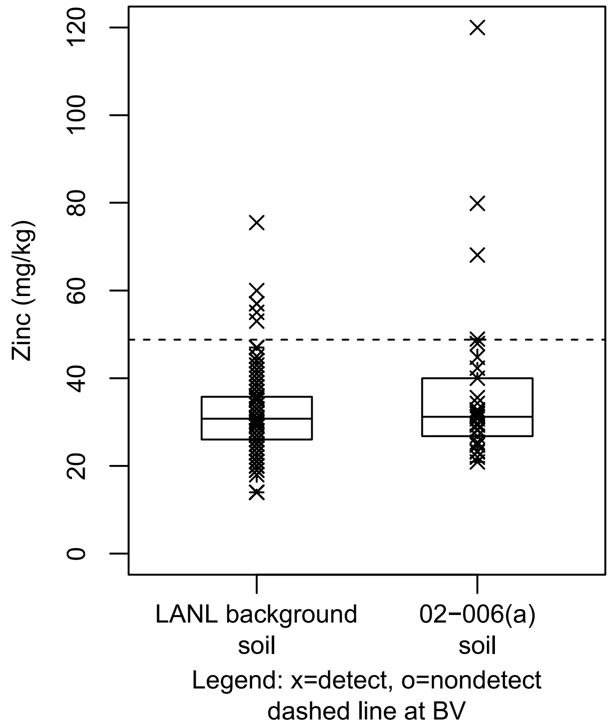

Figure G-123 Box plot for zinc in soil at SWMU 02-006(a)

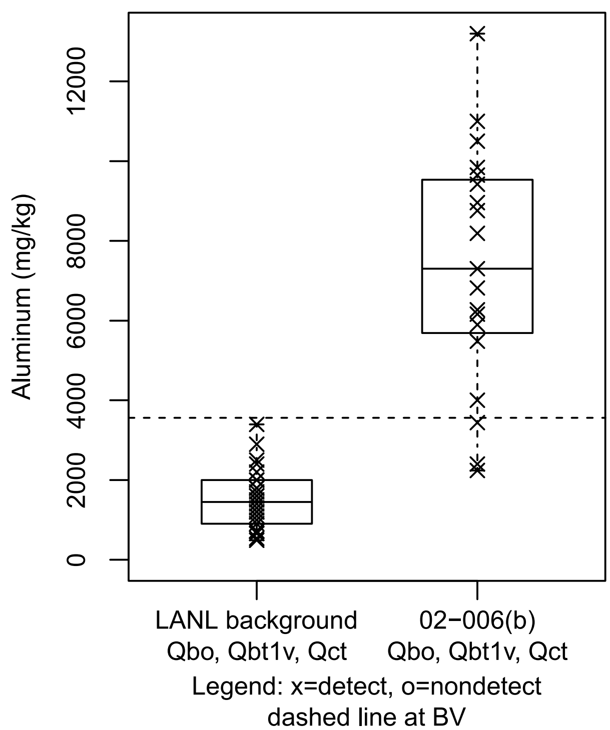

Figure G-124 Box plot for aluminum in Qbo at SWMU 02-006(b)

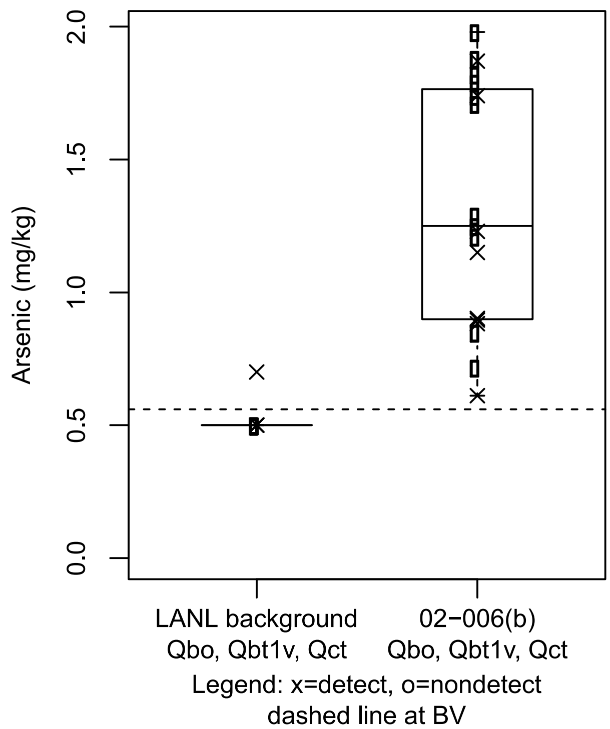

Figure G-125 Box plot for arsenic in Qbo at SWMU 02-006(b)

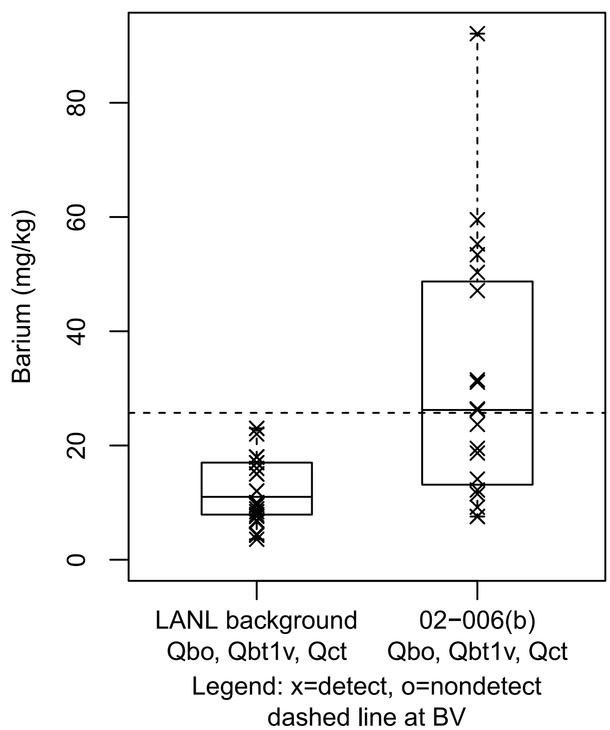

Figure G-126 Box plot for barium in Qbo at SWMU 02-006(b)

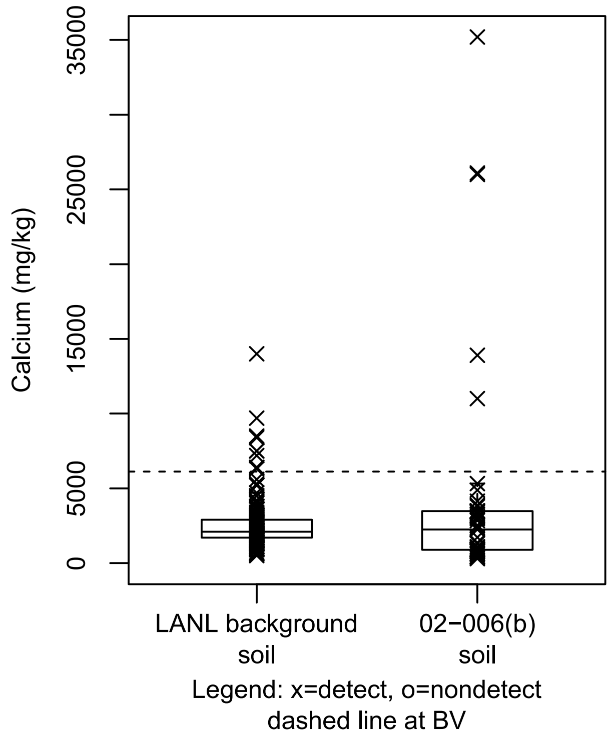

Figure G-127 Box plot for calcium in soil at SWMU 02-006(b)

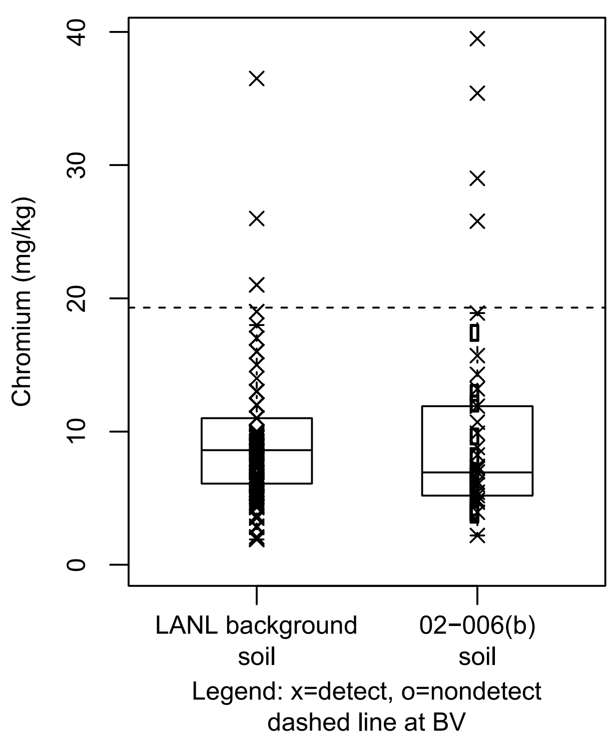

Figure G-128 Box plot for chromium in soil at SWMU 02-006(b)

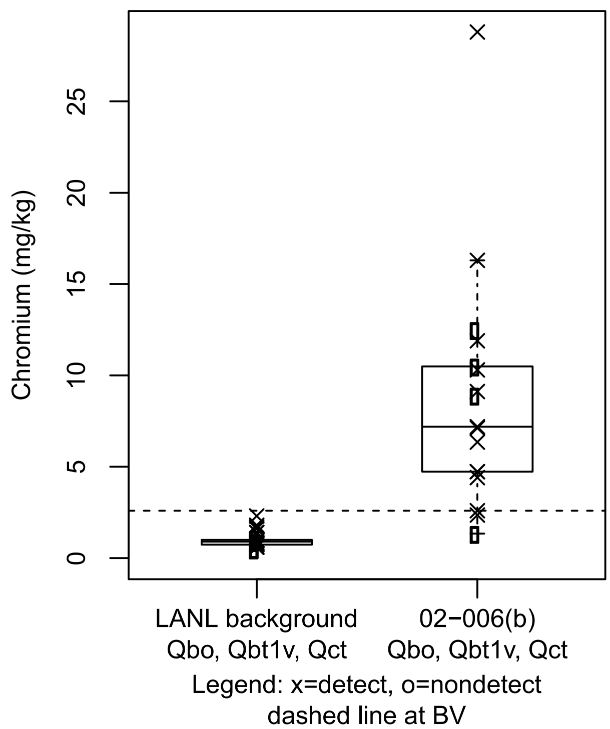

Figure G-129 Box plot for chromium in Qbo at SWMU 02-006(b)

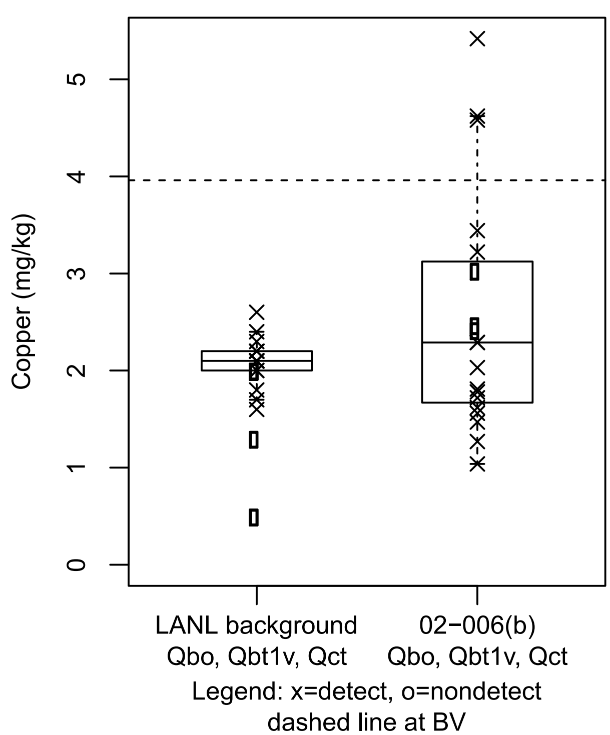

Figure G-130 Box plot for copper in Qbo at SWMU 02-006(b)

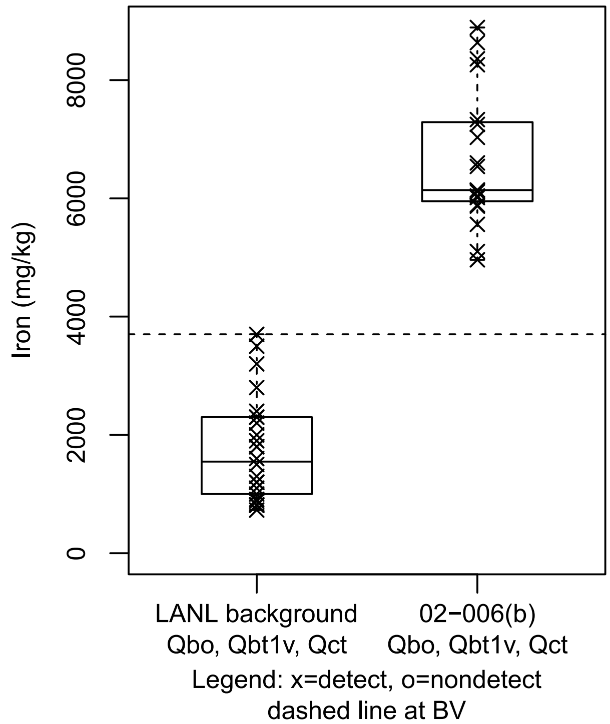

Figure G-131 Box plot for iron in Qbo at SWMU 02-006(b)

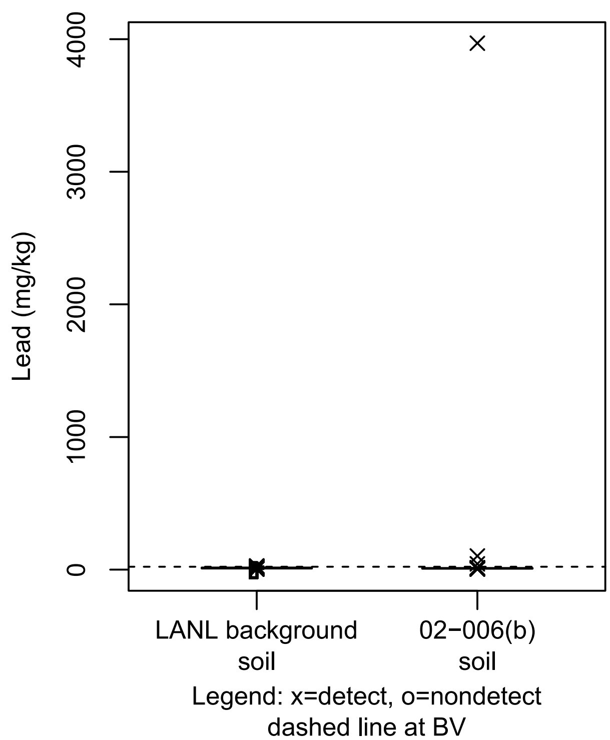

Figure G-132 Box plot for lead in soil at SWMU 02-006(b)

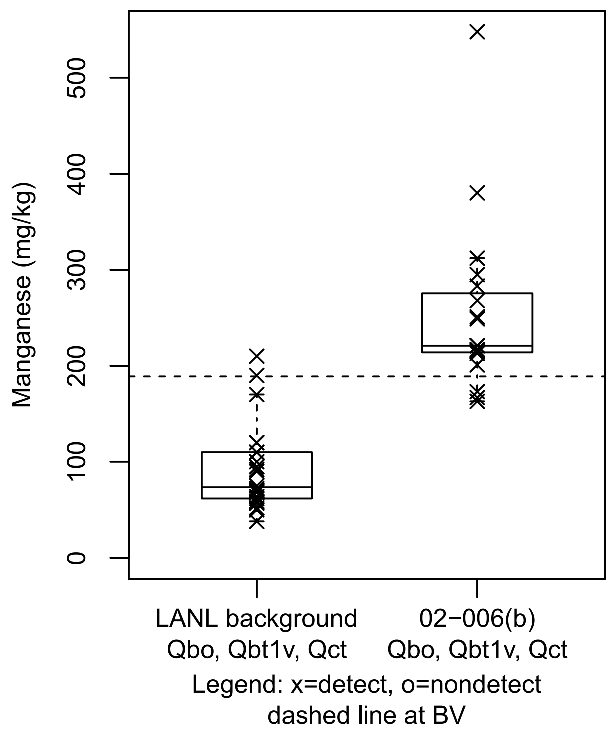

Figure G-133 Box plot for manganese in Qbo at SWMU 02-006(b)

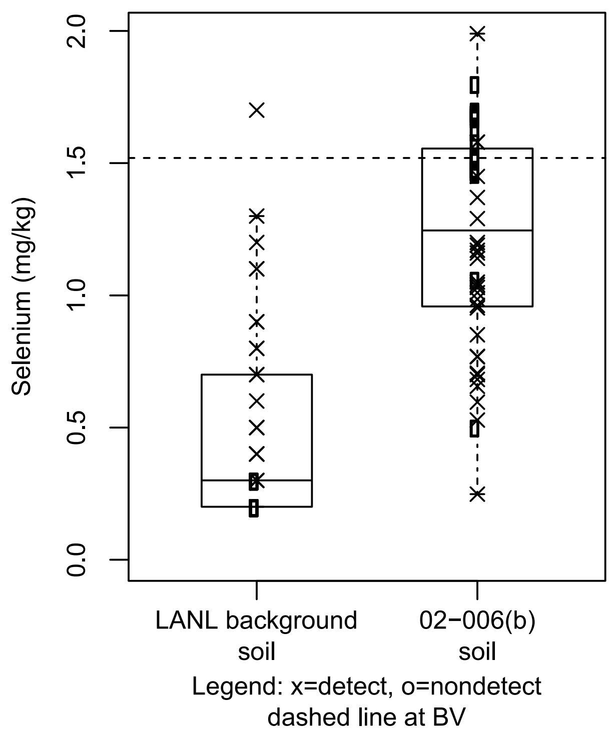

Figure G-134 Box plot for selenium in soil at SWMU 02-006(b)

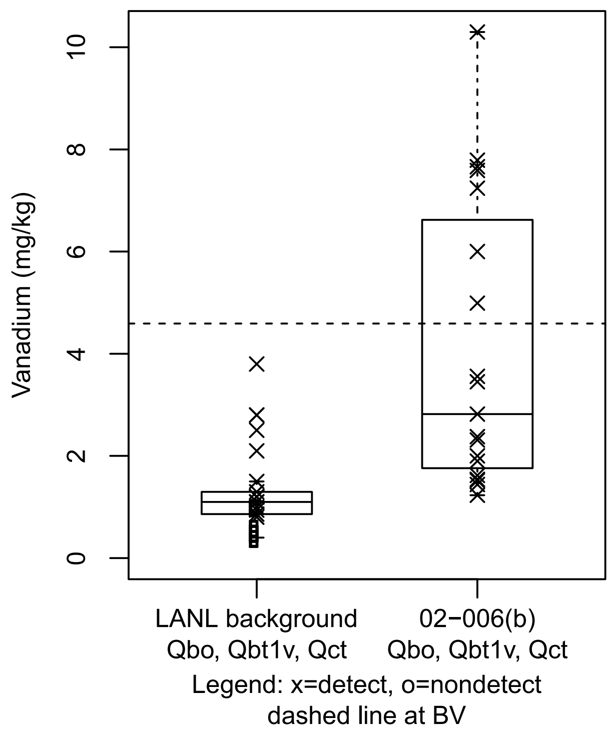

Figure G-135 Box plot for vanadium in Qbo at SWMU 02-006(b)

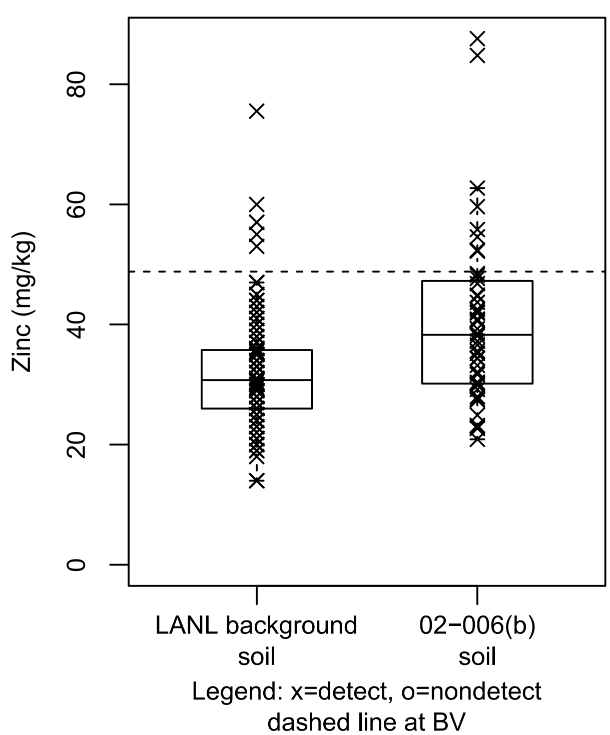

Figure G-136 Box plot for zinc in soil at SWMU 02-006(b)

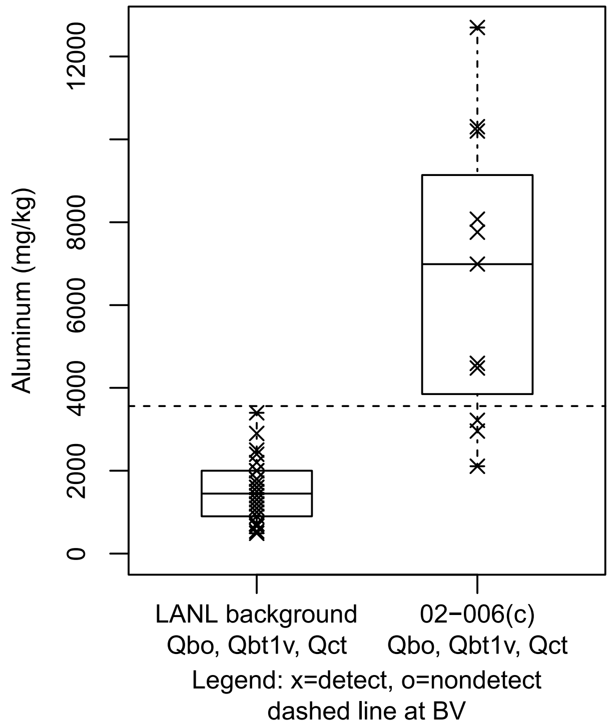

Figure G-137 Box plot for aluminum in Qbo at AOC 02-006(c)

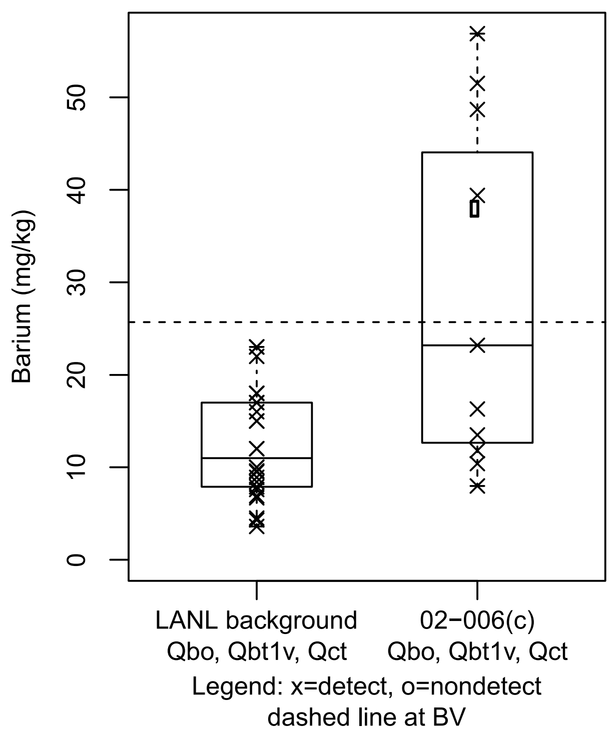

Figure G-138 Box plot for barium in Qbo at AOC 02-006(c)

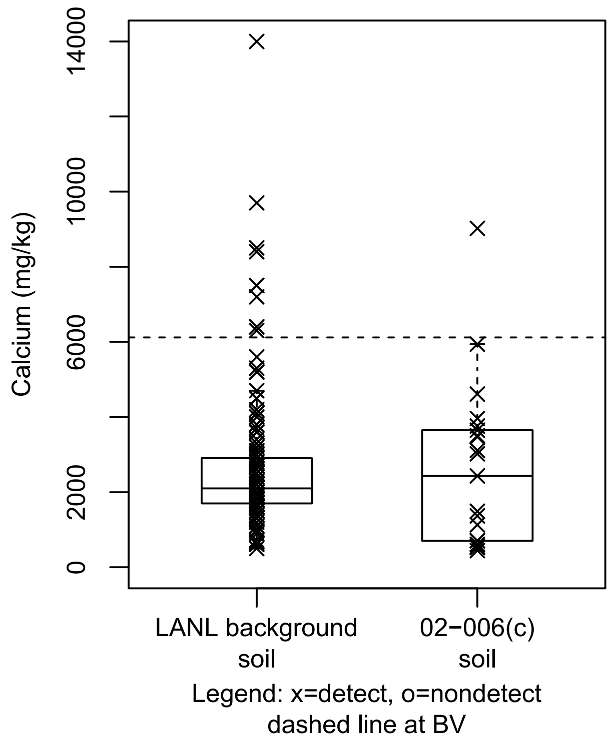

Figure G-139   Box plot for calcium in soil at AOC 02-006(c)

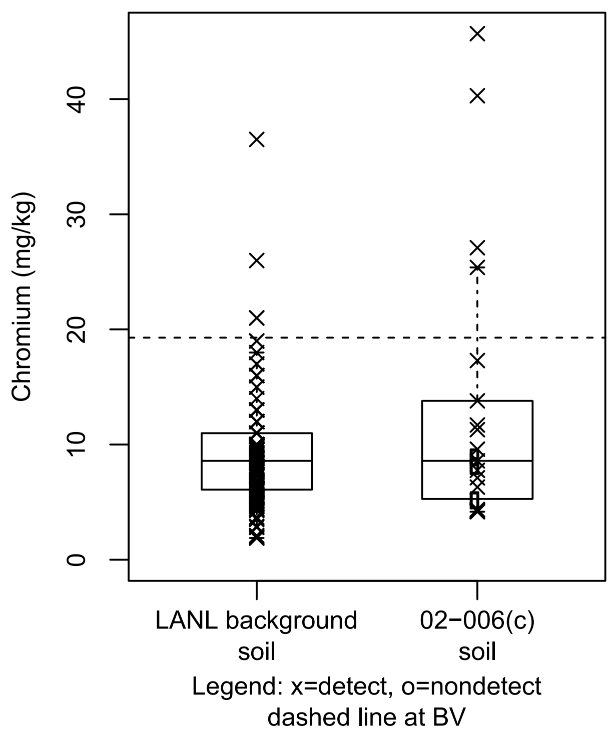

Figure G-140   Box plot for chromium in soil at AOC 02-006(c)

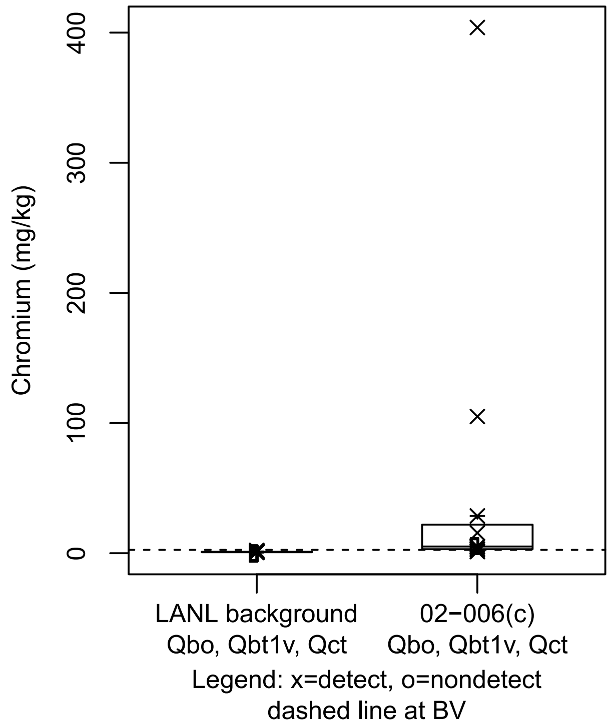

Figure G-141 Box plot for chromium in Qbo at AOC 02-006(c)

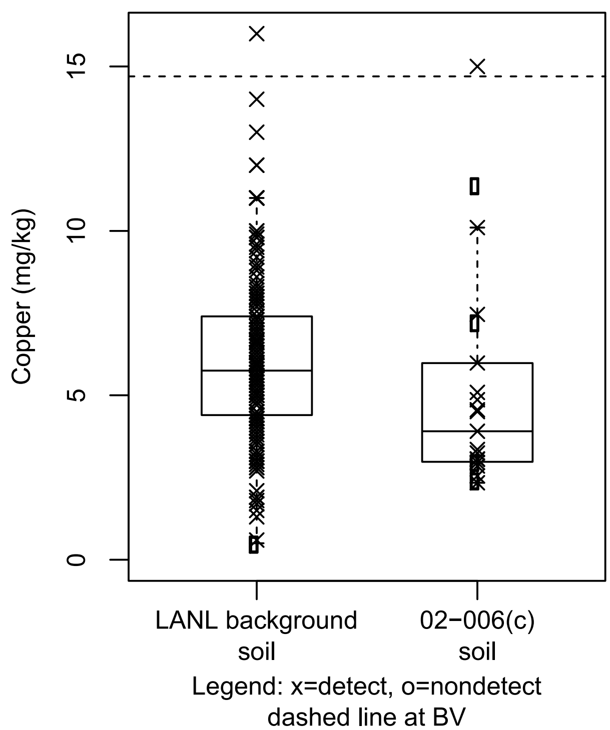

Figure G-142 Box plot for copper in soil at AOC 02-006(c)

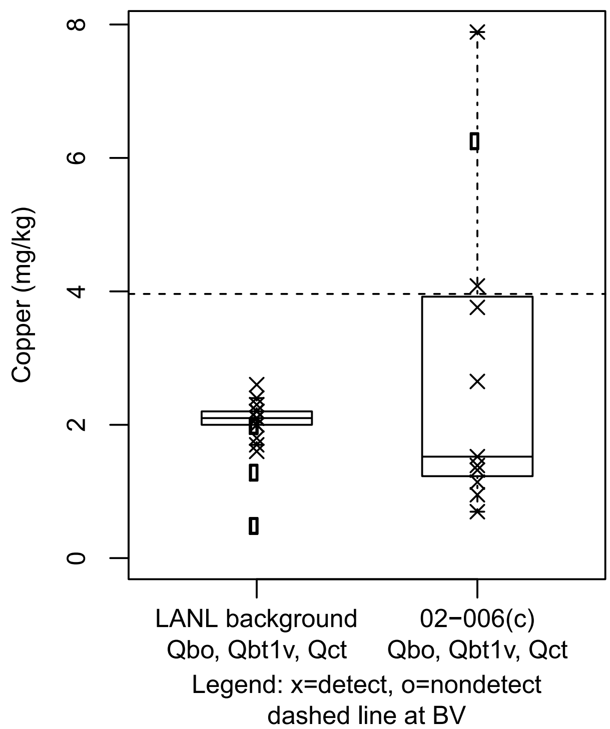

Figure G-143   Box plot for copper in Qbo at AOC 02-006(c)

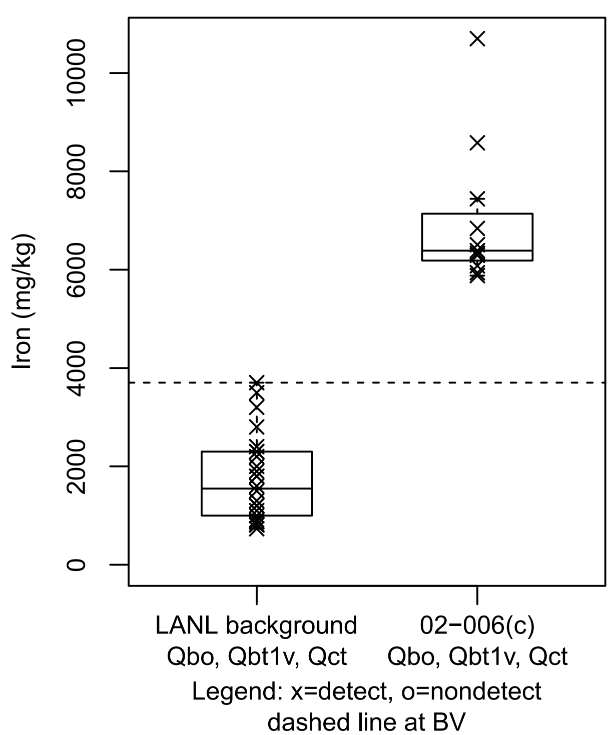

Figure G-144   Box plot for iron in Qbo at AOC 02-006(c)

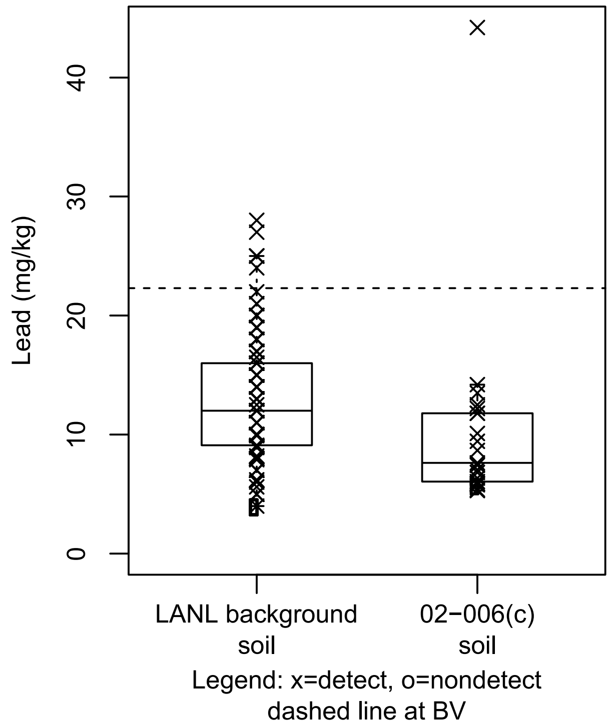

Figure G-145   Box plot for lead in soil at AOC 02-006(c)

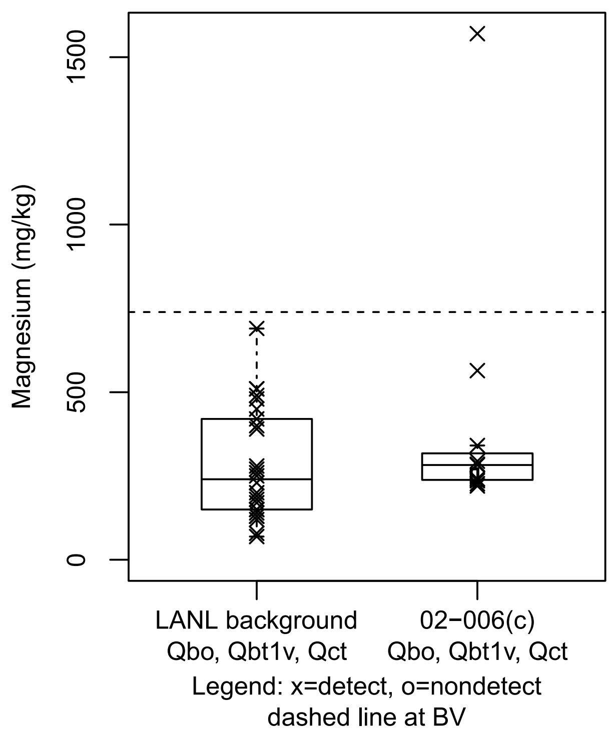

Figure G-146   Box plot for magnesium in Qbo at AOC 02-006(c)

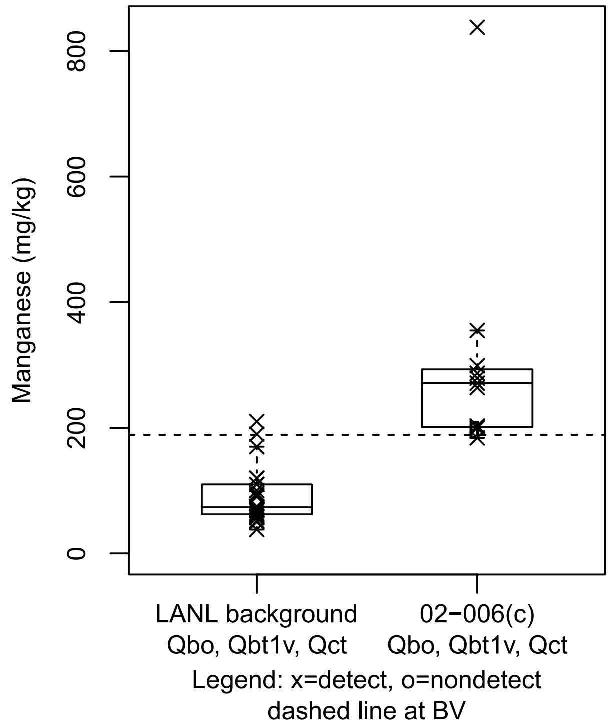

Figure G-147 Box plot for manganese in Qbo at AOC 02-006(c)

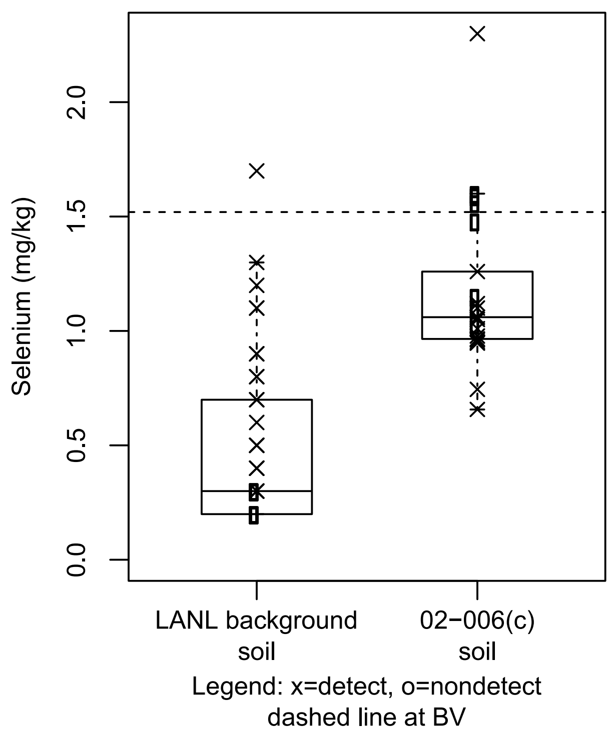

Figure G-148 Box plot for selenium in soil at AOC 02-006(c)

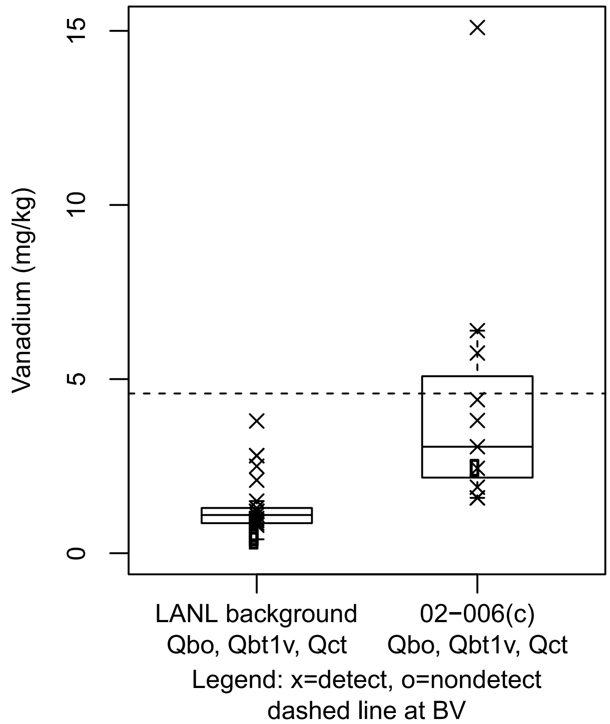

Figure G-149 Box plot for vanadium in Qbo at AOC 02-006(c)

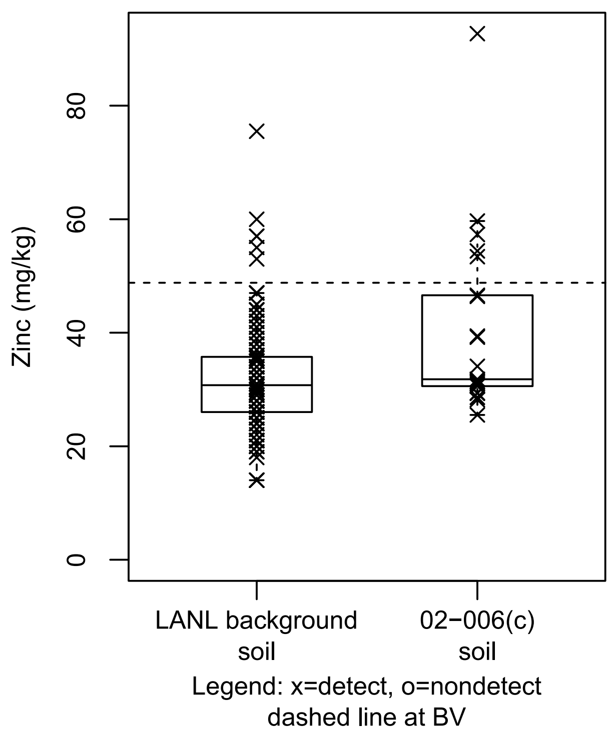

Figure G-150 Box plot for zinc in soil at AOC 02-006(c)

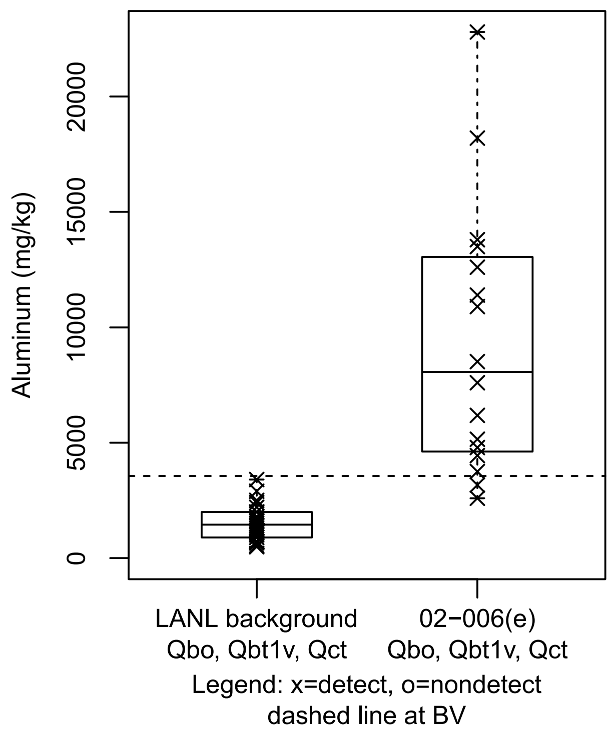

Figure G-151   Box plot for aluminum in Qbo at AOC 02-006(e)

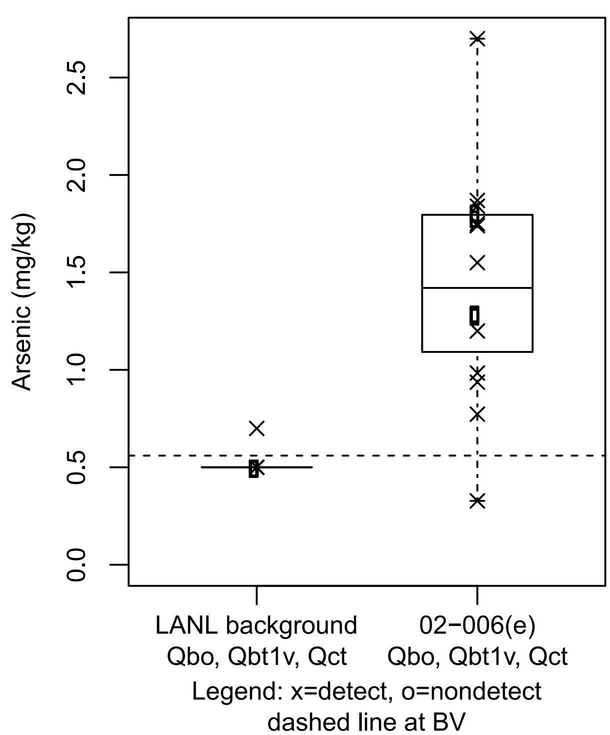

Figure G-152   Box plot for arsenic in Qbo at AOC 02-006(e)

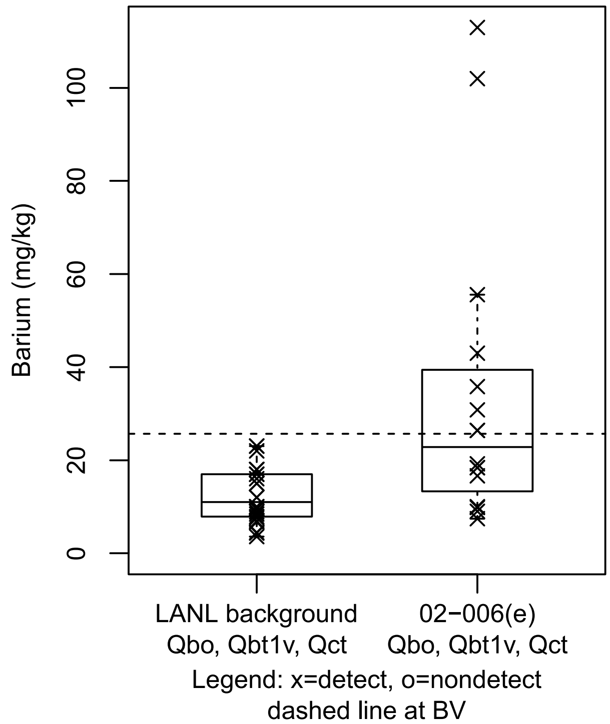

Figure G-153 Box plot for barium in Qbo at AOC 02-006(e)

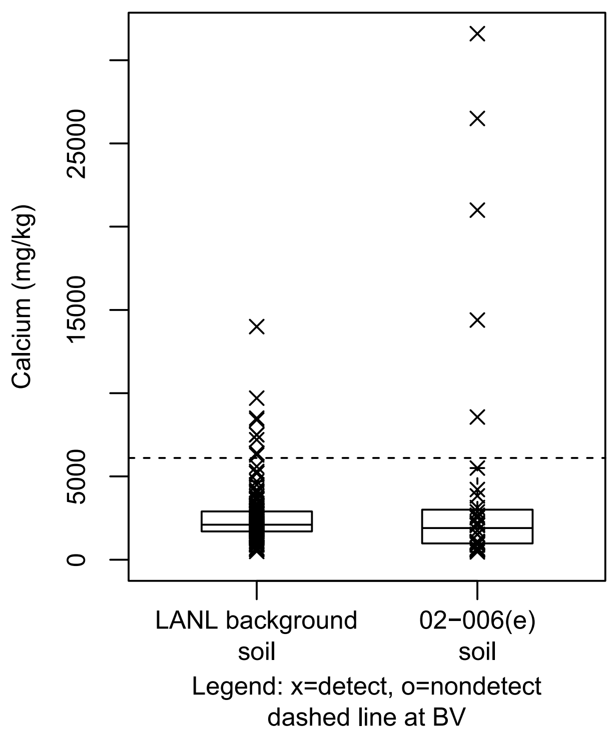

Figure G-154 Box plot for calcium in soil at AOC 02-006(e)

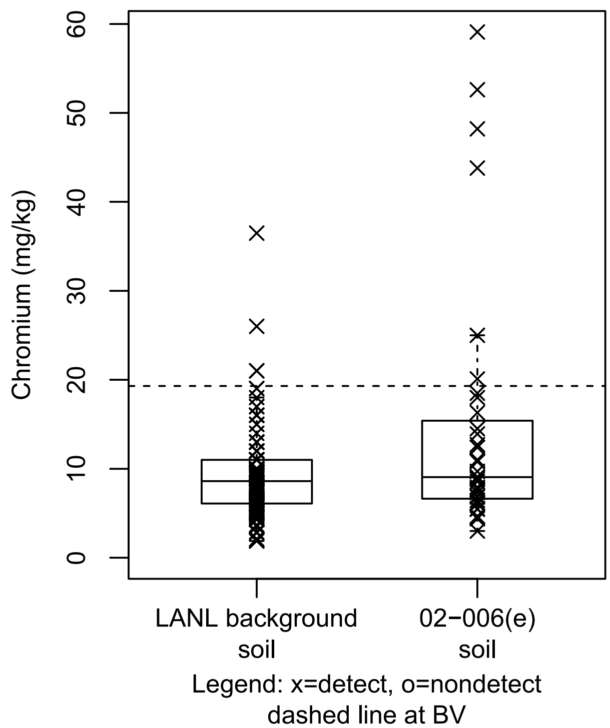

Figure G-155   Box plot for chromium in soil at AOC 02-006(e)

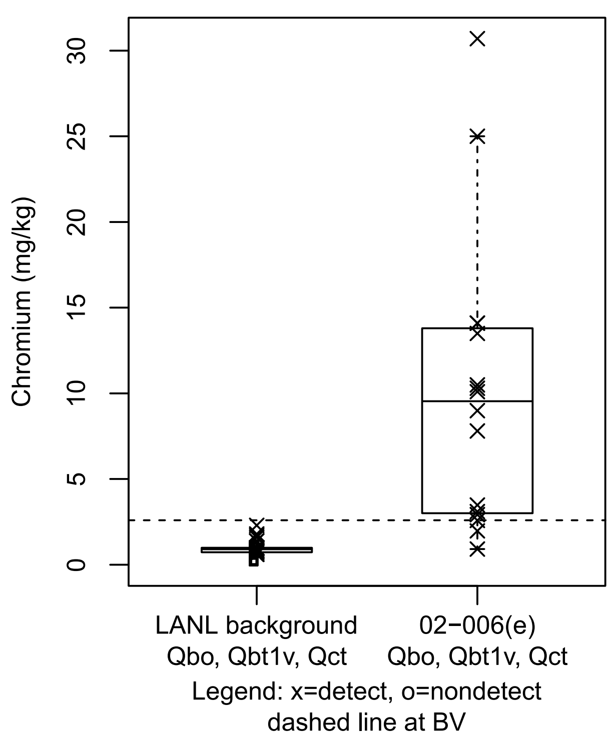

Figure G-156   Box plot for chromium in Qbo at AOC 02-006(e)

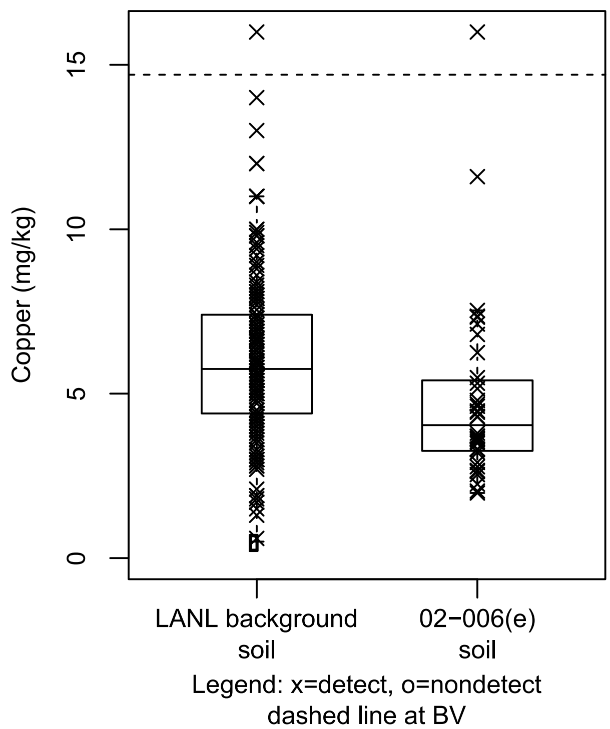

Figure G-157 Box plot for copper in soil at AOC 02-006(e)

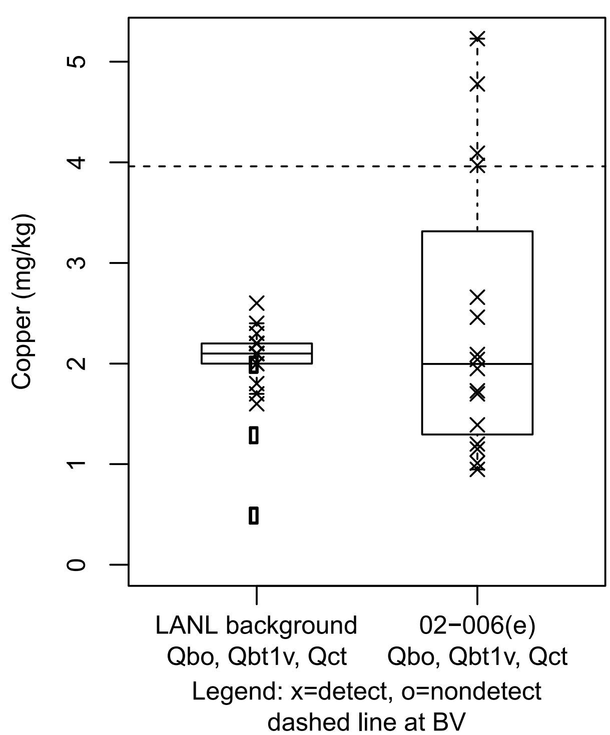

Figure G-158 Box plot for copper in Qbo at AOC 02-006(e)

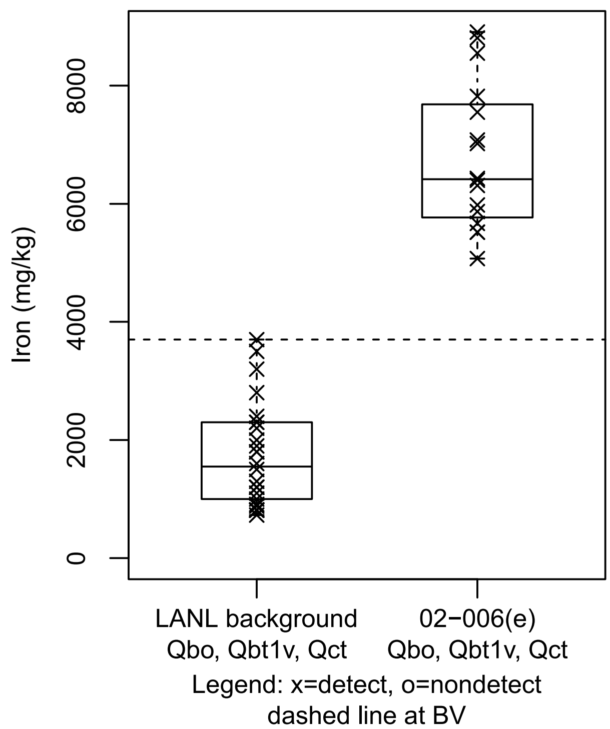

Figure G-159 Box plot for iron in Qbo at AOC 02-006(e)

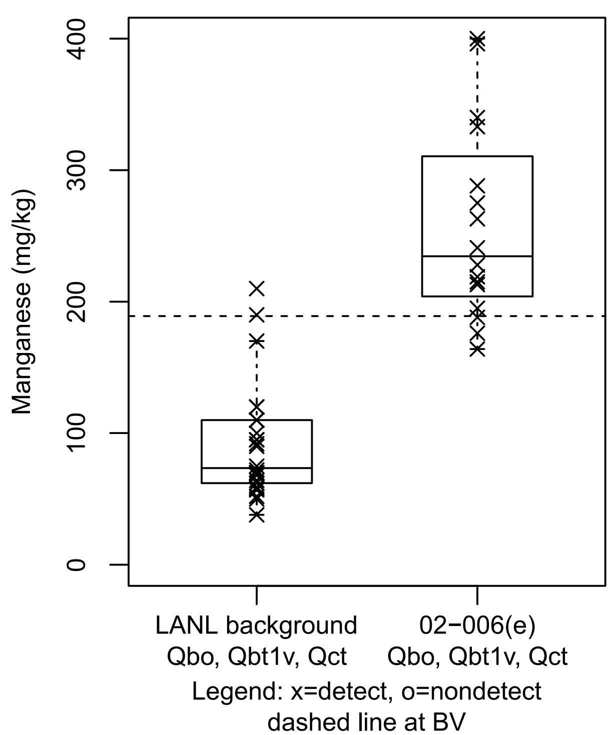

Figure G-160 Box plot for manganese in Qbo at AOC 02-006(e)

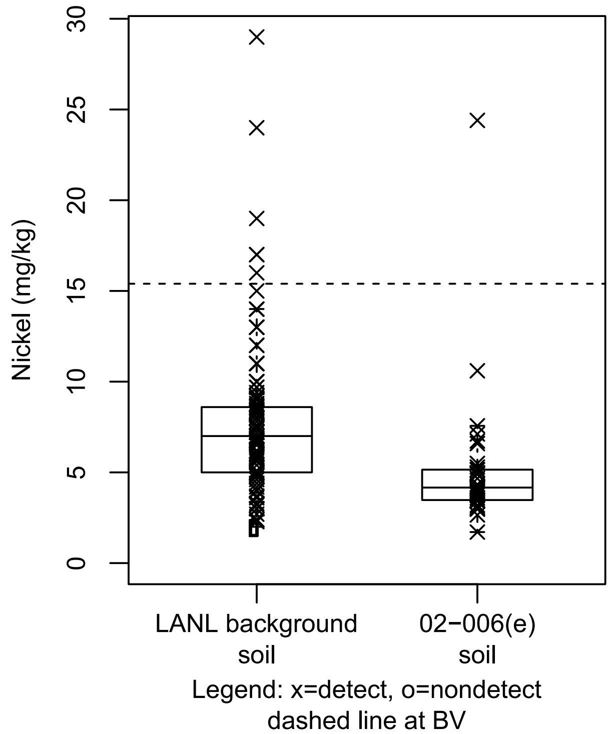

Figure G-161 Box plot for nickel in soil at AOC 02-006(e)

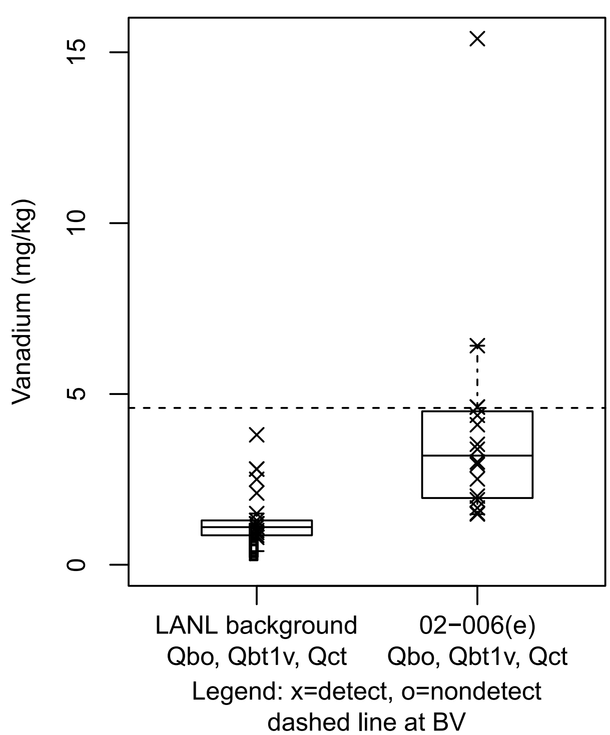

Figure G-162 Box plot for vanadium in Qbo at AOC 02-006(e)

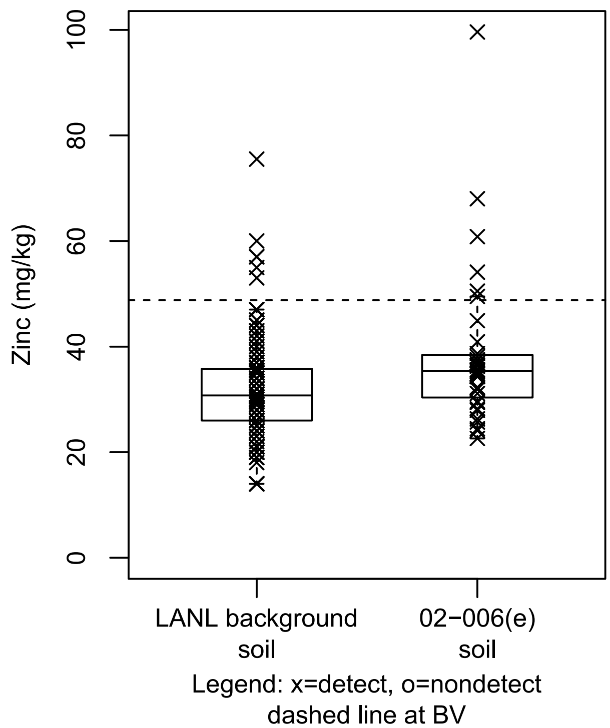

Figure G-163 Box plot for zinc in soil at AOC 02-006(e)

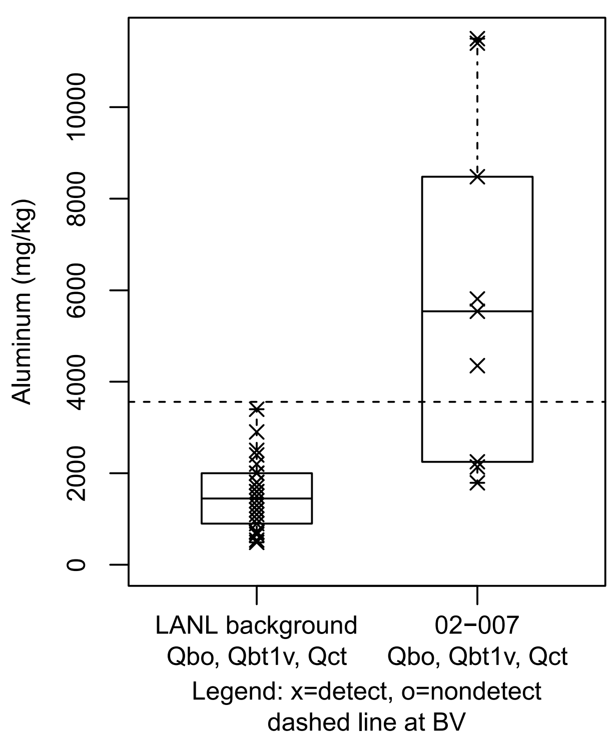

Figure G-164 Box plot for aluminum in Qbo at SWMU 02-007

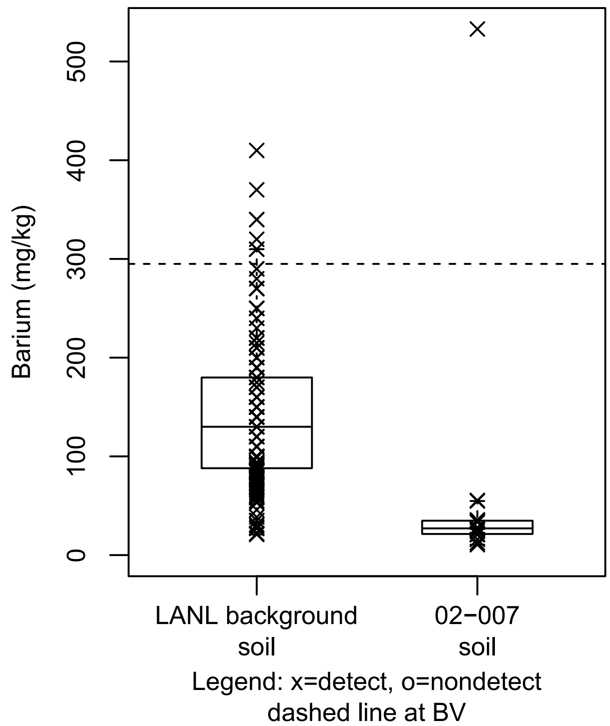

Figure G-165 Box plot for barium in soil at SWMU 02-007

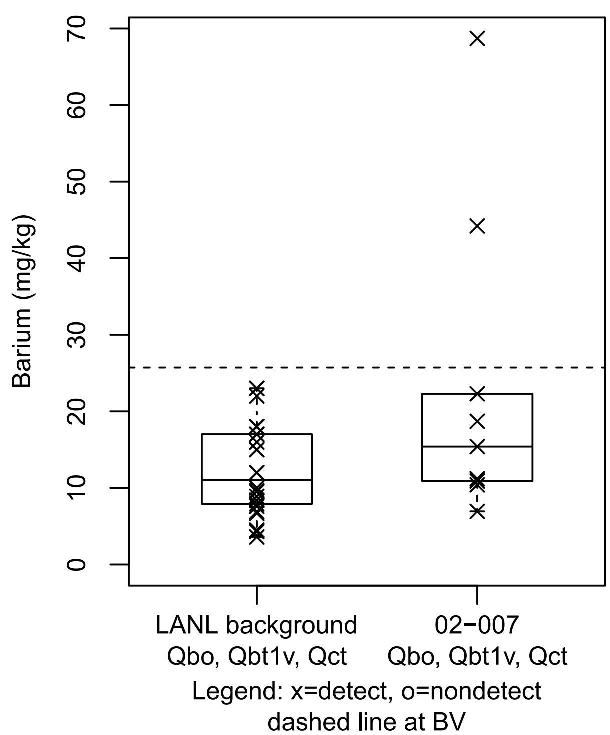

Figure G-166 Box plot for barium in Qbo at SWMU 02-007

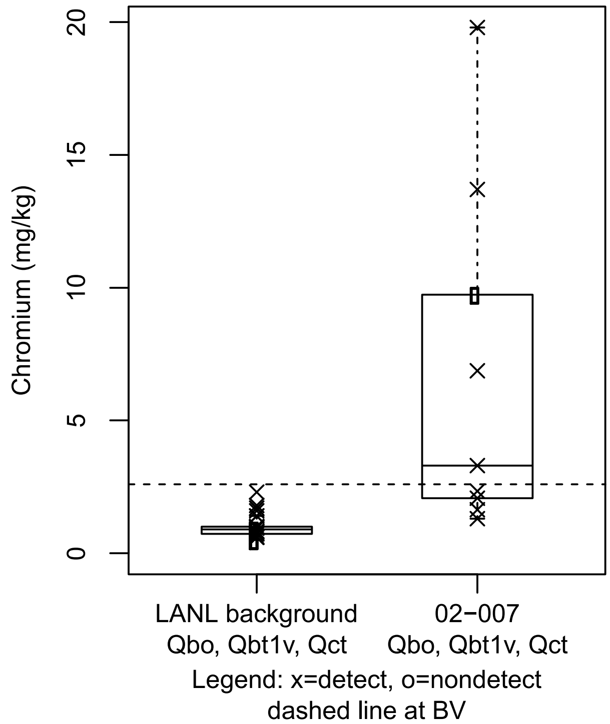

Figure G-167 Box plot for chromium in Qbo at SWMU 02-007

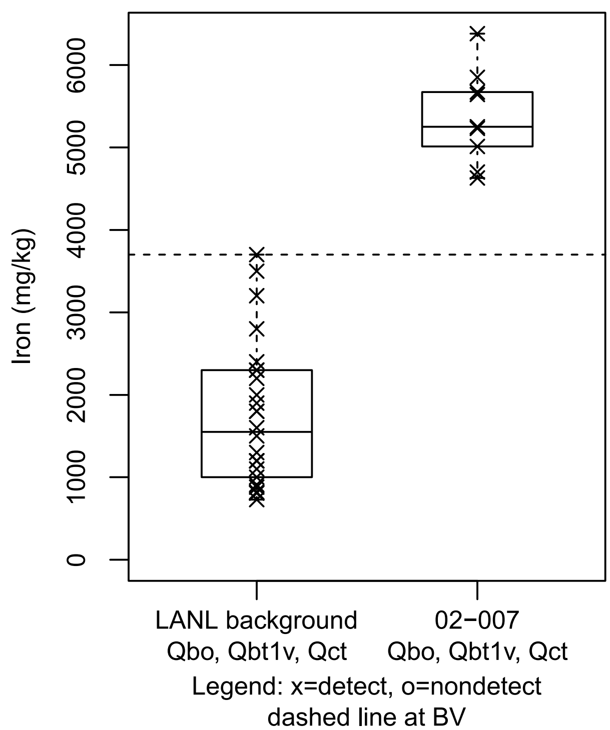

Figure G-168 Box plot for iron in Qbo at SWMU 02-007

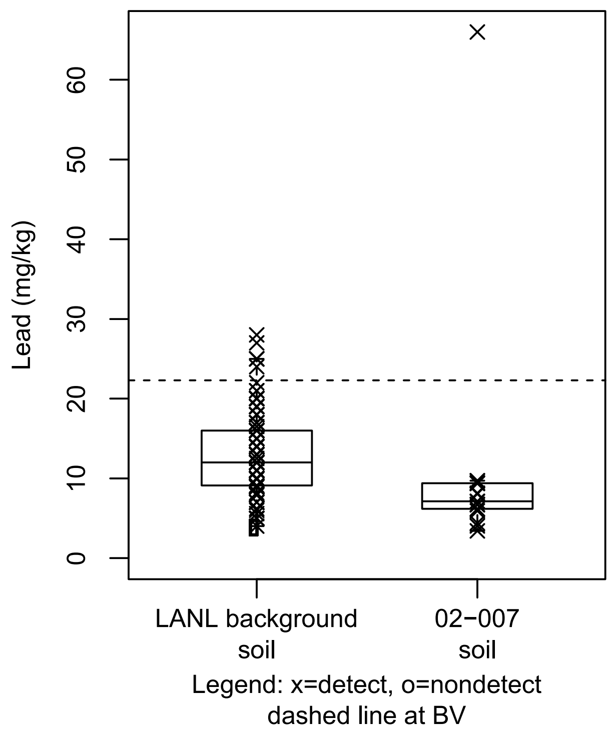

Figure G-169 Box plot for lead in soil at SWMU 02-007

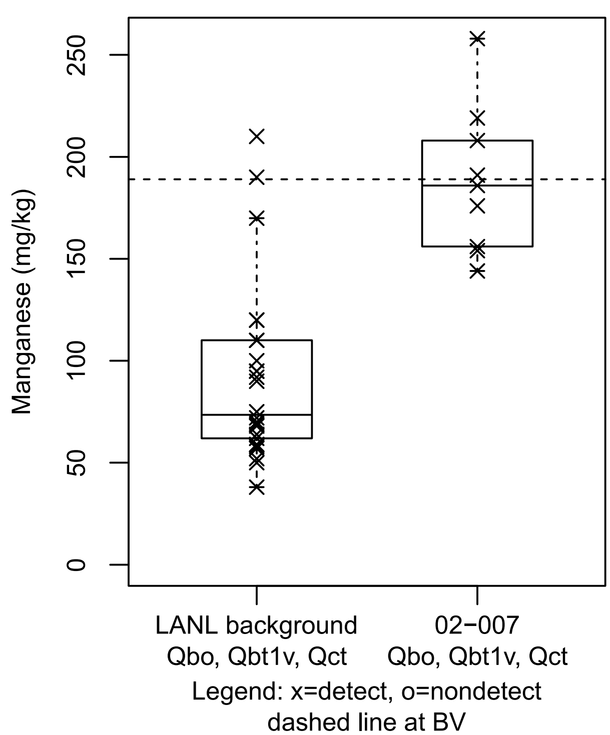

Figure G-170 Box plot for manganese in Qbo at SWMU 02-007

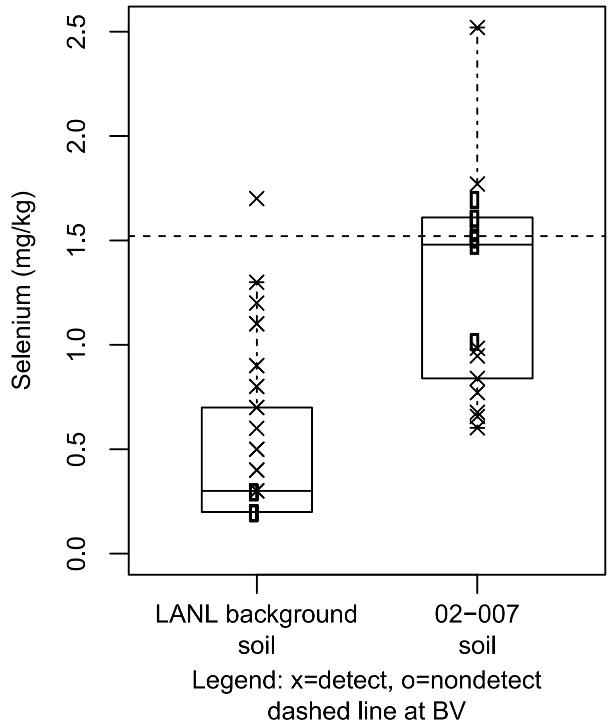

Figure G-171 Box plot for selenium in soil at SWMU 02-007

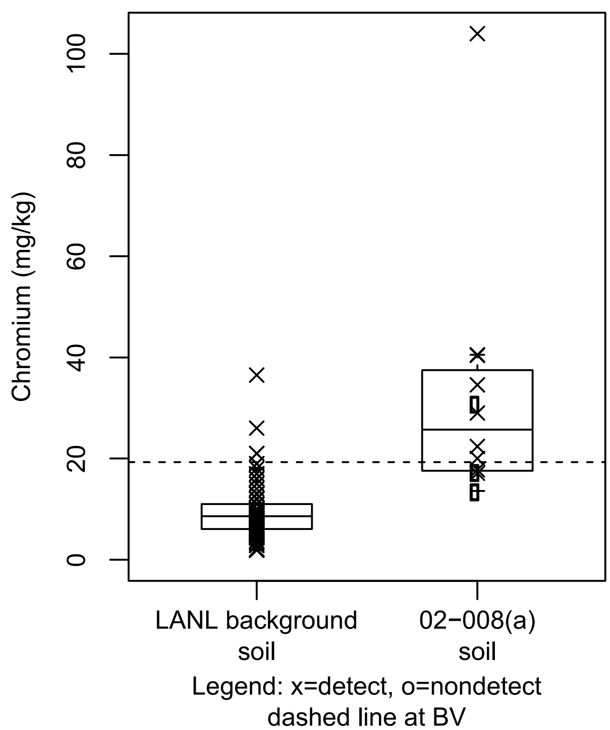

Figure G-172 Box plot for chromium in soil at SWMU 02-008(a)

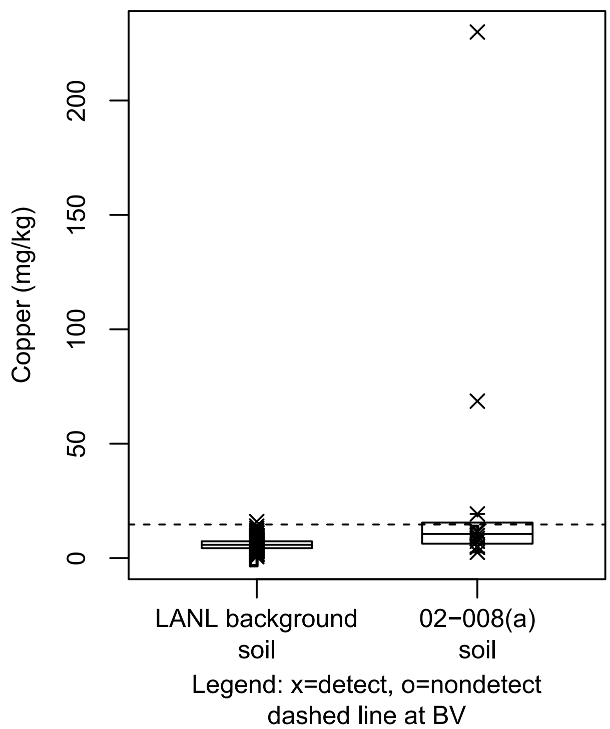

Figure G-173 Box plot for copper in soil at SWMU 02-008(a)

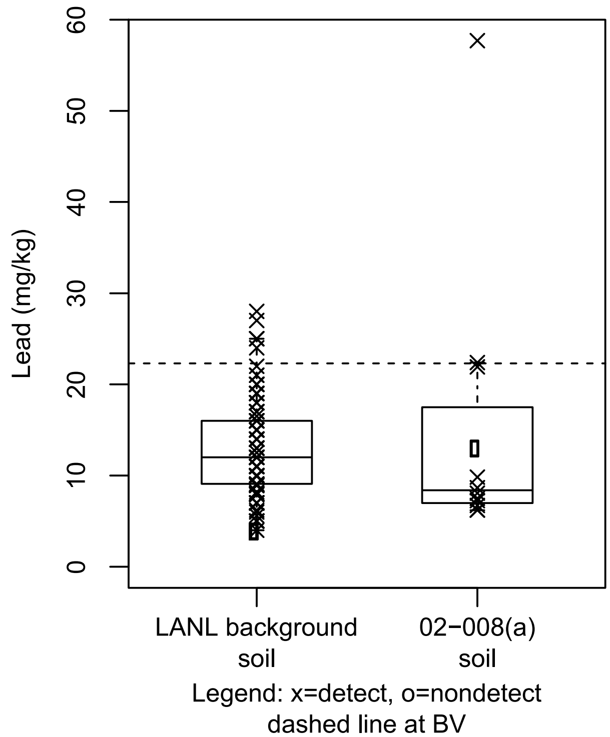

Figure G-174 Box plot for lead in soil at SWMU 02-008(a)

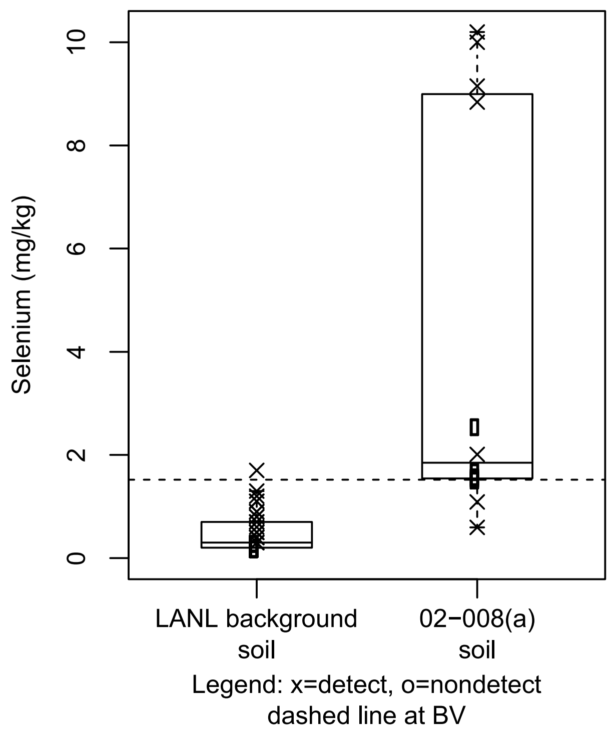

Figure G-175 Box plot for selenium in soil at SWMU 02-008(a)

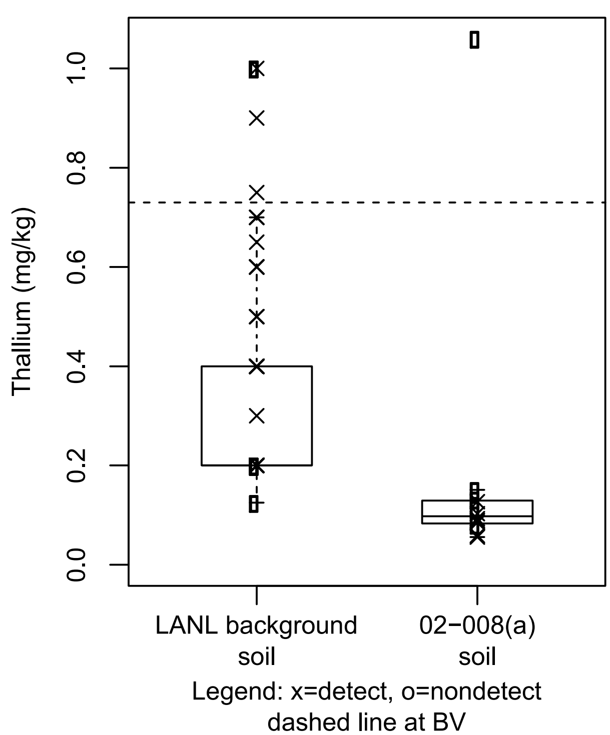

Figure G-176 Box plot for thallium in soil at SWMU 02-008(a)

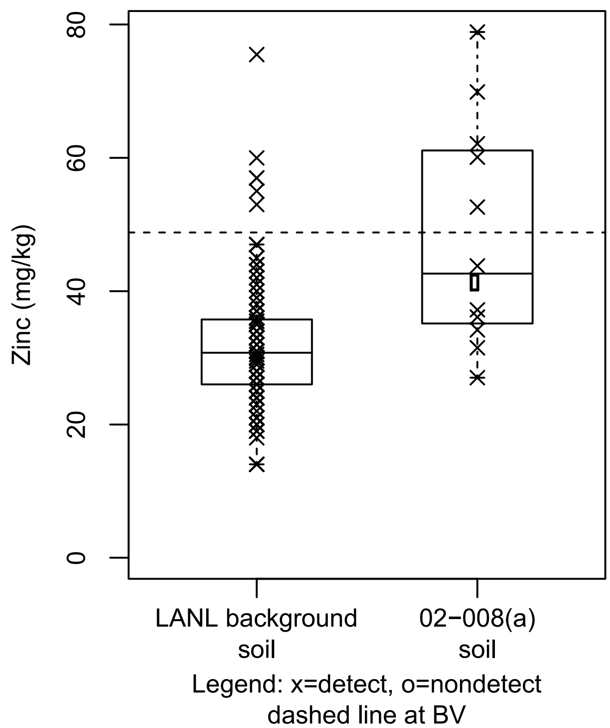

Figure G-177 Box plot for zinc in soil at SWMU 02-008(a)

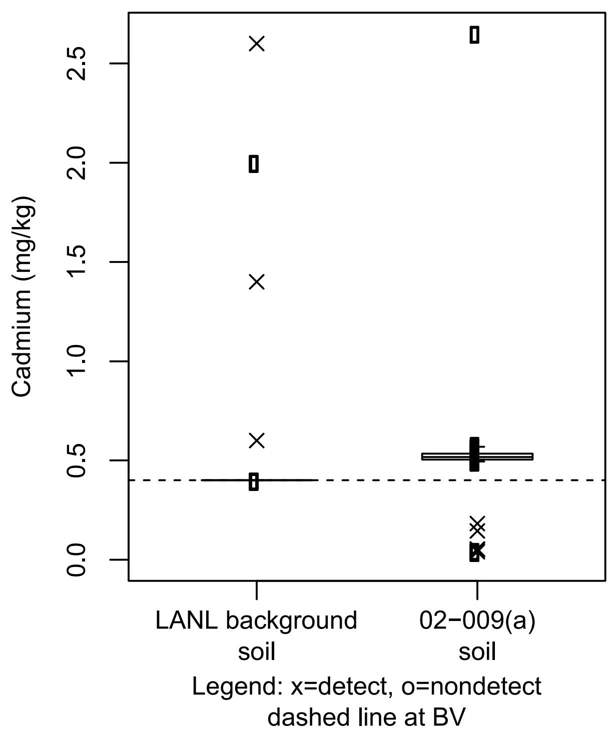

Figure G-178 Box plot for calcium in soil at SWMU 02-009(a)

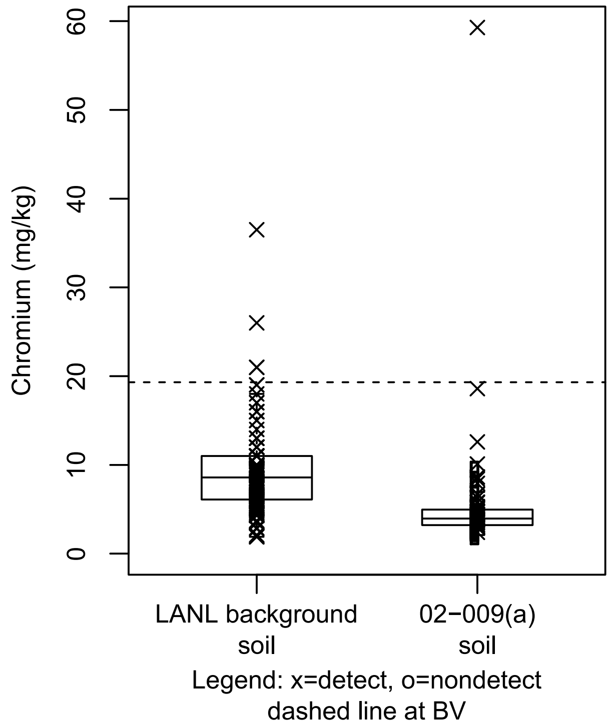

Figure G-179 Box plot for chromium in soil at SWMU 02-009(a)

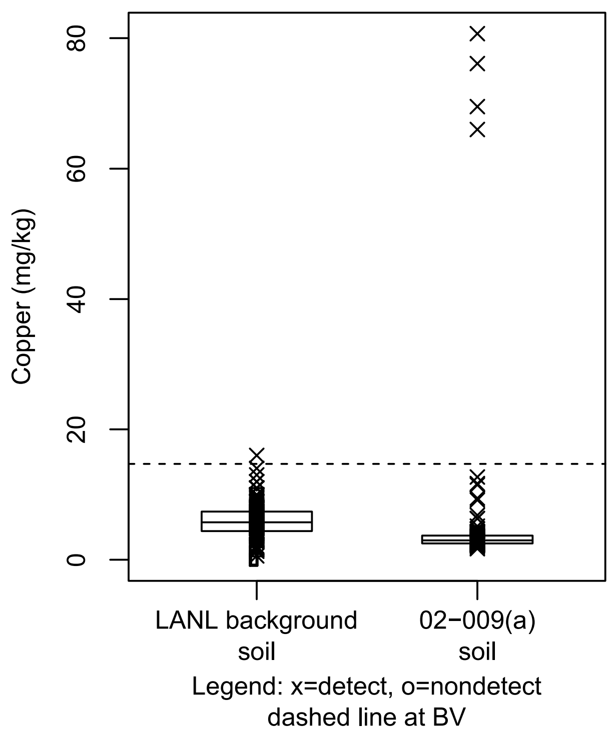

Figure G-180 Box plot for copper in soil at SWMU 02-009(a)

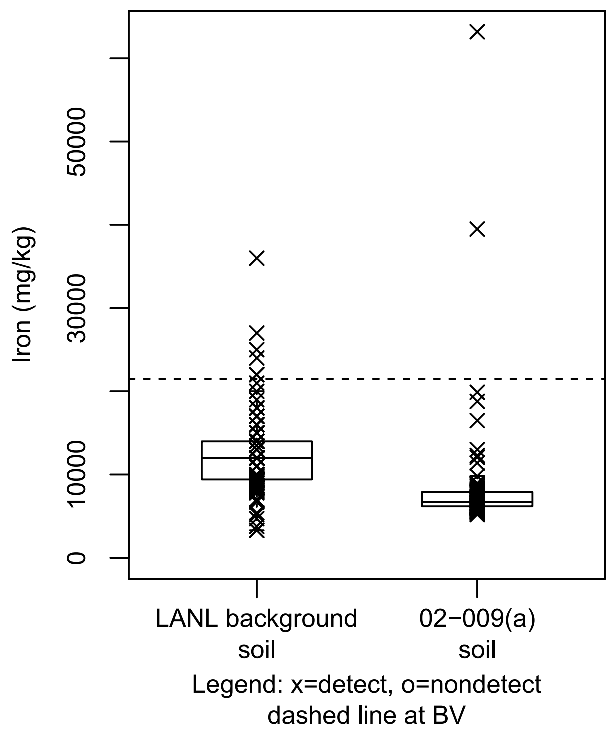

Figure G-181 Box plot for iron in soil at SWMU 02-009(a)

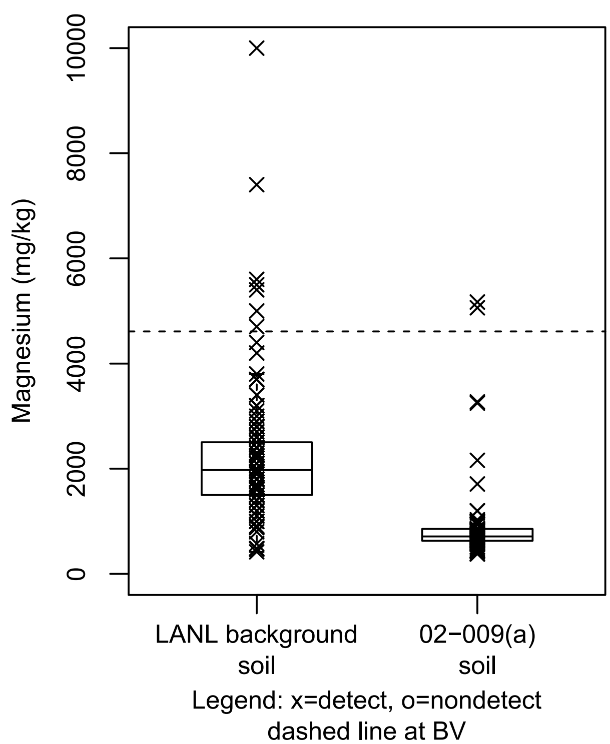

Figure G-182 Box plot for magnesium in soil at SWMU 02-009(a)

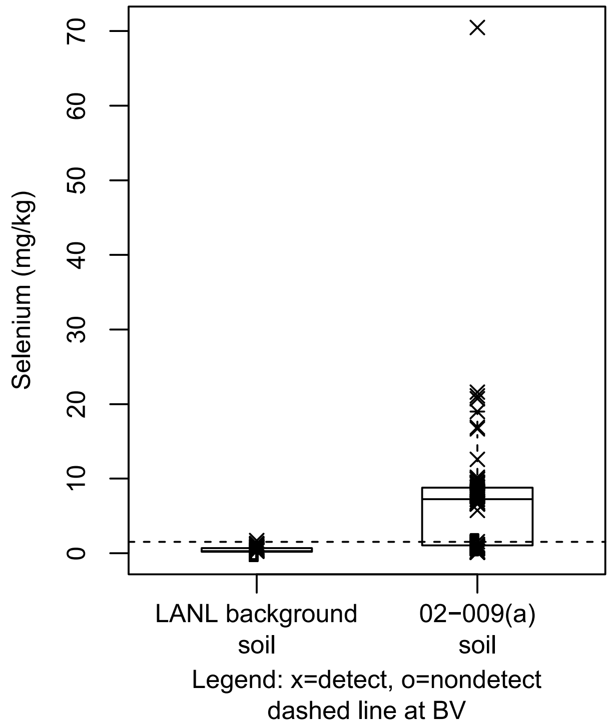

Figure G-183 Box plot for selenium in soil at SWMU 02-009(a)

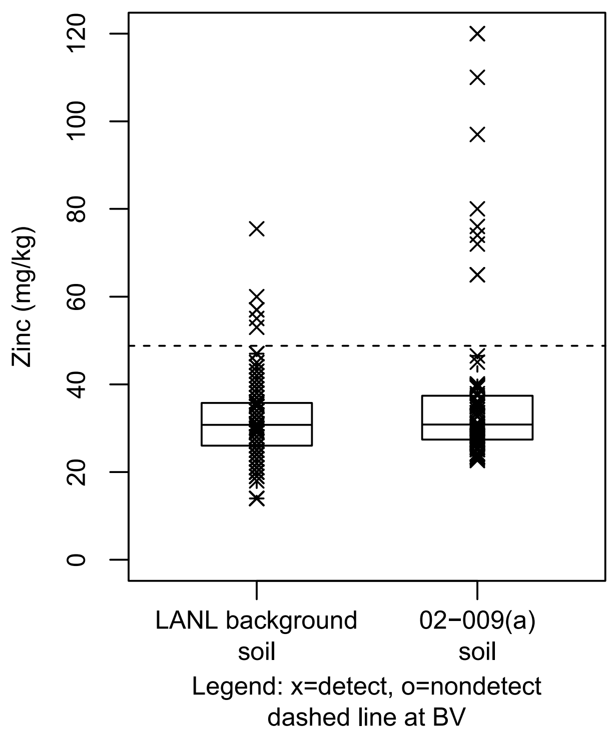

Figure G-184 Box plot for zinc in soil at SWMU 02-009(a)

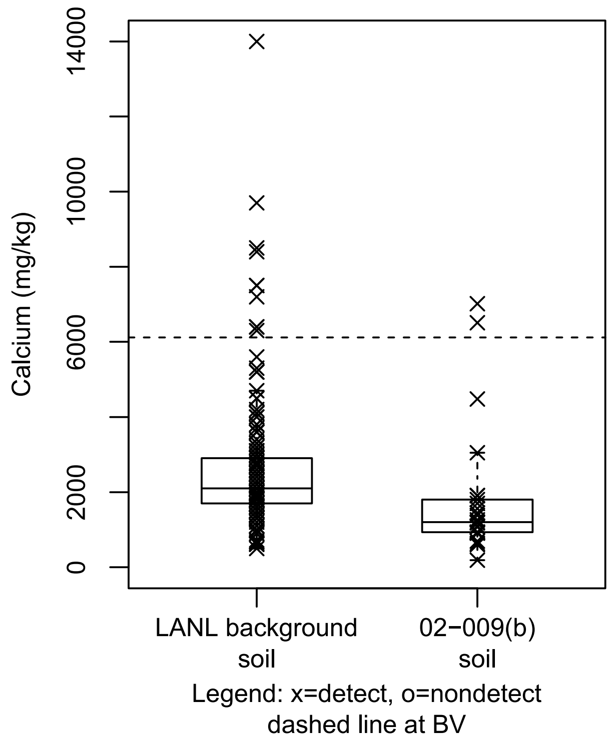

Figure G-185 Box plot for calcium in soil at SWMU 02-009(b)

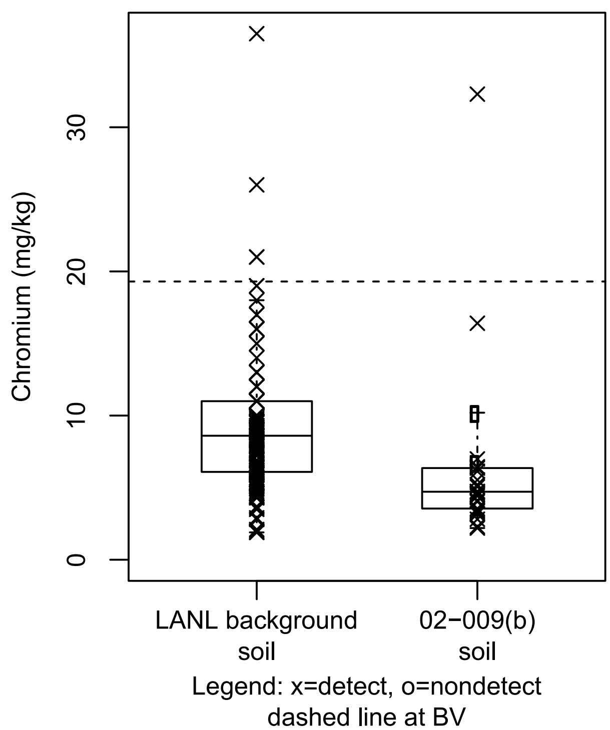

Figure G-186 Box plot for chromium in soil at SWMU 02-009(b)

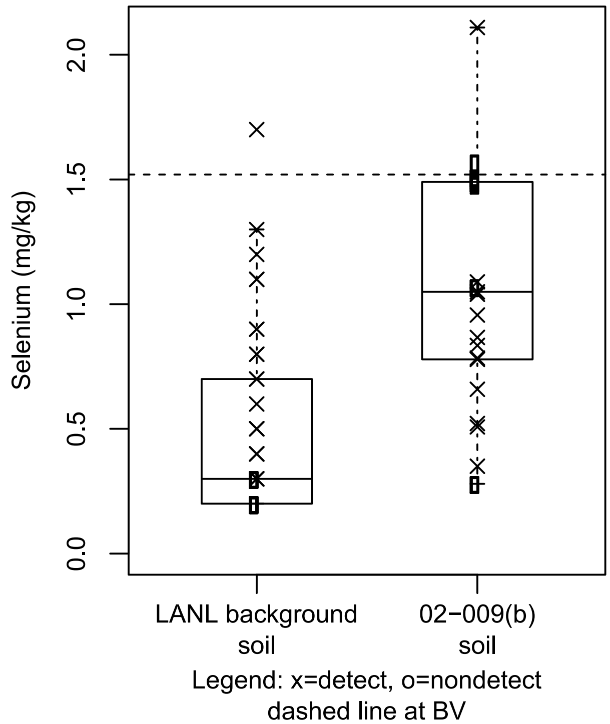

Figure G-187 Box plot for selenium in soil at SWMU 02-009(b)

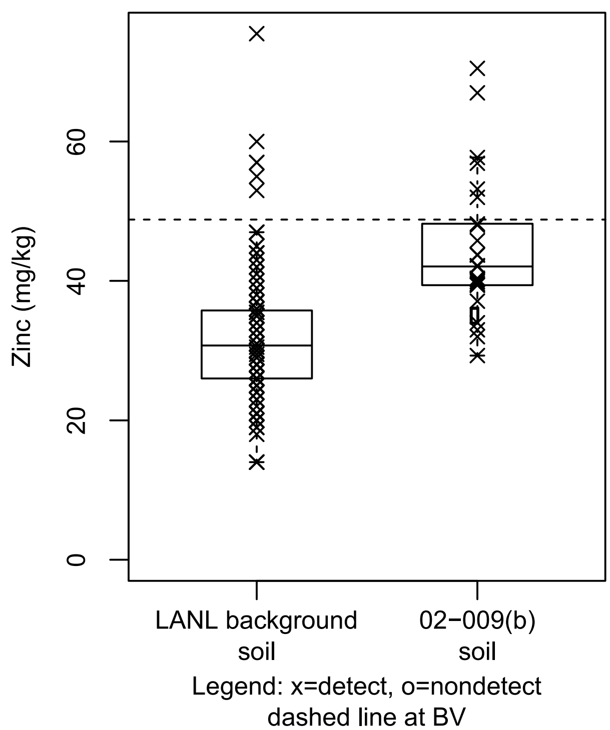

Figure G-188 Box plot for zinc in soil at SWMU 02-009(b)

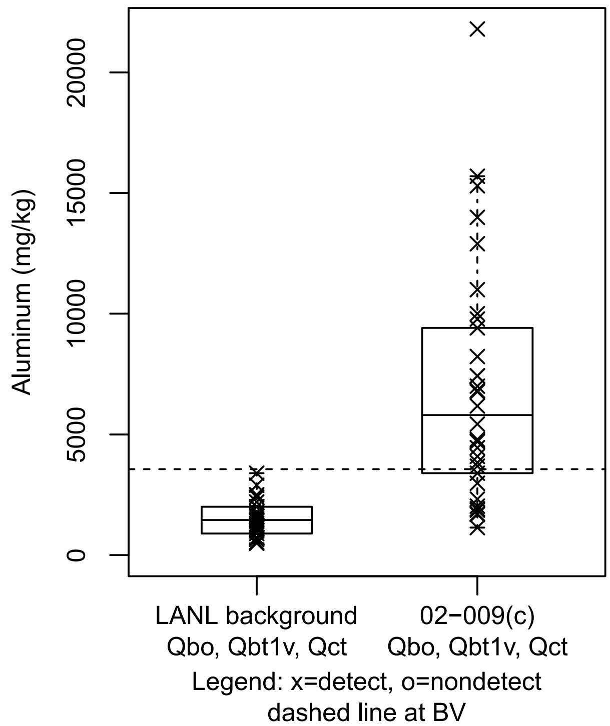

Figure G-189 Box plot for aluminum in Qbo at SWMU 02-009(c)

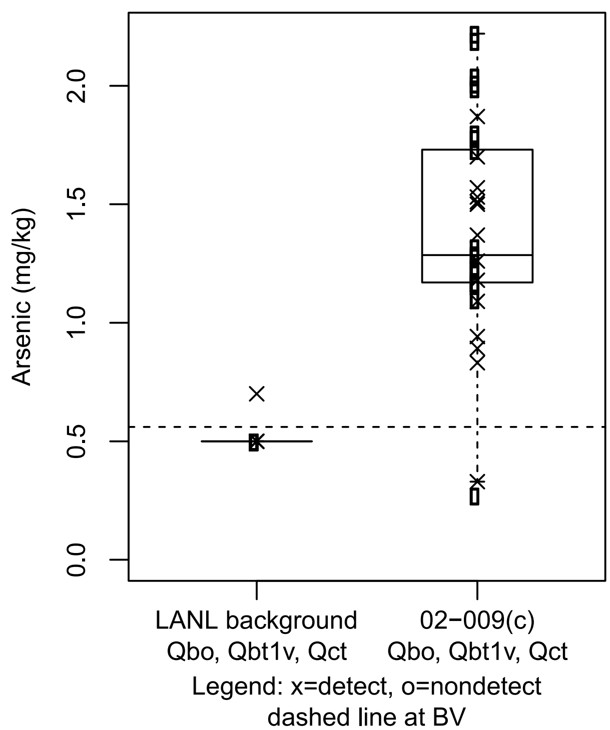

Figure G-190 Box plot for arsenic in Qbo at SWMU 02-009(c)

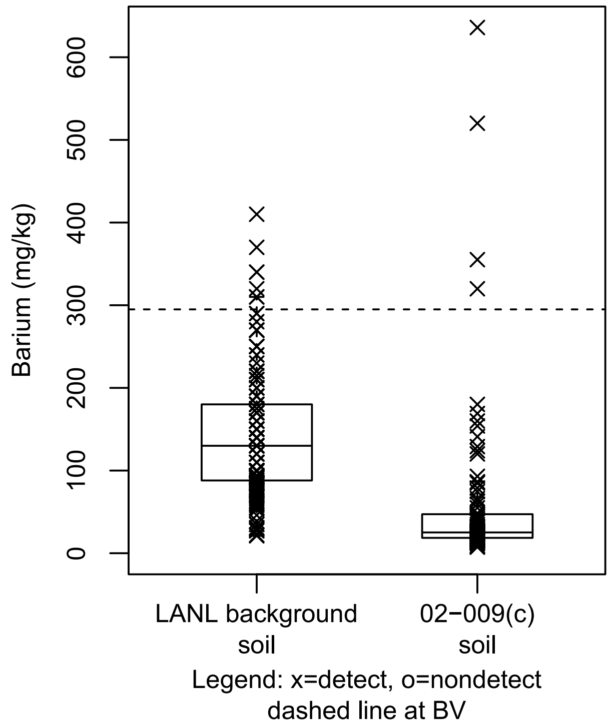

Figure G-191 Box plot for barium in soil at SWMU 02-009(c)

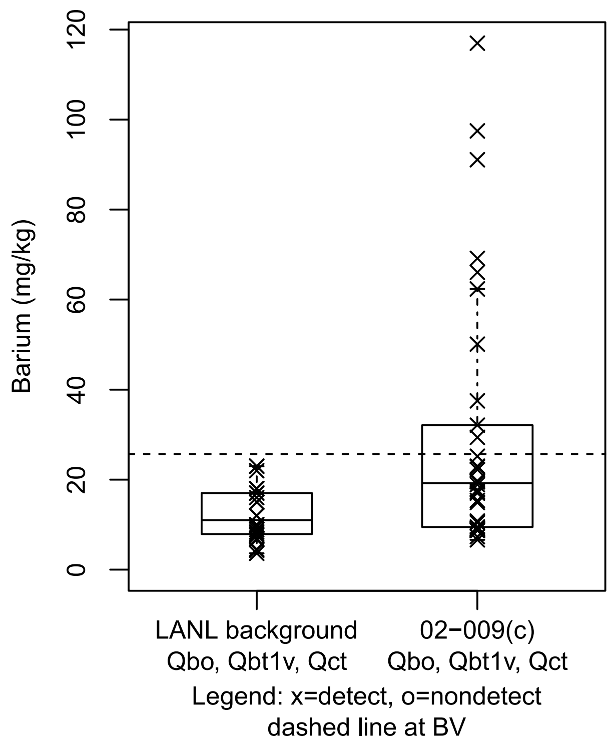

Figure G-192 Box plot for barium in Qbo at SWMU 02-009(c)

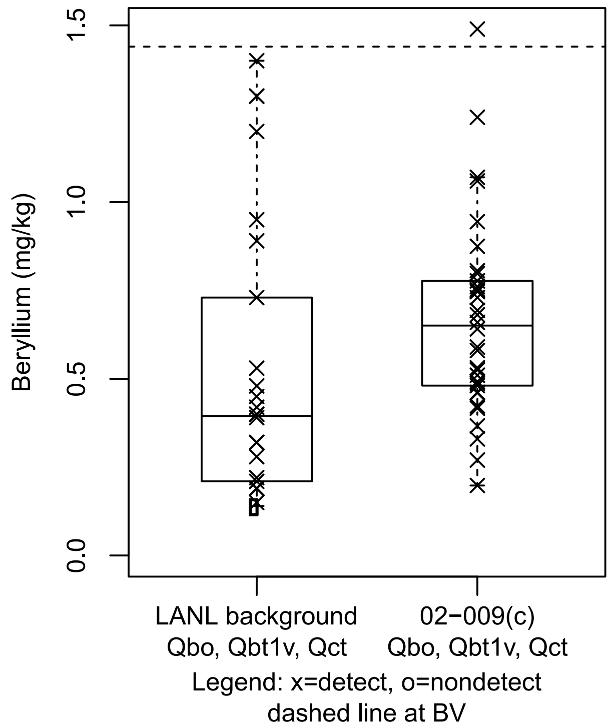

Figure G-193   Box plot for beryllium in Qbo at SWMU 02-009(c)

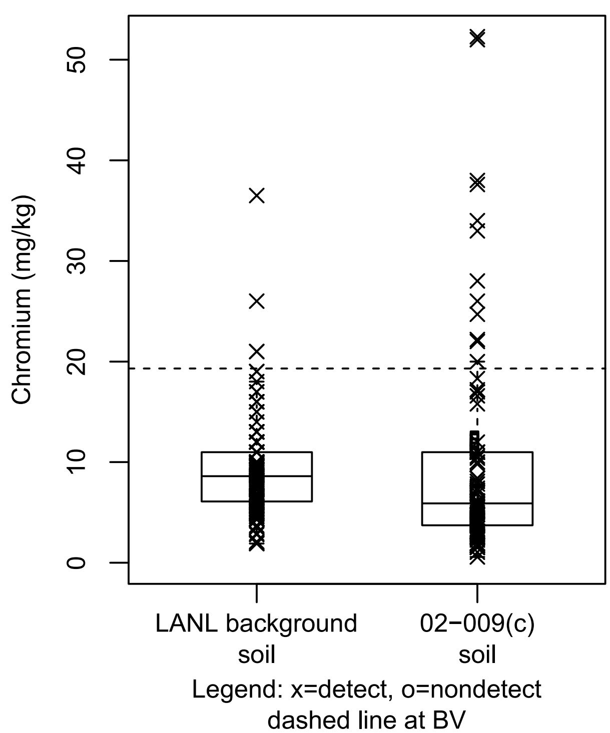

Figure G-194   Box plot for chromium in soil at SWMU 02-009(c)

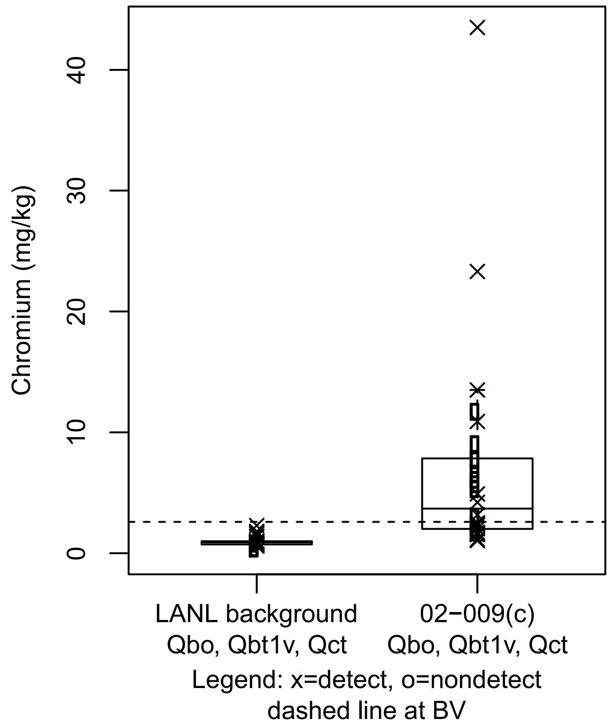

Figure G-195   Box plot for chromium in Qbo at SWMU 02-009(c)

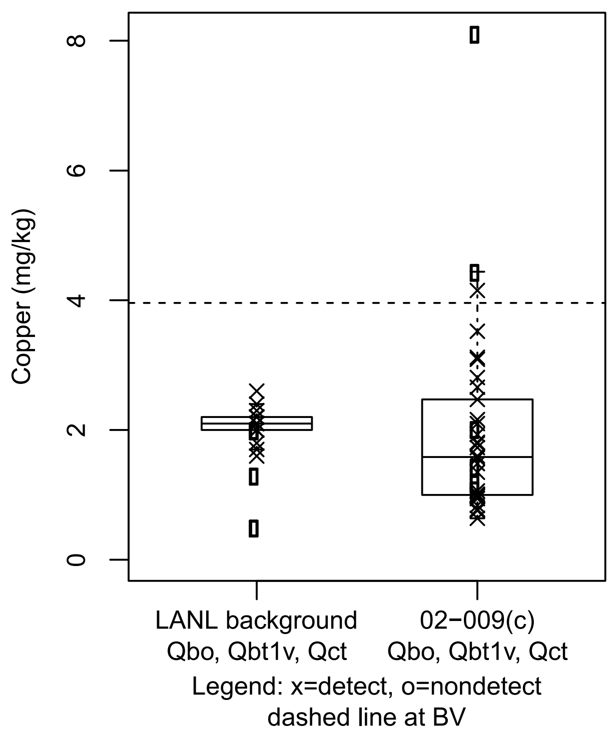

Figure G-196   Box plot for copper in Qbo at SWMU 02-009(c)

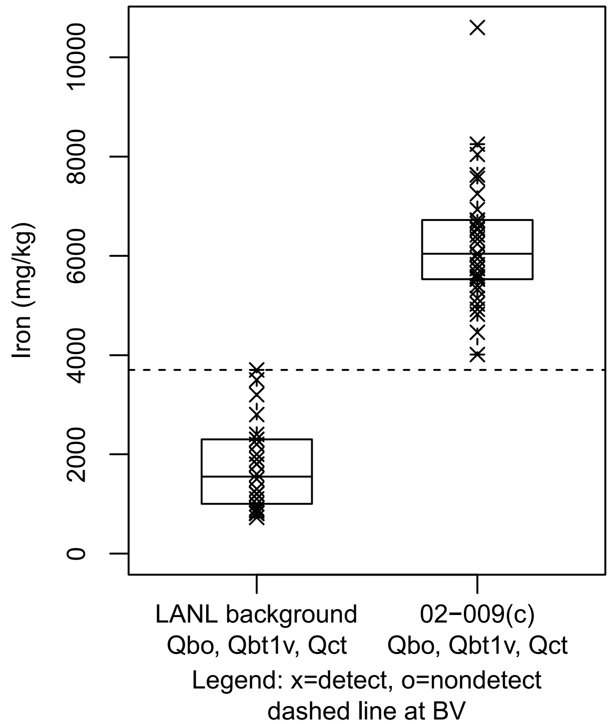

Figure G-197 Box plot for iron in Qbo at SWMU 02-009(c)

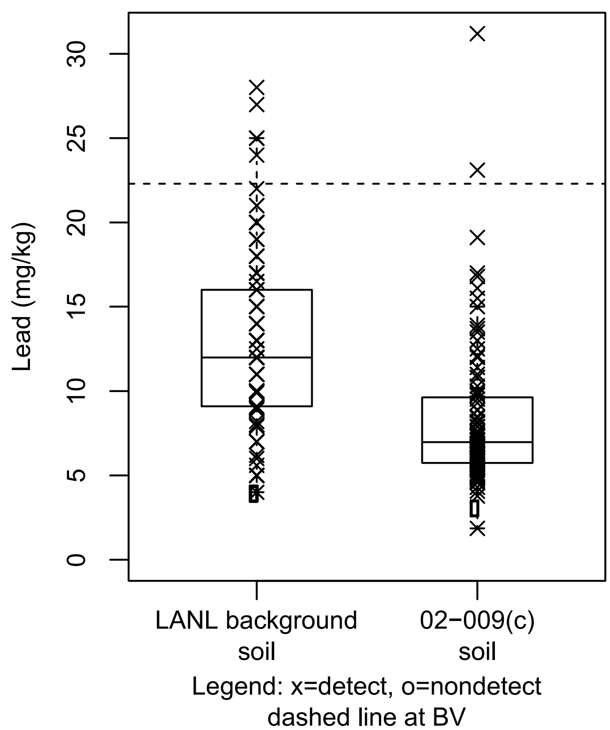

Figure G-198 Box plot for lead in soil at SWMU 02-009(c)

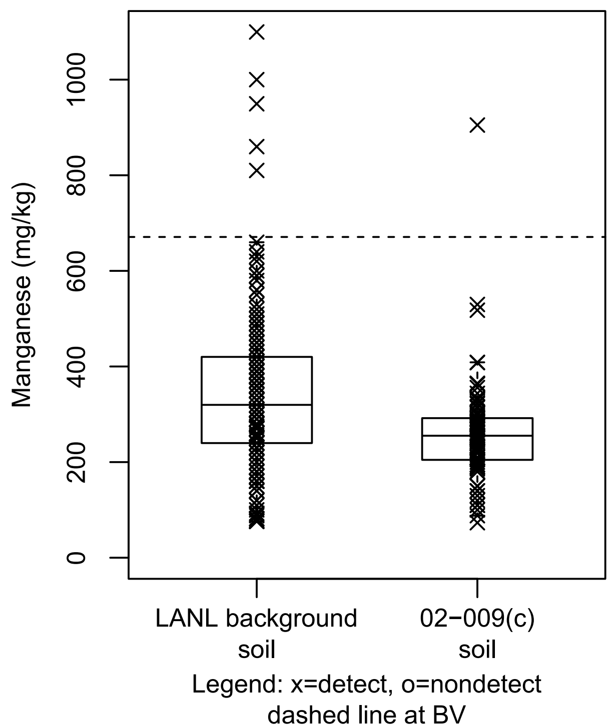

Figure G-199 Box plot for manganese in soil at SWMU 02-009(c)

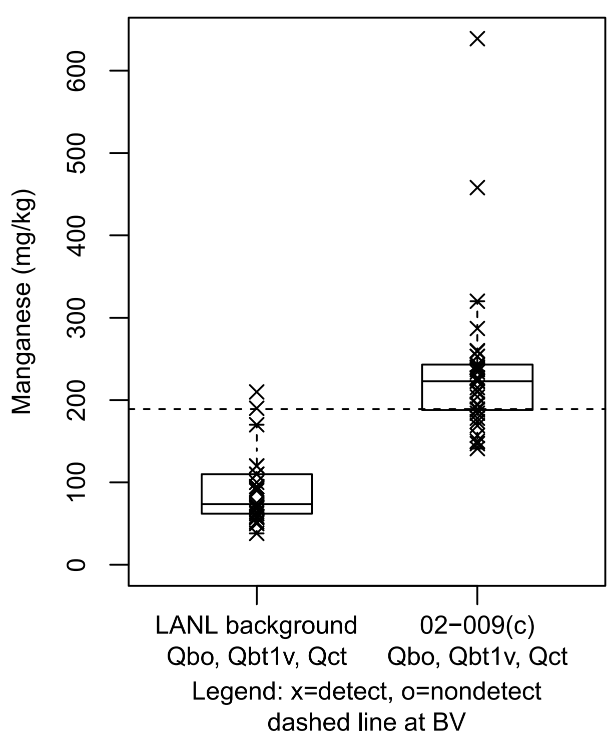

Figure G-200 Box plot for manganese in Qbo at SWMU 02-009(c)

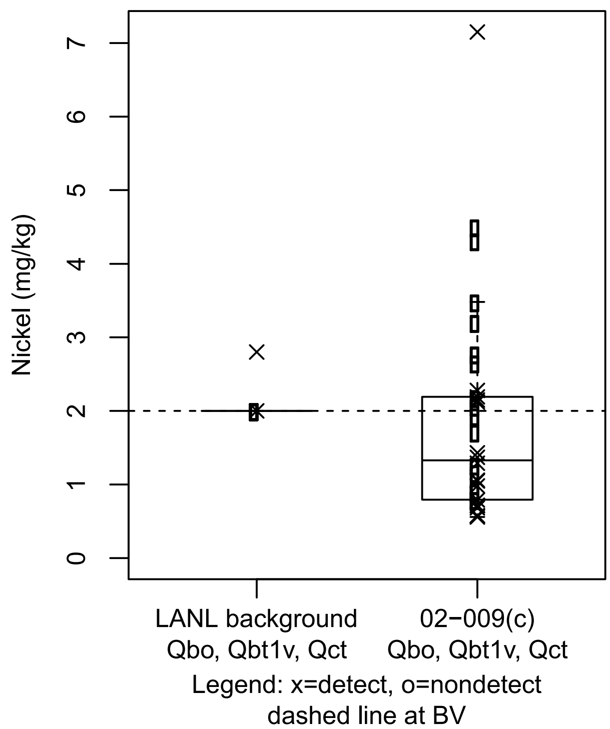

Figure G-201 Box plot for manganese in Qbo at SWMU 02-009(c)

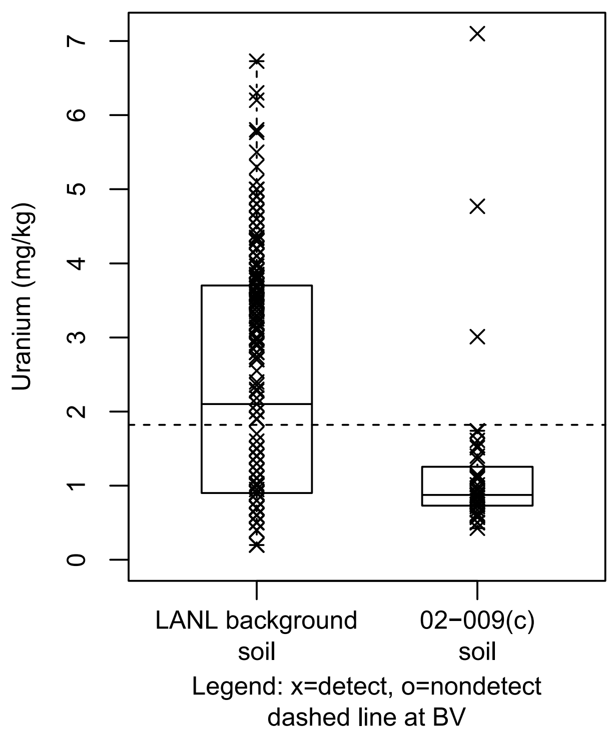

Figure G-202 Box plot for uranium in soil at SWMU 02-009(c)

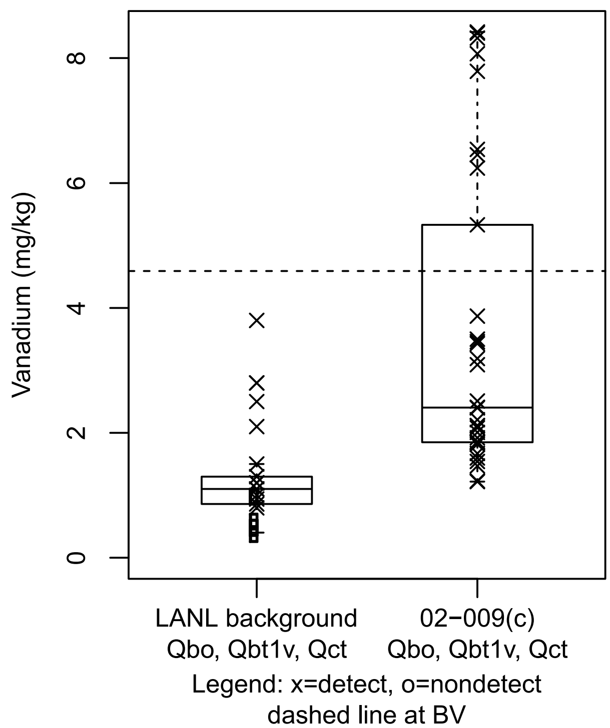

Figure G-203   Box plot for vanadium in Qbo at SWMU 02-009(c)

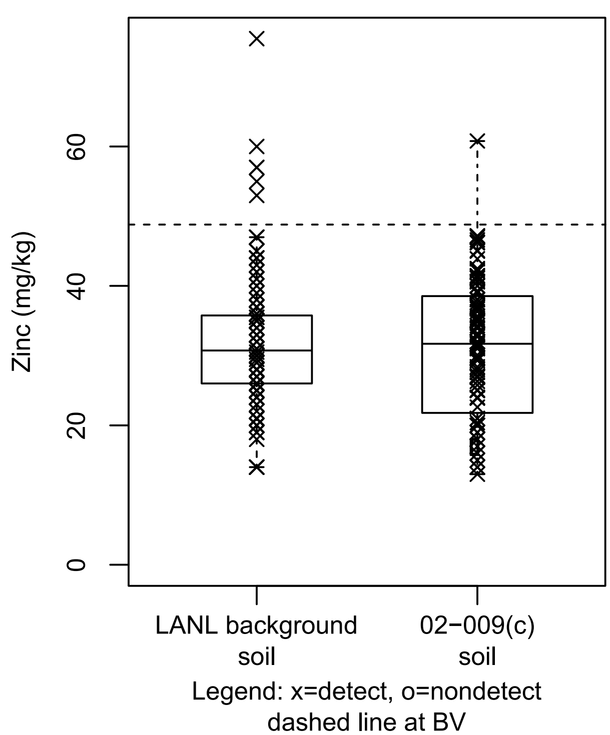

Figure G-204   Box plot for zinc in soil at SWMU 02-009(c)

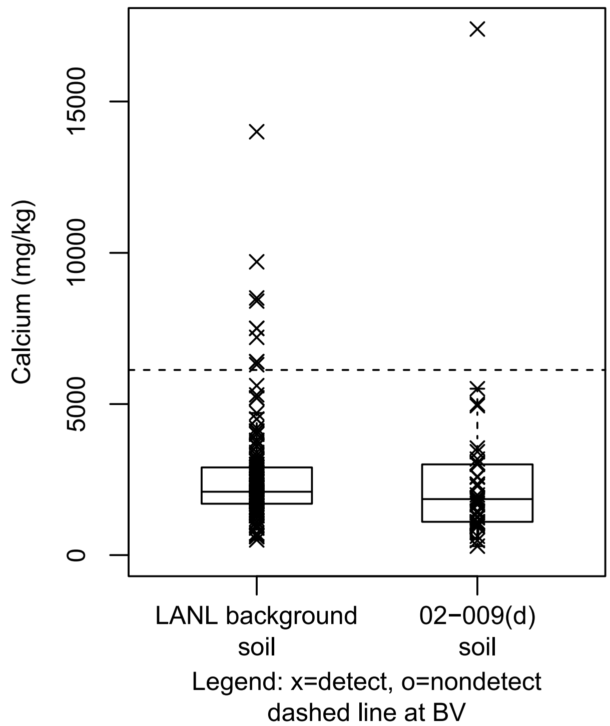

Figure G-205 Box plot for calcium in soil at AOC 02-009(d)

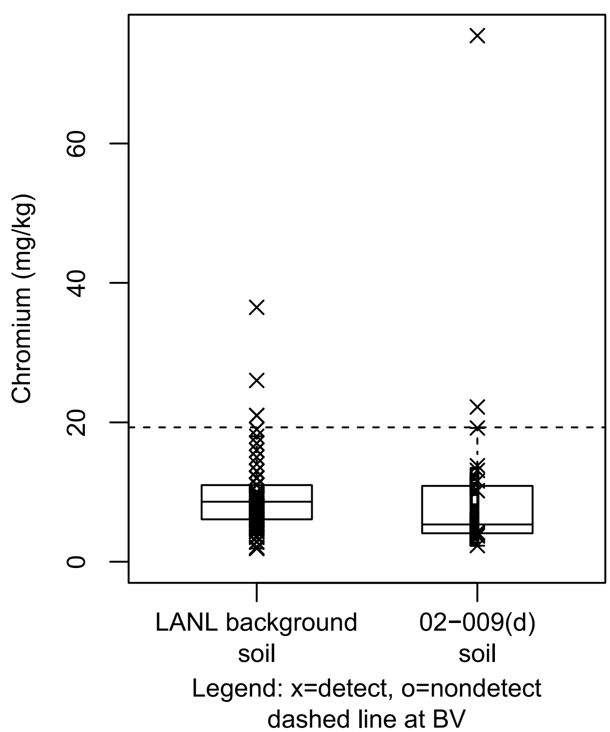

Figure G-206 Box plot for chromium in soil at AOC 02-009(d)

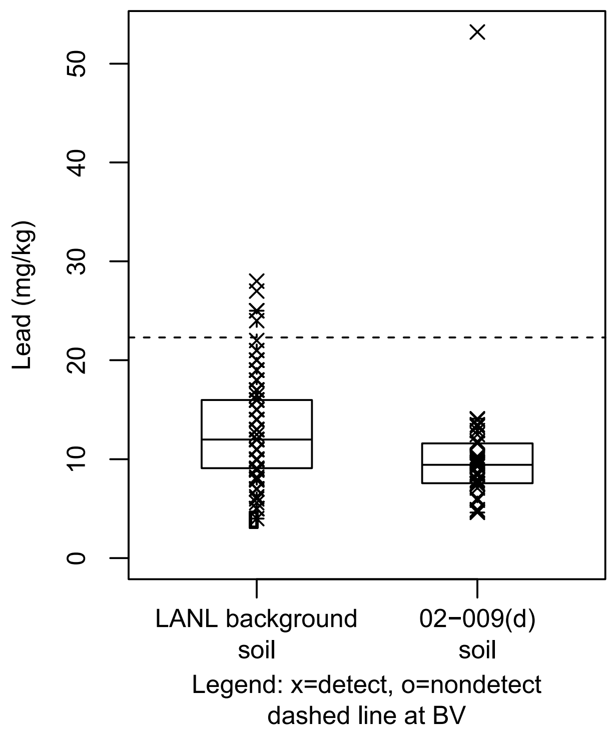

Figure G-207 Box plot for lead in soil at AOC 02-009(d)

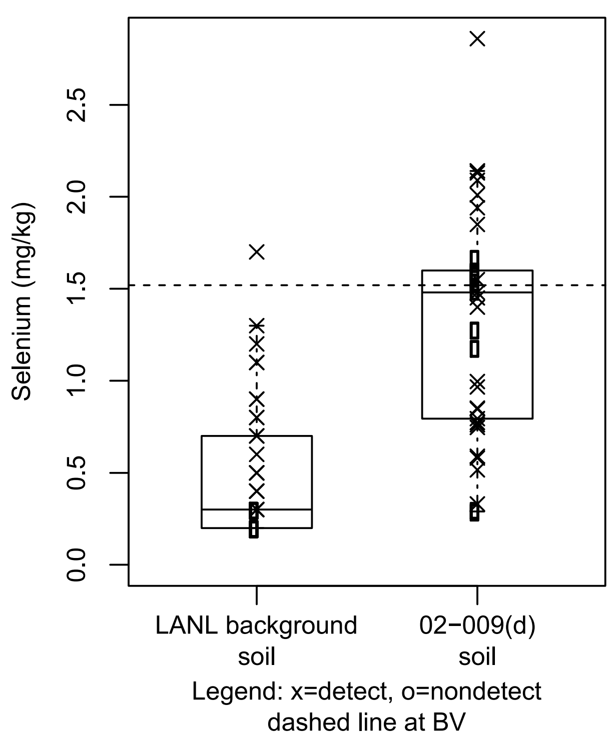

Figure G-208 Box plot for selenium in soil at AOC 02-009(d)

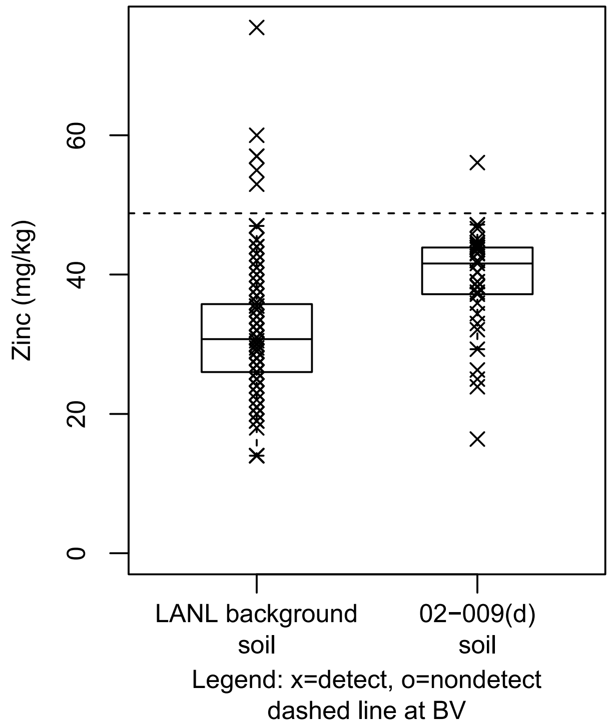

Figure G-209 Box plot for zinc in soil at AOC 02-009(d)

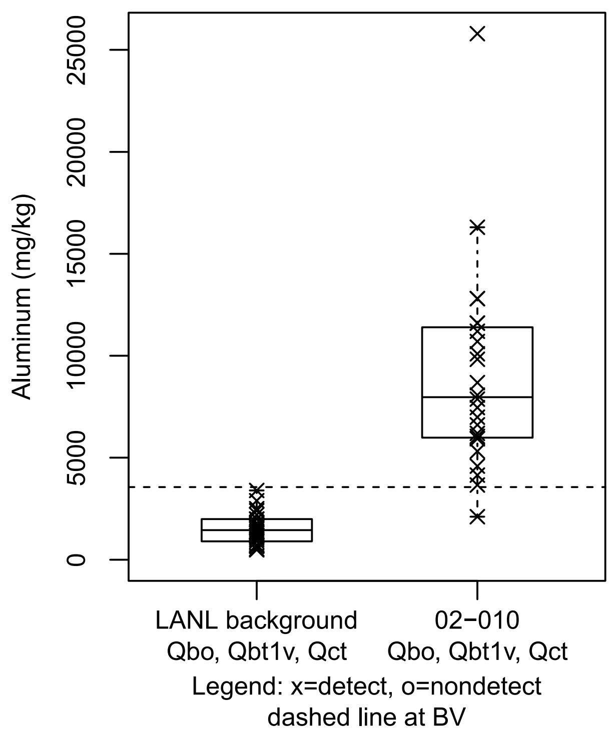

Figure G-210 Box plot for aluminum in Qbo at AOC 02-010

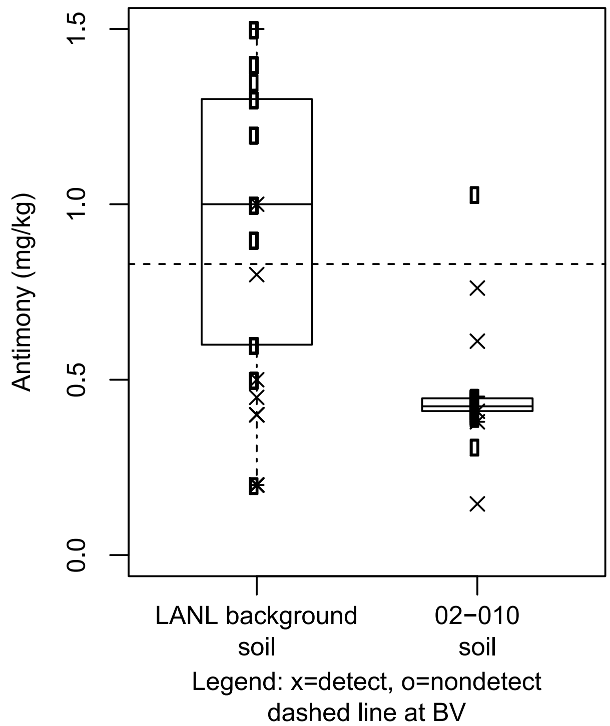

Figure G-211 Box plot for antimony in Soil at AOC 02-010

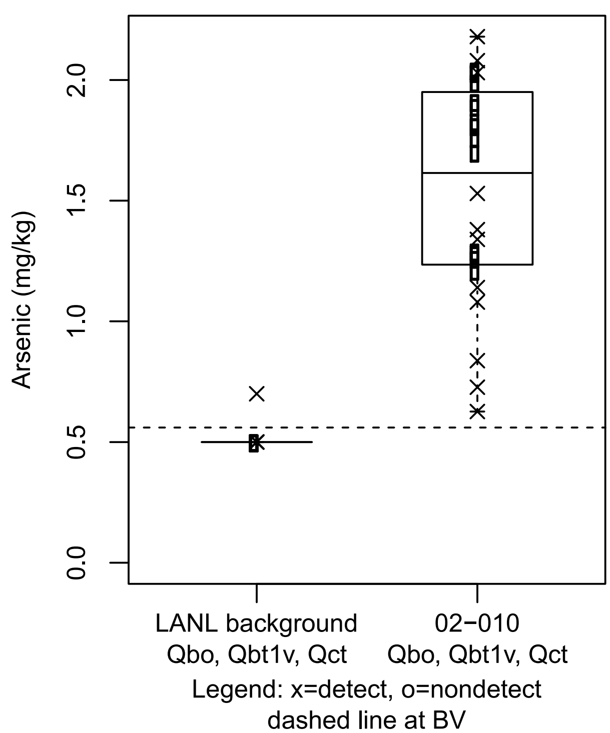

Figure G-212 Box plot for arsenic in Qbo at AOC 02-010

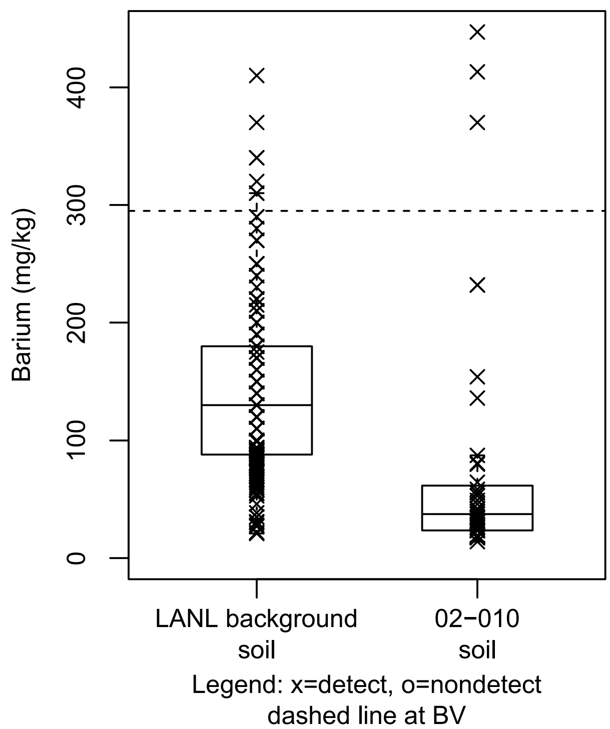

Figure G-213 Box plot for barium in soil at AOC 02-010

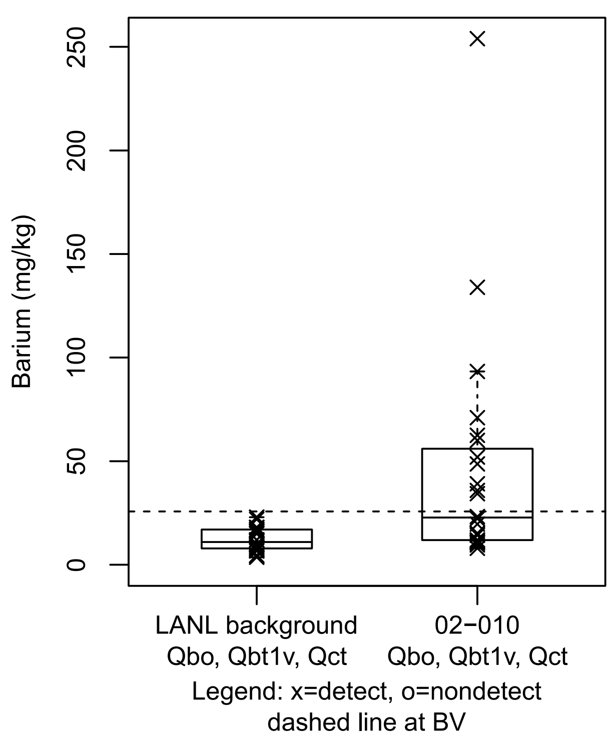

Figure G-214 Box plot for barium in Qbo at AOC 02-010

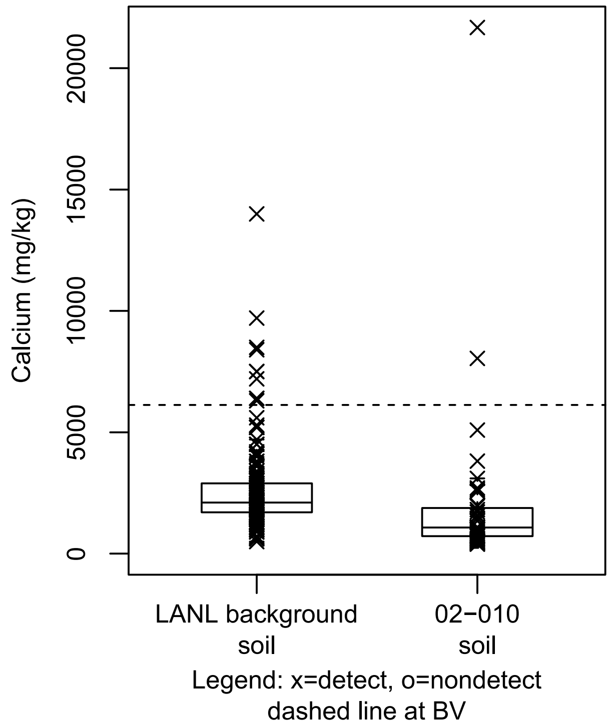

Figure G-215 Box plot for calcium in soil at AOC 02-010

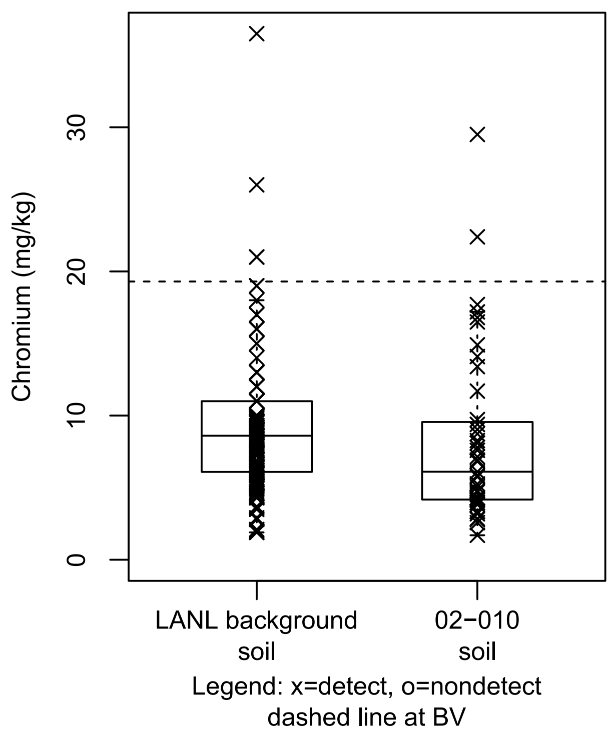

Figure G-216 Box plot for chromium in soil at AOC 02-010

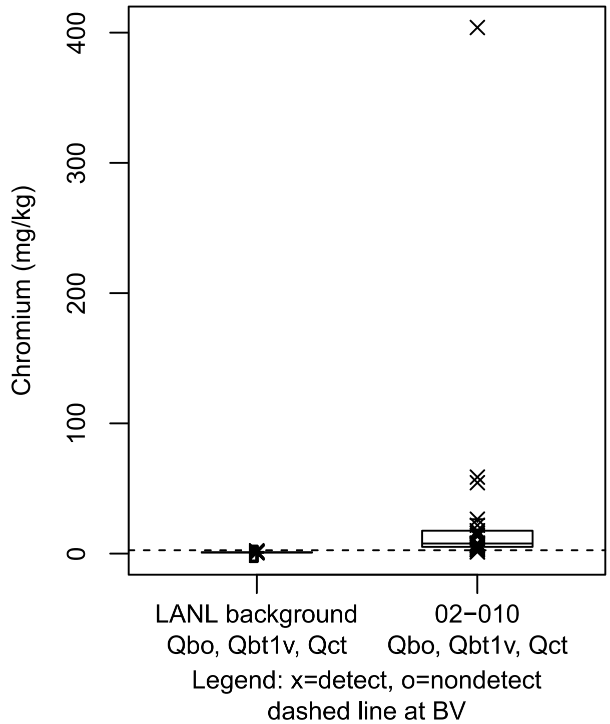

Figure G-217 Box plot for chromium in Qbo at AOC 02-010

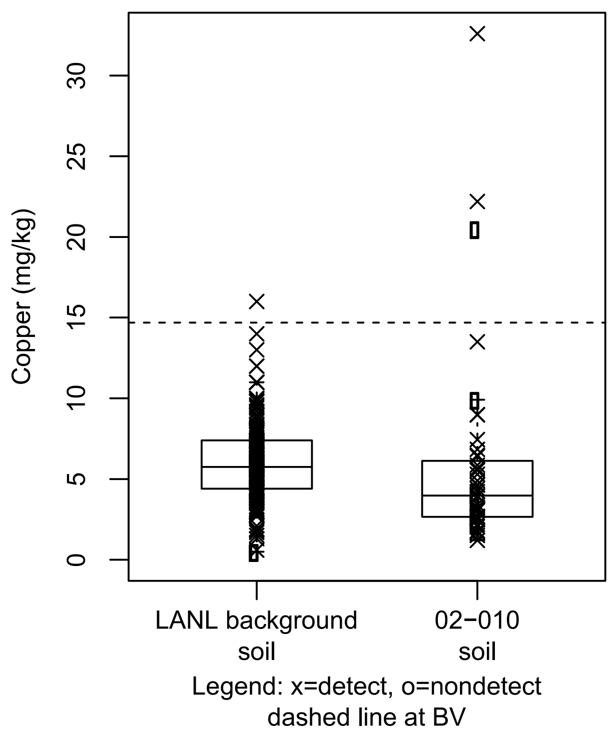

Figure G-218 Box plot for copper in soil at AOC 02-010

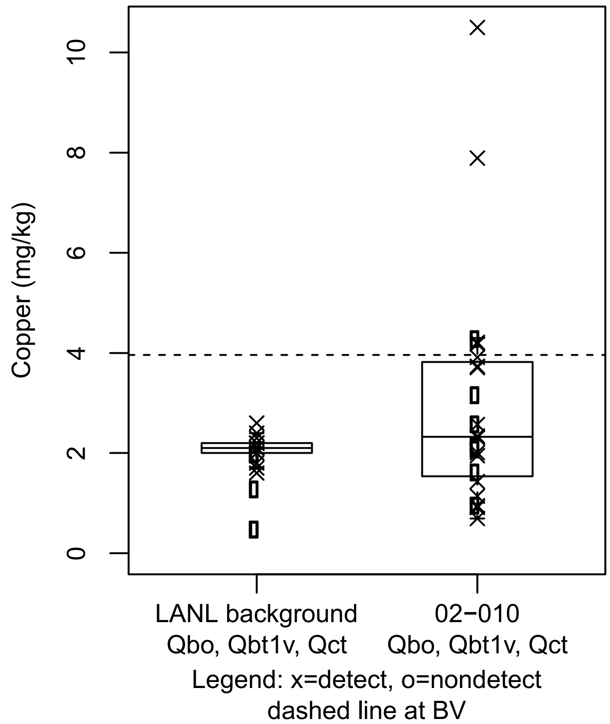

Figure G-219   Box plot for copper in Qbo at AOC 02-010

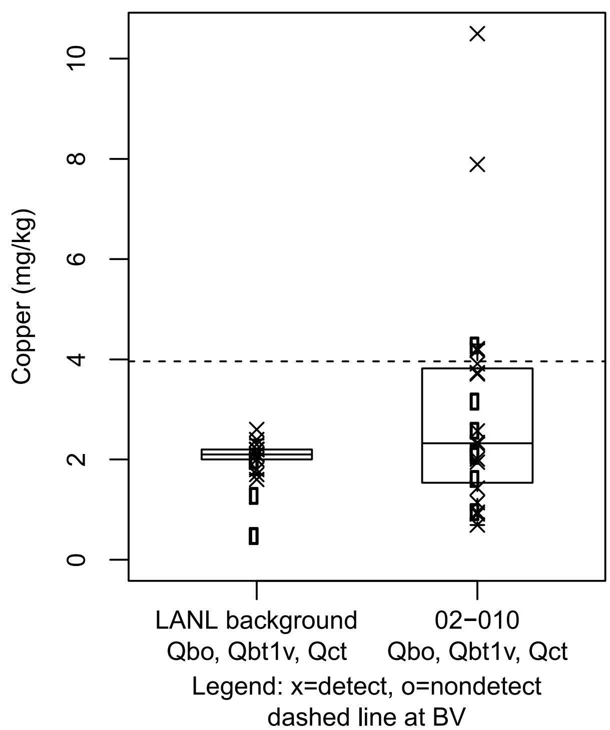

Figure G-220   Box plot for copper in Qbo at AOC 02-010

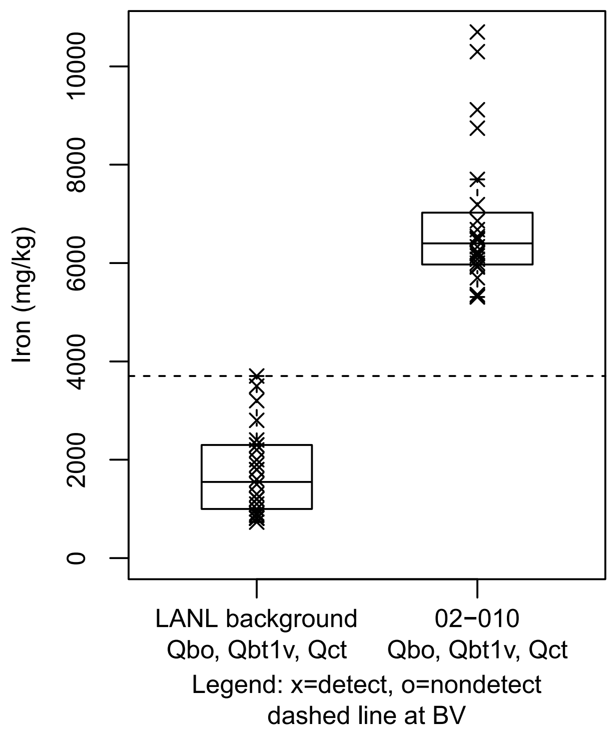

Figure G-221 Box plot for iron in Qbo at AOC 02-010

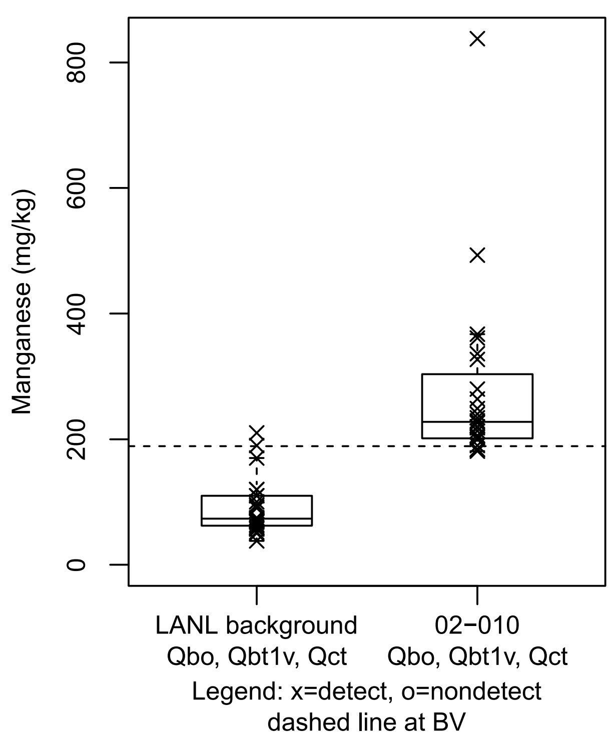

Figure G-222 Box plot for manganese in Qbo at AOC 02-010

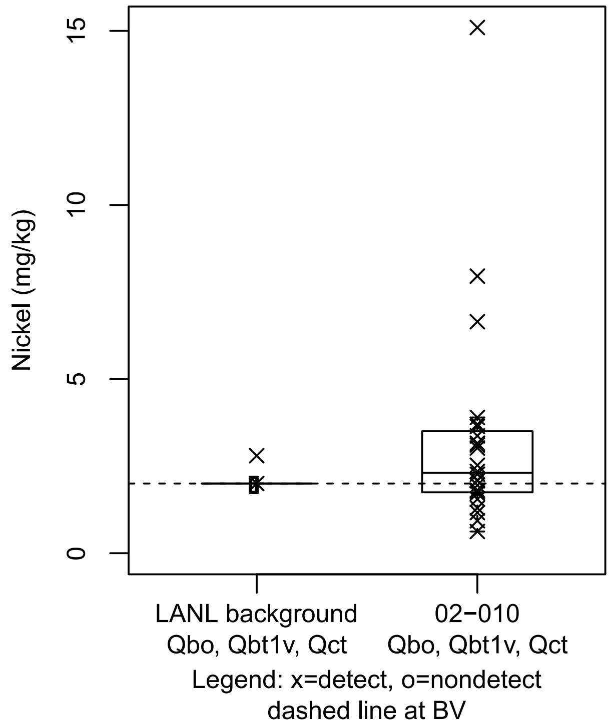

Figure G-223 Box plot for nickel in Qbo at AOC 02-010

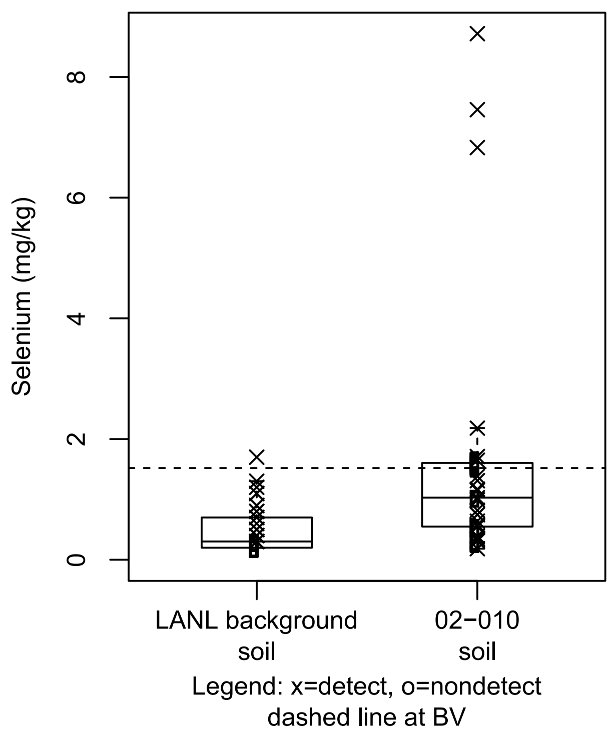

Figure G-224 Box plot for selenium in soil at AOC 02-010

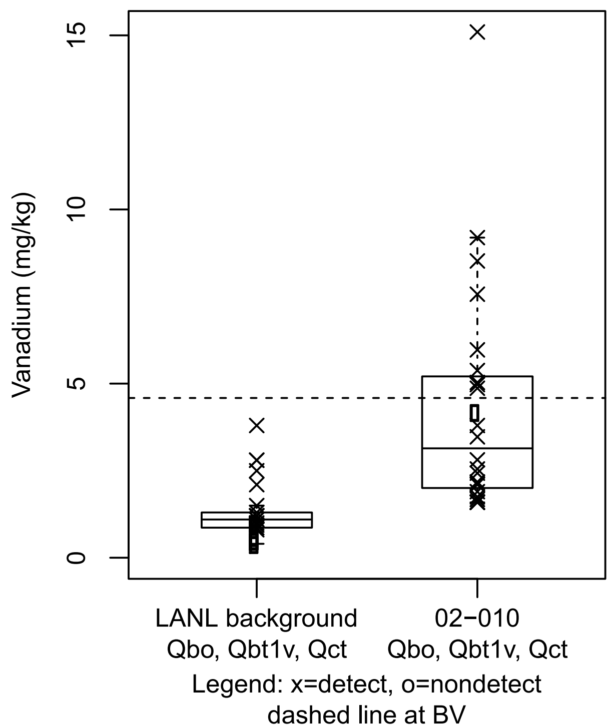

Figure G-225 Box plot for vanadium in Qbo at AOC 02-010

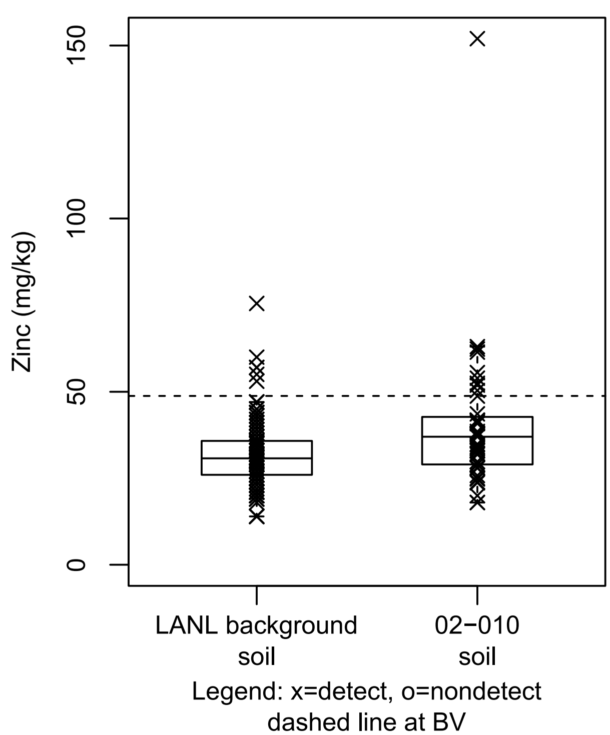

Figure G-226 Box plot for zinc in soil at AOC 02-010

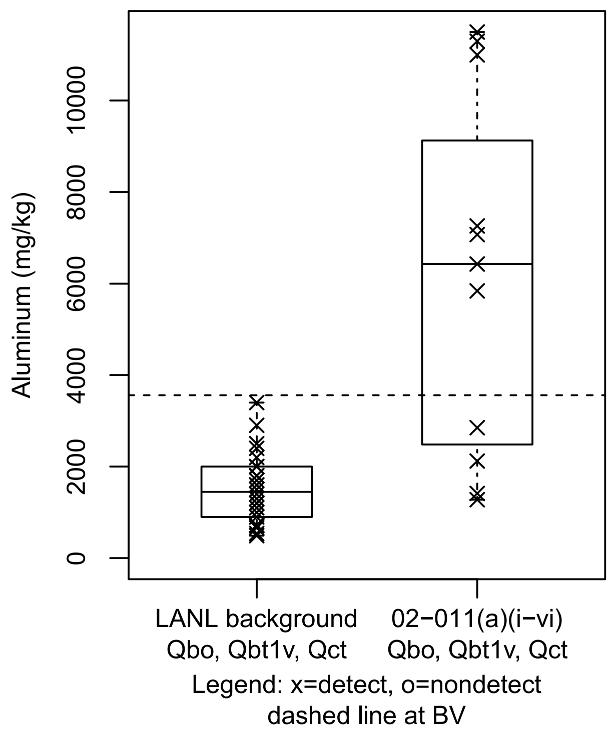

Figure G-227 Box plot for aluminum in Qbo at AOC 02-011(i-vi)

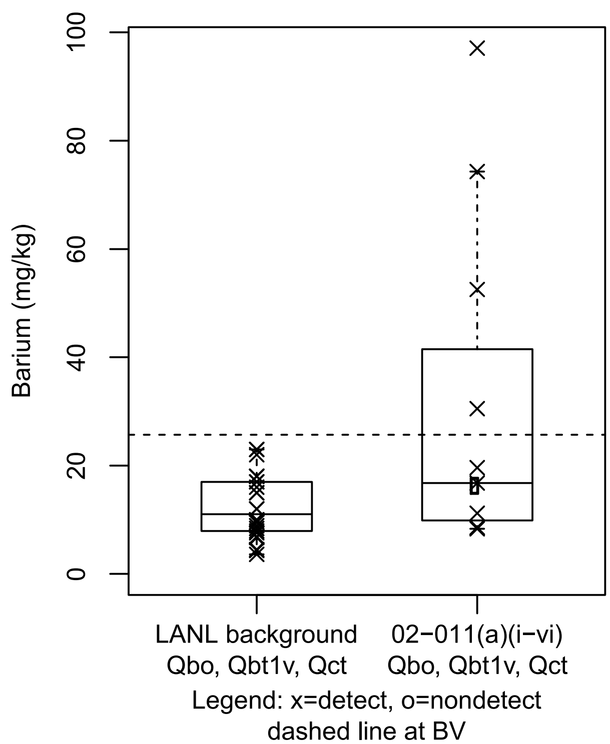

Figure G-228 Box plot for barium in Qbo at AOC 02-011(i-vi)

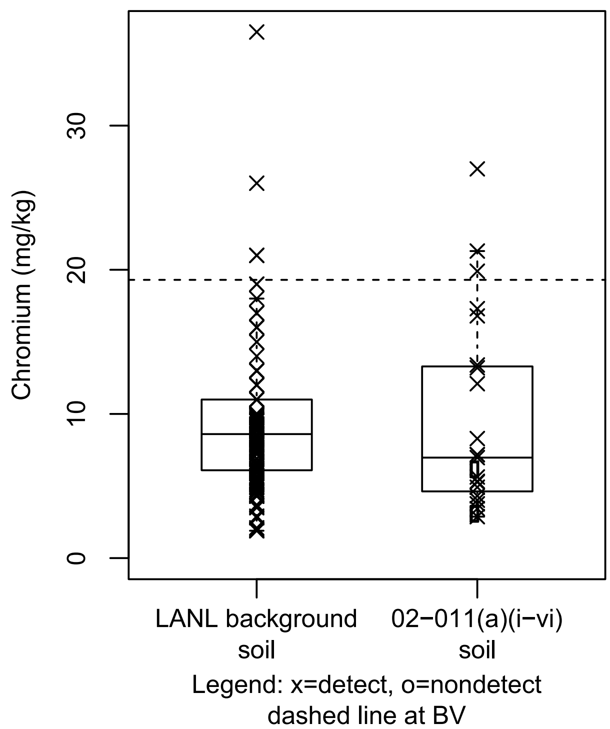

Figure G-229 Box plot for chromium in soil at AOC 02-011(i-vi)

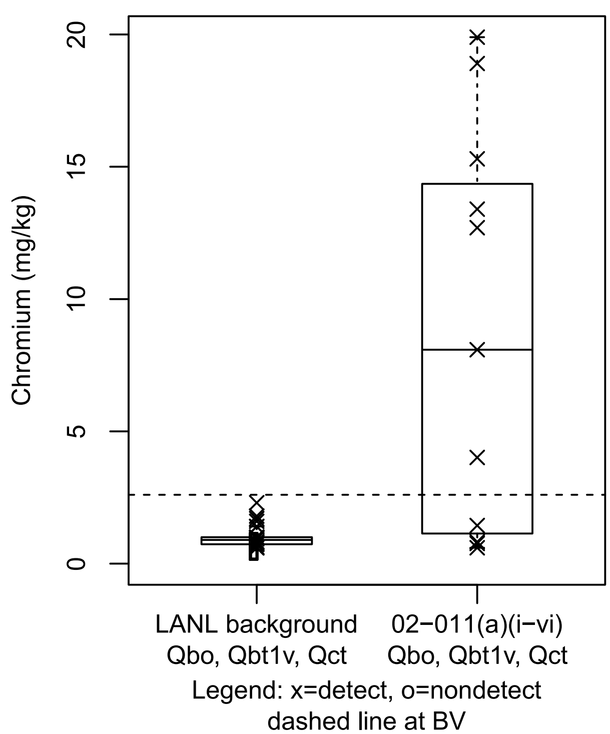

Figure G-230 Box plot for chromium in Qbo at AOC 02-011(i-vi)

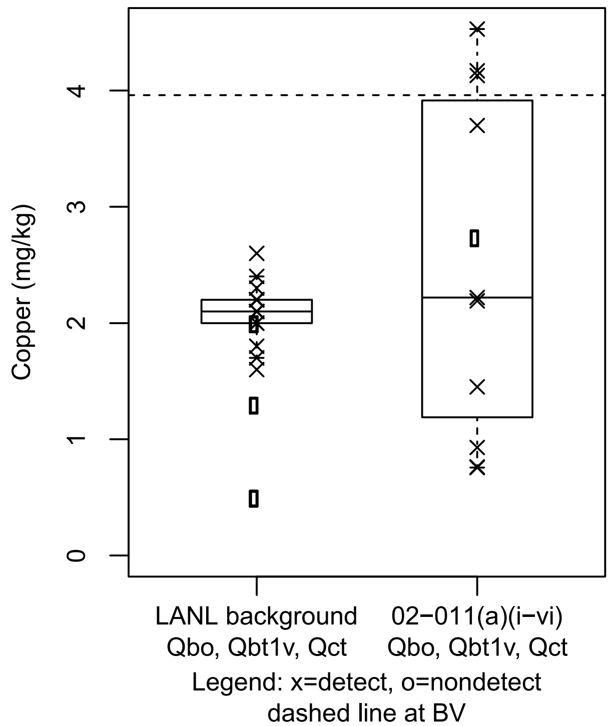

Figure G-231 Box plot for copper in Qbo at AOC 02-011(i-vi)

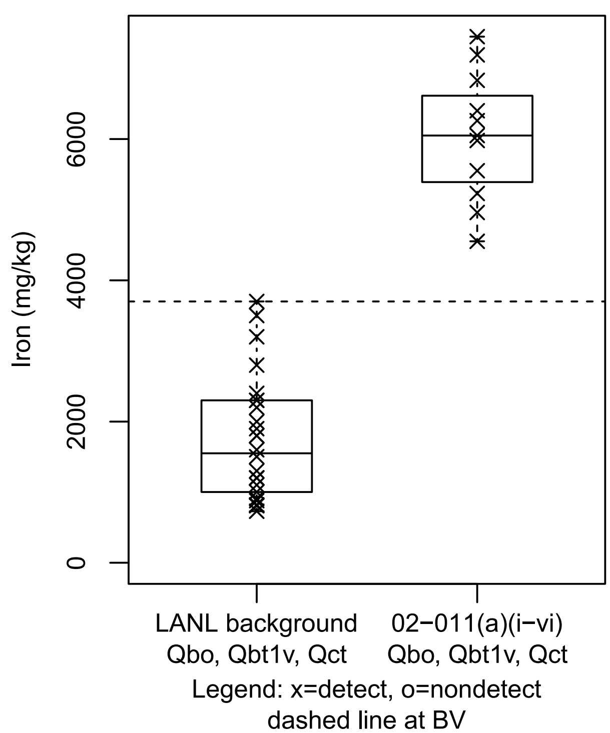

Figure G-232 Box plot for iron in Qbo at AOC 02-011(i-vi)

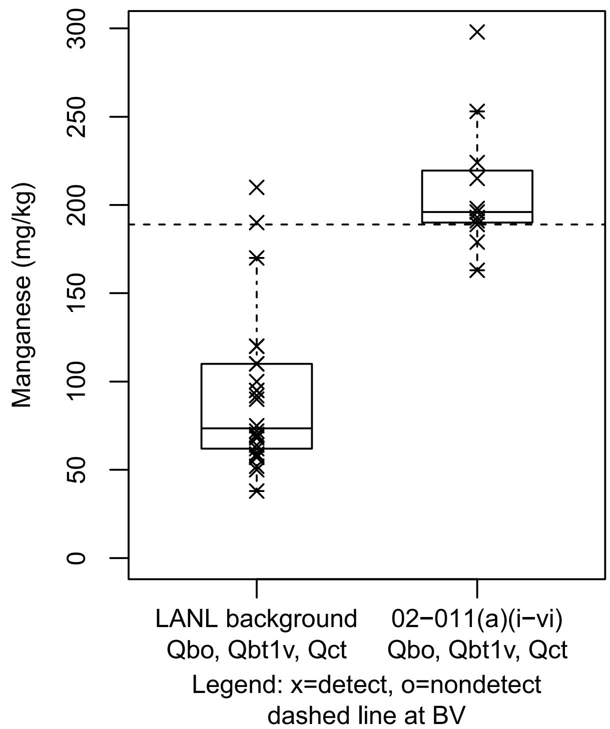

Figure G-233 Box plot for manganese in Qbo at AOC 02-011(i-vi)

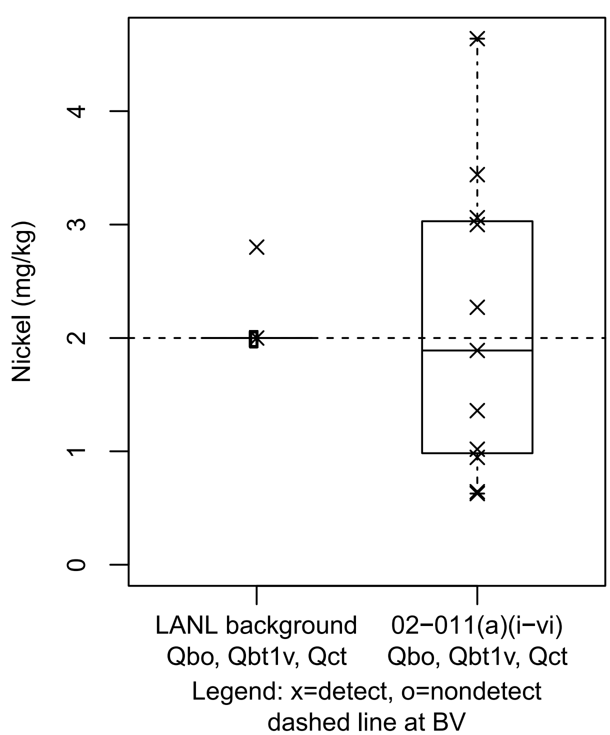

Figure G-234 Box plot for nickel in Qbo at AOC 02-011(i-vi)

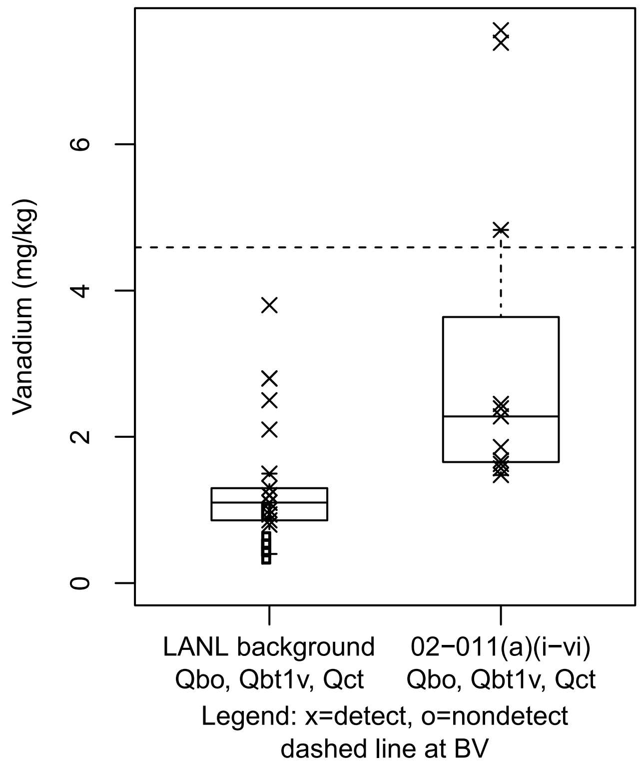

Figure G-235 Box plot for vanadium in Qbo at AOC 02-011(i-vi)

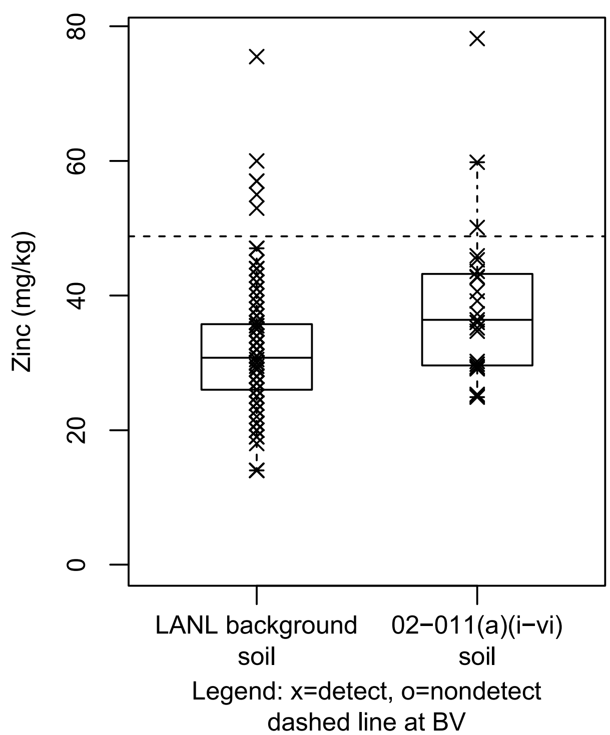

Figure G-236 Box plot for zinc in soil at AOC 02-011(i-vi)

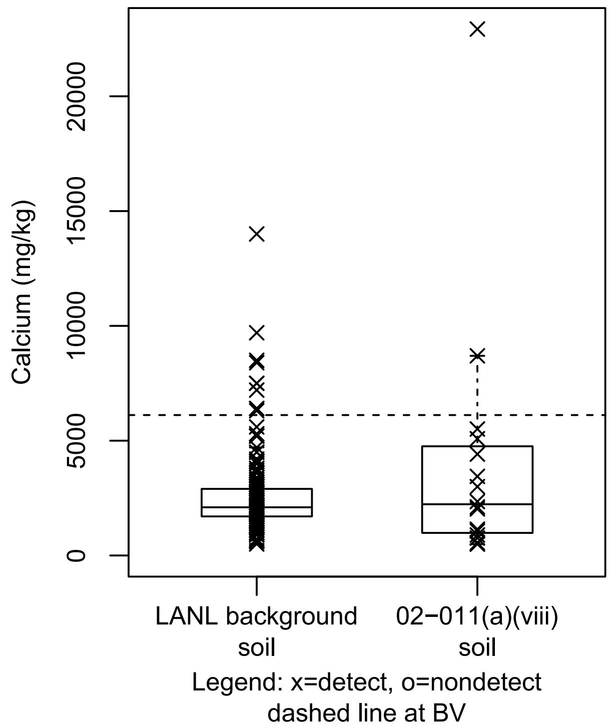

Figure G-237 Box plot for calcium in soil at AOC 02-011(a)(viii)

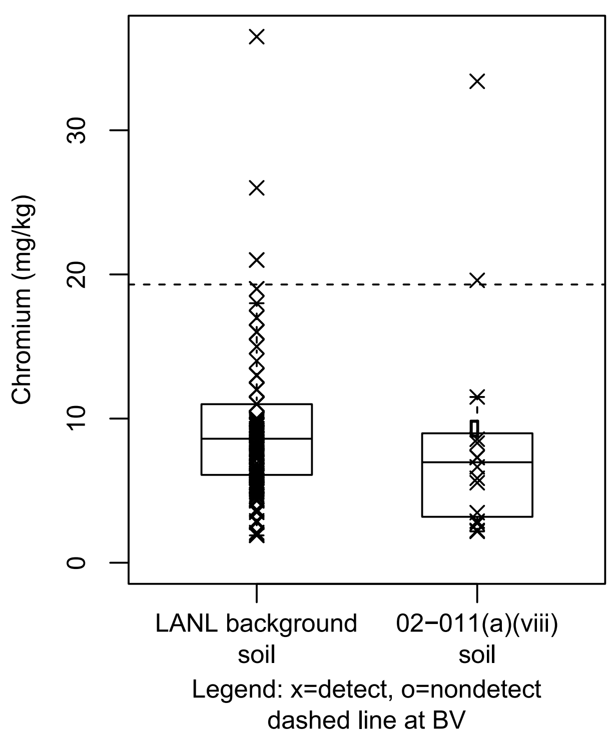

Figure G-238 Box plot for chromium in soil at AOC 02-011(a)(viii)

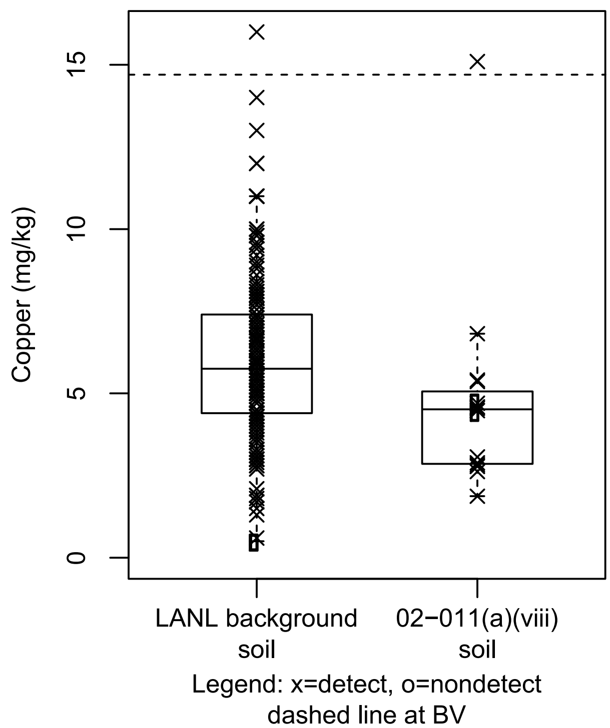

Figure G-239   Box plot for copper in soil at AOC 02-011(a)(viii)

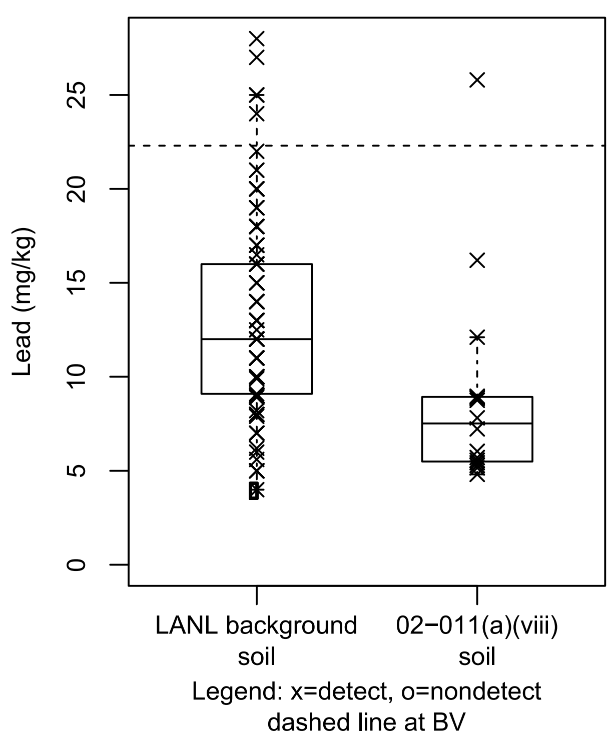

Figure G-240   Box plot for lead in soil at AOC 02-011(a)(viii)

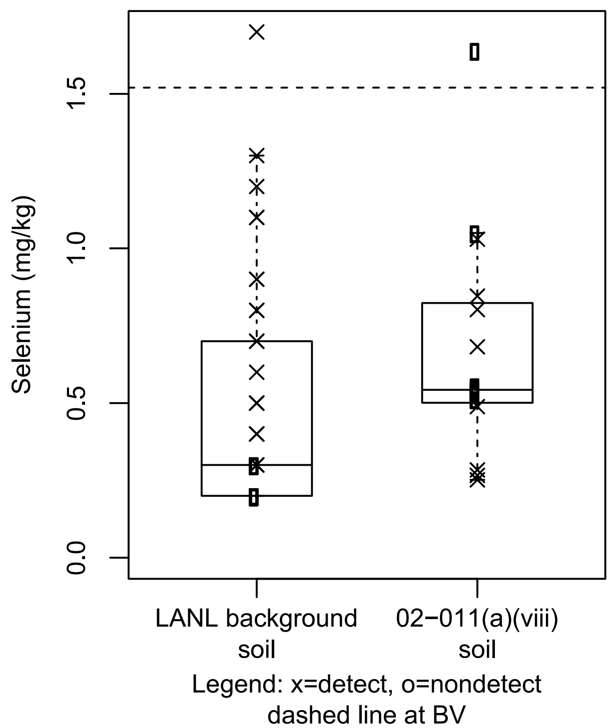

Figure G-241 Box plot for selenium in soil at AOC 02-011(a)(viii)

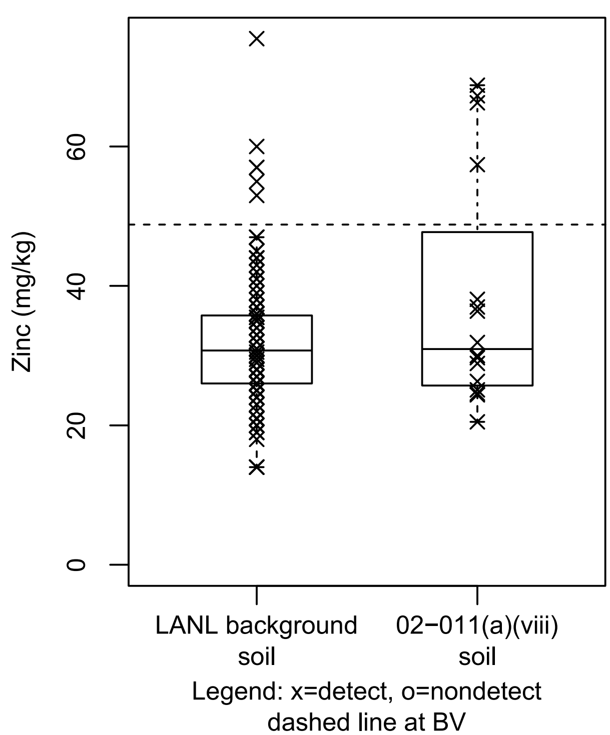

Figure G-242 Box plot for zinc in soil at AOC 02-011(a)(viii)

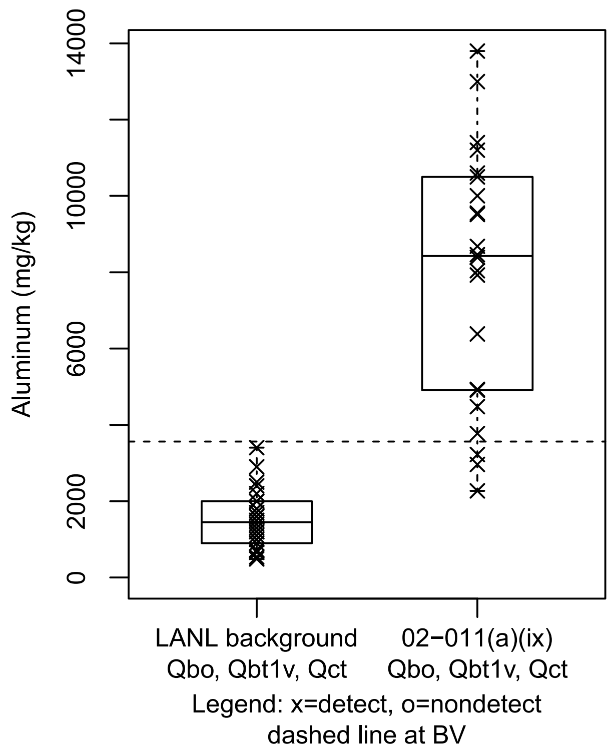

Figure G-243 Box plot for aluminum in Qbo at AOC 02-011(a)(ix)

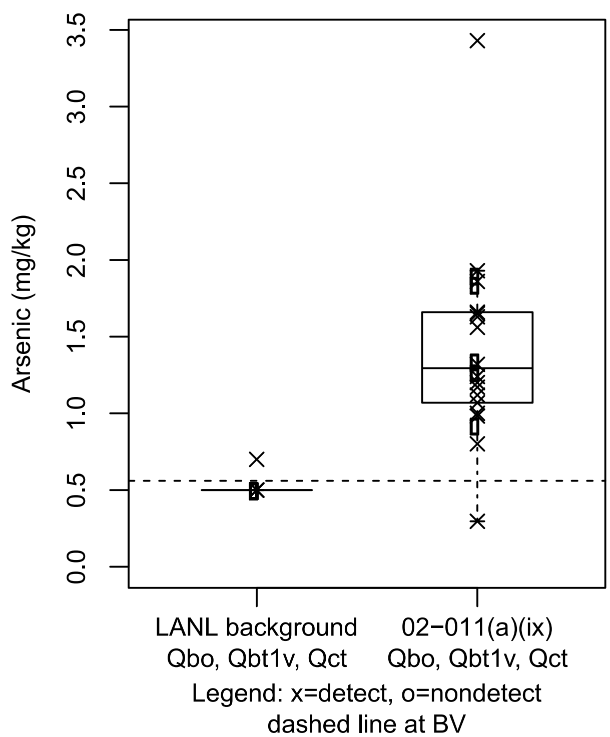

Figure G-244 Box plot for arsenic in Qbo at AOC 02-011(a)(ix)

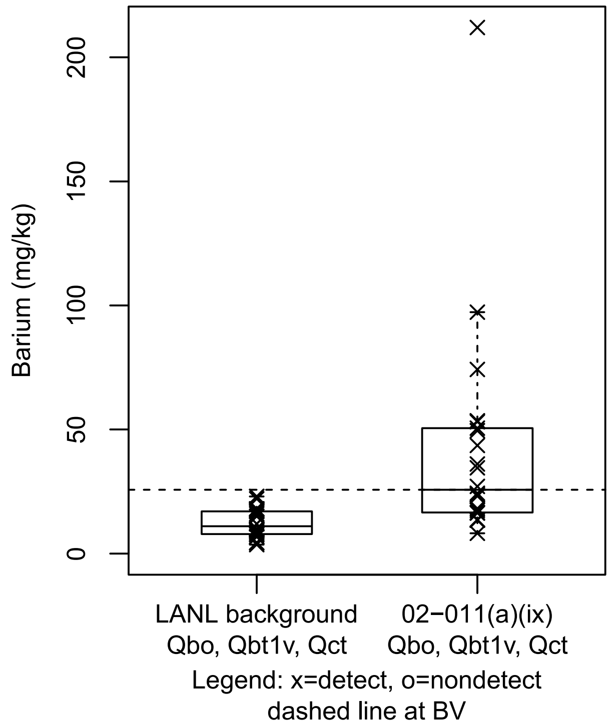

Figure G-245 Box plot for barium in Qbo at AOC 02-011(a)(ix)

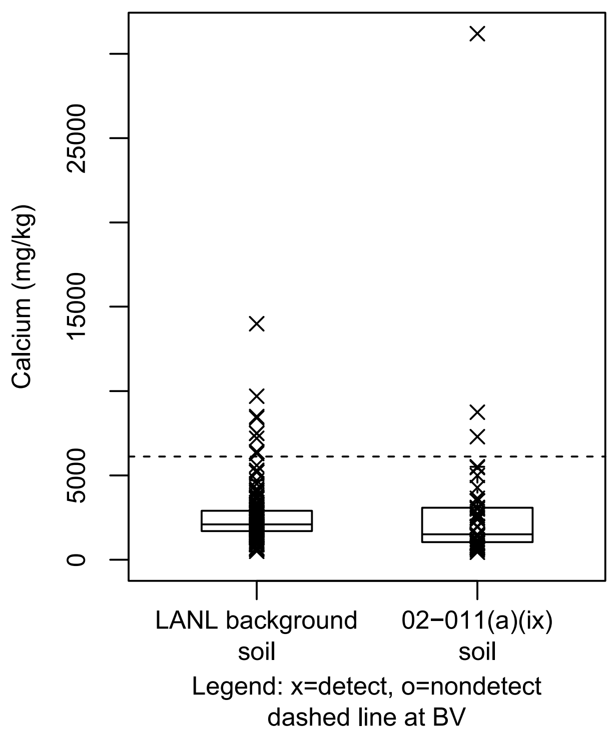

Figure G-246 Box plot for calcium in soil at AOC 02-011(a)(ix)

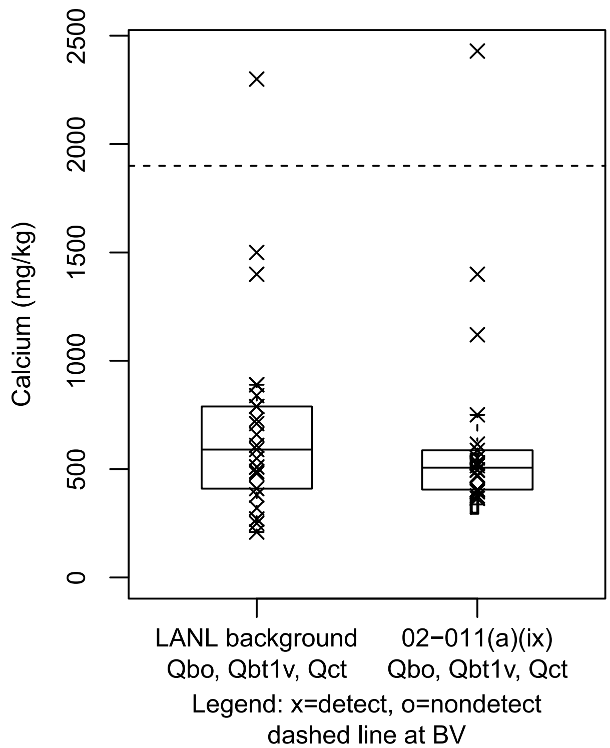

Figure G-247 Box plot for calcium in Qbo at AOC 02-011(a)(ix)

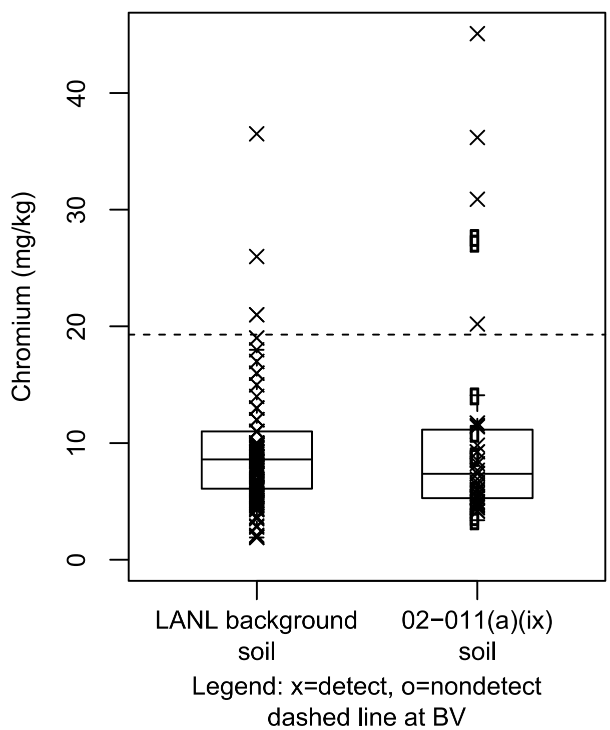

Figure G-248 Box plot for chromium in soil at AOC 02-011(a)(ix)

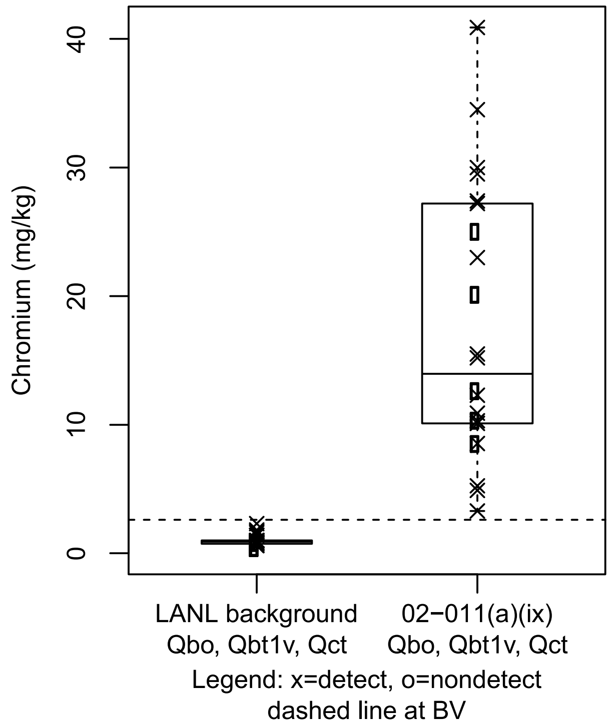

Figure G-249   Box plot for chromium in Qbo at AOC 02-011(a)(ix)

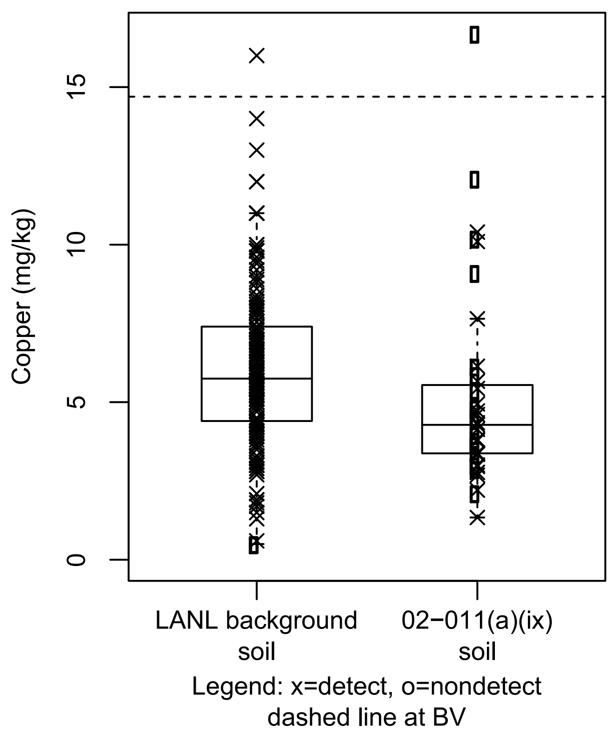

Figure G-250   Box plot for copper in soil at AOC 02-011(a)(ix)

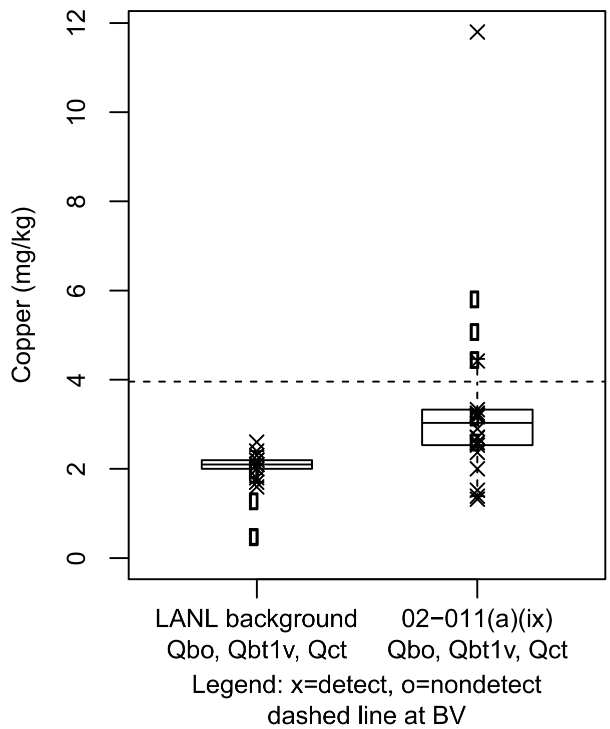

Figure G-251 Box plot for copper in Qbo at AOC 02-011(a)(ix)

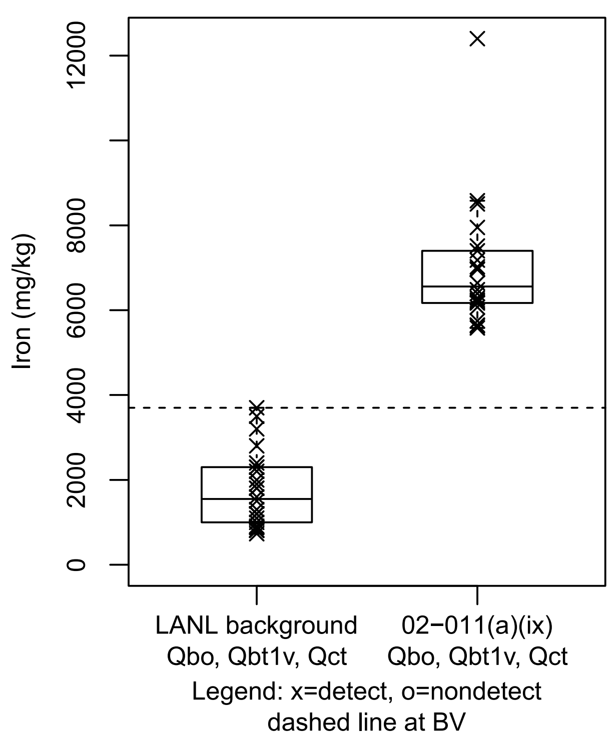

Figure G-252 Box plot for iron in Qbo at AOC 02-011(a)(ix)

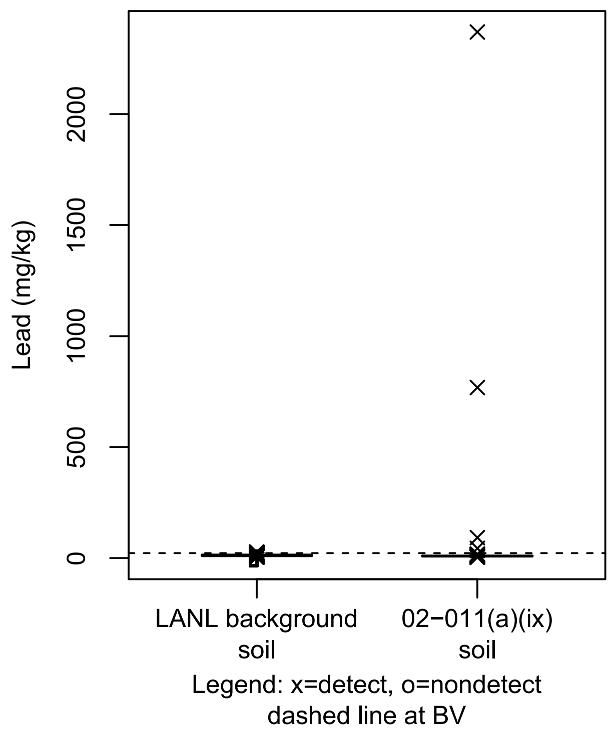

Figure G-253 Box plot lead in soil at AOC 02-011(a)(ix)

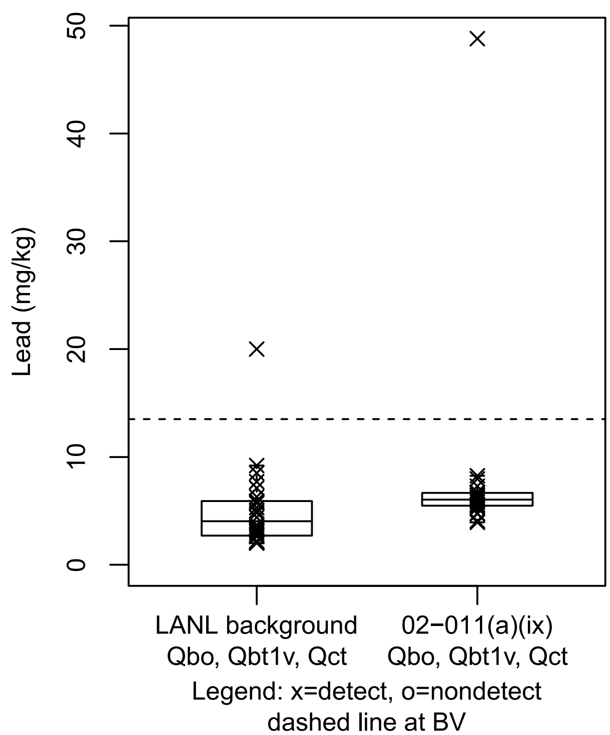

Figure G-254 Box plot lead in Qbo at AOC 02-011(a)(ix)

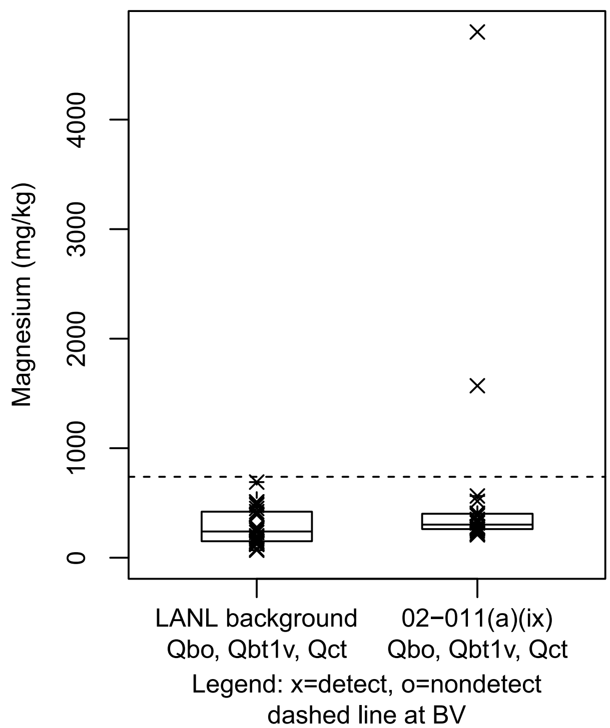

Figure G-255 Box plot magnesium in Qbo at AOC 02-011(a)(ix)

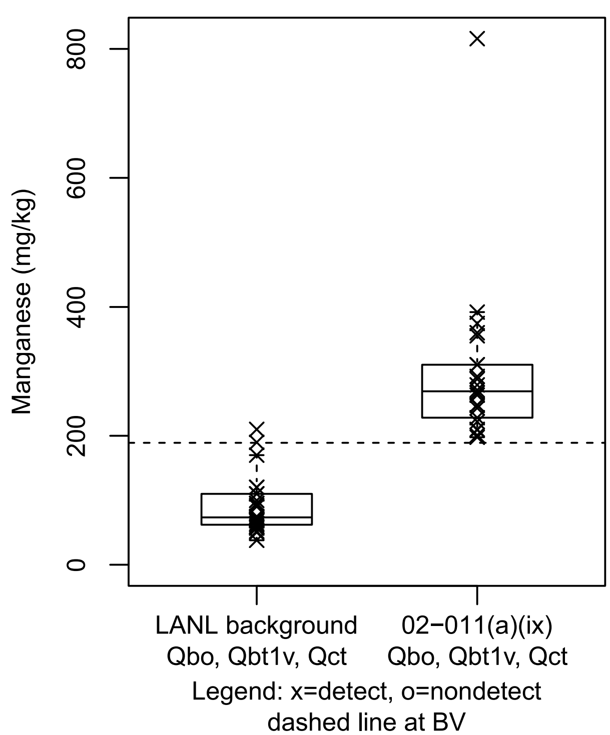

Figure G-256 Box plot for manganese in Qbo at AOC 02-011(a)(ix)

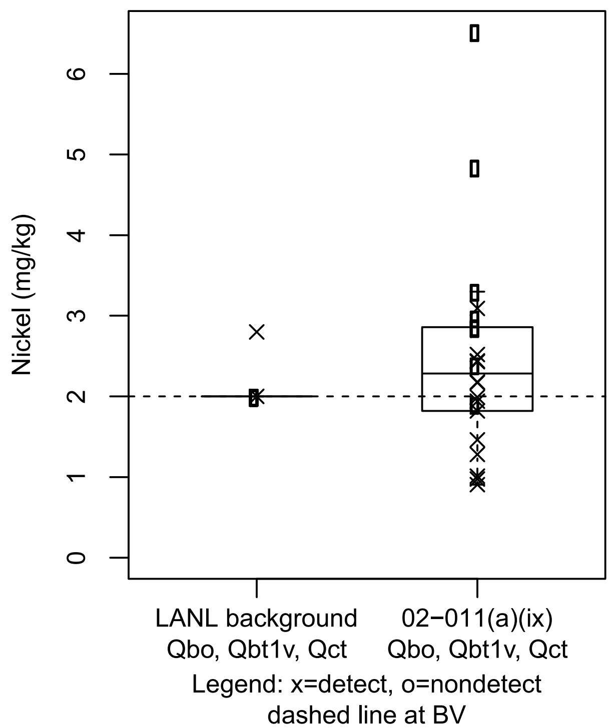

Figure G-257 Box plot nickel in Qbo at AOC 02-011(a)(ix)

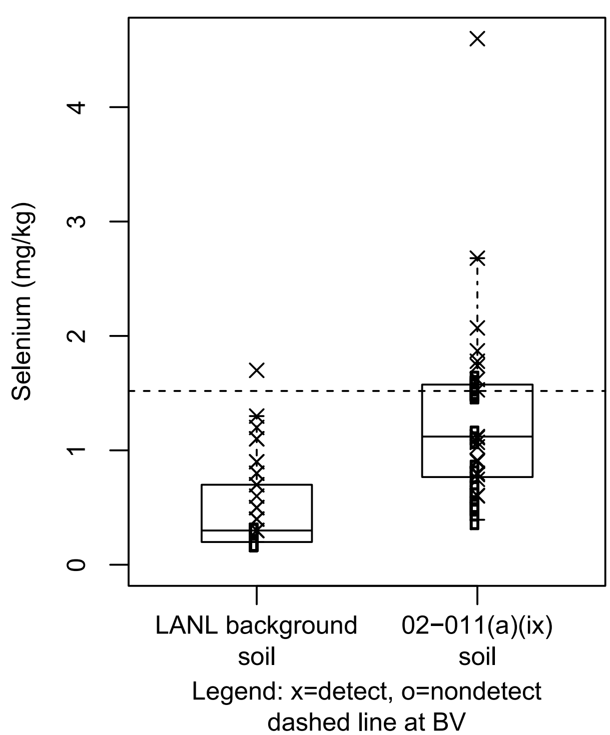

Figure G-258 Box plot selenium in soil at AOC 02-011(a)(ix)

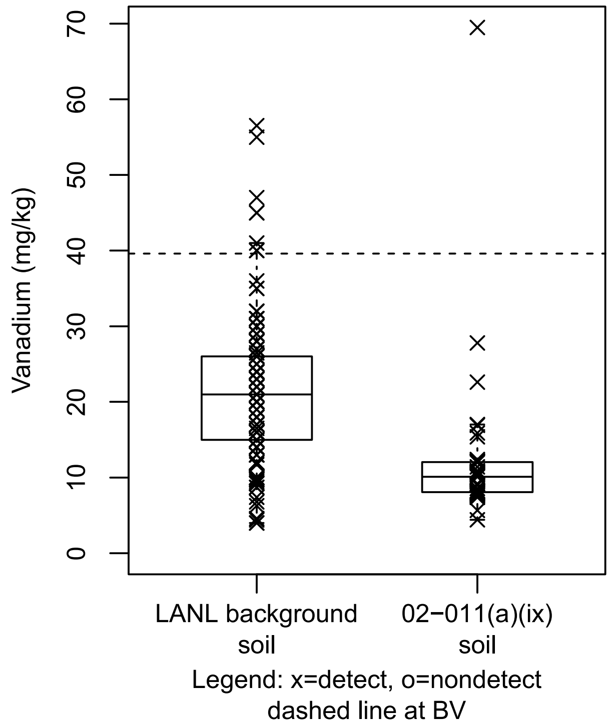

Figure G-259 Box plot vanadium in soil at AOC 02-011(a)(ix)

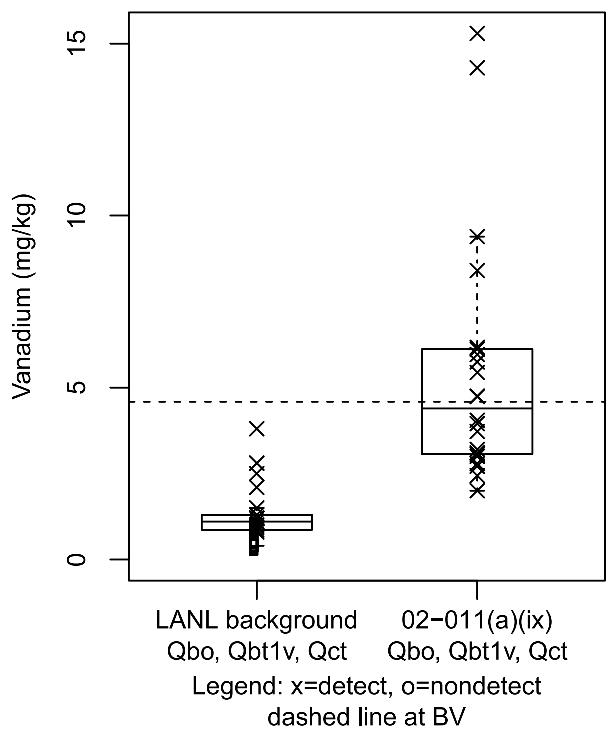

Figure G-260 Box plot vanadium in Qbo at AOC 02-011(a)(ix)

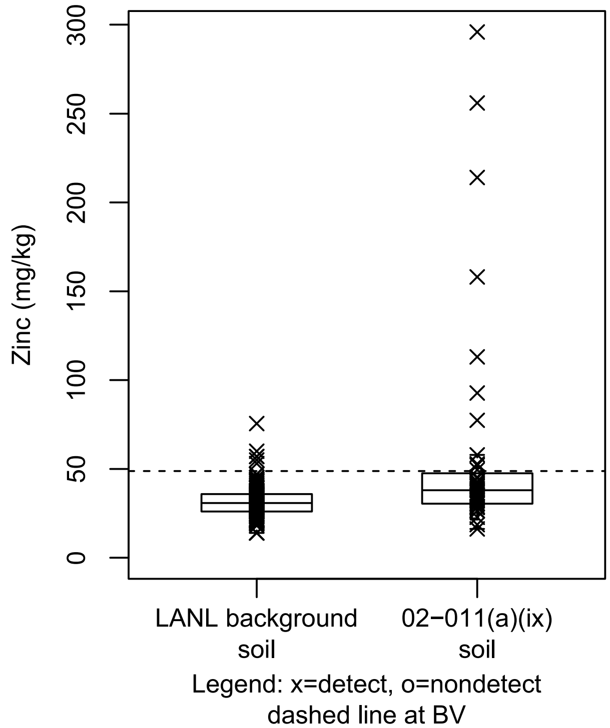

Figure G-261 Box plot zinc in soil at AOC 02-011(a)(ix)

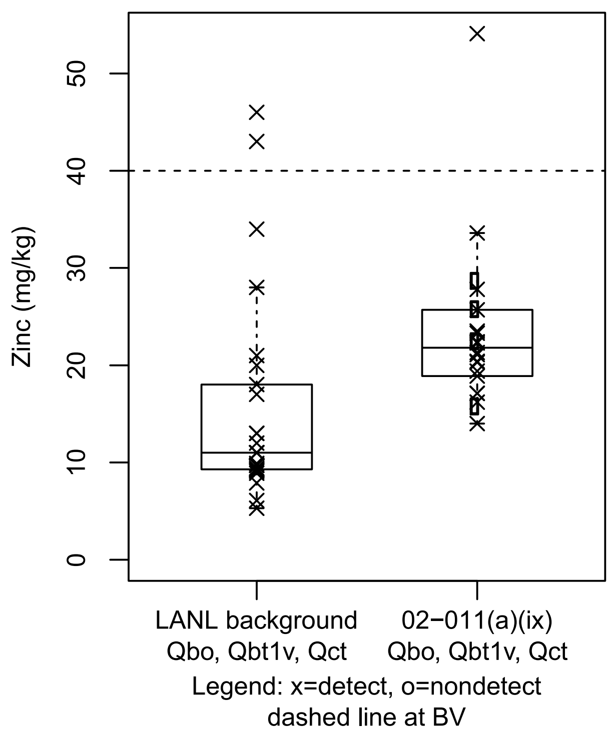

Figure G-262 Box plot zinc in Qbo at AOC 02-011(a)(ix)

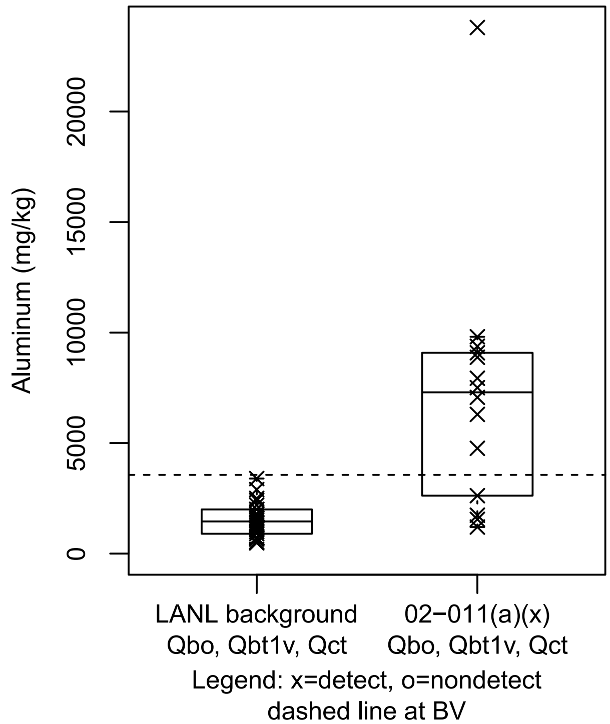

Figure G-263 Box plot for aluminum in Qbo at AOC 02-011(a)(x)

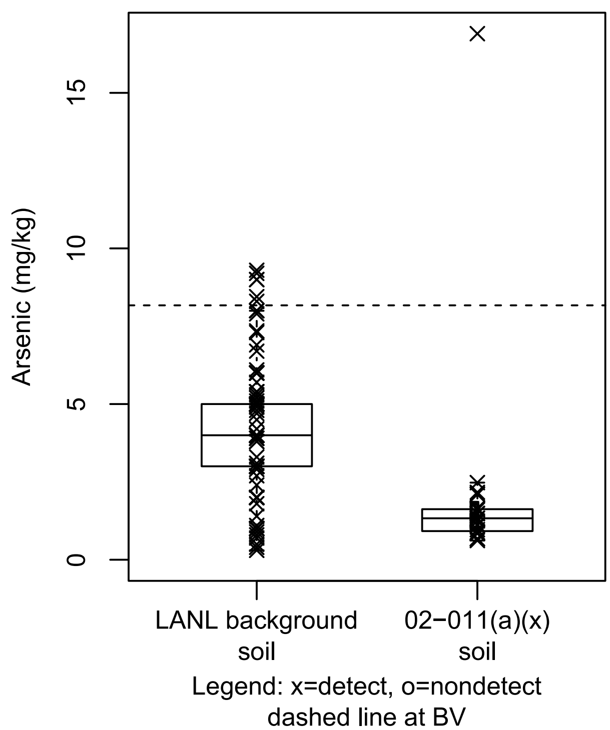

Figure G-264 Box plot arsenic in soil at AOC 02-011(a)(x)

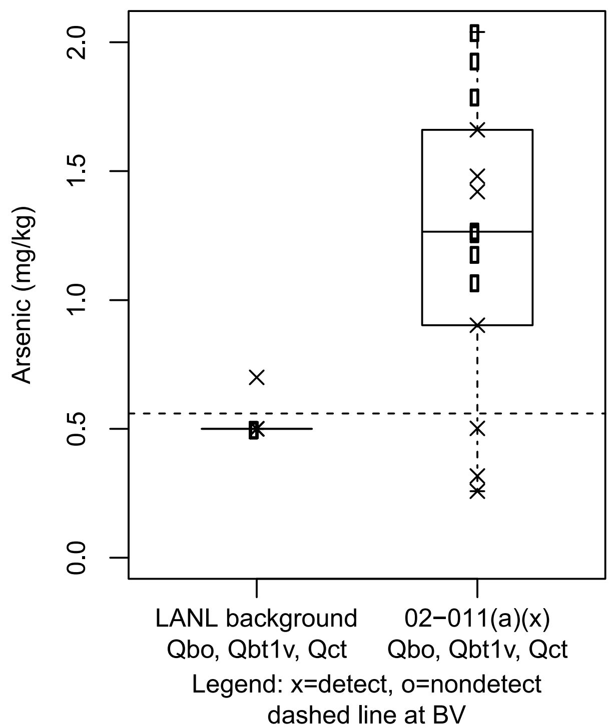

Figure G-265 Box plot arsenic in Qbo at AOC 02-011(a)(x)

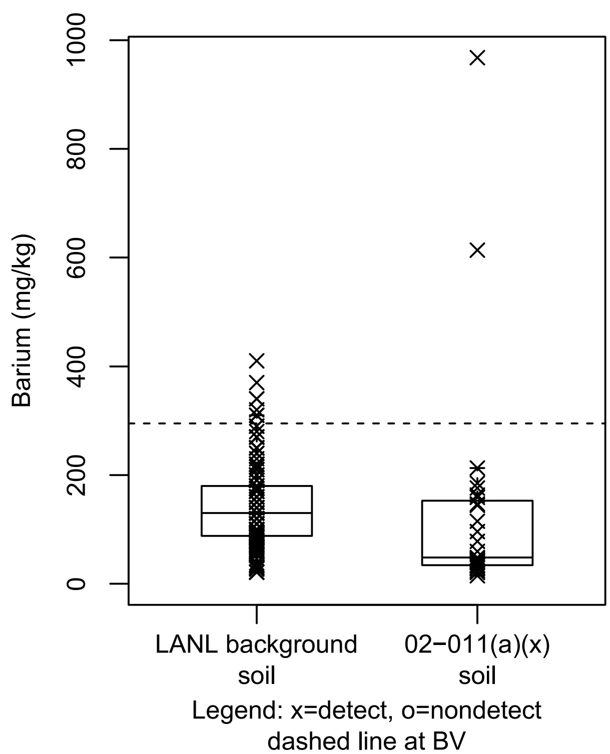

Figure G-266 Box plot for barium in soil at AOC 02-011(a)(x)

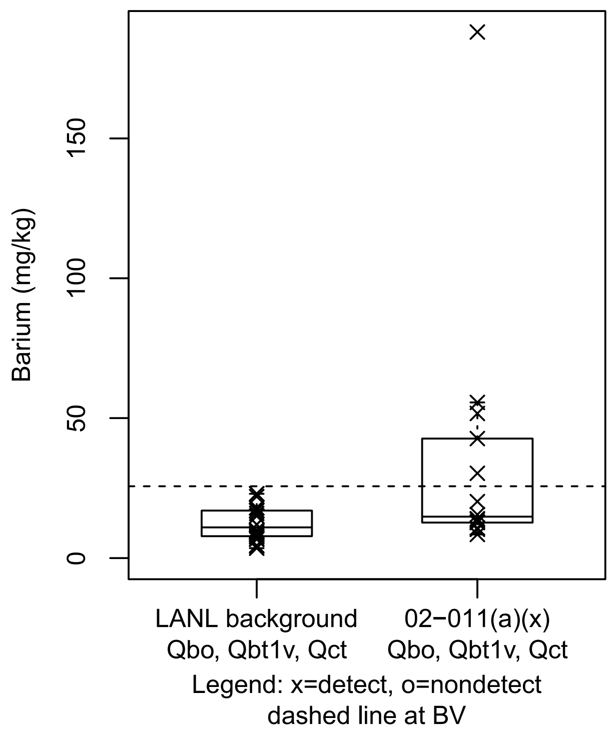

Figure G-267 Box plot for barium in Qbo at AOC 02-011(a)(x)

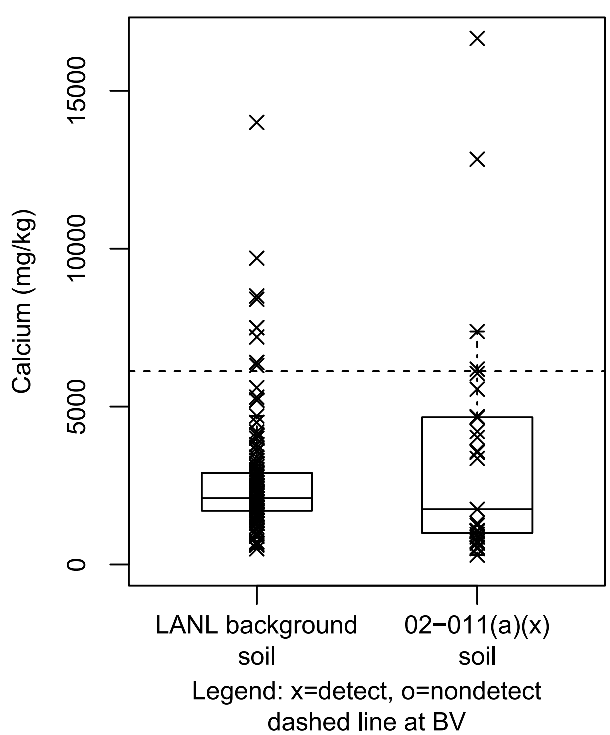

Figure G-268 Box plot for calcium in soil at AOC 02-011(a)(x)

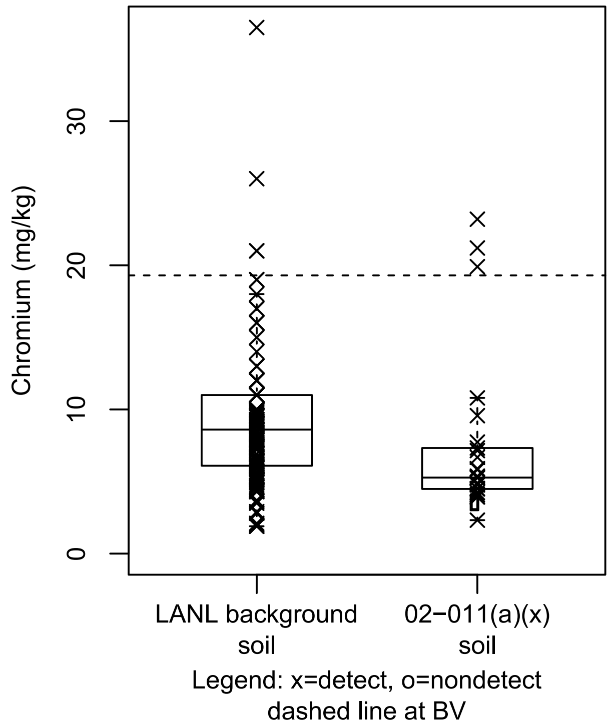

Figure G-269 Box plot chromium in soil at AOC 02-011(a)(x)

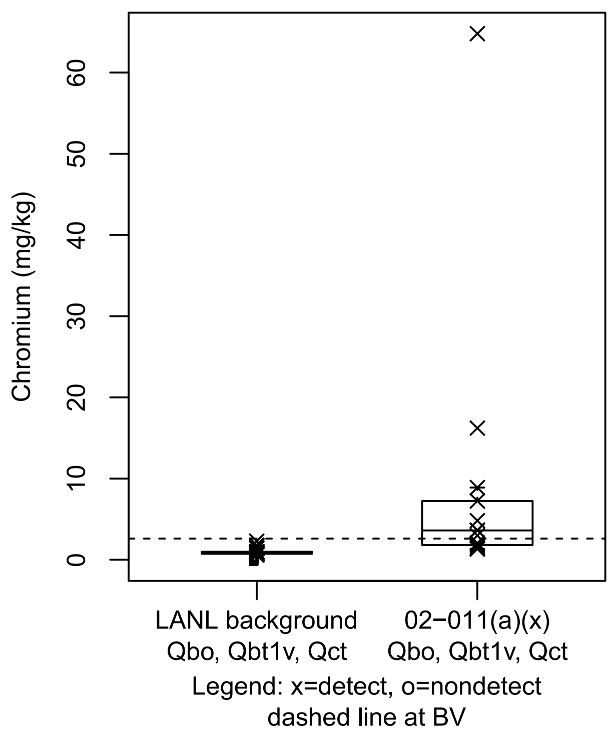

Figure G-270 Box plot chromium in Qbo at AOC 02-011(a)(x)

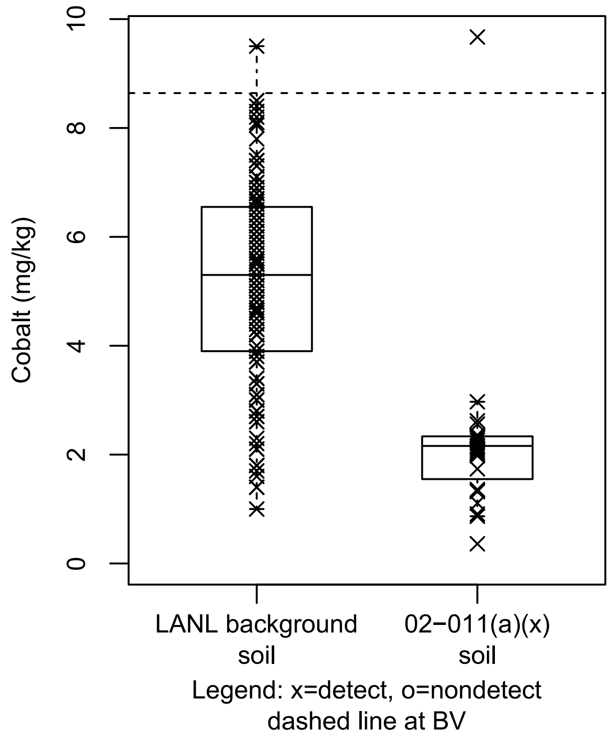

Figure G-271 Box plot cobalt in soil at AOC 02-011(a)(x)

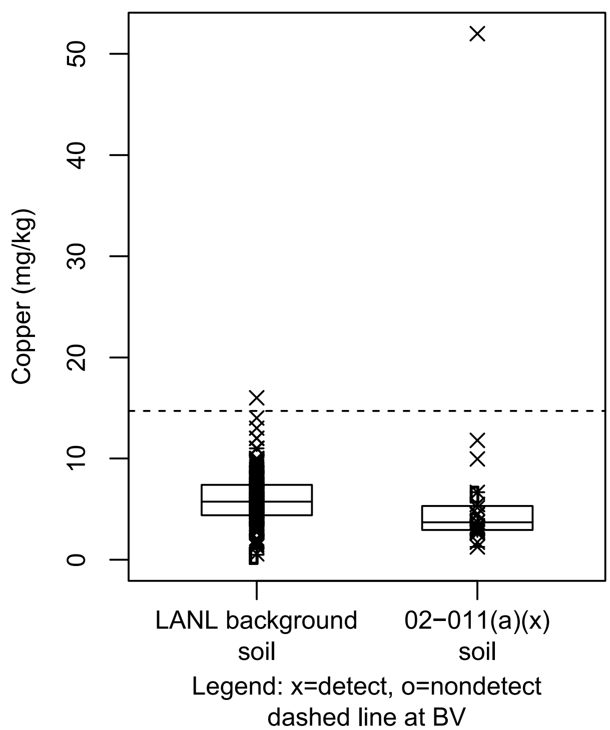

Figure G-272 Box plot copper in soil at AOC 02-011(a)(x)

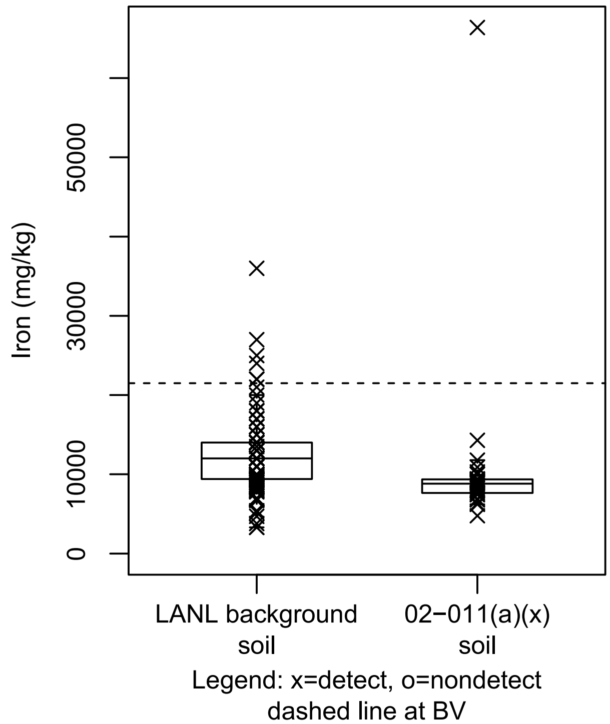

Figure G-273 Box plot iron in soil at AOC 02-011(a)(x)

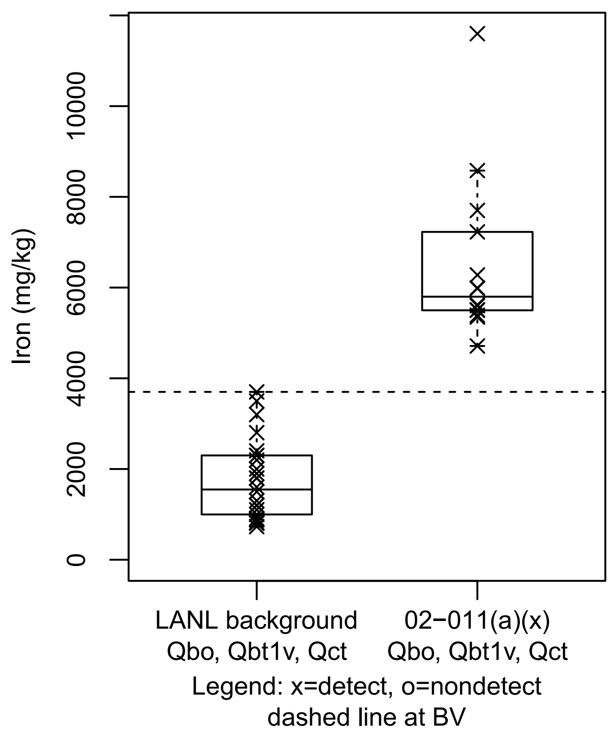

Figure G-274 Box plot iron in Qbo at AOC 02-011(a)(x)

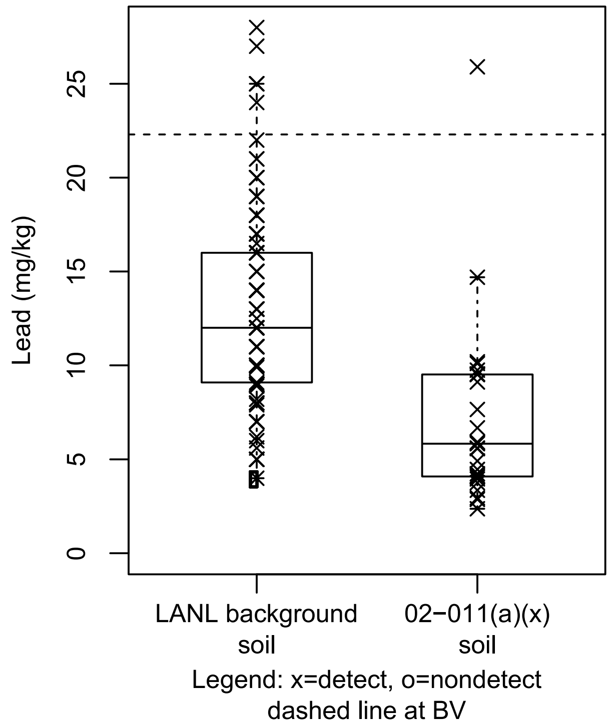

Figure G-275 Box plot lead in soil at AOC 02-011(a)(x)

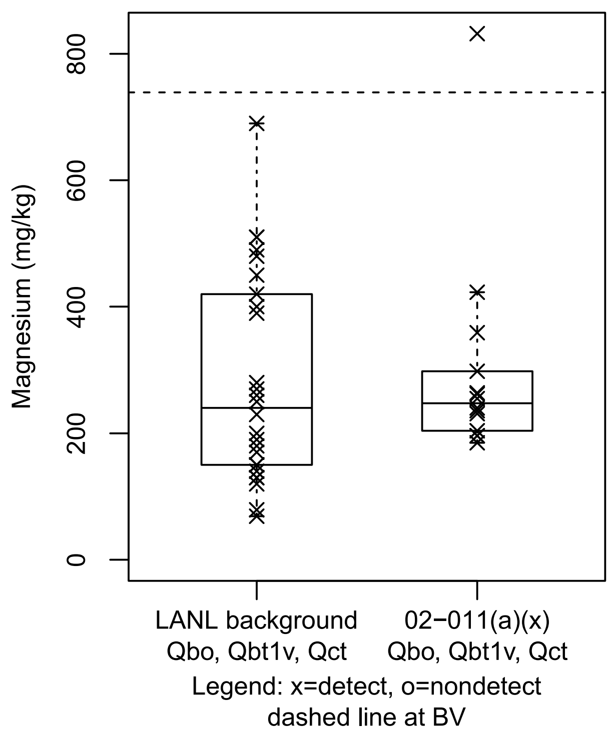

Figure G-276 Box plot magnesium in Qbo at AOC 02-011(a)(x)

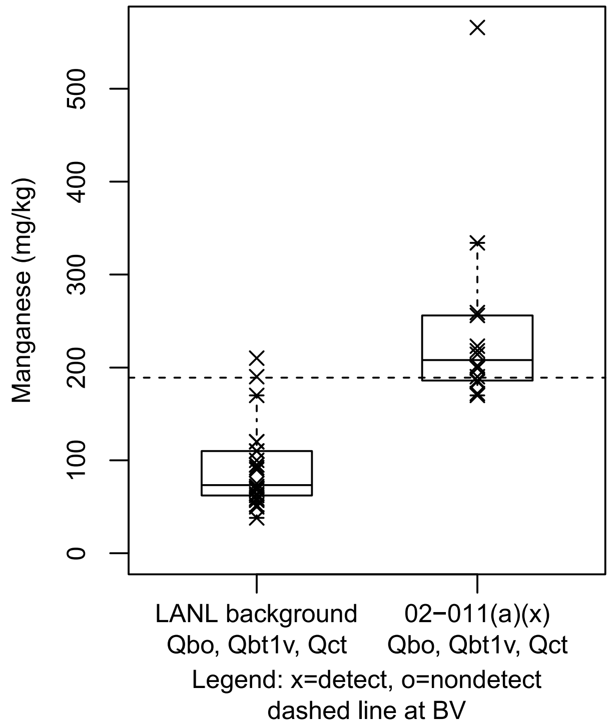

Figure G-277 Box plot manganese in Qbo at AOC 02-011(a)(x)

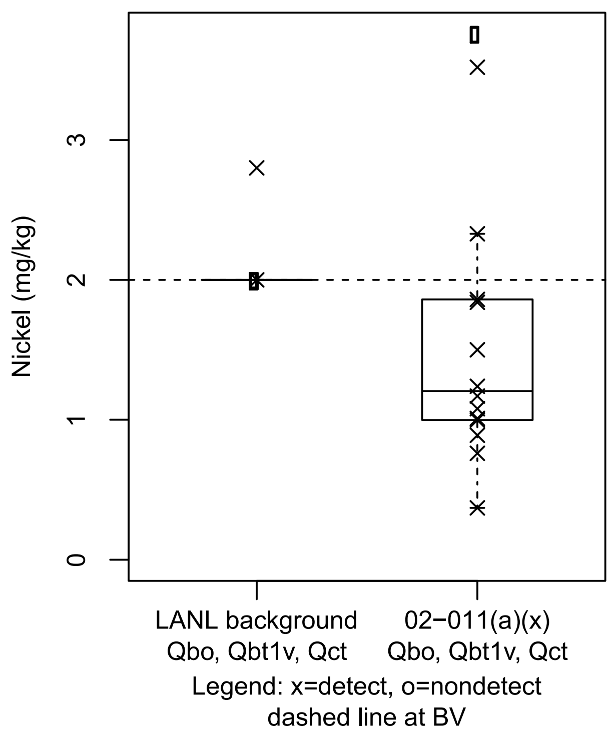

Figure G-278 Box plot nickel in Qbo at AOC 02-011(a)(x)

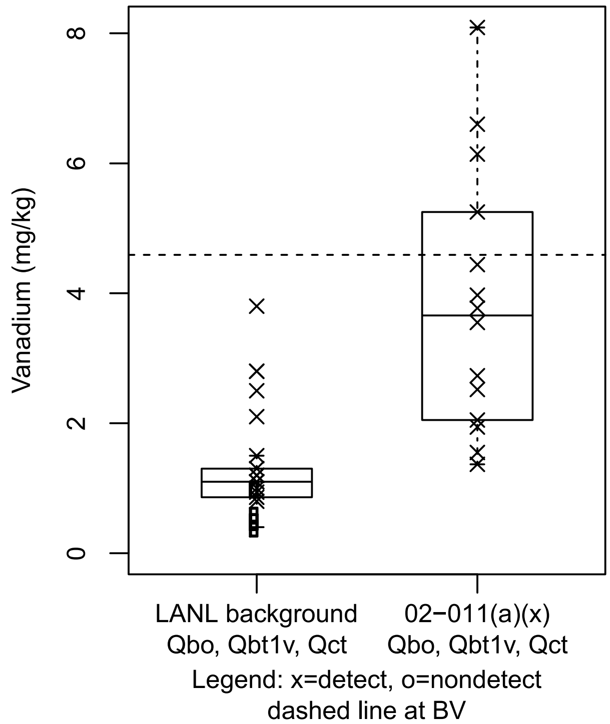

Figure G-279 Box plot vanadium in Qbo at AOC 02-011(a)(x)

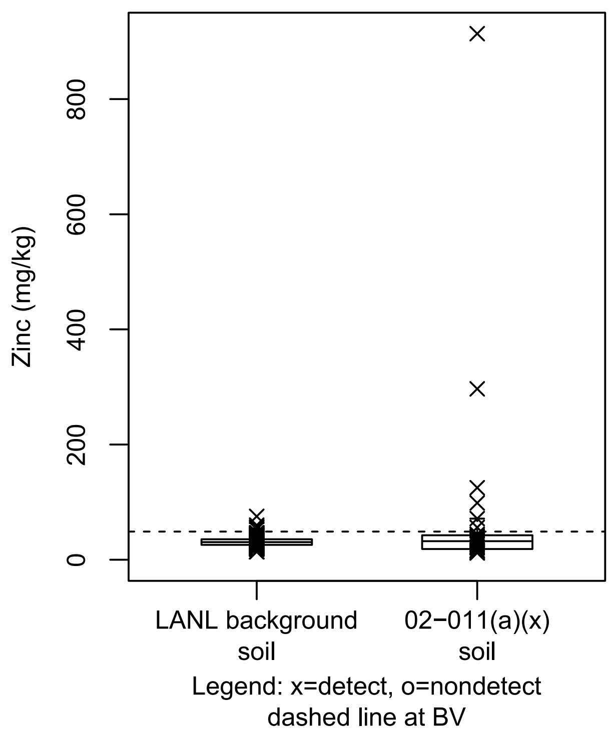

Figure G-280 Box plot for zinc in soil at AOC 02-011(a)(x)

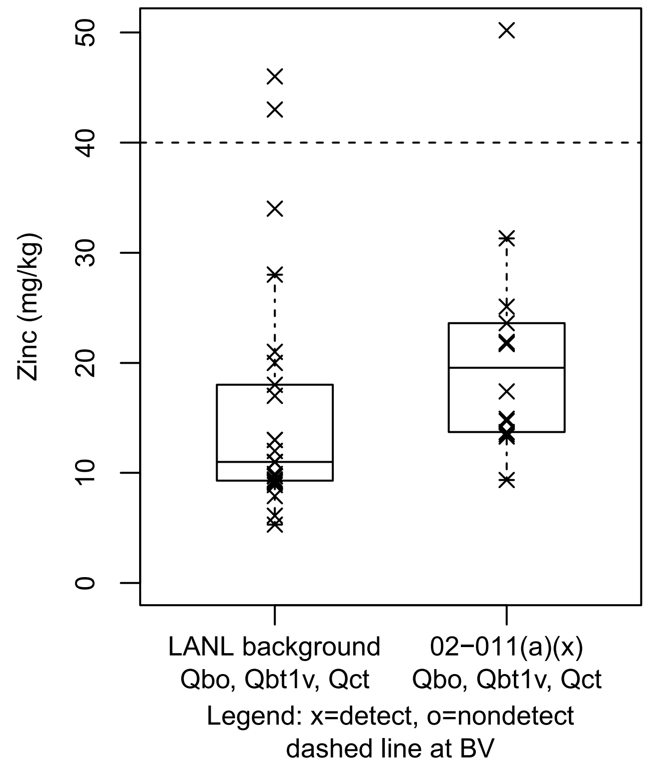

Figure G-281 Box plot for zinc in Qbo at AOC 02-011(a)(x)

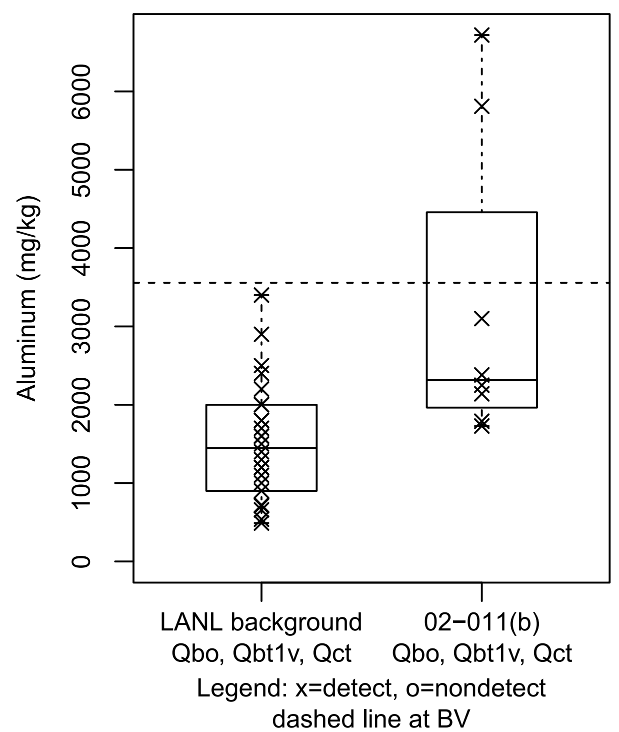

Figure G-282 Box plot for aluminum in Qbo at AOC 02-011(b)

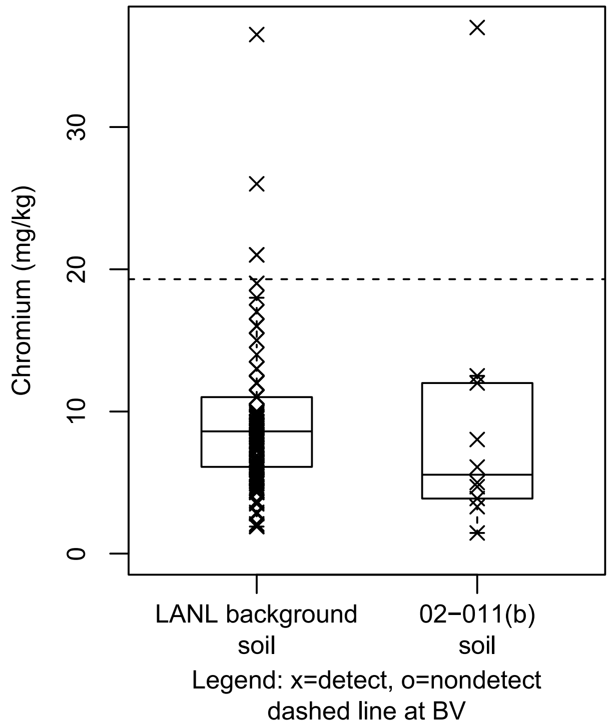

Figure G-283 Box plot for chromium in soil at AOC 02-011(b)

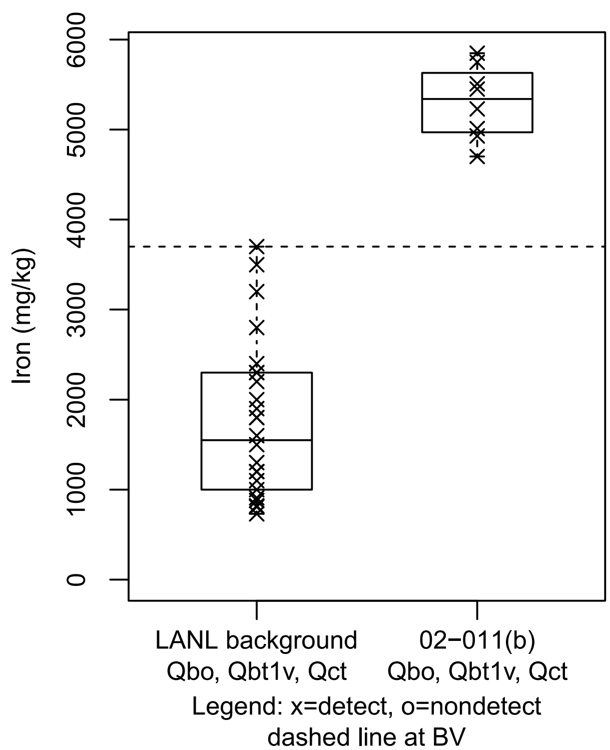

Figure G-284 Box plot for iron in Qbo at AOC 02-011(b)

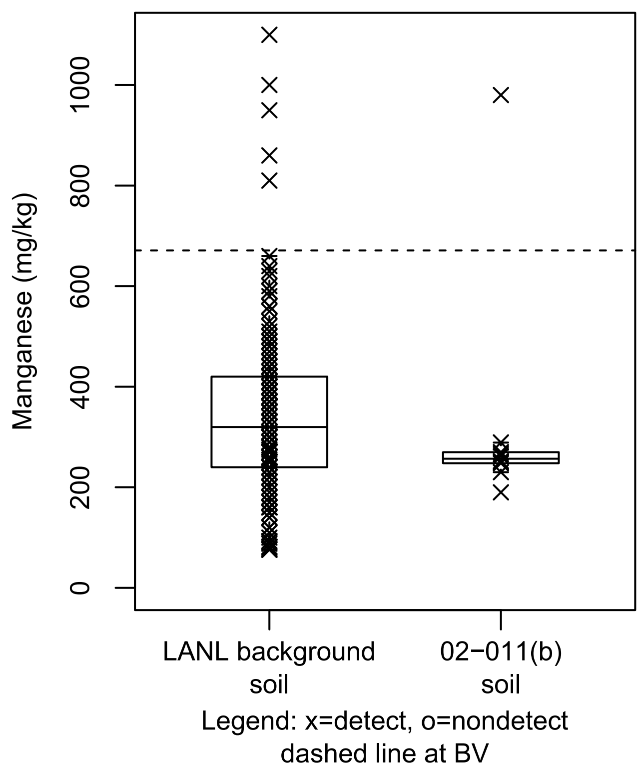

Figure G-285 Box plot for manganese in soil at AOC 02-011(b)

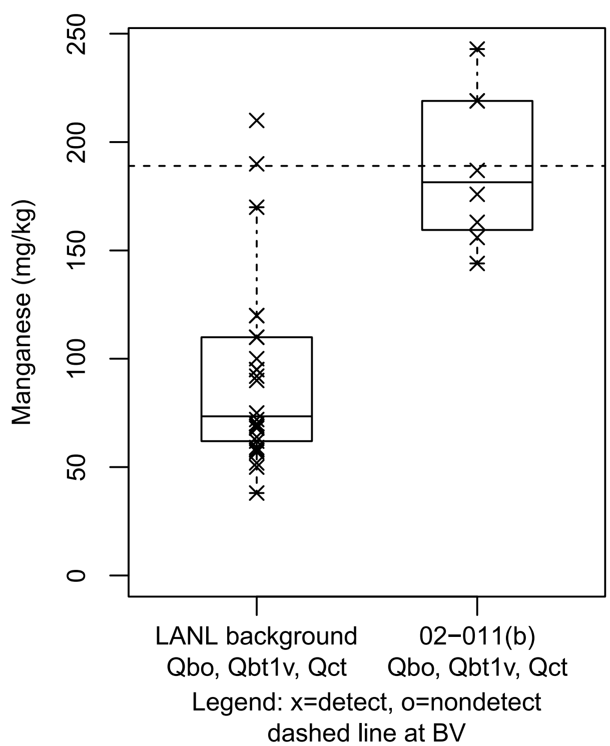

Figure G-286 Box plot for manganese in Qbo at AOC 02-011(b)

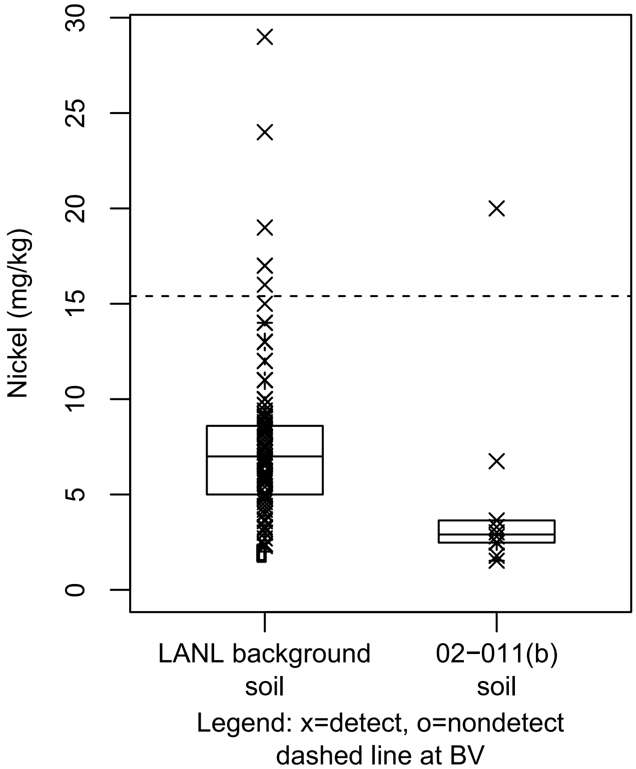

Figure G-287 Box plot for nickel in soil at AOC 02-011(b)

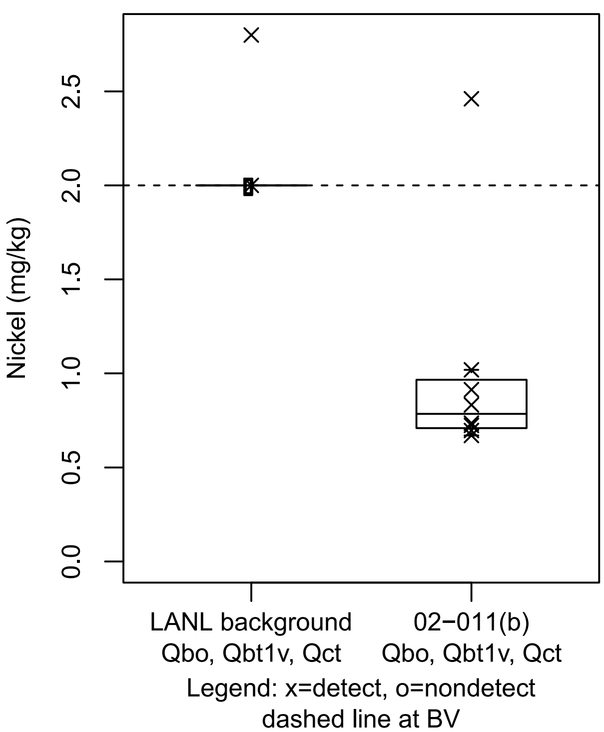

Figure G-288 Box plot for nickel in Qbo at AOC 02-011(b)

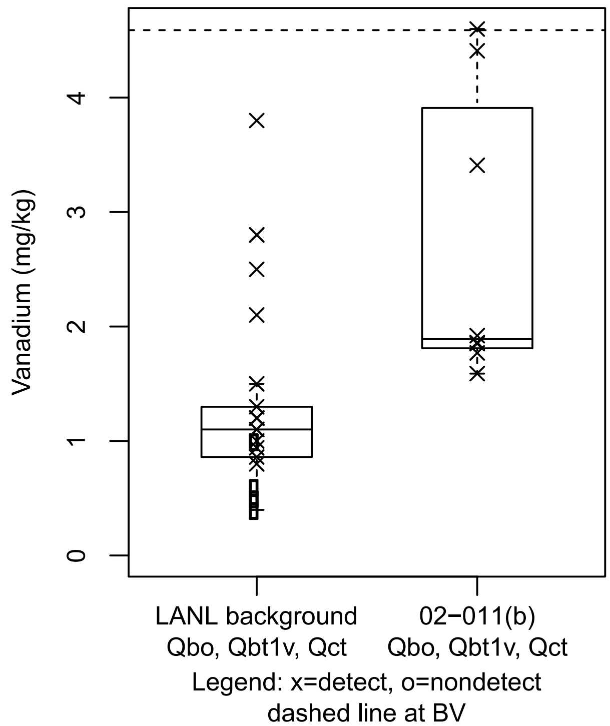

Figure G-289 Box plot for vanadium in Qbo at AOC 02-011(b)

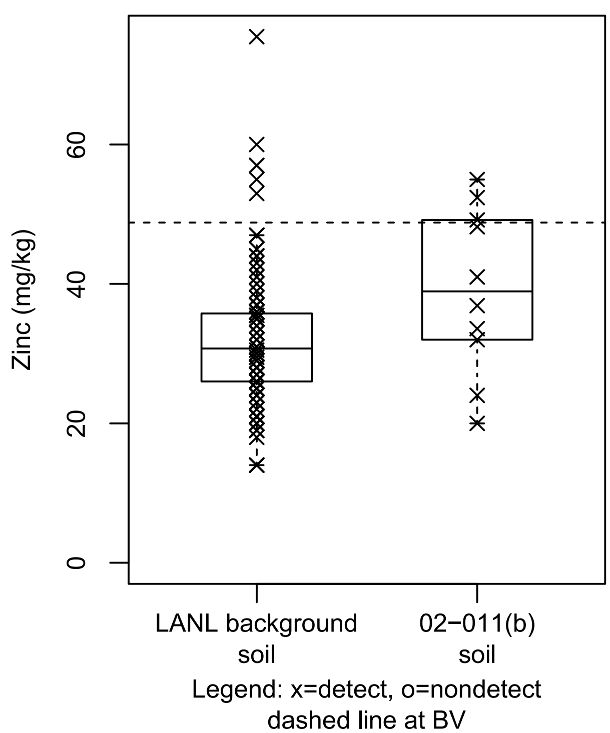

Figure G-290 Box plot for zinc in soil at AOC 02-011(b)

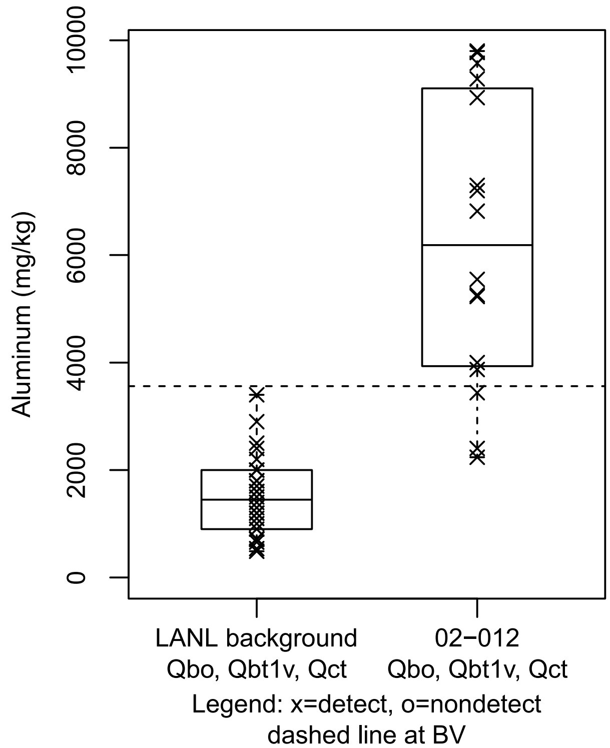

Figure G-291 Box plot for aluminum in Qbo at AOC 02-012

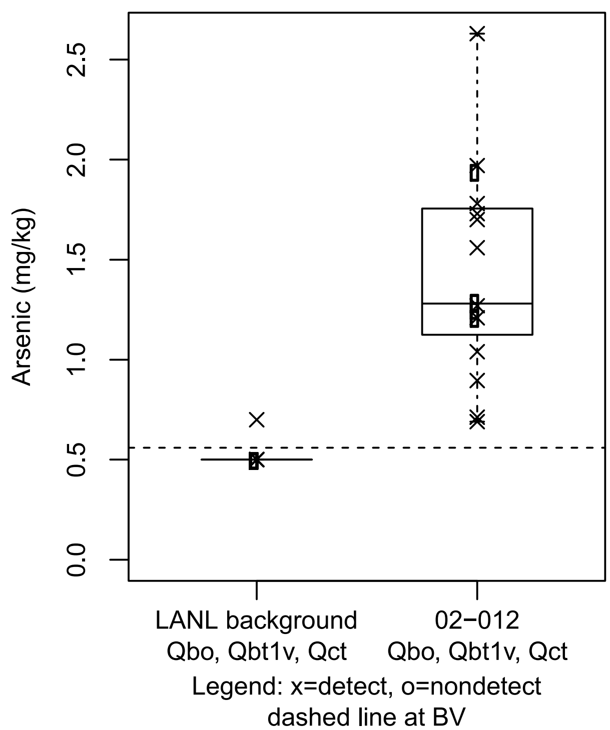

Figure G-292 Box plot for arsenic in Qbo at AOC 02-012

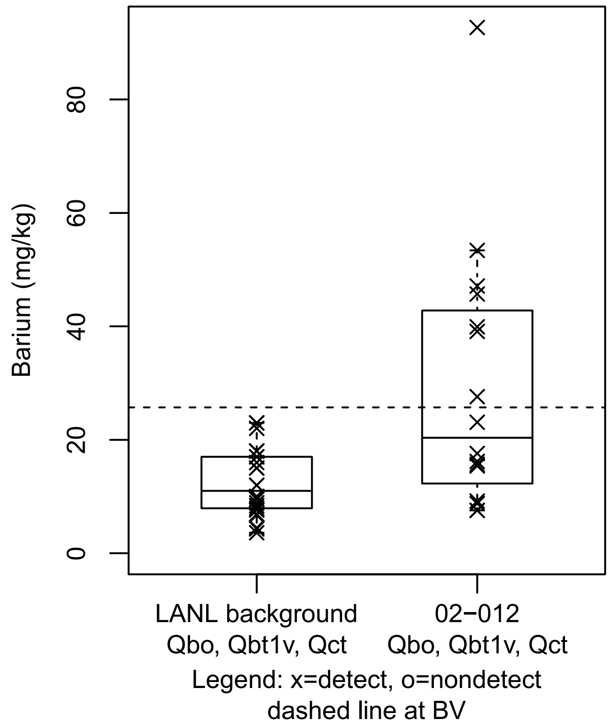

Figure G-293 Box plot for barium in Qbo at AOC 02-012

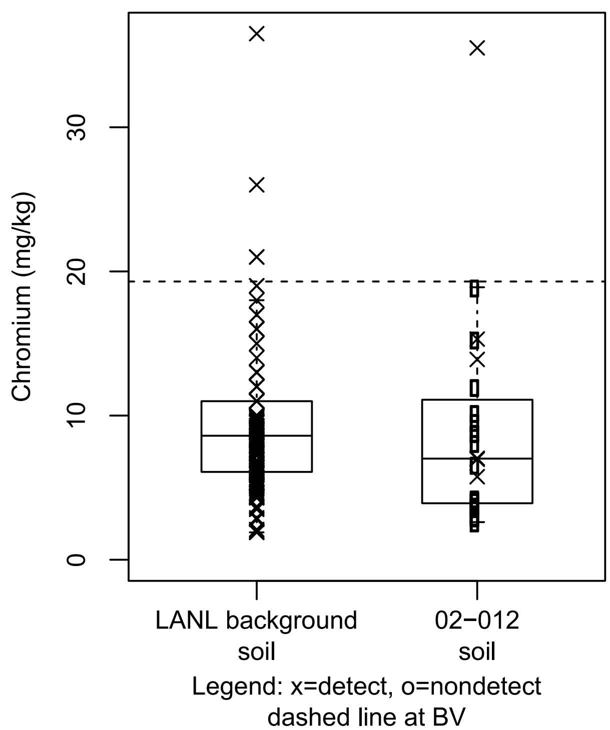

Figure G-294 Box plot for chromium in soil at AOC 02-012

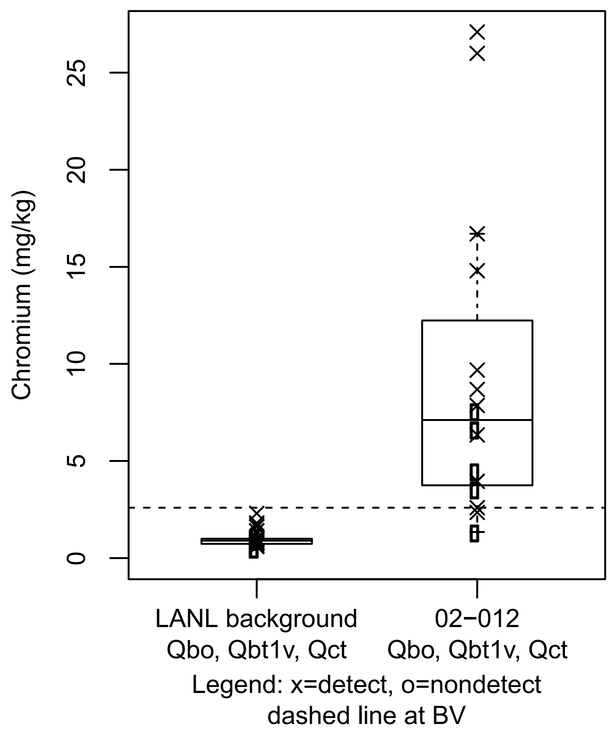

Figure G-295 Box plot for chromium in Qbo at AOC 02-012

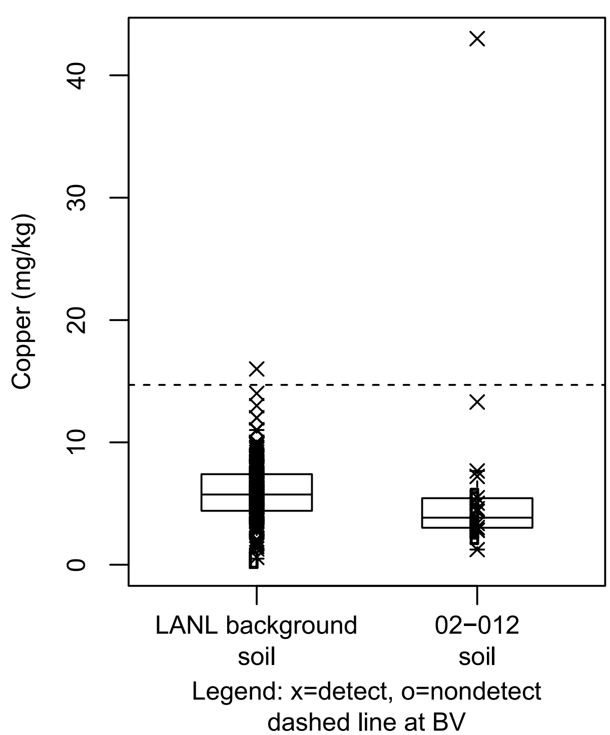

Figure G-296 Box plot for copper in soil at AOC 02-012

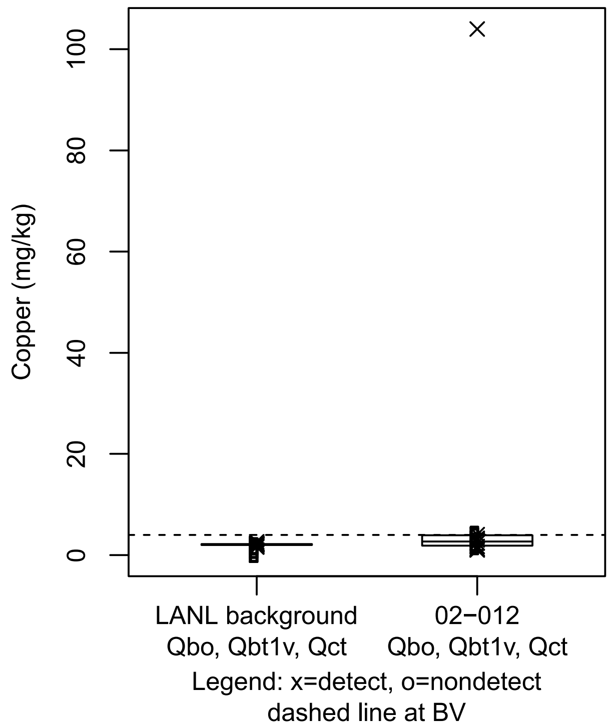

Figure G-297 Box plot for copper in Qbo at AOC 02-012

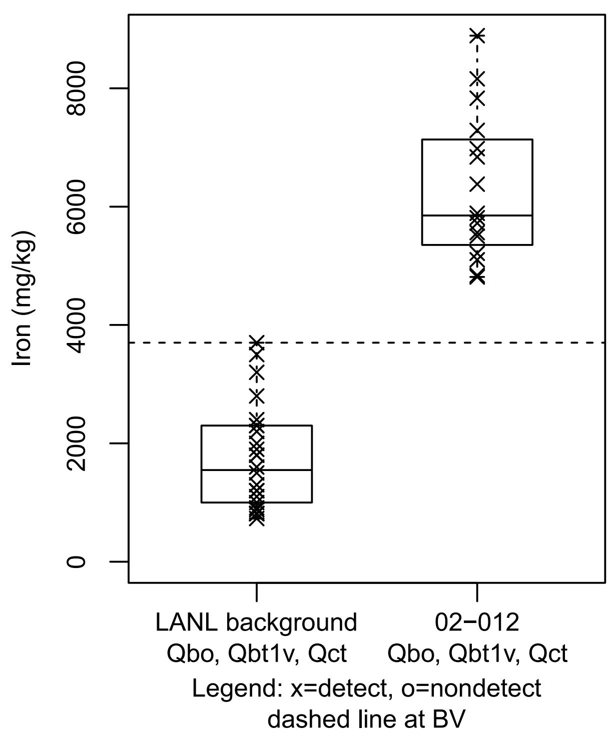

Figure G-298 Box plot for iron in Qbo at AOC 02-012

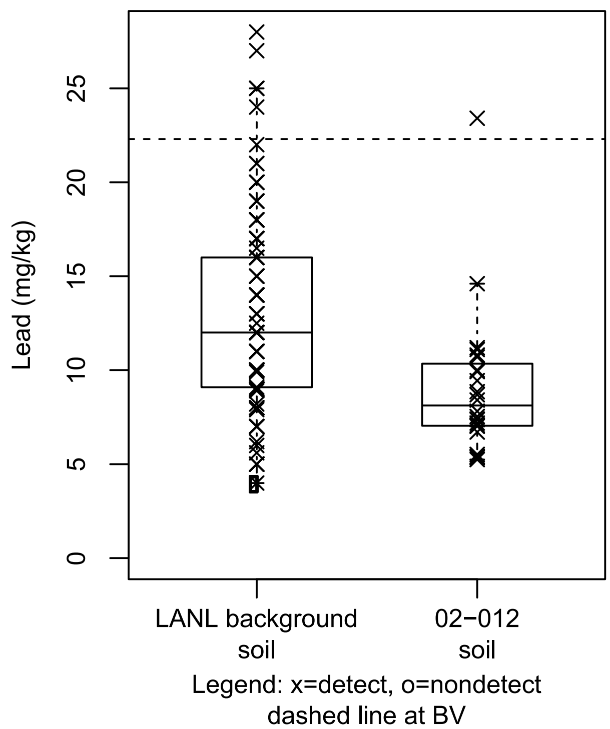

Figure G-299 Box plot for lead in soil at AOC 02-012

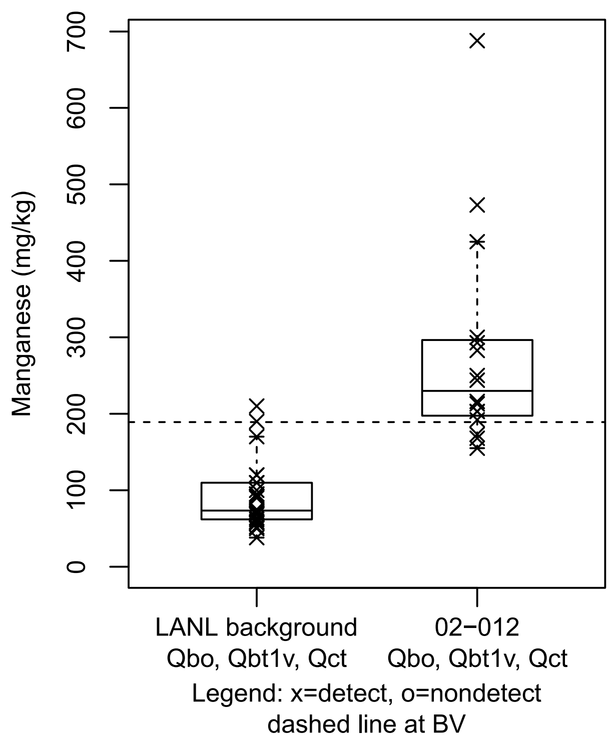

Figure G-300 Box plot for manganese in Qbo at AOC 02-012

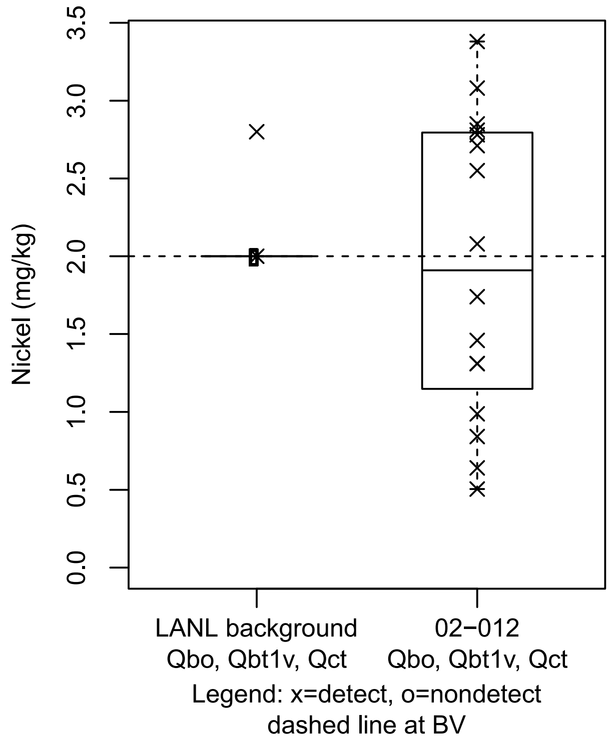

Figure G-301 Box plot for nickel in Qbo at AOC 02-012

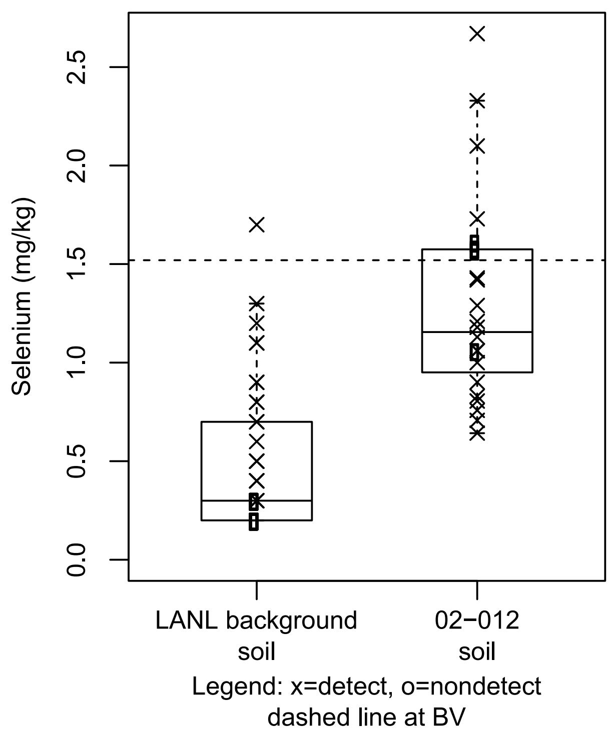

Figure G-302 Box plot for selenium in soil at AOC 02-012

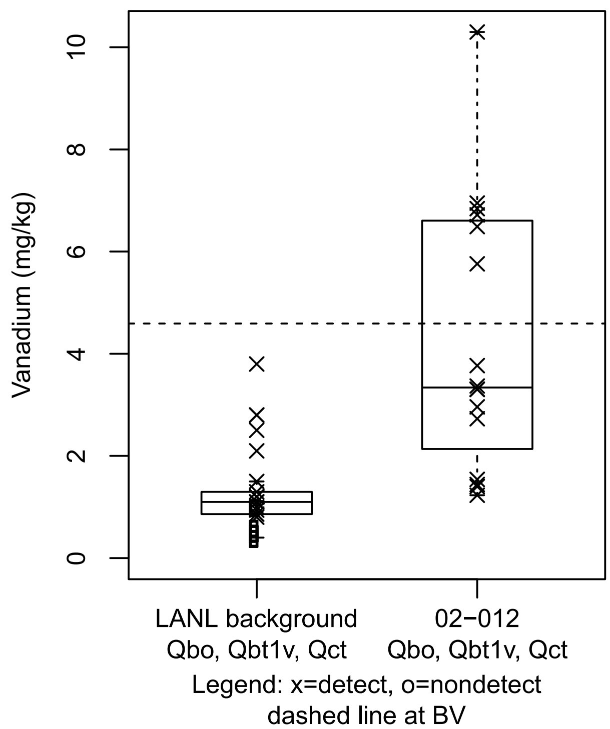

Figure G-303 Box plot for vanadium in Qbo at AOC 02-012

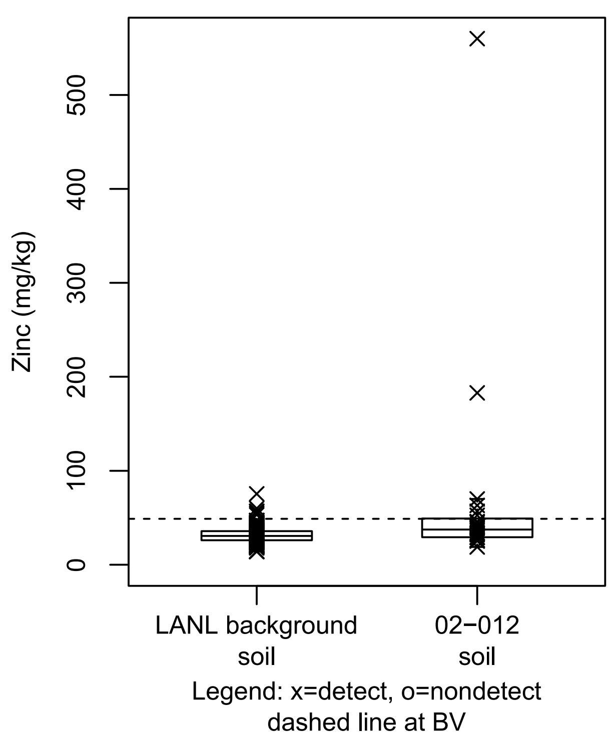

Figure G-304 Box plot for zinc in soil at AOC 02-012

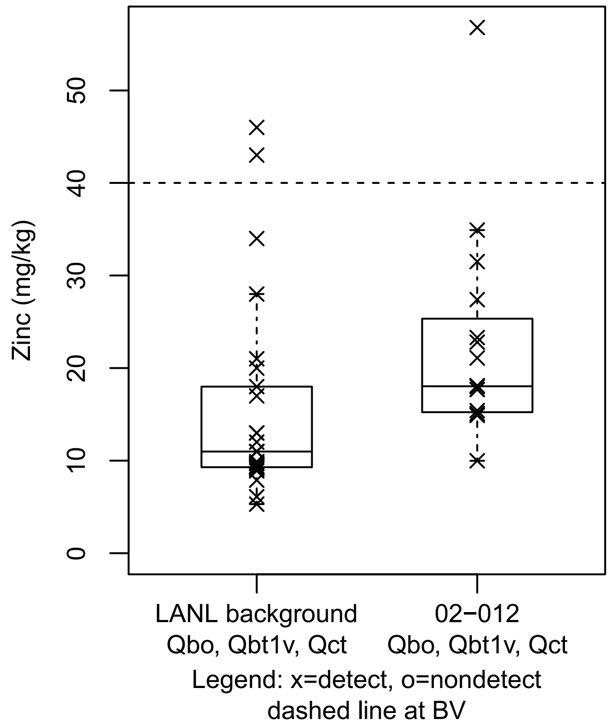

Figure G-305   Box plot for zinc in Qbo at AOC 02-012

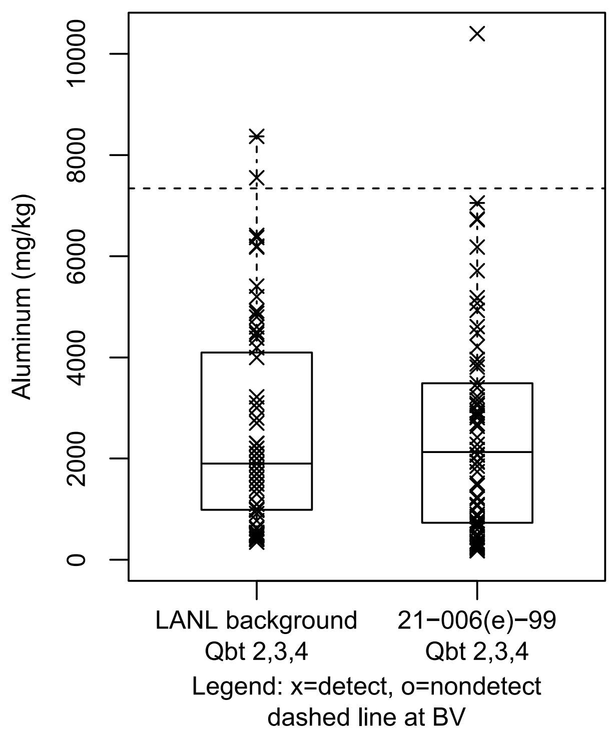

Figure G-306   Box plot for aluminum in Qbt 3 at SWMU 21-006(e) and AOC 21-006(f)

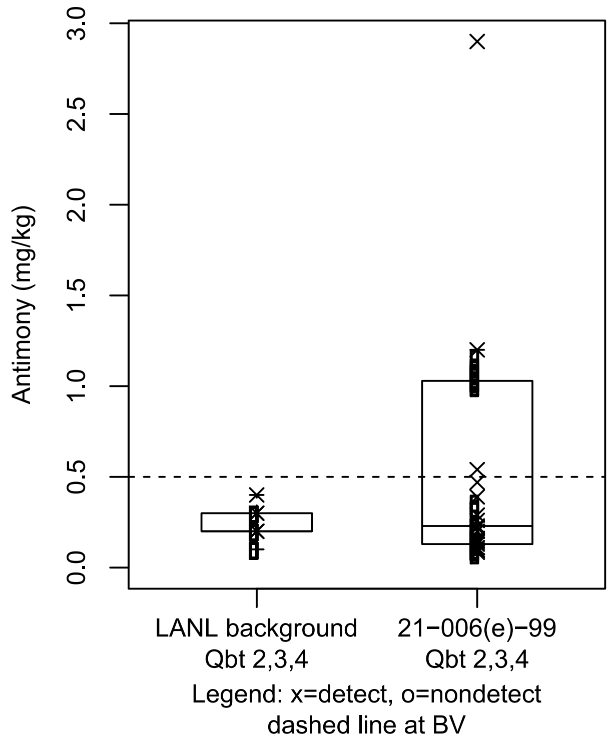

Figure G-307 Box plot for antimony in Qbt 3 at SWMU 21-006(e) and AOC 21-006(f)

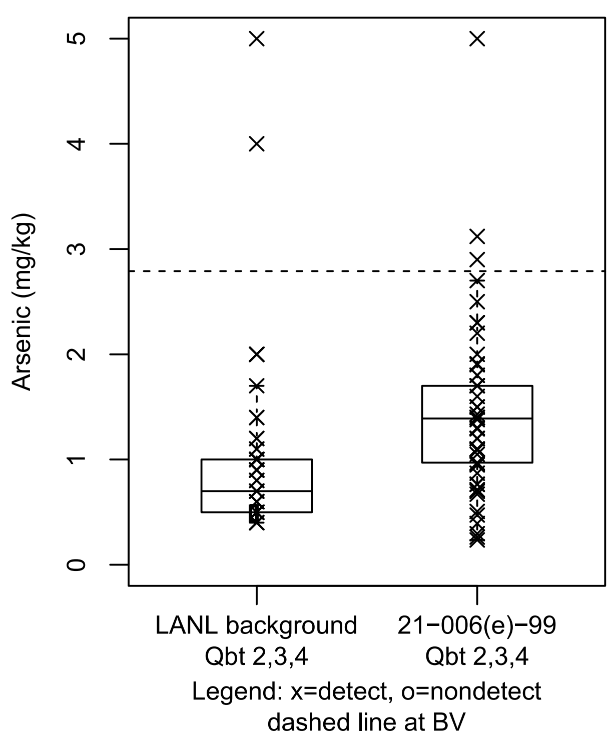

Figure G-308 Box plot for arsenic in Qbt 3 at SWMU 21-006(e) and AOC 21-006(f)

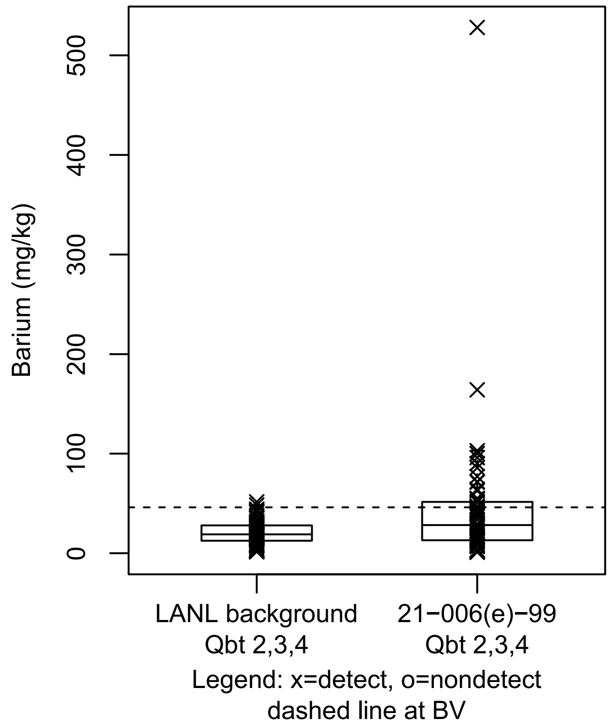

Figure G-309 Box plot for barium in Qbt 3 at SWMU 21-006(e) and AOC 21-006(f)

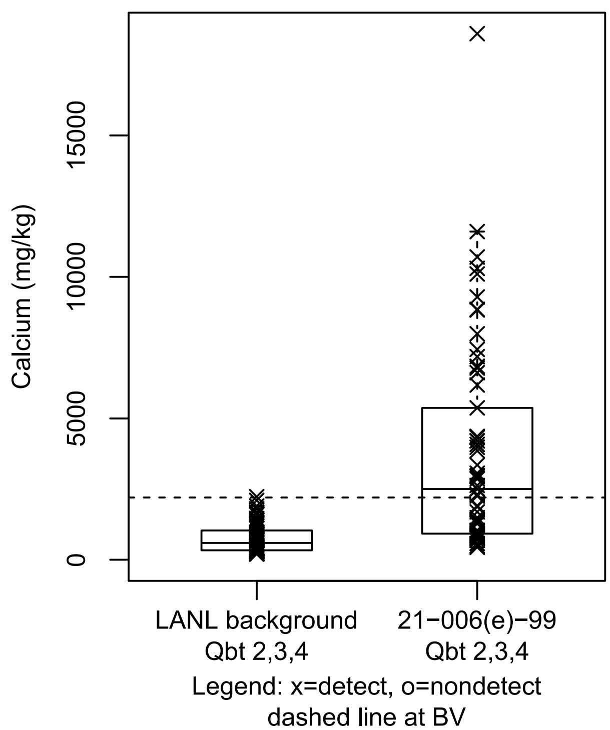

Figure G-310 Box plot for calcium in Qbt 3 at SWMU 21-006(e) and AOC 21-006(f)

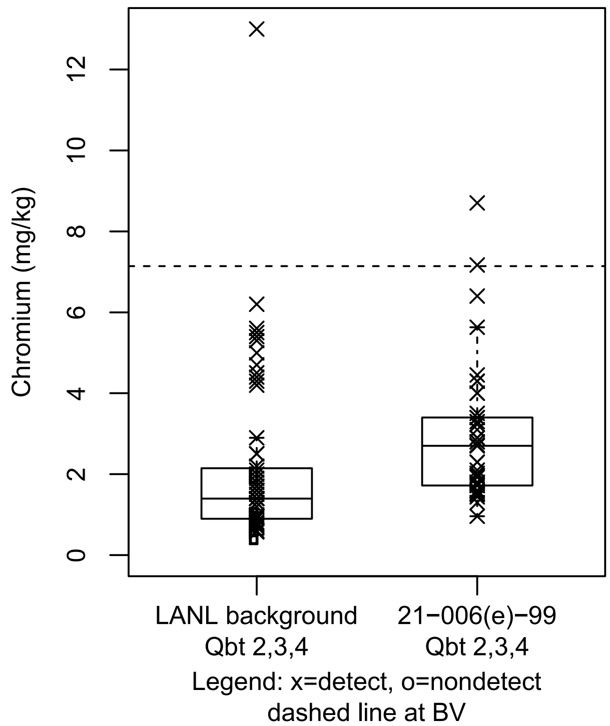

Figure G-311   Box plot for chromium in Qbt 3 at SWMU 21-006(e) and AOC 21-006(f)

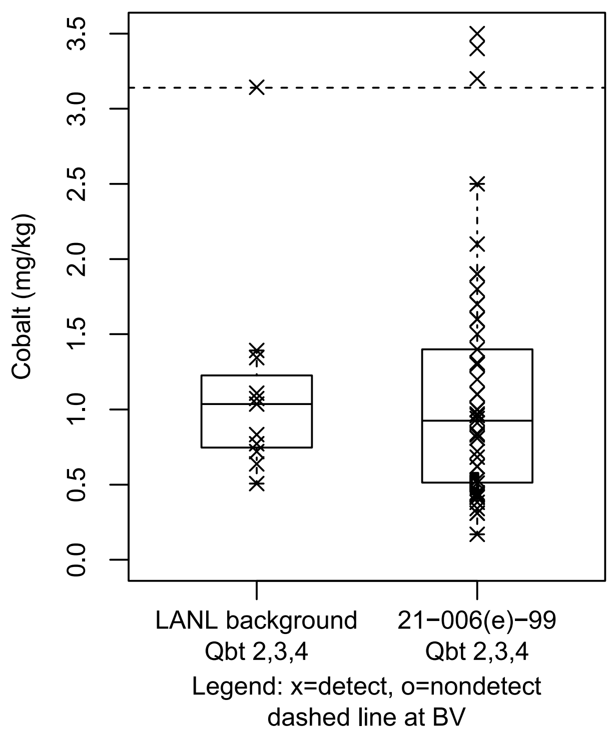

Figure G-312   Box plot for cobalt in Qbt 3 at SWMU 21-006(e) and AOC 21-006(f)

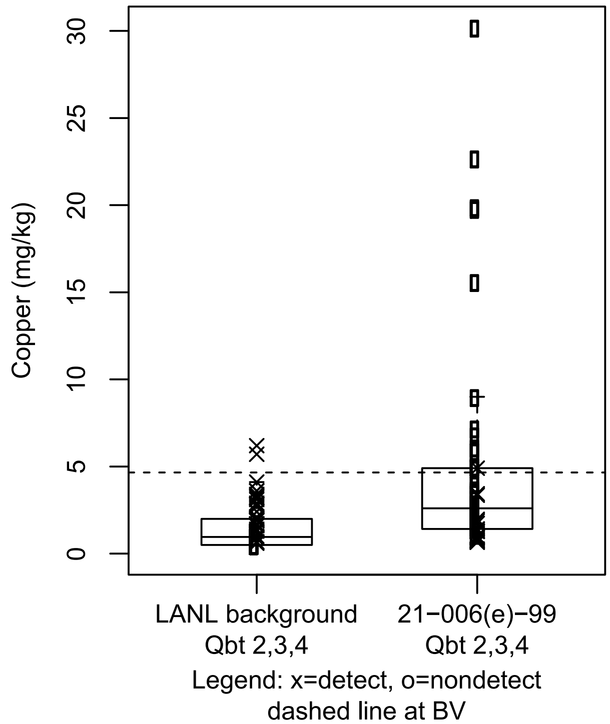

Figure G-313 Box plot for copper in Qbt 3 at SWMU 21-006(e) and AOC 21-006(f)

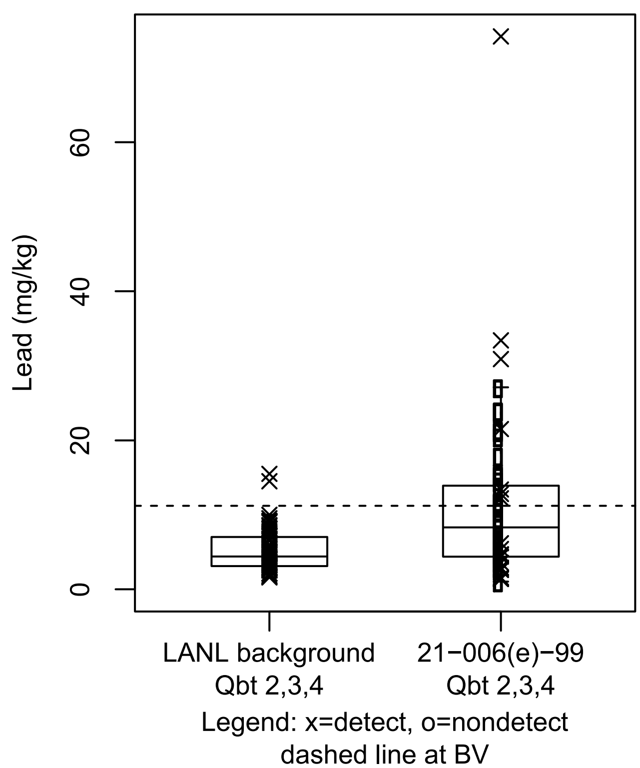

Figure G-314 Box plot for lead in Qbt 3 at SWMU 21-006(e) and AOC 21-006(f)

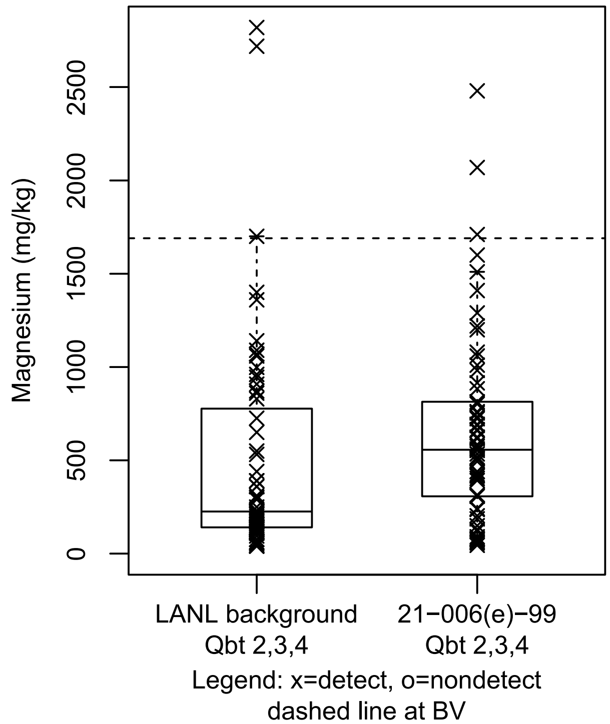

Figure G-315 Box plot for magnesium in Qbt 3 at SWMU 21-006(e) and AOC 21-006(f)

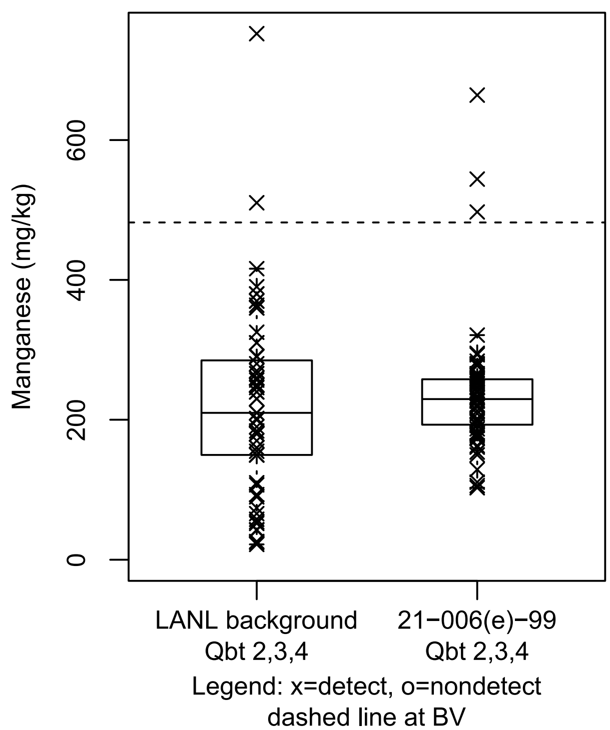

Figure G-316 Box plot for manganese in Qbt 3 at SWMU 21-006(e) and AOC 21-006(f)

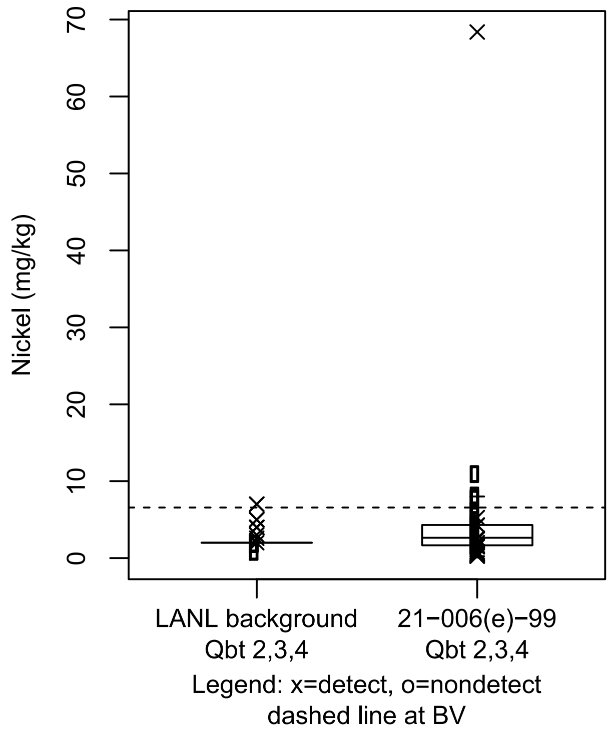

Figure G-317 Box plot for nickel in Qbt 3 at SWMU 21-006(e) and AOC 21-006(f)

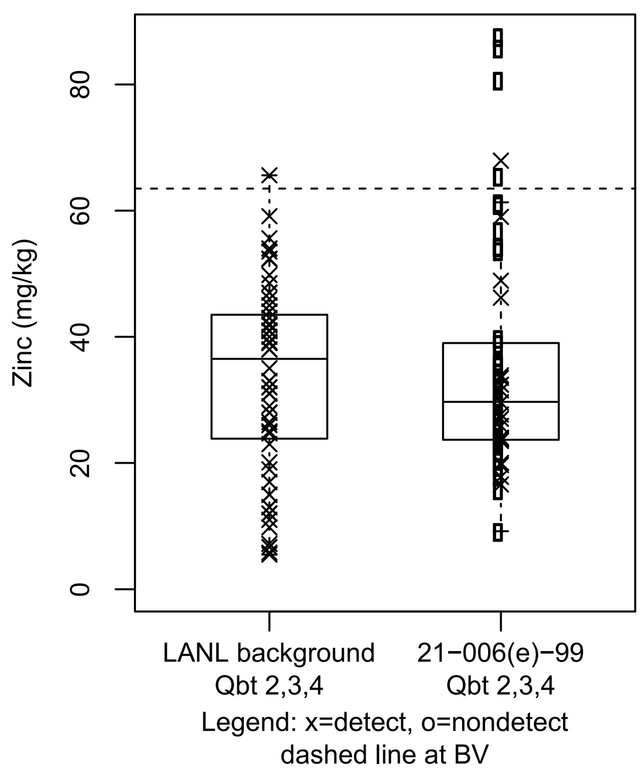

Figure G-318 Box plot for zinc in Qbt 3 at SWMU 21-006(e) and AOC 21-006(f)

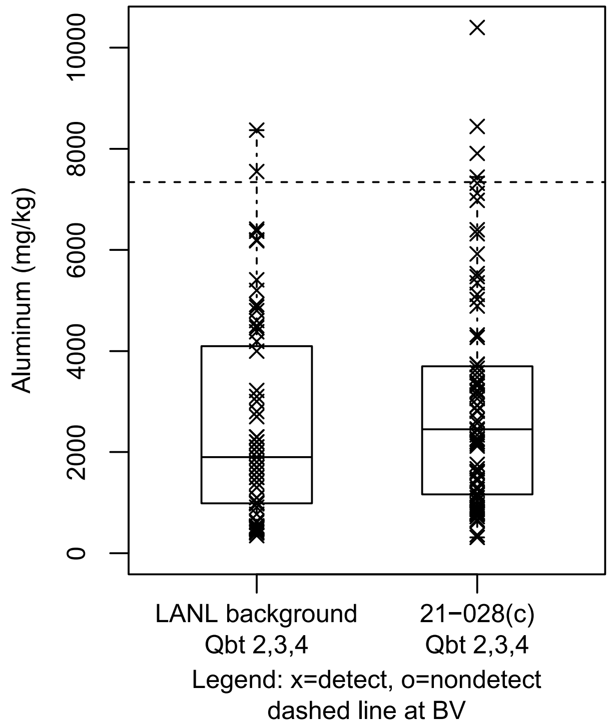

Figure G-319   Box plot for aluminum in Qbt 3 at AOC 21-028(c)

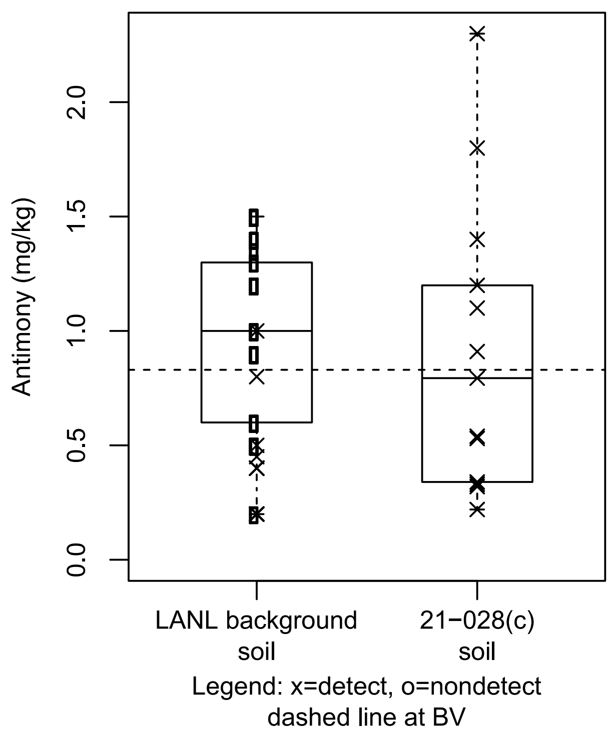

Figure G-320   Box plot for antimony in soil at AOC 21-028(c)

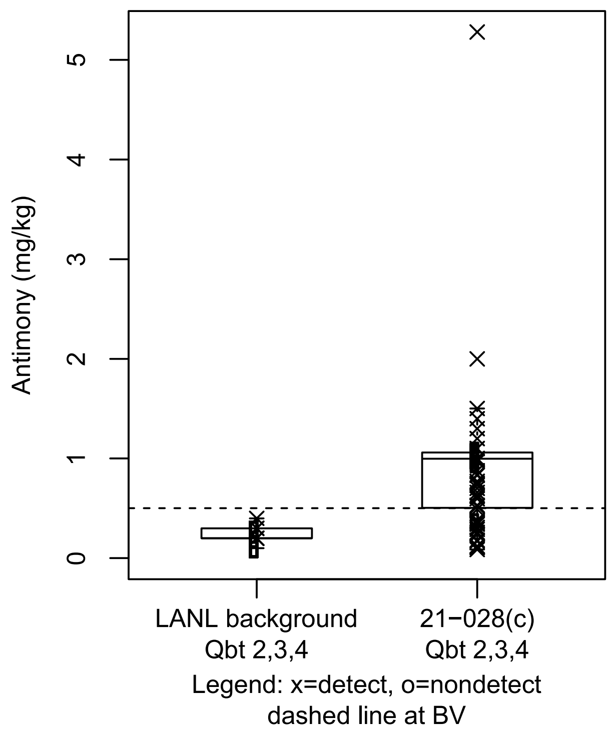

Figure G-321 Box plot for antimony in Qbt 3 at AOC 21-028(c)

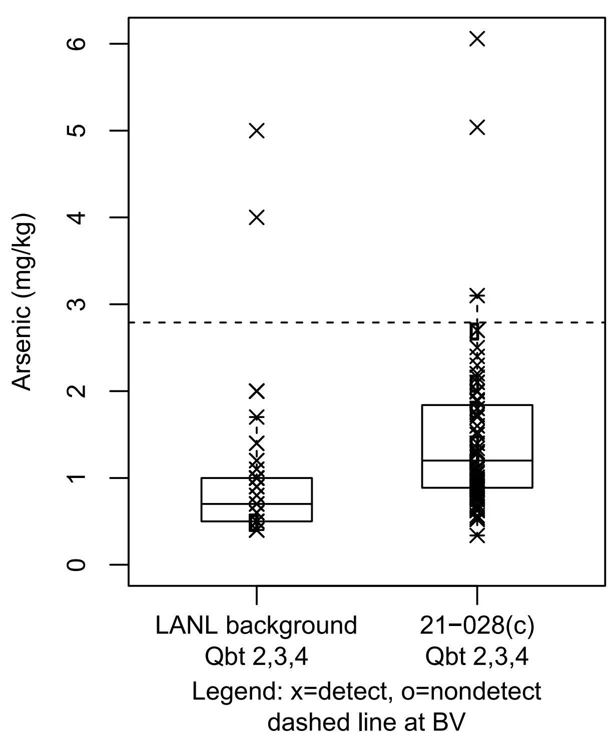

Figure G-322 Box plot for arsenic in Qbt 3 at AOC 21-028(c)

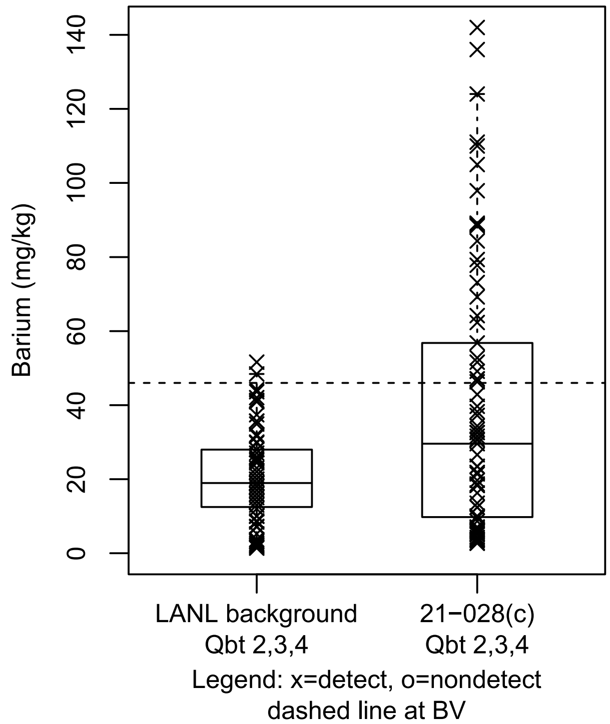

Figure G-323   Box plot for barium in Qbt 3 at AOC 21-028(c)

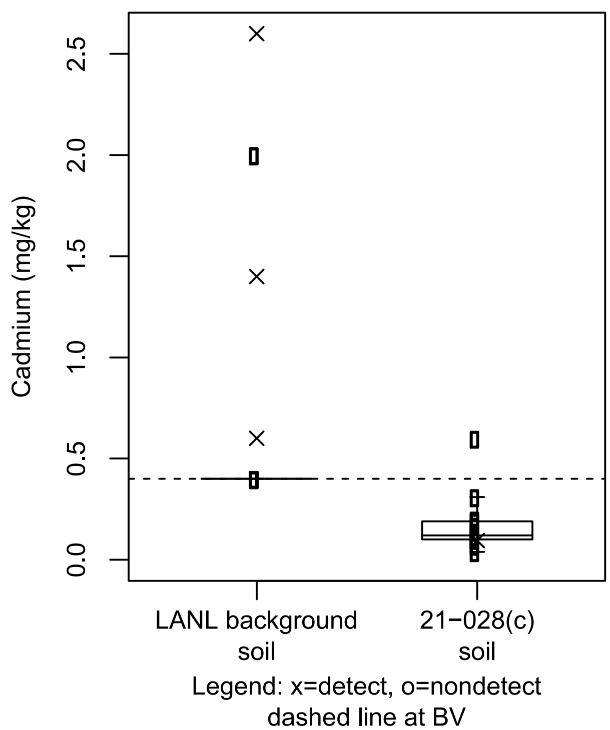

Figure G-324   Box plot for cadmium in soil at AOC 21-028(c)

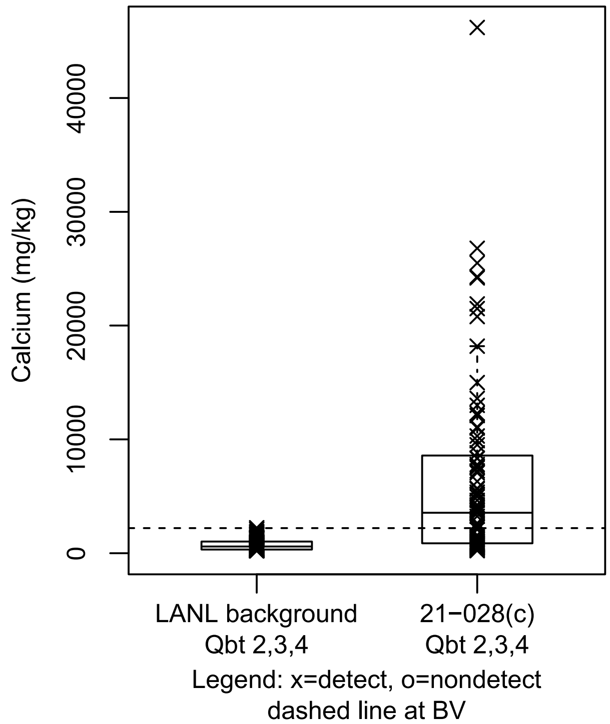

Figure G-325 Box plot for calcium in Qbt 3 at AOC 21-028(c)

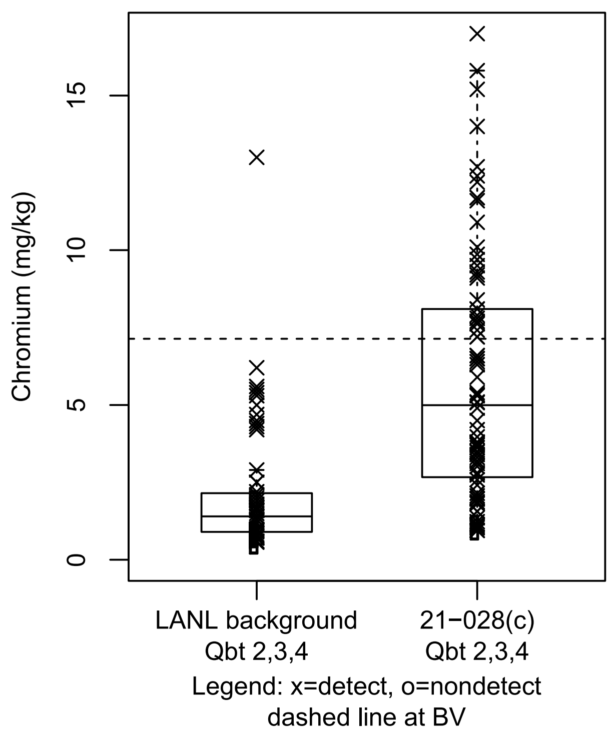

Figure G-326 Box plot for chromium in Qbt 3 at AOC 21-028(c)

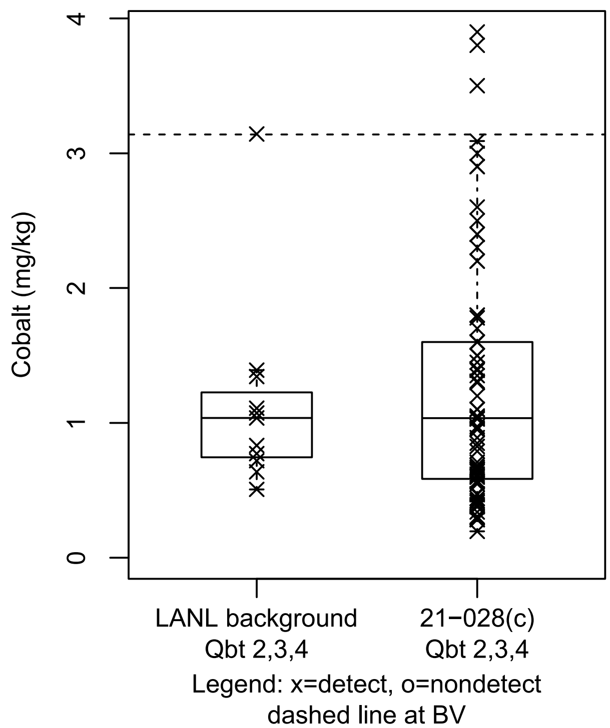

Figure G-327 Box plot for cobalt in Qbt 3 at AOC 21-028(c)

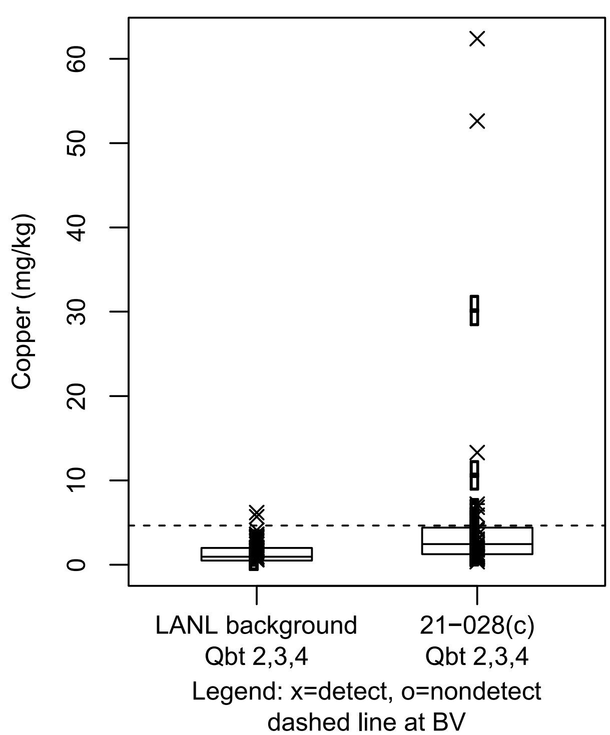

Figure G-328 Box plot for copper in Qbt 3 at AOC 21-028(c)

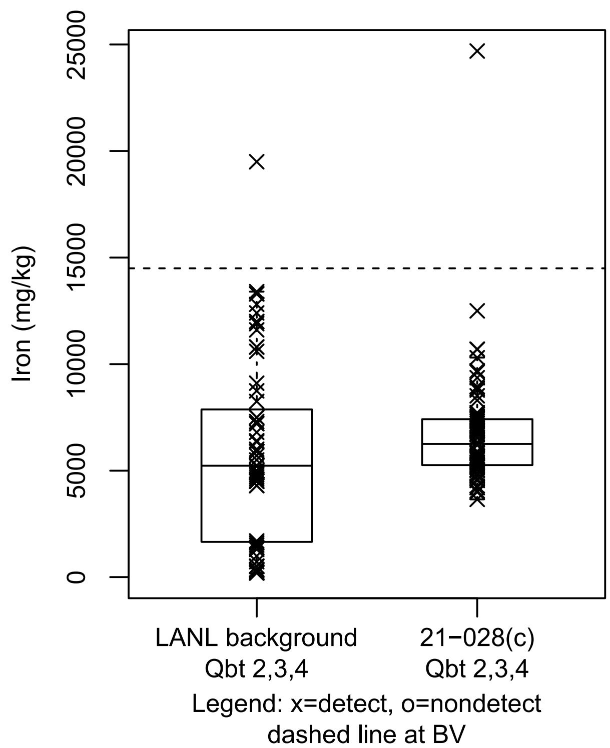

Figure G-329 Box plot for iron in Qbt 3 at AOC 21-028(c)

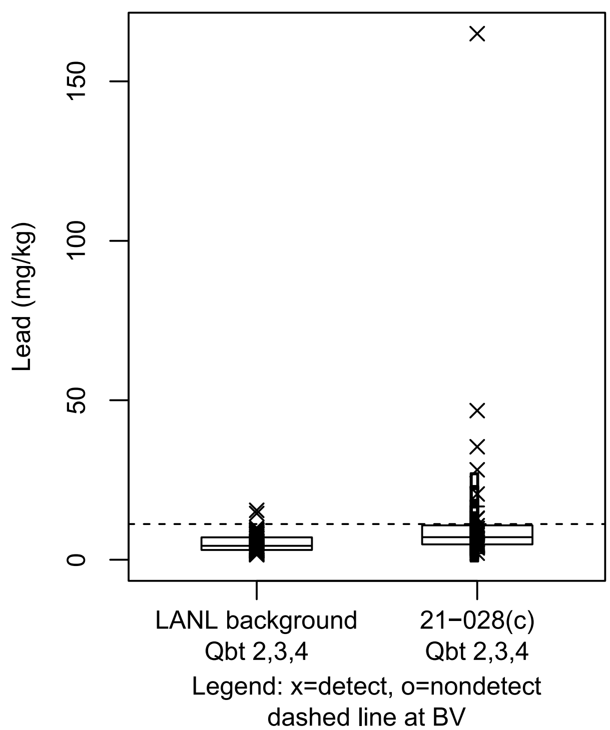

Figure G-330 Box plot for lead in Qbt 3 at AOC 21-028(c)

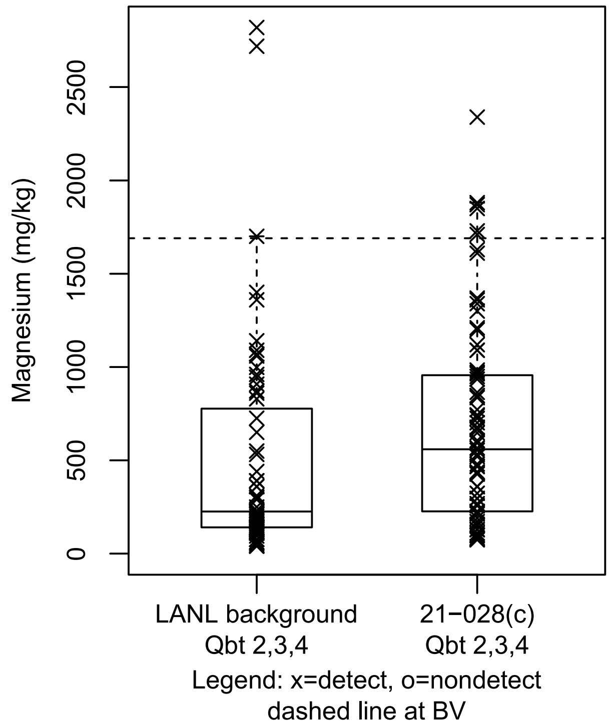

Figure G-331 Box plot for magnesium in Qbt 3 at AOC 21-028(c)

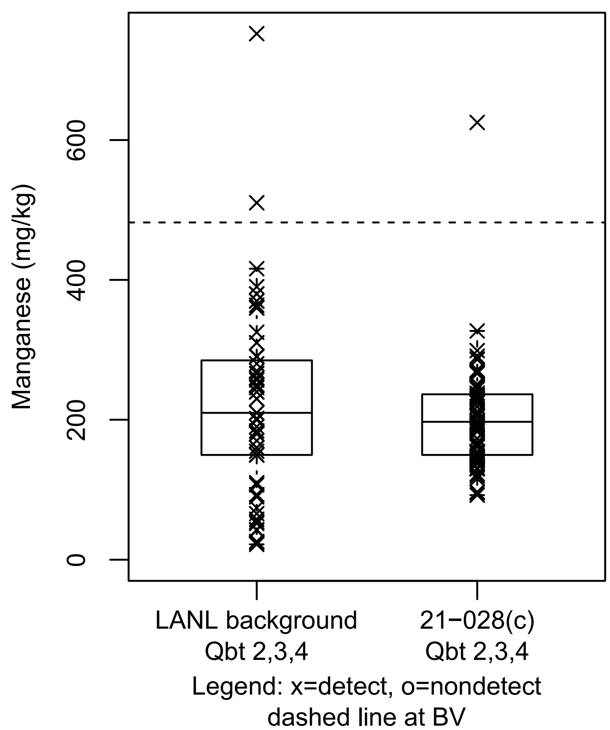

Figure G-332 Box plot for manganese in Qbt 3 at AOC 21-028(c)

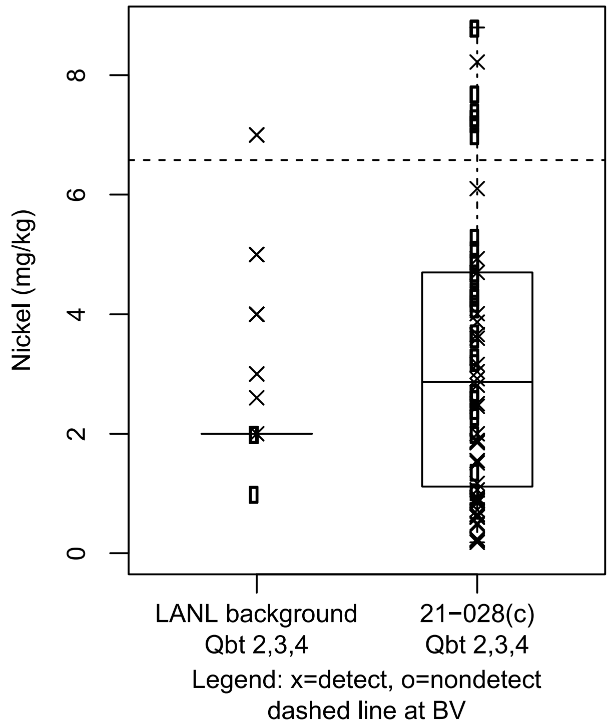

Figure G-333 Box plot for nickel in Qbt 3 at AOC 21-028(c)

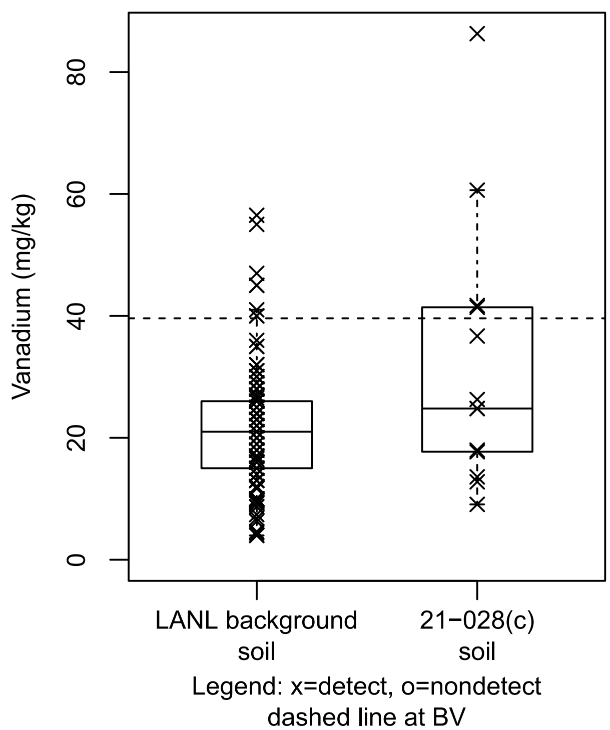

Figure G-334 Box plot for vanadium in soil at AOC 21-028(c)

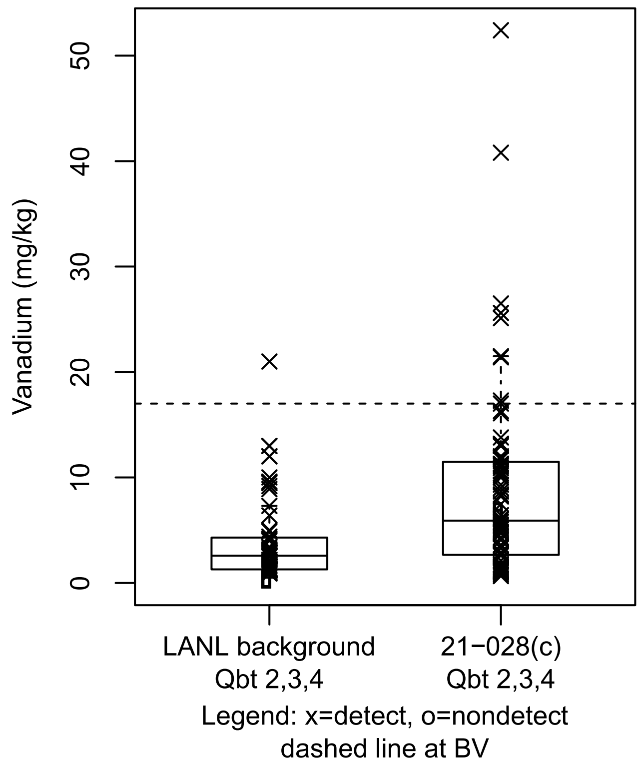

Figure G-335 Box plot for vanadium in Qbt 3 at AOC 21-028(c)

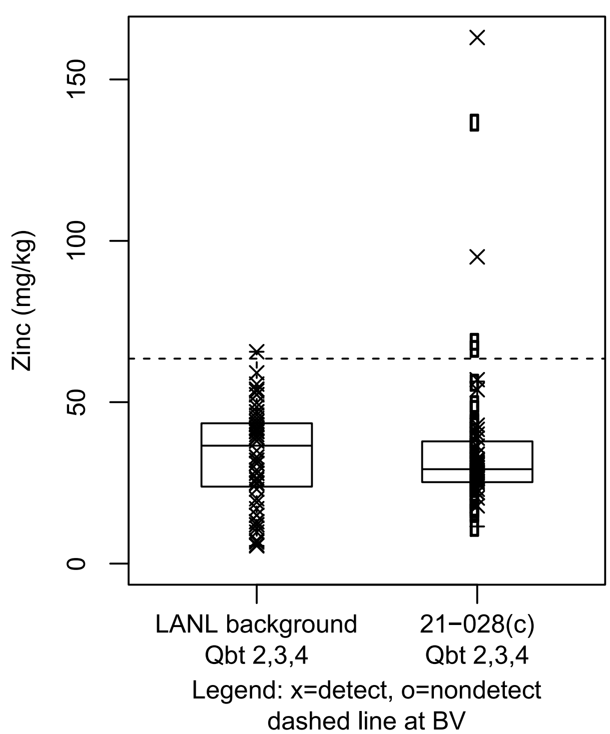

Figure G-336 Box plot for zinc in Qbt 3 at AOC 21-028(c)

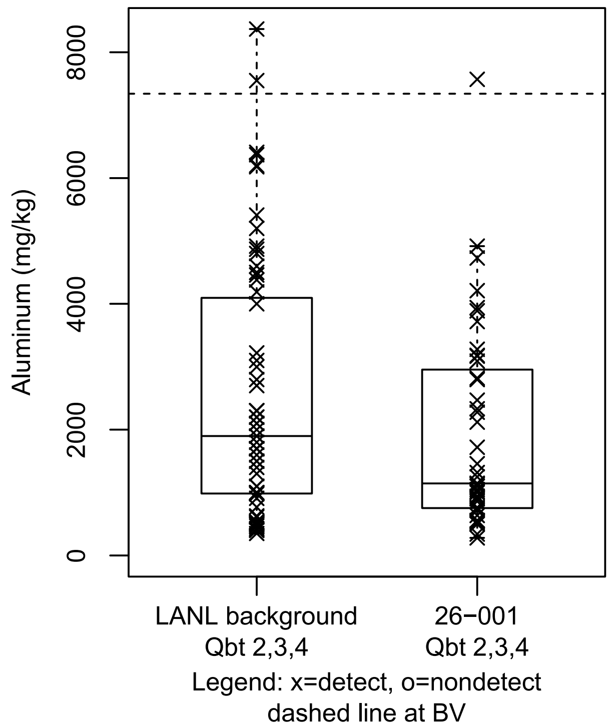

Figure G-337 Box plot for aluminum in Qbt 3 at SWMU 26-001

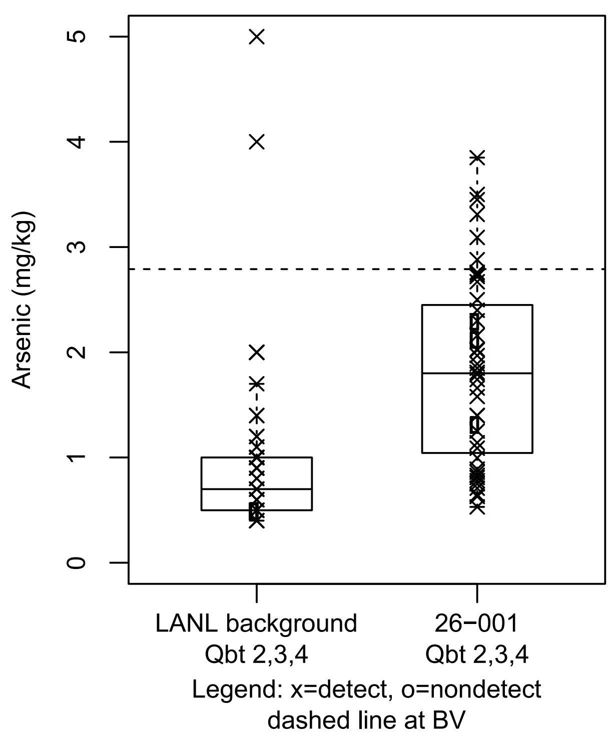

Figure G-338 Box plot for arsenic in Qbt 3 at SWMU 26-001

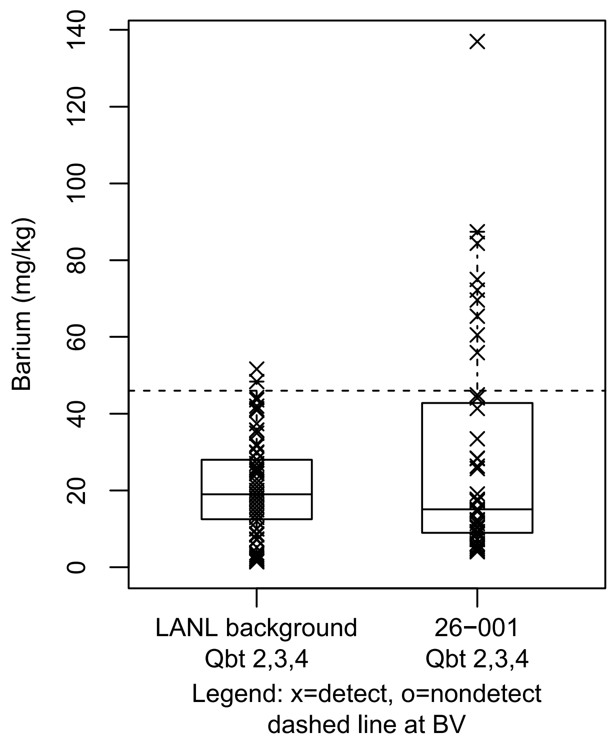

Figure G-339 Box plot for barium in Qbt 3 at SWMU 26-001

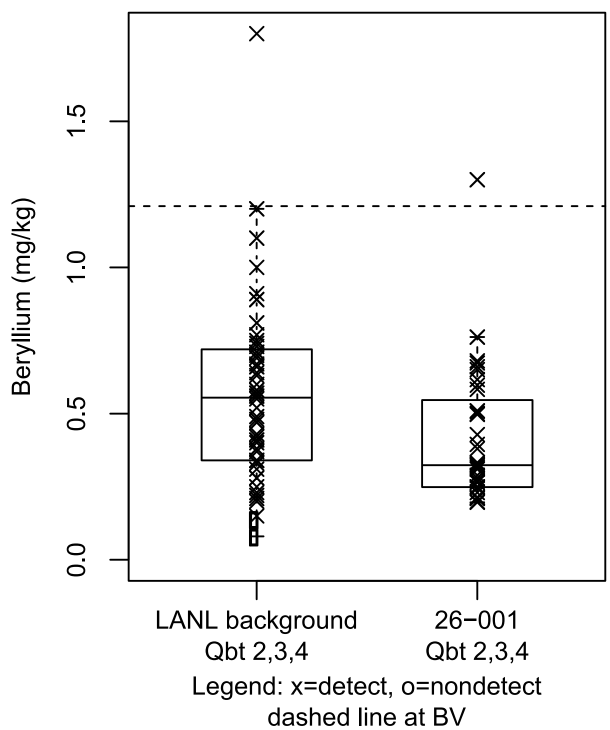

Figure G-340 Box plot for beryllium in Qbt 3 at SWMU 26-001

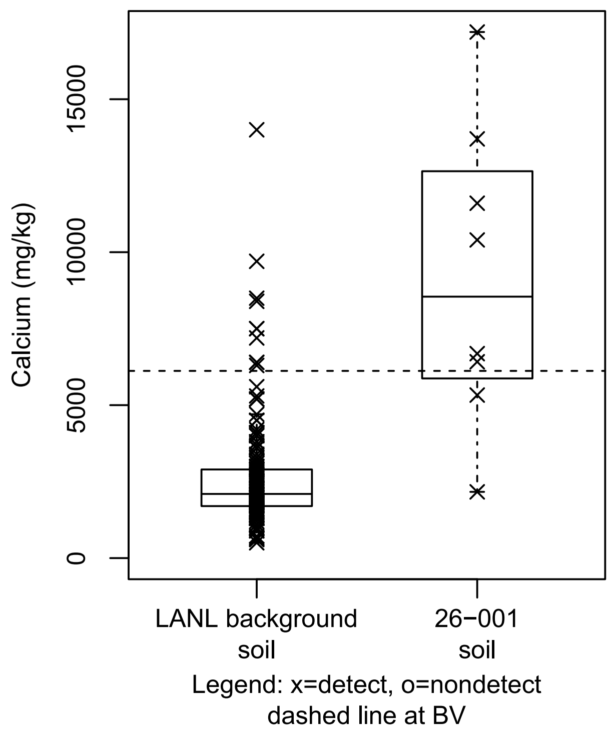

Figure G-341 Box plot for calcium in soil 3 at SWMU 26-001

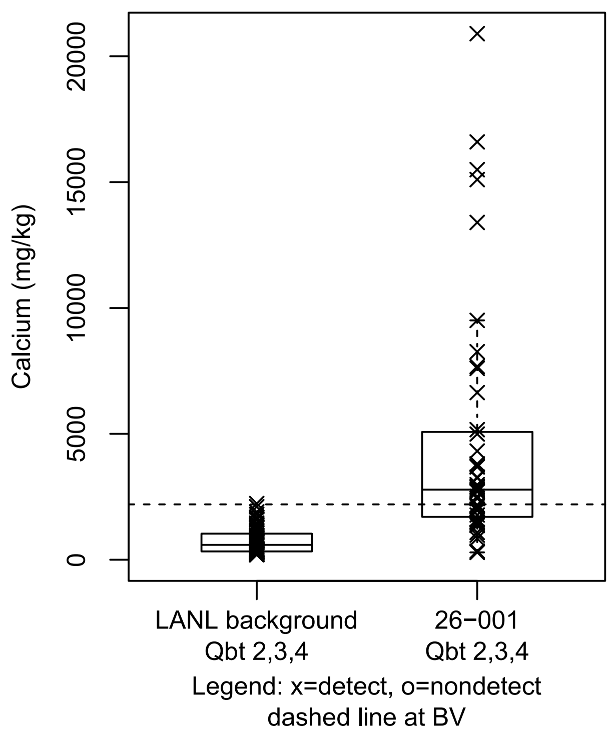

Figure G-342 Box plot for calcium in Qbt 3 at SWMU 26-001

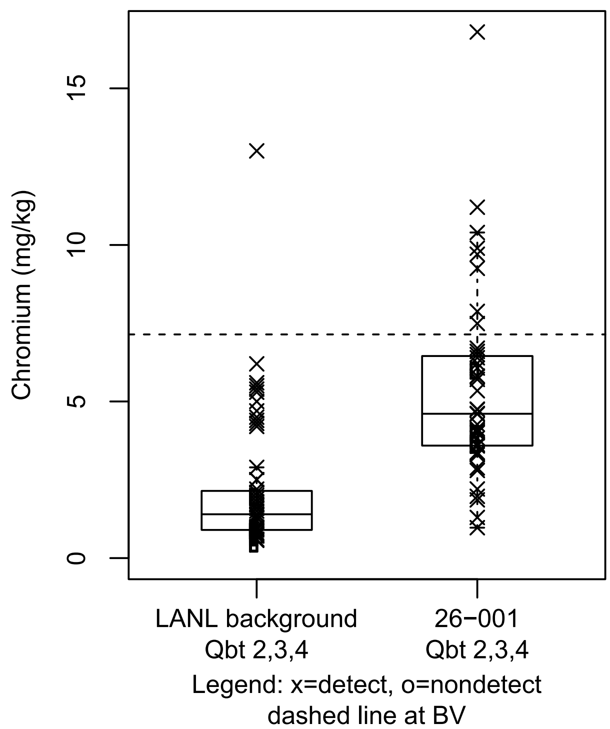

Figure G-343 Box plot for chromium in Qbt 3 at SWMU 26-001

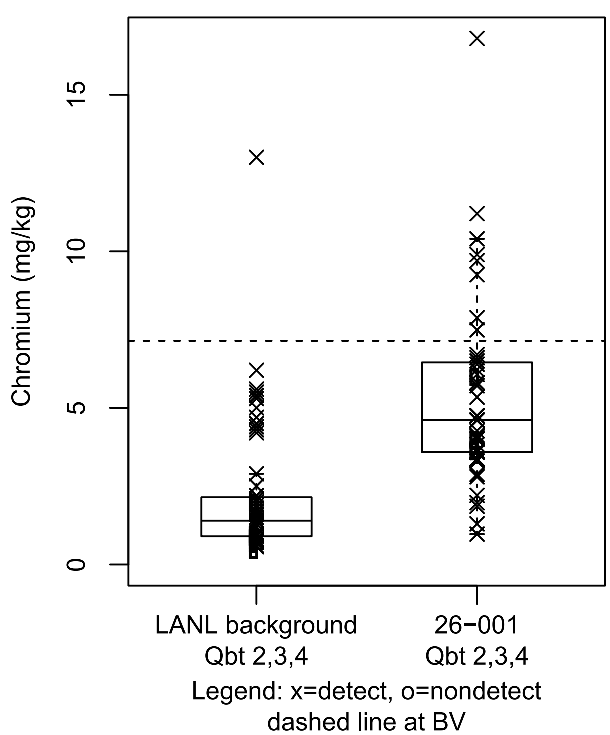

Figure G-344 Box plot for cobalt in Qbt 3 at SWMU 26-001

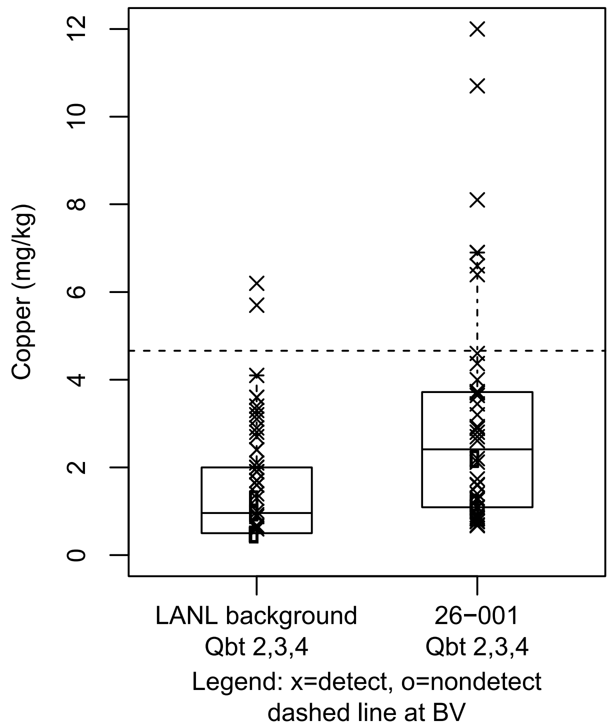

Figure G-345   Box plot for copper in Qbt 3 at SWMU 26-001

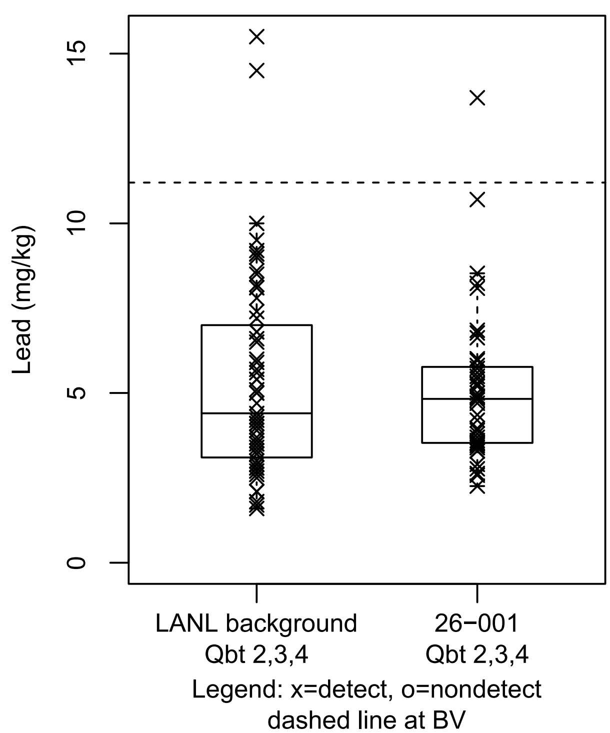

Figure G-346   Box plot for lead in Qbt 3 at SWMU 26-001

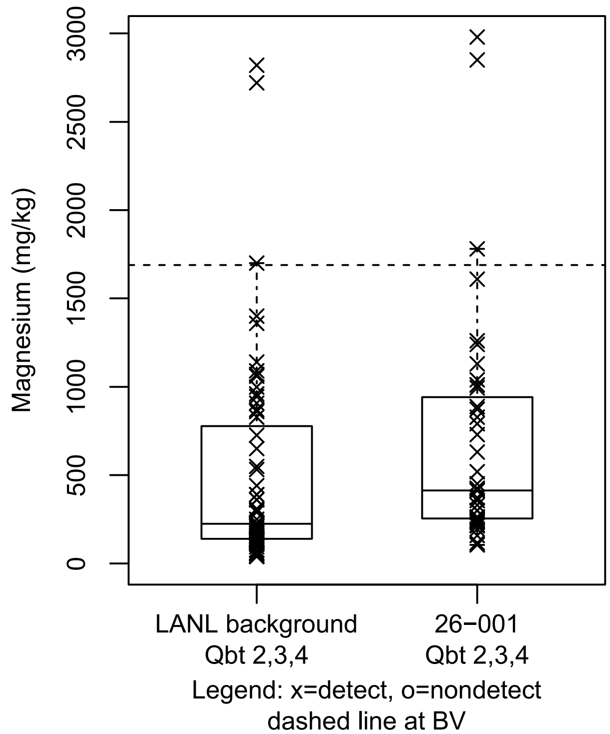

Figure G-347 Box plot for magnesium in Qbt 3 at SWMU 26-001

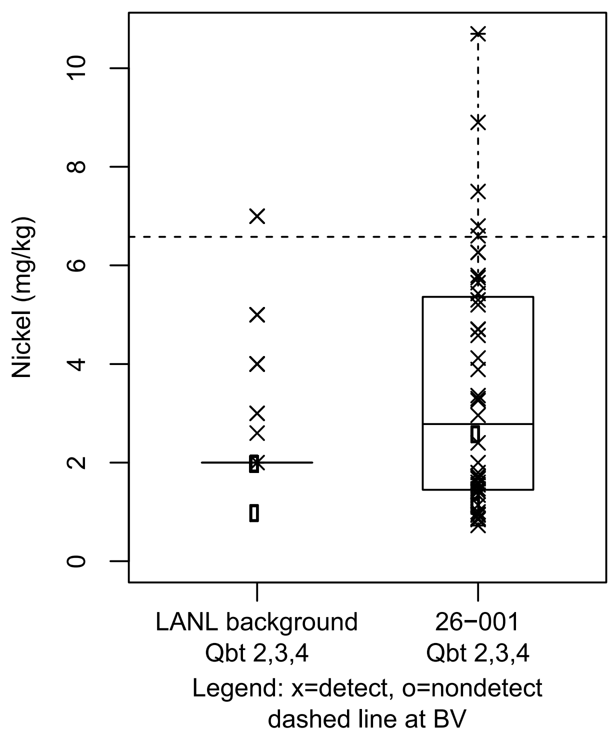

Figure G-348 Box plot for nickel in Qbt 3 at SWMU 26-001

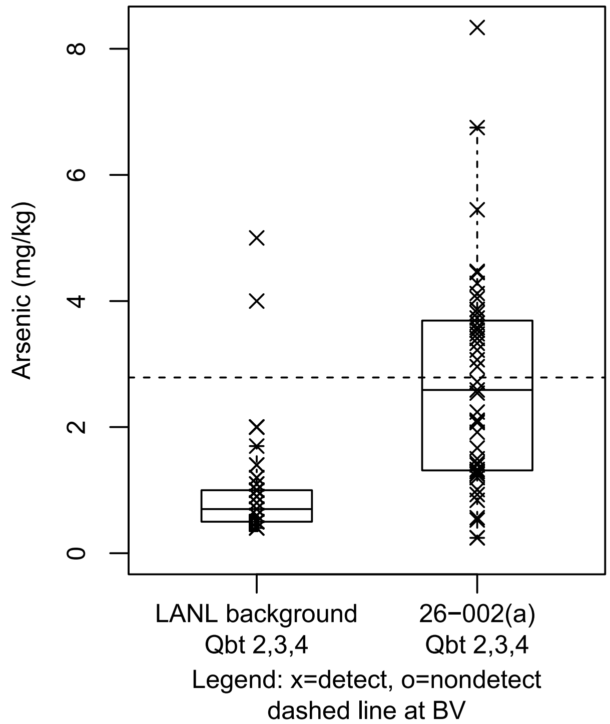

Figure G-349 Box plot for arsenic in Qbt 3 at SWMU 26-002(a)

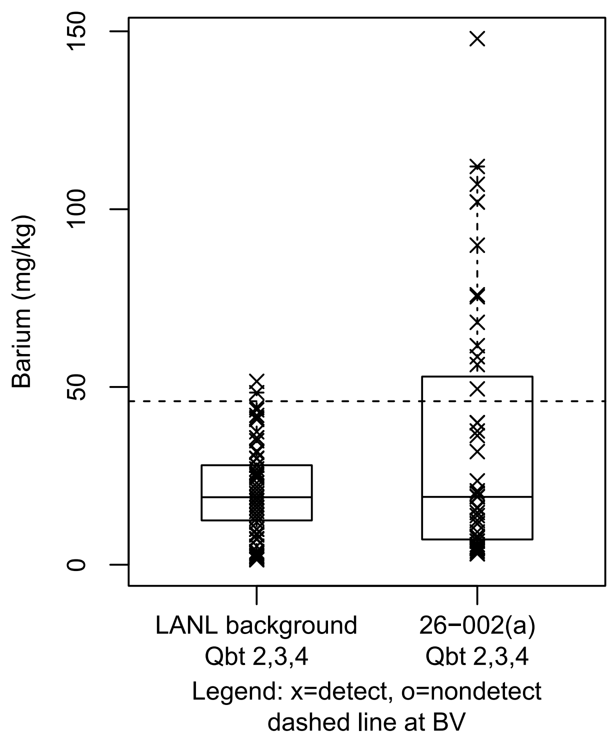

Figure G-350 Box plot for barium in Qbt 3 at SWMU 26-002(a)

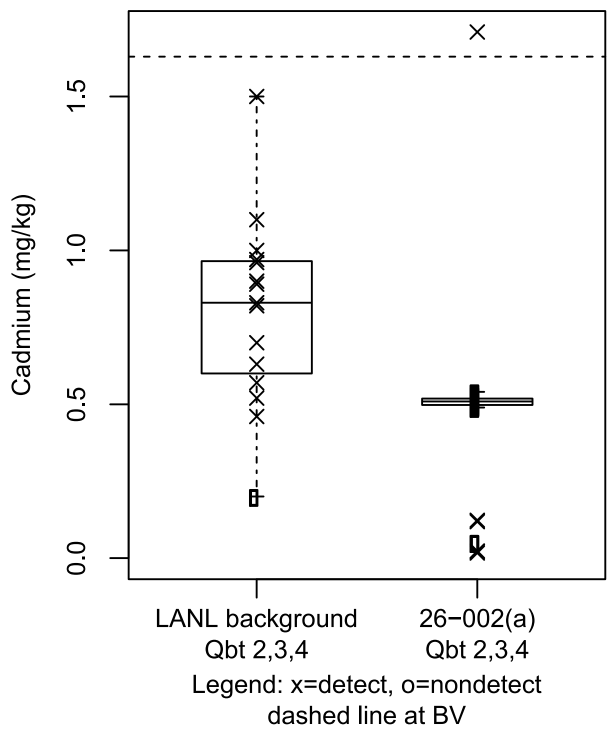

Figure G-351 Box plot for cadmium in Qbt 3 at SWMU 26-002(a)

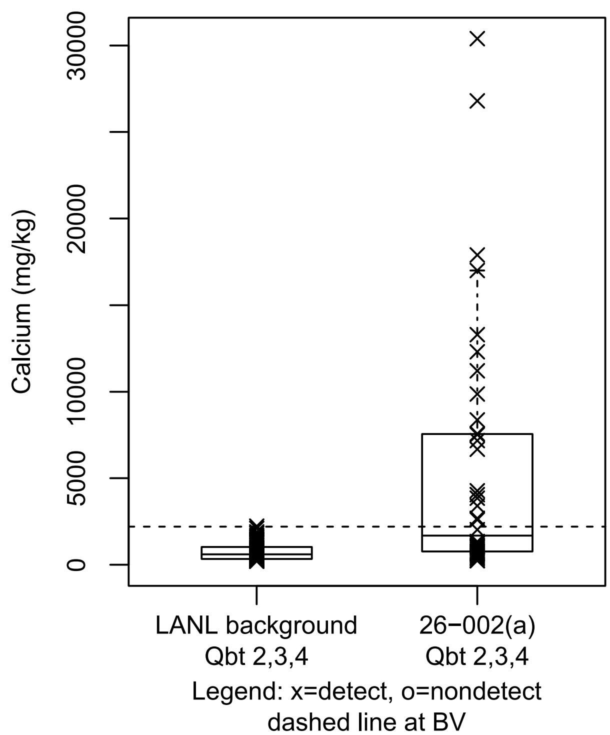

Figure G-352 Box plot for calcium in Qbt 3 at SWMU 26-002(a)

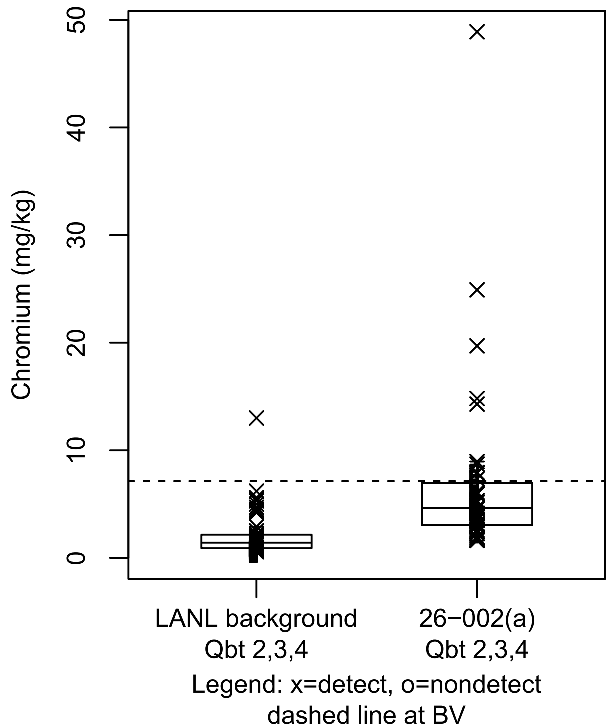

Figure G-353 Box plot for chromium in Qbt 3 at SWMU 26-002(a)

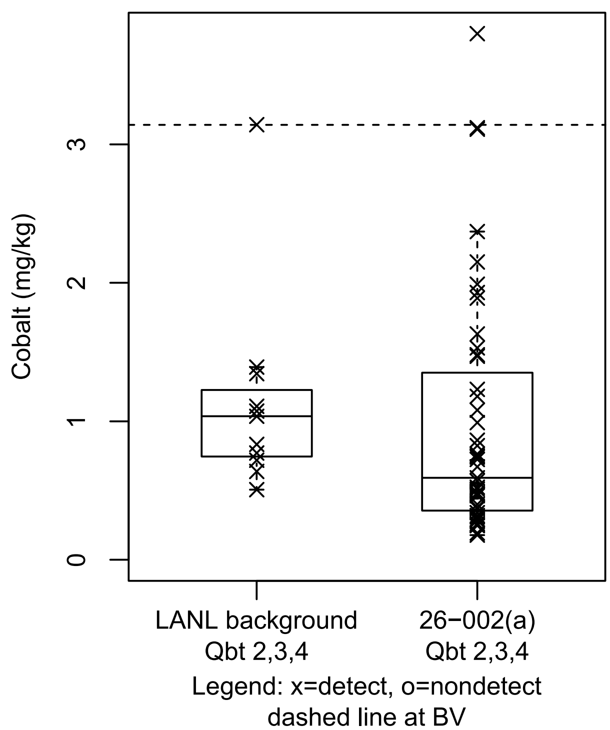

Figure G-354 Box plot for cobalt in Qbt 3 at SWMU 26-002(a)

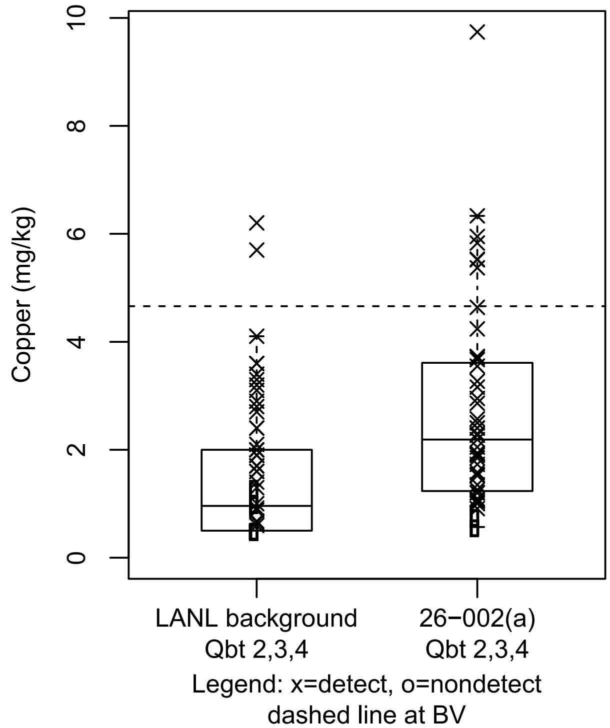

Figure G-355 Box plot for copper in Qbt 3 at SWMU 26-002(a)

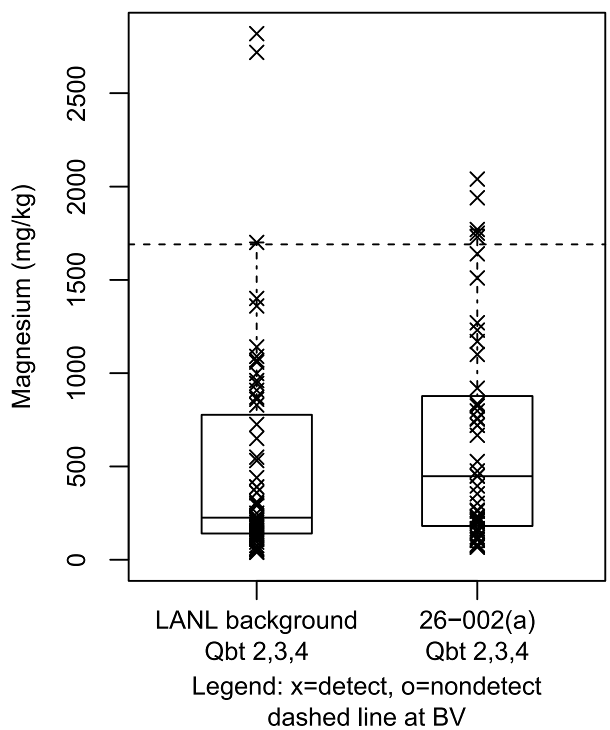

Figure G-356 Box plot for magnesium in Qbt 3 at SWMU 26-002(a)

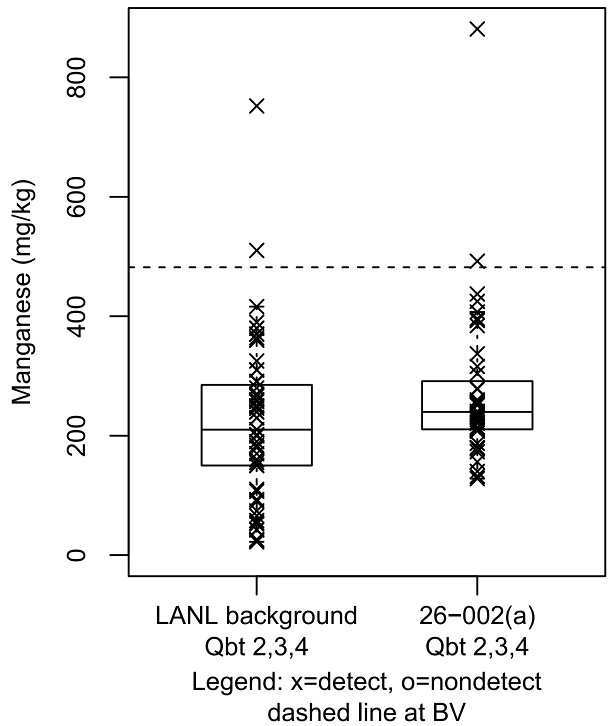

Figure G-357 Box plot for manganese in Qbt 3 at SWMU 26-002(a)

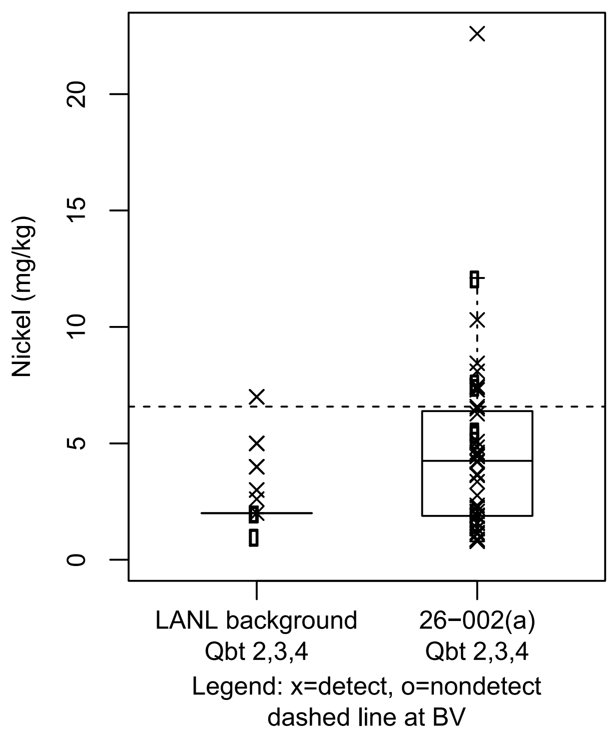

Figure G-358 Box plot for nickel in Qbt 3 at SWMU 26-002(a)

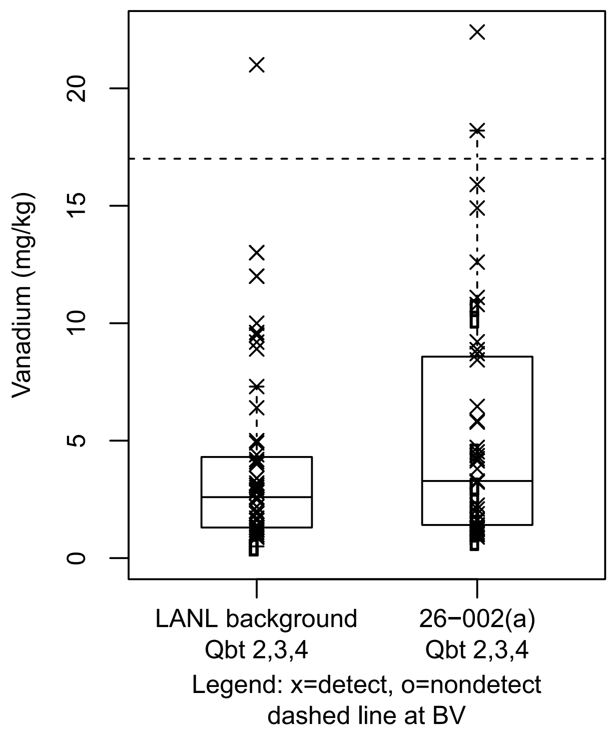

Figure G-359 Box plot for vanadium in Qbt 3 at SWMU 26-002(a)

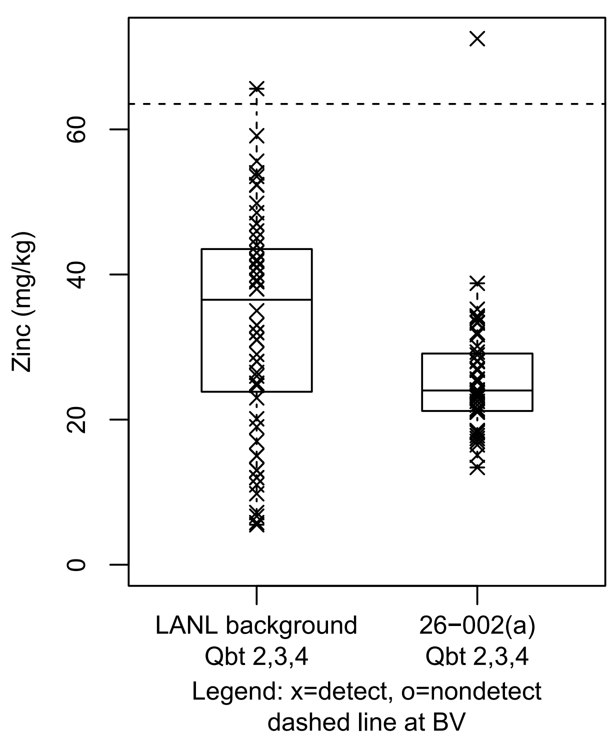

Figure G-360 Box plot for zinc in Qbt 3 at SWMU 26-002(a)

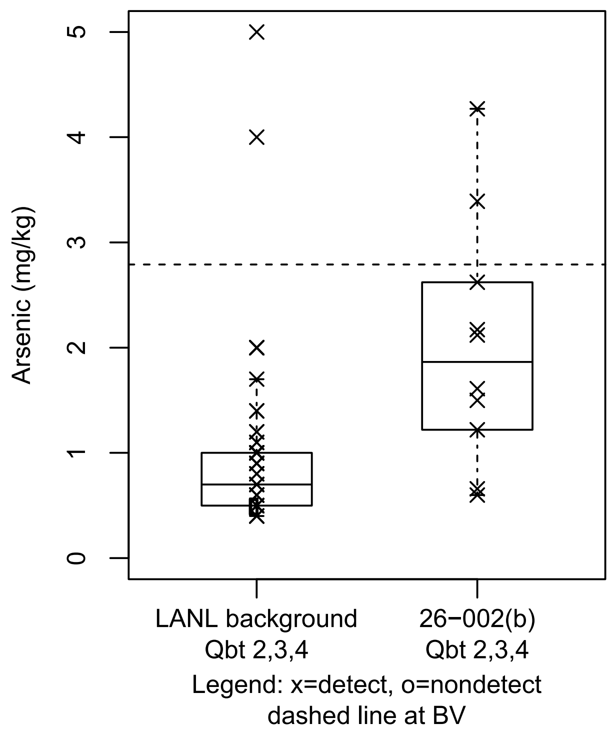

Figure G-361 Box plot for arsenic in Qbt 3 at SWMU 26-002(b)

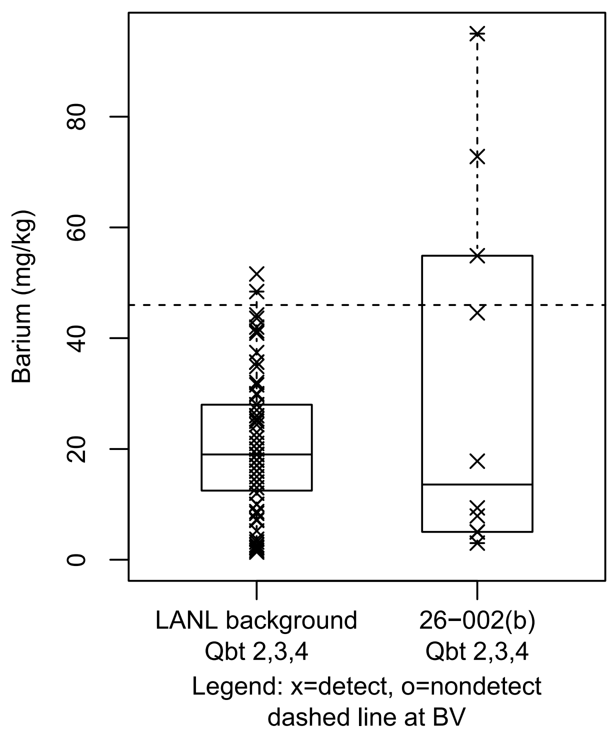

Figure G-362 Box plot for barium in Qbt 3 at SWMU 26-002(b)

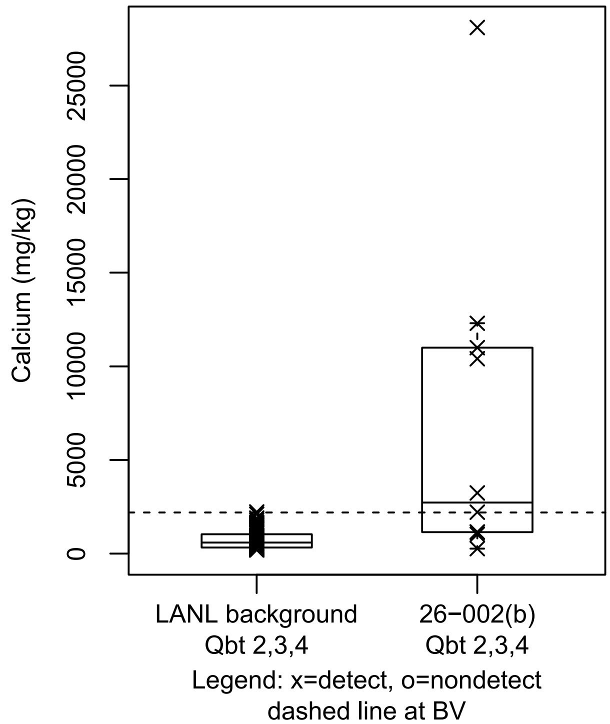

Figure G-363 Box plot for calcium in Qbt 3 at SWMU 26-002(b)

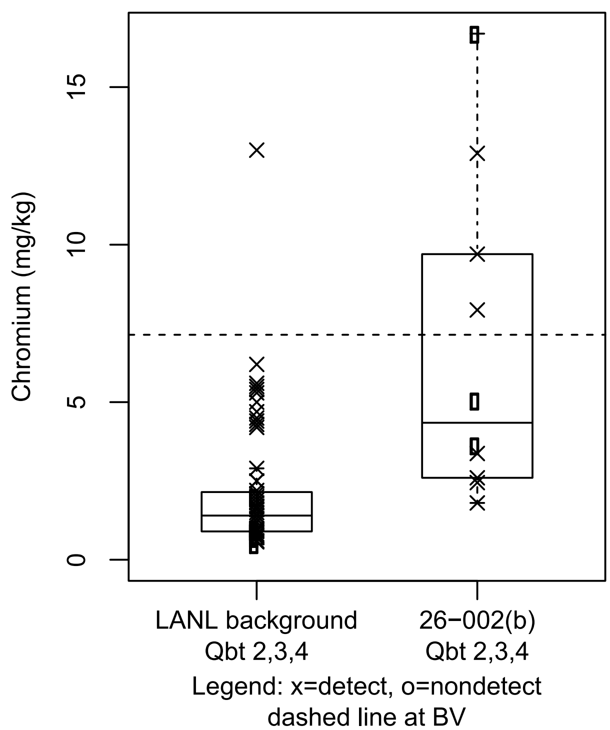

Figure G-364 Box plot for chromium in Qbt 3 at SWMU 26-002(b)

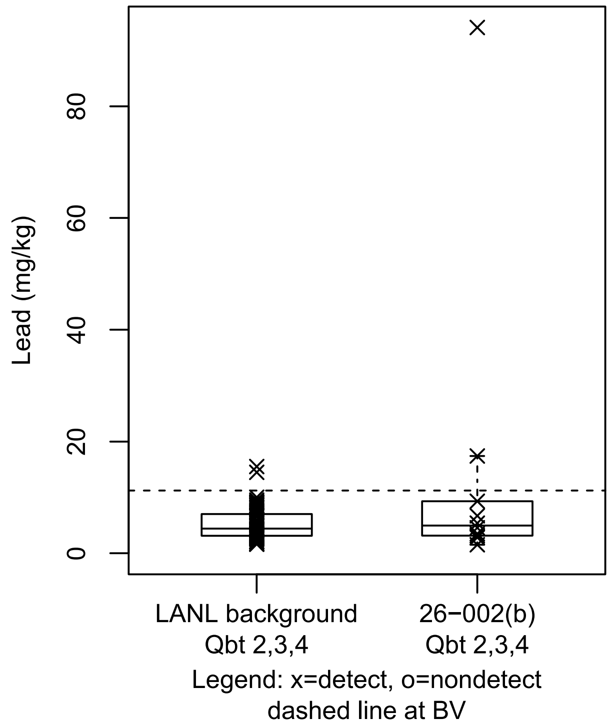

Figure G-365 Box plot for lead in Qbt 3 at SWMU 26-002(b)

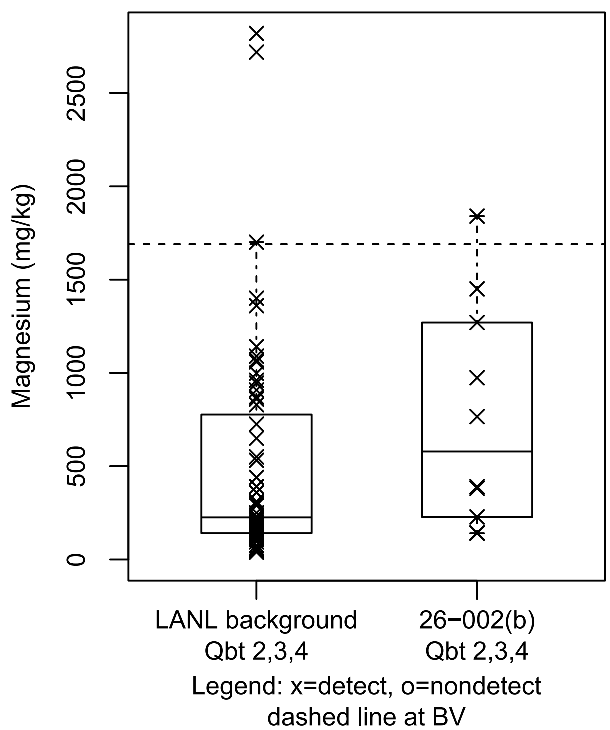

Figure G-366 Box plot for magnesium in Qbt 3 at SWMU 26-002(b)

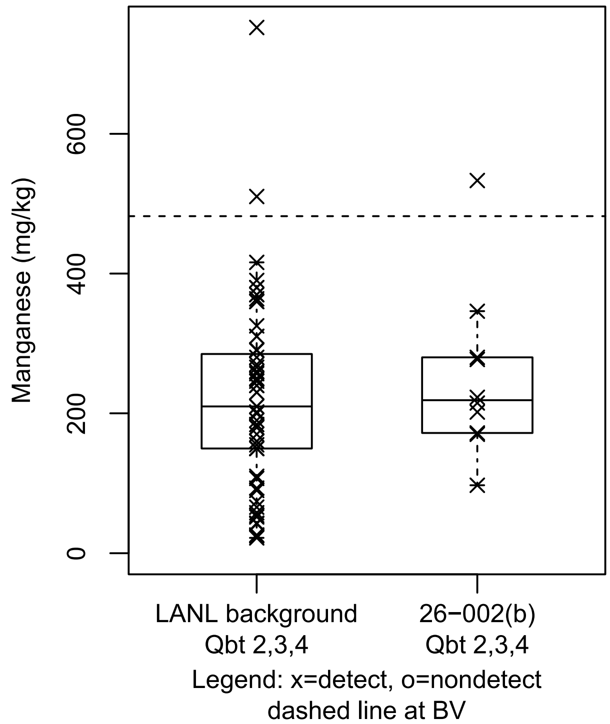

Figure G-367 Box plot for manganese in Qbt 3 at SWMU 26-002(b)

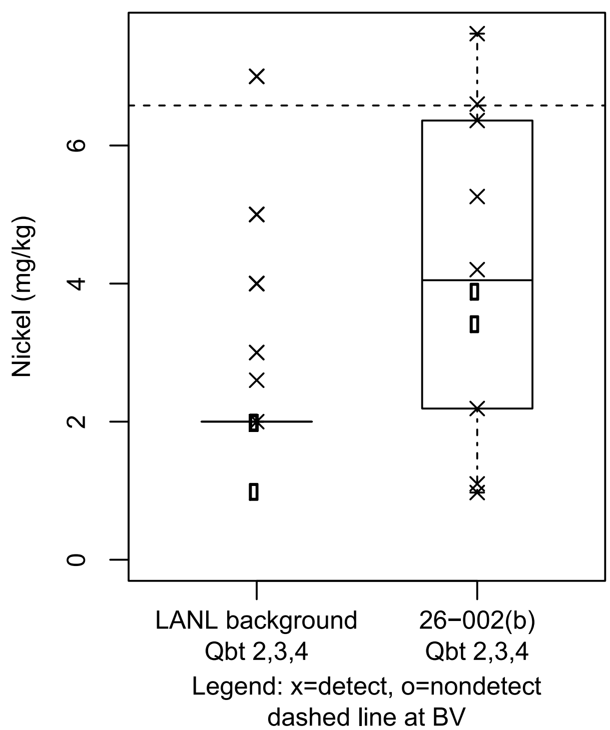

Figure G-368 Box plot for nickel in Qbt 3 at SWMU 26-002(b)

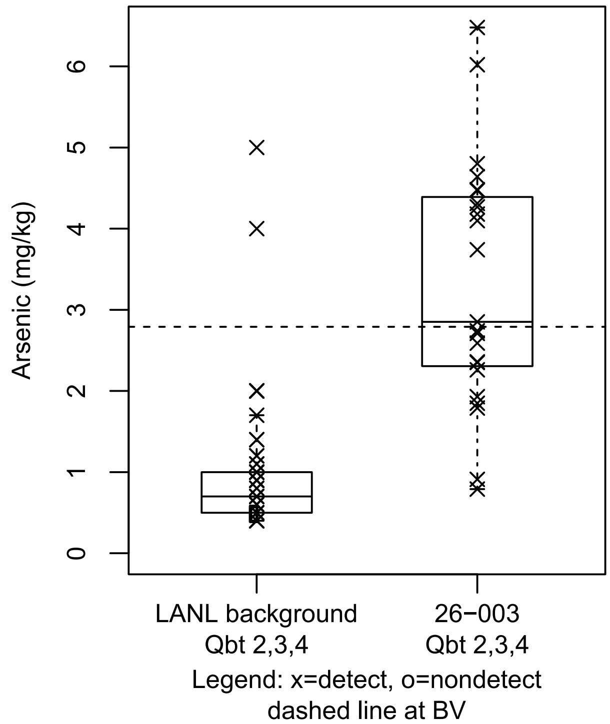

Figure G-369 Box plot for arsenic in Qbt 3 at SWMU 26-003

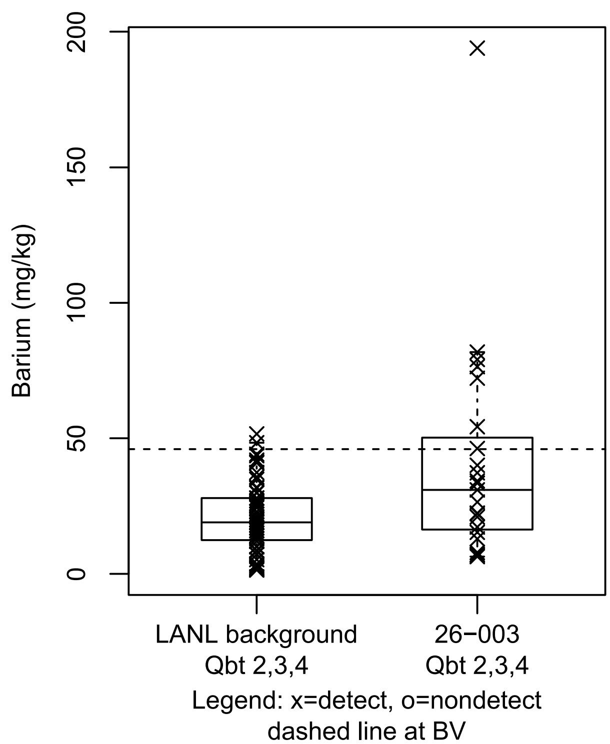

Figure G-370 Box plot for barium in Qbt 3 at SWMU 26-003

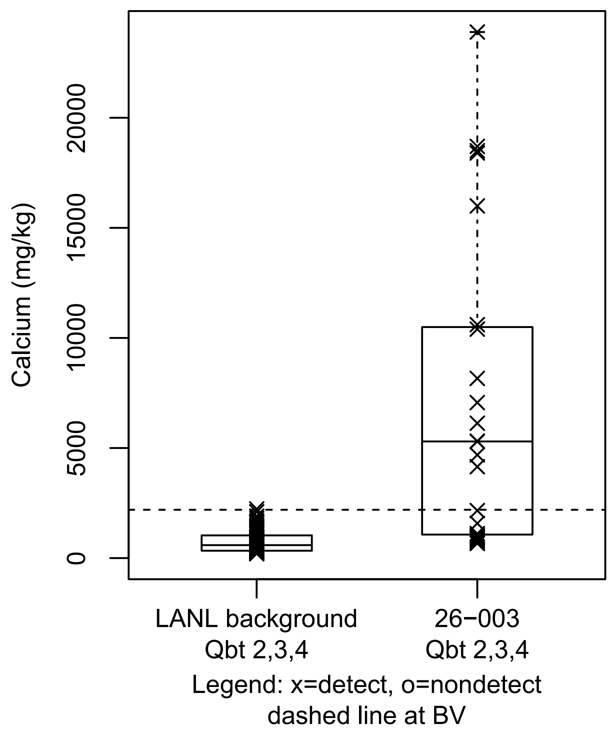

Figure G-371 Box plot for calcium in Qbt 3 at SWMU 26-003

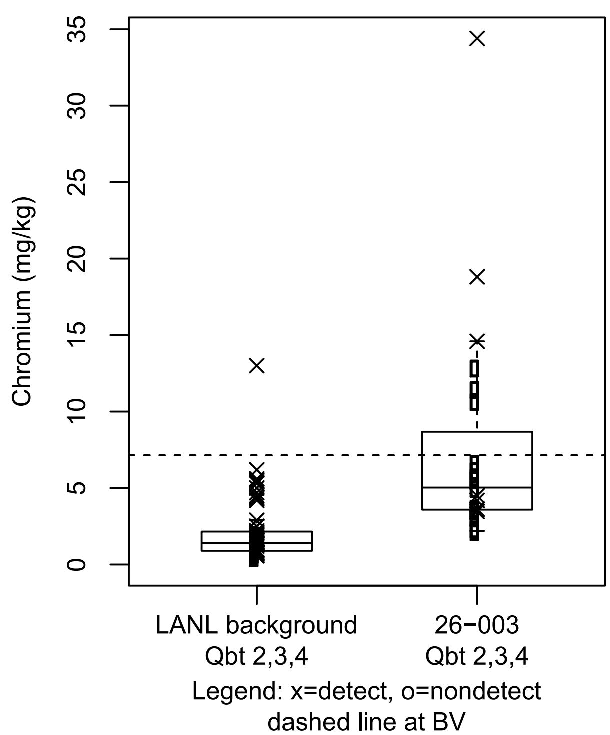

Figure G-372 Box plot for chromium in Qbt 3 at SWMU 26-003

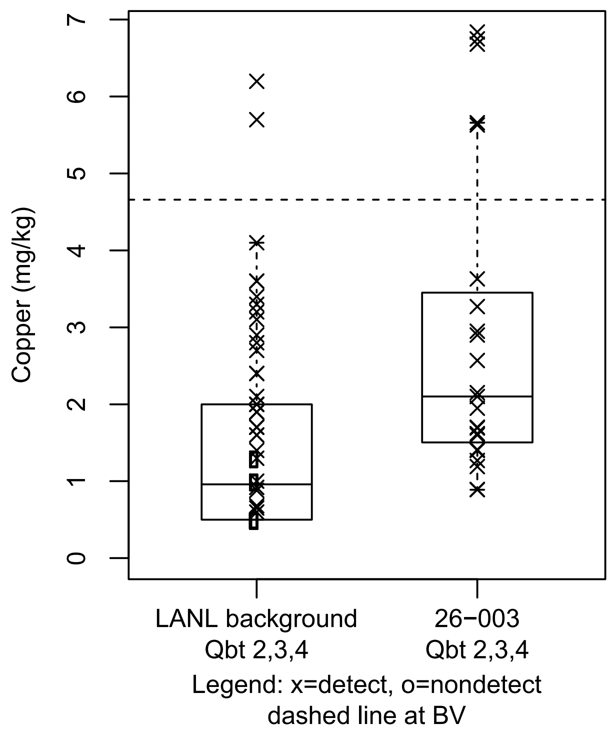

Figure G-373 Box plot for copper in Qbt 3 at SWMU 26-003

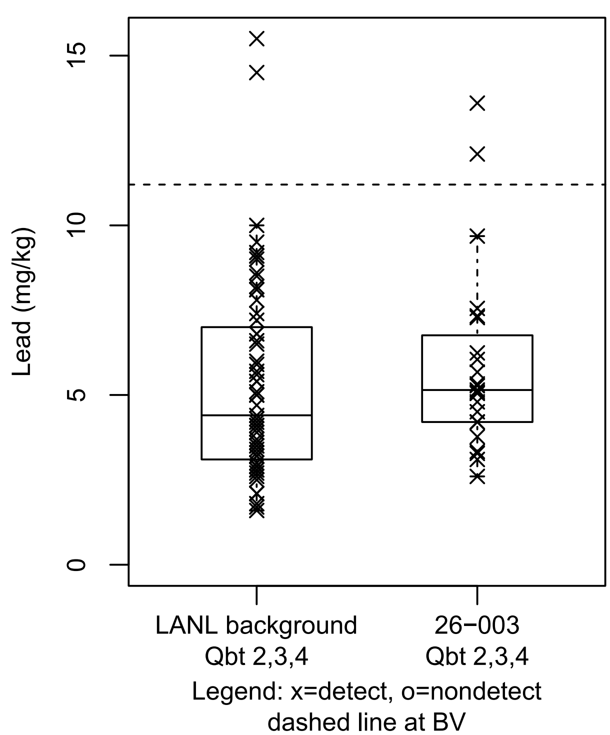

Figure G-374 Box plot for lead in Qbt 3 at SWMU 26-003

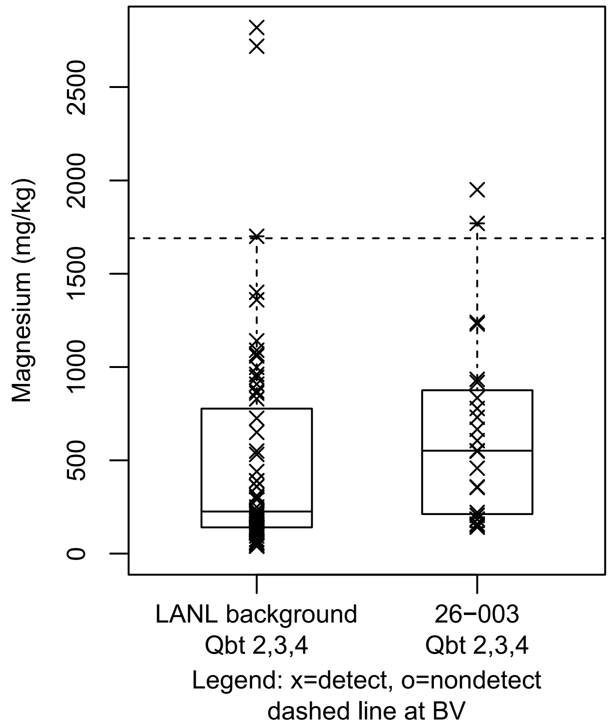

Figure G-375 Box plot for magnesium in Qbt 3 at SWMU 26-003

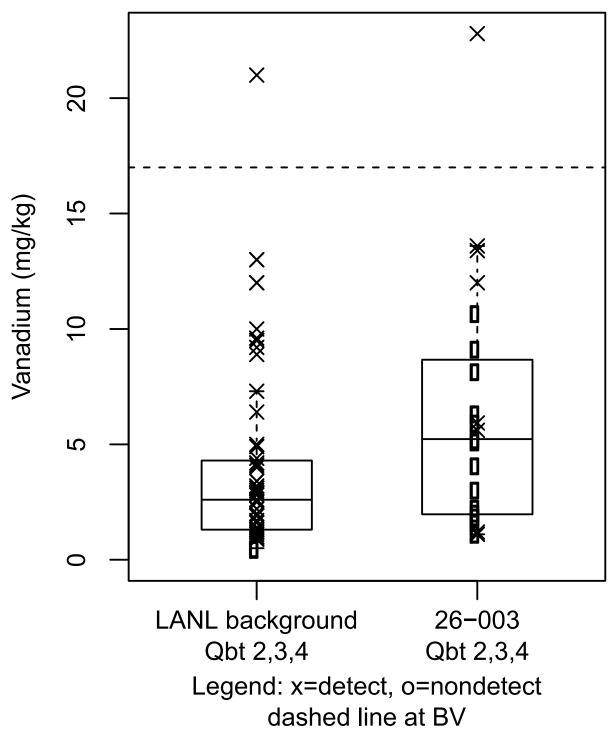

Figure G-376 Box plot for vanadium in Qbt 3 at SWMU 26-003

Table G-1
Results for Statistical Tests for Inorganic Chemicals in Qbo at AOC 02-003(a)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Aluminum	<0.0001	0.0012	0.00106	Yes
Barium	0.14	0.0991	0.0212	No
Chromium	<0.0001	<0.0001	<0.0001	Yes
Copper	0.9543	0.0826	0.0714	No
Iron	<0.0001	<0.0001	<0.0001	Yes
Manganese	<0.0001	<0.0001	<0.0001	Yes
Vanadium	<0.0001	0.0012	0.005	Yes

Table G-2
Results for Statistical Tests for Inorganic Chemicals in Soil at AOC 02-003(a)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Antimony	n/a*	0.114	1	No
Chromium	1	0.807	0.148	No
Copper	1	0.777	0.147	No
Lead	0.995	0.999	0.148	No
Manganese	0.994	0.999	1	No
Nickel	1	0.995	1	No
Selenium	n/a	0.215	1	No
Zinc	<0.0001	<0.0001	0.0214	Yes

* n/a = Not applicable.

Table G-3
Results for Statistical Tests for Inorganic Chemicals in Soil at AOC 02-003(b)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Selenium	n/a*	0.0604	1	No
Zinc	0.229	0.643	1	No

* n/a = Not applicable.

Table G-4
Results for Statistical Tests for Inorganic Chemicals in Qbo at AOC 02-003(c)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Aluminum	<0.0001	<0.0001	<0.0001	Yes
Arsenic	n/a*	0.00560	<0.0001	Yes
Barium	0.0240	0.0158	0.00106	Yes
Chromium	<0.0001	<0.0001	<0.0001	Yes
Iron	<0.0001	<0.0001	<0.0001	Yes
Manganese	<0.0001	0.00120	0.000199	Yes
Vanadium	<0.0001	0.00120	0.00106	Yes

* n/a = Not applicable.

Table G-5
Results for Statistical Tests for Inorganic Chemicals in Soil at AOC 02-003(c)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Barium	1	0.4418	0.0188	No
Calcium	1	0.987	1	No
Chromium	0.897	0.5921	1	No
Copper	0.998	0.668	0.0003	No
Lead	0.999	0.962	0.0188	No
Selenium	<0.0001	0.00014	<0.0001	Yes
Thallium	1	0.706	0.139	No
Zinc	0.204	0.130	1	No

Table G-6
Results for Statistical Tests for Inorganic Chemicals in Soil at AOC 02-003(d)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Beryllium	0.9083	0.8945	0.1594	No
Chromium	1	0.9999	1	No
Selenium	0.00134	0.0170	0.00709	Yes
Thallium	1	0.7057	0.1602	No
Zinc	<0.0001	<0.0001	1	Yes

Table G-7
Results for Statistical Tests for Inorganic Chemicals in Soil at AOC 02-003(e)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Antimony	n/a*	0.9913	0.1234	No
Calcium	1	0.9434	1	No
Chromium	0.9642	0.197	0.1036	No
Copper	0.9973	0.7788	1	No
Selenium	0.0746	0.263	0.111	No
Zinc	0.00270	0.000997	0.1042	Yes

* n/a = Not applicable.

Table G-8
Results for Statistical Tests for Inorganic Chemicals in Qbo at AOC 02-004(a)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Aluminum	<0.0001	0.000693	<0.0001	Yes
Arsenic	n/a*	0.00154	<0.0001	Yes
Barium	0.00488	0.000693	<0.0001	Yes
Beryllium	0.00368	0.8035	0.6338	No
Calcium	0.9516	0.8822	0.6429	No
Chromium	<0.0001	0.000693	<0.0001	Yes
Copper	0.1608	0.000693	0.000202	Yes
Iron	<0.0001	0.000693	<0.0001	Yes
Lead	0.1869	0.3552	0.6338	No
Magnesium	0.1387	0.9275	0.3984	No
Manganese	<0.0001	0.000693	<0.0001	Yes
Vanadium	<0.0001	0.000693	0.000107	Yes
Zinc	<0.0001	0.3552	1	No

* n/a = Not applicable.

Table G-9
Results for Statistical Tests for Inorganic Chemicals in Soil at AOC 02-004(a)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Calcium	1	0.8607	0.3135	No
Chromium	0.9948	0.1677	0.3135	No
Cobalt	1	1	0.3762	No
Copper	1	0.9997	0.0967	No
Lead	1	1	0.3135	No
Manganese	0.9986	1	0.3135	No
Selenium	<0.0001	0.000572	<0.0001	Yes
Zinc	<0.0001	<0.0001	0.3147	Yes

Table G-10
Results for Statistical Tests for Inorganic Chemicals in Qbo at AOC 02-004(b)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Arsenic	n/a*	<0.0001	<0.0001	Yes
Barium	0.1029	0.0551	0.0128	No
Chromium	0.00305	0.00207	0.000388	Yes
Iron	<0.0001	<0.0001	<0.0001	Yes
Manganese	<0.0001	0.000330	0.0128	Yes
Vanadium	<0.0001	0.0551	0.0128	Yes

* n/a = Not applicable.

Table G-11
Results for Statistical Tests for Inorganic Chemicals in Soil at AOC 02-004(b)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Calcium	0.9996	0.9709	1	No
Chromium	0.00128	0.000119	0.0798	Yes
Manganese	0.8765	0.8369	1	No
Selenium	n/a*	1	1	No
Zinc	<0.0001	<0.0001	0.00604	Yes

* n/a = Not applicable.

Table G-12
Results for Statistical Tests for Inorganic Chemicals in Qbo at AOC 02-004(f)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Aluminum	<0.0001	0.000256	<0.0001	Yes
Arsenic	n/a*	0.000318	<0.0001	Yes
Barium	<0.0001	0.000256	<0.0001	Yes
Chromium	<0.0001	0.000256	<0.0001	Yes
Copper	0.5413	0.00441	0.000672	Yes
Iron	<0.0001	0.000256	<0.0001	Yes
Lead	0.1034	0.3287	1	No
Manganese	<0.0001	0.000256	<0.0001	Yes
Vanadium	<0.0001	0.00441	0.00170	Yes

* n/a = Not applicable.

Table G-13
Results for Statistical Tests for Inorganic Chemicals in Soil at AOC 02-004(f)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Chromium	0.6501	0.0203	0.0102	Yes
Copper	0.998	0.0475	0.00211	Yes
Lead	1	1	0.2207	No
Selenium	<0.0001	0.3072	0.1678939	No
Zinc	<0.0001	<0.0001	0.000454	Yes

Table G-14
Results for Statistical Tests for Inorganic Chemicals in Qbo at AOC 02-004(g)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Aluminum	<0.0001	<0.0001	<0.0001	Yes
Barium	0.0259	0.00642	0.000388	Yes
Chromium	0.00169	0.000330	<0.0001	Yes
Copper	0.5826	0.1619	0.0605	No
Iron	<0.0001	<0.0001	<0.0001	Yes
Manganese	<0.0001	<0.0001	0.00241	Yes

Table G-15
Results for Statistical Tests for Inorganic Chemicals in Soil at AOC 02-004(g)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Cadmium	n/a*	0.267	1	No
Calcium	0.9988	0.9938	1	No
Chromium	0.7993	0.0109	0.0143	Yes
Copper	0.9872	0.0393	0.0142	Yes
Lead	0.9975	0.9255	0.0143	No
Manganese	0.9785	0.9728	1	No
Selenium	0.00784	0.0101	0.00198	Yes
Zinc	0.00143	0.0637	0.1224	No

* n/a = Not applicable.

Table G-16
Results for Statistical Tests for Inorganic Chemicals in Soil at SWMU 02-005

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Copper	1	0.9944	0.2091	No
Lead	0.9343	0.9044	0.00879	No
Selenium	n/a*	<0.0001	<0.0001	Yes
Zinc	<0.0001	<0.0001	0.211	Yes

* n/a = Not applicable.

Table G-17
Results for Statistical Tests for Inorganic Chemicals in Qbt 3 at SWMU 02-006(a)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Aluminum	0.2587	0.5209	0.00962	No
Arsenic	<0.0001	0.0172	0.6614	Yes
Barium	0.1047	0.0255	0.000102	Yes
Beryllium	0.3194	0.5006	0.4362	No
Calcium	0.5708	0.2176	0.00580	No
Chromium	<0.0001	0.000816	0.6614	Yes
Copper	<0.0001	0.0243	0.2869	Yes
Lead	<0.0001	<0.0001	0.000102	Yes
Magnesium	0.0531	0.5006	0.6614	No
Nickel	n/a*	0.1943	0.0230	Yes

* n/a = Not applicable.

Table G-18
Results for Statistical Tests for Inorganic Chemicals in Soil at SWMU 02-006(a)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Antimony	n/a*	1	1	No
Barium	1	0.9872	1	No
Lead	0.0365	0.0863	0.1436	No
Selenium	n/a	<0.0001	<0.0001	Yes
Zinc	0.2017	0.1505	0.0202	No

* n/a = Not applicable.

Table G-19
Results for Statistical Tests for Inorganic Chemicals in Qbo at SWMU 02-006(b)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Aluminum	<0.0001	0.000104	<0.0001	Yes
Arsenic	n/a*	0.000427	<0.0001	Yes
Barium	<0.0001	0.000104	<0.0001	Yes
Chromium	<0.0001	0.000168	<0.0001	Yes
Copper	0.335	0.009517	0.00789	Yes
Iron	<0.0001	0.000104	<0.0001	Yes
Manganese	<0.0001	0.000351	<0.0001	Yes
Vanadium	<0.0001	0.00232	0.00111	Yes

* n/a = Not applicable.

Table G-20
Results for Statistical Tests for Inorganic Chemicals in Soil at SWMU 02-006(b)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Calcium	0.8873	0.2111	0.00975	No
Chromium	0.9983	0.1275	0.2064	No
Lead	1	0.9991	0.00975	Yes
Selenium	<0.0001	0.8019	0.000756	Yes
Zinc	<0.0001	<0.0001	0.0468	Yes

Table G-21
Results for Statistical Tests for Inorganic Chemicals in Qbo at AOC 02-006(c)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Aluminum	<0.0001	<0.0001	<0.0001	Yes
Barium	0.0147	0.00500	0.000199	Yes
Chromium	<0.0001	0.00500	<0.0001	Yes
Copper	0.4734	0.01578	0.00106	Yes
Iron	<0.0001	<0.0001	<0.0001	Yes
Magnesium	0.1258	0.6901	0.2973	No
Manganese	<0.0001	<0.0001	<0.0001	Yes
Vanadium	<0.0001	0.00120	0.00106	Yes

Table G-22
Results for Statistical Tests for Inorganic Chemicals in Soil at AOC 02-006(c)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Calcium	0.7383	0.2049	1	No
Chromium	0.5115	0.0870	0.0112	No
Copper	0.9988	0.5	1	No
Lead	0.9991	0.9942	0.1082	No
Selenium	<0.0001	0.5814	0.35	No
Zinc	0.00402	0.0106	0.1088	Yes

Table G-23
Results for Statistical Tests for Inorganic Chemicals in Qbo at AOC 02-006(e)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Aluminum	<0.0001	0.000109	<0.0001	Yes
Arsenic	n/a*	0.0525	<0.0001	Yes
Barium	<0.0001	0.000109	0.000109	Yes
Chromium	<0.0001	0.000109	<0.0001	Yes
Copper	0.3389	0.0247	0.00514	Yes
Iron	<0.0001	0.000109	<0.0001	Yes
Manganese	<0.0001	0.000109	<0.0001	Yes
Vanadium	<0.0001	0.00263	0.00153	Yes

* n/a = Not applicable.

Table G-24
Results for Statistical Tests for Inorganic Chemicals in Soil at AOC 02-006(e)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Calcium	0.9522	0.4085	0.000763	No
Chromium	0.0548	0.0165	0.000763	Yes
Copper	0.9998	0.9983	1	No
Nickel	1	0.9986	1	No
Zinc	<0.0001	0.0625	0.1731	No

Table G-25
Results for Statistical Tests for Inorganic Chemicals in Qbo at SWMU 02-007

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Aluminum	<0.0001	0.000330	<0.0001	Yes
Barium	0.0542	0.05514	0.0605	No
Chromium	<0.0001	0.000330	<0.0001	Yes
Iron	<0.0001	<0.0001	<0.0001	Yes
Manganese	<0.0001	0.00642	0.0605	Yes

Table G-26
Results for Statistical Tests for Inorganic Chemicals in Soil at SWMU 02-007

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Barium	1	0.9791	0.0895	No
Lead	1	0.9853	0.0895	No
Selenium	0.00590	0.2159	0.0883	No

Table G-27
Results for Statistical Tests for Inorganic Chemicals in Soil at SWMU 02-008(a)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Chromium	<0.0001	<0.0001	0.000212	Yes
Copper	0.00493	0.00108	0.000209	Yes
Lead	0.9317	0.3839	0.0649	No
Thallium	1	0.9196	0.0649	No
Zinc	<0.0001	0.00233	0.0652	Yes

Table G-28
Results for Statistical Tests for Inorganic Chemicals in Soil at SWMU 02-009(a)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Calcium	0.9966	0.9978	0.0324	No
Chromium	1	1	0.3216	No
Copper	1	0.9958	0.0100	No
Iron	1	1	0.1017	No
Magnesium	1	1	1	No
Selenium	<0.0001	<0.0001	<0.0001	Yes
Zinc	0.0663	0.1291	0.000996	No

Table G-29
Results for Statistical Tests for Inorganic Chemicals in Soil at SWMU 02-009(b)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Calcium	1	0.9203	1	No
Chromium	1	0.9486	1	No
Selenium	0.0101	0.6324	0.3906	No
Zinc	<0.0001	<0.0001	1	Yes

Table G-30
Results for Statistical Tests for Inorganic Chemicals in Qbo at SWMU 02-009(c)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Aluminum	<0.0001	0.000392	<0.0001	Yes
Arsenic	n/a*	0.00102	<0.0001	Yes
Barium	0.00190	0.000835	0.000835	Yes
Beryllium	0.00414	0.8017	0.5667	No
Chromium	<0.0001	0.1321	<0.0001	Yes
Copper	0.921	0.1336	0.00710	Yes
Iron	<0.0001	0.000392	<0.0001	Yes
Manganese	<0.0001	0.000392	<0.0001	Yes
Nickel	n/a	0.00571	0.0510	Yes
Vanadium	<0.0001	0.00571	0.00174	Yes

* n/a = Not applicable.

Table G-31
Results for Statistical Tests for Inorganic Chemicals in Soil at SWMU 02-009(c)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Barium	1	1	0.1231	No
Chromium	0.9999	0.1661	0.0152	Yes
Lead	1	1	0.3663	No
Manganese	1	1	1	No
Uranium	1	0.999	0.1105	No
Zinc	0.5363	0.02917	1	No

Table G-32
Results for Statistical Tests for Inorganic Chemicals in Soil at AOC 02-009(d)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Calcium	0.9669	0.7808	0.1762	No
Chromium	n/a*	0.5376	0.1762	No
Lead	1	0.9999	0.1762	No
Selenium	<0.0001	0.0114	0.00205	Yes
Zinc	<0.0001	<0.0001	1	Yes

* n/a = Not applicable.

Table G-33
Results for Statistical Tests for Inorganic Chemicals in Qbo at AOC 02-010

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Aluminum	<0.0001	0.000191	<0.0001	Yes
Arsenic	n/a*	0.000636	<0.0001	Yes
Barium	<0.0001	0.000191	<0.0001	Yes
Chromium	<0.0001	0.000191	<0.0001	Yes
Copper	0.2183	0.2253	0.00109	No
Iron	<0.0001	0.000191	<0.0001	Yes
Manganese	<0.0001	0.000191	<0.0001	Yes
Nickel	n/a	0.000191	0.000191	Yes
Vanadium	<0.0001	0.000522	0.000398	Yes

* n/a = Not applicable.

Table G-34
Results for Statistical Tests for Inorganic Chemicals in Soil at AOC 02-010

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Antimony	n/a*	1	1	No
Barium	1	0.9503	0.0389	No
Calcium	1	0.9842	0.1991	No
Chromium	0.995	0.2747	1	No
Copper	1	0.4451	0.0371	Yes
Selenium	0.00343	0.1246	0.0353	Yes
Zinc	<0.0001	0.00250	0.2	Yes

* n/a = Not applicable.

Table G-35
Results for Statistical Tests for Inorganic Chemicals in Qbo at AOC 02-011(a)(i-vi)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Aluminum	0.000171	0.000336	0.000128	Yes
Barium	0.5546	0.7507	0.0552	No
Chromium	0.0124	0.0376	0.00492	Yes
Copper	0.969	0.0552	0.05062	No
Iron	3.15E-10	4.68E-05	2.00E-15	Yes
Manganese	8.86E-09	0.00547	0.000849	Yes
Nickel	n/a*	0.07	0.0552	No
Vanadium	4.20E-05	0.363	0.118	No

* n/a = Not applicable.

Table G-36
Results for Statistical Tests for Inorganic Chemicals in Soil at AOC 02-011(a)(i-vi)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Chromium	0.9937	0.5376	0.1991	Yes
Zinc	<0.0001	<0.0001	<0.0001	No

Table G-37
Results for Statistical Tests for Inorganic Chemicals in Soil at AOC 02-011(a)(viii)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Calcium	0.4752	0.1804	0.0847	No
Chromium	0.9785	0.5774	1	No
Copper	0.999	0.9787	1	No
Selenium	0.236	1	1	No
Zinc	0.1564	0.1528	1	No

* n/a = Not applicable.

Table G-38
Results for Statistical Tests for Inorganic Chemicals in Qbo at AOC 02-011(a)(ix)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Aluminum	<0.0001	0.000297	<0.0001	Yes
Arsenic	n/a*	0.000365	<0.0001	Yes
Barium	<0.0001	0.000297	<0.0001	Yes
Calcium	0.8259	0.8995	0.4681	No
Chromium	<0.0001	0.00608	<0.0001	Yes
Copper	<0.0001	0.000297	<0.0001	Yes
Iron	<0.0001	0.000297	<0.0001	Yes
Lead	0.00305	0.6756	0.4583	No
Magnesium	0.0241	0.6756	0.2048	No
Nickel	n/a	0.00525	0.00232	Yes
Vanadium	<0.0001	0.000297	<0.0001	Yes

* n/a = Not applicable.

Table G-39
Results for Statistical Tests for Inorganic Chemicals in Soil at AOC 02-011(a)(ix)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Calcium	0.9586	0.3364	0.1991	No
Chromium	0.9937	0.5376	0.1991	No
Copper	1	0.5895	0.1982	No
Lead	0.9993	0.9314	0.00140	No
Selenium	n/a*	0.0710	0.0174	Yes
Zinc	<0.0001	<0.0001	<0.0001	Yes

* n/a = Not applicable.

Table G-40
Results for Statistical Tests for Inorganic Chemicals in Qbo at AOC 02-011(a)(x)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Aluminum	<0.0001	<0.0001	<0.0001	Yes
Arsenic	n/a*	0.000223	<0.0001	Yes
Barium	0.0104	0.0816	0.00304	Yes
Chromium	<0.0001	0.000112	<0.0001	Yes
Iron	<0.0001	<0.0001	<0.0001	Yes
Manganese	<0.0001	0.00120	0.000184	Yes
Nickel	n/a	0.0991	0.1167	No
Vanadium	<0.0001	0.00120	0.000782	Yes

* n/a = Not applicable.

Table G-41
Results for Statistical Tests for Inorganic Chemicals in soil at AOC 02-011(a)(x)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Arsenic	1	0.998	0.1524	No
Barium	0.999	0.934	0.0176	No
Calcium	0.702	0.0305	0.135	No
Chromium	1	0.864	1	No
Cobalt	1	0.998	0.171	No
Copper	1	0.947	0.134	No
Iron	1	0.971	0.134	No
Lead	1	0.998	1	No
Zinc	n/a*	0.008704	0.00903	Yes

* n/a = Not applicable.

Table G-42
Results for Statistical Tests for Inorganic Chemicals in Qbo at AOC 02-011(b)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Aluminum	0.00184	0.1263	0.0499	Yes
Iron	<0.0001	<0.0001	<0.0001	Yes
Manganese	<0.0001	0.0180	0.00936	Yes
Nickel	n/a*	0.0180	1	Yes
Vanadium	<0.0001	0.1263	0.04991	Yes

* n/a = Not applicable.

Table G-43
Results for Statistical Tests for Inorganic Chemicals in Soil at AOC 02-011(b)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Chromium	0.915	0.277	0.0546	No
Manganese	0.923	0.895	1	No
Nickel	0.9981	0.8776	1	No
Zinc	0.0169	0.0243	1	Yes

Table G-44
Results for Statistical Tests for Inorganic Chemicals in Qbt 3 at AOC 02-012

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Aluminum	<0.0001	0.000109	<0.0001	Yes
Arsenic	n/a*	0.000135	<0.0001	Yes
Barium	0.00535	0.000109	0.000109	Yes
Chromium	<0.0001	0.000424	<0.0001	Yes
Copper	0.2256	0.000297	<0.0001	Yes
Iron	<0.0001	0.000109	<0.0001	Yes
Manganese	<0.0001	0.000109	<0.0001	Yes
Nickel	n/a	0.002629	0.0163	Yes
Vanadium	<0.0001	0.002629	0.0015	Yes
Zinc	0.0017	0.3514	0.381	No

* n/a = Not applicable.

Table G-45
Results for Statistical Tests for Inorganic Chemicals in Soil at AOC 02-012

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Chromium	n/a*	0.603	1	No
Copper	1	0.976	0.121	No
Lead	1	0.997	1	No
Selenium	<0.0001	0.0264	0.0179	Yes
Zinc	<0.0001	0.000371	0.0144	Yes

* n/a = Not applicable.

Table G-46
Results for Statistical Tests for Inorganic Chemicals in Qbt 3 at SWMU 21-006(e) and AOC 21-006(f)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Aluminum	0.551	0.802	0.496	No
Antimony	n/a*	0.240	<0.0001	Yes
Arsenic	<0.0001	0.01856	1	Yes
Barium	0.002884	<0.0001	<0.0001	Yes
Calcium	<0.0001	<0.0001	<0.0001	Yes
Chromium	<0.0001	0.507	1	No
Cobalt	0.773	0.284	0.608	No
Copper	n/a	0.0008178	0.0026921	Yes
Lead	n/a	0.307	0.001121	Yes
Magnesium	0.003093	0.465	1	No
Manganese	0.244	0.985	1	Yes
Nickel	n/a	0.04068	0.001213	Yes
Zinc	0.551	0.802	0.496	No

* n/a = Not applicable.

Table G-47
Results for Statistical Tests for Inorganic Chemicals in Qbt 3 at AOC 21-028(c)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Aluminum	0.0599	0.53	0.311	No
Antimony	n/a*	0.007705	<0.0001	Yes
Arsenic	<0.0001	0.605	0.307	No
Barium	0.01195	<0.0001	<0.0001	Yes
Calcium	<0.0001	<0.0001	<0.0001	Yes
Chromium	<0.0001	<0.0001	0.0921	Yes
Cobalt	0.502	0.312	0.676	No
Copper	0.006208	0.307	0.001121	Yes
Iron	0.02116	0.902	0.556	No
Lead	0.073	0.119	0.00012263	Yes
Magnesium	0.002368	0.206	1	No
Manganese	0.899	0.995	1	No
Nickel	n/a	0.35	0.0276	Yes
Vanadium	<0.0001	0.001194	0.01446	Yes
Zinc	0.1	0.223	0.04998	No

* n/a = Not applicable.

Table G-48
Results for Statistical Tests for Inorganic Chemicals in Soil at AOC 21-028(c)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Antimony	<0.0001	<0.0001	0.000717	Yes

Table G-49
Results for Statistical Tests for Inorganic Chemicals in Qbt 3 at SWMU 26-001

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Aluminum	0.908	0.996	1	No
Arsenic	<0.0001	<0.0001	1	Yes
Barium	0.509	0.117	<0.0001	No
Beryllium	0.996	0.997	1	No
Calcium	<0.0001	<0.0001	<0.0001	Yes
Chromium	<0.0001	<0.0001	0.4074	Yes
Cobalt	0.919	0.292	0.5048	No
Copper	<0.0001	<0.0001	<0.0001	Yes
Lead	0.436	0.982	1	No
Magnesium	<0.0001	0.168	0.1637	No
Nickel	n/a*	<0.0001	0.06673	No

* n/a = Not applicable.

Table G-50
Results for Statistical Tests for Inorganic Chemicals in Soil at SWMU 26-001

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Calcium	<0.0001	<0.0001	<0.0001	Yes

Table G-51
Results for Statistical Tests for Inorganic Chemicals in Qbt 3 at SWMU 26-002(a)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Arsenic	<0.0001	<0.0001	0.0731	Yes
Barium	0.309	0.00709	<0.0001	Yes
Cadmium	n/a*	1	0.7581	No
Calcium	<0.0001	<0.0001	<0.0001	Yes
Chromium	<0.0001	0.00983	0.012	Yes
Cobalt	0.9501	0.3267	0.8103	No
Copper	<0.0001	0.0223	0.1771	Yes
Magnesium	0.0364	0.2827	1	No
Manganese	0.023	0.4616	0.4234	No
Nickel	n/a	0.000903	0.00011	Yes
Vanadium	0.3207	0.1896	0.4234	No
Zinc	0.9995	1	0.4234	No

* n/a = Not applicable.

Table G-52
Results for Statistical Tests for Inorganic Chemicals in Qbt 3 at SWMU 26-002(b)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Arsenic	0.000261	0.00221	1	Yes
Barium	0.497	0.0911	<0.0001	No
Calcium	0.000367	0.00221	<0.0001	Yes
Chromium	0.0053	0.0248	0.135	Yes
Lead	0.3067	0.291	0.0171	No
Magnesium	0.03323	0.0872	1	No
Manganese	0.264	0.607	1	No
Nickel	n/a*	0.00841	0.137	Yes

* n/a = Not applicable.

Table G-53
Results for Statistical Tests for Inorganic Chemicals in Qbt 3 at SWMU 26-003

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage p-Value	COPC?
Arsenic	<0.0001	<0.0001	0.0676	Yes
Barium	0.0105	0.0098	0.000215	Yes
Calcium	<0.0001	<0.0001	<0.0001	Yes
Chromium	n/a*	0.0549	0.0167	Yes
Copper	0.0001	0.0363	0.0167	Yes
Lead	0.115	0.899	1	No
Magnesium	0.0118	0.486	1	No
Vanadium	n/a	0.182	0.264	No

* n/a = Not applicable.

Appendix H

Risk Assessments

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H-1.0 INTRODUCTION

This appendix presents the results of the human health and ecological risk-screening evaluations conducted in support of the environmental characterization of the Middle Los Alamos Canyon Aggregate Area sites, located in the northern portion of Los Alamos National Laboratory (LANL or the Laboratory). The evaluations of potential risk at 39 solid waste management units (SWMUs) and areas of concern (AOCs) are based on decision-level data from the 2000, 2003, 2007, 2010, 2017, and 2018 investigations.

H-2.0 BACKGROUND

Brief descriptions of the Middle Los Alamos Canyon Aggregate Area sites assessed for potential risks and dose are presented below.

H-2.1 Site Descriptions and Operational History (TA-02, TA-21, and TA-26)

Technical Area 02 (TA-02) was used to house a series of research reactors from 1943 to 2003 when decontamination and decommissioning (D&D) of the site occurred. The main reactor building (02-1) was constructed in 1943. It housed five separate nuclear reactors: three iterations of water boiler reactors (WBRs) located on the east side of the building, one plutonium-fueled reactor (the Clementine Reactor) followed by an enriched uranium reactor, and the Omega West Reactor (OWR). A number of facilities were constructed over the years to support the TA-02 research activities. TA-02 was active from 1943 to 1993 (WD-3 2003, 082646, pp. 1–2). Various remedial actions, such as soil removal and D&D, were conducted in the bottom of Los Alamos Canyon, including at TA-02, after the Cerro Grande fire. These actions were taken to reduce the risk of contaminants dispersing from post-fire floods. Approximately 54 yd^3 of soil contaminated with cesium-137 was removed in 2000, following an extensive field survey for gross-gamma radiation (LANL 2001, 070352). The OWR and associated structures underwent D&D in 2002 and 2003 (WD-3 2003, 082646). After all structures at TA-02 were removed, field radiological surveys were conducted to confirm that surface contamination release limits were not exceeded (WD-3 2003, 082646, pp. 18–19). The land was returned to its original contour and reseeded (WD-3 2003, 082646, pp. 1–2). The road accessing the reactor site is controlled by the Laboratory via a locked gate.

Operations at TA-21 started in 1945 for establishing the chemical and metallurgical properties of the nuclear material necessary to achieve and sustain the required nuclear fission reaction. The primary operation at DP West (western portion of TA-21) was to produce metal and alloys of plutonium from the nitrate solution feedstock provided by other production facilities. A major research objective at DP West was the development of new purification techniques that would increase the efficiency of the separation processes (Christensen and Maraman 1969, 004779). Details of the purification techniques are discussed in the operable unit (OU) work plan for TA-21 (LANL 1991, 007529). Other operations at DP West included nuclear fuel reprocessing. In 1977, a transfer of work to the new plutonium facility at TA-55 began, and much of the DP West complex was vacated. Operations at DP East (the eastern portion of TA-21) were to process polonium and actinium and to produce initiators (a nuclear weapons component). In 1964, building 21-209 was built to house research into high-temperature and actinide chemistry. Building 21-155 formerly housed the Tritium Systems Test Assembly for developing and demonstrating effective technology for handling and processing deuterium and tritium fuels for use in fusion reactors. Building 21-155 underwent D&D as part of TA-21 D&D operations that began in 2009. TA-21 also includes Material Disposal Areas (MDAs) A, B, T, U, and V. Process wastes, transuranic wastes, and liquid wastes were disposed of in the MDAs from the early 1940s to the late 1970s; details of the disposal methods are presented in the TA-21 operable unit work plan (LANL 1991, 007529).

TA-26 is a former technical area located south of NM 502, east and south of the Los Alamos County airport and west of the East Gate Industrial Park. The area is restricted to D-Site, which contained the East Gate vault. D-Site was established for Los Alamos Scientific Laboratory's Chemistry and Metallurgical Research division for the purpose of storing radioactive materials (LASL 1947, 000664). The area consisted of several structures, including the East Gate vault (building 26-1), Guard Tower A (structure 26-2), Guard Tower B (structure 26-3), a guard building (26-4), the east room septic system (structure 26-5), and a sump system (structure 26-6). Construction at D-Site began on April 1, 1946. The concrete storage vault, Guard Tower A, the guard building, and the sump system were completed in October 1946. Guard Tower B was moved from TA-21 to TA-26 in March 1948. The septic system was installed in August 1948. The guard building was removed in December 1948, and the two guard towers were removed in May 1955 (LASL no date, 000675). The storage vault was later used by the Zia Company for storing high explosives (HE) (Lojek 1991, 001904). The vault operated from approximately 1946 to 1965. D-Site was demolished in 1965 and 1966.

H-2.1.1 AOC 02-003(a)

AOC 02-003(a) was the site of the stack-gas valve house (structure 02-19) and associated stainless-steel gaseous effluent vent lines (lines 117 and 118), as shown on engineering drawing C-1718 (LASL 1947, 089677). This system was associated with the WBR, a homogeneous liquid-fueled reactor fueled by an enriched uranyl-salt compound. The stack-gas valve house and effluent vent lines system were installed in 1944 and received off-gas from the WBR. The off-gas contained gaseous fission products, including cesium-137, strontium-90, technetium-99, and iodine-131 (LANL 1993, 015314, p. 7.4-1). The stack-gas valve house was primarily aboveground and was constructed of reinforced concrete, 11 ft × 9 ft × 10 ft high, with 18-in.-thick walls (Elder and Knoell 1986, 006670, p. 4). From 1944 to 1948, gaseous effluent entered the stack-gas valve house from line 117 and was directed via line 118 to the southeast. Line 118 was used as a temporary gas vent until July 1948 when the condensate trap and line 119 [AOC 02-003(b)] became operational. Line 118 was left in place from 1948 to its removal in 1985 (Elder and Knoell 1986, 006670, pp. 8, 29, 43). Line 117 and the stack-gas valve house remained in use until 1974 when they became inactive and were removed and disposed of during D&D efforts in 1985 (Elder and Knoell 1986, 006670, pp. 22-29, p. 43).

H-2.1.2 AOC 02-003(b)

AOC 02-003(b) consisted of the condensate trap (structure 02-48) and associated stainless-steel line (line 119). The WBR off-gas system consisted of the stack-gas valve house, condensate trap, mesa-top vent stack located above TA-02 at TA-61, and associated stainless-steel lines. The condensate trap was a concrete manhole superstructure and a small-diameter standpipe. It was located at the lowest point of line 119 between the stack-gas valve house [structure 02-19, AOC 02-003(a)] and the delay tanks [structure 02-131, AOC 02-003(c)], as shown on engineering drawing C-1718 (LASL 1947, 089677; Elder and Knoell 1986, 006670, p. 29). Line 119 consisted of an approximately 78-ft-long east-west trending pipe section that ran from the stack-gas valve house (structure 02-19) to the condensate trap and a 205-ft-long north-south trending section that ran from the condensate trap to the delay tanks. Line 119 continued from the delay tanks to the junction with the main OWR gaseous effluent vent line and up to the mesa-top stack (structure 02-9) and French drain [SWMU 02-006(a)] located at TA-61 (Elder and Knoell 1986, 006670, pp. 6, 8). The upper portion of the gaseous effluent vent line (line 119) from the delay tanks to the mesa-top stack is addressed as AOC 02-003(d). The WBR off-gas system was installed in 1948. The off-gas contained gaseous fission products, including cesium-137, strontium-90, technetium-99, and iodine-131 (LANL 1993, 015314, p. 7.4-1). The condensate trap and line 119 from the stack-gas valve house (structure 02-19) to the delay tanks remained in use through 1974. The units were inactive from 1974 to 1985 and were removed and disposed of during D&D efforts in 1985 (Elder and Knoell 1986, 006670, pp. 22-29, p. 43).

H-2.1.3 AOC 02-003(c)

AOC 02-003(c) consisted of two parallel underground stainless-steel gaseous effluent delay tanks (each 1 ft in diameter by 20 ft long and buried 4 ft deep). The tanks were part of the gaseous effluent vent line system associated with the WBR. The 1990 SWMU report (LANL 1990, 007511) describes the tanks as being “in series”; however, excavation of the tanks during the 1985 D&D indicated that they were parallel and oriented east to west (Elder and Knoell 1986, 006670, p. 8). The gaseous effluent vent system was in place by 1951 and received off-gas from the WBR. The off-gas contained gaseous fission products, including cesium-137, strontium-90, technetium-99, and iodine-131 (LANL 1993, 015314, p. 7.4-1). It is unclear when the delay tanks were installed. The original as-built drawing of the condensate trap and line 119 (LASL 1947, 089677) dated 1947 does not show the delay tank system. The tanks appear to have been installed in 1951 when other modifications to the gaseous effluent vent line system were made (Montoya 1991, 006997, p. 2); however, no installation record is available. The delay tanks remained in use until 1974 and were inactive from 1974 to 1985. The tanks were removed and disposed of during D&D efforts in 1985 (Elder and Knoell 1986, 006670, pp. 22-29, p. 43).

H-2.1.4 AOC 02-003(d)

AOC 02-003(d) consists of two distinct areas. One is the potential soil contamination area associated with a temporary gaseous effluent vent, the garden hose that reportedly served as a temporary vent line for the WBR during initial operations (LANL 1993, 015314, p. 7.4-3). This area is located approximately 120 ft northeast of the former OWR building. The second and primary area of AOC 02-003(d) is the 1200-ft gaseous effluent vent line from the delay tanks (structure 02-131) to the mesa-top stack [structure 02-9, SWMU 02-006(a)]. The garden hose discharge was reportedly used from 1943 to when the stack on the mesa top (structure 02-9, located at TA-61) was built in 1948 (LANL 1993, 015314, 7.4-3). The gaseous effluent vent line received gaseous effluent from the WBR from 1948 to 1974 and from the OWR from 1956 to 1993 (Elder and Knoell 1986, 006670, p. 8). The mesa-top stack remained in use from 1948 to 1993. The stack received waste from only the WBR from 1948 to 1956, when the OWR was brought online. The stack received waste from both the WBR and the OWR from 1956 to 1974. The stack received effluent from only the OWR from 1974 to 1993. The stack became inactive in 1993 when the OWR was deactivated, and the stack was removed and disposed of in November 2002 (LANL 2003, 090089, p. 2). Line 119 was removed in April 2003 (WD-3 2003, 082646, p. 2).

H-2.1.5 AOC 02-003(e)

AOC 02-003(e) is the former location of an 800-L stainless-steel holding tank (structure 02-62), installed in approximately 1944, and was associated with operation of the WBR. The holding tank was adjacent to the stack-gas valve house (structure 02-19) and was designed to collect WBR cooling water in the event of a cooling coil breach. The WBR holding tank was installed in approximately 1944 and may have been used until 1974, when the WBR was placed in safe-shutdown mode. The holding tank was removed and disposed of during D&D activities in 1985. During D&D, the tank reportedly showed no sign of having been used. However, reports of a “surge tank” running over indicate an original tank may have been used and replaced during its active life (Elder and Knoell 1986, 006670, p. 2; DOE 1987, 008663).

H-2.1.6 AOC 02-004(a)

AOC 02-004(a) is the OWR facility (building 02-1) and is composed of the OWR, the OWR fuel-handling area, the OWR cooling-liquid recirculating piping, the OWR gaseous effluent vent line, the OWR material storage area, and the WBR. To facilitate discussion, AOC 02-004(a) is divided into the following three areas.

OWR, Fuel-Handling Area, Cooling-Liquid Recirculating Piping, and Gaseous Effluent Vent Line. A 25-kilowatt fast-neutron research reactor, Clementine, was located in the western third of building 02-1. The reactor was self-contained and operated from 1946 to 1953 (LANL 1993, 015314, p. E-8). Clementine was the precursor to the OWR and was dismantled in 1954 (WD-3 2003, 082646, p. 2).

The OWR was built above the former Clementine site in the western third of building 02-1. The OWR was an 8-megawatt water-cooled tank-type research reactor fueled by enriched solid uranium. It was put online in 1956 and operated until it was put on standby status in 1993. The reactor remained inactive until it was decommissioned, removed, and disposed of in 2003 (WD-3 2003, 082646, p. 2).

The OWR fuel-handing area consisted of a fuel pit and a closed recirculating system that serviced only the fuel pit. It was located adjacent to the OWR and was used for temporary storage of fuel rods before they were recycled.

The OWR operated with a cooling-liquid recirculating system that consisted of a series of closed-loop pipes in a 100-ft-long corridor that extended from the OWR west to the reactor facility equipment building [building 02-44, AOC 02-004(f)]. The water was routed through pumps, filters, and chillers in the reactor facility equipment building and back to the reactor. The cooling tower (structure 02-49) was added in 1959 to supplement the building 02-44 chillers in this closed system. The recirculating system was active from 1956 to 1993, when it was put on standby status during the OWR shutdown.

Off-gas from the OWR was routed through the gaseous effluent vent line to a connection into line 119 on the east side of TA-02, where the effluent continued up to the mesa-top stack [structure 02-9, SWMU 02-006(a)]. The gaseous effluent vent line teed off from the piping corridor between the OWR and OWR equipment building (02-44), as shown on engineering drawing C-10473 (LASL 1957, 090082).

OWR Material Storage Area. Operation of the OWR included the temporary storage of material (isotope columns, through-put port metal sleeves, etc.) that became activated during contact in the reactor neutron flux field. The material was stored in a structure adjacent to the guard quarters (building 02-4), located south of the reactor, to await final disposition. The material storage structure was present in as-built engineering drawing R-391 in 1958 (LASL 1958, 090085) and was removed in 2000 (LANL 2000, 090087).

WBR. The WBR was the name used for a series of three small research reactors, low power (LOPO), high power (HYPO), and super power (SUPO), located in the eastern third of the OWR building (02-1). The reactors were each progressively stronger in power output, each consisted generally of a 1-ft-diameter sphere filled with liquid fuel, and each was surrounded with neutron-reflecting blocks sitting on a graphite base. The LOPO reactor became functional in May 1944 (Montoya 1991, 006997, p. 5). The LOPO was dismantled, removed, and disposed of in September 1944. The HYPO reactor became operational in December 1944 and was later upgraded to SUPO, which became operational in 1951. The SUPO was decommissioned, removed, and disposed of in 1990 (Montoya 1991, 006997, p. 2).

The reactors were surrounded by a 15-ft × 15-ft × 11-ft concrete biological shield. A shallow sand pit and a utility trench were present beneath the reactor sphere and were used to collect liquids and gases from the reactor and transport them to support structures on the east side of building 02-1. External structures and underground piping associated with the gaseous effluent vent line system were removed and disposed of in 1986 (Elder and Knoell 1986, 006670, p. 43). Six concrete structures were dismantled, and 435 ft of contaminated underground piping was removed and disposed of. Cesium-137 contamination was found in the OWR building (02-1) near the sand pit and the utility trench during D&D activities. The soil was removed and disposed of during D&D activities (Montoya 1991, 006996, p. 5).

At peak operation, the WBR generated approximately 0.25 L/min of excess gas containing some fission products. These gases were managed through the WBR gaseous effluent vent line system (LANL 1993, 015314, p. E-8). Some radionuclides may have been deposited on the ground surface as gaseous effluent drifted from this system, and condensate from the gaseous effluent may have leaked from portions of the vent line system. These releases are addressed as AOCs 02-003(a,b,c,d).

The OWR experienced a cooling system water leak in January 1993. As a result, the reactor was put on standby status in 1993 and remained inactive until it was decommissioned in 2003 (WD-3 2003, 082646, p. 2).

H-2.1.7 AOCs 02-004(b,c,d)

AOCs 02-004(b,c,d) consisted of a system of three individual liquid waste storage tanks. Each tank is a separate AOC, but because of their proximity to one another and identical processes associated with all three tanks, the three AOCs are discussed together and the data for all three are evaluated together in this appendix. The system contained three underground 1200-gal. stainless-steel effluent storage tanks (structures 02-54, 02-55, and 02-56) with rubberized liners, approximately 150 ft west of building 02-1. The tanks received liquid waste that was primarily flushed effluent from the ion-exchange system associated with the OWR [AOC 02-004(a)]. The tanks also received any spills or leaks collected from the floor of the OWR equipment building [02-44, AOC 02-004(f)], as shown on engineering drawing C-29861 (LASL 1962, 090055).

The tanks were approximately 5-ft-high and 6-ft-diameter cylinders with approximately 2 ft of spacing between them within a single reinforced-concrete vault. The vault was rectangular and approximately 8 ft × 23 ft. The top of the vault was approximately 4 ft below ground surface (bgs), as shown on engineering drawing C-29861 (LASL 1962, 090055). The vault was adjacent to the reactor facility acid pit/transfer sump [structure 02-53, AOC 02-004(e)] and aligned perpendicular to Los Alamos Creek. The southernmost tank was structure 02-54 [AOC 02-004(b)], structure 02-55 [AOC 02-004(c)] was the center tank, and structure 02-56 [AOC 02-004(d)] was the northernmost tank. The bottom of the vault was approximately 10 ft bgs. The lines from the tanks to the reactor facility acid pit/transfer sump [(AOC 02-004(e)] were approximately 8 ft long and were used to temporarily store the liquid until it was transferred to the liquid acid waste line [AOC 02-004(f)] leading to TA-50 or to the aboveground portable tank [AOC 02-004(g)].

The tanks, vault, transfer sump, and lines were installed in 1962 according to engineering drawing C-29861, sheet 4 of 13 (LASL 1962, 090055). Leaks in the OWR cooling-liquid system led to the shutdown of the OWR in 1993. All systems were put on standby status in 1993; in 1995, all lines and tanks were drained and the liquids were disposed of (LANL 2000, 090087). In 2000, the tanks, vault, and transfer sump were removed and disposed of (LANL 2000, 090087). In 2003, the lines connecting the tanks to the acid pit/transfer sump [structure 02-53, AOC 02-004(e)], OWR equipment building [02-44, AOC 02-004(f)], the liquid acid waste line leading to TA-50, and the acid pit/transfer sump [structure 02-53, AOC 02-004(e)] outfall [AOC 02-011(d)] were removed and disposed of (WD-3 2003, 082646).

H-2.1.8 AOC 02-004(e)

AOC 02-004(e) was a liquid transfer system that consisted of a series of valves and pumps that transferred waste from the OWR equipment building (02-44) to the structure 02-54, 02-55, or 02-56 tanks, the portable aboveground tank [no structure number, AOC 02-004(g)], or the liquid acid waste line leading to TA-50. The equipment was housed in a partially belowground transfer sump, referred to as the acid pit/transfer sump (structure 02-53). The unit was a reinforced-concrete pit that measured 7 ft wide × 11 ft long × 7 ft deep. Approximately 1 ft of the pit was aboveground, as indicated on engineering drawing C-29861 (LASL 1962, 090055).

The liquid waste line entered the sump from the OWR equipment building [02-44, AOC 02-004(f)] at approximately 5 ft bgs and connected to the tanks at 8 ft bgs.

The acid pit/transfer sump was operational beginning in 1963. The system transferred liquid wastes from the OWR equipment building to three storage tanks [AOCs 02-004(b,c,d)]. The tanks were used to store the liquid temporarily until it was transferred to the liquid acid waste line (no structure number) leading to TA-50 or to the portable aboveground tank [(no structure number) AOC 02-004(g)].

Use of the acid pit/transfer sump was discontinued in 1993 when the OWR was shut down (WD-3 2003, 082646, p. 2). All liquid waste was drained from the system in 1995, and in 2000 the structure and equipment were decommissioned and removed (LANL 2000, 090087). All remaining buried pipes and drains were removed and disposed of in 2003 (WD-3 2003, 082646).

H-2.1.9 AOC 02-004(f)

AOC 02-004(f) was a 49-ft × 26-ft equipment building (02-44) that contained several pumps, including the main circulating pump for the OWR cooling water, a buffalo chiller (a cooling system), and an ion-exchange filter system to maintain the OWR cooling-liquids system. At a later date, these systems were also connected to TA-50 by a liquid acid waste line. Lines associated with the OWR equipment building were present at approximately 4 ft bgs.

Building 02-44 became operational in 1954 and had floor drains that discharged to Los Alamos Creek through an outfall located at SWMU 02-008(a). Modifications to the cooling water system, with the addition of the cooling tower (structure 02-49) and associated outfall, were made in 1959, as shown on engineering drawing C-21327 (LASL 1957, 090058). The drain from the OWR equipment building was connected to the cooling tower outfall in 1959, as shown on engineering drawing C-48768 (LANL 1993, 090056). The outfalls in Los Alamos Creek were physically the same [location of SWMU 02-008(a)]. When the acid pit/transfer sump and effluent storage tank structures (02-53, 02-54, and 02-55) were added in 1962, the wastewater discharge from the OWR equipment building was routed through the acid pit/transfer sump, thus minimizing direct discharge to Los Alamos Creek from building 02-44, as noted on engineering drawing C-29861 (LASL 1962, 090055).

The OWR equipment building operated until 1993, when the OWR was shut down. In 1995, all liquid waste was removed from the system and disposed of at TA-54 (WD-3 2003, 082646, p. 2). In 2003, the building and all remaining buried pipes and drains were removed and disposed of at approved disposal facilities (WD-3 2003, 082646, pp. 26–31).

H-2.1.10 AOC 02-004(g)

AOC 02-004(g) was a 300-gal. portable storage tank located on a platform near the guard station (structure 02-12) at the west end of the OWR facility. The storage tank was used for temporarily storing liquids to supplement the three OWR effluent storage tanks [AOCs 02-004(b,c,d)]. The portable aboveground storage tank was installed and began operations in 1962 (Bunker 1985, 036231). The platform and portable aboveground storage tank were removed by 1993, but removal and disposal details are not available (LANL 1993, 015314).

H-2.1.11 SWMU 02-005

SWMU 02-005 consists of an area potentially affected by airborne drift of potassium dichromate that was used to inhibit corrosion in the OWR cooling tower (structure 02-49). The cooling tower was installed and became operational in 1956. It was constructed with aluminum heat exchangers that were prone to corrosion. Potassium dichromate was added to the make-up water to inhibit corrosion of the heat exchangers. Stainless-steel heat exchangers were installed to eliminate the use of potassium dichromate in 1975 (LANL 1993, 015314). The cooling tower operated until the OWR was shut down in 1993. In 1995, all liquid was drained from the system (WD-3 2003, 082646, p. 2). In 2000, the cooling tower structure and equipment were removed and disposed of at TA-54 (LANL 2000, 090087). In 2003, the remaining buried pipes and drains were removed and disposed of at TA-54 or Envirocare (WD-3 2003, 082646, pp. 26–31).

H-2.1.12 SWMU 02-006(a)

SWMU 02-006(a) was an 8-ft-deep French drain system. The system consisted of the exhaust stack and French drain, all located in TA-61 on the Los Alamos Canyon south rim mesa top, above TA-02. The stack system was the termination point of the gaseous effluent vent line (line 119) from the OWR and WBR at TA-02. The French drain was installed in 1948, designated as structure 02-9, and was also identified as structure 61-26, according to engineering drawing C-1716 (LASL 1948, 090083). The French drain was designed to catch condensate that collected as reactor exhaust gases cooled during venting through the tower exhaust stack. The vent stack and French drain system were active from their installation in 1948 to the OWR deactivation in 1993. The French drain system and contaminated soil were removed and disposed of during D&D activities in 2003 (LANL 2003, 090089).

H-2.1.13 SWMU 02-006(b)

SWMU 02-006(b) was an acid waste line that carried effluent from several laboratory rooms in the center of the OWR building (02-1) south to a discharge point into Los Alamos Creek. Construction of the OWR building (02-1) and associated laboratory rooms, sinks, and waste line [SWMU 02-006(b)] was completed in 1946 (engineering drawing C-1703, LASL 1946, 089678). The OWR became operational in 1956. The acid waste line was reportedly taken out of service in the 1960s; however, no record of its removal is available (DOE 1987, 008663). All SWMU 02-006(b) lines and connections were removed and disposed of in 2003 (WD-3 2003, 082646, p. 2).

H-2.1.14 AOC 02-006(c)

AOC 02-006(c) was a waste line that extended from the office areas in the reactor building to the septic tank (structure 02-43, SWMU 02-007). AOC 02-006(c) was identified in the 1990 SWMU report (LANL 1990, 007511) as a drainline that was connected to the chemical room in the OWR building (02-1) and several OWR laboratories. Closer review of the available engineering drawings, C-1703 (LASL 1946, 089678) and C-1750 (LASL 1949, 089680), provided the following information regarding the connection and use of AOC 02-006(c). AOC 02-006(c) was the drainline that served the office or central portion of the OWR building, 02-1. As indicated on engineering drawing C-1750 (LASL 1949, 089680), the line was separate from the OWR acid waste line [SWMU 02-006(b)] that connected to the chemical laboratories. The AOC 02-006(c) waste line received wastewater from the evaporative cooler and drinking fountain associated with the control room, restrooms, and office areas. The sanitary service provided by AOC 02-006(c) was transferred to TA-41 in the mid-1970s (DOE 1987, 008663). However, the AOC 02-006(c) drainline continued to convey basement seepage to the AOC 02-008(c) outfalls installed in 1985 and 1988. The AOC 02-006(c) sewer line was removed and disposed of during D&D activities in 2003 (WD-3 2003, 082646).

H-2.1.15 AOC 02-006(e)

AOC 02-006(e) was a sump (structure 02-26) and drainline that received effluent from the OWR building (02-1) reactor room floor drains and mezzanine. The AOC 02-006(e) drainline was connected to floor drains in the main reactor room and became operational in 1944. A second collection sump (structure 02-82) was added to the AOC 02-006(e) drainline in 1990, as shown on engineering drawing C-45924 (LANL 1990, 089679). A drainline from the structure 02-82 sump was connected directly to the AOC 02-004(e) acid pit/transfer sump (structure 02-53), possibly replacing the AOC 02-006(e) direct discharge to Los Alamos Creek; however, the sump (structure 02-26) and the original drainline remained in place until they were removed and disposed of during D&D activities in 2003 (WD-3 2003, 082646, p. 6). The second sump (structure 02-82) and the drainline to structure 02-53 [AOC 02-004(e)] were also removed and disposed of during D&D activities in 2003 (WD-3 2003, 082646, p. 6).

H-2.1.16 SWMU 02-007

SWMU 02-007 is a former septic tank (structure 02-43) and outfall. The septic tank was constructed of reinforced concrete and measured 13 ft long × 8 ft wide × 6 ft deep. The septic system received effluent from drains in the OWR facility (building 02-1). The SWMU 02-007 septic tank and outfall were installed in 1944 and removed in 1985. Overflow from the tank discharged to the stream channel through a 6-in.-diameter vitrified clay pipe (VCP). However, the location of the outfall discharge is not known (Elder and Knoell 1986, 006670, p. 26). Laboratory wastes were discharged into the septic system. In 1947, the chemical waste shack (building 02-3, AOC 02-010) was connected to the septic system, as shown on engineering drawing C-1683 (LASL 1944, 090081), and remained connected until the chemical waste shack was decommissioned in 1971 (LASL no date, 034172). The septic tank and overflow outfall and surrounding soils were removed and disposed of in 1986 (Elder and Knoell 1986, 006670, pp. 26-41).

H-2.1.17 SWMU 02-008(a)

SWMU 02-008(a) is a former National Pollutant Discharge Elimination System- (NPDES-) permitted outfall (EPA 03A020) that discharged cooling water from the OWR cooling tower (structure 02-49). The SWMU 02-008(a) outfall was also identified as AOC 02-011(e), NPDES-permitted outfall EPA 03A020. All discussions regarding outfall EPA 03A020 are addressed under SWMU 02-008(a) (LANL 1990, 007511). Therefore, all activities associated with AOC 02-011(e) are addressed under SWMU 02-008(a). The cooling tower became an operational component of the OWR system in 1957. The cooling tower facility began use of potassium dichromate to control aluminum heat exchanger corrosion in 1959. The aluminum heat exchangers were replaced by stainless-steel ones in 1975, thus eliminating the use of potassium dichromate. A shutdown of the OWR in 1993 placed the cooling tower on standby status; in 1995, all liquid waste was drained from the system (WD-3 2003, 082646, p. 2). In 2000, the cooling tower structure and equipment were decommissioned and removed (LANL 2000, 090087). In 2003, the remaining buried pipes and drains were removed and disposed of (WD-3 2003, 082646, pp. 26–31). The outfall (EPA 03A020) was removed from the Laboratory's NPDES permit in July 1990 (LANL 1990, 007511).

H-2.1.18 AOC 02-008(c)

AOC 02-008(c) consists of two specific areas: outfall drains AOC 02-008(c)(i) and AOC 02-008(c)(ii). The outfall drains were two unpermitted outfalls that received OWR building (02-1) basement groundwater seepage. In 1985, the AOC 02-008(c)(i) outfall drain was created to discharge groundwater seepage from the basement sump of the OWR building (02-1) to Los Alamos Creek, as shown on engineering drawing C-39551 (LASL 1971, 089682). In 1988, the AOC 02-008(c)(i) outfall drain became plugged and was abandoned in place. A second drainline was installed, and the outfall of AOC 02-008(c)(ii) was created approximately 100 ft west of the original outfall (LANL 1993, 015314, p. 7.9-1). Both drainpipes and outfalls were removed and disposed of during D&D activities in 2003 (WD-3 2003, 082646, pp. 26–31).

H-2.1.19 SWMU 02-009(a)

SWMU 02-009(a) is an area of beta/gamma radioactive soil contamination located around a boulder, south of the southeast fence corner east of the former Omega-50 storage building (02-50). SWMU 02-009(a) was identified in 1986 during D&D of the WBR (Elder and Knoell 1986, 006670, p. 40). No other information regarding the origin of contamination in this SWMU is available (LANL 1990, 007511). A limited amount of soil was removed at the site, and the soil was disposed of in 1986 (Elder and Knoell 1986, 006670, pp. 26–41).

H-2.1.20 SWMU 02-009(b)

SWMU 02-009(b) is an area of radioactive soil contamination located north of the former stack-gas valve house (structure 02-19) and the east bridge at TA-02. Detectable beta/gamma radioactivity was identified in 1986 when the area of SWMU 02-009(b) was used for truck staging during D&D of the WBR (Elder and Knoell 1986, 006670, p. 40). A limited amount of soil was removed from the site and disposed of (Elder and Knoell 1986, 006670, pp. 26–41).

H-2.1.21 SWMU 02-009(c)

SWMU 02-009(c) is a leach field and an area of alpha-, beta-, and gamma-emitting radioactively contaminated soil south of the condensate trap [structure 02-48, AOC 02-003(b)]. Radioactive soil contamination was identified at SWMU 02-009(c) during 1985–1986 D&D activities associated with the condensate trap (Elder and Knoell 1986, 006670, pp. 36–40). Two sections of contaminated 6-in.-diameter VCP, one 34 ft long and one 20 ft long and lying parallel to the septic tank overflow pipe, were uncovered during D&D activities at the condensate trap. The pipes were approximately 5 ft below and to either side of the septic tank overflow pipe (Elder and Knoell 1986, 006670, pp. 29–40). The purpose of the pipes is unknown. The pipes were present at depths of 3 to 8 ft bgs (Elder and Knoell 1986, 006670, pp. 26–41). All structures (pipes) and adjacent soils down to the saturated zone were removed and disposed of during the 1985–1986 D&D activities (Elder and Knoell 1986, 006670, pp. 36–40).

H-2.1.22 AOC 02-009(d)

AOC 02-009(d) is an area of radioactive soil contamination located near the east end of the OWR building (02-1). Beta and gamma radioactivity were identified during decommissioning and removal of inactive WBR structures at TA-02 during 1985 and 1986. The source of contamination at AOC 02-009(d) is unknown (LANL 1990, 007511). There is no known historical use of the area included in AOC 02-009(d).

H-2.1.23 AOC 02-010

AOC 02-010 is residual soil contamination associated with a small chemical handling building (the chemical waste shack, 02-3) that contained a small underground chamber for working with various radioactive and chemical materials. The chemical waste shack was built in 1944, according to engineering drawing C-1686 (LASL 1944, 090084), and was decommissioned, removed, and disposed of in 1971 (LASL no date, 034172). It is not known if soil was removed when the AOC 02-010 structures were removed (LASL no date, 034172). A boiler house (building 02-63) was built in the area after the chemical waste shack was removed in 1971.

H-2.1.24 AOC 02-011(a)(i-xi)

AOC 02-011(a) consists of 11 drain segments and associated outfalls across TA-02. These individual segments drain either directly or indirectly to Los Alamos Creek. The following drains are associated with this AOC and are divided into the following subunits:

(i) An approximately 50-ft-long concrete storm drain (also described as a concrete flume), located northwest of the OWR building that drains into a drop inlet/catch basin (structure 02-36), as shown on engineering drawing R-5102, sheet 2 of 2 (LANL 1990, 090086). There is no information indicating that the drain handled anything but storm water.

(ii) A 24-in.-diameter, 8-ft-long underground corrugated metal pipe (CMP) between catch basin 02-36 and catch basin 02-27, as shown on engineering drawing R-5102, sheet 2 of 2 (LANL 1990, 090086). There is no information that the drain handled anything but storm water.

(iii) An 85 ft-long concrete storm drain (e.g., concrete flume) located northwest of the OWR building (02-1) that drains into catch basin 02-27, as shown on engineering drawing R-5102, sheet 2 of 2 (LANL 1993, 090086). The drain was reportedly used periodically for discharge of water from the fuel transfer pit (DOE 1987, 008663).

(iv) A 15-in.-diameter, 15-ft-long concrete storm drain west of the OWR building that drains into catch basin 02-28, as shown on engineering drawing R-5102, sheet 2 of 2 (LANL 1993, 090086). There is no information that the drain handled anything but storm water.

(v) A 24-in.-diameter, 30-ft-long concrete storm drain between catch basins 02-27 and 02-28, as shown on engineering drawing R-5102, sheet 2 of 2 (LANL 1993, 090086). This drain may have handled the fuel transfer pit water coming from the concrete flume, with associated contaminated aluminum shards.

(vi) A 30-in.-diameter, 75-ft-long CMP between a catch basin (structure 02-28) and Los Alamos Creek, as shown on engineering drawing R-5102, sheet 2 of 2 (LANL 1993, 090086). This drain may have handled the fuel transfer pit water coming from the concrete flume, with associated contaminated aluminum shards.

(vii) A 6-in.-diameter, 18-ft-long pipe between the OWR building and the salvage basin (structure 02-26) and Los Alamos Creek. AOC 02-011(a)(vii) is a duplicate of AOC 02-006(e), as noted in the 1990 SWMU report (LANL 1990, 007511). This drain is addressed as AOC 02-006(e) throughout this report.

(viii) An 18-in.-diameter, 75-ft-long CMP between the OWR building catch basin (unnumbered structure within building 02-1) and Los Alamos Creek, as shown on engineering drawing C-1699 (LASL 1947, 090070). There is no information that this drain handled anything but storm water runoff.

(ix) A 3-in.-diameter, 75-ft-long pipe between the OWR building and the outfall to Los Alamos Creek. Wastewater system design memoranda (e.g., Heineman 1990, 089739) indicate that floor drains from the eastern side of the WBR area drained to this outfall before 1990.

(x) A 12-in.-diameter, 30-ft-long storm drain northeast of the OWR building that discharged to Los Alamos Creek through a series of concrete ditches and a CMP along the east side of the OWR building, as shown on engineering drawing C-1718 (LASL 1947, 089677). The total length of the drain and ditches to Los Alamos Creek is approximately 130 ft. The drains and concrete ditches remained in place until they were removed during D&D activities in 2003 (WD-3 2003, 082646, pp. 26–31). There is no information that this drain handled anything but storm water.

(xi) A 4-in.-diameter, 95-ft-long pipe between the OWR building and Los Alamos Creek. AOC 02-011(a)(xi) is a duplicate of the OWR acid waste line [SWMU 02-006(b)]. AOC 02-011(a)(xi) is addressed as SWMU 02-006(b) throughout this report.

The drains in AOC 02-011(a) date from approximately the time of construction of the reactor building in 1944. Drains from operational areas of the facility may have received effluent until the 2003 D&D of the OWR facility, although the reactor was inactive from 1993 to 2003. Several of the drains were removed in either the 2000 or 2003 D&D activities, but five of the drains, or some portion of them, remained in place (WD-3 2003, 082646, pp. 26–31).

H-2.1.25 AOC 02-011(b)

AOC 02-011(b) consists of two drains and outfalls associated with the stack-gas valve house (structure 02-19). One drain was a 9-ft-long × 15-in.-diameter CMP between the stack-gas valve house and the catch basin (structure 02-35). The second drain was a 9-ft-long × 24-in.-diameter CMP that drained from the catch basin (structure 02-35) to Los Alamos Creek outside the east fence. The drains and structures are shown on engineering drawing C-1718 (LASL 1947, 089677). The drains and outfalls were presumably installed at the same time the stack-gas valve house [AOC 02-003(a)] was constructed in 1944. The stack-gas valve house was in use through 1974 when it became inactive and was removed during 1985 D&D activities. The actual purpose of the drainlines and catch basin is not documented. The drains and outfalls remained in place until they were removed and disposed of during 2003 D&D activities (WD-3 2003, 082646).

H-2.1.26 AOC 02-011(c)

AOC 02-011(c) was a storm drain associated with the OWR equipment building [02-44, AOC 02-004(f)]. The drainline was a 4-in.-diameter VCP that was approximately 12 ft long, and drained to the surface west of the western fence. The drainline was installed in 1954, as shown on engineering drawing C-14930 (LASL 1954, 090076). The drainline was removed and disposed of in 2003 (WD-3 2003, 082646, pp. 26–31). The OWR equipment building was in operation from 1954 to 1993. The AOC 02-011(c) storm drain and outfall collected and discharged storm water from the vicinity of the building from 1954 to 2003. The AOC 02-011(c) outfall piping was decommissioned and removed, and the waste was disposed of at an approved facility in 2003 (WD-3 2003, 082646, pp. 1–6).

H-2.1.27 AOC 02-011(d)

AOC 02-011(d) was an NPDES-permitted outfall that discharged effluent from the OWR equipment building [02-44, AOC 02-004(f)]. The line ran from the equipment building south-southwest, past the western side of the cooling tower (structure 02-49), to Los Alamos Creek. The outfall at AOC 02-011(d) became operational in 1949, discharging effluent to Los Alamos Creek. The discharge consisted primarily of regenerate water from the ion-exchange system. Discharge was rerouted through the OWR effluent storage tanks and disposed of through the liquid acid waste line to TA-50 beginning in 1963. The outfall was removed from the NPDES permit in 1995 (NMED 2001, 071256).

H-2.1.28 AOC 02-012

AOC 02-012 consists of the potential soil contamination associated with two removed fuel underground storage tanks (USTs), structures 02-29 and 02-67 (New Mexico Environment Department- [NMED-] registered tank 02-1). AOC 02-003(e) is the former location of an 800-L stainless-steel holding tank (structure 02-62), installed in approximately 1944, and was associated with operation of the WBR. The tank was removed in 1950 (LANL 1996, 055226, p. 5-15). In 1982, a 517-gal. diesel tank [structure 02-67 (NMED-registered tank 02-1)] was installed on the north side of the OWR building (02-1). The diesel tank (structure 02-67, NMED registered tank 02-1) and associated lines were removed and disposed of in 1998 in accordance with NMED requirements (LANL 2000, 090023).

H-2.1.29 SWMU 02-014

SWMU 02-014 consists of three former electrical transformer stations (structures 02-31, 02-45, and 02-51) that served buildings in TA-02. This site was not identified as a SWMU or area of concern (AOC) in the 1990 SWMU report. This site was identified during efforts to discover the source of polychlorinated biphenyl (PCB) contamination identified during investigation sampling at storm drain AOC 02-011(a)(ii). Historical records, including engineering drawings and photographs, were reviewed and three potential sources of PCBs were identified. Former structure 02-31 was an electrical transformer station located 40 ft behind building 02-1. The transformer station was built in 1944 and was removed in 1950. Former structure 02-45 was built in 1954 to serve building 02-44. The transformer structure consisted of three transformers mounted across two telephone poles approximately 14 ft above the ground. The transformer station was replaced with another transformer station (structure 02-51). Former structure 02-51 was an electrical transformer station located approximately 20 ft southwest of former structure 02-31 and 20 ft southeast of former structure 02-45. Historical records indicated PCB-containing transformer oil had been used at this former transformer station. Structure 02-51 was constructed in 1961 and demolished in 2003.

H-2.1.30 SWMU 21-006(e) and AOC 21-006(f)

SWMU 21-006(e) is a seepage pit that may be located south of building 21-4. The location of this seepage pit is unclear (LANL 1990, 007512), but it may be the same seepage pit as AOC 21-006(f) (LANL 1991, 007680, p. 18-13). AOC 21-006(f) is described as a gravel seepage pit located on the south side of the DP West complex (Tribby 1947, 001404, p. 1). The seepage pit(s) may have received up to 4000 L per day of hydrogen fluoride wastewater effluent from a hydrofluorination process located in room 413, the southernmost room of building 21-4 (Tribby 1947, 001404, p. 1). The period of operation is not known. During repair work on the drain system under room 413, a hole in the ground was identified under the drainlines. It was evident that acid waste had escaped from the drain system into the ground (Meyer 1978, 000526). This hole may have been one of the seepage pits of SWMU 21-006(e) and AOC 21-006(f).

H-2.1.31 AOC 21-028(c)

AOC 21-028(c) consists of four satellite container storage areas that were located around building 21-3. The four container storage areas were located at the door to room 301 on the north dock, at the outer door to room 360, at the northeast side of the fan room 3N, and inside a chemical safety cabinet in room 362. The period of operation for the storage areas is not available but probably began in 1945, when the building was constructed (LANL 1991, 007680, p. 18-21). The areas were in use as late as

1990 (LANL 1991, 007680, pp. 18-23–18-24). These areas have stored a wide variety of chemicals including depleted uranium salts, metal salts, organic chemicals, synthetic inorganic chemicals, and other reagents (LANL 1991, 007680, pp. 18-23–18-24)

H-2.1.32 SWMU 26-001

SWMU 26-001 is a surface disposal area on the south-facing slope of Los Alamos Canyon that contains debris from a five-room concrete storage vault. The vault was constructed in 1946 (LASL 1949, 000696) and was decommissioned and dismantled in 1966 (Blackwell 1973, 000619). Although the vault was constructed for storing radioactive materials, documentation describing the specific type and quantity of radioactive materials is not available. One document states that the vault "stored friable containers which now contain, or have contained radioactive material" (Maddy 1957, 006349). The vault was later used for storing high explosives (Lojek 1991, 001904). Before the vault was dismantled, the contaminated contents that could be removed, including shelving, drainlines, the sump, and duct work, were disposed of at MDA C (Blackwell 1973, 000619). The remains of the vault were bulldozed onto the south-facing slope of Los Alamos Canyon. In the 1970s, most of the vault debris rested on the bench below the mesa top; however, some debris may have fallen as far as the canyon floor (Buckland 1978, 000496). The debris on the ledge was covered with approximately 3 ft of soil (Blackwell 1973, 000619).

H-2.1.33 SWMU 26-002(a)

SWMU 26-002(a) is the acid sump system that served the concrete storage vault at TA-26 from 1946 to 1965. Engineering records note the sump as having an internal diameter of 4 ft and a depth of 10 ft (LANL 1990, 007513). The collection sump was located outside the vault. The vault and its associated structures were constructed in 1946 (LASL 1949, 000696) and decommissioned and dismantled in 1966 (Blackwell 1973, 000619). The sump system consisted of a 6-in.-diameter VCP floor drain in the south center room of the vault. The drain connected to a collection sump and outfall that discharged to Los Alamos Canyon. The vault was decommissioned and dismantled in 1966 (LASL 1949, 000696). The sump and its drainlines were removed before demolition of the vault and disposed of at MDA C (Blackwell 1973, 000619).

H-2.1.34 SWMU 26-002(b)

SWMU 26-002(b) was the equipment room drainage system constructed in 1946 for the concrete storage vault at TA-26. The drainage system was installed during construction of the storage vault in 1946. It carried effluent through a 4-in.-diameter VCP floor drain that discharged directly to the south-facing slope. Specific uses of the drain system are not documented. The drainlines were removed before demolition of the vault structure in 1966 (Blackwell 1973, 000619). All removable material, including the drainlines, was disposed of at MDA C (Blackwell 1973, 000619).

H-2.1.35 SWMU 26-003

SWMU 26-003 is the septic system that served sanitary facilities in the east room of the concrete storage vault at TA-26. The septic system consisted of a 4-in.-diameter VCP drainline connected to a 250-gal. steel septic tank. The septic system was installed in August 1948 (LASL no date, 000675). Overflow from the system was discharged to the slope below the mesa top. It was assumed that the septic tank was free from radioactive contamination because the tank served the toilet and sink in the least contaminated room of the storage vault (Buckland 1965, 000628). The septic tank was thought to have handled only sanitary waste; however, because radioactive contamination was found in the vault, it is possible that contaminants were introduced into the system. The septic tank system may have been removed at the same time as the sump system [SWMU 26-002(a)] and other removable material in 1966, but no clear documentation is available (Blackwell 1973, 000619).

H-2.2 Investigation Sampling

The final data set used to identify chemicals of potential concern (COPCs) for the Middle Los Alamos Canyon Aggregate Area sites and used in this appendix to evaluate the potential risks to human health and the environment are the qualified analytical results from the 2000–2018 investigations. Only those data determined to be of decision-level quality following the data quality assessment (Appendix F) are included in the final data set evaluated in this appendix.

H-2.3 Determination of COPCs

Section 5.0 of the investigation report summarizes the COPC selection process. Only COPCs detected above background (inorganic chemicals and naturally occurring radionuclides), with detection limits greater than background values (BVs) (inorganic chemicals), and detected organic chemicals, inorganic chemicals with no BVs, and fallout radionuclides were retained. The industrial scenario and the recreational scenario used data for samples collected from 0.0 to 1.0 ft. The ecological screening used data for samples collected from 0.0 to 5.0 ft bgs. The residential and construction worker scenarios used data for samples collected from 0.0 to 10.0 ft bgs. However, sampling depths often overlapped because of multiple investigations; therefore, samples with a starting depth less than the lower bound of the interval were included in the risk-screening assessments for a given scenario as appropriate.

Tables H-2.3-1 to H-2.3-83 summarize the COPCs evaluated for potential risk for each of the sites in the Middle Los Alamos Canyon Aggregate Area. Some of the COPCs identified in this report may not be evaluated for potential risk under one or more scenarios because they were not within the specified depth intervals associated with a given scenario.

H-3.0 CONCEPTUAL SITE MODEL

The primary mechanisms of release related to historical contaminant sources are described in detail in the approved investigation work plan for the Middle Los Alamos Canyon Aggregate Area (LANL 2006, 092571.12; NMED 2006, 095416). Releases from the Middle Los Alamos Canyon Aggregate Area may have occurred as a result of air emissions, surface releases, subsurface leaks, or effluent discharges. Previous sampling results indicated contamination from inorganic chemicals, organic chemicals, and radionuclides (LANL 2008, 101669.12).

H-3.1 Receptors and Exposure Pathways

The primary exposure pathway for human receptors is surface soil and subsurface soil/tuff that may be brought to the surface through intrusive activities. Migration of contamination to groundwater through the vadose zone is unlikely given the depth to groundwater (more than 500 ft bgs). Human receptors may be exposed through direct contact with soil or suspended particulates by ingestion, inhalation, dermal contact, and external irradiation pathways. Direct contact exposure pathways from subsurface contamination to human receptors are complete for the resident and the construction worker. The exposure pathways are the same as those for surface soil. Sources, exposure pathways, and receptors are shown in the conceptual site model (Figure H-3.1-1).

New Mexico Environment Department (NMED) guidance (NMED 2017, 602273) requires that sites larger than 2 acres be evaluated to determine if beef ingestion is a plausible and complete exposure pathway. The sites in the Middle Los Alamos Canyon Aggregate Area are generally smaller than 2 acres. In addition, grazing is not allowed on Laboratory property. Therefore, further evaluation of the beef ingestion pathway is not necessary.

The Middle Los Alamos Canyon Aggregate Area is primarily a former industrial area, and all sites are on Laboratory property. None of the sites are active and therefore they currently provide habitat for ecological receptors. 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 conceptual site model (Figure H-3.1-1).

H-3.2 Environmental Fate and Transport

The evaluation of environmental fate addresses the chemical processes affecting the persistence of chemicals in the environment, and the evaluation of transport addresses the physical processes affecting mobility along a migration pathway. Migration into soil and tuff depends on precipitation or snowmelt, soil moisture content, depth of soil, soil hydraulic properties, and properties of the COPCs. Migration into and through tuff also depends on the unsaturated flow properties of the tuff and the presence of joints and fractures.

The most important factor with respect to the potential for COPCs to migrate to groundwater is the presence of saturated conditions. Downward migration in the vadose zone is also limited by a lack of hydrostatic pressure as well as the lack of a source for the continued release of contamination. Without sufficient moisture and a source, little or no potential migration of materials through the vadose zone to groundwater occurs.

Contamination at depth is addressed in the discussion of nature and extent in the Phase II investigation report. Results from the deepest samples collected at most sites showed either no detected concentrations of COPCs or low- to trace-level concentrations of only a few inorganic, radionuclide, and/or organic COPCs in tuff. The limited extent of contamination is related to the absence of the key factors that facilitate migration, as discussed above. Given how long the contamination has been present in the subsurface, the physical and chemicals properties of the COPCs, and the lack of saturated conditions, the potential for contaminant migration to groundwater is very low.

NMED guidance (NMED 2017, 602273) 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 sites in the Middle Los Alamos 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 sites in the Middle Los Alamos Canyon Aggregate Area include direct discharge; precipitation, sorption, and mechanical transport; dissolution and advective transport in water; and volatilization, diffusion, and dispersion. Less significant transport mechanisms include wind entrainment and, given the asphalt pavement covering most sites, dispersal of surface soil and uptake of contaminants from soil and water by biota.

Gas or vapor-phase contaminants such as VOCs are likely to volatilize to the atmosphere from near-surface soil and sediment and/or migrate by diffusion through air-filled pores in the vadose zone. Migration of vapor-phase contaminants from tuff into ambient air may occur by diffusion or advection driven by barometric pressure changes.

H-3.2.1 Inorganic Chemicals

In general, and particularly in a semiarid climate, inorganic chemicals are not highly soluble or mobile in the environment, although there are exceptions. The physical and chemical factors that determine the distribution of inorganic COPCs within the soil and tuff at sites in the Middle Los Alamos 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 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 ones. Chemicals with K_d values greater than 40 are very unlikely to migrate through soil towards the water table

(Kincaid et al. 1998, 093270). Table H-3.2-1 presents the K_d values and water solubility for the inorganic COPCs for sites in the Middle Los Alamos 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, lead, manganese, mercury, nickel, thallium, uranium, vanadium, and zinc. The K_d values for arsenic, copper, cyanide (total), hexavalent chromium, iron, 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. A K_d is not available for nitrate or perchlorate.

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 in the Middle Los Alamos Canyon Aggregate Area.

Copper movement in soil is determined by physical and chemical interactions with the soil components. Most copper deposited in soil will be strongly adsorbed and remains in the upper few centimeters of soil. Copper will adsorb to organic matter, carbonate minerals, clay minerals, or hydrous iron, and manganese oxides. In most temperate soil, pH, organic matter, and ionic strength of the soil solutions are the key factors affecting adsorption. Soil in the area is neutral to slightly alkaline, so the leaching of copper is not a concern at this site. Copper binds to soil much more strongly than other divalent cations, and the distribution of copper in the soil solution is less affected by pH than other metals. Copper is expected to be bound to the soil and move in the system by way of transport of soil particles by water as opposed to movement as dissolved species.

Cyanide tends to adsorb onto various natural media, including clay and sediment; however, sorption is insignificant relative to the potential for cyanide to volatilize and/or biodegrade. At soil surfaces, volatilization of hydrogen cyanide is a significant mechanism for cyanide loss. Cyanide at low concentrations in subsurface soil is likely to biodegrade under both aerobic and anaerobic conditions. Cyanide is present at the site in trace to low levels and is not expected to be mobile.

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 and 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 to slightly alkaline, well-drained soil at the Middle Los Alamos Canyon Aggregate Area.

Nitrate is highly soluble in water and may migrate with water molecules in saturated soil. As noted above, the subsurface material beneath the Middle Los Alamos Canyon Aggregate Area sites generally has low moisture content, which inhibits the mobility of nitrate as well as most other inorganic chemicals.

Perchlorate is somewhat soluble in water and may migrate with water molecules in saturated soil. As noted above, the subsurface material beneath the sites has low moisture content, which inhibits the mobility of 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 at most sites in the Middle Los Alamos Canyon Aggregate Area is neutral to slightly alkaline, indicating that selenium is not likely to migrate.

Silver sorbs onto soil and sediment and tends to form complexes with inorganic chemicals and humic substances in soil. Natural processes, such as the weathering of rock and the erosion of soil, release silver to air and water. 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.

H-3.2.2 Organic Chemicals

Table H-3.2-2 presents the physical and chemical properties (organic carbon-water partition coefficient [K_{oc}], logarithm to the base 10 octanol/water partition coefficient [log K_{ow}], and solubility) of the organic COPCs identified for sites in the Middle Los Alamos Canyon Aggregate Area. The physical and chemical properties of organic chemicals are important when evaluating their fate and transport. The following physiochemical property information illustrates some aspects of the fate and transport of COPCs at sites in the Middle Los Alamos Canyon Aggregate Area. The information is summarized from Ney (1995, 058210).

Water solubility may be the most important chemical characteristic used to assess mobility of organic chemicals. The higher the water solubility of a chemical, the more likely it is to be mobile and the less likely it is to accumulate, bioaccumulate, volatilize, or persist in the environment. A highly soluble chemical (water solubility greater than 1000 mg/L) is prone to biodegradation and metabolism that may detoxify the parent chemical. The following chemicals detected at sites in the Middle Los Alamos Canyon Aggregate Area have water solubilities greater than 1000 mg/L, including acetone, carbon disulfide, chloroform, chloromethane, diethylphthalate, 2-hexanone, isophorone, and methylene chloride, 4-methyl-2-pentanone, phenol, and trichloroethene.

The lower the water solubility of a chemical, especially below 10 mg/L, the more likely it will be immobilized by adsorption. Chemicals with lower water solubilities are more likely to accumulate or bioaccumulate and persist in the environment, are slightly prone to biodegradation, and are metabolized in plants and animals. The chemicals identified as having water solubilities less than 10 mg/L are the polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), benzoic acid, bis(2-ethylhexyl)phthalate, 2-butanone, butylbenzylphthalate, dibenzofuran, and 2,3,7,8-tetrachlorodibenzodioxin.

Vapor pressure is a 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; bromobenzene; 2-butanone; n-butylbenzene; sec-butylbenzene; carbon disulfide; chloroform; chloromethane; 1,2-dichlorobenzene; 1,3-dichlorobenzene; 1,4-dichlorobenzene; ethylbenzene; 2-hexanone; isophorone; isopropylbenzene; 4-isopropyltoluene; methylene chloride; 2-methylnaphthalene; 4-methyl-2-pentanone; naphthalene; phenol; styrene; tetrachloroethene; toluene; trichloroethene; trichlorofluoromethane; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; 1,2-xylene; and 1,3-xylene+1,4-xylene and xylene(total) 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. Benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, and 2,3,7,8-tetrachlorodibenzodioxin 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).

Butanone[2-] and trichlorofluoromethane 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. PAHs; PCBs; acetone; benzoic acid; bis(2-ethylhexyl)phthalate; 2-butanone; butylbenzylphthalate; bromobenzene; n-butylbenzene; sec-butylbenzene; carbon disulfide; chloroform; chloromethane; di-n-butylphthalate; dibenzofuran; 1,2-dichlorobenzene; 1,3-dichlorobenzene; 1,4-dichlorobenzene; diethylphthalate; ethylbenzene; 2-hexanone; isophorone; isopropylbenzene; 4-isopropyltoluene; methylene chloride; 2-methylnaphthalene; 4-methyl-2-pentanone; pentachlorophenol; phenol; pyrene; styrene; tetrachloride; 2,3,7,8-tetrachlorodibenzodioxin; tetrachloroethene; toluene; trichloroethane; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; xylene; 1,2-xylene; and 1,3-xylene+1,4-xylene 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 2017, 602273). Most organic chemicals detected have K_{oc} values above 500 cm^3/g, indicating a very low potential to migrate toward groundwater. The organic chemicals with K_{oc} values less than 500 cm^3/g include acetone; benzoic acid; bromobenzene; 2-butanone; carbon disulfide; chloroform; chloromethane; 1,2-dichlorbenzene; 1,3-dichlorbenzene; 1,4-dichlorbenzene; diethylphthalate; ethylbenzene; 2-hexanone; isophorone; methylene chloride; 4-methyl-2-pentanone; phenol; styrene; toluene; tetrachloroethene; trichloroethene; trichlorofluoromethane; xylene; 1,2-xylene; and 1,3-xylene+1,4-xylene.

The PAHs, PCBs, and bis(2-ethylhexyl)phthalate are the least mobile and the most likely to bioaccumulate. Acetone, 2-hexanone, methylene chloride, and toluene are more soluble and volatile and are more likely to travel toward the atmosphere and not migrate toward groundwater. Because the organic chemicals detected were at low concentrations and extent is defined, they are not likely to migrate to groundwater.

H-3.2.3 Radionuclides

Radionuclides are generally not highly soluble or mobile in the environment, particularly in the semiarid climate of the Laboratory. The physical and chemical factors that determine the distribution of radionuclides within soil and tuff are the K_d, the pH of the soil and other soil characteristics (e.g., sand or clay content), and the Eh. The interaction of these factors is complex, but K_d values provide a general assessment of the potential for migration through the subsurface: chemicals with higher K_d values are less likely to be mobile than those with lower values. Radionuclides with K_d values greater than 40 are very unlikely to migrate through soil towards the water table (Kincaid et al. 1998, 093270).

Table H-3.2-3 gives physical and chemical properties of the radionuclide COPCs identified at sites in the Middle Los Alamos Canyon Aggregate Area. Based on K_d values, americium-241, cesium-134, cesium-137, cobalt-60, plutonium-238, and plutonium-239/240 have a very low potential to migrate towards groundwater at the sites in the Middle Los Alamos Canyon Aggregate Area. The K_d values for tritium and isotopic uranium are less than 40 and indicates a potential to migrate towards groundwater.

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.

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 are therefore not considered biologically mobile. The actinides are transported in ecosystems mainly by physical and sometimes chemical processes. They tend to attach, sometimes strongly, to surfaces, and tend to accumulate in soil and sediment, which ultimately serve as strong reservoirs. Subsequent movement is largely associated with geological processes such as erosion and sometimes leaching.

H-3.3 Exposure Point Concentration Calculations

The exposure point concentrations (EPCs) represent upper bound concentrations of COPCs. For comparison to risk-screening levels, the upper confidence limit (UCL) of the arithmetic mean was calculated when possible and used as the EPC. The UCLs were calculated using all available decision-level data within the depth range of interest. If an appropriate UCL of the mean could not be calculated or if the UCL exceeded the maximum concentration, the maximum detected concentration of the COPC was used as the EPC (maximum detection limits were used as the EPCs for some inorganic COPCs). The summary statistics, including the EPC for each COPC for the human health and the ecological risk-screening assessments and the distribution used for the calculation, are presented in Tables H-2.3-1 to H-2.3-83.

The EPCs for the dioxin and furan congeners are the sums of the detected congeners weighted by the toxic equivalency factors (NMED 2017, 602273); the sum is expressed as the 2,3,7,8- tetrachlorodibenzo-p-dioxin- (TCDD-) equivalent concentration. The toxic equivalency factors used are presented in Table H-3.3-1. The results of the toxic equivalency factor calculations for each site where dioxins/furans are COPCs are presented in Attachment H-1 and the 2,3,7,8-TCDD-equivalent concentrations (95% UCLs or maximum concentrations) are presented in the tables in section H-4.2.

Calculation of UCLs of the mean concentrations was done using the U.S. Environmental Protection Agency (EPA) ProUCL 5.1.002 software (EPA 2015, 601725), which is based on EPA guidance (EPA 2002, 085640). Consistent with the ProUCL v5.1 Technical Guide, a minimum of eight samples and five detects are needed to calculate UCLs (EPA 2015, 601724). The ProUCL program calculates 95%, 97.5%, and 99% UCLs and recommends a distribution and UCL. The 95% UCL for the recommended calculation method was used as the EPC. The ProUCL software performs distributional tests on the data set for each COPC and calculates the most appropriate UCL based on the distribution of the 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 H-1.

H-4.0 HUMAN HEALTH RISK-SCREENING EVALUATIONS

The human health risk-screening assessments were conducted for sites in the Middle Los Alamos Canyon Aggregate Area. All sites were screened for the residential scenarios using data from 0.0 to 10.0 ft bgs. All TA-21 and former TA-26 sites were screened for the construction worker scenarios using data from 0.0 to 10.0 ft bgs. Sites were also screened for the industrial scenario using data from 0.0 to 1.0 ft bgs, where available. TA-02 sites were also screened for recreational scenario using data from 0.0 to 1.0 ft bgs, where available. The human health risk-screening assessments compared either the 95% UCL of the mean concentration, the maximum detected concentration, or the maximum detection limit of each COPC with SSLs for chemicals and screening action levels (SALs) for radionuclides.

H-4.1 Human Health SSLs and SALs

Human health risk-screening assessments were conducted using SSLs for the industrial, construction worker, and residential scenarios obtained from NMED guidance (NMED 2017, 602273). The NMED SSLs are based on a target hazard quotient (HQ) of 1 and a target cancer risk of 1×10^{-5} (NMED 2017, 602273). If SSLs were not available from NMED guidance, the EPA regional screening level tables were used (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables). EPA regional screening levels are not available for construction workers; therefore, when regional screening levels were used for a COPC, the construction worker SSLs were calculated using toxicity values from EPA regional screening level tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables) and exposure parameters from NMED guidance (NMED 2017, 602273). The EPA regional screening levels for carcinogens were multiplied by 10 to adjust from a 10^{-6} cancer risk level to the NMED target cancer risk level of 10^{-5}. Recreational SSLs were obtained from Laboratory guidance (LANL 2017, 602581) and are based on the same target risk levels as the NMED SSLs. Surrogate chemicals were also used for some COPCs without an SSL based on structural similarity or because the COPC is a breakdown product (NMED 2003, 081172). Exposure parameters used to calculate the industrial, recreational, construction worker, and residential SSLs are presented in Table H-4.1-1.

For most constituents, the residential exposure scenario is the most protective, and the residential scenario is used for evaluating whether a site is appropriate for corrective action complete without controls. Although potential exposure to construction workers is not expected at TA-02 based on current and foreseeable land use, sites being recommended for corrective action complete without controls must not pose an unacceptable risk to construction workers. For some constituents, the construction worker

SSL is less than the residential SSL and the residential exposure scenario may not also be protective of construction workers. Therefore, sites posing no potential unacceptable risk under the residential scenario were evaluated to determine whether the residential exposure scenario was also protective of construction workers. If not, the construction worker scenario was evaluated to determine whether the site could be recommended for corrective action complete without controls.

Total petroleum hydrocarbon (TPH) data were compared with the NMED TPH screening guidelines (NMED 2017, 602273). The NMED 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 2017, 602273). 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 were used for comparison with radionuclide COPC EPCs and were derived using the residual radioactivity (RESRAD) model, Version 7.0 (LANL 2015, 600929). The SALs are based on a 25-mrem/yr dose as authorized by U.S. Department of Energy (DOE) Order 458.1. Exposure parameters used to calculate the SALs are presented in Tables H-4.1-2, H-4.1-3, and H-4.1-4.

H-4.2 Results of Human Health Screening Evaluation

The EPC of each COPC was compared with the SSLs for the industrial, recreational, construction worker, and residential scenarios, as appropriate. 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 H-4.2-1 to H-4.2-359 and are described below for each SWMU and AOC evaluated.

Sites posing no unacceptable risk under the residential scenario may be recommended for corrective action complete if the residential scenario is also protective of construction workers. For the TA-02 sites at Middle Los Alamos Canyon Aggregate Area, the following COPCs have construction worker SSLs less than residential SSLs: aluminum; barium; beryllium, manganese; nickel; trichlorofluoromethane; 1,2-xylene; and 1,3-xylene+1,4-xylene. The maximum EPC for each of these COPCs was compared with the construction worker SSL. The ratio of the maximum EPC to the construction worker SSL (i.e., the maximum HQ) was 1.05 for manganese, 0.16 for aluminum, 0.14 for barium, and less than 0.02 for all other COPCs. Thus, manganese is the only COPC that could potentially pose an unacceptable construction worker risk. If manganese is a COPC at a site, the construction worker scenario was evaluated to determine whether the site can be recommended for corrective action complete without controls. All construction worker SALs are equal to or greater than residential SALs and the residential scenario is protective of construction workers for all radionuclide COPCs.

H-4.2.1 AOC 02-003(a)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-1, H-4.2-2, and H-4.2-3. The total excess cancer risk for the industrial scenario is 8×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.01, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 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 recreational scenario are presented in Tables H-4.2-4, H-4.2-5, and H-4.2-6. The total excess cancer risk for the recreational scenario is 9×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-7, H-4.2-8, and H-4.2-9. 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 2017, 602273). The residential HI is 0.6, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 160 mrem/yr, which is greater than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is a COPC at AOC 02-003(a) and may potentially pose an unacceptable risk to the construction worker. The noncarcinogenic risk screening results for the construction worker at AOC 02-003(a) are presented in Table H-4.2-10. The construction worker HI is 1, which is equivalent to the NMED target of 1 (NMED 2017, 602273). The primary contributor to construction worker noncarcinogenic risk is manganese.

H-4.2.2 AOC 02-003(b)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-11, H-4.2-12, and H-4.2-13. 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 2017, 602273). The industrial HI is 0.05, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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.

The results of the risk-screening assessment for the recreational scenario are presented in Tables H-4.2-14, H-4.2-15, and H-4.2-16. The total excess cancer risk for the recreational scenario is 1×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.01 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-17, H-4.2-18, and H-4.2-19. The total excess cancer risk for the residential scenario is 6×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.8, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 8 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is a COPC at AOC 02-003(b) and may potentially pose an unacceptable risk to the construction worker. The noncarcinogenic risk screening results for the construction worker at AOC 02-003(b) are presented in Table H-4.2-20. The construction worker HI is 1, which is equivalent to the NMED target of 1 (NMED 2017, 602273). The primary contributor to construction worker noncarcinogenic risk is manganese.

H-4.2.3 AOC 02-003(c)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-21, H-4.2-22, and H-4.2-23. The total excess cancer risk for the industrial scenario is 1×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.004, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the recreational scenario are presented in Tables H-4.2-24, H-4.2-25, and H-4.2-26. The total excess cancer risk for the recreational scenario is 1×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.01, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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 H-4.2-27, H-4.2-28, and H-4.2-29. The total excess cancer risk for the residential scenario is 4×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 3, which is greater than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 4 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is a COPC at AOC 02-003(c) and may potentially pose an unacceptable risk to the construction worker. The noncarcinogenic risk screening results for the construction worker at AOC 02-003(c) are presented in Table H-4.2-30. The construction worker HI is 1, which is equivalent to the NMED target of 1 (NMED 2017, 602273). The primary contributor to construction worker noncarcinogenic risk is manganese.

H-4.2.4 AOC 02-003(d)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-31, H-4.2-32, and H-4.2-33. The total excess cancer risk for the industrial scenario is 1×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.002, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 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 recreational scenario are presented in Tables H-4.2-34, H-4.2-35, and H-4.2-36. The total excess cancer risk for the recreational scenario is 1×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.004, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-37, H-4.2-38, and H-4.2-39. The total excess cancer risk for the residential scenario is 4×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.5, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 10 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is a COPC at AOC 02-003(d) and may potentially pose an unacceptable risk to the construction worker. The noncarcinogenic risk screening results for the construction worker at AOC 02-003(d) are presented in Table H-4.2-40. The construction worker HI is 1, which is equivalent to the NMED target of 1 (NMED 2017, 602273). The primary contributor to construction worker noncarcinogenic risk is manganese.

H-4.2.5 AOC 02-003(e)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-41, H-4.2-42, and H-4.2-43. The total excess cancer risk for the industrial scenario is 6×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.007, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.0000001 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the recreational scenario are presented in Tables H-4.2-44, H-4.2-45, and H-4.2-46. The total excess cancer risk for the recreational scenario is 6×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.01, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.00000004 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-47, H-4.2-48, and H-4.2-49. 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 2017, 602273). The residential HI is 3, which is greater than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 400 mrem/yr, which is greater than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is not a COPC at AOC 02-003(e) and the residential exposure scenario is also protective of construction workers.

H-4.2.6 AOC 02-004(a)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-50, H-4.2-51, and H-4.2-52. The total excess cancer risk for the industrial scenario is 1×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.03, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 9 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the recreational scenario are presented in Tables H-4.2-53, H-4.2-54, and H-4.2-55. The total excess cancer risk for the recreational scenario is 2×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.06, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-56, H-4.2-57, and H-4.2-58. The total excess cancer risk for the residential scenario is 7×10^{-6}, which less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.8, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 8 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

TPH was identified as a COPC. The industrial TPH HQ was 0.05 and the residential TPH HQ was 0.08 (Tables H-4.2-59 and H-4.2-60, respectively).

Manganese is a COPC at AOC 02-004(a) and may potentially pose an unacceptable risk to the construction worker. The noncarcinogenic risk screening results for the construction worker at AOC 02-004(a) are presented in Table H-4.2-61. The construction worker HI is 1, which is equivalent to the NMED target of 1 (NMED 2017, 602273). The primary contributor to construction worker noncarcinogenic risk is manganese.

H-4.2.7 AOCs 02-004(b,c,d)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-62, H-4.2-63, and H-4.2-64. 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} (NMED 2017, 602273). The industrial HI is 0.008, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 2.5 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the recreational scenario are presented in Tables H-4.2-65, H-4.2-66, and H-4.2-67. The total excess cancer risk for the recreational scenario is 1×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.02, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-68, H-4.2-69, and H-4.2-70. 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 2017, 602273). The residential HI is 0.5, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 10 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is a COPC at AOCs 02-004(b,c,d) and may potentially pose an unacceptable risk to the construction worker. The noncarcinogenic risk screening results for the construction worker at AOCs 02-004(b,c,d) are presented in Table H-4.2-71. The construction worker HI is 1, which equal to the NMED target of 1 (NMED 2017, 602273). The primary contributor to construction worker noncarcinogenic risk is manganese.

H-4.2.8 AOC 02-004(e)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-72, H-4.2-73, and H-4.2-74. The total excess cancer risk for the industrial scenario is 9×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.008 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the recreational scenario are presented in Tables H-4.2-75, H-4.2-76, and H-4.2-77. The total excess cancer risk for the recreational scenario is 1×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.008 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-78, H-4.2-79, and H-4.2-80. The total excess cancer risk for the residential scenario is 4×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is not a COPC at AOC 02-004(e) and the residential exposure scenario is also protective of construction workers.

H-4.2.9 AOC 02-004(f)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-81, H-4.2-82, and H-4.2-83. 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} (NMED 2017, 602273). The industrial HI is 0.009, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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 recreational scenario are presented in Tables H-4.2-84, H-4.2-85, and H-4.2-86. The total excess cancer risk for the recreational scenario is 1×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.02, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.03 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-87, H-4.2-88, and H-4.2-89. The total excess cancer risk for the residential scenario is 4×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.1, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is not a COPC at AOC 02-004(f) and the residential exposure scenario is also protective of construction workers.

H-4.2.10 AOC 02-004(g)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-90, H-4.2-91, and H-4.2-92. 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 2017, 602273). The industrial HI is 0.004, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 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 recreational scenario are presented in Tables H-4.2-93, H-4.2-94, and H-4.2-95. The total excess cancer risk for the recreational scenario is 9×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.01, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.4 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-96, H-4.2-97, and H-4.2-98. 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 2017, 602273). The residential HI is 0.05, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 13 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is not a COPC at AOC 02-004(g) and the residential exposure scenario is also protective of construction workers.

H-4.2.11 SWMU 02-005

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-99, H-4.2-100, and H-4.2-101. 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 2017, 602273). The industrial HI is 0.003, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.01 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the recreational scenario are presented in Tables H-4.2-102, H-4.2-103, and H-4.2-104. The total excess cancer risk for the recreational scenario is 2×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.008, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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 H-4.2-105, H-4.2-106, and H-4.2-107. 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 2017, 602273). The residential HI is 0.4, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.9 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is a COPC at SWMU 02-005 and may potentially pose an unacceptable risk to the construction worker. The noncarcinogenic risk screening results for the construction worker at SWMUs 02-005 are presented in Table H-4.2-108. The construction worker HI is 1, which is equivalent to the NMED target of 1 (NMED 2017, 602273). The primary contributor to construction worker noncarcinogenic risk is manganese.

H-4.2.12 SWMU 02-006(a)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-109, H-4.2-110, and H-4.2-111. The total excess cancer risk for the industrial scenario is 1×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 8 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the recreational scenario are presented in Tables H-4.2-112, H-4.2-113, and H-4.2-114. The total excess cancer risk for the recreational scenario is 1×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.06, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.9 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-115, H-4.2-116, and H-4.2-117. The total excess cancer risk for the residential scenario is 4×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.3, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 11 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is not a COPC at SWMU 02-006(a) and the residential exposure scenario is also protective of construction workers.

H-4.2.13 SWMU 02-006(b)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-118, H-4.2-119, and H-4.2-120. 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 2017, 602273). The industrial HI is 0.03, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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 recreational scenario are presented in Tables H-4.2-121, H-4.2-122, and H-4.2-123. The total excess cancer risk for the recreational scenario is 2×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.06 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-124, H-4.2-125, and H-4.2-126. The total excess cancer risk for the residential scenario is 3×10^{-5}, which is greater than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 2, which is greater than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

TPH was identified as a COPC. The industrial TPH HQ was 0.02 and the residential TPH HQ was 0.03 (Tables H-4.2-127 and H-4.2-128, respectively).

Manganese is a COPC at SWMU 02-006(b) and may potentially pose an unacceptable risk to the construction worker. The noncarcinogenic risk screening results for the construction worker at SWMU 02-006(b) are presented in Table H-4.2-129. The construction worker HI is 1, which is equivalent to the NMED target of 1 (NMED 2017, 602273). The primary contributor to construction worker noncarcinogenic risk is manganese.

H-4.2.14 AOC 02-006(c)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-130, H-4.2-131, and H-4.2-132. The total excess cancer risk for the industrial scenario is 3×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.01, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 10 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the recreational scenario are presented in Tables H-4.2-133, H-4.2-134, and H-4.2-135. The total excess cancer risk for the recreational scenario is 3×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.03, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-136, H-4.2-137, and H-4.2-138. 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 2017, 602273). The residential HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 20 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

TPH was identified as a COPC. The industrial TPH HQ was 0.005 and the residential TPH HQ was 0.5 (Tables H-4.2-139 and H-4.2-140, respectively).

Manganese is not a COPC at AOC 02-006(c) and the residential exposure scenario is also protective of construction workers.

H-4.2.15 AOC 02-006(e)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-141, H-4.2-142, and H-4.2-143. 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 2017, 602273). The industrial HI is 0.1, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the recreational scenario are presented in Tables H-4.2-144, H-4.2-145, and H-4.2-146. The total excess cancer risk for the recreational scenario is 2×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.1, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-147, H-4.2-148, and H-4.2-149. 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 2017, 602273). The residential HI is 0.8, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is not a COPC at AOC 02-006(e) and the residential exposure scenario is also protective of construction workers.

H-4.2.16 SWMU 02-007

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-150, H-4.2-151, and H-4.2-152. 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 2017, 602273). The industrial HI is 0.1, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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.

The results of the risk-screening assessment for the recreational scenario are presented in Tables H-4.2-153, H-4.2-154, and H-4.2-155. The total excess cancer risk for the recreational scenario is 3×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.3, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.008 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-156, H-4.2-157, and H-4.2-158. The total excess cancer risk for the residential scenario is 6×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.4, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 6 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is not a COPC at SWMU 02-007 and the residential exposure scenario is also protective of construction workers.

H-4.2.17 SWMU 02-008(a)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-159, H-4.2-160, and H-4.2-161. 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 2017, 602273). The industrial HI is 0.02, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.04 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the recreational scenario are presented in Tables H-4.2-162, H-4.2-163, and H-4.2-164. The total excess cancer risk for the recreational scenario is 2×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.04 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-165, H-4.2-166, and H-4.2-167. 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 2017, 602273). The residential HI is 0.6, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.6 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is a COPC at SWMU 02-008(a) and may potentially pose an unacceptable risk to the construction worker. The noncarcinogenic risk screening results for the construction worker at SWMU 02-008(a) are presented in Table H-4.2-168. The construction worker HI is 1, which is equivalent to the NMED target of 1 (NMED 2017, 602273). The primary contributor to construction worker noncarcinogenic risk is manganese.

H-4.2.18 AOC 02-008(c)(i)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-169, H-4.2-170, and H-4.2-171. The total excess cancer risk for the industrial scenario is 1×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.0007, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.01 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the recreational scenario are presented in Tables H-4.2-172, H-4.2-173, and H-4.2-174. The total excess cancer risk for the recreational scenario is 2×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.002, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.01 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-175, H-4.2-176, and H-4.2-177. 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 2017, 602273). The residential HI is 0.01, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is not a COPC at AOC 02-008(c)(i) and the residential exposure scenario is also protective of construction workers.

H-4.2.19 AOC 02-008(c)(ii)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-178, H-4.2-179, and H-4.2-180. 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 2017, 602273). The industrial HI is 0.02, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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.

The results of the risk-screening assessment for the recreational scenario are presented in Tables H-4.2-181, H-4.2-182, and H-4.2-183. The total excess cancer risk for the recreational scenario is 2×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-184, H-4.2-185, and H-4.2-186. 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 2017, 602273). The residential

HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is not a COPC at AOC 02-008(c)(ii) and the residential exposure scenario is also protective of construction workers.

H-4.2.20 SWMU 02-009(a)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-187, H-4.2-188, and H-4.2-189. The total excess cancer risk for the industrial scenario is 6×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.02, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the recreational scenario are presented in Tables H-4.2-190, H-4.2-191, and H-4.2-192. The total excess cancer risk for the recreational scenario is 8×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-193, H-4.2-194, and H-4.2-195. The total excess cancer risk for the residential scenario is 5×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.3, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 5 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is not a COPC at SWMU 02-009(a) and the residential exposure scenario is also protective of construction workers.

H-4.2.21 SWMU 02-009(b)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-196, H-4.2-197, and H-4.2-198. 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 2017, 602273). The industrial HI is 0.006, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 5 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the recreational scenario are presented in Tables H-4.2-199, H-4.2-200, and H-4.2-201. The total excess cancer risk for the recreational scenario is 1×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.01, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.6 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-202, H-4.2-203, and H-4.2-204. The total excess cancer risk for the residential scenario is 5×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.09, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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.

Manganese is not a COPC at SWMU 02-009(b) and the residential exposure scenario is also protective of construction workers.

H-4.2.22 SWMU 02-009(c)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-205, H-4.2-206, and H-4.2-207. 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 2017, 602273). The industrial HI is 0.02, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 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 recreational scenario are presented in Tables H-4.2-208, H-4.2-209, and H-4.2-210. The total excess cancer risk for the recreational scenario is 3×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-211, H-4.2-212, and H-4.2-213. 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 2017, 602273). The residential HI is 0.4, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 56 mrem/yr, which is greater than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is a COPC at SWMU 02-009(c) and may potentially pose an unacceptable risk to the construction worker. The noncarcinogenic risk screening results for the construction worker at SWMU 02-009(c) are presented in Table H-4.2-214. The construction worker HI is 1, which is equivalent to the NMED target of 1 (NMED 2017, 602273). The primary contributor to construction worker noncarcinogenic risk is manganese.

H-4.2.23 AOC 02-009(d)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-215, H-4.2-216, and H-4.2-217. The total excess cancer risk for the industrial scenario is 9×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.006, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 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 recreational scenario are presented in Tables H-4.2-218, H-4.2-219, and H-4.2-220. The total excess cancer risk for the recreational scenario is 1×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.01, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.4 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-221, H-4.2-222, and H-4.2-223. The total excess cancer risk for the residential scenario is 8×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.06, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 30 mrem/yr, which is greater than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is not a COPC at AOC 02-009(d) and the residential exposure scenario is also protective of construction workers.

H-4.2.24 AOC 02-010

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-224, H-4.2-225, and H-4.2-226. The total excess cancer risk for the industrial scenario is 4×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.3, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 5 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the recreational scenario are presented in Tables H-4.2-227, H-4.2-228, and H-4.2-229. The total excess cancer risk for the recreational scenario is 5×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.5 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-230, H-4.2-231, and H-4.2-232. The total excess cancer risk for the residential scenario is 9×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 1, which is equivalent to the NMED target HI of 1 (NMED 2017, 602273). The total dose is 12 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is not a COPC at AOC 02-010 and the residential exposure scenario is also protective of construction workers.

H-4.2.25 AOC 02-011(a)(i-vi)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-233 H-4.2-234, and H-4.2-235. The total excess cancer risk for the industrial scenario is 4×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.02, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the recreational scenario are presented in Tables H-4.2-236, H-4.2-237, and H-4.2-238. The total excess cancer risk for the recreational scenario is 4×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.05, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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 H-4.2-239, H-4.2-240, and H-4.2-241. 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 2017, 602273). The residential HI is 0.3, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 7 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is not a COPC at AOC 02-011(a)(i-vi) and the residential exposure scenario is also protective of construction workers.

H-4.2.26 AOC 02-011(a)(viii)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-242, H-4.2-243, and H-4.2-244. The total excess cancer risk for the industrial scenario is 3×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial

HI is 0.06, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the recreational scenario are presented in Tables H-4.2-245, H-4.2-246, and H-4.2-247. The total excess cancer risk for the recreational scenario is 5×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.06, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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 H-4.2-248, H-4.2-249, and H-4.2-250. 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 2017, 602273). The residential HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 8 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is not a COPC at AOC 02-011(a)(viii) and the residential exposure scenario is also protective of construction workers.

H-4.2.27 AOC 02-011(a)(ix)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-251, H-4.2-252, and H-4.2-253. 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 2017, 602273). The industrial HI is 0.03, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.03 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the recreational scenario are presented in Tables H-4.2-254, H-4.2-255, and H-4.2-256. The total excess cancer risk for the recreational scenario is 8×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.05, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.03 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-257, H-4.2-258, and H-4.2-259. The total excess cancer risk for the residential scenario is 6×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 1, which is equivalent to the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.8 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

TPH was identified as a COPC. The industrial TPH HQ was 0.006 and the residential TPH HQ was 0.08 (Tables H-4.2-260 and H-4.2-261, respectively).

Manganese is not a COPC at AOC 02-011(a)(ix) and the residential exposure scenario is also protective of construction workers.

H-4.2.28 AOC 02-011(a)(x)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-262, H-4.2-263, and H-4.2-264. The total excess cancer risk for the industrial scenario is 6×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.03 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the recreational scenario are presented in Tables H-4.2-265, H-4.2-266, and H-4.2-267. The total excess cancer risk for the recreational scenario is 6×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.4, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.03 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-268, H-4.2-269, and H-4.2-270. 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 2017, 602273). The residential HI is 0.8, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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.

TPH was identified as a COPC. The industrial TPH HQ was 0.02 and the residential TPH HQ was 0.05 (Tables H-4.2-271 and H-4.2-272, respectively).

Manganese is a COPC at AOC 02-011(a)(x) and may potentially pose an unacceptable risk to the construction worker. The noncarcinogenic risk screening results for the construction worker at AOC 02-011(a)(x) are presented in Table H-4.2-273. The construction worker HI is 1, which is equivalent to the NMED target of 1 (NMED 2017, 602273). The primary contributor to construction worker noncarcinogenic risk is manganese.

H-4.2.29 AOC 02-011(b)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-274, H-4.2-275, and H-4.2-276. The total excess cancer risk for the industrial scenario is 4×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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.

The results of the risk-screening assessment for the recreational scenario are presented in Tables H-4.2-277, H-4.2-278, and H-4.2-279. The total excess cancer risk for the recreational scenario is 5×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.05, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-280, H-4.2-281, and H-4.2-282. The total excess cancer risk for the residential scenario is 4×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.3, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 20 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is a COPC at AOC 02-011(b) and may potentially pose an unacceptable risk to the construction worker. The noncarcinogenic risk screening results for the construction worker at AOC 02-011(b) are presented in Table H-4.2-283. The construction worker HI is 1, which is equivalent to the NMED target of 1 (NMED 2017, 602273). The primary contributor to construction worker noncarcinogenic risk is manganese.

H-4.2.30 AOC 02-011(c)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-284 and H-4.2-285. 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 2017, 602273). The industrial HI is 0.003, which is less than the NMED target HI of 1 (NMED 2017, 602273). No radionuclide COPCs were identified in the 0.0–1.0 ft depth interval.

The results of the risk-screening assessment for the recreational scenario are presented in Tables H-4.2-286 and H-4.2-287. The total excess cancer risk for the recreational scenario is 2×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.009, which is less than the NMED target HI of 1 (NMED 2017, 602273). No radionuclide COPCs were identified in the 0.0–1.0 ft depth interval.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-288, H-4.2-289, and H-4.2-290. The total excess cancer risk for the residential scenario is 7×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.08, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.4 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is not a COPC at AOC 02-011(c) and the residential exposure scenario is also protective of construction workers.

H-4.2.31 AOC 02-011(d)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-291, H-4.2-292, and H-4.2-293. 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 2017, 602273). The industrial HI is 0.1, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 7 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the recreational scenario are presented in Tables H-4.2-294, H-4.2-295, and H-4.2-296. The total excess cancer risk for the recreational scenario is 1×10^{-5}, which is equivalent to the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.8 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-297, H-4.2-298, and H-4.2-299. The total excess cancer risk for the residential scenario is 2×10^{-5}, which is greater than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.6, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 12 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

Manganese is not a COPC at AOC 02-011(d) and the residential exposure scenario is also protective of construction workers.

H-4.2.32 AOC 02-012

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-300, H-4.2-301, and H-4.2-302. 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 2017, 602273). The industrial

HI is 0.009, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.0000001 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the recreational scenario are presented in Tables H-4.2-303, H-4.2-304, and H-4.2-305. The total excess cancer risk for the recreational scenario is 2×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.02, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.0008 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-306, H-4.2-307, and H-4.2-308. 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 2017, 602273). The residential HI is 0.5, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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.

TPH was identified as a COPC. The industrial TPH HQ was 0.03 and the residential TPH HQ was 0.02 (Tables H-4.2-309 and H-4.2-310, respectively).

Manganese is a COPC at AOC 02-012 and may potentially pose an unacceptable risk to the construction worker. The noncarcinogenic risk screening results for the construction worker at AOC 02-012 are presented in Table H-4.2-311. The construction worker HI is 1, which is equivalent to the NMED target of 1 (NMED 2017, 602273). The primary contributor to construction worker noncarcinogenic risk is manganese.

H-4.2.33 SWMU 21-006(e) and AOC 21-006(f)

The results of the risk-screening assessment for the construction worker scenario are presented in Tables H-4.2-312, H-4.2-313, and H-4.2-314. 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 2017, 602273). The construction worker HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 6 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-315, H-4.2-316, and H-4.2-317. The total excess cancer risk for the residential scenario is 4×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.4, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 20 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

H-4.2.34 AOC 21-028(c)

The results of the risk-screening assessment for the construction worker scenario are presented in Tables H-4.2-318, H-4.2-319 and H-4.2-320. 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 2017, 602273). The construction worker HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 1.5 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-321, H-4.2-322, and H-4.2-323. The total excess cancer risk for the residential scenario is 4×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.3, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 4 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

H-4.2.35 SWMU 26-001

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-324, H-4.2-325, and H-4.2-326. 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} (NMED 2017, 602273). The industrial HI is 0.06, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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 H-4.2-327, H-4.2-328, and H-4.2-329. 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 2017, 602273). The construction worker HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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 H-4.2-330, H-4.2-331, and H-4.2-332. The total excess cancer risk for the residential scenario is 4×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.7, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.9 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

H-4.2.36 SWMU 26-002(a)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-333, H-4.2-334, and H-4.2-335. 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 2017, 602273). The industrial HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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 H-4.2-336, H-4.2-337, and H-4.2-338. 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 2017, 602273). The construction worker HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-339, H-4.2-340, and H-4.2-341. The total excess cancer risk for the residential scenario is 6×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.5, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

H-4.2.37 SWMU 26-002(b)

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-342, H-4.2-343, and H-4.2-344. 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 2017, 602273). The industrial HI is 0.02, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.03 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the construction worker scenario are presented in Tables H-4.2-345, H-4.2-346, and H-4.2-347. 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 2017, 602273). The construction worker HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-348, H-4.2-349, and H-4.2-350. 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 2017, 602273). The residential HI is 0.4, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.4 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

H-4.2.38 SWMU 26-003

The results of the risk-screening assessment for the industrial scenario are presented in Tables H-4.2-351, H-4.2-352, and H-4.2-353. 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 2017, 602273). The industrial HI is 0.03, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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 construction worker scenario are presented in Tables H-4.2-354, H-4.2-355, and H-4.2-356. 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 2017, 602273). The construction worker HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.4 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

The results of the risk-screening assessment for the residential scenario are presented in Tables H-4.2-357, H-4.2-358, and H-4.2-359. 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 2017, 602273). The residential HI is 0.4, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1.

H-4.3 Vapor Intrusion Pathway

NMED guidance (NMED 2017, 602273) requires an evaluation of the vapor-intrusion pathway. The vapor intrusion pathway of VOCs into a building was evaluated where appropriate. The evaluation can be qualitative for a potentially complete pathway if the following criteria are met:

- Volatile and toxic compounds are minimally detected
- Concentrations are below NMED's vapor-intrusion screening levels for soil-gas and/or groundwater. There is no suspected source(s) for volatile and toxic compounds, and
- Concentrations are decreasing with depth (for soil).

Because only bulk soil data are available for three sites, the vapor-intrusion screening levels are not applicable for the evaluation. The vapor intrusion pathway was qualitatively evaluated as part of the residential scenario for some of the sites in this report. Among the factors considered for the vapor intrusion pathway to be relevant to human health risk is the current extent of structures and their proximity to the VOC source. One may also consider if construction of buildings is possible or proposed in the reasonably foreseeable future. Few structures exist at the Middle Los Alamos Canyon Aggregate Area SWMUs or AOCs.

No VOCs were detected at AOC 02-004(e) and AOC 02-008(c)(i). Therefore, the vapor intrusion pathway is incomplete for this site. The potential for the vapor intrusion pathway is discussed for each of the remaining sites.

Samples collected at SWMU 26-001 were located on hill slopes and not suitable for placement of a structure. In addition, part of SWMU 26-002(a) and SWMU 26-003 are also on a hill slope and not buildable; there were no VOCs significantly detected (maximum detect concentration less than or similar to maximum nondetect concentration) at the mesa top sampling locations for these SWMUs. Therefore, the vapor intrusion pathway was not evaluated for these sites.

H-4.3.1 AOC 02-003(a)

AOC 02-003(a) was the site of the stack-gas valve house (structure 02-19) and associated stainless-steel gaseous effluent vent lines (lines 117 and 118), as shown on engineering drawing C-1718 (LASL 1947, 089677). This system was associated with the WBR, a homogeneous liquid-fueled reactor fueled by an enriched uranyl-salt compound. The stack-gas valve house and effluent vent lines system were installed in 1944 and received off-gas from the WBR. The off-gas contained gaseous fission products, including cesium-137, strontium-90, technetium-99, and iodine-131 (LANL 1993, 015314, p. 7.4-1). The stack-gas valve house was primarily aboveground and was constructed of reinforced concrete, 11 ft × 9 ft × 10 ft high, with 18-in.-thick walls (Elder and Knoell 1986, 006670, p. 4). From 1944 to 1948, gaseous effluent entered the stack-gas valve house from line 117 and was directed via line 118 to the southeast. Line 118 was used as a temporary gas vent until July 1948 when the condensate trap and line 119 [AOC 02-003(b)] became operational. Line 118 was left in place from 1948 to its removal in 1985 (Elder and Knoell 1986, 006670, pp. 8, 29, 43). Line 117 and the stack-gas valve house remained in use until 1974 when they became inactive and were removed and disposed of during D&D efforts in 1985 (Elder and Knoell 1986, 006670, pp. 22-29, p. 43).

Four VOCs (1,4-dichlorobenzene; methylene chloride; naphthalene; and toluene) were minimally detected at this site. The detected concentrations are less than the estimated quantitation limits (EQLs) for these VOCs.

Dichlorobenzene[1,4-] was detected in 1 of 15 samples with a maximum concentration of 0.000563 mg/kg; the depth of this sample was from 2.0 to 4.5 ft bgs. The depths of all 1,4-dichlorobenzene samples were up to 21 ft bgs. Methylene chloride was detected in 2 of 15 samples with concentrations ranging from 0.00355 mg/kg to 0.00452 mg/kg; the depth of these samples was up to 6.3 ft bgs, and the maximum detected concentration was at a depth of 4.5 to 6.3 ft bgs. The depth of all samples was up to 21 ft bgs. No detected concentrations were at depths below the maximum detected concentration. Naphthalene was detected in 1 of 31 samples with a maximum concentration of 0.0111 mg/kg; the depth of this sample was from of 0.0 to 0.5 ft bgs. The depth of all samples was up to 50 ft bgs. Toluene was detected in 2 of 15 samples with concentrations ranging from 0.000362 mg/kg to 0.00037 mg/kg; the depth of these samples was up to 6.3 ft bgs, and the maximum detected concentration was at a depth of 4.5 to 6.3 ft bgs. The depth of all samples was up to 21 ft bgs. One detected concentration was at a depth below the maximum detected concentration: 0.000362 mg/kg in the depth interval of 4.5 to 7.6 ft bgs.

The site description indicates that solvents were not used, so no sources of VOCs are present and VOCs were only detected minimally. In addition, the drain lines and structures have been removed and the site is inactive. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.3.2 AOC 02-003(b)

AOC 02-003(b) consisted of the condensate trap (structure 02-48) and associated stainless-steel line (line 119). The WBR off-gas system consisted of the stack-gas valve house, condensate trap, mesa-top vent stack located above TA-02 at TA-61, and associated stainless-steel lines. The condensate trap was a concrete manhole superstructure and a small-diameter standpipe. It was located at the lowest point of line 119 between the stack-gas valve house [structure 02-19, AOC 02-003(a)] and the delay tanks [structure 02-131, AOC 02-003(c)], as shown on engineering drawing C-1718 (LASL 1947, 089677; Elder and Knoell 1986, 006670, p. 29). Line 119 consisted of an approximately 78-ft-long east-west trending pipe section that ran from the stack-gas valve house (structure 02-19) to the condensate trap and a 205-ft-long north-south trending section that ran from the condensate trap to the delay tanks. Line 119 continued from the delay tanks to the junction with the main OWR gaseous effluent vent line and up to the mesa-top stack (structure 02-9) and French drain [SWMU 02-006(a)] located at TA-61 (Elder and Knoell 1986, 006670, pp. 6, 8). The upper portion of the gaseous effluent vent line (line 119) from the delay tanks to the mesa-top stack is addressed as AOC 02-003(d). The WBR off-gas system was installed in 1948. The off-gas contained gaseous fission products, including cesium-137, strontium-90, technetium-99, and iodine-131 (LANL 1993, 015314, p. 7.4-1). The condensate trap and line 119 from the stack-gas valve house (structure 02-19) to the delay tanks remained in use through 1974. The units were inactive from 1974 to 1985 and were removed and disposed of during D&D efforts in 1985 (Elder and Knoell 1986, 006670, pp. 22-29, p. 43).

Four VOCs (n-butylbenzene, 4-isopropyltoluene, 2-methylnaphthalene, and 1,2,4-trimethylbenzene) were minimally detected at this site. The detected concentrations are less than the EQLs for these VOCs.

Butylbenzene[n-] was detected in 1 of 8 samples with a maximum concentration of 0.000661 mg/kg; the depth of this sample was from 0.0 to 0.5 ft bgs. The depth of all samples was up to 16.7 ft bgs. Isopropyltoluene[4-] was detected in 1 of 8 samples with a maximum concentration of 0.000403 mg/kg; the depth of this sample was from 4.5 to 9.0 ft bgs. The depth of all samples was up to 16.7 ft bgs. Methylnaphthalene[2-] was detected in 1 of 24 samples with a maximum concentration of 0.0137 mg/kg; the depth of this sample was from 0.0 to 0.5 ft bgs. The depth of all samples was up to 50 ft bgs. Trimethylbenzene[1,2,4-] was detected in 1 of 8 samples with a maximum concentration of 0.000229 mg/kg; the depth of this sample was from 4.5 to 9.0 ft bgs. The depth of all samples was up to 16.7 ft bgs.

The site description indicates that solvents were not used, so no sources of VOCs are present and VOCs were only detected minimally. In addition, the drain lines and structures have been removed and the site is inactive. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.3.3 AOC 02-003(c)

AOC 02-003(c) consisted of two parallel underground stainless-steel gaseous effluent delay tanks (each 1 ft in diameter by 20 ft long and buried 4 ft deep). The tanks were part of the gaseous effluent vent line system associated with the WBR. The 1990 SWMU report (LANL 1990, 007511) describes the tanks as being “in series”; however, excavation of the tanks during the 1985 D&D indicated that they were parallel and oriented east to west (Elder and Knoell 1986, 006670, p. 8). The gaseous effluent vent system was in place by 1951 and received off-gas from the WBR. The off-gas contained gaseous fission products, including cesium-137, strontium-90, technetium-99, and iodine-131 (LANL 1993, 015314, p. 7.4-1). It is unclear when the delay tanks were installed. The original as-built drawing of the condensate trap and line 119 (LASL 1947, 089677) dated 1947 does not show the delay tank system. The tanks appear to have been installed in 1951 when other modifications to the gaseous effluent vent line system were made

(Montoya 1991, 006997, p. 2); however, no installation record is available. The delay tanks remained in use until 1974 and were inactive from 1974 to 1985. The tanks were removed and disposed of during D&D efforts in 1985 (Elder and Knoell 1986, 006670, pp. 22-29, p. 43).

Five VOCs (acetone, chloroform, 2-methylnaphthalene, naphthalene, and toluene) were minimally detected at this site. The detected concentrations are less than or similar to the EQLs for these VOCs.

Acetone was detected in 1 of 22 samples with a maximum concentration of 0.0101 mg/kg; the depth of this sample was from 4.5 to 9.0 ft bgs. The depth of all acetone samples was up to 24.5 ft bgs. Chloroform was detected in 6 of 22 samples with concentrations ranging from 0.000257 mg/kg to 0.000322 mg/kg; the depth of these samples was up to 20.5 ft bgs, and the maximum detected concentration was at a depth of 14.5 to 18.5 ft bgs. The depth of all samples was up to 24.5 ft bgs. One detected concentration was at a depth below the maximum detected concentration: 0.000266 mg/kg in the depth interval of 15.9 to 20.5 ft bgs. Methylnaphthalene[2-] was detected in 1 of 36 samples with a maximum concentration of 0.00792 mg/kg; the depth of this sample was from 4.5 to 6.5 ft bgs. The depth of all samples was up to 50 ft bgs. Naphthalene was detected in 1 of 36 samples with a maximum concentration of 0.0161 mg/kg; the depth of this sample was from 4.5 to 6.5 ft bgs. The depth of all samples was up to 50 ft bgs. Toluene was detected in 6 of 22 samples with concentrations ranging from 0.00037 mg/kg to 0.000928 mg/kg; the depth of these samples was up to 20.5 ft bgs, and the maximum detected concentration was at a depth of 0.5 to 5.0 ft bgs. The depth of all samples was up to 24.5 ft bgs. Five concentrations were at depths below the maximum detected concentration: 0.0037 mg/kg, 0.00394 mg/kg, 0.000458 mg/kg, 0.000665 mg/kg, and 0.000892 mg/kg at depth intervals of 4.5 to 7.3, 4.5 to 6.2, 4.5 to 9.5, 4.5 to 6.7, and 4.5 to 9 ft bgs, respectively.

The site description indicates that solvents were not used, so no sources of VOCs are present and VOCs were only detected minimally. In addition, the tanks have been removed and the site is inactive. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.3.4 AOC 02-003(d)

AOC 02-003(d) consists of two distinct areas. One is the potential soil contamination area associated with a temporary gaseous effluent vent, the garden hose that reportedly served as a temporary vent line for the WBR during initial operations (LANL 1993, 015314, p. 7.4-3). This area is located approximately 120 ft northeast of the former OWR building. The second and primary area of AOC 02-003(d) is the 1200-ft gaseous effluent vent line from the delay tanks (structure 02-131) to the mesa-top stack [structure 02-9, SWMU 02-006(a)]. The garden hose discharge was reportedly used from 1943 to when the stack on the mesa top (structure 02-9, located at TA-61) was built in 1948 (LANL 1993, 015314, 7.4-3). The gaseous effluent vent line received gaseous effluent from the WBR from 1948 to 1974 and from the OWR from 1953 to 1993 (Elder and Knoell 1986, 006670, p. 8). The mesa-top stack remained in use from 1948 to 1993. The stack received waste from only the WBR from 1948 to 1956, when the OWR was brought online. The stack received waste from both the WBR and the OWR from 1956 to 1974. The stack received effluent from only the OWR from 1974 to 1993. The stack became inactive in 1993 when the OWR was deactivated, and the stack was removed and disposed of in November 2002 (LANL 2003, 090089, p. 2). Line 119 was removed in April 2003 (WD-3 2003, 082646, p. 2).

One VOC (toluene) was minimally detected at this site. The detected concentrations are less than the EQLs for this VOCs.

Toluene was detected in 3 of 14 samples with concentrations ranging from 0.000375 mg/kg to 0.000646 mg/kg; the depth of these samples was up to 3.4 ft bgs, and the maximum detected concentration was at a depth of 2.7 to 3.4 ft bgs. The depth of all samples was up to 5 ft bgs. No detected concentration was at a depth below the maximum detected concentration.

The site description indicates that solvents were not used, so no sources of VOCs are present and VOCs were only detected minimally. In addition, the vent line has been removed and the site is inactive. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.3.5 AOC 02-003(e)

AOC 02-003(e) is the former location of an 800-L stainless-steel holding tank (structure 02-62), installed in approximately 1944, and was associated with operation of the WBR. The holding tank was adjacent to the stack-gas valve house (structure 02-19) and was designed to collect WBR cooling water in the event of a cooling coil breach. The WBR holding tank was installed in approximately 1944 and may have been used until 1974, when the WBR was placed in safe-shutdown mode. The holding tank was removed and disposed of during D&D activities in 1985. During D&D, the tank reportedly showed no sign of having been used. However, reports of a “surge tank” running over indicate an original tank may have been used and replaced during its active life (Elder and Knoell 1986, 006670, p. 2; DOE 1987, 008663).

One VOC (toluene) was minimally detected at this site. The detected concentrations are less than the EQLs for this VOCs.

Toluene was detected in 1 of 12 samples with a maximum detected concentration of 0.00043 mg/kg at a depth of 4.5 to 7.5 ft bgs. The depth of all samples was up to 23.4 ft bgs.

The site description indicates that solvents were not used, so no sources of VOCs are present and VOCs were only detected minimally. In addition, the tank was removed and the site is inactive. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.3.6 AOC 02-004(a)

AOC 02-004(a) is the OWR facility (building 02-1) and is composed of the OWR, the OWR fuel-handling area, the OWR cooling-liquid recirculating piping, the OWR gaseous effluent vent line, the OWR material storage area, and the WBR. To facilitate discussion, AOC 02-004(a) is divided into the following three areas.

OWR, Fuel-Handling Area, Cooling-Liquid Recirculating Piping, and Gaseous Effluent Vent Line. A 25-kilowatt fast-neutron research reactor, Clementine, was located in the western third of building 02-1. The reactor was self-contained and operated from 1946 to 1953 (LANL 1993, 015314, p. E-8). Clementine was the precursor to the OWR and was dismantled in 1954 (WD-3 2003, 082646, p. 2).

The OWR was built above the former Clementine site in the western third of building 02-1. The OWR was an 8-megawatt water-cooled tank-type research reactor fueled by enriched solid uranium. It was put online in 1956 and operated until it was put on standby status in 1993. The reactor remained inactive until it was decommissioned, removed, and disposed of in 2003 (WD-3 2003, 082646, p. 2).

The OWR fuel-handing area consisted of a fuel pit and a closed recirculating system that serviced only the fuel pit. It was located adjacent to the OWR and was used for temporary storage of fuel rods before they were recycled.

The OWR operated with a cooling-liquid recirculating system that consisted of a series of closed-loop pipes in a 100-ft-long corridor that extended from the OWR west to the reactor facility equipment building [building 02-44, AOC 02-004(f)]. The water was routed through pumps, filters, and chillers in the reactor facility equipment building and back to the reactor. The cooling tower (structure 02-49) was added in 1959 to supplement the building 02-44 chillers in this closed system. The recirculating system was active from 1956 to 1993, when it was put on standby status during the OWR shutdown.

Off-gas from the OWR was routed through the gaseous effluent vent line to a connection into line 119 on the east side of TA-02, where the effluent continued up to the mesa-top stack [structure 02-9, SWMU 02-006(a)]. The gaseous effluent vent line teed off from the piping corridor between the OWR and OWR equipment building (02-44), as shown on engineering drawing C-10473 (LASL 1957, 090082).

OWR Material Storage Area. Operation of the OWR included the temporary storage of material (isotope columns, through-put port metal sleeves, etc.) that became activated during contact in the reactor neutron flux field. The material was stored in a structure adjacent to the guard quarters (building 02-4), located south of the reactor, to await final disposition. The material storage structure was present in as-built engineering drawing R-391 in 1958 (LASL 1958, 090085) and was removed in 2000 (LANL 2000, 090087).

WBR. The WBR was the name used for a series of three small research reactors, low power (LOPO), high power (HYPO), and super power (SUPO), located in the eastern third of the OWR building (02-1). The reactors were each progressively stronger in power output, each consisted generally of a 1-ft-diameter sphere filled with liquid fuel, and each was surrounded with neutron-reflecting blocks sitting on a graphite base. The LOPO reactor became functional in May 1944 (Montoya 1991, 006997, p. 5). The LOPO was dismantled, removed, and disposed of in September 1944. The HYPO reactor became operational in December 1944 and was later upgraded to SUPO, which became operational in 1951. The SUPO was decommissioned, removed, and disposed of in 1990 (Montoya 1991, 006997, p. 2).

The reactors were surrounded by a 15-ft × 15-ft × 11-ft concrete biological shield. A shallow sand pit and a utility trench were present beneath the reactor sphere and were used to collect liquids and gases from the reactor and transport them to support structures on the east side of building 02-1. External structures and underground piping associated with the gaseous effluent vent line system were removed and disposed of in 1986 (Elder and Knoell 1986, 006670, p. 43). Six concrete structures were dismantled, and 435 ft of contaminated underground piping was removed and disposed of. Cesium-137 contamination was found in the OWR building (02-1) near the sand pit and the utility trench during D&D activities. The soil was removed and disposed of during D&D activities (Montoya 1991, 006996, p. 5).

At peak operation, the WBR generated approximately 0.25 L/min of excess gas containing some fission products. These gases were managed through the WBR gaseous effluent vent line system (LANL 1993, 015314, p. E-8). Some radionuclides may have been deposited on the ground surface as gaseous effluent drifted from this system, and condensate from the gaseous effluent may have leaked from portions of the vent line system. These releases are addressed as AOCs 02-003(a,b,c,d).

The OWR experienced a cooling system water leak in January 1993. As a result, the reactor was put on standby status in 1993 and remained inactive until it was decommissioned in 2003 (WD-3 2003, 082646, p. 2).

Nine VOCs (acetone; chloroform; 4-isopropyltoluene; methylene chloride; 2-methylnaphthalene; naphthalene; toluene; 1,2-xylene; and 1,3-xylene+1,4-xylene) were minimally detected at this site. The detected concentrations are less than or similar to the EQLs for these VOCs, except for naphthalene, which had a maximum detected concentration greater than the EQL.

Acetone was detected in 4 of 60 samples with concentrations ranging from 0.00366 mg/kg to 0.00865 mg/kg; the depth of these samples was up to 14 ft bgs, and the maximum detected concentration was at a depth of 9.5 to 14.0 ft bgs. The depth of all samples was up to 24.5 ft bgs. No detected concentration was at a depth below the maximum detected concentration. Chloroform was detected in 3 of 60 samples with concentrations ranging from 0.000232 mg/kg to 0.000268 mg/kg; the depth of these samples was up to 22.5 ft bgs, and the maximum detected concentration was at a depth of 14.5 to 22.5 ft bgs. The depth of all samples was up to 24.5 ft bgs. No detected concentration was at a depth below the maximum detected concentration. Isopropyltoluene[4-] was detected in 1 of 60 samples with a maximum detected concentration of 0.0006 mg/kg at a depth of 9.5 to 14.0 ft bgs. The depth of all samples was up to 24.5 ft bgs. Methylene chloride was detected in 1 of 60 samples with a maximum detected concentration of 0.00242 mg/kg at a depth of 15.5 to 20.0 ft bgs. The depth of all samples was up to 24.5 ft bgs. Methylnaphthalene[2-] was detected in 8 of 98 samples with concentrations ranging from 0.00764 mg/kg to 0.16 mg/kg; the depth of these samples was up to 11.5 ft bgs, and the maximum detected concentration was at a depth of 0.0 to 0.5 ft bgs. The depth of all samples was up to 50 ft bgs. Two concentrations were at depths below the maximum detected concentration: 0.0145 mg/kg and 0.00764 mg/kg at depth intervals of 9.5 to 10.5 ft bgs and 10.5 to 11.5 ft bgs, respectively. Naphthalene was detected in 14 of 108 samples with concentrations ranging from 0.00258 mg/kg to 0.352 mg/kg; the depth of these samples was up to 11.5 ft bgs, and the maximum detected concentration was at a depth of 0.0 to 0.5 ft bgs. The depth of all samples was up to 50 ft bgs. Three concentrations were at depths below the maximum detected concentration: 0.014 mg/kg, 0.0383 mg/kg, and 0.0237 mg/kg at depth intervals of 4.5 to 9.5 ft bgs, 9.5 to 10.5 ft bgs, and 10.5 to 11.5 ft bgs, respectively. Toluene was detected in 3 of 60 samples with concentrations ranging from 0.000478 mg/kg to 0.00107 mg/kg; the depth of these samples was up to 14 ft bgs, and the maximum detected concentration was at a depth of 9.5 to 14.0 ft bgs. The depth of all samples was up to 24.5 ft bgs. No detected concentration was at a depth below the maximum detected concentration. Xylene[1,2-] was detected in 1 of 60 samples with a maximum detected concentration of 0.000353 mg/kg at a depth of 8.5 to 10.0 ft bgs. The depth of all samples was up to 24.5 ft bgs. Xylene+1,4-xylene[1,3-] was detected in 1 of 60 samples with a maximum detected concentration of 0.000839 mg/kg at a depth of 8.5 to 10.0 ft bgs. The depth of all samples was up to 24.5 ft bgs.

The site description indicates that solvents were not used, so no sources of VOCs are present and VOCs were only detected minimally. Nahpthalene had only one detected concentration out of 108 samples that was greater than its EQL, approximately 3 times the EQL, in the upper depth interval of 0.0 to 0.5 ft bgs. Furthermore, the data indicate that the concentrations are decreasing with depth. In addition, the structures and soil were removed and the site is inactive. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.3.7 AOCs 02-004(b,c,d)

AOCs 02-004(b,c,d) consisted of a system of three individual liquid waste storage tanks. Each tank is a separate AOC, but because of their proximity to one another and identical processes associated with all three tanks, the three AOCs are discussed together and the data for all three are evaluated together in this appendix. The system contained three underground 1200-gal. stainless-steel effluent storage tanks (structures 02-54, 02-55, and 02-56) with rubberized liners, approximately 150 ft west of building 02-1. The tanks received liquid waste that was primarily flushed effluent from the ion-exchange system associated with the OWR [AOC 02-004(a)]. The tanks also received any spills or leaks collected from the floor of the OWR equipment building [02-44, AOC 02-004(f)], as shown on engineering drawing C-29861 (LASL 1962, 090055).

The tanks were approximately 5-ft-high and 6-ft-diameter cylinders with approximately 2 ft of spacing between them within a single reinforced-concrete vault. The vault was rectangular and approximately 8 ft × 23 ft. The top of the vault was approximately 4 ft bgs, as shown on engineering drawing C-29861 (LASL 1962, 090055). The vault was adjacent to the reactor facility acid pit/transfer sump [structure 02-53, AOC 02-004(e)] and aligned perpendicular to Los Alamos Creek. The southernmost tank was structure 02-54 [AOC 02-004(b)], structure 02-55 [AOC 02-004(c)] was the center tank, and structure 02-56 [AOC 02-004(d)] was the northernmost tank. The bottom of the vault was approximately 10 ft bgs. The lines from the tanks to the reactor facility acid pit/transfer sump [(AOC 02-004(e)] were approximately 8 ft long and were used to temporarily store the liquid until it was transferred to the liquid acid waste line [AOC 02-004(f)] leading to TA-50 or to the aboveground portable tank [AOC 02-004(g)].

The tanks, vault, transfer sump, and lines were installed in 1962 according to engineering drawing C-29861, sheet 4 of 13 (LASL 1962, 090055). Leaks in the OWR cooling-liquid system led to the shutdown of the OWR in 1993. All systems were put on standby status in 1993; in 1995, all lines and tanks were drained and the liquids were disposed of (LANL 2000, 090087). In 2000, the tanks, vault, and transfer sump were removed and disposed of (LANL 2000, 090087). In 2003, the lines connecting the tanks to the acid pit/transfer sump [structure 02-53, AOC 02-004(e)], OWR equipment building [02-44, AOC 02-004(f)], the liquid acid waste line leading to TA-50, and the acid pit/transfer sump [structure 02-53, AOC 02-004(e)] outfall [AOC 02-011(d)] were removed and disposed of (WD-3 2003, 082646).

Two VOCs (2-methylnaphthalene and naphthalene) were minimally detected at this site. The maximum detected concentrations were higher than the EQLs for these VOCs.

Methylnaphthalene[2-] was detected in 3 of 19 samples with concentrations ranging from 0.00703 mg/kg to 0.156 mg/kg; the depth of these samples was up to 0.5 ft bgs, and the maximum detected concentration was at a depth of 0.0 to 0.5 ft bgs. The depth of all samples was up to 23 ft bgs. No detected concentration was at a depth below the maximum detected concentration. Naphthalene was detected in 3 of 19 samples with concentrations ranging from 0.017 mg/kg to 0.551 mg/kg; the depth of these samples was up to 0.5 ft bgs, and the maximum detected concentration was at a depth of 0.0 to 0.5 ft bgs. The depth of all samples was up to 23 ft bgs. No detected concentration was at a depth below the maximum detected concentration.

The site description indicates that solvents were not used, so no sources of VOCs are present, and although the VOCs detected were above the EQLs, they were only detected minimally and only at the upper soil depth interval 0.0 to 0.5 ft bgs with a maximum sampling depth of 23 ft bgs for all samples. In addition, the tanks and structures were removed and the site is inactive. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.3.8 AOC 02-004(f)

AOC 02-004(f) was a 49-ft × 26-ft equipment building (02-44) that contained several pumps, including the main circulating pump for the OWR cooling water, a buffalo chiller (a cooling system), and an ion-exchange filter system to maintain the OWR cooling-liquids system. At a later date, these systems were also connected to TA-50 by a liquid acid waste line. Lines associated with the OWR equipment building were present at approximately 4 ft bgs.

Building 02-44 became operational in 1954 and had floor drains that discharged to Los Alamos Creek through an outfall located at SWMU 02-008(a). Modifications to the cooling water system, with the addition of the cooling tower (structure 02-49) and associated outfall, were made in 1959, as shown on engineering drawing C-21327 (LASL 1957, 090058). The drain from the OWR equipment building was connected to the cooling tower outfall in 1959, as shown on engineering drawing C-48768 (LANL 1993, 090056). The outfalls in Los Alamos Creek were physically the same [location of SWMU 02-008(a)]. When the acid pit/transfer sump and effluent storage tank structures (02-53, 02-54, and 02-55) were added in 1962, the wastewater discharge from the OWR equipment building was routed through the acid pit/transfer sump, thus minimizing direct discharge to Los Alamos Creek from building 02-44, as noted on engineering drawing C-29861 (LASL 1962, 090055).

The OWR equipment building operated until 1993, when the OWR was shut down. In 1995, all liquid waste was removed from the system and disposed of at TA-54 (WD-3 2003, 082646, p. 2). In 2003, the building and all remaining buried pipes and drains were removed and disposed of at approved disposal facilities (WD-3 2003, 082646, pp. 26–31).

Seven VOCs (acetone, chloroform, isopropylbenzene, methylene chloride, 2-methylnaphthalene, naphthalene, toluene) were minimally detected at this site. The detected concentrations were less than the EQLs for these VOCs.

Acetone was detected in 1 of 39 samples with a maximum detected concentration of 0.00356 mg/kg at a depth of 16.5 to 19.0 ft bgs. The depth of all samples was up to 25 ft bgs. Chloroform was detected in 2 of 39 samples with concentrations ranging from 0.000258 mg/kg to 0.000317 mg/kg; the depth of these samples was up to 23 ft bgs, and the maximum detected concentration was at a depth of 18 to 23 ft bgs. The depth of all samples was up to 25 ft bgs. No detected concentration was at a depth below the maximum detected concentration. Isopropylbenzene was detected in 1 of 39 samples with a maximum detected concentration of 0.000251 mg/kg at a depth of 14.0 to 18.8 ft bgs. The depth of all samples was up to 25 ft bgs. Methylene chloride was detected in 6 of 39 samples with concentrations ranging from 0.00215 mg/kg to 0.00968 mg/kg; the depth of these samples was up to 25 ft bgs, and the maximum detected concentration was at a depth of 23 to 25 ft bgs. The depth of all samples was up to 25 ft bgs. No detected concentration was at a depth below the maximum detected concentration. Methylnaphthalene[2-] was detected in 1 of 66 samples with a maximum detected concentration of 0.00811 mg/kg at a depth of 0.0 to 0.5 ft bgs. The depth of all samples was up to 25 ft bgs. Naphthalene was detected in 2 of 66 samples with concentrations ranging from 0.0143 mg/kg to 0.0147 mg/kg; the depth of these samples was up to 7.5 ft bgs, and the maximum detected concentration was at a depth of 0.0 to 0.5 ft bgs. The depth of all samples was up to 25 ft bgs. One detected concentration was at a depth below the maximum detected concentration: 0.0143 mg/kg at a depth interval of 4.5 to 7.5 ft bgs. Toluene was detected in 6 of 39 samples with concentrations ranging from 0.000411 mg/kg to 0.00112 mg/kg; the depth of these samples was up to 12.7 ft bgs, and the maximum detected concentration was at a depth of 4.5 to 10 ft bgs. The depth of all samples was up to 25 ft bgs. One detected concentration was at a depth below the maximum detected concentration: 0.000425 mg/kg at a depth interval of 9.5 to 12.7 ft bgs.

The site description indicates that solvents were not used, so no sources of VOCs are present and VOCs were only detected minimally. In addition, the building pipes and drains were removed and the site is inactive. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.3.9 AOC 02-004(g)

AOC 02-004(g) was a 300-gal. portable storage tank located on a platform near the guard station (structure 02-12) at the west end of the OWR facility. The storage tank was used for temporarily storing liquids to supplement the three OWR effluent storage tanks [AOCs 02-004(b,c,d)]. The portable aboveground storage tank was installed and began operations in 1962 (Bunker 1985, 036231). The platform and portable aboveground storage tank were removed by 1993, but removal and disposal details are not available (LANL 1993, 015314).

Seven VOCs (chloroform, methylene chloride, 2-methylnaphthalene, naphthalene, tetrachloroethene, toluene, trichloroethene) were minimally detected at this site. The detected concentrations were less than the EQLs for these VOCs, except for toluene which was detected at a concentration larger than its EQL.

Chloroform was detected in 1 of 12 samples with a maximum detected concentration of 0.000313 mg/kg at a depth of 4.5 to 9.5 ft bgs. The depth of all samples was up to 22 ft bgs. Methylene chloride was detected in 1 of 12 samples with a maximum detected concentration of 0.00254 mg/kg at a depth of 4.5 to 9.5 ft bgs. The depth of all samples was up to 22 ft bgs. Methylaphthalene[2-] was detected in 2 of 26 samples with concentrations ranging from 0.00783 mg/kg to 0.0152 mg/kg; the depth of these samples was up to 0.5 ft bgs, and the maximum detected concentration was at a depth of 0.0 to 0.5 ft bgs. The depth of all samples was up to 50 ft bgs. No detected concentration was at a depth below the maximum detected concentration. Naphthalene was detected in 1 of 26 samples with a maximum detected concentration of 0.0178 mg/kg at a depth of 0.0 to 0.5 ft bgs. The depth of all samples was up to 50 ft bgs. Tetrachloroethene was detected in 1 of 12 samples with a maximum detected concentration of 0.000302 mg/kg at a depth of 4.5 to 9.5 ft bgs. The depth of all samples was up to 22 ft bgs. Toluene was detected in 3 of 12 samples with concentrations ranging from 0.000343 mg/kg to 0.00336 mg/kg; the depth of these samples was up to 14.5 ft bgs, and the maximum detected concentration was at a depth of 4.5 to 9.5 ft bgs. The depth of all samples was up to 22 ft bgs. One detected concentration was at a depth below the maximum detected concentration: 0.000343 mg/kg at a depth interval of 4.5 to 14.5 ft bgs. Trichloroethene was detected in 1 of 12 samples with a maximum detected concentration of 0.000884 mg/kg at a depth of 4.5 to 9.5 ft bgs. The depth of all samples was up to 22 ft bgs.

The site description indicates that solvents were not used, so no sources of VOCs are present. Also, all VOCs were minimally detected and below EQLs, except toluene. Although toluene was detected above its EQL, it was only detected minimally and only at the soil depth interval 4.5 to 9.5 ft bgs with a maximum sampling depth of 22.0 ft bgs for all samples. In addition, the tank was removed and the site is inactive. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.3.10 SWMU 02-005

SWMU 02-005 consists of an area potentially affected by airborne drift of potassium dichromate that was used to inhibit corrosion in the OWR cooling tower (structure 02-49). The cooling tower was installed and became operational in 1956. It was constructed with aluminum heat exchangers that were prone to corrosion. Potassium dichromate was added to the make-up water to inhibit corrosion of the heat exchangers. Stainless-steel heat exchangers were installed to eliminate the use of potassium dichromate in 1975 (LANL 1993, 015314). The cooling tower operated until the OWR was shut down in 1993. In 1995, all liquid was drained from the system (WD-3 2003, 082646, p. 2). In 2000, the cooling tower structure and equipment were removed and disposed of at TA-54 (LANL 2000, 090087). In 2003, the remaining buried pipes and drains were removed and disposed of at TA-54 or Envirocare (WD-3 2003, 082646, pp. 26–31).

One VOC (toluene) was minimally detected at this site. There was no EQL for comparison.

Toluene was detected in one sample with a maximum detected concentration of 0.00142 mg/kg at a depth of 2.0 to 2.5 ft bgs. The depth of all samples was up to 2.5 ft bgs.

The site description indicates that solvents were not used, so no sources of VOCs are present and VOCs were only detected minimally. In addition, the structures associated with potentially contaminating this site via airborne drift were removed and the site is inactive. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.3.11 SWMU 02-006(a)

SWMU 02-006(a) was an 8-ft-deep French drain system. The system consisted of the exhaust stack and French drain, all located in TA-61 on the Los Alamos Canyon south rim mesa top, above TA-02. The stack system was the termination point of the gaseous effluent vent line (line 119) from the OWR and WBR at TA-02. The French drain was installed in 1948, designated as structure 02-9, and was also identified as structure 61-26, according to engineering drawing C-1716 (LASL 1948, 090083). The French drain was designed to catch condensate that collected as reactor exhaust gases cooled during venting through the tower exhaust stack. The vent stack and French drain system were active from their installation in 1948 to the OWR deactivation in 1993. The French drain system and contaminated soil were removed and disposed of during D&D activities in 2003 (LANL 2003, 090089).

Three VOCs (1,4-dicholorbenzene; toluene; and trichloroethene) were minimally detected at this site. The detected concentrations were less than the EQLs for these VOCs.

Dichlorobenzene[1,4-] was detected in 1 of 60 samples with a maximum detected concentration of 0.00215 mg/kg at a depth of 0.6 to 1.4 ft bgs. The depth of all samples was up to 23.5 ft bgs. Toluene was detected in 1 of 60 samples with a maximum detected concentration of 0.00328 mg/kg at a depth of 0.5 to 1.5 ft bgs. The depth of all samples was up to 23.5 ft bgs. Trichloroethene was detected in 3 of 60 samples with concentrations ranging from 0.000275 mg/kg to 0.000313 mg/kg; the depth of these samples was up to 9.5 ft bgs, and the maximum detected concentration was at a depth of 0.6 to 1.4 ft bgs. The depth of all samples was up to 23.5 ft bgs. Two concentrations were at depths below the maximum detected concentration: 0.000276 mg/kg and 0.000275 mg/kg at depth intervals of 0.5 to 1.9 ft bgs and 4.5 to 9.5 ft bgs, respectively.

The site description indicates that solvents were not used, so no sources of VOCs are present and VOCs were only detected minimally. In addition, the drain and contaminated soil were removed and the site is inactive. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.3.12 SWMU 02-006(b)

SWMU 02-006(b) was an acid waste line that carried effluent from several laboratory rooms in the center of the OWR building (02-1) south to a discharge point into Los Alamos Creek. Construction of the OWR building (02-1) and associated laboratory rooms, sinks, and waste line [SWMU 02-006(b)] was completed in 1946 (engineering drawing C-1703, LASL 1946, 089678). The OWR became operational in 1956. The acid waste line was reportedly taken out of service in the 1960s; however, no record of its removal is available (DOE 1987, 008663). All SWMU 02-006(b) lines and connections were removed and disposed of in 2003 (WD-3 2003, 082646, p. 2).

Seventeen VOCs (acetone; carbon disulfide;1,4-dicholorbenzene; ethylbenzene; 4-isopropyltoluene; 4-methyl-2-pentanone; methylene chloride; 2-methylnaphthalene; naphthalene; styrene; toluene; trichloroethene; trichlorofluoromethane; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; 1,2-xylene; and 1,3-xylene+1,4-xylene) were minimally detected at this site. The detected concentrations were less than the EQLs for these VOCs, except in the case of styrene which was detected at a concentration greater than its EQL.

Acetone was detected in 1 of 47 samples with a maximum detected concentration of 0.00434 mg/kg at a depth of 4.5 to 9.0 ft bgs. The depth of all samples was up to 22.5 ft bgs. Carbon disulfide was detected in 1 of 47 samples with a maximum detected concentration of 0.004 mg/kg at a depth of 0.0 to 0.5 ft bgs. The depth of all samples was up to 22.5 ft bgs. Dichlorobenzene[1,4-] was detected in 1 of 47 samples with a maximum detected concentration of 0.000282 mg/kg at a depth of 4.5 to 9.0 ft bgs. The depth of all samples was up to 22.5 ft bgs. Ethylbenzene was detected in 1 of 47 samples with a maximum detected concentration of 0.00276 mg/kg at a depth of 4.5 to 9.0 ft bgs. The depth of all samples was up to 22.5 ft bgs. Isopropyltoluene[4-] was detected in 1 of 47 samples with a maximum detected concentration of 0.000507 mg/kg at a depth of 4.5 to 9.0 ft bgs. The depth of all samples was up to 22.5 ft bgs. Methyl-2-pentanone[4-] was detected in 1 of 47 samples with a maximum detected concentration of 0.01 mg/kg at a depth of 4.5 to 9.0 ft bgs. The depth of all samples was up to 22.5 ft bgs. Methylene chloride was detected in 3 of 47 samples with concentrations ranging from 0.00265 mg/kg to 0.003 mg/kg; the depth of these samples was up to 20.0 ft bgs, and the maximum detected concentration was at a depth of 4.5 to 7.0 ft bgs. The depth of all samples was up to 22.5 ft bgs. Two concentrations were at depths below the maximum detected concentration: 0.00265 mg/kg and 0.00294 mg/kg at depth intervals of 9.5 to 11.4 ft bgs and 17.5 to 20.0 ft bgs, respectively. Methylnaphthalene[2-] was detected in 23 of 70 samples with concentrations ranging from 0.0074 mg/kg to 0.33 mg/kg; the depth of these samples was up to 9 ft bgs, and the maximum detected concentration was at a depth of 0.0 to 0.5 ft bgs. The depth of all samples was up to 22.5 ft bgs. Two concentrations were at depths below the maximum detected concentration: 0.00265 mg/kg and 0.00294 mg/kg at depth intervals of 9.5 to 11.4 ft bgs and 17.5 to 50.0 ft bgs, respectively. Naphthalene was detected in 25 of 70 samples with concentrations ranging from 0.0128 mg/kg to 0.799 mg/kg; the depth of these samples was up to 9 ft bgs, and the maximum detected concentration was at a depth of 0.0 to 0.5 ft bgs. The depth of all samples was up to 50 ft bgs. Twelve concentrations were at depths below the maximum detected concentration; concentrations ranged from 0.013 mg/kg to 0.72 mg/kg at depth intervals between 4.5 and 9.0 ft bgs. Styrene was detected in 2 of 47 samples with concentrations ranging from 0.00023 mg/kg to 0.037 mg/kg; the depth of these samples was up to 9 ft bgs, and the maximum detected concentration was at a depth of 0.0 to 0.5 ft bgs. The depth of all samples was up to 22.5 ft bgs. One concentration was at a depth below the maximum detected concentration: 0.00023 mg/kg at a depth interval of 4.5 to 9.0 ft bgs. Toluene was detected in 1 of 47 samples with a maximum detected concentration of 0.000433 mg/kg at a depth of 4.5 to 6.5 ft bgs. The depth of all samples was up to 22.5 ft bgs. Trichloroethene was detected in 1 of 47 samples with a maximum detected concentration of 0.000265 mg/kg at a depth of 4.5 to 6.5 ft bgs. The depth of all samples was up to 22.5 ft bgs. Trichlorofluoromethane was detected in 1 of 47 samples with a maximum detected concentration of 0.002 mg/kg at a depth of 0.0 to 0.5 ft bgs. The depth of all samples was up to 22.5 ft bgs. Trimethylbenzene[1,2,4-] was detected in 2 of 47 samples with concentrations ranging from 0.000293 mg/kg to 0.000494 mg/kg; the depth of these samples was up to 9 ft bgs, and the maximum detected concentration was at a depth of 4.5 to 7.5 ft bgs. The depth of all samples was up to 22.5 ft bgs. No concentrations were at depths below the maximum detected concentration. Trimethylbenzene[1,3,5-] was detected in 2 of 47 samples with concentrations ranging from 0.000232 mg/kg to 0.000234 mg/kg; the depth of these samples was up to 9 ft bgs, and the maximum detected concentration was at a depth of 4.5 to 7.5 ft bgs. The depth of all samples was up to 22.5 ft bgs. No concentrations were at depths below the maximum detected concentration. Xylene[1,2-] was detected in 1 of 44 samples with a maximum detected concentration of 0.000493 mg/kg at a depth of 4.5 to 9.0 ft bgs. The depth of all samples was up to 22.5 ft bgs. Xylene+1,4-xylene[1,3-] was detected in 3 of 44 samples with concentrations ranging from 0.000305 mg/kg to 0.000469 mg/kg; the depth of these samples was up to 9 ft bgs, and the maximum detected concentration was at a depth of 4.5 to 9.0 ft bgs. The depth of all samples was up to 22.5 ft bgs. No concentrations were at depths below the maximum detected concentration.

The site description indicates that solvents were not used, so no sources of VOCs are present and VOCs were only detected minimally, except for styrene. Although styrene was detected above its EQLs, it was only detected minimally and only at the soil depth interval 0.0 to 0.5 ft bgs with a maximum sampling depth of 22.5 ft bgs for all samples. In addition, the line was removed and the site is inactive. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.3.13 AOC 02-006(c)

AOC 02-006(c) was a waste line that extended from the office areas in the reactor building to the septic tank (structure 02-43, SWMU 02-007). AOC 02-006(c) was identified in the 1990 SWMU report (LANL 1990, 007511) as a drainline that was connected to the chemical room in the OWR building (02-1) and several OWR laboratories. Closer review of the available engineering drawings, C-1703 (LASL 1946, 089678) and C-1750 (LASL 1949, 089680), provided the following information regarding the connection and use of AOC 02-006(c). AOC 02-006(c) was the drainline that served the office or central portion of the OWR building, 02-1. As indicated on engineering drawing C-1750 (LASL 1949, 089680), the line was separate from the OWR acid waste line [SWMU 02-006(b)] that connected to the chemical laboratories. The AOC 02-006(c) waste line received wastewater from the evaporative cooler and drinking fountain associated with the control room, restrooms, and office areas. The sanitary service provided by AOC 02-006(c) was transferred to TA-41 in the mid-1970s (DOE 1987, 008663). However, the AOC 02-006(c) drainline continued to convey basement seepage to the AOC 02-008(c) outfalls installed in 1985 and 1988. The AOC 02-006(c) sewer line was removed and disposed of during D&D activities in 2003 (WD-3 2003, 082646).

Four VOCs (methylene chloride, 2-methylnaphthalene, naphthalene, and toluene) were minimally detected at this site. The detected concentrations were less than the EQLs for these VOCs.

Methylene chloride was detected in 2 of 15 samples with concentrations ranging from 0.0023 mg/kg to 0.00272 mg/kg; the depth of these samples was up to 18 ft bgs, and the maximum detected concentration was at a depth of 12.5 to 18.0 ft bgs. The depth of all samples was up to 19 ft bgs. No concentrations were at depths below the maximum detected concentration. Methylnaphthalene[2-] was detected in 5 of 27 samples with concentrations ranging from 0.00717 mg/kg to 0.0508 mg/kg; the depth of these samples was up to 9 ft bgs, and the maximum detected concentration was at a depth of 5.0 to 6.0 ft bgs. The depth of all samples was up to 50 ft bgs. One concentration was at a depth below the maximum detected concentration: 0.011 mg/kg at a depth interval of 4.5 to 9.0 ft bgs. Naphthalene was detected in 5 of 27 samples with concentrations ranging from 0.0114 mg/kg to 0.054 mg/kg; the depth of these samples was up to 9 ft bgs, and the maximum detected concentration was at a depth of 0.0 to 0.5 ft bgs. The depth of naphthalene samples was up to 50 ft bgs. Two concentrations were at depths below the maximum detected concentration: 0.0295 mg/kg and 0.0378 mg/kg at depth intervals of 4.5 to 9.0 ft bgs and 5.0 to 6.0 ft bgs, respectively. Toluene was detected in 1 of 15 samples with a maximum detected concentration of 0.00037 mg/kg at a depth of 4.5 to 10.0 ft bgs. The depth of all samples was up to 19 ft bgs.

The site description indicates that solvents were not used, so no sources of VOCs are present and VOCs were only detected minimally. In addition, the waste line was removed and the site is inactive. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.3.14 AOC 02-006(e)

AOC 02-006(e) was a sump (structure 02-26) and drainline that received effluent from the OWR building (02-1) reactor room floor drains and mezzanine. The AOC 02-006(e) drainline was connected to floor drains in the main reactor room and became operational in 1944. A second collection sump (structure 02-82) was added to the AOC 02-006(e) drainline in 1990, as shown on engineering drawing C-45924 (LANL 1990, 089679). A drainline from the structure 02-82 sump was connected directly to the AOC 02-004(e) acid pit/transfer sump (structure 02-53), possibly replacing the AOC 02-006(e) direct discharge to Los Alamos Creek; however, the sump (structure 02-26) and the original drainline remained in place until they were removed and disposed of during D&D activities in 2003 (WD-3 2003, 082646, p. 6). The second sump (structure 02-82) and the drainline to structure 02-53 [AOC 02-004(e)] were also removed and disposed of during D&D activities in 2003 (WD-3 2003, 082646, p. 6).

Eight VOCs (chloroform; 1,4-dichlorobenzene; isopropylbenzene; methylene chloride; 2-methylnaphthalene; naphthalene; toluene; and 1,3-xylene+1,4-xylene) were minimally detected at this site. The detected concentrations were less than the EQLs for these VOCs.

Chloroform was detected in 1 of 32 samples with a maximum detected concentration of 0.000279 mg/kg at a depth of 3.0 to 5.0 ft bgs. The depth of all samples was up to 25 ft bgs. Dichlorobenzene[1,4-] was detected in 3 of 32 samples with concentrations ranging from 0.000266 mg/kg to 0.000384 mg/kg; the depth of these samples was up to 16.5 ft bgs, and the maximum detected concentration was at a depth of 14.3 to 16.5 ft bgs. The depth of all samples was up to 25 ft bgs. No concentrations were at depths below the maximum detected concentration. Isopropylbenzene was detected in 3 of 32 samples with concentrations ranging from 0.000328 mg/kg to 0.000433 mg/kg; the depth of these samples was up to 13 ft bgs, and the maximum detected concentration was at a depth of 9.5 to 12.0 ft bgs. The depth of all samples was up to 25 ft bgs. One concentration was at a depth below the maximum detected concentration: 0.000328 mg/kg at a depth interval of 9.5 to 13.0 ft bgs. Methylene chloride was detected in 3 of 32 samples with concentrations ranging from 0.00224 mg/kg to 0.00456 mg/kg; the depth of these samples was up to 19.5 ft bgs, and the maximum detected concentration was at a depth of 11 to 16 ft bgs. The depth of all samples was up to 25 ft bgs. One concentration was at a depth below the maximum detected concentration: 0.00315 mg/kg at a depth interval of 18.8 to 19.5 ft bgs. Methylnaphthalene[2-] was detected in 5 of 49 samples with concentrations ranging from 0.0165 mg/kg to 0.145 mg/kg; the depth of these samples was up to 5 ft bgs, and the maximum detected concentration was at a depth of 3 to 5 ft bgs. The depth of all samples was up to 50 ft bgs. No concentrations were at depths below the maximum detected concentration. Naphthalene was detected in 4 of 49 samples with concentrations ranging from 0.0435 mg/kg to 0.415 mg/kg; the depth of these samples was up to 5 ft bgs, and the maximum detected concentration was at a depth of 4.5 to 5.0 ft bgs. The depth of all samples was up to 50 ft bgs. No concentration was at a depth below the maximum detected concentration. Toluene was detected in 1 of 32 samples with a maximum detected concentration of 0.000522 mg/kg at a depth of 4.5 to 7.0 ft bgs. The depth of all samples was up to 25 ft bgs. Xylene+1,4-xylene[1,3-] was detected in 1 of 30 samples with a maximum detected concentration of 0.000282 mg/kg at a depth of 9.0 to 10.2 ft bgs. The depth of all samples was up to 25 ft bgs.

The site description indicates that solvents were not used, so no sources of VOCs are present and VOCs were only detected minimally. In addition, the sump and waste line were removed and the site is inactive. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.3.15 SWMU 02-007

SWMU 02-007 is a former septic tank (structure 02-43) and outfall. The septic tank was constructed of reinforced concrete and measured 13 ft long × 8 ft wide × 6 ft deep. The septic system received effluent from drains in the OWR facility (building 02-1). The SWMU 02-007 septic tank and outfall were installed in 1944 and removed in 1985. Overflow from the tank discharged to the stream channel through a 6-in.-diameter VCP. However, the location of the outfall discharge is not known (Elder and Knoell 1986, 006670, p. 26). Laboratory wastes were discharged into the septic system. In 1947, the chemical waste shack (building 02-3, AOC 02-010) was connected to the septic system, as shown on engineering drawing C-1683 (LASL 1944, 090081), and remained connected until the chemical waste shack was decommissioned in 1971 (LASL no date, 034172). The septic tank and overflow outfall and surrounding soils were removed and disposed of in 1986 (Elder and Knoell 1986, 006670, pp. 26-41).

Four VOCs (acetone, 2-methylnaphthalene, naphthalene, and toluene) were minimally detected at this site. The detected concentrations were less than the EQLs for these VOCs, except for naphthalene which had a detected concentration higher than its EQL.

Acetone was detected in 1 of 13 samples with a maximum detected concentration of 0.00478 mg/kg at a depth of 14.5 to 16.7 ft bgs. The depth of all samples was up to 21 ft bgs. Methylnaphthalene[2-] was detected in 1 of 26 samples with a maximum detected concentration of 0.0281 mg/kg at a depth of 4.5 to 6.9 ft bgs. The depth of all samples was up to 21 ft bgs. Naphthalene was detected in 1 of 26 samples with a maximum detected concentration of 0.0755 mg/kg at a depth of 4.5 to 6.9 ft bgs. The depth of all samples was up to 21 ft bgs. Toluene was detected in 1 of 13 samples with a maximum detected concentration of 0.000311 mg/kg at a depth of 4.5 to 6.7 ft bgs. The depth of all samples was up to 21 ft bgs.

The site description does not, specifically, indicate that solvents were not used; however, even though the septic tank did receive laboratory and chemical shack waste streams, VOCs were only detected minimally. Also, the detected concentration of naphthalene that was higher than the EQL was only from a depth interval of 4.5 to 6.9 ft bgs while the depth of all naphthalene samples was up to 21 ft bgs. In addition, the septic tank and contaminated soil were removed and the site is inactive. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.3.16 SWMU 02-008(a)

SWMU 02-008(a) is a former NPDES-permitted outfall (EPA 03A020) that discharged cooling water from the OWR cooling tower (structure 02-49). The SWMU 02-008(a) outfall was also identified as AOC 02-011(e), NPDES-permitted outfall EPA 03A020. All discussions regarding outfall EPA 03A020 are addressed under SWMU 02-008(a) (LANL 1990, 007511). Therefore, all activities associated with AOC 02-011(e) are addressed under SWMU 02-008(a). The cooling tower became an operational component of the OWR system in 1957. The cooling tower facility began use of potassium dichromate to control aluminum heat exchanger corrosion in 1959. The aluminum heat exchangers were replaced by stainless-steel ones in 1975, thus eliminating the use of potassium dichromate. A shutdown of the OWR in 1993 placed the cooling tower on standby status; in 1995, all liquid waste was drained from the system (WD-3 2003, 082646, p. 2). In 2000, the cooling tower structure and equipment were decommissioned and removed (LANL 2000, 090087). In 2003, the remaining buried pipes and drains were removed and disposed of (WD-3 2003, 082646, pp. 26–31). The outfall (EPA 03A020) was removed from the Laboratory's NPDES permit in July 1990 (LANL 1990, 007511).

Three VOCs (methylene chloride, styrene, and toluene) were minimally detected at this site. The detected concentrations were less than the EQLs for these VOCs, except for styrene which had a detected concentration higher than its EQL.

Methylene chloride was detected in 3 of 10 samples with concentrations ranging from 0.00295 mg/kg to 0.00385 mg/kg; the depth of these samples was up to 14.5 ft bgs, and the maximum detected concentration was at a depth of 9.5 to 14.5 ft bgs. The depth of all samples was up to 16 ft bgs. No concentrations were at depths below the maximum detected concentration. Styrene was detected in 1 of

10 samples with a maximum detected concentration of 0.00589 mg/kg at a depth of 2.0 to 2.7 ft bgs. The depth of all samples was up to 21 ft bgs. Toluene was detected in 1 of 10 samples with a maximum detected concentration of 0.000665 mg/kg at a depth of 2.0 to 2.7 ft bgs. The depth of all samples was up to 16 ft bgs.

The site description does not indicate that solvents were used; however, the septic tank did receive laboratory and chemical shack waste streams, but VOCs were only detected minimally. Also, the detected concentration of styrene that was higher than the EQL was only from a depth interval of 2.0 to 2.7 ft bgs while the depth of all styrene samples was up to 21 ft bgs. In addition, the outfall and associated structures were removed and the site is inactive. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.3.17 AOC 02-008(c)

AOC 02-008(c) consists of two specific areas: outfall drains AOC 02-008(c)(i) and AOC 02-008(c)(ii). The outfall drains were two unpermitted outfalls that received OWR building (02-1) basement groundwater seepage. In 1985, the AOC 02-008(c)(i) outfall drain was created to discharge groundwater seepage from the basement sump of the OWR building (02-1) to Los Alamos Creek, as shown on engineering drawing C-39551 (LASL 1971, 089682). In 1988, the AOC 02-008(c)(i) outfall drain became plugged and was abandoned in place. A second drainline was installed, and the outfall of AOC 02-008(c)(ii) was created approximately 100 ft west of the original outfall (LANL 1993, 015314, p. 7.9-1). Both drainpipes and outfalls were removed and disposed of during D&D activities in 2003 (WD-3 2003, 082646, pp. 26–31).

AOC 02-008(c)(i) had no detected VOCs and is not evaluated here.

AOC 02-008(c)(ii) had four VOCs (4-isopropyltoluene, 2-methylnaphthalene, naphthalene, and toluene) that were minimally detected at this site. The detected concentrations were less than the EQLs for these VOCs, except for 2-methylnaphthalene and naphthalene, which had detected concentrations higher than their EQLs.

Isopropyltoluene[4-] was detected in 1 of 5 samples with a maximum detected concentration of 0.0029 mg/kg at a depth of 4.5 to 8.0 ft bgs. The depth of all samples was up to 21 ft bgs. Methylnaphthalene[2-] was detected in 1 of 15 samples with a maximum detected concentration of 0.00892 mg/kg at a depth of 0.0 to 0.5 ft bgs. The depth of all samples was up to 50 ft bgs. Naphthalene was detected in 1 of 15 samples with a maximum detected concentration of 0.0271 mg/kg at a depth of 0.0 to 0.5 ft bgs. The depth of all samples was up to 50 ft bgs. Toluene was detected in 2 of 5 samples with concentrations ranging from 0.000475 mg/kg to 0.000516 mg/kg; the depth of these samples was up to 8.5 ft bgs, and the maximum detected concentration was at a depth of 4.5 to 8.0 ft bgs. The depth of all samples was up to 21 ft bgs. One concentration was at a depth below the maximum detected concentration: 0.000475 mg/kg at a depth interval of 4.5 to 8.5 ft bgs.

The site description does not indicate that solvents were used. There were two VOCs (2-methylnaphthalene and naphthalene) with detected concentrations that were higher than their EQLs, but VOCs were only detected minimally. Furthermore, the maximum detected concentrations that were higher than the EQL were from the 0.0 to 0.5 ft bgs depth and did not show an increasing trend with depths up to 50 ft bgs, so no VOC source is present. In addition, the outfall and associated drainpipes were removed, and the site is inactive. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.3.18 SWMU 02-009(a)

SWMU 02-009(a) is an area of beta/gamma radioactive soil contamination located around a boulder, south of the southeast fence corner east of the former Omega-50 storage building (02-50). SWMU 02-009(a) was identified in 1986 during D&D of the WBR (Elder and Knoell 1986, 006670, p. 40). No other information regarding the origin of contamination in this SWMU is available (LANL 1990, 007511). A limited amount of soil was removed at the site, and the soil was disposed of in 1986 (Elder and Knoell 1986, 006670, pp. 26–41).

Nine VOCs (acetone; chloroform; chloromethane; 1,4-dichlorobenzene; 4-isopropyltoluene; toluene; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; and 1,2-xylene) were minimally detected at this site. The detected concentrations were less than the EQLs for these VOCs, except for acetone and chloromethane which had detected concentrations higher than their EQLs.

Acetone was detected in 2 of 44 samples with concentrations ranging from 0.00731 mg/kg to 0.041 mg/kg; the depth of these samples was up to 7.2 ft bgs, and the maximum detected concentration was at a depth of 4.5 to 7.2 ft bgs. The depth of all samples was up to 14 ft bgs. No concentrations were at depths below the maximum detected concentration. Chloroform was detected in 5 of 44 samples with concentrations ranging from 0.000231 mg/kg to 0.000273 mg/kg; the depth of these samples was up to 5 ft bgs, and the maximum detected concentration was at a depth of 4.5 to 5.0 ft bgs. The depth of all samples was up to 14 ft bgs. No concentrations were at depths below the maximum detected concentration. Chloromethane was detected in 1 of 44 samples with a maximum detected concentration of 0.00288 mg/kg at a depth of 4.5 to 5.5 ft bgs. The depth of all samples was up to 14 ft bgs. Dichlorobenzene[1,4-] was detected in 1 of 44 samples with a maximum detected concentration of 0.000364 mg/kg at a depth of 4.5 to 5.0 ft bgs. The depth of all samples was up to 14 ft bgs. Isopropyltoluene[4-] was detected in 3 of 44 samples with concentrations ranging from 0.000324 mg/kg to 0.000519 mg/kg; the depth of these samples was up to 7.2 ft bgs, and the maximum detected concentration was at a depth of 2.0 to 2.5 ft bgs. The depth of all samples was up to 14 ft bgs. Two concentrations were at depths below the maximum detected concentration: 0.000345 mg/kg and 0.000324 mg/kg at depth intervals of 4.5 to 5.0 ft bgs and 4.5 to 7.2 ft bgs, respectively. Toluene was detected in 31 of 44 samples with concentrations ranging from 0.000308 mg/kg to 0.00143 mg/kg; the depth of these samples was up to 10 ft bgs, and the maximum detected concentration was at a depth of 2 to 3 ft bgs. The depth of all samples was up to 14 ft bgs. Fifteen concentrations were at depths below the maximum detected concentration, ranging from 0.000331 mg/kg to 0.000986 mg/kg at a depth interval of 2 to 10 ft bgs. Trimethylbenzene[1,2,4-] was detected in 1 of 44 samples with a maximum detected concentration of 0.000843 mg/kg at a depth of 4.5 to 5.0 ft bgs. The depth of all samples was up to 14 ft bgs. Trimethylbenzene[1,3,5-] was detected in 1 of 44 samples with a maximum detected concentration of 0.000535 mg/kg at a depth of 4.5 to 5.0 ft bgs. The depth of all samples was up to 14 ft bgs. Xylene[1,2-] was detected in 2 of 44 samples with concentrations ranging from 0.000619 mg/kg to 0.000648 mg/kg; the depth of these samples was up to 5 ft bgs, and the maximum detected concentration was at a depth of 4.5 to 5.0 ft bgs. The depth of all samples was up to 14 ft bgs. No concentrations were at depths below the maximum detected concentration.

The site description does not indicate that solvents were used, and VOCs were only detected minimally. However, there were a limited number of detected concentrations of acetone (2) and chloromethane (1) that were higher than their respective EQLs in the depth intervals of 4.5 to 7.2 ft bgs and 4.5 to 5.0 ft bgs, respectively. Both VOCs had a total sampling depth range from 2 to 14 ft bgs. This indicates that the extent of the contamination is known and decreasing in concentration with depth. In addition, a portion of the contaminated soil was removed. Therefore, a VOC source is not present. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.3.19 SWMU 02-009(b)

SWMU 02-009(b) is an area of radioactive soil contamination located north of the former stack-gas valve house (structure 02-19) and the east bridge at TA-02. Detectable beta/gamma radioactivity was identified in 1986 when the area of SWMU 02-009(b) was used for truck staging during D&D of the WBR (Elder and Knoell 1986, 006670, p. 40). A limited amount of soil was removed from the site and disposed of (Elder and Knoell 1986, 006670, pp. 26–41).

Five VOCs (acetone, isopropylbenzene, 4-isopropyltoluene, 2-methylnaphthalene, and toluene) were minimally detected at this site. The detected concentrations were less than the EQLs for these VOCs, except for acetone which had a detected concentration higher than its EQL.

Acetone was detected in 1 of 15 samples with a maximum detected concentration of 0.0108 mg/kg at a depth of 11.5 to 13.5 ft bgs. The depth of all samples was up to 24.5 ft bgs. Isopropylbenzene was detected in 1 of 15 samples with a maximum detected concentration of 0.000342 mg/kg at a depth of 1.5 to 2.5 ft bgs. The depth of all samples was up to 24.5 ft bgs. Isopropyltoluene[4-] was detected in 1 of 15 samples with a maximum detected concentration of 0.000986 mg/kg at a depth of 11.5 to 13.5 ft bgs. The depth of all samples was up to 24.5 ft bgs. Methylnaphthalene[2-] was detected in 1 of 29 samples with a maximum detected concentration of 0.00949 mg/kg at a depth of 0.0 to 1.5 ft bgs. The depth of all samples was up to 50 ft bgs. Toluene was detected in 2 of 15 samples with concentrations ranging from 0.000653 mg/kg to 0.00136 mg/kg; the depth of these samples was up to 3.5 ft bgs, and the maximum detected concentration was at a depth of 1.5 to 1.9 ft bgs. The depth of all samples was up to 24.5 ft bgs. One concentration was at a depth below the maximum detected concentration: 0.000653 mg/kg at a depth interval of 1.5 to 3.5 ft bgs.

The site description indicates that solvents were not used, so no sources of VOCs are present and VOCs were only detected minimally. Acetone was detected once at a concentration greater than the EQL, and it was isolated to the 11.5 to 13.5 ft bgs with no detects below that depth interval up to 24.5 ft bgs. In addition, a limited amount of the contaminated soil was removed and the site is inactive. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.3.20 SWMU 02-009(c)

SWMU 02-009(c) is a leach field and an area of alpha-, beta-, and gamma-emitting radioactively contaminated soil south of the condensate trap [structure 02-48, AOC 02-003(b)]. Radioactive soil contamination was identified at SWMU 02-009(c) during 1985–1986 D&D activities associated with the condensate trap (Elder and Knoell 1986, 006670, pp. 36–40). Two sections of contaminated 6-in.-diameter VCP, one 34 ft long and one 20 ft long and lying parallel to the septic tank overflow pipe, were uncovered during D&D activities at the condensate trap. The pipes were approximately 5 ft below and to either side of the septic tank overflow pipe (Elder and Knoell 1986, 006670, pp. 29–40). The purpose of the pipes is unknown. The pipes were present at depths of 3 to 8 ft bgs (Elder and Knoell 1986, 006670, pp. 26–41). All structures (pipes) and adjacent soils down to the saturated zone were removed and disposed of during the 1985–1986 D&D activities (Elder and Knoell 1986, 006670, pp. 36–40).

Eight VOCs (acetone, chloroform, 4-isopropyltoluene, methylene chloride, 2-methylnaphthalene, naphthalene, styrene, and toluene) were minimally detected at this site. The detected concentrations were less than the EQLs for these VOCs, except for acetone (1), 4-isopropyltoluene (1), and toluene (4), which had detected concentrations greater than the EQL.

Acetone was detected in 1 of 54 samples with a maximum detected concentration of 0.133 mg/kg at a depth of 4.5 to 6.3 ft bgs. The depth of all samples was up to 21.7 ft bgs. Chloroform was detected in 3 of 54 samples with concentrations ranging from 0.000223 mg/kg to 0.000305 mg/kg; the depth of these samples was up to 17 ft bgs, and the maximum detected concentration was at a depth of 14.5 to 17.0 ft bgs. The depth of all samples was up to 21.7 ft bgs. No concentration was at a depth below the maximum detected concentration. Isopropyltoluene[4-] was detected in 1 of 54 samples with a maximum detected concentration of 0.0505 mg/kg at a depth of 4.5 to 6.3 ft bgs. The depth of all samples was up to 21.7 ft bgs. Methylene chloride was detected in 1 of 54 samples with a maximum detected concentration of 0.0031 mg/kg at a depth of 19.5 to 21.6 ft bgs. The depth of all samples was up to 21.7 ft bgs. Methylnaphthalene[2-] was detected in 12 of 54 samples with concentrations ranging from 0.00922 mg/kg to 0.29 mg/kg; the depth of these samples was up to 12.7 ft bgs, and the maximum detected concentration was at a depth of 0.0 to 2.5 ft bgs. The depth of all samples was up to 50 ft bgs. Two concentrations were at depths below the maximum detected concentration: 0.0116 mg/kg and 0.0217 mg/kg at depth intervals of 4.5 to 6.7 ft bgs and 9.5 to 12.7 ft bgs, respectively. Naphthalene was detected in 10 of 54 samples with concentrations ranging from 0.011 mg/kg to 0.2 mg/kg; the depth of these samples was up to 12.7 ft bgs, and the maximum detected concentration was at a depth of 0.0 to 2.5 ft bgs. The depth of all samples was up to 50 ft bgs. One concentration was at a depth below the maximum detected concentration: 0.0763 mg/kg at a depth interval of 9.5 to 12.7 ft bgs. Styrene was detected in 1 of 54 samples with a maximum detected concentration of 0.000239 mg/kg at a depth of 9.5 to 11.7 ft bgs. The depth of all samples was up to 21.7 ft bgs. Toluene was detected in 4 of 54 samples with concentrations ranging from 0.000418 mg/kg to 0.00456 mg/kg; the depth of these samples was up to 6.7 ft bgs, and the maximum detected concentration was at a depth of 4.5 to 6.3 ft bgs. The depth of all samples was up to 21.7 ft bgs. Two concentrations were at depths below the maximum detected concentration: 0.000511 mg/kg and 0.000418 mg/kg, both at a depth interval of 4.5 to 6.7 ft bgs.

The site description indicates that solvents were not used, so no sources of VOCs are present and VOCs were only detected minimally. Acetone and 4-isopropyltoluene were detected once above their EQLs and toluene four times. The data indicated that the VOCs were not increasing in concentration with depth. In addition, all structures (pipes) and adjacent soils down to the saturated zone were removed and the site is inactive. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.3.21 AOC 02-009(d)

AOC 02-009(d) is an area of radioactive soil contamination located near the east end of the OWR building (02-1). Beta and gamma radioactivity were identified during decommissioning and removal of inactive WBR structures at TA-02 during 1985 and 1986. The source of contamination at AOC 02-009(d) is unknown (LANL 1990, 007511). There is no known historical use of the area included in AOC 02-009(d).

Seven VOCs (1,4-dichlorobenzene, 4-isopropyltoluene, 2-methylnaphthalene, naphthalene, styrene, toluene, and 1,3-xylene+1,4-xylene) were minimally detected at this site. The detected concentrations were less than the EQLs for these VOCs, except for 4-isopropyltoluene, which had one detected concentration greater than the EQL.

Dichlorobenzene[1,4-] was detected in 2 of 23 samples with concentrations ranging from 0.000213 mg/kg to 0.000595 mg/kg; the depth of these samples was up to 3.6 ft bgs, and the maximum detected concentration was at a depth of 1.5 to 3.6 ft bgs. The depth of all samples was up to 19.2 ft bgs. No concentration was at a depth below the maximum detected concentration. Isopropyltoluene[4-] was detected in 1 of 23 samples with a maximum detected concentration of 0.0034 mg/kg at a depth of 1.5 to 1.9 ft bgs. The depth of all samples was up to 19.2 ft bgs. Methylnaphthalane[2-] was detected in 1 of 43 samples with a maximum detected concentration of 0.00756 mg/kg at a depth of 0.0 to 0.5 ft bgs. The depth of all samples was up to 19.2 ft bgs. Naphthalene was detected in 2 of 43 samples with concentrations ranging from 0.0121 mg/kg to 0.0122 mg/kg; the depth of these samples was up to 0.5 ft bgs, and the maximum detected concentration was at a depth of 0.0 to 0.5 ft bgs. The depth of all samples was up to 19.2 ft bgs. No concentration was at a depth below the maximum detected concentration. Styrene was detected in 1 of 23 samples with a maximum detected concentration of 0.0011 mg/kg at a depth of 1.5 to 3.5 ft bgs. The depth of all samples was up to 19.2 ft bgs. Toluene was detected in 2 of 23 samples with concentrations ranging from 0.000533 mg/kg to 0.000775 mg/kg; the depth of these samples was up to 3.6 ft bgs, and the maximum detected concentration was at a depth of 1.5 to 3.6 ft bgs. The depth of all samples was up to 19.2 ft bgs. No concentration was at a depth below the maximum detected concentration. Xylene+1,4-xylene[1,3-] was detected in 1 of 23 samples with a maximum detected concentration of 0.000302 mg/kg at a depth of 13.0 to 15.5 ft bgs. The depth of all samples was up to 19.2 ft bgs.

The site description indicates that solvents were not used, so no sources of VOCs are present and VOCs were only detected minimally. Isopropyltoluene[4-] was detected once above the EQL. The data indicated that the VOCs were not increasing in concentration with depth. In addition, there is no known historical use of this site. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.3.22 AOC 02-010

AOC 02-010 is residual soil contamination associated with a small chemical handling building (the chemical waste shack, 02-3) that contained a small underground chamber for working with various radioactive and chemical materials. The chemical waste shack was built in 1944, according to engineering drawing C-1686 (LASL 1944, 090084), and was decommissioned, removed, and disposed of in 1971 (LASL no date, 034172). It is not known if soil was removed when the AOC 02-010 structures were removed (LASL no date, 034172). A boiler house (building 02-63) was built in the area after the chemical waste shack was removed in 1971.

Eight VOCs (acetone, chloroform, isopropylbenzene, 4-isopropyltoluene, methylene chloride, 2-methylnaphthalene, naphthalene, and toluene) were minimally detected at this site. The detected concentrations were less than the EQLs for these VOCs.

Acetone was detected in 2 of 38 samples with concentrations ranging from 0.0039 mg/kg to 0.00815 mg/kg; the depth of these samples was up to 26.5 ft bgs, and the maximum detected concentration was at a depth of 24 to 26.5 ft bgs. The depth of all samples was up to 32 ft bgs. No concentration was at a depth below the maximum detected concentration. Chloroform was detected in 1 of 38 samples with a maximum detected concentration of 0.000219 mg/kg at a depth of 4.5 to 8.5 ft bgs. The depth of all samples was up to 32 ft bgs. Isopropylbenzene was detected in 1 of 38 samples with a maximum detected concentration of 0.000763 mg/kg at a depth of 18.3 to 21 ft bgs. The depth of all samples was up to 32 ft bgs. Isopropyltoluene[4-] was detected in 1 of 38 samples with a maximum detected concentration of 0.000499 mg/kg at a depth of 19.5 to 22.0 ft bgs. The depth of all samples was up to 32 ft bgs. Methylene chloride was detected in 5 of 38 samples with concentrations ranging from 0.00213 mg/kg to 0.00415 mg/kg; the depth of these samples was up to 26.5 ft bgs, and the maximum detected concentration was at a depth of 18.3 to 21.0 ft bgs. The depth of all samples was up to 32 ft bgs. Three concentrations were at depths below the maximum detected concentration: 0.00341 mg/kg, 0.00406 mg/kg, and 0.00329 mg/kg at depth intervals of 19.5 to 22.0 ft bgs, 19.5 to 22.0 ft bgs, and 24.0 to 26.5 ft bgs, respectively. Methylnaphthalene[2-] was detected in 4 of 63 samples with concentrations ranging from 0.00701 mg/kg to 0.0121 mg/kg; the depth of these samples was up to 2.5 ft bgs, and the maximum detected concentration was at a depth of 0.0 to 2.5 ft bgs. The depth of all samples was up to 39 ft bgs. No concentration was at a depth below the maximum detected concentration. Naphthalene was detected in 3 of 63 samples with concentrations ranging from 0.0169 mg/kg to 0.022 mg/kg; the depth of these samples was up to 2.5 ft bgs. and the maximum detected concentration was at a depth of 0.0 to 2.5 ft bgs. The depth of all samples was up to 39 ft bgs. No concentration was at a depth below the maximum detected concentration. Toluene was detected in 4 of 38 samples with concentrations ranging from 0.000372 mg/kg to 0.000593 mg/kg; the depth of these samples was up to 9.5 ft bgs, and the maximum detected concentration was at a depth of 4.5 to 6.4 ft bgs. The depth of all samples was up to 32 ft bgs. Three concentrations were at depths below the maximum detected concentration: 0.000372 mg/kg, 0.000417 mg/kg, and 0.00042 mg/kg at depth intervals of 4.5 to 7.5 ft bgs, 4.5 to 9.5 ft bgs, and 4.5 to 9.5 ft bgs, respectively.

The site description indicates that solvents were not used, but a chemical waste shack was associated with this site. VOCs were only detected minimally. In addition, the chemical waste shack was removed and a boiler house built over the site. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.3.23 AOC 02-011(a)(i-xi)

AOC 02-011(a) consists of 11 drain segments and associated outfalls across TA-02. These individual segments drain either directly or indirectly to Los Alamos Creek. The following drains are associated with this AOC and are divided into the following subunits:

(i) An approximately 50-ft-long concrete storm drain (also described as a concrete flume), located northwest of the OWR building that drains into a drop inlet/catch basin (structure 02-36), as shown on engineering drawing R-5102, sheet 2 of 2 (LANL 1990, 090086). There is no information indicating that the drain handled anything but storm water.

(ii) A 24-in.-diameter, 8-ft-long underground corrugated metal pipe (CMP) between catch basin 02-36 and catch basin 02027, as shown on engineering drawing R-5102, sheet 2 of 2 (LANL 1990, 090086). There is no information that the drain handled anything but storm water.

(iii) An 85 ft-long concrete storm drain (e.g., concrete flume) located northwest of the OWR building (02-1) that drains into catch basin 02-27, as shown on engineering drawing R-5102, sheet 2 of 2 (LANL 1993, 090086). The drain was reportedly used periodically for discharge of water from the fuel transfer pit (DOE 1987, 008663).

(iv) A 15-in.-diameter, 15-ft-long concrete storm drain west of the OWR building that drains into catch basin 02-28, as shown on engineering drawing R-5102, sheet 2 of 2 (LANL 1993, 090086). There is no information that the drain handled anything but storm water.

(v) A 24-in.-diameter, 30-ft-long concrete storm drain between catch basins 02-27 and 02-28, as shown on engineering drawing R-5102, sheet 2 of 2 (LANL 1993, 090086). This drain may have handled the fuel transfer pit water coming from the concrete flume, with associated contaminated aluminum shards.

(vi) A 30-in.-diameter, 75-ft-long CMP between a catch basin (structure 02-28) and Los Alamos Creek, as shown on engineering drawing R-5102, sheet 2 of 2 (LANL 1993, 090086). This drain may have handled the fuel transfer pit water coming from the concrete flume, with associated contaminated aluminum shards.

(vii) A 6-in.-diameter, 18-ft-long pipe between the OWR building and the salvage basin (structure 02-26) and Los Alamos Creek. AOC 02-011(a)(vii) is a duplicate of AOC 02-006(e), as noted in the 1990 SWMU report (LANL 1990, 007511). This drain is addressed as AOC 02-006(e) throughout this report.

(viii) An 18-in.-diameter, 75-ft-long CMP between the OWR building catch basin (unnumbered structure within building 02-1) and Los Alamos Creek, as shown on engineering drawing C-1699 (LASL 1947, 090070). There is no information that this drain handled anything but storm water runoff.

(ix) A 3-in.-diameter, 75-ft-long pipe between the OWR building and the outfall to Los Alamos Creek. Wastewater system design memoranda (e.g., Heineman 1990, 089739) indicate that floor drains from the eastern side of the WBR area drained to this outfall before 1990.

(x) A 12-in.-diameter, 30-ft-long storm drain northeast of the OWR building that discharged to Los Alamos Creek through a series of concrete ditches and a CMP along the east side of the OWR building, as shown on engineering drawing C-1718 (LASL 1947, 089677). The total length of the drain and ditches to Los Alamos Creek is approximately 130 ft. The drains and concrete ditches remained in place until they were removed during D&D activities in 2003 (WD-3 2003, 082646, pp. 26–31). There is no information that this drain handled anything but storm water.

(xi) A 4-in.-diameter, 95-ft-long pipe between the OWR building and Los Alamos Creek. AOC 02-011(a)(xi) is a duplicate of the OWR acid waste line [SWMU 02-006(b)]. AOC 02-011(a)(xi) is addressed as SWMU 02-006(b) throughout this report.

The drains in AOC 02-011(a) date from approximately the time of construction of the reactor building in 1944. Drains from operational areas of the facility may have received effluent until the 2003 D&D of the OWR facility, although the reactor was inactive from 1993 to 2003. Several of the drains were removed in either the 2000 or 2003 D&D activities, but five of the drains, or some portion of them, remained in place (WD-3 2003, 082646, pp. 26–31).

No data was available for AOC 02-011(a)(vii) and is not evaluated here. AOC 02-011(a)(xi) is addressed as SWMU 02-006(b). All other AOC 02-011 (a) sites are evaluated here. Data is presented separately for AOC 02-011(i-vi), AOC 02-011(viii), AOC 02-011(x), and AOC 02-011(xi).

In AOC 02-011(a)(i-vi), five VOCs (chloroform, methylene chloride, 2-methylnaphthalene, naphthalene, and toluene) were minimally detected at this site. The detected concentrations were less than the EQLs for these VOCs.

Chloroform was detected in 1 of 21 samples with a maximum detected concentration of 0.000237 mg/kg at a depth of 4.5 to 10.0 ft bgs. The depth of all samples was up to 22.5 ft bgs. Methylene chloride was detected in 1 of 21 samples with a maximum detected concentration of 0.00273 mg/kg at a depth of 15 to 20 ft bgs. The depth of all samples was up to 22.5 ft bgs. Methylnaphthalene[2-] was detected in 3 of 54 samples with concentrations ranging from 0.00793 mg/kg to 0.0611 mg/kg; the depth of these samples was up to 10 ft bgs, and the maximum detected concentration was at a depth of 0.0 to 0.5 ft bgs. The depth of all samples was up to 50 ft bgs. One concentration was at a depth below the maximum detected concentration: 0.0121 mg/kg at a depth interval of 4.5 to 10.0 ft bgs. Naphthalene was detected in 6 of 64 samples with concentrations ranging from 0.00185 mg/kg to 0.0971 mg/kg; the depth of these samples was up to 10 ft bgs, and the maximum detected concentration was at a depth interval of 0.0 to 0.5 ft bgs. The depth of all samples was up to 50 ft bgs. Four concentrations were at depths below the maximum detected concentration: 0.00212 mg/kg, 0.0175 mg/kg, 0.00185 mg/kg, and 0.0272 mg/kg at depth intervals of 2.0 to 2.2 ft bgs, 2.0 to 2.2 ft bgs, 4.0 to 4.2 ft bgs, and 4.5 to 10.0 ft bgs, respectively. Toluene was detected in 1 of 21 samples at a concentration of 0.000465 mg/kg at a depth of 2 to 2.6 ft bgs. The depth of all samples was up to 22.5 ft bgs.

In AOC 02-011(a)(viii), four VOCs (chloroform, methylene chloride, 2-methylnaphthalene, and naphthalene) were minimally detected at this site. The detected concentrations were less than the EQLs for these VOCs.

Chloroform was detected in 1 of 5 samples with a maximum detected concentration of 0.000304 mg/kg at a depth of 19.5 to 22.0 ft bgs. The depth of all samples was up to 22 ft bgs. Methylene chloride was detected in 1 of 5 samples with a maximum detected concentration of 0.00361 mg/kg at a depth of 19.5 to 22.0 ft bgs. The depth of all samples was up to 22 ft bgs. Methylnaphthalene[2-] was detected in 1 of 12 samples with a maximum detected concentration of 0.0176 mg/kg at a depth of 0.0 to 0.5 ft bgs. The depth of all samples was up to 22 ft bgs. Naphthalene was detected in 1 of 12 samples with a maximum detected concentration of 0.0336 mg/kg at a depth of 0.0 to 0.5 ft bgs. The depth of all samples was up to 22 ft bgs

In AOC 02-011(a)(ix), 10 VOCs (chloroform, isopropylbenzene, 4-isopropyltoluene, methylene chloride, 2-methylnaphthalene, naphthalene, toluene, 1,2,4-trimethylbenzene, 1,3,5-trimenthylbenzene, and 1,2-xylene) were minimally detected at this site. The detected concentrations were less than the EQLs for these VOCs, except for 1,2,4-trimethylbenzene, which had a maximum detected concentration greater than the EQL.

Chloroform was detected in 1 of 38 samples with a maximum detected concentration of 0.000218 mg/kg at a depth of 7.5 to 8.5 ft bgs. The depth of all samples was up to 29 ft bgs. Isopropylbenzene was detected in 2 of 38 samples with concentrations ranging from 0.000401 mg/kg to 0.00072 mg/kg; the depth of these samples was up to 12.5 ft bgs, and the maximum detected concentration was at a depth of 10.0 to 12.5 ft bgs. The depth of all samples was up to 29 ft bgs. No concentration was at a depth below the maximum detected concentration. Isopropyltoluene[4-] was detected in 1 of 38 samples with a maximum detected concentration of 0.000534 mg/kg at a depth of 7.5 to 14.5 ft bgs. The depth of all samples was up to 29 ft bgs. Methylene chloride was detected in 1 of 38 samples with a maximum detected concentration of 0.00322 mg/kg at a depth of 24.5 to 29.0 ft bgs. The depth of all samples was up to 29 ft bgs. Methylnaphthalene[2-] was detected in 2 of 38 samples with concentrations ranging from 0.00962 mg/kg to 0.0194 mg/kg; the depth of these samples was up to 0.5 ft bgs, and the maximum detected concentration was at a depth of 0.0 to 0.5 ft bgs. The depth of all samples was up to 29 ft bgs. No concentration was at a depth below the maximum detected concentration. Naphthalene was detected in 4 of 38 samples with concentrations ranging from 0.0125 mg/kg to 0.0278 mg/kg; the depth of these samples was up to 14.5 ft bgs, and the maximum detected concentration was at a depth of 0.0 to 0.5 ft bgs. The depth of all samples was up to 29 ft bgs. One concentration was at a depth below the maximum detected concentration: 0.0176 mg/kg at a depth interval of 7.5 to 14.0 ft bgs. Toluene was detected in 1 of 38 samples with a maximum detected concentration of 0.000362 mg/kg at a depth of 4 to 8 ft bgs. The depth of all samples was up to 29 ft bgs. Trimethylbenzene[1,2,4-] was detected in 1 of 38 samples with a maximum detected concentration of 0.00329 mg/kg at a depth of 7.5 to 14.5 ft bgs. The depth of all samples was up to 29 ft bgs. Trimenthylbenzene[1,3,5-] was detected in 1 of 38 samples with a maximum detected concentration of 0.00101 mg/kg at a depth of 7.5 to 14.5 ft bgs. The depth of all samples was up to 29 ft bgs. Xylene[1,2-] was detected in 1 of 38 samples with a maximum detected concentration of 0.000249 mg/kg at a depth of 7.5 to 14.5 ft bgs. The depth of all samples was up to 29 ft bgs.

In AOC 02-011(a)(x), four VOCs (methylene chloride, 2-methylnaphthalene, naphthalene, and toluene) were minimally detected at this site. The detected concentrations were less than the EQLs for these VOCs, except for naphthalene, which had a maximum detected concentration greater than the EQL.

Methylene chloride was detected in 1 of 15 samples with a maximum detected concentration of 0.00295 mg/kg at a depth of 19.5 to 23.5 ft bgs. The depth of all samples was up to 30 ft bgs. Methylnaphthalene[2-] was detected in 1 of 31 samples with a maximum detected concentration of 0.0408 mg/kg at a depth of 0.0 to 0.5 ft bgs. The depth of all samples was up to 50 ft bgs. Naphthalene was detected in 3 of 31 samples with concentrations ranging from 0.0112 mg/kg to 0.0861 mg/kg; the depth of these samples was up to 0.5 ft bgs, and the maximum detected concentration was at a depth of

0.0 to 0.5 ft bgs. The depth of all samples was up to 50 ft bgs. No concentration was at a depth below the maximum detected concentration. Toluene was detected in 1 of 15 samples with a maximum detected concentration of 0.00097 mg/kg at a depth of 4.5 to 10.0 ft bgs. The depth of all samples was up to 30.0 ft bgs.

The site description indicates that solvents were not used, so no sources of VOCs are present and VOCs were only detected minimally. Trimethylbenzene[1,2,4-] and naphthalene had detected concentrations greater than their EQLs at AOC 02-11(a)(ix) and AOC 02-011(a)(x), respectively. Data indicated that the concentrations were not increasing with depth. In addition, several of the drains were removed in either the 2000 or 2003 D&D activities. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.3.24 AOC 02-011(b)

AOC 02-011(b) consists of two drains and outfalls associated with the stack-gas valve house (structure 02-19). One drain was a 9-ft-long × 15-in.-diameter CMP between the stack-gas valve house and the catch basin (structure 02-35). The second drain was a 9-ft-long × 24-in.-diameter CMP that drained from the catch basin (structure 02-35) to Los Alamos Creek outside the east fence. The drains and structures are shown on engineering drawing C-1718 (LASL 1947, 089677). The drains and outfalls were presumably installed at the same time the stack-gas valve house [AOC 02-003(a)] was constructed in 1944. The stack-gas valve house was in use through 1974 when it became inactive and was removed during 1985 D&D activities. The actual purpose of the drainlines and catch basin is not documented. The drains and outfalls remained in place until they were removed and disposed of during 2003 D&D activities (WD-3 2003, 082646).

Two VOCs (2-methylnaphthalene, and naphthalene) were minimally detected at this site. The detected concentrations were less than the EQLs for these VOCs.

Methylnaphthalene[2-] was detected in 1 of 19 samples with a maximum detected concentration of 0.0151 mg/kg at a depth of 0.0 to 0.5 ft bgs. The depth of all samples was up to 16.7 ft bgs. Naphthalene was detected in 1 of 19 samples with a maximum detected concentration of 0.0239 mg/kg at a depth of 0.0 to 0.5 ft bgs. The depth of all samples was up to 16.7 ft bgs.

The site description indicates that solvents were not used, so no sources of VOCs are present and VOCs were only detected minimally. In addition, the drains and outfalls were removed and the site is inactive. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.3.25 AOC 02-011(c)

AOC 02-011(c) was a storm drain associated with the OWR equipment building [02-44, AOC 02-004(f)]. The drainline was a 4-in.-diameter VCP that was approximately 12 ft long, and drained to the surface west of the western fence. The drainline was installed in 1954, as shown on engineering drawing C-14930 (LASL 1954, 090076). The drainline was removed and disposed of in 2003 (WD-3 2003, 082646, pp. 26–31). The OWR equipment building was in operation from 1954 to 1993. The AOC 02-011(c) storm drain and outfall collected and discharged storm water from the vicinity of the building from 1954 to 2003. The AOC 02-011(c) outfall piping was decommissioned and removed, and the waste was disposed of at an approved facility in 2003 (WD-3 2003, 082646, pp. 1–6).

One VOC (toluene) was minimally detected at this site. The detected concentrations were less than the EQL for this VOC.

Toluene was detected in one of three samples with a maximum detected concentration of 0.000674 mg/kg at a depth of 4.5 to 9.0 ft bgs. The depth of all samples was up to 19.5 ft bgs.

The site description indicates that solvents were not used, so no sources of VOCs are present and VOCs were only detected minimally. In addition, the drains and outfall piping were removed and the site is inactive. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.3.26 AOC 02-011(d)

AOC 02-011(d) was an NPDES-permitted outfall that discharged effluent from the OWR equipment building [02-44, AOC 02-004(f)]. The line ran from the equipment building south-southwest, past the western side of the cooling tower (structure 02-49), to Los Alamos Creek. The outfall at AOC 02-011(d) became operational in 1949, discharging effluent to Los Alamos Creek. The discharge consisted primarily of regenerate water from the ion-exchange system. Discharge was rerouted through the OWR effluent storage tanks and disposed of through the liquid acid waste line to TA-50 beginning in 1963. The outfall was removed from the NPDES permit in 1995 (NMED 2001, 071256).

Four VOCs (acetone, 2-butanone, 2-methylnaphthalene, and naphthalene) were minimally detected at this site. The detected concentrations were less than the EQLs for these VOCs, except for acetone, which had maximum detected concentration greater than the EQL.

Acetone was detected in 1 of 6 samples with a maximum detected concentration of 0.00917 mg/kg at a depth of 3 to 4 ft bgs. The depth of all samples was up to 5.1 ft bgs. Butanone[2-] was detected in 1 of 6 samples with a maximum detected concentration of 0.0024 mg/kg at a depth of 3 to 4 ft bgs. The depth of all samples was up to 5.1 ft bgs. Methylnaphthalene[2-] was detected in 3 of 7 samples with concentrations ranging from 0.00869 mg/kg to 0.0154 mg/kg; the depth of these samples was up to 5.1 ft bgs, and the maximum detected concentration was at a depth of 2 to 3 ft bgs. The depth of all samples was up to 5.1 ft bgs. One concentration was at a depth below the maximum detected concentration: 0.0112 mg/kg at a depth interval of 5.0 to 5.1 ft bgs. Naphthalene was detected in 4 of 7 samples with concentrations ranging from 0.0164 mg/kg to 0.0551 mg/kg; the depth of these samples was up to 5.1 ft bgs, and the maximum detected concentration was at a depth of 2 to 3 ft bgs. The depth of all samples was up to 5.1 ft bgs. Two concentrations were at depths below the maximum detected concentration: 0.0202 mg/kg and 0.0468 mg/kg at depth intervals of 4 to 5 ft bgs and 5.0 to 5.1 ft bgs, respectively.

The site description indicates that solvents were not used, so no sources of VOCs are present and VOCs were only detected minimally. Acetone were detected once above the EQL. The data indicated that the VOC was not increasing in concentration with depth. In addition, the outfall is now inactive. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.3.27 AOC 02-012

AOC 02-012 consists of the potential soil contamination associated with two removed fuel USTs, structures 02-29 and 02-67 (NMED-registered tank 02-1). AOC 02-003(e) is the former location of an 800-L stainless-steel holding tank (structure 02-62), installed in approximately 1944, and was associated with operation of the WBR. The tank was removed in 1950 (LANL 1996, 055226, p. 5-15). In 1982, a 517-gal. diesel tank [structure 02-67 (NMED-registered tank 02-1)] was installed on the north side of the OWR building (02-1). The diesel tank (structure 02-67, NMED registered tank 02-1) and associated lines were removed and disposed of in 1998 in accordance with NMED requirements (LANL 2000, 090023).

Six VOCs (chloroform, 1,4-dichlorobenzene, methylene chloride, 2-methylnaphthalene, naphthalene, and trichloroethene) were minimally detected at this site. The detected concentrations were less than the EQLs for these VOCs, except for 2-methylnaphthalene and naphthalene, which both had detected concentrations greater than the EQLs.

Chloroform was detected in 1 of 24 samples with a maximum detected concentration of 0.000245 mg/kg at a depth of 14 to 19 ft bgs. The depth of all samples was up to 21 ft bgs. Dichlorobenzene[1,4-] was detected in 1 of 24 samples with a maximum detected concentration of 0.000252 mg/kg at a depth of 4.5 to 9.0 ft bgs. The depth of all samples was up to 21 ft bgs. Methylene chloride was detected in 6 of 24 samples with concentrations ranging from 0.00217 mg/kg to 0.00416 mg/kg; the depth of these samples was up to 17 ft bgs, and the maximum detected concentration was at a depth of 9 to 16 ft bgs. The depth of all samples was up to 21 ft bgs. One concentration was at a depth below the maximum detected concentration: 0.00235 mg/kg at a depth interval of 10 to 17 ft bgs. Methylnaphthalene[2-] was detected in 7 of 40 samples with concentrations ranging from 0.0106 mg/kg to 0.14 mg/kg; the depth of these samples was up to 9 ft bgs, and the maximum detected concentration was at a depth of 4.5 to 9.0 ft bgs. The depth of all samples was up to 21 ft bgs. No concentration was at a depth below the maximum detected concentration. Naphthalene was detected in 9 of 40 samples with concentrations ranging from 0.0111 mg/kg to 0.381 mg/kg; the depth of these samples was up to 12 ft bgs, and the maximum detected concentration was at a depth of 4.5 to 9.0 ft bgs. The depth of all samples was up to 21 ft bgs. One concentration was at a depth below the maximum detected concentration: 0.0147 mg/kg at a depth interval of 4.5 to 12.0 ft bgs. Trichloroethene was detected in 1 of 24 samples with a maximum detected concentration of 0.000635 mg/kg at a depth of 4.5 to 7.5 ft bgs. The depth of all samples was up to 21 ft bgs.

The site description indicates that solvents were not used, but the site is associated with two removed underground fuel storage tanks. VOCs were only detected minimally. Methylnaphthalene[2-] (3 out of 40 samples) and naphthalene (3 out of 40 samples) were the only VOCs detected above their EQLs, which is not indicative of widespread contamination or source. The data also indicated that the VOCs were not increasing in concentration with depth. In addition, tanks were removed. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.3.28 SWMU 21-006(e) and AOC 21-006(f)

SWMU 21-006(e) is a seepage pit that may be located south of building 21-4. The location of this seepage pit is unclear (LANL 1990, 007512), but it may be the same seepage pit as AOC 21-006(f) (LANL 1991, 007680, p. 18-13). AOC 21-006(f) is described as a gravel seepage pit located on the south side of the DP West complex (Tribby 1947, 001404, p. 1). The seepage pit(s) may have received up to 4000 L per day of hydrogen fluoride wastewater effluent from a hydrofluorination process located in room 413, the southernmost room of building 21-4 (Tribby 1947, 001404, p. 1). The period of operation is not known. During repair work on the drain system under room 413, a hole in the ground was identified under the drainlines. It was evident that acid waste had escaped from the drain system into the ground (Meyer 1978, 000526). This hole may have been one of the seepage pits of SWMU 21-006(e) and AOC 21-006(f).

Fourteen VOCs (acetone, bromobenzene, n-butylbenzene, sec-butylbenzene, 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, ethylbenzene, 4-isopropyltoluene, methylene chloride, toluene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and xylene [total]) were minimally detected at this site. The detected concentrations were less than the EQLs for these VOCs, except for xylene (total), which had a detected concentration greater than the EQL.

Acetone was detected in 8 of 45 samples with concentrations ranging from 0.0071 mg/kg to 0.033 mg/kg; the depth of these samples was up to 13 ft bgs, and the maximum detected concentration was at depth intervals of 2 to 3 ft bgs and 7 and 8 ft bgs. The depth of all samples was up to 13 ft bgs. Three concentrations were at depths below the maximum detected concentration: 0.0071 mg/kg, 0.009 mg/kg, and 0.01 mg/kg, all at a depth interval of 12 to 13 ft bgs. Bromobenzene was detected in 1 of 45 samples with a maximum detected concentration of 0.00047 mg/kg at a depth of 2 to 3 ft bgs. The depth of all samples was up to 13 ft bgs. Butylbenzene[n-] was detected in 1 of 45 samples with a maximum detected concentration of 0.0011 mg/kg at a depth of 7 to 8 ft bgs. The depth of all samples was up to 13 ft bgs. Butylbenzene[sec-] was detected in 1 of 45 samples with a maximum detected concentration of 0.00041 mg/kg at a depth of 2 to 3 ft bgs. The depth of all samples was up to 13 ft bgs. Dichlorobenzene[1,2-] was detected in 4 of 45 samples with concentrations ranging from 0.00024 mg/kg to 0.00051 mg/kg; the depth of these samples was up to 8 ft bgs, and the maximum detected concentration was at a depth of 2 to 3 ft bgs. The depth of all samples was up to 13 ft bgs. Two concentrations were at depths below the maximum detected concentration: 0.00024 mg/kg and 0.00041 mg/kg, both at the depth interval of 7 to 8 ft bgs. Dichlorobenzene[1,3-] was detected in 4 of 45 samples with concentrations ranging from 0.00025 mg/kg to 0.00047 mg/kg; the depth of these samples was up to 8 ft bgs, and the maximum detected concentration was at a depth of 2 to 3 ft bgs. The depth of all samples was up to 13 ft bgs. Two concentrations were at depths below the maximum detected concentration: 0.00025 mg/kg and 0.00038 mg/kg, both at the depth interval of 7 to 8 ft bgs. Dichlorobenzene[1,4-] was detected in 4 of 45 samples with concentrations ranging from 0.00039 mg/kg to 0.00049 mg/kg; the depth of these samples was up to 13 ft bgs, and the maximum detected concentration was at a depth of 7 to 8 ft bgs. The depth of all samples was up to 13 ft bgs. One concentration was at a depth below the maximum detected concentration: 0.00039 mg/kg at the depth interval of 12 to 13 ft bgs. Ethylbenzene was detected in 2 of 45 samples with concentrations ranging from 0.0016 mg/kg to 0.00033 mg/kg; the depth of these samples was up to 8 ft bgs, and the maximum detected concentration was at a depth of 7 to 8 ft bgs. The depth of all samples was up to 13 ft bgs. No concentration was at a depth below the maximum detected concentration. Isopropyltoluene[4-] was detected in 2 of 45 samples with concentrations ranging from 0.00079 mg/kg to 0.0021 mg/kg; the depth of these samples was up to 13 ft bgs, and the maximum detected concentration was at a depth of 7 to 8 ft bgs. The depth of all samples was up to 13 ft bgs. One concentration was at a depth below the maximum detected concentration: 0.00079 mg/kg at the depth interval of 12 to 13 ft bgs. Methylene chloride was detected in 7 of 45 samples with concentrations ranging from 0.0035 mg/kg to 0.015 mg/kg; the depth of these samples was up to 13 ft bgs, and the maximum detected concentration was at a depth of 2 to 3 ft bgs. The depth of all samples was up to 13 ft bgs. Three concentrations were at depths below the maximum detected concentration: 0.01 mg/kg, 0.012 mg/kg, and 0.012 mg/kg at the depth intervals of 7 to 8 ft bgs, 12 to 13 ft bgs, and 12 to 13 ft bgs, respectively. Toluene was detected in 13 of 45 samples with concentrations ranging from 0.00018 mg/kg to 0.0023 mg/kg; the depth of these samples was up to 13 ft bgs, and the maximum detected concentration was at a depth of 7 to 8 ft bgs. The depth of all samples was up to 13 ft bgs. Four concentrations were at depths below the maximum detected concentration: 0.0014 mg/kg, 0.00057 mg/kg, 0.0002 mg/kg, and 0.00018 mg/kg, all at the depth interval of 12 to 13 ft bgs. Trimethylbenzene[1,2,4-] was detected in 7 of 45 samples with concentrations ranging from 0.00029 mg/kg to 0.0024 mg/kg; the depth of these samples was up to 13 ft bgs, and the maximum detected concentration was at a depth of 7 to 8 ft bgs. The depth of all samples was up to 13 ft bgs. Two concentrations were at depths below the maximum detected concentration: 0.00039 mg/kg and 0.00044 mg/kg, both at the depth interval of 12 to 13 ft bgs. Trimethylbenzene[1,3,5-] was detected in 4 of 45 samples with concentrations ranging from 0.00027 mg/kg to 0.0024 mg/kg; the depth of these samples was up to 13 ft bgs, and the maximum detected concentration was at a depth of 7 to 8 ft bgs. The depth of all samples was up to 13 ft bgs. One concentration was at a depth below the maximum detected concentration: 0.00034 mg/kg at the depth interval of 12 to 13 ft bgs. Xylene (total) was detected in 1 of

45 samples with a maximum detected concentration of 0.0092 mg/kg at a depth of 7 to 8 ft bgs. The depth of all samples was up to 13 ft bgs.

The site description indicates that solvents were not used, so no sources of VOCs are present and VOCs were only detected minimally. Xylene (total) had a single detected concentration greater than the EQL out of 45 samples, and the data indicated that the concentrations were decreasing with depth, so the vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.3.29 AOC 21-028(c)

AOC 21-028(c) consists of four satellite container storage areas that were located around building 21-3. The four container storage areas were located at the door to room 301 on the north dock, at the outer door to room 360, at the northeast side of the fan room 3N, and inside a chemical safety cabinet in room 362. The period of operation for the storage areas is not available but probably began in 1945, when the building was constructed (LANL 1991, 007680, p. 18-21). The areas were in use as late as 1990 (LANL 1991, 007680, pp. 18-23–18-24). These areas have stored a wide variety of chemicals including depleted uranium salts, metal salts, organic chemicals, synthetic inorganic chemicals, and other reagents (LANL 1991, 007680, pp. 18-23–18-24)

Eleven VOCs (acetone, bromobenzene, 1,2-dichlorobenzene, 1,3-dichlorobenzene, ethylbenzene, 4-isopropyltoluene, methylene chloride, tetrachloroethene, toluene, 1,2,4-trimethylbenzene, and xylene [total)] were minimally detected at this site. The detected concentrations were less than the EQLs for these VOCs, except for 4-isopropyltoluene, which had maximum detected concentration greater than the EQL.

Acetone was detected in 18 of 49 samples with concentrations ranging from 0.009 mg/kg to 0.042 mg/kg; the depth of these samples was up to 13 ft bgs and the maximum detected concentration was at a depth of 7.0 to 8.0 ft bgs. The depth of all samples was up to 13 ft bgs. Five concentrations were at depths below the maximum detected concentration; ranging from 0.0095 mg/kg to 0.037 mg/kg all at a depth interval of 12.0 to 13.0 ft bgs. Bromobenzene was detected in 1 of 44 samples with a maximum detected concentration of 0.00053 mg/kg at a depth of 7.0 to 8.0 ft bgs. The depth of all samples was up to 13 ft bgs. Dichlorobenzene[1,2-] was detected in 2 of 44 samples with concentrations ranging from 0.00049 mg/kg to 0.00054 mg/kg; the depth of these samples was up to 8 ft bgs and the maximum detected concentration was at a depth of 7.0 to 8.0 ft bgs. The depth of all samples was up to 13 ft bgs. No concentration was at a depth below the maximum detected concentration. Dichlorobenzene[1,3-] was detected in 3 of 44 samples with concentrations ranging from 0.00015 mg/kg to 0.00049 mg/kg; the depth of these samples was up to 13.0 ft bgs and the maximum detected concentration was at a depth of 7.0 to 8.0 ft bgs. The depth of all samples was up to 13 ft bgs. One concentration was at a depth below the maximum detected concentration; 0.00015 mg/kg at a depth interval of 12.0 to 13.0 ft bgs. Ethylbenzene was detected in 4 of 44 samples with concentrations ranging from 0.00022 mg/kg to 0.001 mg/kg; the depth of these samples was up to 13.0 ft bgs and the maximum detected concentration was at a depth of 12.0 to 13.0 ft bgs. The depth of all samples was up to 13 ft bgs. No concentration was at a depth below the maximum detected concentration. Isopropyltoluene[4-] was detected in 3 of 44 samples with concentrations ranging from 0.00028 mg/kg to 0.0097 mg/kg; the depth of these samples was up to 13.0 ft bgs and the maximum detected concentration was at a depth of 12.0 to 13.0 ft bgs. The depth of all samples was up to 13 ft bgs. No concentration was at a depth below the maximum detected concentration. Methylene chloride was detected in 14 of 47 samples with concentrations ranging from 0.0033 mg/kg to 0.013 mg/kg; the depth of these samples was up to 13 ft bgs and the maximum detected concentration was at a depth of 2.0 to 3.0 ft bgs. The depth of all samples was up to 13 ft bgs. Ten concentrations were at depths below the maximum detected concentration; ranging from 0.0033 mg/kg to

0.011 mg/kg at a depth interval of 7.0 to 8.0 ft bgs and 0.0035 mg/kg to 0.01 mg/kg in the depth interval of 12.0 to 13.0 ft bgs. Tetrachloroethene was detected in 3 of 44 samples with concentrations ranging from 0.00081 mg/kg to 0.0014 mg/kg; the depth of these samples was up to 13.0 ft bgs and the maximum detected concentration was at a depth of 7.0 to 8.0 ft bgs. The depth of all samples was up to 13 ft bgs. One concentration was at a depth below the maximum detected concentration; 0.0012 mg/kg at a depth interval of 12.0 to 13.0 ft bgs. Toluene was detected in 26 of 49 samples with concentrations ranging from 0.0002 mg/kg to 0.0017 mg/kg; the depth of these samples was up to 13 ft bgs and the maximum detected concentration was at a depth of 2.0 to 3.0 ft bgs. The depth of all samples was up to 13 ft bgs. Fifteen concentrations were at depths below the maximum detected concentration; ranging from 0.002 mg/kg to 0.00083 mg/kg at a depth interval of 7.0 to 8.0 ft bgs and 0.00021 mg/kg to 0.000791 mg/kg in the depth interval of 12.0 to 13.0 ft bgs. Trimethylbenzene[1,2,4-] was detected in 15 of 45 samples with concentrations ranging from 0.00025 mg/kg to 0.00068 mg/kg; the depth of these samples was up to 13 ft bgs and the maximum detected concentration was at a depth of 7.0 to 8.0 ft bgs. The depth of all samples was up to 13 ft bgs. Six concentrations were at depths below the maximum detected concentration; ranging from 0.00025 mg/kg to 0.00043 mg/kg in the depth interval of 12.0 to 13.0 ft bgs. Xylene (total) was detected in 2 of 44 samples with concentrations ranging from 0.0018 mg/kg to 0.0071 mg/kg; the depth of these samples was up to 13 ft bgs and the maximum detected concentration was at a depth of 12.0 to 13.0 ft bgs. The depth of all samples was up to 13 ft bgs. No concentration was at a depth below the maximum detected concentration.

The site description indicates that solvents were stored at the storage areas, so a VOC source is possible. However, VOCs were only detected minimally. Isopropyltoluene[4-] did have a single maximum detected concentration out of 44 samples that was greater than the EQL, and this concentration was at the lowest depth sample, so extent is not known, but the site is inactive. The vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and additional evaluation may be necessary to determine extent of contamination.

H-4.3.30 SWMU 26-001

SWMU 26-001 is a surface disposal area on the south-facing slope of Los Alamos Canyon that contains debris from a five-room concrete storage vault. The vault was constructed in 1946 (LASL 1949, 000696) and was decommissioned and dismantled in 1966 (Blackwell 1973, 000619). Although the vault was constructed for storing radioactive materials, documentation describing the specific type and quantity of radioactive materials is not available. One document states that the vault “stored friable containers which now contain, or have contained radioactive material” (Maddy 1957, 006349). The vault was later used for storing high explosives (Lojek 1991, 001904). Before the vault was dismantled, the contaminated contents that could be removed, including shelving, drainlines, the sump, and duct work, were disposed of at MDA C (Blackwell 1973, 000619). The remains of the vault were bulldozed onto the south-facing slope of Los Alamos Canyon. In the 1970s, most of the vault debris rested on the bench below the mesa top; however, some debris may have fallen as far as the canyon floor (Buckland 1978, 000496). The debris on the ledge was covered with approximately 3 ft of soil (Blackwell 1973, 000619).

Two VOCs (4-isopropyltoluene and toluene) were minimally detected at this site. The detected concentrations were less than the EQLs for these VOCs, except for 4-isopropyltoluene, which had a maximum detected concentration greater than the EQL.

Isopropyltoluene[4-] was detected in 1 of 29 samples with a maximum detected concentration of 0.00237 mg/kg at a depth of 2.5 to 3.0 ft bgs. The depth of all samples was up to 6.1 ft bgs. Toluene was detected in 14 of 29 samples with concentrations ranging from 0.000336 mg/kg to 0.00123 mg/kg; the depth of these samples was up to 3.4 ft bgs, and the maximum detected concentration was at a depth of

2.7 to 3.2 ft bgs. The depth of all samples was up to 6.1 ft bgs. One concentration was at a depth below the maximum detected concentration: 0.000344 mg/kg at the depth interval of 2.8 to 3.4 ft bgs.

The site description indicates that solvents were not used, so no sources of VOCs are present and VOCs were only detected minimally. Isopropyltoluene[4-] had a single maximum detected concentration greater than the EQL out of 29 samples, and the data indicated that the concentrations were decreasing with depth. In addition, most of the contaminated contents were removed off-site and any remaining material was covered with 3 ft of soil, so the vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.3.31 SWMU 26-002(a)

SWMU 02-006(a) was an 8-ft-deep French drain system. The system consisted of the exhaust stack and French drain, all located in TA-61 on the Los Alamos Canyon south rim mesa top, above TA-02. The stack system was the termination point of the gaseous effluent vent line (line 119) from the OWR and WBR at TA-02. The French drain was installed in 1948, designated as structure 02-9, and was also identified as structure 61-26, according to engineering drawing C-1716 (LASL 1948, 090083). The French drain was designed to catch condensate that collected as reactor exhaust gases cooled during venting through the tower exhaust stack. The vent stack and French drain system were active from their installation in 1948 to the OWR deactivation in 1993. The French drain system and contaminated soil were removed and disposed of during D&D activities in 2003 (LANL 2003, 090089).

Two VOCs (2-hexanone and toluene) were minimally detected at this site. The detected concentrations were less than the EQLs for these VOCs, except for toluene, which had two detected concentrations greater than the EQL.

Hexanone[2-] was detected in 2 of 36 samples with concentrations ranging from 0.00163 mg/kg to 0.00218 mg/kg; the depth of these samples was up to 7.5 ft bgs, and the maximum detected concentration was at a depth of 6.0 to 7.5 ft bgs. The depth of all samples was up to 13.5 ft bgs. No concentration was at a depth below the maximum detected concentration. Toluene was detected in 7 of 36 samples with concentrations ranging from 0.000377 mg/kg to 0.00524 mg/kg; the depth of these samples was up to 4.5 ft bgs, and the maximum detected concentration was at a depth of 2.5 to 3.0 ft bgs. The depth of all samples was up to 13.5 ft bgs. Four concentrations were at depths below the maximum detected concentration, ranging from 0.000377 mg/kg to 0.00182 mg/kg, at a depth interval of 0.5 to 4.5 ft bgs. The concentration at the lowest depth interval of 3.5 to 4.5 ft bgs was 0.000398 mg/kg.

The site description indicates that solvents were not used, so no sources of VOCs are present and VOCs were only detected minimally. Toluene had two detected concentrations greater than the EQL out of 36 samples, and the data indicated that the concentrations were decreasing with depth. In addition, the French drain system and contaminated soils were removed and the site is inactive, so the vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.3.32 SWMU 26-002(b)

SWMU 26-002(b) was the equipment room drainage system constructed in 1946 for the concrete storage vault at TA-26. The drainage system was installed during construction of the storage vault in 1946. It carried effluent through a 4-in.-diameter VCP floor drain that discharged directly to the south-facing slope. Specific uses of the drain system are not documented. The drainlines were removed before demolition of the vault structure in 1966 (Blackwell 1973, 000619). All removable material, including the drainlines, was disposed of at MDA C (Blackwell 1973, 000619).

Two VOCs (acetone and toluene) were minimally detected at this site. The detected concentrations were less than the EQLs for these VOCs.

Acetone was detected in one of seven samples with a maximum detected concentration of 0.00331 mg/kg at a depth of 1.2 to 1.7 ft bgs. The depth of all samples was up to 11 ft bgs. Toluene was detected in one of seven samples with a maximum detected concentration of 0.000579 mg/kg at a depth of 1.2 to 1.7 ft bgs. The depth of all samples was up to 11 ft bgs.

The site description indicates that solvents were not used, so no sources of VOCs are present and VOCs were only detected minimally. In addition, all removable material was disposed of off-site and the site is inactive, so the vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.3.33 SWMU 26-003

SWMU 26-003 is the septic system that served sanitary facilities in the east room of the concrete storage vault at TA-26. The septic system consisted of a 4-in.-diameter VCP drainline connected to a 250-gal. steel septic tank. The septic system was installed in August 1948 (LASL no date, 000675). Overflow from the system was discharged to the slope below the mesa top. It was assumed that the septic tank was free from radioactive contamination because the tank served the toilet and sink in the least contaminated room of the storage vault (Buckland 1965, 000628). The septic tank was thought to have handled only sanitary waste; however, because radioactive contamination was found in the vault, it is possible that contaminants were introduced into the system. The septic tank system may have been removed at the same time as the sump system [SWMU 26-002(a)] and other removable material in 1966, but no clear documentation is available (Blackwell 1973, 000619).

Three VOCs (acetone, 4-isopropyltoluene and toluene) were minimally detected at this site. The detected concentrations were less than the EQLs for these VOCs.

Acetone was detected in 2 of 21 samples with concentrations ranging from 0.00452 mg/kg to 0.00596 mg/kg; the depth of these samples was up to 3.1 ft bgs, and the maximum detected concentration was at a depth of 2.6 to 3.1 ft bgs. The depth of all samples was up to 10.8 ft bgs. No concentration was at a depth below the maximum detected concentration.

Isopropyltoluene[4-] was detected in 1 of 21 samples with a maximum detected concentration of 0.000896 mg/kg at a depth of 5.1 to 7.0 ft bgs. The depth of all samples was up to 10.8 ft bgs. Toluene was detected in 4 of 21 samples with concentrations ranging from 0.000485 mg/kg to 0.000915 mg/kg; the depth of these samples was up to 3.9 ft bgs, and the maximum detected concentration was at a depth of 2.6 to 3.1 ft bgs. The depth of all samples was up to 10.8 ft bgs. One concentration was at a depth below the maximum detected concentration: 0.000818 mg/kg at a depth interval of 3.2 to 3.9 ft bgs.

The site description indicates that solvents were not used, so no sources of VOCs are present and VOCs were only detected minimally. In addition, the septic system was thought to have been removed and the site is inactive, so the vapor intrusion pathway is therefore potentially complete based on NMED guidance (NMED 2017, 602273) and no additional evaluation is necessary.

H-4.4 Essential Nutrients

NMED has SSLs for evaluation of essential nutrients (NMED 2017, 602273). The maximum detected concentrations of calcium and magnesium were compared with the appropriate NMED SSLs at those sites where they were identified as COPCs. The results of the comparisons found calcium and magnesium concentrations to be substantially less than the SSLs as presented in Table H-4.4-1. Further evaluation of calcium at these sites is not necessary.

H-4.5 Uncertainty Analysis

H-4.5.1 Data Evaluation and COPC Identification Process

A primary uncertainty associated with the COPC identification process is the possibility that a chemical may be inappropriately identified as a COPC when it is actually not a COPC or that a chemical may not be identified as a COPC when it actually should be identified as a COPC. Inorganic chemicals are appropriately identified as COPCs because only the chemicals detected or that have detection limits above background are retained for further analysis. There are no established BVs for organic chemicals, and all detected organic chemicals are identified as COPCs and are retained for further analysis. Other uncertainties may include errors in sampling, laboratory analysis, and data analysis. However, because concentrations used in the risk-screening evaluations include those detected below the EQLs and nondetects above BVs, data evaluation uncertainties are expected to have little effect on the risk-screening results.

H-4.5.2 Exposure Evaluation

The current and reasonably foreseeable future land use is industrial. To the degree actual activity patterns are not represented by those activities assumed by the industrial scenario, uncertainties are introduced in the assessment, and the evaluation presented in this assessment overestimates potential risk. An individual may be subject to exposures in a different manner than the exposure assumptions used to derive the industrial SSLs. For the sites evaluated, individuals might not be on-site at present or in the future for that frequency and duration. The construction worker assumptions for the SSLs are that the potentially exposed individual is outside on-site for 8 hr/day, 250 days/yr, and 1 yr (NMED 2017, 602273). The industrial assumptions for the SSLs are that the potentially exposed individual is outside on-site for 8 hr/day, 225 days/yr, and 25 yr (NMED 2017, 602273). The residential SSLs are based on exposure of 24 hr/day, 350 days/yr, and 30 yr (NMED 2017, 602273). 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 2017, 602273). When several upper-bound values (as are found in NMED 2017, 602273) are combined to estimate exposure for any one pathway, the resulting risk estimate can exceed the 99^{th} percentile, and therefore, can exceed the range of risk that may be reasonably expected. Also, the assumption that residual concentrations of chemicals in the tuff are available and result in exposure in the same manner as if they were in soil overestimates the potential exposure and risk to receptors.

Uncertainty is introduced in the concentration aggregation of data for estimating the EPCs at a site. Risk from a single location or area with relatively high COPC concentrations may be underestimated by using a representative site-wide value. The use of a UCL is intended to provide a protective upper-bound (i.e., conservative) COPC concentration and is assumed to be representative of the average exposure to a COPC across the entire site. Potential risk and exposure from a single location or area with relatively high COPC concentrations may be overestimated if a representative site-wide value is used. The use of the maximum detected concentration for the EPC overestimates the exposure to contamination because receptors are not consistently exposed to the maximum detected concentration across the site. In addition, the maximum detection limit was used as the EPC for some inorganic COPCs with elevated detection limits above BVs.

AOC 02-003(a)

The residential dose at AOC 02-003(a) was 160 mrem/yr, which is greater than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. Cesium-137 was responsible for most of the calculated dose at 144 mrem/yr. The EPC for cesium-137 of 69.1 pCi/g, which was influenced by a maximum detected concentration of 274 pCi/g, was greater than its SSL of 12 pCi/g.

AOC 02-003(c)

The residential HI at AOC 02-003(c) was approximately 3 and was due primarily to thallium (HQ = 2.21). The EPC for thallium of 1.72 was influenced by one high concentration of 8.21 mg/kg compared with the next highest concentration of 0.4 mg/kg, which is less than the SSL of 0.78 mg/kg.

AOC 02-003(e)

The residential HI at AOC 02-003(e) was approximately 3 (3.27) and was due primarily to lead (HQ = 3.05). Because the lead SSL is based upon blood lead levels, lead is evaluated separately from other noncarcinogenic COPCs. For the residential scenario the lead EPC of 1220 mg/kg at AOC 02-003(e) is greater than the SSL of 400 mg/kg. The HI without lead would be 0.22.

The residential dose at AOC 02-003(e) was 416 mrem/yr, which is greater than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. Cesium-137 was responsible for most of the calculated dose at 410 mrem/yr. The EPC for cesium-137 of 197 pCi/g was greater than its SSL of 12 pCi/g.

AOC 02-004(a)

The construction worker HI at AOC 02-004(a) was approximately 1 and was due primarily to manganese with an HQ of 0.63. The EPC for manganese of 293 mg/kg is less than its construction worker SSL of 464 mg/kg.

AOCs 02-004(b,c,d)

The construction worker HI at AOCs 02-004(b,c,d) was approximately 1 and was due primarily to manganese with an HQ of 0.832. The EPC for manganese of 386 mg/kg is less than its construction worker SSL of 464 mg/kg.

SWMU 02-005

The residential total excess cancer risk at SWMU 02-005 was approximately 1 × 10^{-5}. Aroclor-1260 (6.09 x 10^{-6}), arsenic (2.8 x 10^{-6}), and chromium hexavalent (1.0 x 10^{-6}) make up a majority of this risk. The residential EPCs for Aroclor-1260 (1.48 mg/kg), arsenic (1.98 mg/kg), and chromium hexavalent (0.318 mg/kg) are all less than their respective SSLs of 2.43 mg/kg, 7.07 mg/kg, and 3.05 mg/kg.

SWMU 02-006(b)

The residential total excess cancer risk at SWMU 02-006(b) was approximately 3 × 10^{-5}. Arsenic (2.8 x 10^{-6}), and the PAHs benzo(a)anthracene (1.9 x 10^{-6}), benzo(a)pyrene (3 x 10^{-6}), benzo(b)fluoranthene (2.7 x 10^{-6}), and dibenz(a,h)anthracene (1.3 x 10^{-5}) make up a majority of this risk. The residential EPCs for arsenic (2 mg/kg), benzo(a)anthracene (0.283 mg/kg), benzo(a)pyrene (0.335 mg/kg), and benzo(b)fluoranthene

(0.419 mg/kg) are all less than their respective SSLs of 7.07, 1.53, 1.12, and 1.53 mg/kg. The EPC of 0.194 mg/kg for dibenz(a,h)anthracene is greater than its SSL of 0.15 mg/kg.

The residential HI at SWMU 02-006(b) was approximately 2 (1.55) and was due primarily to lead (HQ = 1.05). Because the lead SSL is based upon blood lead levels, lead is evaluated separately from other noncarcinogenic COPCs. For the residential scenario the lead EPC of 420 mg/kg at SWMU 02-006(b) is above the SSL of 400 mg/kg. The HI would be less than 1 if lead were removed.

The construction worker HI at SWMU 02-006(b) was approximately 1 and was due primarily to manganese with an HQ of 0.619. The EPC for manganese of 287 mg/kg is less than its construction worker SSL of 464 mg/kg.

AOC 02-006(e)

The residential total excess cancer risk at AOC 02-006(e) was approximately 1×10^{-5}. Arsenic (3.7×10^{-6}), chromium (total) (2.5×10^{-6}), Aroclor-1248 (1.7×10^{-6}), and Aroclor-1254 (1×10^{-6}) make up a majority of this risk. The residential EPCs for arsenic (2.64 mg/kg), chromium (total) (24.2 mg/kg), Aroclor-1248 (0.408 mg/kg), and Aroclor-1254 (0.242 mg/kg) are all less than their respective SSLs of 7.07 mg/kg, 96.6 mg/kg, 2.43 mg/kg, and 2.43 mg/kg.

SWMU 02-008(a)

The residential total excess cancer risk at SWMU 02-008(a) was approximately 1×10^{-5}. Arsenic (3.5×10^{-6}), chromium (total) (4.2×10^{-6}), and hexavalent chromium (3.7×10^{-6}) make up a majority of this risk. The residential EPCs for arsenic (2.45 mg/kg), chromium (total) (40.2 mg/kg), and chromium hexavalent (1.12 mg/kg) are all less than their respective SSLs of 7.07 mg/kg, 96.6 mg/kg, and 3.05 mg/kg.

The construction worker HI at SWMU 02-008(a) was approximately 1 and was due primarily to manganese with an HQ of 0.711. The EPC for manganese of 330 mg/kg is less than its construction worker SSL of 464 mg/kg.

SWMU 02-009(c)

The residential dose at SWMU 02-009(c) was 56 mrem/yr, which is greater than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. Cesium-137 was responsible for most of the calculated dose at 54 mrem/yr. The EPC for cesium-137 of 26.1 pCi/g was greater than its SSL of 12 pCi/g.

AOC 02-009(d)

The residential dose at AOC 02-009(d) was approximately 30 mrem/yr, which is greater than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. Cesium-137 and strontium-90 were responsible for most of the calculated dose of 25.3 mrem/yr. The EPC for cesium-137 of 4.86 pCi/g and the EPC for strontium-90 of 7.8 pCi/g were both less than their respective SSLs of 12 pCi/g and 15 pCi/g.

AOC 02-010

The residential HI at AOC 02-010 was approximately 1 (1.4) and was due primarily to cyanide (total) (HQ = 1.3). Cyanide (total) has an EPC of 14.4 mg/kg, which is above its SSL of 11.1 mg/kg.

AOC 02-011(a)(ix)

The residential HI at AOC 02-011(a)(ix) was approximately 1 (1.03) and was due primarily to lead (HQ = 0.85). Because the lead SSL is based upon blood lead levels, lead is evaluated separately from other noncarcinogenic COPCs. For the residential scenario the lead EPC of 341 mg/kg at AOC 02-011(a)(ix) is less than the SSL of 400 mg/kg.

AOC 02-011(a)(x)

The residential total excess cancer risk at AOC 02-011(a)(x) was approximately 1×10^{-5}. Arsenic (6.6×10^{-6}) and chromium (total) (1.5×10^{-6}) make up a majority of this risk. The residential EPCs for arsenic (4.66 mg/kg) and chromium (total) (14.2 mg/kg) are both less than their respective SSLs of 7.07 mg/kg and 96.6 mg/kg.

The construction worker HI at AOC 02-011(a)(x) was approximately 1 and was due primarily to manganese with an HQ of 0.655. The EPC for manganese of 304 mg/kg is less than its construction worker SSL of 464 mg/kg.

AOC 02-011(b)

The construction worker HI at AOC 02-011(b) was approximately 1 and was due primarily to manganese with an HQ of 1.05. The EPC for manganese of 486 mg/kg is greater than its construction worker SSL of 464 mg/kg.

AOC 02-011(d)

The recreational total excess cancer risk at AOC 02-011(d) was approximately 1×10^{-5}. Arsenic (2.0×10^{-6}) and chromium (total) (8.6×10^{-6}) make up a majority of this risk. The recreational EPCs for arsenic (8.7 mg/kg) and chromium (total) (240 mg/kg) are both less than their respective SSLs of 43 mg/kg and 280 mg/kg.

The residential total excess cancer risk at AOC 02-011(d) was approximately 2×10^{-5}. Arsenic (6.6×10^{-6}), chromium (total) (1.3×10^{-5}), and hexavalent chromium (2.5×10^{-6}) make up a majority of this risk. The residential EPCs for arsenic (4.69 mg/kg) and chromium hexavalent (0.775 mg/kg) are both less than their respective SSLs of 7.07 mg/kg and 3.05 mg/kg. Chromium (total) has an EPC of 129 mg/kg, which is greater than its SSL of 96.6 mg/kg.

AOC 02-012

The residential total excess cancer risk at AOC 02-012 was approximately 1×10^{-5}. Arsenic (3.2×10^{-6}) and chromium (total) (3.7×10^{-6}) make up a majority of this risk. The residential EPCs for arsenic (2.25 mg/kg) and chromium (total) (35.5) are both less than their respective SSLs of 7.07 mg/kg and 96.6 mg/kg.

The construction worker HI at AOC 02-012 was approximately 1 and was due primarily to manganese with an HQ of 0.7 and chromium (total) with an HQ of 027. The EPC for manganese of 324 mg/kg is less than its construction worker SSL of 464 mg/kg. The EPC for chromium (total) is 35.5 mg/kg less than its SSL of 134 mg/kg.

H-4.5.3 Toxicity Evaluation

The primary uncertainty associated with the SSLs is related to the derivation of toxicity values used in their calculation. Toxicity values (reference doses [RfDs] and slope factors [SFs]) were used to derive the SSLs used in this risk-screening evaluation (NMED 2017, 602273). 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 overestimation or underestimation of the risk. The uncertainty associated with the toxicity factors for noncarcinogens is measured by the uncertainty factor, the modifying factor, and the confidence level. For carcinogens, the weight of evidence classification indicates the likelihood that a contaminant is a human carcinogen. Toxicity values with high uncertainties may change as new information is evaluated.

Chemical Form of the COPC. COPCs may be bound to the environment matrix and not available for absorption into the human body. However, it is assumed that the COPCs are bioavailable. This assumption can lead to an overestimation of the total risk.

*Use of Surrogate Chemicals***.** The use of surrogates for chemicals that do not have EPA-approved or provisional toxicity values also contributes to uncertainty in the risk assessment. Surrogates were used to provide SSLs for benzo(g,h,i)perylene, 4-isopropyltoluene, and 1,3-xylene+1,4-xylene based on structural similarity. The overall impact of surrogates on the risk assessment is minimal because these COPCs were detected infrequently and at low concentrations.

TPH Screening

AOC 02-004(a). TPH was identified as a COPC. Although this site included a fuel-handling area, the source of the TPH was unknown and the screening level for unknown oil was used. The HQs for both industrial and residential are less than 1. The results of SVOC analyses for samples from this site show the low amounts of petroleum product constituents such as PAHs. Therefore, the unknown oil screening level likely overestimates risk.

SWMU 02-006(b). TPH was identified as a COPC. Because the source of the TPH was unknown, the screening level for unknown oil was used. The HQs for both industrial and residential are less than 1.

The results of SVOC analyses for samples from this site show low amounts of petroleum product constituents such as PAHs. Therefore, the unknown oil screening level likely overestimates risk.

AOC 02-006(c). TPH was identified as a COPC. Because the source of the TPH was unknown, the screening level for unknown oil was used. The HQs for both industrial and residential are less than 1. The results of SVOC analyses for samples from this site show no petroleum product constituents such as PAHs in the 0–1 ft depth and only one detected PAH at a low concentration in the 0–10 ft depth. Therefore, the unknown oil screening level likely overestimates risk.

AOC 02-011(a)(i-vi). TPH was identified as a COPC. Because the source of the TPH was unknown, the screening level for unknown oil was used. The HQs for both industrial and residential are less than 1. The results of SVOC analyses for samples from this site show no petroleum product constituents such as PAHs detected. Therefore, the unknown oil screening level likely overestimates risk.

AOC 02-011(a)(ix). TPH was identified as a COPC. Because the source of the TPH was unknown, the screening level for unknown oil was used. The HQs for both industrial and residential are less than 1. The results of SVOC analyses for samples from this site show low concentrations of petroleum product constituents such as PAHs detected. Therefore, the unknown oil screening level likely overestimates risk.

AOC 02-011(a)(x). TPH was identified as a COPC. Because the source of the TPH was unknown, the screening level for unknown oil was used. The HQs for both industrial and residential are less than 1. The results of SVOC analyses for samples from this site show no petroleum product constituents such as PAHs. Therefore, the unknown oil screening level likely overestimates risk.

AOC 02-012. TPH was identified as a COPC. Because the source of the TPH was unknown, the screening level for unknown oil was used. The HQs for both industrial and residential are less than 1. The results of SVOC analyses for samples from this site show low amounts of petroleum product constituents such as PAHs. Therefore, the unknown oil screening level likely overestimates risk.

H-4.5.4 Additive Approach

For noncarcinogens, the effects of exposure to multiple chemicals are generally unknown, and possible interactions could be synergistic or antagonistic, resulting in either an overestimation or underestimation of the potential risk. Additionally, RfDs used in the risk calculations typically are not based on the same endpoints with respect to severity, effects, or target organs. Therefore, the potential for noncarcinogenic effects may be overestimated for individual COPCs that act by different mechanisms or by different modes of action but are addressed additively.

H-4.6 Interpretation of Human Health Risk Screening Results

H-4.6.1 AOC 02-003(a)

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} (NMED 2017, 602273). The industrial HI is 0.01, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of 4×10^{-5}, based on conversion from dose using RESRAD Version 7.0.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 9 × 10^{-7}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The recreational HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the recreational scenario is equivalent to a total risk of 5 × 10^{-6}, based on conversion from dose using RESRAD Version 7.0.

Residential Scenario

The total excess cancer risk for the residential scenario is 7 × 10^{-6}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The residential HI is 0.6, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 160 mrem/yr, which is greater than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 2 × 10^{-3}, based on conversion from dose using RESRAD Version 7.0.

Construction Worker Scenario

The residential exposure scenario is also protective of construction workers for carcinogenic and radionuclide COPCs. The construction worker HI is approximately 1 (with manganese, see section H-4.5.2, Exposure Evaluation), which is equal to the NMED target HI of 1.

H-4.6.2 AOC 02-003(b)

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} (NMED 2017, 602273). The industrial HI is 0.05, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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. The total dose for the industrial scenario is equivalent to a total risk of 8 × 10^{-8}, based on conversion from dose using RESRAD Version 7.0.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 1 × 10–6, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The recreational HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.01 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the recreational scenario is equivalent to a total risk of 3 × 10^{-8}, based on conversion from dose using RESRAD Version 7.0.

Residential Scenario

The total excess cancer risk for the residential scenario is 6 × 10^{-6}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The residential HI is 0.8, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 8 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 1 × 10^{-4}, based on conversion from dose using RESRAD Version 7.0.

Construction Worker Scenario

The residential exposure scenario is also protective of construction workers for carcinogenic and radionuclide COPCs. The construction worker HI is approximately 1 (with manganese, see section H4.5.2, Exposure Evaluation), which is equal to the NMED target HI of 1.

H-4.6.3 AOC 02-003(c)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 1 × 10–8, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.004, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of 2×10^{-5}, based on conversion from dose using RESRAD Version 7.0.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 1×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.01, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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 total dose for the recreational scenario is equivalent to a total risk of 2×10^{-6}, based on conversion from dose using RESRAD Version 7.0.

Residential Scenario

The total excess cancer risk for the residential scenario is 4×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 3, which is greater than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 4 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 5×10^{-5}, based on conversion from dose using RESRAD Version 7.0.

Construction Worker Scenario

The residential exposure scenario is also protective of construction workers for carcinogenic and radionuclide COPCs. The construction worker HI is approximately 1 (with manganese, see section H-4.5.2, Exposure Evaluation), which is equal to the NMED target HI of 1.

H-4.6.4 AOC 02-003(d)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 1×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.004, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of 2×10^{-5}, based on conversion from dose using RESRAD Version 7.0.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 1 × 10^{-8}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The recreational HI is 0.009, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the recreational scenario is equivalent to a total risk of 2 × 10^{-6}, based on conversion from dose using RESRAD Version 7.0.

Residential Scenario

The total excess cancer risk for the residential scenario is 4 × 10^{-6}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The residential HI is 0.5, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 10 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 7 × 10^{-5}, based on conversion from dose using RESRAD Version 7.0.

Construction Worker Scenario

The residential exposure scenario is also protective of construction workers for carcinogenic and radionuclide COPCs. The construction worker HI is approximately 1 (with manganese, see section H-4.5.2, Exposure Evaluation), which is equal to the NMED target HI of 1.

H-4.6.5 AOC 02-003(e)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 6 × 10^{-7}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The industrial HI is 0.007, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.0000001 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of 9 × 10^{-12}, based on conversion from dose using RESRAD Version 7.0.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 6 × 10^{-7}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The recreational HI is 0.01, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.00000004 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the recreational scenario is equivalent to a total risk of 3 × 10^{-12}, based on conversion from dose using RESRAD Version 7.0.

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} (NMED 2017, 602273). The residential HI is 3, which is greater than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 400 mrem/yr, which is greater than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 7 × 10^{-3}, based on conversion from dose using RESRAD Version 7.0.

The residential exposure scenario is also protective of construction workers.

H-4.6.6 AOC 02-004(a)

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} (NMED 2017, 602273). The industrial HI is 0.03, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 9 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of 7×10^{-5}, based on conversion from dose using RESRAD Version 7.0.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 2×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.06, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the recreational scenario is equivalent to a total risk of 7×10^{-6}, based on conversion from dose using RESRAD Version 7.0.

Residential Scenario

The total excess cancer risk for the residential scenario is 7×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.8, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 8 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 6×10^{-5}, based on conversion from dose using RESRAD Version 7.0.

Construction Worker Scenario

The residential exposure scenario is also protective of construction workers for carcinogenic and radionuclide COPCs. The construction worker HI is approximately 1 (with manganese, see section H-4.5.2, Exposure Evaluation), which is equal to the NMED target HI of 1.

H-4.6.7 AOCs 02-004(b,c,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} (NMED 2017, 602273). The industrial HI is 0.008, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 2.5 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of 2×10^{-5}, based on conversion from dose using RESRAD Version 7.0.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 1×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.02, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the recreational scenario is equivalent to a total risk of 2×10^{-6}, based on conversion from dose using RESRAD Version 7.0.

Residential Scenario

The total excess cancer risk for the residential scenario is 7 × 10^{-6}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The residential HI is 0.5, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 10 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 7 × 10^{-5}, based on conversion from dose using RESRAD Version 7.0.

Construction Worker Scenario

The residential exposure scenario is also protective of construction workers for carcinogenic and radionuclide COPCs. The construction worker HI is approximately 1 (with manganese, see section H-4.5.2, Exposure Evaluation), which is equal to the NMED target HI of 1.

H-4.6.8 AOC 02-004(e)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 9 × 10^{-7}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The industrial HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.008 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of 4 × 10^{-8}, based on conversion from dose using RESRAD Version 7.0.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 1 × 10^{-6}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The recreational HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.008 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the recreational scenario is equivalent to a total risk of 2 × 10^{-8}, based on conversion from dose using RESRAD Version 7.0.

Residential Scenario

The total excess cancer risk for the residential scenario is 4 × 10^{-6}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The residential HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 2 × 10^{-5}, based on conversion from dose using RESRAD Version 7.0.

The residential exposure scenario is also protective of construction workers.

H-4.6.9 AOC 02-004(f)

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} (NMED 2017, 602273). The industrial HI is 0.009, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of 2 × 10^{-6}, based on conversion from dose using RESRAD Version 7.0.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 1×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.02, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.03 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the recreational scenario is equivalent to a total risk of 2×10^{-7}, based on conversion from dose using RESRAD Version 7.0.

Residential Scenario

The total excess cancer risk for the residential scenario is 4×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.1, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 3×10^{-5}, based on conversion from dose using RESRAD Version 7.0.

The residential exposure scenario is also protective of construction workers.

H-4.6.10 AOC 02-004(g)

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} (NMED 2017, 602273). The industrial HI is 0.004, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of 4×10^{-5}, based on conversion from dose using RESRAD Version 7.0.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 9×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.01, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.4 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the recreational scenario is equivalent to a total risk of 4×10^{-6}, based on conversion from dose using RESRAD Version 7.0.

Residential Scenario

The total excess cancer risk for the residential scenario is 3×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.05, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 13 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 1×10^{-4}, based on conversion from dose using RESRAD Version 7.0.

The residential exposure scenario is also protective of construction workers.

H-4.6.11 SWMU 02-005

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} (NMED 2017, 602273). The industrial HI is 0.003, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.01 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of 5×10^{-8}, based on conversion from dose using RESRAD Version 7.0.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 2×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.008, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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 total dose for the recreational scenario is equivalent to a total risk of 2×10^{-8}, based on conversion from dose using RESRAD Version 7.0.

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 2017, 602273). The residential HI is 0.4, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.9 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 9×10^{-6}, based on conversion from dose using RESRAD Version 7.0.

Construction Worker Scenario

The residential exposure scenario is also protective of construction workers for carcinogenic and radionuclide COPCs. The construction worker HI is approximately 1 (with manganese, see section H-4.5.2, Exposure Evaluation), which is equal to the NMED target HI of 1.

H-4.6.12 SWMU 02-006(a)

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} (NMED 2017, 602273). The industrial HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 8 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of 1×10^{-4}, based on conversion from dose using RESRAD Version 7.0.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 1×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.06, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.9 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the recreational scenario is equivalent to a total risk of 1×10^{-5}, based on conversion from dose using RESRAD Version 7.0.

Residential Scenario

The total excess cancer risk for the residential scenario is 4 × 10^{-6}, which is less than the NMED target risk level of 4× 10^{-6} (NMED 2017, 602273). The residential HI is 0.3, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 11 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 2 × 10^{-4}, based on conversion from dose using RESRAD Version 7.0.

The residential exposure scenario is also protective of construction workers.

H-4.6.13 SWMU 02-006(b)

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} (NMED 2017, 602273). The industrial HI is 0.03, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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 total dose for the industrial scenario is equivalent to a total risk of 6 × 10^{-7}, based on conversion from dose using RESRAD Version 7.0.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 2 × 10^{-6}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The recreational HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.06 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the recreational scenario is equivalent to a total risk of 2 × 10^{-7}, based on conversion from dose using RESRAD Version 7.0.

Residential Scenario

The total excess cancer risk for the residential scenario is 3 × 10^{-5}, which is greater than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The residential HI is 2, which is greater than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 1 × 10^{-5}, based on conversion from dose using RESRAD Version 7.0.

Construction Worker Scenario

The residential exposure scenario is also protective of construction workers for carcinogenic and radionuclide COPCs. The construction worker HI is approximately 1 (with manganese, see section H-4.5.2, Exposure Evaluation), which is equal to the NMED target HI of 1.

H-4.6.14 AOC 02-006(c)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 3 × 10^{-7}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The industrial HI is 0.01, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 10 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of 2 × 10^{-4}, based on conversion from dose using RESRAD Version 7.0.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 3 × 10^{-7}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The recreational HI is 0.03, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the recreational scenario is equivalent to a total risk of 2 × 10^{-5}, based on conversion from dose using RESRAD Version 7.0.

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} (NMED 2017, 602273). The residential HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 20 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 2 × 10^{-4}, based on conversion from dose using RESRAD Version 7.0.

The residential exposure scenario is also protective of construction workers.

H-4.6.15 AOC 02-006(e)

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} (NMED 2017, 602273). The industrial HI is 0.1, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of 1 × 10^{-5}, based on conversion from dose using RESRAD Version 7.0.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 2 × 10–6, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The recreational HI is 0.1, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the recreational scenario is equivalent to a total risk of 1 × 10^{-6}, based on conversion from dose using RESRAD Version 7.0.

Residential Scenario

The total excess cancer risk for the residential scenario is 1 × 10^{-5}, which is equivalent to the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The residential HI is 0.8, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 2 × 10^{-5}, based on conversion from dose using RESRAD Version 7.0.

The residential exposure scenario is also protective of construction workers.

H-4.6.16 SWMU 02-007

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} (NMED 2017, 602273). The industrial HI is 0.1, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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. The total dose for the industrial scenario is equivalent to a total risk of 2×10^{-7}, based on conversion from dose using RESRAD Version 7.0.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 3×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.3, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.008 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the recreational scenario is equivalent to a total risk of 4×10^{-8}, based on conversion from dose using RESRAD Version 7.0.

Residential Scenario

The total excess cancer risk for the residential scenario is 6×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.4, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 6 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 7×10^{-5}, based on conversion from dose using RESRAD Version 7.0.

The residential exposure scenario is also protective of construction workers.

H-4.6.17 SWMU 02-008(a)

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} (NMED 2017, 602273). The industrial HI is 0.02, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.04 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of 2×10^{-7}, based on conversion from dose using RESRAD Version 7.0.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 2×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.04 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the recreational scenario is equivalent to a total risk of 7×10^{-8}, based on conversion from dose using RESRAD Version 7.0.

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 2017, 602273). The residential HI is 0.6, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.6 mrem/yr, which is less than the target dose of

0.6 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 6 × 10^{-6}, based on conversion from dose using RESRAD Version 7.0.

Construction Worker Scenario

The residential exposure scenario is also protective of construction workers for carcinogenic and radionuclide COPCs. The construction worker HI is approximately 1 (with manganese, see section H-4.5.2, Exposure Evaluation), which is equal to the NMED target HI of 1.

H-4.6.18 AOC 02-008(c)(i)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 1 × 10^{-8}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The industrial HI is 0.0007, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.01 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of 5 × 10^{-8}, based on conversion from dose using RESRAD Version 7.0.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 2 × 10^{-8}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The recreational HI is 0.002, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.01 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the recreational scenario is equivalent to a total risk of 2 × 10^{-8}, based on conversion from dose using RESRAD Version 7.0.

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} (NMED 2017, 602273). The residential HI is 0.01, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 5 × 10^{-5}, based on conversion from dose using RESRAD Version 7.0.

The residential exposure scenario is also protective of construction workers.

H-4.6.19 AOC 02-008(c)(ii)

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} (NMED 2017, 602273). The industrial HI is 0.02, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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. The total dose for the industrial scenario is equivalent to a total risk of 8 × 10^{-8}, based on conversion from dose using RESRAD Version 7.0.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 2 × 10^{-7}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The recreational HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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. The total dose for the recreational scenario is equivalent to a total risk of 3 × 10^{-8}, based on conversion from dose using RESRAD Version 7.0.

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} (NMED 2017, 602273). The residential HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 3 × 10^{-5}, based on conversion from dose using RESRAD Version 7.0.

The residential exposure scenario is also protective of construction workers.

H-4.6.20 SWMU 02-009(a)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 6 × 10^{-8}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The industrial HI is 0.02, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of 4 × 10^{-5}, based on conversion from dose using RESRAD Version 7.0.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 8 × 10^{-8}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The recreational HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the recreational scenario is equivalent to a total risk of 4 × 10^{-6}, based on conversion from dose using RESRAD Version 7.0.

Residential Scenario

The total excess cancer risk for the residential scenario is 5 × 10^{-7}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The residential HI is 0.3, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 5 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 7 × 10^{-5}, based on conversion from dose using RESRAD Version 7.0.

The residential exposure scenario is also protective of construction workers.

H-4.6.21 SWMU 02-009(b)

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} (NMED 2017, 602273). The industrial HI is 0.006, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 5 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of 8 × 10^{-5}, based on conversion from dose using RESRAD Version 7.0.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 1 × 10^{-7}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The recreational HI is 0.01, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.6 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the recreational scenario is equivalent to a total risk of 9 × 10^{-6}, based on conversion from dose using RESRAD Version 7.0.

Residential Scenario

The total excess cancer risk for the recreational scenario is 5 × 10^{-7}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The recreational HI is 0.09, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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. The total dose for the recreational scenario is equivalent to a total risk of 2 × 10^{-4}, based on conversion from dose using RESRAD Version 7.0.

The residential exposure scenario is also protective of construction workers.

H-4.6.22 SWMU 02-009(c)

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} (NMED 2017, 602273). The industrial HI is 0.02, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of 4 × 10^{-5}, based on conversion from dose using RESRAD Version 7.0.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 3 × 10^{-7}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The recreational HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the recreational scenario is equivalent to a total risk of 5 × 10^{-6}, based on conversion from dose using RESRAD Version 7.0.

Residential Scenario

The total excess cancer risk for the residential scenario is 5 × 10^{-6}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The residential HI is 0.4, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 56 mrem/yr, which is greater than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 9 × 10^{-4}, based on conversion from dose using RESRAD Version 7.0.

Construction Worker Scenario

The residential exposure scenario is also protective of construction workers for carcinogenic and radionuclide COPCs. The construction worker HI is approximately 1 (with manganese, see section H-4.5.2, Exposure Evaluation), which is equal to the NMED target HI of 1.

H-4.6.23 AOC 02-009(d)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 9×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.006, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of 4×10^{-5}, based on conversion from dose using RESRAD Version 7.0.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 1×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.01, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.4 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the recreational scenario is equivalent to a total risk of 5×10^{-6}, based on conversion from dose using RESRAD Version 7.0.

Residential Scenario

The total excess cancer risk for the residential scenario is 8×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.06, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 30 mrem/yr, which is greater than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 3×10^{-4}, based on conversion from dose using RESRAD Version 7.0.

The residential exposure scenario is also protective of construction workers.

H-4.6.24 AOC 02-010

Industrial Scenario

The total excess cancer risk for the industrial scenario is 4×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.3, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 5 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of 7×10^{-5}, based on conversion from dose using RESRAD Version 7.0.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 5×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.5 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the recreational scenario is equivalent to a total risk of 8×10^{-6}, based on conversion from dose using RESRAD Version 7.0.

Residential Scenario

The total excess cancer risk for the residential scenario is 9×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 1, which is equivalent to the NMED target HI of 1 (NMED 2017, 602273). The total dose is 12 mrem/yr, which is less than the target dose of

25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 2 × 10^{-4}, based on conversion from dose using RESRAD Version 7.0.

The residential exposure scenario is also protective of construction workers.

H-4.6.25 AOC 02-011(a)(i-vi)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 4 × 10^{-7}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The industrial HI is 0.02, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of 1 × 10^{-5}, based on conversion from dose using RESRAD Version 7.0.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 4 × 10^{-7}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The recreational HI is 0.05, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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 total dose for the recreational scenario is equivalent to a total risk of 2 × 10^{-6}, based on conversion from dose using RESRAD Version 7.0.

Residential Scenario

The total excess cancer risk for the residential scenario is 3 × 10^{-6}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The residential HI is 0.3, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 7 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 5 × 10^{-5}, based on conversion from dose using RESRAD Version 7.0.

The residential exposure scenario is also protective of construction workers.

H-4.6.26 AOC 02-011(a)(viii)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 3 × 10^{-7}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The industrial HI is 0.06, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of 1 × 10^{-5}, based on conversion from dose using RESRAD Version 7.0.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 5 × 10^{-7}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The recreational HI is 0.06, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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 total dose for the recreational scenario is equivalent to a total risk of 1 × 10^{-6}, based on conversion from dose using RESRAD Version 7.0.

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} (NMED 2017, 602273). The residential HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 8 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 6×10^{-5}, based on conversion from dose using RESRAD Version 7.0.

The residential exposure scenario is also protective of construction workers.

H-4.6.27 AOC 02-011(a)(ix)

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} (NMED 2017, 602273). The industrial HI is 0.03, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.03 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of 2×10^{-7}, based on conversion from dose using RESRAD Version 7.0.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 8×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.05, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.03 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the recreational scenario is equivalent to a total risk of 6×10^{-8}, based on conversion from dose using RESRAD Version 7.0.

Residential Scenario

The total excess cancer risk for the residential scenario is 6×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 1, which is equivalent to the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.8 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 1×10^{-5}, based on conversion from dose using RESRAD Version 7.0.

The residential exposure scenario is also protective of construction workers.

H-4.6.28 AOC 02-011(a)(x)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 6×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.03 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of 2×10^{-7}, based on conversion from dose using RESRAD Version 7.0.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 6×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.4, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.03 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the recreational scenario is equivalent to a total risk of 6×10^{-8}, based on conversion from dose using RESRAD Version 7.0.

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 2017, 602273). The residential HI is 0.8, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.7 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 1×10^{-5}, based on conversion from dose using RESRAD Version 7.0.

Construction Worker Scenario

The residential exposure scenario is also protective of construction workers for carcinogenic and radionuclide COPCs. The construction worker HI is approximately 1 (with manganese, see section H-4.5.2, Exposure Evaluation), which is equal to the NMED target HI of 1.

H-4.6.29 AOC 02-011(b)

Industrial Scenario

The total excess cancer risk for the industrial scenario is 4×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The industrial HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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. The total dose for the industrial scenario is equivalent to a total risk of 2×10^{-4}, based on conversion from dose using RESRAD Version 7.0.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 5×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.05, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 2 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the recreational scenario is equivalent to a total risk of 2×10^{-5}, based on conversion from dose using RESRAD Version 7.0.

Residential Scenario

The total excess cancer risk for the residential scenario is 4×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.3, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 20 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 3×10^{-4}, based on conversion from dose using RESRAD Version 7.0.

Construction Worker Scenario

The residential exposure scenario is also protective of construction workers for carcinogenic and radionuclide COPCs. The construction worker HI is approximately 1 (with manganese, see section H-4.5.2, Exposure Evaluation), which is equal to the NMED target HI of 1.

H-4.6.30 AOC 02-011(c)

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} (NMED 2017, 602273). The industrial HI is 0.003, which is less than the NMED target HI of 1 (NMED 2017, 602273). No radionuclide COPCs were identified in the 0.0–1.0 ft depth interval.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 2×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.009, which is less than the NMED target HI of 1 (NMED 2017, 602273). No radionuclide COPCs were identified in the 0.0–1.0 ft depth interval.

Residential Scenario

The total excess cancer risk for the residential scenario is 7×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The residential HI is 0.08, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.4 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 3×10^{-6}, based on conversion from dose using RESRAD Version 7.0.

The residential exposure scenario is also protective of construction workers.

H-4.6.31 AOC 02-011(d)

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} (NMED 2017, 602273). The industrial HI is 0.1, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 7 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of 5×10^{-5}, based on conversion from dose using RESRAD Version 7.0.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 1×10^{-5}, which is equivalent to the NMED target risk level of 1×10^{-5} (NMED 2017, 602273). The recreational HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.8 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the recreational scenario is equivalent to a total risk of 6×10^{-6}, based on conversion from dose using RESRAD Version 7.0.

Residential Scenario

The total excess cancer risk for the residential scenario is 2 × 10^{-5}, which is greater than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The residential HI is 0.6, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 12 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 1 × 10^{-4}, based on conversion from dose using RESRAD Version 7.0.

The residential exposure scenario is also protective of construction workers.

H-4.6.32 AOC 02-012

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} (NMED 2017, 602273). The industrial HI is 0.009, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.0000001 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of 9 × 10^{-12}, based on conversion from dose using RESRAD Version 7.0.

Recreational Scenario

The total excess cancer risk for the recreational scenario is 2 × 10^{-6}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The recreational HI is 0.02, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.00000004 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the recreational scenario is equivalent to a total risk of 3 × 10^{-12}, based on conversion from dose using RESRAD Version 7.0.

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 2017, 602273). The residential HI is 0.5, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 2 × 10^{-7}, based on conversion from dose using RESRAD Version 7.0.

Construction Worker Scenario

The residential exposure scenario is also protective of construction workers for carcinogenic and radionuclide COPCs. The construction worker HI is approximately 1 (with manganese, see section H-4.5.2, Exposure Evaluation), which is equal to the NMED target HI of 1.

H-4.6.34 SWMU 21-006(e) and AOC 21-006(f)

Industrial Scenario

Samples were not collected from the 0.0–1.0 ft depth interval, and the industrial scenario was not evaluated for SWMU 21-006(e) and AOC 21-006(f).

Construction Worker Scenario

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 2017, 602273). The construction worker HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 6 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the construction worker scenario is equivalent to a total risk of 2 × 10^{-6}, based on conversion from dose using RESRAD Version 7.0.

Residential Scenario

The total excess cancer risk for the residential scenario is 4 × 10^{-6}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The residential HI is 0.4, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 20 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 5 × 10^{-5}, based on conversion from dose using RESRAD Version 7.0.

H-4.6.35 AOC 21-028(c)

Industrial Scenario

Samples were not collected from the 0.0–1.0 ft depth interval, and the industrial scenario was not evaluated for AOC 21-028(c).

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} (NMED 2017, 602273). The construction worker HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 1.5 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the construction worker scenario is equivalent to a total risk of 4 × 10^{-7}, based on conversion from dose using RESRAD Version 7.0.

Residential Scenario

The total excess cancer risk for the residential scenario is 4 × 10^{-6}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The residential HI is 0.3, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 4 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 1 × 10^{-5}, based on conversion from dose using RESRAD Version 7.0.

H-4.6.36 SWMU 26-001

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} (NMED 2017, 602273). The industrial HI is 0.06, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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 total dose for the industrial scenario is equivalent to a total risk of 3 × 10^{-6}, based on conversion from dose using RESRAD Version 7.0

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} (NMED 2017, 602273). The construction worker HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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 total dose for the construction worker scenario is equivalent to a total risk of 8 × 10^{-8}, based on conversion from dose using RESRAD Version 7.0.

Residential Scenario

The total excess cancer risk for the residential scenario is 4 × 10^{-6}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The residential HI is 0.7, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.9 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 5 × 10^{-6}, based on conversion from dose using RESRAD Version 7.0.

H-4.6.37 SWMU 26-002(a)

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} (NMED 2017, 602273). The industrial HI is 0.04, which is less than the NMED target HI of 1 (NMED 2017, 602273). 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 total dose for the industrial scenario is equivalent to a total risk of 3 × 10^{-7}, based on conversion from dose using RESRAD Version 7.0.

Construction Worker Scenario

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 2017, 602273). The construction worker HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the construction worker scenario is equivalent to a total risk of 2 × 10^{-7}, based on conversion from dose using RESRAD Version 7.0.

Residential Scenario

The total excess cancer risk for the residential scenario is 6 × 10^{-6}, which is less than the NMED target risk level of 1 × 10^{-5} (NMED 2017, 602273). The residential HI is 0.5, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 2 × 10^{-5}, based on conversion from dose using RESRAD Version 7.0.

H-4.6.38 SWMU 26-002(b)

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} (NMED 2017, 602273). The industrial HI is 0.02, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.03 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of 6 × 10^{-7}, based on conversion from dose using RESRAD Version 7.0.

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} (NMED 2017, 602273). The construction worker HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the construction worker scenario is equivalent to a total risk of 1×10^{-7}, based on conversion from dose using RESRAD Version 7.0.

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} (NMED 2017, 602273). The residential HI is 0.4, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.4 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 9×10^{-6}, based on conversion from dose using RESRAD Version 7.0.

H-4.6.39 SWMU 26-003

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} (NMED 2017, 602273). The industrial HI is 0.03, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.3 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the industrial scenario is equivalent to a total risk of 5×10^{-6}, based on conversion from dose using RESRAD Version 7.0.

Construction Worker Scenario

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 2017, 602273). The construction worker HI is 0.2, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 0.4 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the construction worker scenario is equivalent to a total risk of 3×10^{-7}, based on conversion from dose using RESRAD Version 7.0.

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} (NMED 2017, 602273). The residential HI is 0.4, which is less than the NMED target HI of 1 (NMED 2017, 602273). The total dose is 1 mrem/yr, which is less than the target dose of 25 mrem/yr as authorized by DOE Order 458.1. The total dose for the residential scenario is equivalent to a total risk of 2×10^{-5}, based on conversion from dose using RESRAD Version 7.0.

H-5.0 ECOLOGICAL RISK-SCREENING EVALUATIONS

The approach for conducting ecological evaluations is described in the "Screening Level Ecological Risk Evaluation Methods, Revision 5" (LANL 2017, 602649). The evaluation consists of four parts: a scoping evaluation, a screening evaluation, an uncertainty analysis, and an interpretation of the results.

H-5.1 Scoping Evaluation

The scoping evaluation establishes the breadth and focus of the screening evaluation. The ecological scoping checklist (Attachment H-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 sites in the Middle Los Alamos Canyon Aggregate Area (Attachment H-3). Although the quality of the habitat varies, most of the land within the aggregate area has 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 to 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 700 ft bgs) and the semiarid climate limit transport to groundwater. The potential exposure pathways for terrestrial receptors in soil and tuff are root uptake, inhalation, soil ingestion, dermal contact, and food web transport. The weathering of tuff is the only viable natural process that may result in the exposure of receptors to contaminants in tuff. Because of the slow rate of weathering expected for tuff, exposure in tuff is negligible, although it is included in the assessment. Plant exposure in tuff is largely limited to fractures near the surface, which does not produce sufficient biomass to support an herbivore population. Consequently, the contaminants in tuff are unavailable to receptors.

The potential risk was evaluated in the risk-screening assessments for the following ecological receptors representing several trophic levels:

- plants
- soil dwelling invertebrates (represented by the earthworm)
- the deer mouse (mammalian omnivore)
- the montane shrew (mammalian insectivore)
- cottontail (mammalian herbivore)
- 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 5” (LANL 2017, 602649). The Mexican spotted owl is the only T&E species known to frequent the area and may use the Middle Los Alamos Canyon Area for foraging.

H-5.2 Assessment Endpoints

An assessment endpoint is an explicit expression of the environmental value to be protected. The endpoints are ecologically relevant and help sustain the natural structure, function, and biodiversity of an ecosystem or its components (EPA 1998, 062809). In a screening-level ecological evaluation, receptors represent the populations and/or communities, and assessment endpoints are any adverse effects on the chosen ecological receptors. The purpose of the ecological evaluation is to protect populations and communities of biota rather than individual organisms, except for listed or candidate T&E species and treaty-protected species, when individuals must be protected (EPA 1999, 070086). Populations of protected species tend to be small, and the loss of an individual adversely affects the species as a whole (EPA 1997, 059370).

In accordance with this guidance, the Laboratory developed generic assessment endpoints (LANL 1999, 064137) to ensure that values at all levels of ecological organization are considered in the ecological screening process. These general assessment endpoints can be measured using impacts on reproduction, growth, and survival to represent categories of effects that may adversely impact populations. In addition, specific receptor species were chosen to represent each functional group. The receptor species were chosen because of their presence at the site, their sensitivity to the COPCs, and their potential for exposure to those COPCs. These categories of effects and the chosen receptor species were used to select the types of effects seen in toxicity studies considered in the development of the toxicity reference values. Toxicity studies used in the development of toxicity reference values included only studies in which the adverse effect evaluated affected reproduction, survival, and/or growth.

The selection of receptors and assessment endpoints is designed to be protective of both the representative species used as screening receptors and the other species within their feeding guilds and the overall food web for the terrestrial and aquatic ecosystems. Focusing the assessment endpoints on the general characteristics of species that affect populations (rather than the biochemical and behavioral changes that may affect only the studied species) also ensures the applicability to the ecosystem of concern.

H-5.3 Ecological Risk Screening Evaluation

The ecological screening evaluation identifies chemicals of potential ecological concern (COPECs) and is based on the comparison of EPCs (95% UCLs, maximum detected concentrations, or maximum detection limits) to ecological screening levels (ESLs). The EPCs used in the assessments for the Middle Los Alamos Canyon Aggregate Area are presented in Tables H-2.3-1 through H-2.3-82.

The ESLs were obtained from the ECORISK Database, Release 4.1 (LANL 2017, 602538) and are presented in Table H-5.3-1. The ESLs are based on similar species and are derived from experimentally determined NOAELs, lowest observed adverse effect levels (LOAELs), or doses determined lethal to 50% of the test population. Information relevant to the calculation of ESLs, including concentration equations, dose equations, bioconcentration factors, transfer factors, and toxicity reference values, are presented in the ECORISK Database, Release 4.1 (LANL 2017, 602538).

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 2017, 602649). Individual HQs for a receptor are summed to derive an HI; COPCs without ESLs are retained as COPECs and evaluated further in the uncertainty section. An HI greater than 1 indicates further assessment may be needed to ensure exposure to multiple COPECs at a site will not lead to potential adverse impacts to a given receptor population. The HQ and HI analysis is a conservative indication of potential adverse effects and is designed to minimize the potential of overlooking possible COPECs at the site.

H-5.3.1 AOC 02-003(d)

The results of the minimum ESL comparisons are presented in Table H-5.3-2. Arsenic, barium, beryllium, cadmium, manganese, mercury, nickel, selenium, vanadium, and zinc are retained as COPECs because the HQs were greater than 0.3.

Potential ecological risks associated with aluminum are based on soil pH. Aluminum is retained only in soil with a pH lower than 5.5, in accordance with EPA guidance (EPA 2003, 085645). Aluminum was eliminated as a COPEC and was not evaluated further because the soil pH for the Upper Los Alamos Canyon Aggregate Area is neutral to slightly alkaline.

Calcium, iron, magnesium and nitrate do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

The HQs and HIs for each COPEC and receptor combination are presented in Table H-5.3-3. The HI analysis indicates that kestrel (intermediate carnivore), robin (all feeding guilds), shrew, deer mouse, cottontail, earthworm, and plant have HIs greater than 1. The HIs for the fox and kestrel (top carnivore) were less than 1. The COPECs and receptors are discussed in the uncertainty section.

H-5.3.2 SWMU 02-006(a)

The results of the minimum ESL comparisons are presented in Table H-5.3-4. Arsenic, barium, chromium (total), copper, cyanide (total), lead, nickel, and selenium are retained as COPECs because the HQs were greater than 0.3.

The HQs and HIs for each COPEC and receptor combination are presented in Table H-5.3-5. The HI analysis indicates that kestrel (intermediate carnivore), robin (all feeding guilds), shrew, deer mouse, cottontail, earthworm, and plant have HIs greater than 1. The HIs for the fox and kestrel (top carnivore) were less than 1. The COPECs and receptors are discussed in the uncertainty section.

H-5.3.3 SWMU 21-006(e) and AOC 21-006(f)

The results of the minimum ESL comparisons are presented in Table H-5.3-6. Antimony, arsenic, barium, copper, cyanide (total), lead, mercury, nickel, selenium, zinc, and bis(2-ethylhexyl)phthalate are retained as COPECs because the HQs were greater than 0.3.

Bromobenzene, sec-butylbenzene, calcium, ethylbenzene, 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 H-5.3-7. The HI analysis indicates that the kestrel (intermediate carnivore), robin (all feeding guilds), shrew, deer mouse, earthworm, and plant have HIs greater than 1. The HI for the kestrel (top carnivore) and cottontail were equivalent to 1 and the HI for the fox was less than 1. The COPECs and receptors are discussed in the uncertainty section.

H-5.3.4 AOC 21-028(c)

The results of the minimum ESL comparisons are presented in Table H-5.3-8. Antimony, barium, chromium (total), copper, cyanide (total), lead, mercury, nickel, selenium, vanadium, zinc, Aroclor-1254, bis(2-ethylhexyl)phthalate, and benzoic acid are retained as COPECs because the HQs were greater than 0.3.

Calcium, ethylbenzene, 4-isopropyltoluene, and 1,2,4-trimethylbenzene do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

The HQs and HIs for each COPEC and receptor combination are presented in Table H-5.3-9. The HI analysis indicates that the kestrel (top carnivore and intermediate carnivore), robin (all feeding guilds), shrew, deer mouse, earthworm, and plant have HIs greater than 1. The HI for the cottontail was equivalent to 1 and the HI for the fox was less than 1. The COPECs and receptors are discussed in the uncertainty section.

H-5.3.5 SWMU 26-001

The results of the minimum ESL comparisons are presented in Table H-5.3-10. Antimony, arsenic, cyanide (total), selenium, and Aroclor-1248 are retained as COPECs because the HQs were greater than 0.3.

Calcium, nitrate, and 4-isopropyltoluene do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

The HQs and HIs for each COPEC and receptor combination are presented in Table H-5.3-11. The HI analysis indicates that kestrel (intermediate carnivore), robin (all feeding guilds), cottontail, shrew, deer mouse, earthworm, and plant have HIs greater than 1. The HIs for the fox and kestrel (top carnivore) were less than 1. The COPECs and receptors are discussed in the uncertainty section.

H-5.3.6 SWMU 26-002(a)

The results of the minimum ESL comparisons are presented in Table H-5.3-12. Arsenic, barium, chromium (total), copper, nickel, selenium, and thallium are retained as COPECs because the HQs were greater than 0.3.

Calcium does not have ESLs, is retained as a COPEC, and is discussed in the uncertainty section.

The HQs and HIs for each COPEC and receptor combination are presented in Table H-5.3-13. The HI analysis indicates that kestrel (intermediate carnivore), robin (all feeding guilds), cottontail, shrew, deer mouse, earthworm, and plant have HIs greater than 1. The HIs for the fox and kestrel (top carnivore), were less than 1. The COPECs and receptors are discussed in the uncertainty section.

H-5.3.7 SWMU 26-002(b)

The results of the minimum ESL comparisons are presented in Table H-5.3-14. Arsenic, chromium (total), nickel, and selenium are retained as COPECs because the HQs were greater than 0.3.

Calcium does not have ESLs, is retained as a COPEC, and is discussed in the uncertainty section.

The HQs and HIs for each COPEC and receptor combination are presented in Table H-5.3-15. The HI analysis indicates that kestrel (intermediate carnivore), robin (all feeding guilds), cottontail, shrew, deer mouse, earthworm, and plant have HIs greater than 1. The HIs for the fox and kestrel (top carnivore) were less than 1. The COPECs and receptors are discussed in the uncertainty section.

H-5.3.8 SWMU 26-003

The results of the minimum ESL comparisons are presented in Table H-5.3-16. Arsenic, barium, and selenium are retained as COPECs because the HQs were greater than 0.3.

Calcium does not have ESLs, is retained as a COPEC, and is discussed in the uncertainty section.

The HQs and HIs for each COPEC and receptor combination are presented in Table H-5.3-17. The HI analysis indicates that kestrel (intermediate carnivore), robin (all feeding guilds), cottontail, shrew, deer mouse, earthworm, and plant have HIs greater than 1. The HIs for the fox and kestrel (top carnivore), were less than 1. The COPECs and receptors are discussed in the uncertainty section.

H-5.4 Uncertainty Analysis

The uncertainty analysis describes the key sources of uncertainty related to the screening evaluations. This analysis can result in either adding or removing chemicals from the list of COPECs for sites. The following narrative contains a qualitative uncertainty analysis of the issues relevant to evaluating the potential ecological risk at the Middle Los Alamos Canyon Aggregate Area.

H-5.4.1 Chemical Form

The assumptions used in the ESL derivations were conservative and not necessarily representative of actual conditions. These assumptions include maximum chemical bioavailability, maximum receptor ingestion rates, minimum bodyweight, and additive effects of multiple COPECs. Most of these factors tend to result in conservative estimates of the ESLs, which may lead to an overestimation of the potential risk. The assumption of additive effects for multiple COPECs may result in an overestimation 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 2017, 602649) and the values were biased toward overestimating the potential risk to receptors.

H-5.4.2 Exposure Assumptions

The EPCs used in the calculations of HQs were the 95% UCL, the maximum detected concentration, or the maximum detection limit to a depth of 5.0 ft, thereby conservatively estimating the exposure to each COPC. As a result, the exposure of individuals within a population was evaluated using this specific concentration, which was assumed constant throughout the exposure area. The sampling also focused on areas of known contamination, and receptors were assumed to ingest 100% of their food and spend 100% of their time at the site. The assumptions made regarding exposure for terrestrial receptors results in an overestimation of the potential exposure and risk because COPECs varied across the site and were infrequently detected.

H-5.4.3 Toxicity Values

The HQs were calculated using ESLs, which are based on NOAELs as threshold effect levels; actual risk for a given COPEC/receptor combination occurs at a higher level, somewhere between the NOAEL-based threshold and the LOAEL-based threshold. 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 underestimation or overestimation of potential risk.

H-5.4.4 Area Use Factors

In addition to the direct comparison of the EPC with the ESLs, area use factors (AUF) are used to account for the amount of time a receptor is likely to spend within the contaminated areas based on the size of the receptor's home range (HR). The AUF for individual organisms is calculated by dividing the size of the site by the HR for that receptor. Because T&E species must be assessed on an individual basis (EPA 1999, 070086), the AUF is used for the Mexican spotted owl. The HR for the Mexican spotted owl is 366 ha (EPA (1993, 059384). The site areas and AUFs for each site are presented in Table H-5.4-1. The kestrel (top carnivore) is used as the surrogate receptor for the Mexican spotted owl.

One site had the HI for the kestrel (top carnivore) equivalent to 1 [AOC 21-028(d)]. Application of the AUF for the Mexican spotted owl to the HI for the kestrel (top carnivore) resulted in an adjusted HI of 0.00002. Therefore, there are no potential adverse impacts to the Mexican spotted owl at any of the sites.

H-5.4.5 Population Area Use Factors

EPA guidance is to manage the ecological risk to populations rather than to individuals, with the exception of T&E species (EPA 1999, 070086). One approach to address the potential effects on populations at these sites in the Middle Los Alamos 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 40 HR.

The HRs for the kestrel, robin, deer mouse, shrew, cottontail, and fox were determined using the data in EPA's wildlife exposure factors handbook (EPA 1993, 059384). The HRs were either for specific environments or averages of different environments presented in the respective exposure parameter/population dynamic tables (EPA 1993, 059384). LANL (2017, 602649, Table 3.3-1) presents how the EPA data were used to derive the HRs for each receptor. The HRs were used to calculate the population areas for each receptor as described in the previous paragraph.

H-5.4.5.1 AOC 02-003(d)

The area of AOC 02-003(d) is approximately 0.125 ha. The population area use factors (PAUFs) are estimated by dividing the site area by the population area of each receptor population (Table H-5.4-2). The HQs and HIs are recalculated using the PAUFs. The HIs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The adjusted HIs for AOC 02-003(d) are less than 1 for all receptors (Table H-5.4-3). The plant had an unadjusted HI of 11 and the earthworm had an unadjusted HI of 3 (Table H-5.4-3).

H-5.4.5.2 SWMU 02-006(a)

The area of SWMU 02-006(a) is approximately 0.226 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table H-5.4-4). The HQs and HIs are recalculated using the PAUFs. The HIs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The adjusted HIs for SWMU 02-006(a) are less than 1 for all receptors (Table H-5.4-5). The plant had an unadjusted HI of 14 and the earthworm had an unadjusted HI of 2 (Table H-5.4-5).

H-5.4.5.3 SWMU 21-006(e) and AOC 21-006(f)

The area of SWMU 21-006(e) and AOC 21-006(f) is approximately 0.06 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table H-5.4-6). The HQs and HIs are recalculated using the PAUFs. The HIs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The adjusted HIs for SWMU 21-006(e) and AOC 21-006(f) are less than 1 for all receptors (Table H-5.4-7). The plant had an unadjusted HI of 6 and the earthworm had an unadjusted HI of 4 (Table H-5.4-7).

H-5.4.5.4 AOC 21-028(c)

The area of AOC 21-028(c) is approximately 0.0501 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table H-5.4-8). The HQs and HIs are recalculated using the PAUFs. The HIs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The adjusted HIs for AOC 21-028(c) are less than 1 for all receptors (Table H-5.4-9). The plant had an unadjusted HI of 4 and the earthworm had an unadjusted HI of 7 (Table H-5.4-9).

H-5.4.5.5 SWMU 26-001

The area of SWMU 26-001 is approximately 0.0939 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table H-5.4-10). The HQs and HIs are recalculated using the PAUFs. The HIs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The adjusted HIs for SWMU 26-001 are less than 1 for all receptors (Table H-5.4-11). The plant had an unadjusted HI of 13 and the earthworm had an unadjusted HI of 2 (Table H-5.4-11).

H-5.4.5.6 SWMU 26-002(a)

The area of SWMU 26-002(a) is approximately 0.047 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table H-5.4-12). The HQs and HIs are recalculated using the PAUFs. The HIs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The adjusted HIs for SWMU 26-002(a) are less than 1 for all receptors (Table H-5.4-13). The plant had an unadjusted HI of 23 and the earthworm had an unadjusted HI of 3 (Table H-5.4-13).

H-5.4.5.7 SWMU 26-002(b)

The area of SWMU 26-002(b) is approximately 0.0112 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table H-5.4-14). The HQs and HIs are recalculated using the PAUFs. The HIs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The adjusted HIs for SWMU 26-002(b) are less than 1 for all receptors (Table H-5.4-15). The plant had an unadjusted HI of 33 and the earthworm had an unadjusted HI of 5 (Table H-5.4-15).

H-5.4.5.8 SWMU 26-003

The area of SWMU 26-003 is approximately 0.0196 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table H-5.4-16). The HQs and HIs are recalculated using the PAUFs. The HIs for the plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The adjusted HIs for SWMU 26-003 are less than 1 for all receptors (Table H-5.4-17). The plant had an unadjusted HI of 18 and the earthworm had an unadjusted HI of 3 (Table H-5.4-17).

H-5.4.6 LOAEL Analysis

All of the 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 4.1 (LANL 2017, 602538) and are presented in Table H-5.4-18. 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 for COPECs having unadjusted or PAUF-adjusted HQs greater than 0.1 and a receptor HI greater than 1.

H-5.4.7 Site Discussions

H-5.4.7.1 AOC 02-003(d)

The plant HI for AOC 02-003(d) is greater than 1, with arsenic, barium, beryllium, manganese, selenium, vanadium, and zinc being the primary COPECs. The HI analysis using LOAEL-based ESLs resulted in an HI of 2 for the plant (Table H-5.4-19). The only COPEC with a HQ greater than 1 was selenium for the plant.

Seedling germination bioassays were completed at TA-02 and TA-26 and showed that selenium does not cause phytotoxicity (section H-6.2.1).

H-5.4.7.2 SWMU 02-006(a)

The plant HI for SWMU 02-006(a) is greater than 1, with arsenic, barium, lead, nickel, and selenium being the primary COPECs. The HI analysis using LOAEL-based ESLs resulted in an HI of 3 for the plant (Table H-5.4-20). The only COPEC with a HQ greater than 1 was selenium for the plant (2).

Seedling germination bioassays were completed at TA-02 and TA-26 and showed that selenium does not cause phytotoxicity (section H-6.2.1).

H-5.4.7.3 SWMU 21-006(e) and AOC 21-006(f)

The plant HI for SWMU 21-006(e) and AOC 21-006(f) is equivalent to 1, with arsenic, barium, copper, lead, nickel, selenium, and zinc being the primary COPECs. The HI analysis using LOAEL-based ESLs resulted in an HI of 1 for the plant (Table H-5.4-21). There are no HQs above 1 for the plant, but barium has the largest HQ (0.7).

Barium was detected in all 15 samples in the 0.0 to 5.0 ft depth interval in soil and upper tuff (unit Qbt 3) with an EPC of 193 mg/kg. Nine of thirteen concentrations of barium in tuff (46.1, 62.8, 64.3, 72.0, 77.1, 100, 103, 164, 528 mg/kg) were above the BV (46 mg/kg). All soil concentrations were below the BV (295 mg/kg). The EPC, which represents the average exposure concentration, is within the range of soil background concentrations (410 mg/kg, maximum concentration) but greater than the maximum upper tuff background concentration (51.6 mg/kg).

The plant LOAEL-based ESL for barium is 260 mg/kg is similar to background concentrations (soil BV = 295 mg/kg) and all the soil and sediment concentrations were below background, except one (528 mg/kg). The EPC is also above background and is influenced largely by the one high value. Furthermore, the site is very small, 0.06 ha, and the impact on the local population of plants is likely to be minimal.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the ecological community (Attachment H-2). The site currently has no active operations and is becoming naturalized, with abundant habitat for ecological receptors. Therefore, the HI may not indicate potential risk to ecological receptors.

H-5.4.7.4 AOC 21-028(c)

The plant HI for AOC 21-028(c) is equivalent to 1, with antimony, barium, lead, nickel, selenium, vanadium, and zinc, being the primary COPECs. The HI analysis using LOAEL-based ESLs resulted in HI of 1 for the plant (Table H-5.4-22). There are no HQs above 1 for the plant, but barium and vanadium have the largest HQs, both with HQs of 0.5.

Barium was detected in all 14 samples in the 0.0 to 5.0 ft depth interval in soil and upper tuff (unit Qbt 3) with an EPC of 137 mg/kg. All five concentrations of barium in tuff (88.4, 110, 111, 136, 142 mg/kg) were above the BV (46 mg/kg). All nine concentrations of barium in soil were below the soil BV (295 mg/kg). The EPC, which represents the average exposure concentration, is within the range of soil background concentrations (410 mg/kg, maximum concentration) but greater than the maximum upper tuff background concentration (51.6 mg/kg).

The plant LOAEL-based ESL for barium is 260 mg/kg is similar to background concentrations (soil BV = 295 mg/kg) and all the soil and sediment concentrations were below background, except one (528 mg/kg). This EPC is also above background and is influenced largely by the one high value indicating that the majority of the below back ground range exposure to the highest concentration will likely not result in overall effects on the plant population.

Vanadium was detected in all 14 samples in the 0.0−5.0-ft depth interval with an EPC of 12.9 mg/kg. Four of six concentrations of barium in tuff (21.4, 25.1, 25.6, 52.4 mg/kg) were above the BV (17 mg/kg). Four of eleven concentrations of barium in soil (41.4, 41.7, 60.6, 86.3 mg/kg) were above the soil BV (39.6 mg/kg). The EPC, which represents the average exposure concentration, is larger than the maximum of soil background concentrations (56.5 mg/kg) and the maximum of upper Qbt background concentrations (21 mg/kg).

The plant LOAEL-based ESL for vanadium is 80 mg/kg and all the soil and sediment concentrations were below background (39.6 mg/kg) and will likely not result in overall effects on the plant population

Furthermore, the site is very small, 0.0501 ha, and the impact on the local population of plants is likely to be minimal.

In addition, field observations made during the site visit found no indication of adverse effects from COPECs on the ecological community (Attachment H-2). The site currently has no active operations and is becoming naturalized, with abundant habitat for ecological receptors. Therefore, the HI may not indicate potential risk to ecological receptors.

H-5.4.7.5 SWMU 26-001

The plant HI for SWMU 26-001 is greater than 1, with antimony, arsenic, and zinc being the primary COPECs. The HI analysis using LOAEL-based ESLs resulted in an HI of 2 for the plant (Table H-5.4-23). The only COPEC with a HQ greater than 1 was selenium for the plant (2).

Seedling germination bioassays were completed at TA-02 and TA-26 and showed that selenium does not cause phytotoxicity (section H-6.2.1).

H-5.4.7.6 SWMU 26-002(a)

The plant HI for SWMU 26-002(a) is greater than 1, with arsenic, barium, nickel, selenium, and thallium being the primary COPECs. The HI analysis using LOAEL-based ESLs resulted in an HI of 4 for the plant (Table H-5.4-24). The only COPEC with a HQ greater than 1 was selenium for the plant (3).

Seedling germination bioassays were completed at TA-02 and TA-26 and showed that selenium does not cause phytotoxicity (section H-6.2.1).

H-5.4.7.7 SWMU 26-002(b)

The plant HI for SWMU 26-002(b) is greater than 1, with arsenic, nickel, and selenium being the primary COPECs. The HI analysis using LOAEL-based ESLs resulted in an HI of 6 for the plant (Table H-5.4-25). The only COPEC with a HQ greater than 1 was selenium for the plant (6).

Seedling germination bioassays were completed at TA-02 and TA-26 and showed that selenium does not cause phytotoxicity (section H-6.2.1).

H-5.4.7.8 SWMU 26-003

The plant HI for SWMU 26-003 is greater than 1, with arsenic, barium, and selenium being the primary COPECs. The HI analysis using LOAEL-based ESLs resulted in an HI of 3 for the plant (Table H-5.4-26). The only COPEC with a HQ greater than 1 was selenium for the plant (3).

Seedling germination bioassays were completed at TA-02 and TA-26 and showed that selenium does not cause phytotoxicity (section H-6.2.1).

H-5.4.8 Chemicals without ESLs

Several COPECs do not have ESLs for any receptor in Release 4.1 of the ECORISK Database (LANL 2016, 602538). In an effort to address this uncertainty and to provide a quantitative assessment of potential ecological risk, several online toxicity database 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.

In the absence of a chemical-specific ESL, COPEC concentrations can be compared to ESLs for a surrogate chemical. Comparison to surrogate ESLs provides an estimate of potential effects of a chemically related compound and a line of evidence to indicate the likelihood that ecological receptors are potentially impacted.

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 often infrequently detected across the site. In these cases, comparisons to residential human health SSLs are presented as part of a qualitative assessment. The comparison of COPEC concentrations to residential human health SSLs is a viable alternative for several reasons. Animal studies are used to infer effects on humans and is the basic premise of modern toxicology (EPA 1989, 008021). In addition, toxicity values derived for the calculation of human health SSLs are often based on potential effects that are more sensitive than the ones used to derive ESLs (e.g., cellular effects for humans versus survival or reproductive effects for terrestrial animals). The EPA also applies uncertainty factors or modifying factors to ensure that the toxicity values are protective (i.e., they are adjusted by uncertainty factors to values much lower than the study results). COPEC concentrations compared with these values are an order of magnitude or more below the SSLs, which corresponds to uncertainty factors of 10 or more. Therefore, it is assumed the differences in toxicity would not be more than an order of magnitude for any given chemical. The relative difference between values provides a weight of evidence that the potential toxicity of the COPC is likely to be low or very low to the receptor(s). The COPECs without ESLs were common to many of the sites and are discussed below.

Toxicity data are not available for calcium, iron, magnesium, nitrate, bromobenzene, sec-butylbenzene, ethylbenzene, 4-isopropyltoluene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene. For calcium, iron, magnesium, and nitrate, no surrogate or other toxicity information is available. For bromobenzene, sec-butylbenzene, ethylbenzene, 4-isopropyltoluene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene, a surrogate is used based on structural similarity to evaluate the potential toxicity.

Calcium was identified as a COPC from 0.0 to 5.0 ft at seven sites with maximum concentrations ranging from 3,850 mg/kg to 46,200 mg/kg. As presented in Table H-4.4-1, concentrations of calcium are substantially less than the NMED essential nutrient SSLs. Calcium is eliminated as a COPEC.

Iron was identified as a COPC from 0.0 to 5.0 ft at one site with a maximum concentration of 10,500 mg/kg. The maximum iron concentration is also approximately one-fifth the NMED residential SSL (54,800 mg/kg). In addition, the EPA Eco-SSL for iron (EPA 2003, 111415) suggests it is not phytotoxic at circumneutral soil pH (5 to 8). This soil pH range is consistent with nearly all measurements taken for the Middle Los Alamos Canyon Aggregate Area. Therefore, iron is eliminated as a COPEC.

Magnesium was identified as a COPC from 0.0 to 5.0 ft at one site with a maximum concentration of 1,800 mg/kg. As presented in Table H-4.4-1, concentrations of magnesium are substantially less than the NMED essential nutrient SSLs. Magnesium is eliminated as a COPEC.

Nitrate was identified as a COPC from 0.0 to 5.0 ft at one site with a maximum concentration of 22.6 mg/kg. The NMED residential SSL for nitrate is 125,000 mg/kg, indicating that potential toxicity is very low. Because nitrate concentrations are about four orders of magnitude less than SSL, nitrate is eliminated as a COPEC.

Bromobenzene was detected at one site from 0.0 to 5.0 ft with a maximum concentration of 0.00047 mg/kg [one detect in 15 samples at SWMU 21-006(e) and AOC 21-006(f)]. The minimum ESL for benzene (24 mg/kg for the deer mouse) is used to screen the bromobenzene concentration and results in a maximum HQ of 0.00002. Because the maximum HQ is less than 0.3, bromobenzene is not retained as a COPEC.

Butylbenzene[sec-] was detected at one site from 0.0 to 5.0 ft with a maximum concentration of 0.00041 mg/kg [one detect in 15 samples at SWMU 21-006(e) and AOC 21-006(f)]. The minimum ESL for benzene (24 mg/kg for the deer mouse) is used to screen the sec-butylbenzene concentration and results in a maximum HQ of 0.00002. Because the maximum HQ is less than 0.3, sec-butylbenzene is not retained as a COPEC.

Ethylbenzene was identified as a COPC from 0.0 to 5.0 ft at two sites based on a maximum detected concentration of 0.0016 mg/kg [two detects in 29 samples from SWMU 21-006(e) and AOC 21-006(f) and SWMU 21-028(c)]. 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 0.00002. Because the maximum HQ is less than 0.3, ethylbenzene is eliminated as a COPEC.

Isopropyltoluene[4-] was identified as a COPC from 0.0 to 5.0 ft at two sites with a maximum detected concentration of 0.0041 mg/kg (two detects in 38 samples from SWMU 21-028(c) and SWMU 26-001). The minimum ESL for toluene (23 mg/kg for the shrew) is used to screen the 4-isopropyltoluene concentrations and results in a maximum HQ of 0.0001. Because the maximum HQ is less than 0.3, 4-isopropyltoluene is eliminated as a COPEC.

Trimethylbenzene[1,2,4-] was detected at two sites from 0.0 to 5.0 ft with a maximum concentration of 0.00069 mg/kg [seven detects in 30 samples from SWMU 21-006(e) and AOC 21-006(f) and SWMU 21-028(c)]. The minimum ESL for benzene (24 mg/kg for the deer mouse) is used to screen the 1,2,4-trimethylbenzene concentrations and results in a maximum HQ of 0.00003. Because the maximum HQ is less than 0.3, 1,2,4-trimethylbenzene is not retained as a COPEC.

Trimethylbenzene[1,3,5-] was detected at one site from 0.0 to 5.0 ft with a maximum concentration of 0.00027 mg/kg [one detect in 15 samples at SWMU 21-006(e) and AOC 21-006(f)]. The minimum ESL for benzene (24 mg/kg for the deer mouse) is used to screen the 1,3,5-trimethylbenzene concentrations and results in a maximum HQ of 0.00001. Because the maximum HQ is less than 0.3, 1,2,5-trimethylbenzene is not retained as a COPEC.

H-5.5 Interpretation of Ecological Risk Screening Results

H-5.5.1 Receptor Lines of Evidence

Based on the ecological risk-screening assessments, several COPECs (including COPECs without an ESL) were identified for the Middle Los Alamos 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.
- The HI analyses using the LOAEL-based ESLs resulted in HIs less than or equivalent to 1 for SWMU 21-006(e) and AOC 21-006(f) and SWMU 21-028(c). LOAEL-based HIs and HQs are greater than 1 for selenium at all sites, except 02-003(d), 21-006(e) and AOC 21-006(f), and SWMU 21-028(c).
- Seedling germination bioassays were completed at TA-02 and TA-26 and showed that selenium does not cause phytotoxicity (section H-6.2.1).

These lines of evidence support the conclusion no potential ecological risk to the plants exists at the Middle Los Alamos 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 1 for the earthworm at all sites.
- The HI analyses using the LOAEL-based ESLs resulted in HIs less than 1 at all sites.

These lines of evidence support the conclusion that no potential ecological risk to the earthworm exists at the Middle Los Alamos 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.
- The HIs were adjusted by the PAUF, which is the ratio of the site area to the shrew 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 Middle Los Alamos 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 1 for the deer mouse at all sites.
- The HIs were adjusted by the PAUF, which is the ratio of the site area to the deer mouse 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 deer mouse exists at the Middle Los Alamos Canyon Aggregate Area.

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 greater than or equivalent to 1 for the cottontail at all sites.
- The HIs were adjusted by the PAUFs, which is the ratio of the site area to the cottontail population area. The adjusted HIs were less than 1 at all sites.

These lines of evidence support the conclusion that no potential ecological risk to the cottontail exists at the Middle Los Alamos Canyon Aggregate Area.

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 less than 1 for the fox at all sites.

These lines of evidence support the conclusion that no potential ecological risk to the fox exists at the Middle Los Alamos 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 1 for the robin (all feeding guilds) at all sites.
- The HIs were adjusted by the PAUFs. The adjusted HIs were less than 1 at all sites.

These lines of evidence support the conclusion that no potential ecological risk to the robin (all feeding guilds) exists at the Middle Los Alamos 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 1 for the kestrel (intermediate carnivore) at all sites.

- The HIs were adjusted by the PAUFs, 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 Middle Los Alamos Canyon Aggregate Area.

Kestrel (Top Carnivore)

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs for all of the receptors, including the kestrel (top carnivore), were less than 0.3.
- The HIs were less than or equivalent to 1 for the kestrel (top carnivore) at all sites, except AOC 21-028(c) and SWMU 26-001.
- The HIs were adjusted by the PAUFs, which is the ratio of the site area to the kestrel's population area. The adjusted HIs were less than 1 for all sites.
- The kestrel (top carnivore) is a surrogate for the Mexican spotted owl. The HIs were adjusted by the Mexican spotted owl AUFs. The adjusted HIs were less than 1 at all sites.

These lines of evidence support the conclusion that no potential ecological risks to the kestrel (top carnivore) and the Mexican spotted owl exist at the Middle Los Alamos Canyon Aggregate Area.

H-5.5.2 COPECs with No ESLs

COPECs without ESLs were eliminated based on comparisons to surrogate ESLs or human health SSLs. The analysis of COPECs without ESLs supports the conclusion that no potential ecological risk to receptors exists at the Middle Los Alamos Canyon Aggregate Area.

H-5.5.3 Summary

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and COPECs without ESLs for the remaining sites, no potential ecological risks to the earthworm, plant, robin, kestrel, deer mouse, montane shrew, cottontail, fox, and Mexican spotted owl exist for the Middle Los Alamos Canyon Aggregate Area.

H-6.0 ECOLOGICAL RISK EVALUATION TA-02 CORE AREA

In accordance with the approved work plan (LANL 2009, 105073; NMED 2009, 105595), locations surrounding the core area of TA-02 were sampled to define contamination for TA-02 as a whole (section 6.32). The ecological risk assessment has been conducted for the sites within the TA-02 core area as one exposure unit.

In preparation for this ecological risk assessment, a biota investigation work plan was prepared to identify COPECs and studies to help assess the potential for ecological risk (LANL 2017, 700036). Screening and subsequent studies focused on the terrestrial ecological community at the TA-02 core area. The screening in the biota investigation work plan used the maximum soil concentration as a protective estimate of exposure. To provide a more realistic estimate of exposure, the EPC (UCL of the mean) was evaluated using the same screening process used for the site-by-site ecological risk evaluations presented in Section 5.

H-6.1 TA-02 Core Area Screening Level Ecological Risk Assessment

Minimum ESL Comparison. The results of the minimum ESL comparisons are presented in Table H-6.1-1. Barium, cadmium, chromium (total), chromium hexavalent ion, copper, cyanide (total), lead, manganese, mercury, nickel, selenium, thallium, vanadium, zinc, Aroclor-1242, Aroclor-1248, Aroclor-1254, Aroclor-1260, bis(2-ethylhexyl)phthalate, di-n-butylphthalate, pentachlorophenol, and TCDD are retained as COPECs because the HQs were greater than 0.3.

Potential ecological risks associated with aluminum are based on soil pH. Aluminum is retained only in soil with a pH lower than 5.5, in accordance with EPA guidance (EPA 2003, 085645). Aluminum was eliminated as a COPEC and was not evaluated further because the soil pH for the TA-02 core area is generally neutral to slightly alkaline. The 10^{th} percentile of the pH results for the TA-02 core area is 7 and the 90^{th} percentile of the pH results is 8.7.

COPECs without ESLs. Calcium, iron, magnesium, nitrate, n-butylbenzene, chloromethane, ethylbenzene, isopropylbenzene, 4-isopropyltoluene, TPH-diesel range organics (DRO), 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and 1,2-xylene do not have ESLs and are evaluated to determine if they should be retained as COPECs. TPH-DRO is a collection of chemicals and its individual constituents are evaluated if they are detected. The remainder of the COPECs without ESLs are nutrients and VOCs and these chemicals do not exist at substantial quantities in the TA-02 core area and therefore further assessment is not needed.

Receptor HI. The HQs and HIs for each COPEC and receptor combination are presented in Table H-6.1-2. The HI analysis indicates that kestrel (top carnivore and intermediate carnivore), robin (all feeding guilds), cottontail, shrew, deer mouse, earthworm, and plant have HIs greater than 1. The HI for the fox was equivalent to 1. The COPECs and receptors are discussed below.

Adjusted HI. The area of TA-02 core area is approximately 5.3 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table H-6.1-3). 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 the TA-02 core area are less than 1 for the fox, kestrel (top carnivore and intermediate carnivore), and cottontail (Table H-6.1-4). The adjusted HIs for the robin (all feeding guilds) and the shrew are greater than 1. The population area for the deer mouse is smaller than the TA-02 core area so its HI is not adjusted and remains at 38. The plant had an unadjusted HI of 12 and the earthworm had an unadjusted HI of 13 (Table H-6.1-4).

LOAEL Analysis. The HIs for the TA-02 core area are equivalent to or greater than 1 for the robin (all feeding guilds), shrew, deer mouse, earthworm and plant, with lead, mercury, selenium, Aroclor-1260, and TCDD being the primary COPECs for one or more receptors. The HI analysis using LOAEL-based ESLs resulted in HIs of 6 for robin (herbivore), 15 for robin (omnivore), 24 for robin (invertivore), 14 for shrew, 8 for deer mouse, 1 for the earthworm, and 2 for plant (Table H-6.1-5). Adjusted LOAEL-based HQs were calculated for the robin (all feeding guilds) and shrew; the results are provided in Table H-6.1-6. The adjusted HI analysis using LOAEL-based ESLs resulted in HIs of 2 for robin (herbivore), 5 for robin (omnivore), 8 for robin (invertivore), and 5 for shrew. The COPECs with adjusted LOAEL-based HQs equivalent to or greater than 1 are mercury, Aroclor-1260, and TCDD. The population area for the deer mouse is estimated to be smaller than the TA-02 core area; therefore, the LOEAL-based HQs for the deer mouse cannot be adjusted. Selenium and TCDD had unadjusted LOEAL-based HQs greater than 1 for the deer mouse. The earthworm and plant do not have population areas and so are not adjusted. The LOAEL-based HI for the earthworm is 1 and mercury is the largest contributor. The LOAEL-based HI for the plant is 2 and selenium is the largest contributor.

Ecological Risk Assessment Studies. The biota investigation work plan identified the same list of COPECs and receptors for additional studies (LANL 2017, 700036) as were identified by the screening steps described above. As stated in LANL (2017, 700036), the following were the study-design COPECs and receptors:

- Metals
  - ❖ Mercury: earthworm and robin (TA-02)
  - ❖ Selenium: plant, earthworm, and middle-trophic-level wildlife (TA-02 and TA-26)
- Organic chemicals
  - ❖ PCBs: robin, with shrew and deer mouse to lesser extent (TA-02)
  - ❖ TCDD: shrew and deer mouse (TA-02)

The results from the TA-02 core area studies used to evaluate the potential for ecological risk to these receptors from these COPECs are discussed in the next section. Note that selenium was identified for studies at TA-26 locations and these results are also discussed below.

H-6.2 TA-02 Core Area Baseline Ecological Risk Assessment

These biota studies were prepared following currently accepted approaches for evaluating ecological risks, including EPA's "Ecological Risk Assessment Guidance for Superfund" (EPA 1997, 059370) and the Laboratory's screening level ecological risk assessment process (LANL 2017, 602649). It also follows the general process used to evaluate potential ecological risks in Los Alamos and Pueblo Canyons that was developed in consultation with NMED and DOE, as documented in a record of communication (Katzman 2002, 073667), and the process used in the "Mortandad Canyon Biota Investigation Work Plan" (LANL 2005, 089308) and the "Pajarito Canyon Biota Investigation Work Plan" (LANL 2006, 093553), both of which were approved by NMED (NMED 2005, 092084; NMED 2007, 096332). These documents describe the assessment endpoints (AEs) and associated ecological measures developed.

The five AEs adopted for the biota investigation are as follows:

- AE1: Survival and reproduction of the Mexican spotted owl
- AE2: Reproductive success of avian ground insectivore feeding-guild species (e.g., American robin)
- AE3: Survival of mammalian insectivore and omnivore feeding-guild species (e.g., shrew and deer mouse)
- AE4: Survival and growth of detritivore species (earthworm)
- AE5: Survival and growth of native plant species.

The proposed studies represent the measures of exposure and/or effect for these endpoints and include

- seedling germination testing and chemical analysis of associated soil samples,
- earthworm bioaccumulation testing and chemical analysis of associated soil samples—measures of growth and survival and chemical analysis of whole organisms,
- cavity-nesting bird monitoring and chemical analysis of eggs, and
- small-mammal trapping and chemical analysis of whole organisms and associated soil samples.

H-6.2.1 Seedling Germination Tests

Soil collected from the 0- to 30-cm- (0- to 1-ft-) depth interval was used for the plant toxicity tests (a measure for AE5). The plant toxicity tests used the standard American Society for Testing and Materials (ASTM) Method E1963-98. The plant toxicity tests compared germination rates and shoot and root measures for plants grown in soil from the same locations used for the earthworm toxicity tests with plants grown in soil samples from the reference locations (one control site in TA-02 and one control site in TA-26). The tests used perennial ryegrass (*Lolium perenne*), which is one of the standard test species for the seedling germination test. The species was selected based on the availability of seeds and the experience of the bioassay laboratory in successfully completing tests with ryegrass. The results from the ryegrass test are not directly comparable to tests conducted in the Los Alamos, Pueblo, and Mortandad watersheds with yarrow (*Achillea millefolium* L. var *occidentalis*) (LANL 2004, 087390; LANL 2006, 094161), but the ryegrass results are comparable to tests performed on Pajarito Canyon and Sandia Canyon soils (LANL 2009, 106939; LANL 2009, 107453).

Selenium was identified as the only COPEC for plants (section H-6.1). The potential for adverse ecological effects from this COPEC was evaluated by measuring germination and growth of ryegrass at 19 locations in TA-02 and 7 locations in TA-26 in comparison with two reference locations. There were five replicates for each location. The results are provided in four reports from the toxicity-testing laboratory (TRE Environmental Strategies 2017, 700028; TRE Environmental Strategies 2017, 700029; TRE Environmental Strategies 2017, 700030; TRE Environmental Strategies 2017, 700031).

A number of measures of plant growth and survival are included in the laboratory toxicity test on samples collected from TA-02 and TA-26; these measures include percent germination, shoot length, root length, mass of dry shoots, and mass of dry roots. The mean results (of the five replicates) are plotted on box plots to show the comparison of the various study areas (TA-02, TA-02 control, TA-26, and TA-26 control). The boxes on these plots indicate the interquartile range of the sampling results, with the upper and lower ends defined by the 75th and 25th percentiles, respectively. Horizontal lines within the boxes indicate median values, and lines above and below the boxes represent the 5th and 95th percentiles of the data. As shown in Figures H-6.2-1 to H-6.2-5, the plant bioassay measures are similar among the various study areas except for one location in TA-02.

Per the report from the bioassay laboratory (TRE Environmental Strategies 2017, 700030), the sample with low germination and low values for shoots and roots was sample ID RE-17-132810 (location ID 02-600269). The chemical and physical measurements for this sample were different in pH compared with all other samples. The pH at test initiation was 3.0 and the pH at the end was basically the same (2.9). Therefore, this sample had a much lower pH compared with other soils at TA-02 or TA-26. Scatter plots showing the relationship of plant bioassay measures versus soil pH are provided as Figures H-6.2-6 to H-6.2-10. These plots confirm that soil pH is a factor inhibiting germination and growth and thus is associated with adverse effects on plants.

The soil samples were also analyzed for the COPEC (selenium) concentrations; the concentrations of selenium did not correlate to differences in germination, shoots, or roots (Figures H-6.2-11 to H-6.2-15). It is worth comparing the soil selenium concentrations tested with the bioassays to those in the TA-02 core area as a whole. The EPC of the 28 samples tested at TA-02 and TA-26 for seedling germination was 0.8 mg/kg, which is smaller than the EPC for selenium in the TA-02 core area (2.7 mg/kg). Therefore, the elevated results for selenium at TA-02 and TA-26 were not replicated in the soil samples collected for phytotoxicity evaluation. Although, one sample did show toxicity to plants (based on pH), adverse effects on the plant community are not indicated from selenium.

H-6.2.2 Earthworm Bioaccumulation Tests

Soil collected from the 0- to 30-cm- (0- to 1-ft-) depth interval was used for the earthworm toxicity tests (a measure for AE4). The earthworm tests used the standard ASTM Method E1676-97. The toxicity tests compared the growth and mortality of the earthworms from the same locations used for the seedling germination tests with earthworms exposed to soil samples from the reference locations (one control site in TA-02 and one control site in TA-26). Earthworms were sent to an analytical laboratory for chemical analyses. The results are provided in a report from the toxicity-testing laboratory (Pacific Ecorisk 2017, 700034).

Mercury was the only COPEC identified for detritivores (earthworms) (section H-6.1). The potential for adverse ecological effects from mercury was evaluated by measuring growth and survival of earthworms at 19 locations in TA-02 and 7 locations in TA-26 in comparison with two reference locations. There was a single replicate of these samples for TA-02 and TA-26.

The results for the earthworm bioaccumulation test are summarized with box plots for survival and growth (as ending weight) in Figures H-6.2-16 and H-6.2-17. The boxes on these plots indicate the interquartile range of the sampling results, with the upper and lower ends defined by the 75th and 25th percentiles, respectively. Horizontal lines within the boxes indicate median values, and lines above and below the boxes represent the 5th and 95th percentiles of the data. The earthworm bioaccumulation test measures are similar among the various study areas except for survival at two locations in TA-02.

Per the report from the bioassay laboratory (Pacific Ecorisk 2017, 700034), one of the samples (sample ID RE-17-132746 at location ID 02-600269) had low pH (and lower than the range specified). The pH at test initiation was 3.1 and the pH at the end was a bit higher (3.6). This sample had a much lower pH compared with other soils at TA-02 or TA-26. Scatter plots showing the relationship of earthworm bioaccumulation test measures versus soil pH are provided as Figures H-6.2-18 and H-6.2-19. These plots show that soil pH had no impact on earthworm bioaccumulation test measures.

The soil samples were also analyzed for the COPEC (mercury) concentrations; the concentrations of mercury did not correlate to differences in earthworm bioaccumulation test measures (Figures H-6.2-20 and H-6.2-21). It is worth comparing the soil mercury concentrations tested with the bioassays to those in the TA-02 core area as a whole. The EPC of the 21 samples tested at TA-02 for earthworm bioaccumulation was 4.4 mg/kg, which is larger than the EPC for mercury in the TA-02 core area (0.46 mg/kg). Therefore, soil samples collected for earthworm bioaccumulation testing overrepresented the upper range of mercury concentrations in TA-02. Mercury was also measured in earthworm tissues; tissue concentrations of mercury did not correlate to differences in earthworm bioaccumulation test measures (Figures H-6.2-22 and H-6.2-23). However, concentrations of mercury in earthworm tissues did strongly correlate to concentrations of mercury in soil (Figure H-6.2-24). In summary, no adverse effects on detritivores are indicated by the results of the earthworm bioaccumulation test results.

H-6.2.3 Middle Trophic Level Wildlife Studies

As stated in LANL (2017, 700036), the objectives of these studies were to document chemical levels in soil and animal tissues and to document occupancy and density of small mammal and avian species at the site. Specifically, the studies were designed to evaluate the potential for risk to middle trophic level wildlife from selenium, PCBs, and TCDD.

Six composite soil samples were collected from each of three grids (an upper grid, which contained the five reactors, and middle and lower grids downstream of the upper grid) within TA-02 as well as at a control location upstream in Los Alamos Canyon (reach LA-0); all soil samples underwent chemical analyses, and statistical comparisons among grids were made. Small mammal population parameters were assessed by conducting a mark-recapture study and involved live-trapping small mammals for five consecutive nights; these data were statistically analyzed. At the end of the study, small mammals were euthanized to meet minimum sample requirements, then composited and submitted for chemical analyses. Avian nest boxes were also placed in TA-02 and monitored weekly from May to July 2017.

Most inorganic chemical concentrations did not differ statistically among grids. However, soil collected from the upper grid contained significantly higher concentrations of mercury and total PCBs (up to 546 parts per million of PCBs). Most dioxins and furans were statistically different, with the general trend of the upper grid containing higher concentrations when compared with other grids.

In small mammals, all metal concentrations were detected below the regional statistical reference levels (RSRLs) (mean + 3 standard deviations of concentrations in small mammals collected from background locations) in all four grids. PCBs were detected in all small mammal samples, and upper grid small mammal PCB concentrations exceeded the RSRLs; however, total PCB concentrations were below the LOAEL of PCBs in whole-body mice from published literature. Most dioxins and furans were not detected in small mammals with the exception of 1,2,3,7,8-pentachlorodibenzodioxin; 2,3,4,7,8-pentachlorodibenzofuran; total pentachlorodibenzofurans; and 2,3,4,6,7,8-hexachlorodibenzofuran, which were detected mostly in the upper grid and also exceeded the RSRLs. Whole-body burdens of TCDD-like chemical concentrations were calculated using the toxic equivalent method, and whole-body burdens observed in small mammals from middle, lower, and control grids are not expected to cause adverse effects; however, TCDD-induced adverse effects are possible in small mammals from the upper grid.

Small mammal density was analyzed by using spatially explicit capture-recapture models. A density of 4.59 animals/ha (95% confidence interval [CI] = 3.30–7.98) and abundance (N) of 50 animals (95% CI = 36–87) within the 10.9-ha state space around all three grids was estimated. There was not a statistical difference in density among the three grids. Only 4 of the 16 nest boxes were used in the 2017 field season, one of which was used by a target species, the ash-throated flycatcher, and the nest was successful. However, nonviable eggs were not found nor collected from the nest; therefore, no chemical analyses could be completed. Historically, nest boxes in upper Los Alamos Canyon are not very active.

Despite many of the chemicals of interest in this study exceeding ESLs in soil, most concentrations of these chemicals in small mammal tissues were below RSRLs or LOAELs from published literature. These data, along with the small mammal population assessment, suggest that adverse effects to the population level for small mammals is unlikely. However, it is possible for the COPECs to cause negative effects in other species that inhabit TA-02 in the Middle Los Alamos Canyon Aggregate Area, such as the avian species studied here but with less definitive results due to low occupancy of the nest boxes deployed in the TA-02 core area.

H-7.0 CONCLUSIONS

H-7.1 Human Health Risk

The total excess cancer risks were less than the target risk level of 1×10^{-5} for the industrial, construction worker, recreational, and residential scenarios at all sites with the exception of the residential risks at SWMU 02-005, SWMU 02-006(b), AOC 02-006(e), SWMU 02-008(a), AOC 02-011(a)(x), AOC 02-011(d), and AOC 02-012, and the recreational risk at AOC 02-011(d). The carcinogenic risks were related to Aroclor-1260, arsenic, and chromium hexavalent at SWMU 02-005; arsenic, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenz(a,h)anthracene at SWMU 02-006(b); arsenic, chromium (total), Aroclor-1248, and Aroclor-1254 at AOC 02-006(e); arsenic, chromium (total), and chromium hexavalent at SWMU 02-008(a); arsenic and chromium (total) at AOC 02-011(a)(x); arsenic, chromium (total) and chromium hexavalent at AOC 02-011(d); and arsenic and chromium (total) at AOC 02-012.

The HIs were less than the target HI of 1 for the industrial, construction worker, recreational, and residential scenarios at all sites with the exception of the residential risks at AOC 02-003(c), AOC 02-003(e), SWMU 02-006(b), AOC 02-010, and AOC 02-011(a)(ix); and the construction worker risks at AOC 02-003(c), AOC 02-004(a), AOCs 02-004(b,c,d), SWMU 02-006(b), SWMU 02-008(a), AOC 02-011(a)(x), AOC 02-011(b), and AOC 02-012.

The non-carcinogenic residential risks were related to thallium at AOC 02-003(c), lead at AOC 02-003(e), lead at SWMU 02-006(b), cyanide at AOC 02-010, and lead at AOC 02-011(a)(ix). The lead at AOC 02-003(e) and SWMU 02-006(b) have EPCs greater than the residential SSL for lead of 400 mg/kg, and each contribute an HQ greater than 1 to the overall HI for each site. The non-carcinogenic industrial risks at SWMU 02-005 were related to manganese. The non-carcinogenic construction worker risks were related to thallium at AOC 02-003(c); lead at SWMU 02-006(b); and manganese at AOC 02-004(a), AOCs 02-004(b,c,d), SWMU 02-008(a), AOC 02-011(a)(x), AOC 02-011(b), and AOC 02-012.

The total doses were below the target dose limit of 25 mrem/yr as authorized by DOE Order 458.1 for the industrial, construction worker, recreational, and residential scenarios at all sites, except for dose to the resident at AOC 02-003(a), AOC 02-003(e), SWMU 02-009(c), and AOC 02-009(d) due to cesium-137. Strontium-90 also contributed to dose for AOC 02-009(d). The total doses were equivalent to total risks ranging from 9×10^{-12} to 2×10^{-4} for the industrial scenario, from 3×10^{-12} to 2×10^{-5} for the recreational scenario, and from 2×10^{-7} to 7×10^{-3} for the residential scenario, based on conversion from dose using RESRAD Version 7.0.

Sites in the Middle Los Alamos Canyon Aggregate Area are not accessible by the public (except for parts of former TA-26) and are not planned for release by DOE in the foreseeable future. Doses at the TA-26 sites are low (<3 mrem/year). 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.

H-7.2 Ecological Risk

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and COPECs without ESLs for the other sites, no potential ecological risks to the earthworm, plant, robin, kestrel, deer mouse, montane shrew, cottontail, fox, and Mexican spotted owl exist in the Middle Los Alamos Canyon Aggregate Area, with the exception of certain wildlife in the TA-02 core area.

H-8.0 REFERENCES

The following reference list includes documents cited in this report. Parenthetical information following each reference provides the author(s), publication date, and ERID, ESHID, or EMID. This information is also included in text citations. ERIDs were assigned by the Laboratory's Associate Directorate for Environmental Management (IDs through 599999); ESHIDs were assigned by the Laboratory's Associate Directorate for Environment, Safety, and Health (IDs 600000 through 699999); and EMIDs are assigned by Newport News Nuclear BWXT – Los Alamos, LLC (N3B) (IDs 700000 and above). IDs are used to locate documents in N3B's Records Management System and in the Master Reference Set. The NMED Hazardous Waste Bureau and N3B maintain copies of the Master Reference Set. The set ensures that NMED has the references to review documents. The set is updated when new references are cited in documents.

ATSDR (Agency for Toxic Substances and Disease Registry), 1997. ATSDR's Toxicology Profiles on CD-ROM. (ATSDR 1997, 056531)

Blackwell, C.D., December 12, 1973. "Removal of Structures at TA-26 (D-Site Vault)," Los Alamos Scientific Laboratory memorandum to A. Valentine (H-1) from C.D. Blackwell (H-1), Los Alamos, New Mexico. (Blackwell 1973, 000619)

Bowman, J., J.A.G. Jaeger, and L. Fahrig, 2002. "Dispersal Distance of Mammals is Proportional to Home Range Size," *Ecology,* Vol. 83, No. 7, pp. 2049-2055. (Bowman et al. 2002, 073475)

Buckland, C., March 21, 1978. "I. Recollection of 1945 Contaminated Dump Fire, II: Additional Waste Disposal Areas," Los Alamos Scientific Laboratory memorandum to M.A. Rogers (H-12) from C. Buckland (H-1), Los Alamos, New Mexico. (Buckland 1978, 000496)

Buckland, C.D., April 20, 1965. "Radioactive Contamination Survey Results at D-Site Vault Area, TA-26-1, 5, 6," Los Alamos Scientific Laboratory memorandum to S.E. Russo (ENG-3) from C.D. Buckland (H-1), Los Alamos, New Mexico. (Buckland 1965, 000628)

Bunker, M., November 1985. "Personal Notes on TA-2," Los Alamos National Laboratory Personal Notes to file by M. Bunker (INC-5), Los Alamos, New Mexico. (Bunker 1985, 036231)

Christensen, E.L., and W.J. Maraman, April 1969. "Plutonium Processing at the Los Alamos Scientific Laboratory," Los Alamos Scientific Laboratory report LA-3542, Los Alamos, New Mexico. (Christensen and Maraman 1969, 004779)

DOE (U.S. Department of Energy), October 1987. "Phase I: Installation Assessment, Los Alamos National Laboratory," draft, Volume 1 of 2, Comprehensive Environmental Assessment and Response Program, Environment and Health Division, Environmental Programs Branch, Albuquerque Operations Office, Albuquerque, New Mexico. (DOE 1987, 008663)

Elder, J.C., and C.L. Knoell, December 1986. "TA-2 Water Boiler Reactor Decommissioning (Phase I)," Los Alamos National Laboratory report LA-10890-MS, Los Alamos, New Mexico. (Elder and Knoell 1986, 006670)

EPA (U.S. Environmental Protection Agency), December 1989. "Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part A), Interim Final," EPA/540/1-89/002, Office of Emergency and Remedial Response, Washington, D.C. (EPA 1989, 008021)

EPA (U.S. Environmental Protection Agency), December 1993. "Wildlife Exposure Factors Handbook," Vol. I of II, EPA/600/R-93/187a, Office of Research and Development, Washington, D.C. (EPA 1993, 059384)

EPA (U.S. Environmental Protection Agency), May 1996. "Soil Screening Guidance: Technical Background Document," EPA/540/R-95/128, Office of Solid Waste and Emergency Response, Washington, D.C. (EPA 1996, 059902)

EPA (U.S. Environmental Protection Agency), 1996. "Superfund Chemical Data Matrix," EPA/540/R-96/028, Office of Emergency and Remedial Response, Washington, D.C. (EPA 1996, 064708)

EPA (U.S. Environmental Protection Agency), June 5, 1997. "Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments, Interim Final," Office of Emergency and Remedial Response, Washington, D.C. (EPA 1997, 059370)

EPA (U.S. Environmental Protection Agency), April 1998. "Guidelines for Ecological Risk Assessment," EPA/630/R-95/002F, Risk Assessment Forum, Washington, D.C. (EPA 1998, 062809)

EPA (U.S. Environmental Protection Agency), October 7, 1999. "Issuance of Final Guidance: Ecological Risk Assessment and Risk Management Principles for Superfund Sites," OSWER Directive No. 9285.7-28 P, Office of Solid Waste and Emergency Response, Washington, D.C. (EPA 1999, 070086)

EPA (U.S. Environmental Protection Agency), December 2002. "Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites," OSWER Directive No. 9285.6-10, Office of Emergency and Remedial Response, Washington, D.C. (EPA 2002, 085640)

EPA (U.S. Environmental Protection Agency), November 2003. "Ecological Soil Screening Level for Iron, Interim Final," OSWER Directive No. 9285.7-69, Office of Solid Waste and Emergency Response, Washington, D.C. (EPA 2003, 111415)

EPA (U.S. Environmental Protection Agency), November 2003. "Ecological Soil Screening Level for Aluminum, Interim Final," OSWER Directive No. 9285.7-60, Office of Solid Waste and Emergency Response, Washington, D.C. (EPA 2003, 085645)

EPA (U.S. Environmental Protection Agency), September 2011. "Exposure Factors Handbook: 2011 Edition," EPA/600/R-09/052F, Office of Research and Development, Washington, D.C. (EPA 2011, 208374)

EPA (U.S. Environmental Protection Agency), October 2015. "ProUCL Version 5.1.002 User Guide," Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations, EPA/600/R-07/041, Office of Research and Development, Washington, D.C. (EPA 2015, 601725)

EPA (U.S. Environmental Protection Agency), October 2015. "ProUCL Version 5.1.002 Technical Guide," Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations, EPA/600/R-07/041, Office of Research and Development, Washington, D.C. (EPA 2015, 601724)

Heineman, D., March 19, 1990. "Design Wast Water Collect System, Bldg. 1, 44, 53," Los Alamos National Laboratory memorandum to G. Ramsey (INO-5) from D. Heineman (HSE-3), Los Alamos, New Mexico. (Heineman 1990, 089739)

Katzman, D., September 26, 2002. "Los Alamos/Pueblo Surface Aggregate Report – Record of Communication #1," Los Alamos National Laboratory memorandum (ER2002-0690) from D. Katzman, Environmental Restoration Project, Los Alamos, New Mexico. (Katzman 2002, 073667)

Kincaid, C.T., M.P. Bergeron, C.R. Cole, M.D. Freshley, N. Hassig, V.G. Johnson, D.I. Kaplan, R.J. Serne, G.P. Steile, D.L. Strenge, P.D. Thorne, L.W. Vail, G.A. Whyatt, and S.K. Wurstner, March 1998. "Composite Analysis for Low-Level Waste Disposal in the 200 Area Plateau of the Hanford Site," Pacific Northwest Laboratory report PNNL-11800, Richland, Washington. (Kincaid et al. 1998, 093270)

LANL (Los Alamos National Laboratory), June 22, 1990. "Structure Location Plan, TA-2, Omega Site, Revision 1," Engineering Drawing ENG-R-5102, sheet number 2 of 2, Los Alamos, New Mexico. (LANL 1990, 090086)

LANL (Los Alamos National Laboratory), August 31, 1990. "Design Waste Water Collection System, Civil: Site Plan, Bldg. 1, 8, 44, TA-2," Engineering Drawing ENG-C-45924, sheet number 1 of 8, Los Alamos, New Mexico. (LANL 1990, 089679)

LANL (Los Alamos National Laboratory), November 1990. "Solid Waste Management Units Report," Vol. I of IV (TA-0 through TA-9), Los Alamos National Laboratory document LA-UR-90-3400, Los Alamos, New Mexico. (LANL 1990, 007511)

LANL (Los Alamos National Laboratory), November 1990. "Solid Waste Management Units Report," Vol. II of IV (TA-10 through TA-25), Los Alamos National Laboratory document LA-UR-90-3400, Los Alamos, New Mexico. (LANL 1990, 007512)

LANL (Los Alamos National Laboratory), November 1990. "Solid Waste Management Units Report," Vol. III of IV (TA-26 through TA-50), Los Alamos National Laboratory document LA-UR-90-3400, Los Alamos, New Mexico. (LANL 1990, 007513)

LANL (Los Alamos National Laboratory), May 1991. "TA-21 Operable Unit RFI Work Plan for Environmental Restoration," Vol. II (Chapters 14 to 16), Los Alamos National Laboratory document LA-UR-91-962, Los Alamos, New Mexico. (LANL 1991, 007529)

LANL (Los Alamos National Laboratory), May 1991. "TA-21 Operable Unit RFI Work Plan for Environmental Restoration," Vol. III (Chapters 17 to Appendix G), Los Alamos National Laboratory document LA-UR-91-962, Los Alamos, New Mexico. (LANL 1991, 007680)

LANL (Los Alamos National Laboratory), February 10, 1993. "Automatic Sprinkler System (FY-64), Cooling Tower - Omega-49, TA-2, Utility Plan - Water and Alarm," Engineering Drawing ENG-C-48768, sheet number 4 of 79, Los Alamos, New Mexico. (LANL 1993, 090056)

LANL (Los Alamos National Laboratory), June 1993. "RFI Work Plan for Operable Unit 1098," Los Alamos National Laboratory document LA-UR-92-3825, Los Alamos, New Mexico. (LANL 1993, 015314)

LANL (Los Alamos National Laboratory), September 1996. "RFI Report for Potential Release Sites 2-004(a through f), 2-008(b), and 2-012," Los Alamos National Laboratory document LA-UR-96-3155, Los Alamos, New Mexico. (LANL 1996, 055226)

LANL (Los Alamos National Laboratory), June 1999. "General Assessment Endpoints for Ecological Risk Assessment at Los Alamos National Laboratory," report prepared for Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 1999, 064137)

LANL (Los Alamos National Laboratory), January 25, 2000. "Deferral of Additional Site Investigation for UST# TA-2-1," Los Alamos National Laboratory letter (ESH-19:00-007) to L. Georger (NMED USTB) from A. Jackson (LANL), Los Alamos, New Mexico. (LANL 2000, 090023)

LANL (Los Alamos National Laboratory), July 2000. "Decommissioning Completion Report for Buildings 4, 46, 49, 50, 53, 54, 55, 56, 57, 69, and 88 at TA-02, Omega Site, Flood Control Project," draft, Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2000, 090087)

LANL (Los Alamos National Laboratory), March 2001. "TA-2 Sampling and Soil Removal, Final Closeout Report," Los Alamos National Laboratory document LA-UR-01-1243, Los Alamos, New Mexico. (LANL 2001, 070352)

LANL (Los Alamos National Laboratory), August 2003. "Field Summary Report for Removal of Omega West Reactor French Drain, TA-61, Potential Release Site 2-006(a)," Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2003, 090089)

LANL (Los Alamos National Laboratory), April 2004. "Los Alamos and Pueblo Canyons Investigation Report," Los Alamos National Laboratory document LA-UR-04-2714, Los Alamos, New Mexico. (LANL 2004, 087390)

LANL (Los Alamos National Laboratory), May 2005. "Mortandad Canyon Biota Investigation Work Plan," Los Alamos National Laboratory document LA-UR-05-2231, Los Alamos, New Mexico. (LANL 2005, 089308)

LANL (Los Alamos National Laboratory), May 2006. "Investigation Work Plan for Middle Los Alamos Canyon Aggregate Area, Revision 1," Los Alamos National Laboratory document LA-UR-06-3015, Los Alamos, New Mexico. (LANL 2006, 092571.12)

LANL (Los Alamos National Laboratory), July 2006. "Pajarito Canyon Biota Investigation Work Plan," Los Alamos National Laboratory document LA-UR-06-4106, Los Alamos, New Mexico. (LANL 2006, 093553)

LANL (Los Alamos National Laboratory), October 2006. "Mortandad Canyon Investigation Report," Los Alamos National Laboratory document LA-UR-06-6752, Los Alamos, New Mexico. (LANL 2006, 094161)

LANL (Los Alamos National Laboratory), May 2008. "Investigation Report for Middle Los Alamos Canyon Aggregate Area, Revision 1," Los Alamos National Laboratory document LA-UR-08-2725, Los Alamos, New Mexico. (LANL 2008, 101669.12)

LANL (Los Alamos National Laboratory), February 2009. "Phase II Investigation Work Plan for Middle Los Alamos Canyon Aggregate Area, Revision 1," Los Alamos National Laboratory document LA-UR-09-1206, Los Alamos, New Mexico. (LANL 2009, 105073)

LANL (Los Alamos National Laboratory), August 2009. "Pajarito Canyon Investigation Report, Revision 1," Los Alamos National Laboratory document LA-UR-09-4670, Los Alamos, New Mexico. (LANL 2009, 106939)

LANL (Los Alamos National Laboratory), October 2009. "Investigation Report for Sandia Canyon," Los Alamos National Laboratory document LA-UR-09-6450, Los Alamos, New Mexico. (LANL 2009, 107453)

LANL (Los Alamos National Laboratory), September 2015. "Derivation and Use of Radionuclide Screening Action Levels, Revision 4," Los Alamos National Laboratory document LA-UR-15-24859, Los Alamos, New Mexico. (LANL 2015, 600929)

LANL (Los Alamos National Laboratory), March 2017. "Middle Los Alamos Canyon Aggregate Area Biota Investigation Work Plan," Los Alamos National Laboratory document LA-UR-17-21799, Los Alamos, New Mexico. (LANL 2017, 700036)

LANL (Los Alamos National Laboratory), September 2017. "Technical Approach for Calculating Recreational Soil Screening Levels for Chemicals, Revision 5," Los Alamos National Laboratory document LA-UR-17-27660, Los Alamos, New Mexico. (LANL 2017, 602581)

LANL (Los Alamos National Laboratory), September 2017. "Screening-Level Ecological Risk Assessment Methods, Revision 5," Los Alamos National Laboratory document LA-UR-17-28553, Los Alamos, New Mexico. (LANL 2017, 602649)

LANL (Los Alamos National Laboratory), October 2017. "ECORISK Database (Release 4.1)," on CD, LA-UR-17-26376, Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2017, 602538)

LASL (Los Alamos Scientific Laboratory), September 22, 1944. "Plot Plan and Piping Details, Omega Building/Annex," Engineering Drawing ENG-C-1686, sheet number 0, Los Alamos, New Mexico. (LASL 1944, 090084)

LASL (Los Alamos Scientific Laboratory), 1944. "Laboratory Bldg 3, Heating - Plumbing, Omega Site," Engineering Drawing ENG-C-1683, sheet number 4, Los Alamos, New Mexico. (LASL 1944, 090081)

LASL (Los Alamos Scientific Laboratory), 1946. "Omega Site - Fast Reactor Building Structural Foundation Plan, Revised," Engineering Drawing ENG-C-1703, sheet number 5 of 16, Los Alamos, New Mexico. (LASL 1946, 089678)

LASL (Los Alamos Scientific Laboratory), January 23, 1947. "Nomenclature; Technical Areas Assigned to the Laboratory," Los Alamos Scientific Laboratory, Los Alamos, New Mexico. (LASL 1947, 000664)

LASL (Los Alamos Scientific Laboratory), February 24, 1947. “Fast Reactor Building, Omega Site Bldg. T, Plot Plan, Revised,” Engineering Drawing ENG-C-1699, Los Alamos, New Mexico. (LASL 1947, 090070)

LASL (Los Alamos Scientific Laboratory), June 30, 1947. “Blower House - Drain Trap - Misc. Details, 150 ft. Mast, TA-2,” Engineering Drawing ENG-C-1718, sheet number 3 of 4, Los Alamos, New Mexico. (LASL 1947, 089677)

LASL (Los Alamos Scientific Laboratory), July 30, 1948. “General Layout, 150 ft. Mast, TA-2,” Engineering Drawing ENG-C-1716, sheet number 1 of 4, Los Alamos, New Mexico. (LASL 1948, 090083)

LASL (Los Alamos Scientific Laboratory), June 30, 1949. “Structure Descriptions from Laboratory Pan Am History Book, TA-26,” Los Alamos Scientific Laboratory, Los Alamos, New Mexico. (LASL 1949, 000696)

LASL (Los Alamos Scientific Laboratory), October 10, 1949. “Plumbing Layout, Waste and Drain Piping, Alterations and Additions to Bldg. 1, TA-2,” Engineering Drawing ENG-C-1750, sheet number 30 of 34, Los Alamos, New Mexico. (LASL 1949, 089680)

LASL (Los Alamos Scientific Laboratory), April 3, 1954. “West Reactor, Civil Plot Plan, Omega-1 and Omega-44, TA-2,” Engineering Drawing ENG-C-14930, sheet number 1 of 33, Los Alamos, New Mexico. (LASL 1954, 090076)

LASL (Los Alamos Scientific Laboratory), October 11, 1957. “O.W.R. Exhaust Line, Plan, Profiles, Details, Bldg. Omega-1, TA-2, Revision 1,” Engineering Drawing ENG-C-10473, sheet number 1 of 1, Los Alamos, New Mexico. (LASL 1957, 090082)

LASL (Los Alamos Scientific Laboratory), November 13, 1957. “OWR Cooling Tower Installation, Civil Plans, Sections and Details, Omega-49, TA-2,” Engineering Drawing ENG-C-21327, sheet number 1 of 7, Los Alamos, New Mexico. (LASL 1957, 090058)

LASL (Los Alamos Scientific Laboratory), July 9, 1958. “Utility Location Plan, TA-2, Omega-Site, Sewer and Storm Drainage System, Revision 2,” Engineering Drawing ENG-R-391, sheet number 1 of 3, Los Alamos, New Mexico. (LASL 1958, 090085)

LASL (Los Alamos Scientific Laboratory), May 25, 1962. “Omega West Reactor Cooling Water Modifications, Mech. Piping Plot Plan, Elevations and Sect., Bldg. Omega 44,” Engineering Drawing ENG-C-29861, sheet number 4 of 13, Los Alamos, New Mexico. (LASL 1962, 090055)

LASL (Los Alamos Scientific Laboratory), January 26, 1971. “Boiler Room and Equipment Relocation, Design Criteria, Bldg. Omega-63, TA-2,” Engineering Drawing ENG-C-39551, sheet number 2 of 4, Los Alamos, New Mexico. (LASL 1971, 089682)

LASL (Los Alamos Scientific Laboratory), no date. “Status of Structures TA-26-1 through TA-26-6,” Los Alamos Scientific Laboratory, Los Alamos, New Mexico. (LASL no date, 000675)

LASL (Los Alamos Scientific Laboratory), no date. “Chemical Shack Waste Units,” handwritten status report concerning TA-2 (period of use, 1940s to 1971), Los Alamos, New Mexico. (LASL no date, 034172)

Lojek, C.A., May 13, 1991. "Record of Bob Drake Interview for OU 1071 Work Plan," IT Corporation letter to M.J. Aldrich (EES-1 Project Leader) from C.A. Lojek (IT Corp.), Los Alamos, New Mexico. (Lojek 1991, 001904)

Maddy, J.R., March 29, 1957. "Use of East Gate Pass Office Building," Los Alamos National Laboratory memorandum to T.L. Shipman (Director/H Division) from Maddy (Chief/Project Services Branch/AEC), Los Alamos, New Mexico. (Maddy 1957, 006349)

Meyer, D., March 7, 1978. "Review of LA-6848-MS [document]," Los Alamos Scientific Laboratory letter to M.A. Rogers (H-12) from D. Meyer (Consultant to H-12), Los Alamos, New Mexico. (Meyer 1978, 000526)

Montoya, G., June 1991. "Final Project Report, TA-2 Water Boiler Reactor Decommissioning Project," Los Alamos National Laboratory report LA-12049, Los Alamos, New Mexico. (Montoya 1991, 006997)

Montoya, G.M., June 1, 1991. "Post-Remedial Action Report for the Water Boiler Reactor Site," Los Alamos National Laboratory report LA-12012, Los Alamos, New Mexico. (Montoya 1991, 006996)

Ney, R.E., 1995. Excerpted pages from *Fate and Transport of Organic Chemicals in the Environment: A Practical Guide*, 2nd Ed., Government Institutes, Inc., Rockville, Maryland. (Ney 1995, 058210)

NMED (New Mexico Environment Department), October 10, 2001. "Approval of Class III Permit Modification to Remove Seven (7) Solid Waste Management Units from the Department of Energy / Los Alamos National Laboratory RCRA Permit NM 0890010515," New Mexico Environment Department letter to D.A. Gurulé (Program Manager/LAAO) and J.C. Browne (LANL Director) from G.J. Lewis (NMED WWMD Director), Santa Fe, New Mexico. (NMED 2001, 071256)

NMED (New Mexico Environment Department), November 24, 2003. "LANL's Risk Reduction and Environmental Stewardship (RRES) Remediation Services Project Use of Surrogate Chemicals in Risk Assessments," New Mexico Environment Department letter to D. Gregory (DOE-LASO) and G.P. Nanos (LANL Director) from J.E. Kieling (NMED-HWB), Santa Fe, New Mexico. (NMED 2003, 081172)

NMED (New Mexico Environment Department), December 13, 2005. "Approval with Modifications, Mortandad Canyon Biota 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 2005, 092084)

NMED (New Mexico Environment Department), May 30, 2006. "Approval with Modifications, Investigation Work Plan for the Middle Los Alamos Canyon Aggregate Area," 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 2006, 095416)

NMED (New Mexico Environment Department), May 29, 2007. “Notice of Approval, Pajarito Canyon Biota 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 2007, 096332)

NMED (New Mexico Environment Department), March 25, 2009. “Approval, Middle Los Alamos Canyon Aggregate Area Phase II Work Plan, Revision 1,” New Mexico Environment Department letter to D. Gregory (DOE LASO) and D. McInroy (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2009, 105595)

NMED (New Mexico Environment Department), July 2015. “Risk Assessment Guidance for Site Investigations and Remediation,” Hazardous Waste Bureau and Ground Water Quality Bureau, Santa Fe, New Mexico. (NMED 2015, 600915)

NMED (New Mexico Environment Department), March 2017. “Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Soil Screening Guidance for Human Health Risk Assessments,” Hazardous Waste Bureau and Ground Water Quality Bureau, Santa Fe, New Mexico. (NMED 2017, 602273)

Pacific Ecorisk, October 30, 2017. “Supplemental Report, Bioaccumulation Testing of the Los Alamos National Laboratory Soil Samples,” samples collected July 7, 10, 20, and 27, and August 3 and 4, 2017, document prepared for Los Alamos National Laboratory, Fairfield, California. (Pacific Ecorisk 2017, 700034)

TRE Environmental Strategies, August/September 2017. “Report of Short-Term Chronic Toxicity of Soil Samples to *Lolium perenne* (Rye Grass),” document prepared for Pacific EcoRisk, Project ID: 14001-259-(066-074), Fort Collins, Colorado. (TRE Environmental Strategies 2017, 700028)

TRE Environmental Strategies, September 2017. “Report of Short-Term Chronic Toxicity of Soil Samples to *Lolium perenne* (Rye Grass),” document prepared for Pacific EcoRisk, Project ID: 14001-259-(075-083), Fort Collins, Colorado. (TRE Environmental Strategies 2017, 700029)

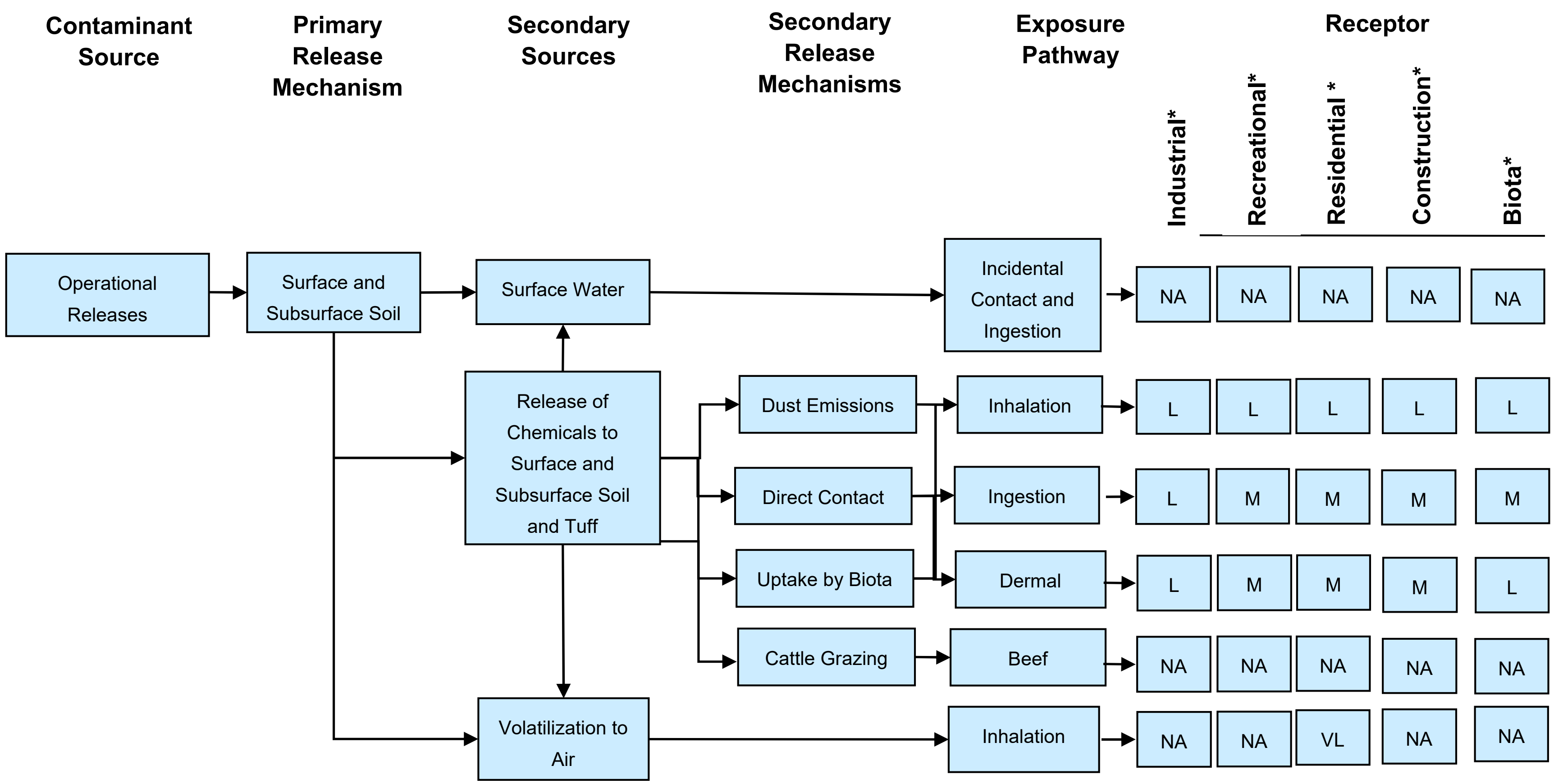
TRE Environmental Strategies, September/October 2017. “Report of Short-Term Chronic Toxicity of Soil Samples to *Lolium perenne* (Rye Grass),” document prepared for Pacific EcoRisk, Project ID: 14001-259-(084-088), Fort Collins, Colorado. (TRE Environmental Strategies 2017, 700030)

TRE Environmental Strategies, September/October 2017. “Report of Short-Term Chronic Toxicity of Soil Samples to *Lolium perenne* (Rye Grass),” document prepared for Pacific EcoRisk, Project ID: 14001-259-(089-093), Fort Collins, Colorado. (TRE Environmental Strategies 2017, 700031)

Tribby, J.F., May 8, 1947. “Fluid Waste Disposal at D.P. West,” Los Alamos Scientific Laboratory memorandum to F.R. Jette from J.F. Tribby, Los Alamos, New Mexico. (Tribby 1947, 001404)

WD-3 (Washington-Framatome ANP Decontamination and Decommissioning, LLC), August 2003. "Omega West Decommissioning, Final Project Report, Volume 1," report prepared for Los Alamos National Laboratory, Los Alamos, New Mexico. (WD-3 2003, 082646)

Whicker, F., and V. Schultz, 1982. Excerpted pages from *Radioecology: Nuclear Energy and the Environment*, Vol. 1, CRC Press, Boca Raton, Florida. (Whicker and Schultz 1982, 058209)



* Very Low (VL), Low (L), and Moderate (M) designations indicate the pathway is a potentially complete pathway and is evaluated in the risk assessments.
Not Applicable (NA) indicates the pathway is incomplete and is not evaluated in the risk assessments.

Figure H-3.1-1 Conceptual site model for Middle Los Alamos Canyon Aggregate Area sites

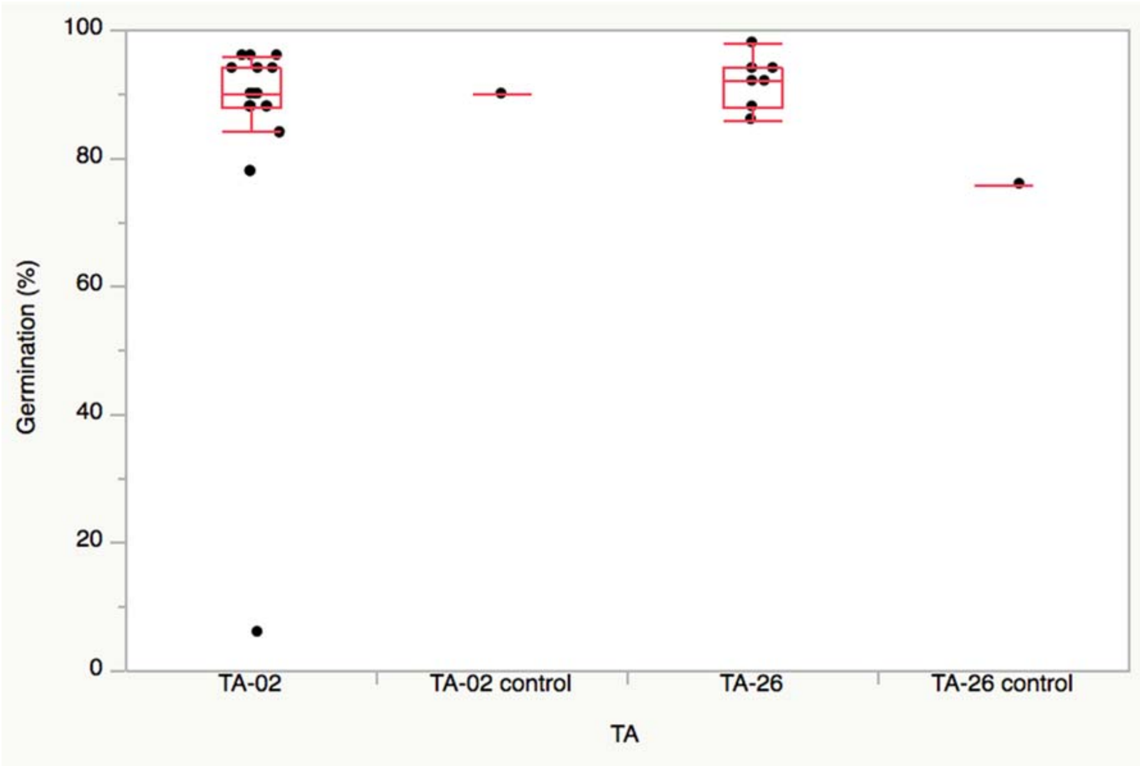


Figure H-6.2-1 Seedling germination for study areas

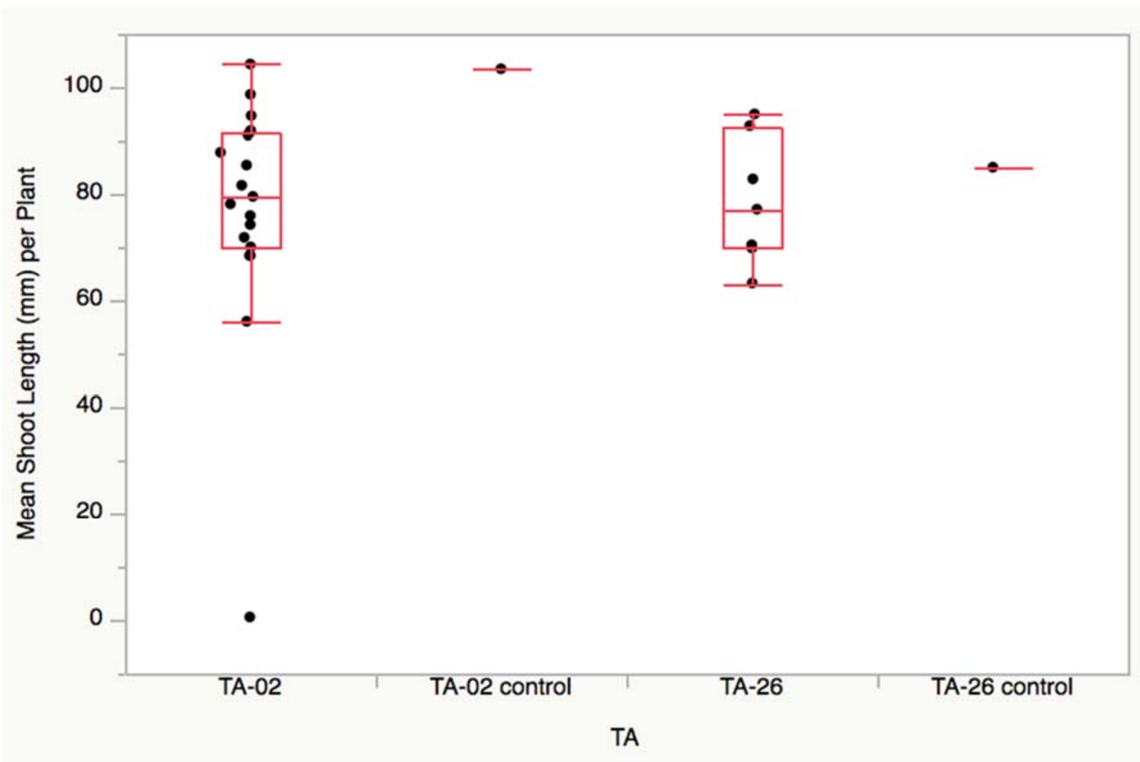


Figure H-6.2-2 Mean shoot length for study areas

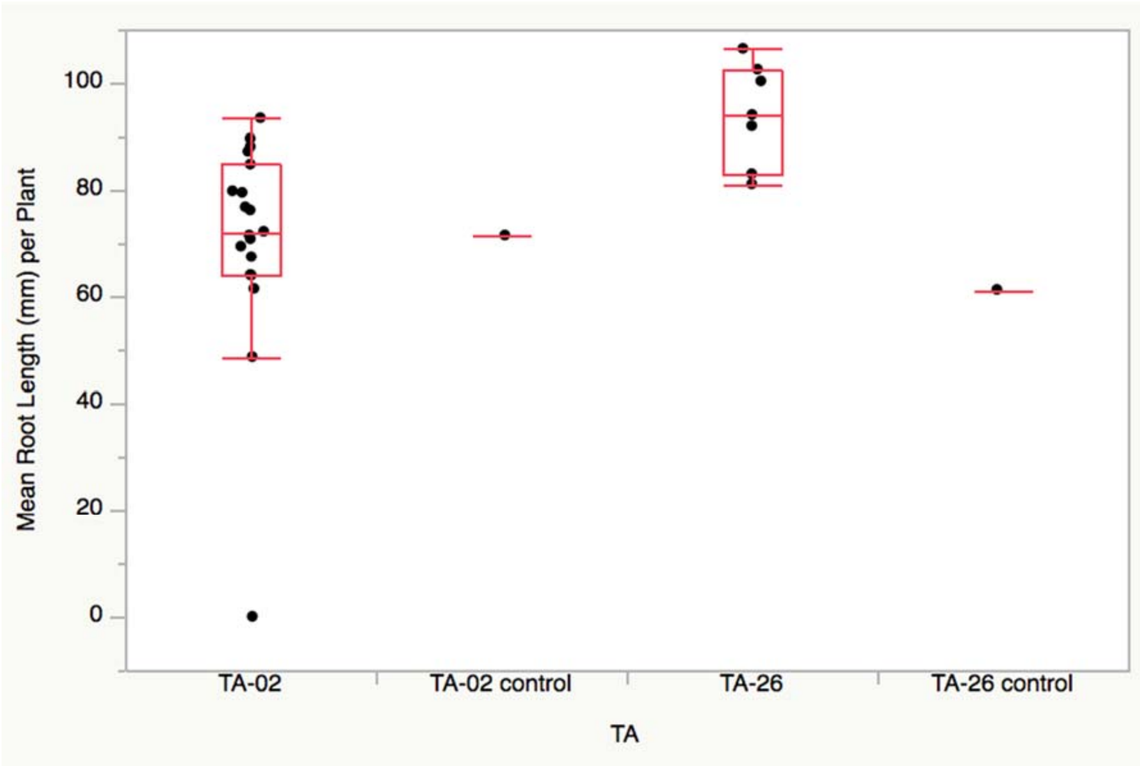


Figure H-6.2-3 Mean root length for study areas

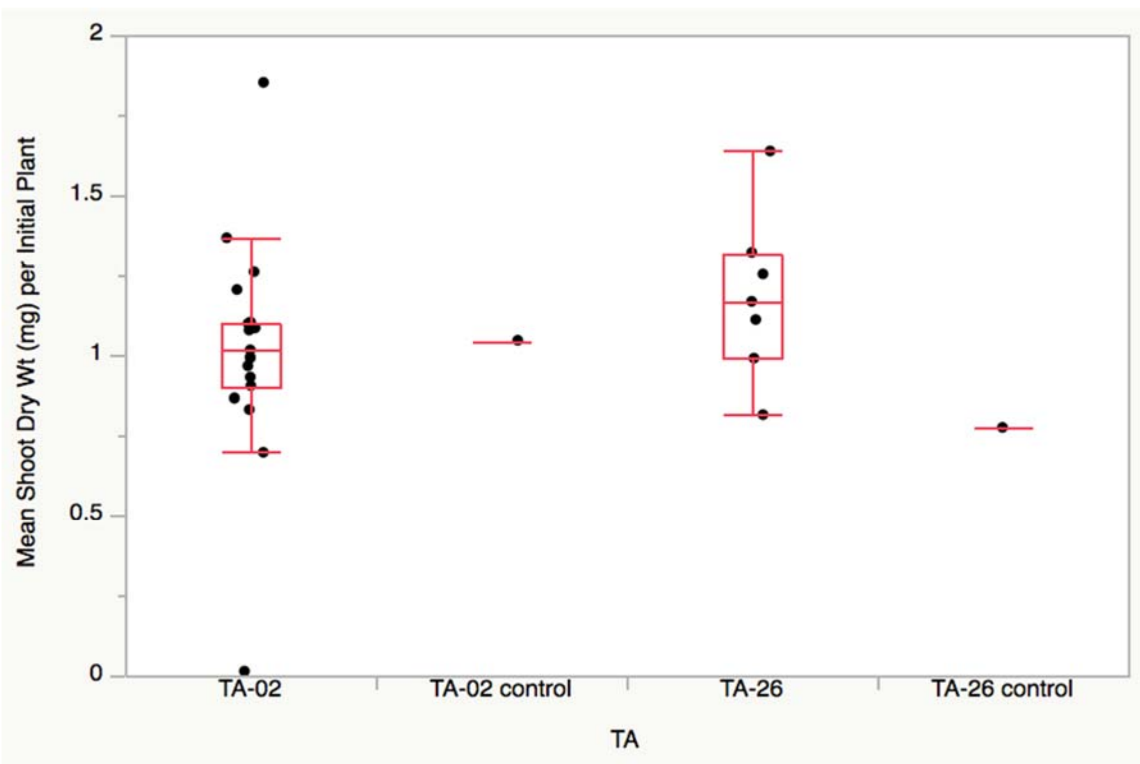


Figure H-6.2-4 Mean shoot dry weight for study areas

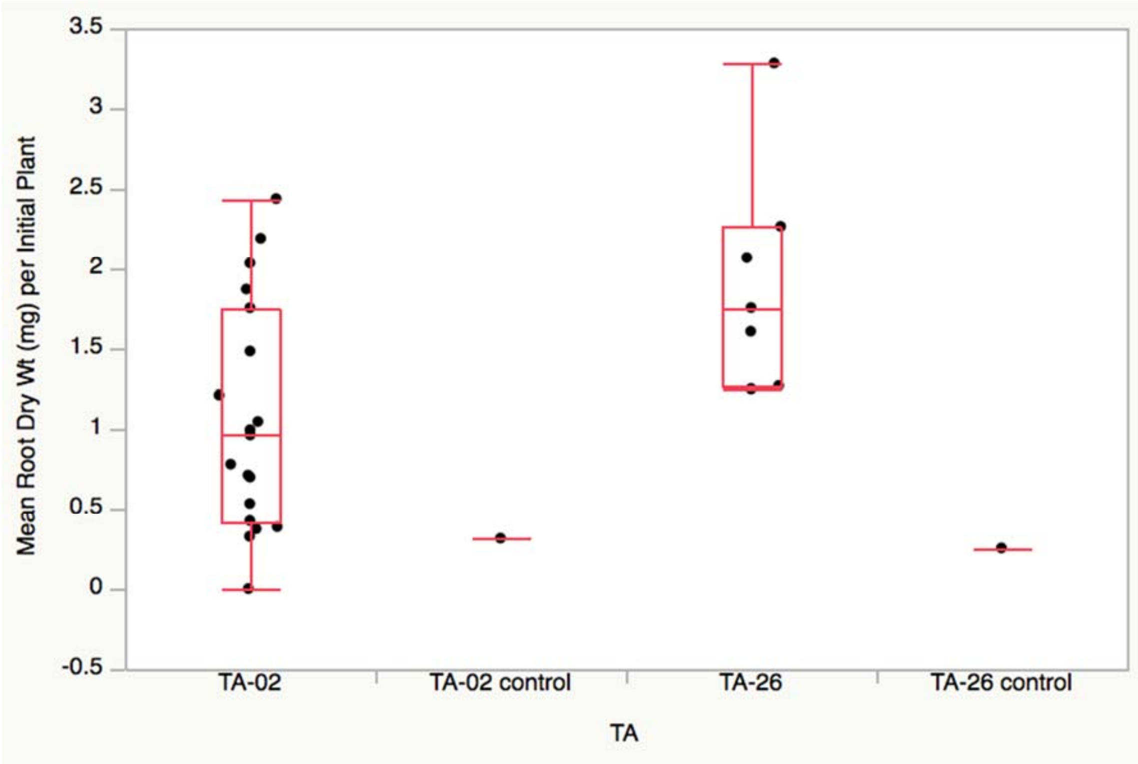


Figure H-6.2-5 Mean root dry weight for study areas

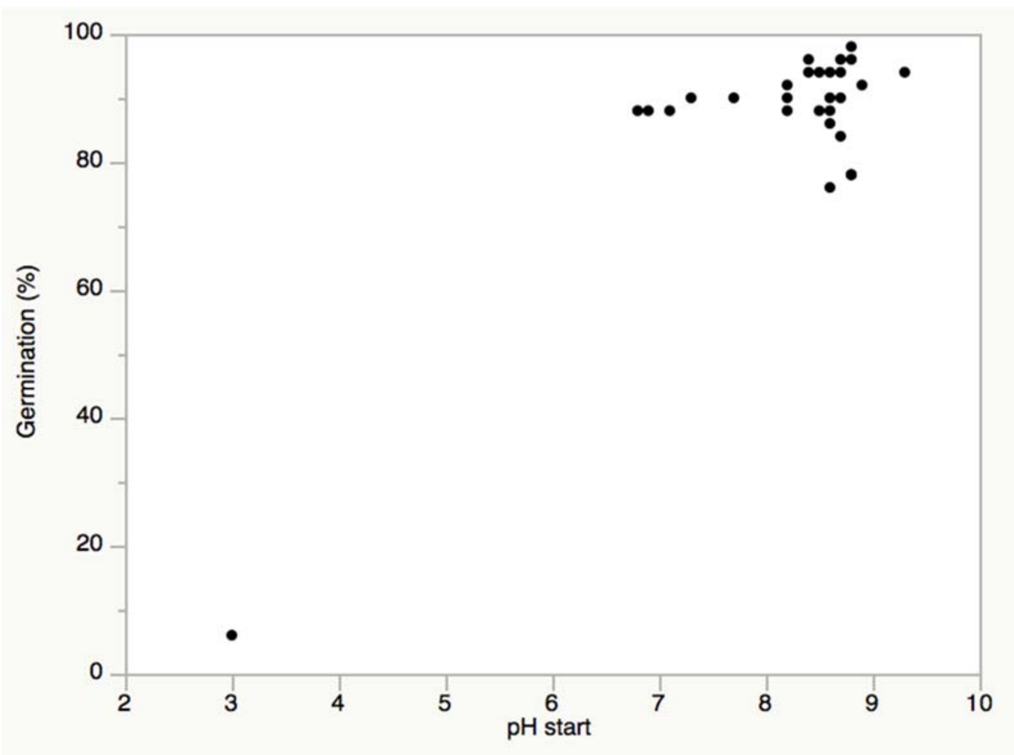


Figure H-6.2-6 Seedling germination versus soil pH (start of bioassay)

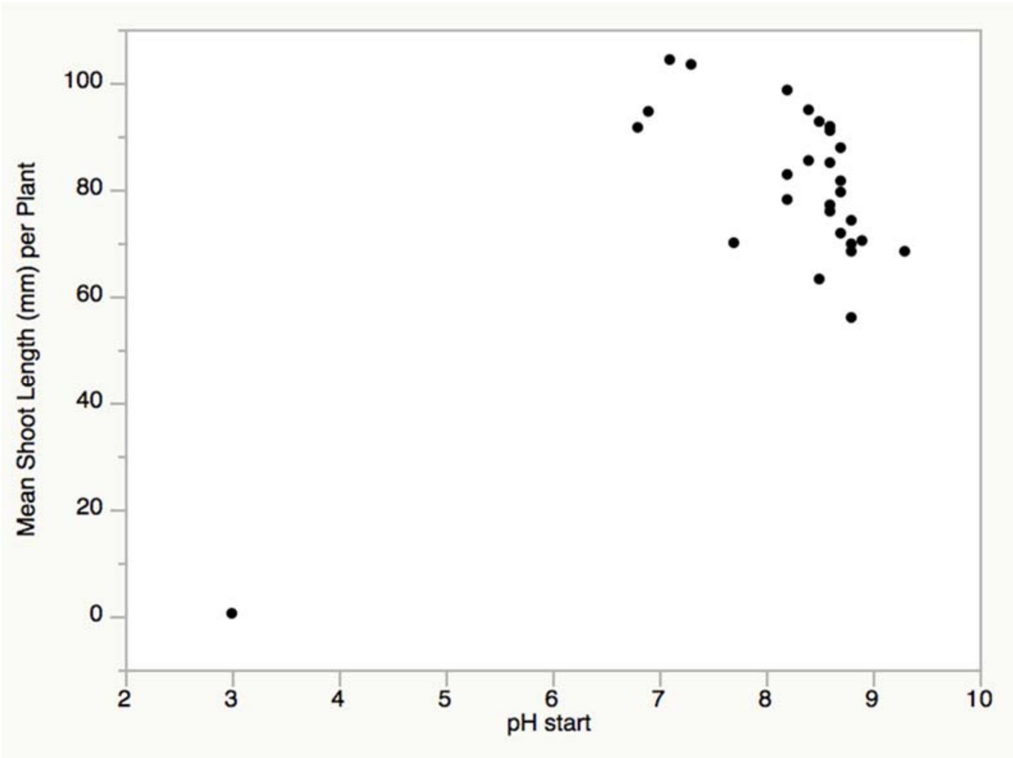


Figure H-6.2-7 Mean shoot length versus soil pH (start of bioassay)

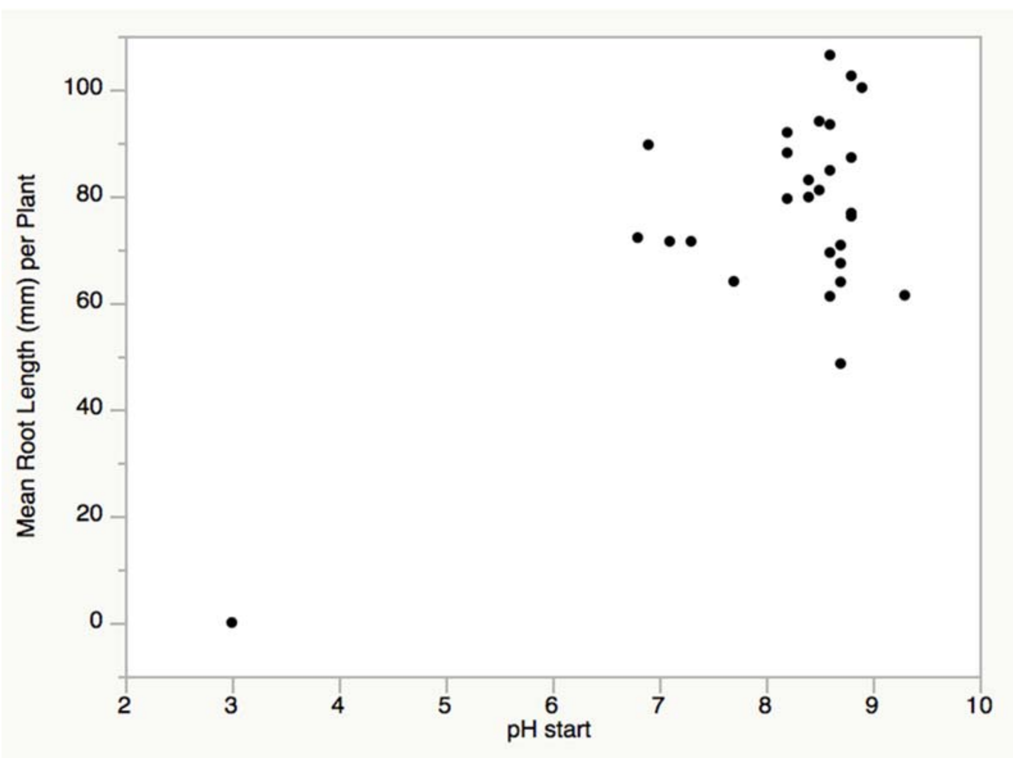


Figure H-6.2-8 Mean root length versus soil pH (start of bioassay)

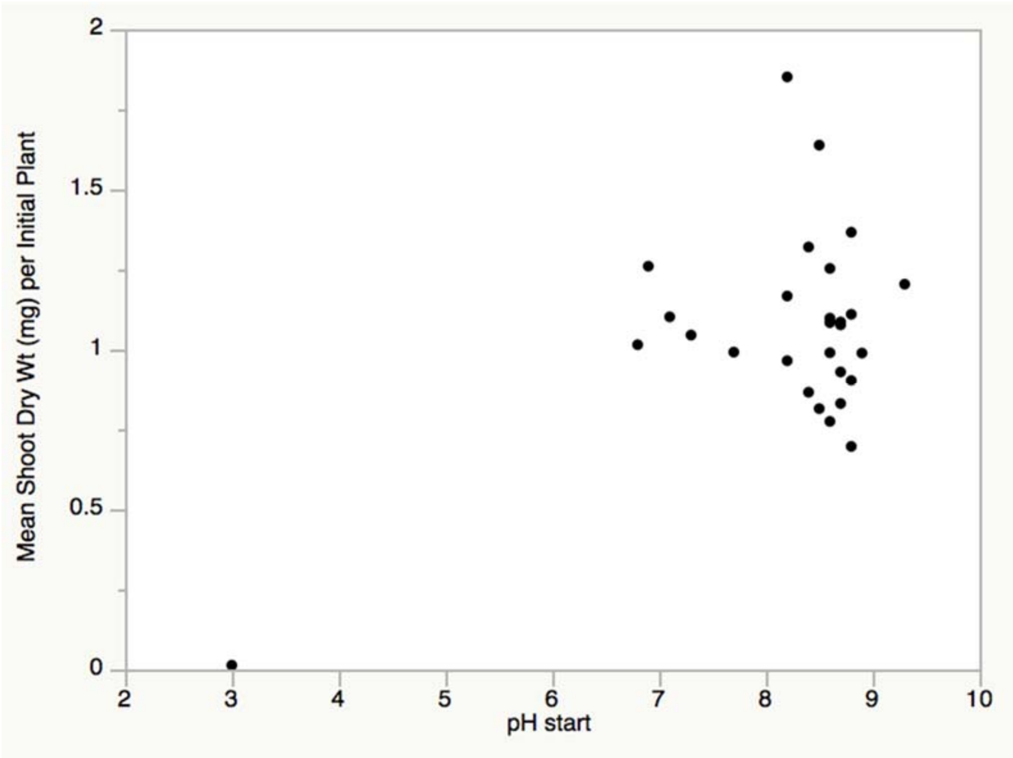


Figure H-6.2-9 Mean shoot dry weight versus soil pH (start of bioassay)

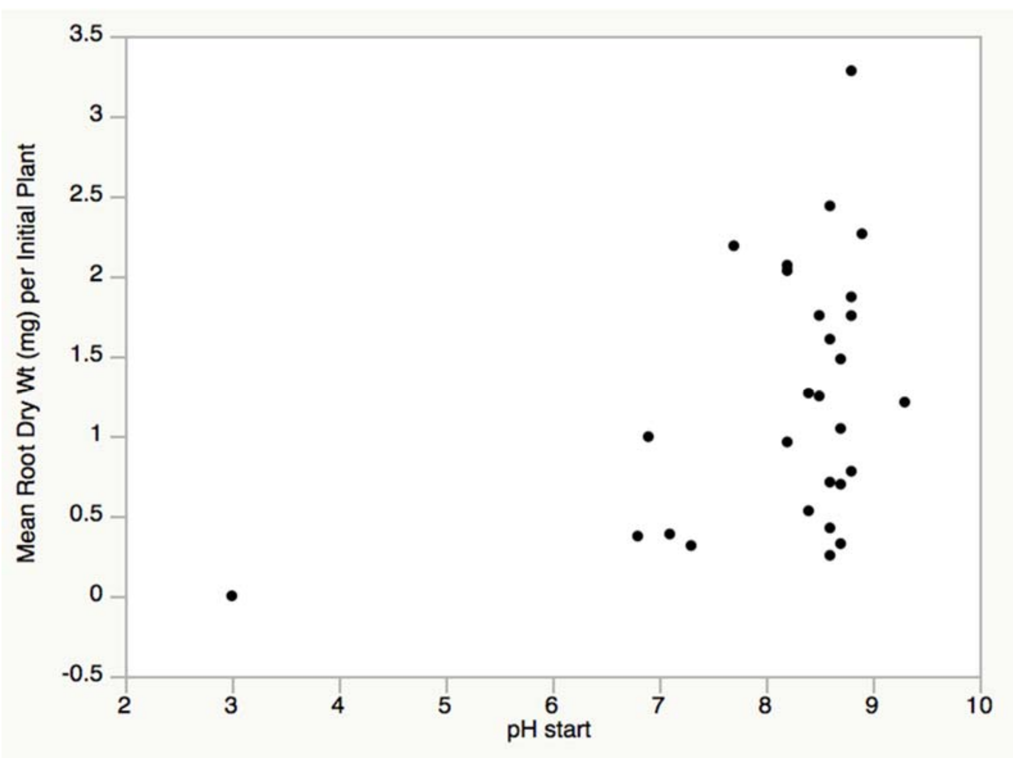


Figure H-6.2-10 Mean root dry weight versus soil pH (start of bioassay)

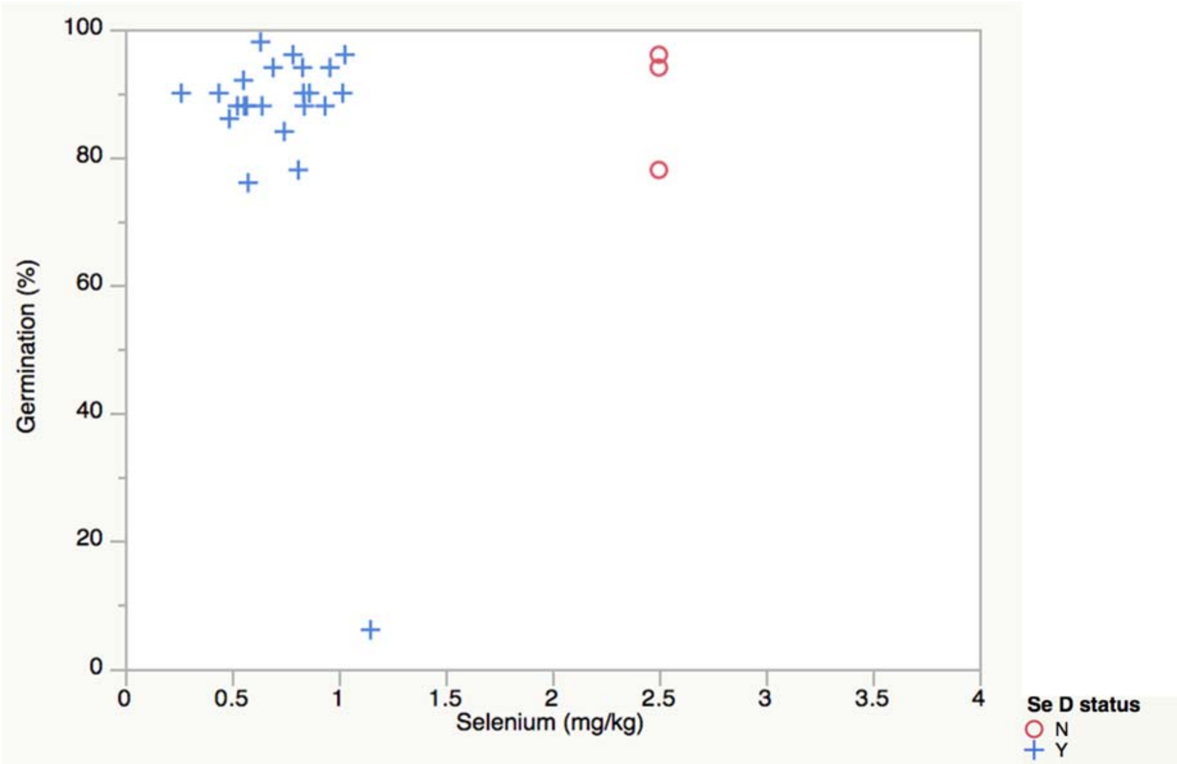


Figure H-6.2-11 Seedling germination versus selenium soil concentration

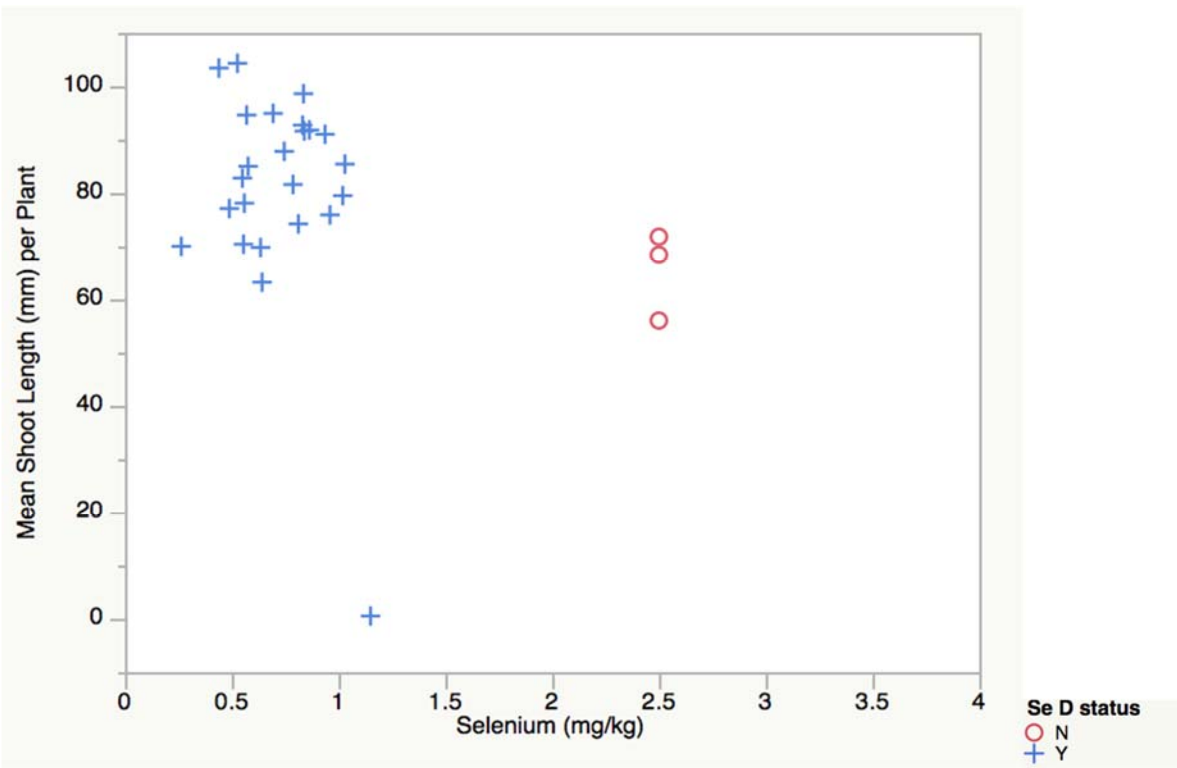


Figure H-6.2-12 Mean shoot length versus selenium soil concentration

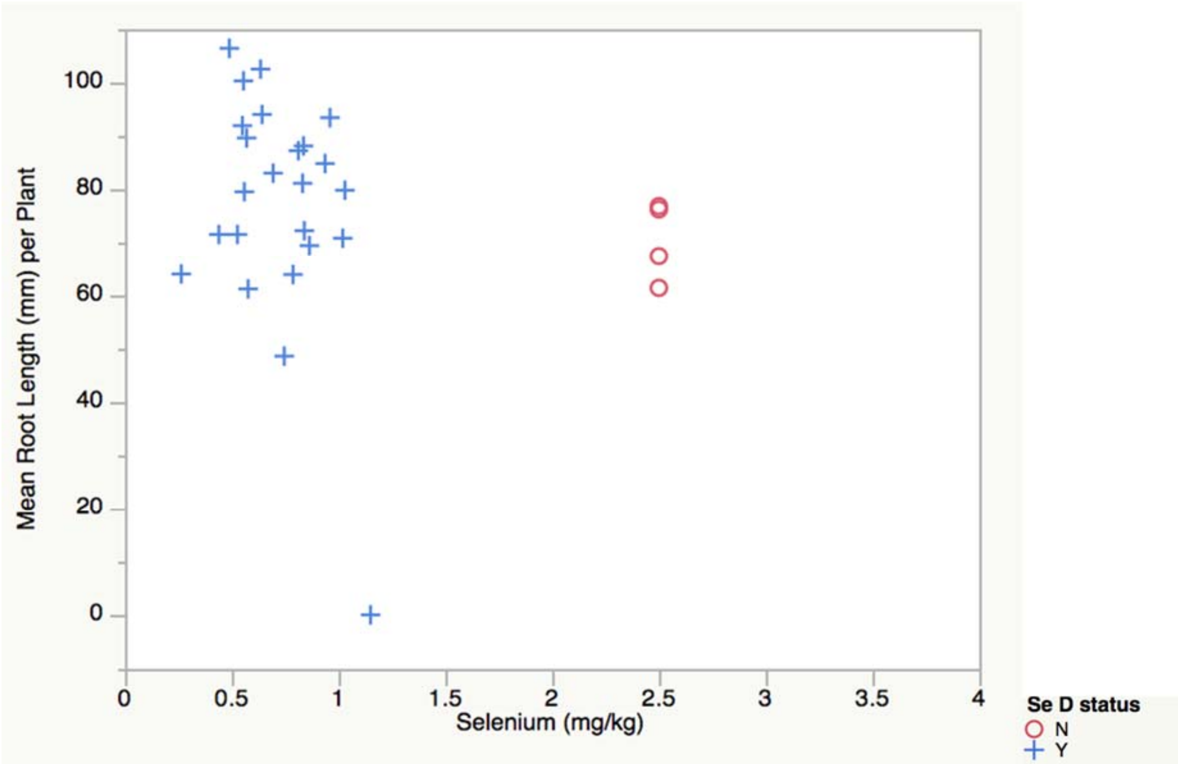


Figure H-6.2-13 Mean root length versus selenium soil concentration

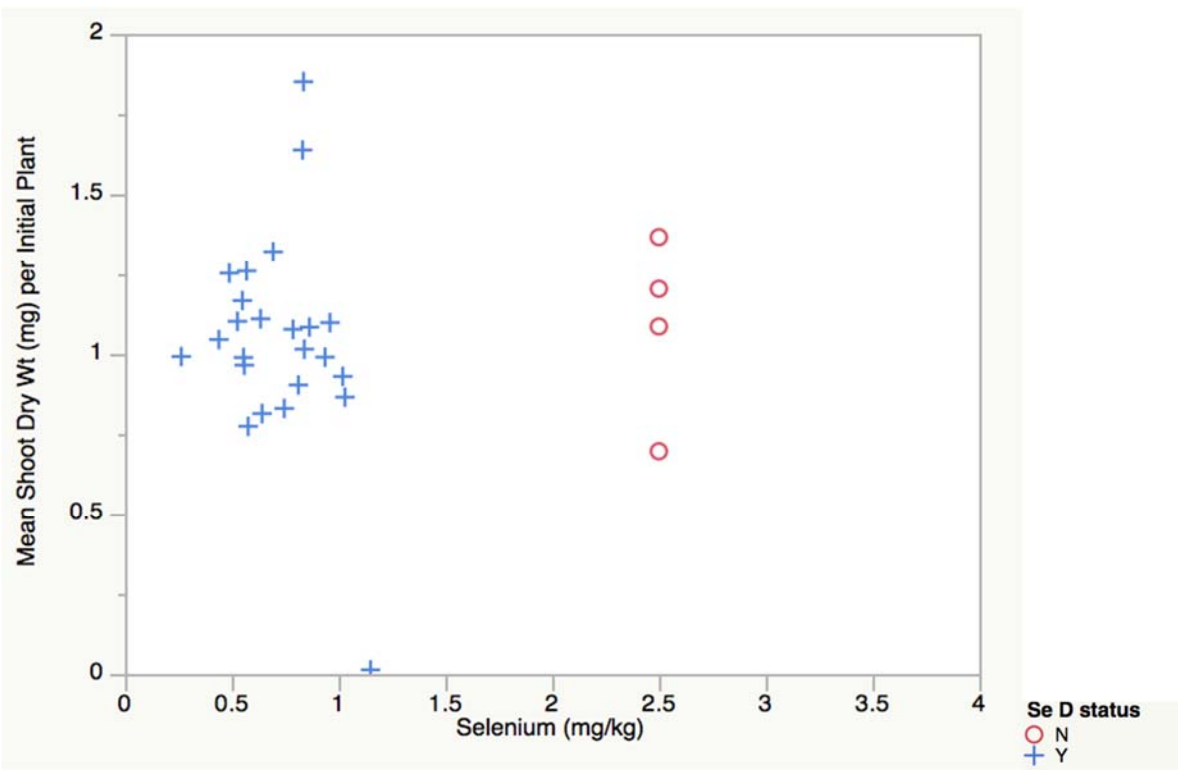


Figure H-6.2-14 Mean shoot dry weight versus selenium soil concentration

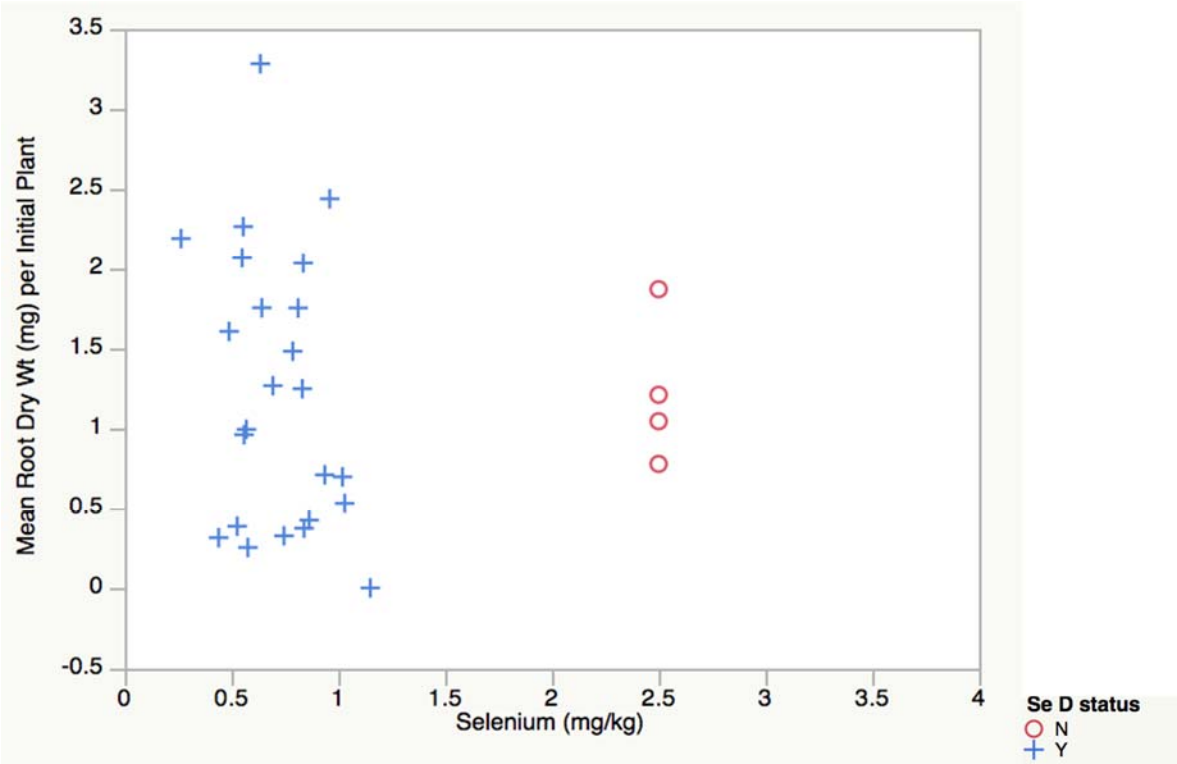


Figure H-6.2-15 Mean root dry weight versus selenium soil concentration

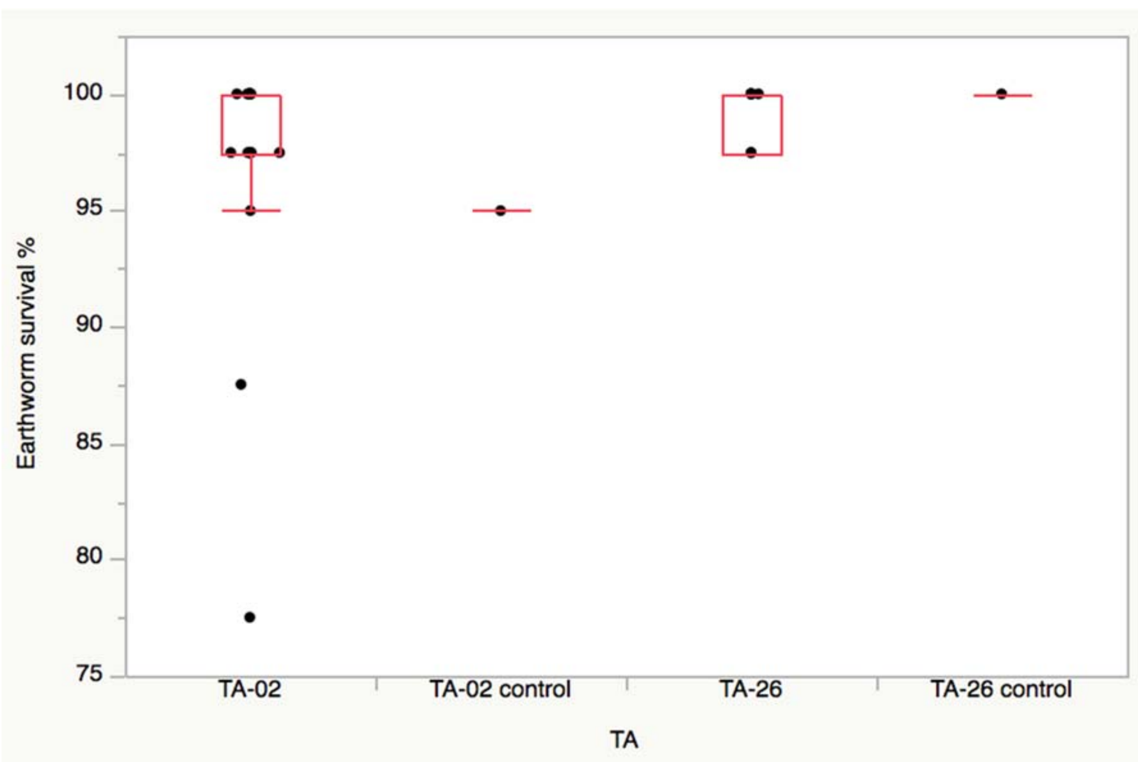


Figure H-6.2-16 Earthworm survival for study groups

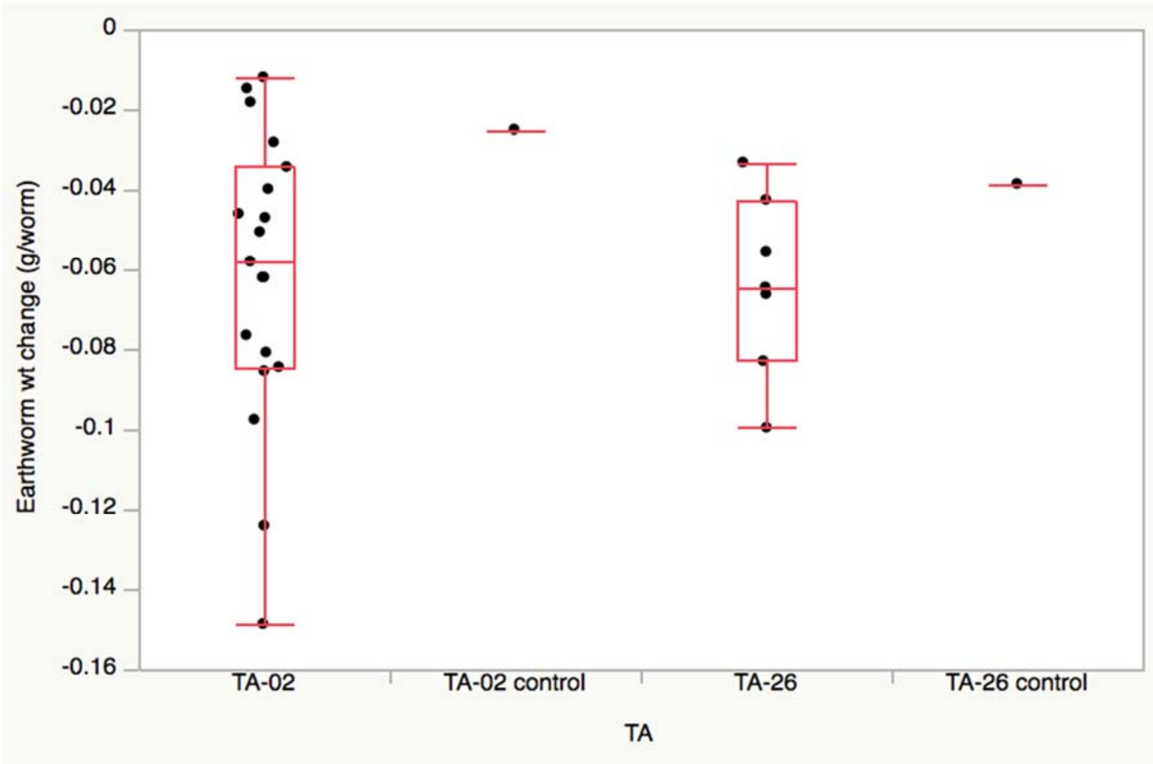


Figure H-6.2-17 Earthworm weight change for study groups

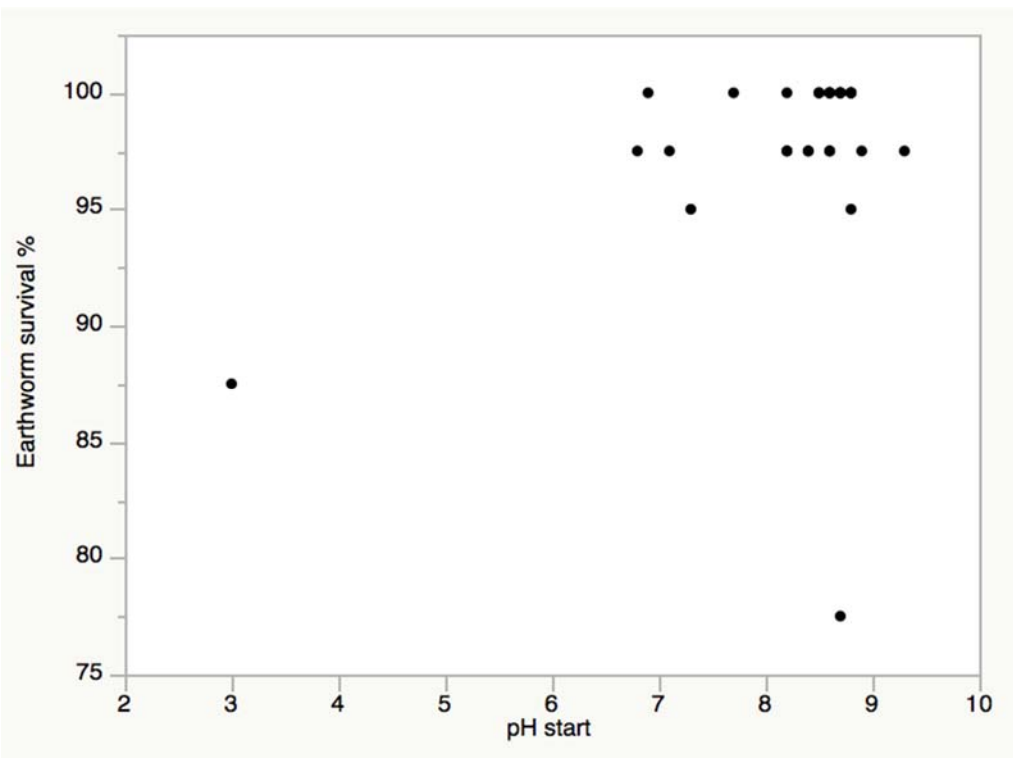


Figure H-6.2-18 Earthworm survival versus soil pH (start of bioassay).

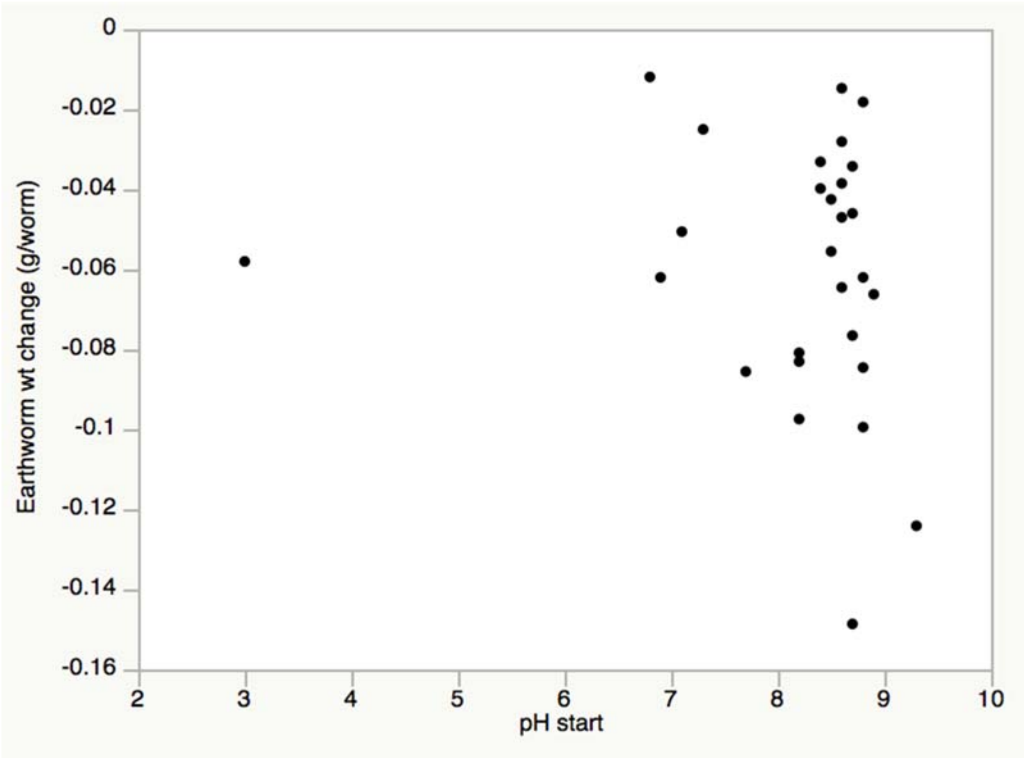


Figure H-6.2-19 Earthworm weight change versus soil pH (start of bioassay)

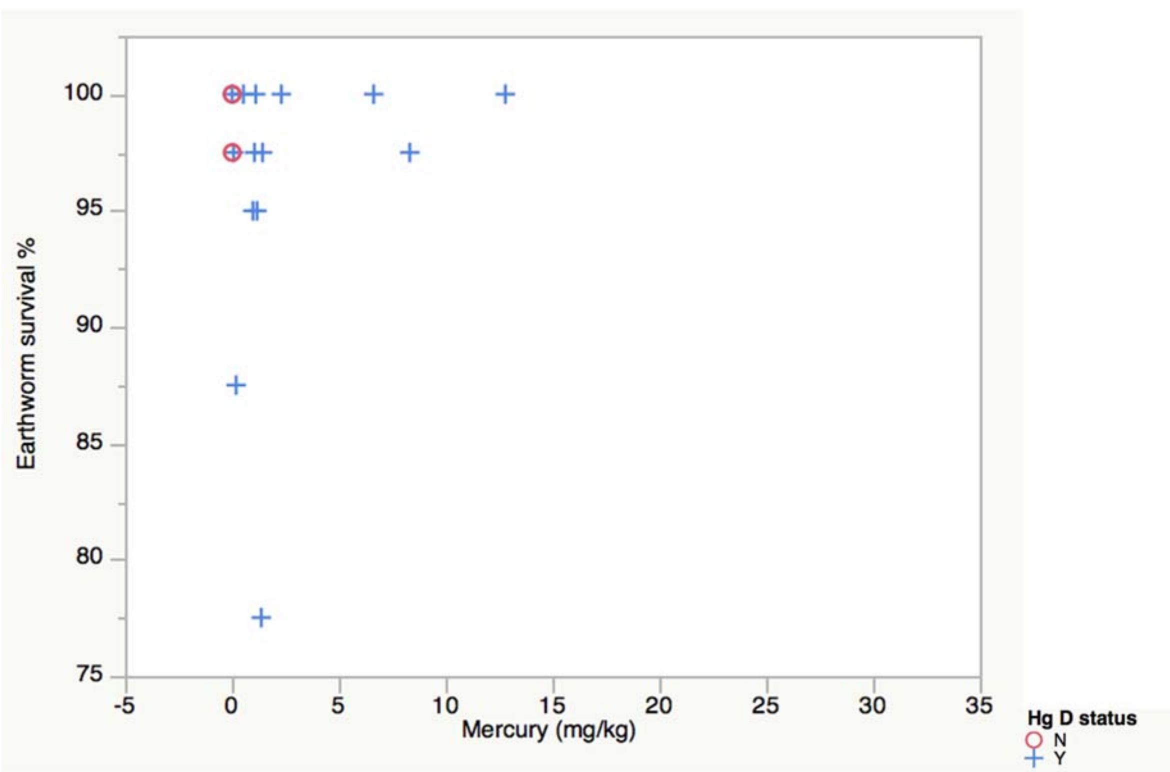


Figure H-6.2-20 Earthworm survival versus mercury soil concentration

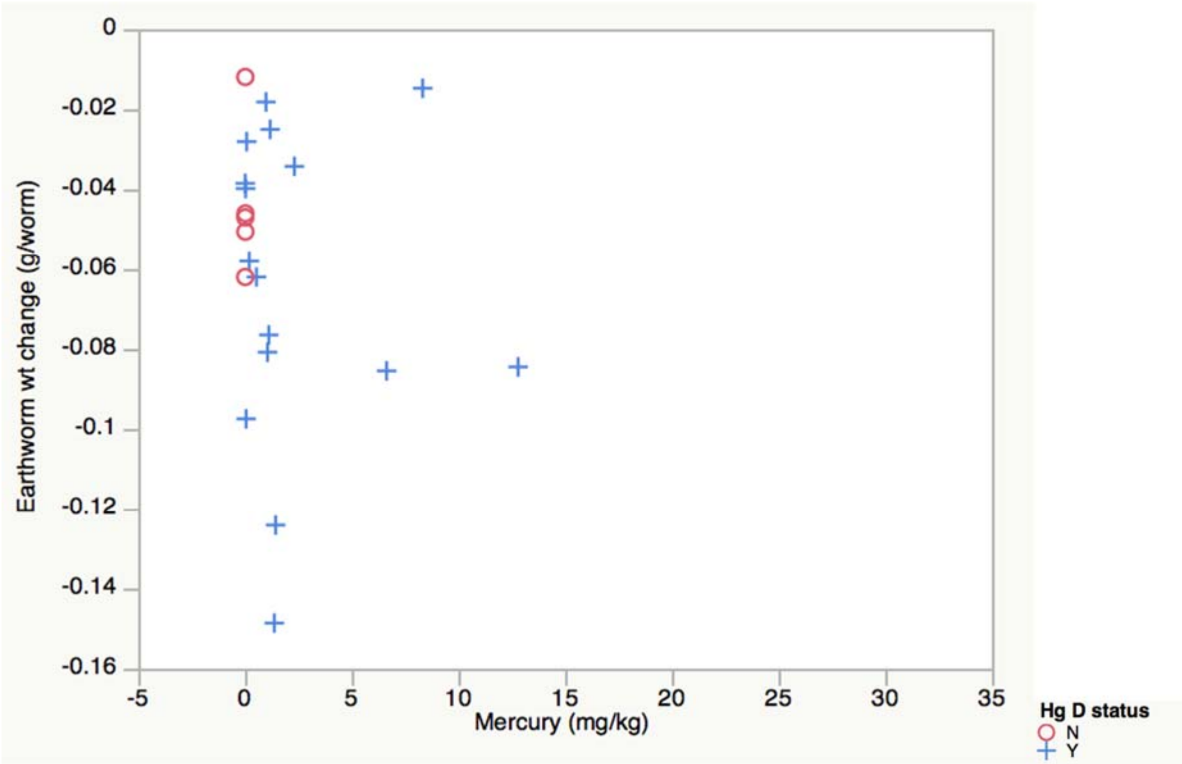


Figure H-6.2-21 Earthworm weight change versus mercury soil concentration

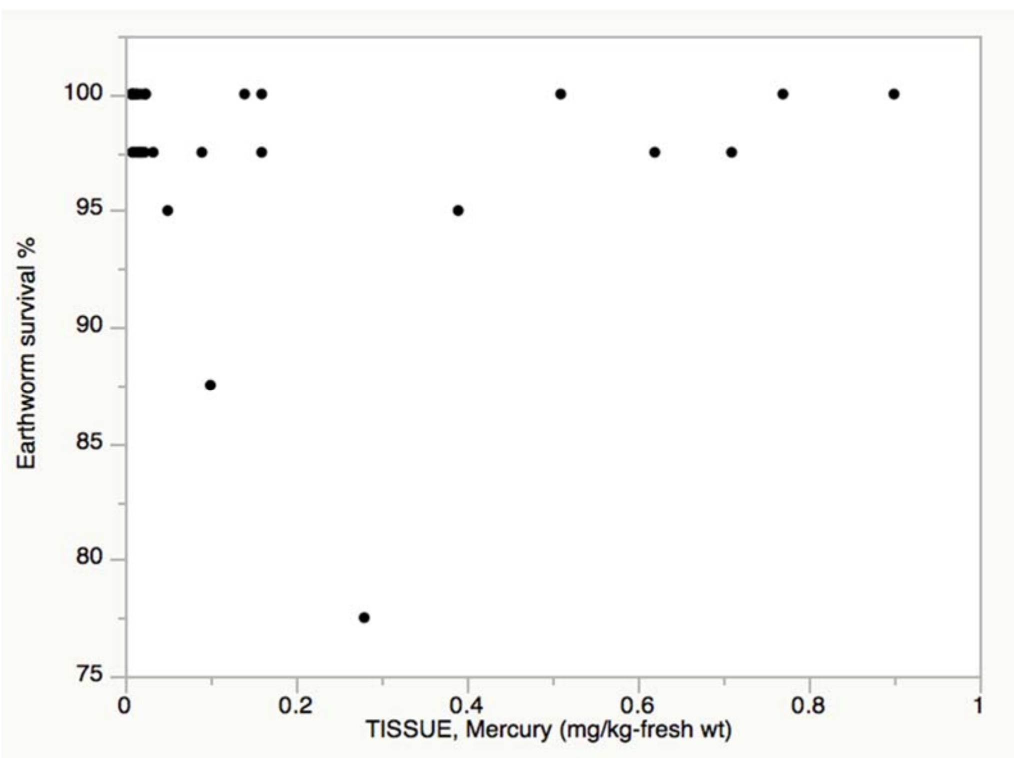


Figure H-6.2-22 Earthworm survival versus mercury tissue concentration

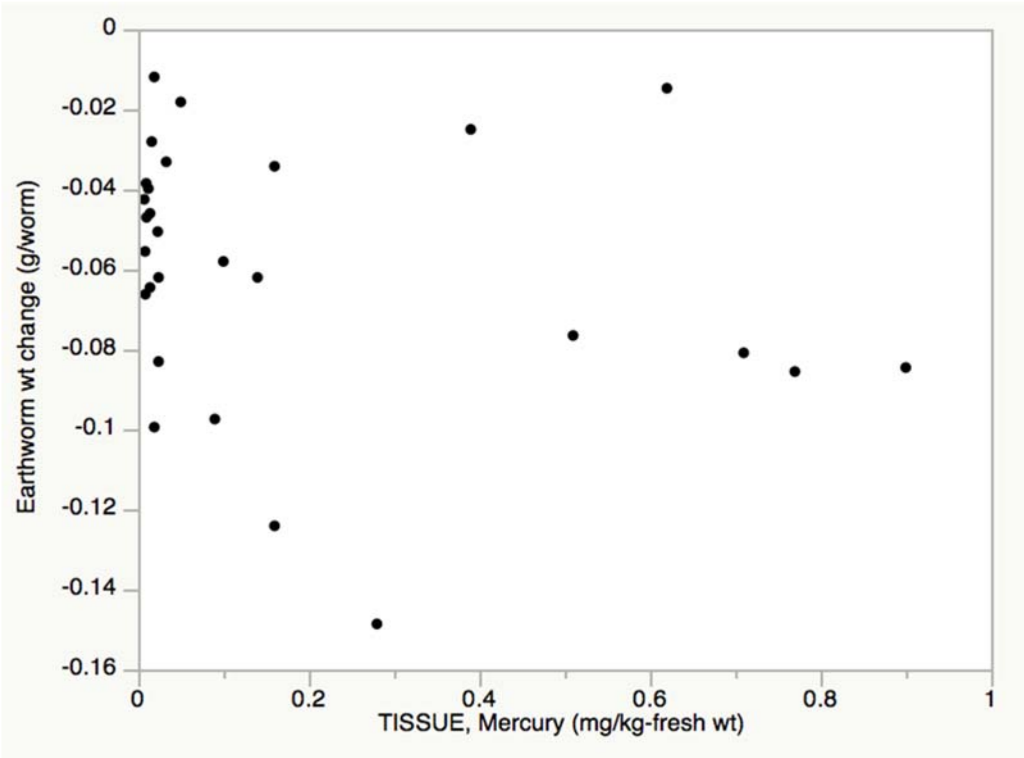


Figure H-6.2-23 Earthworm weight change versus mercury tissue concentration

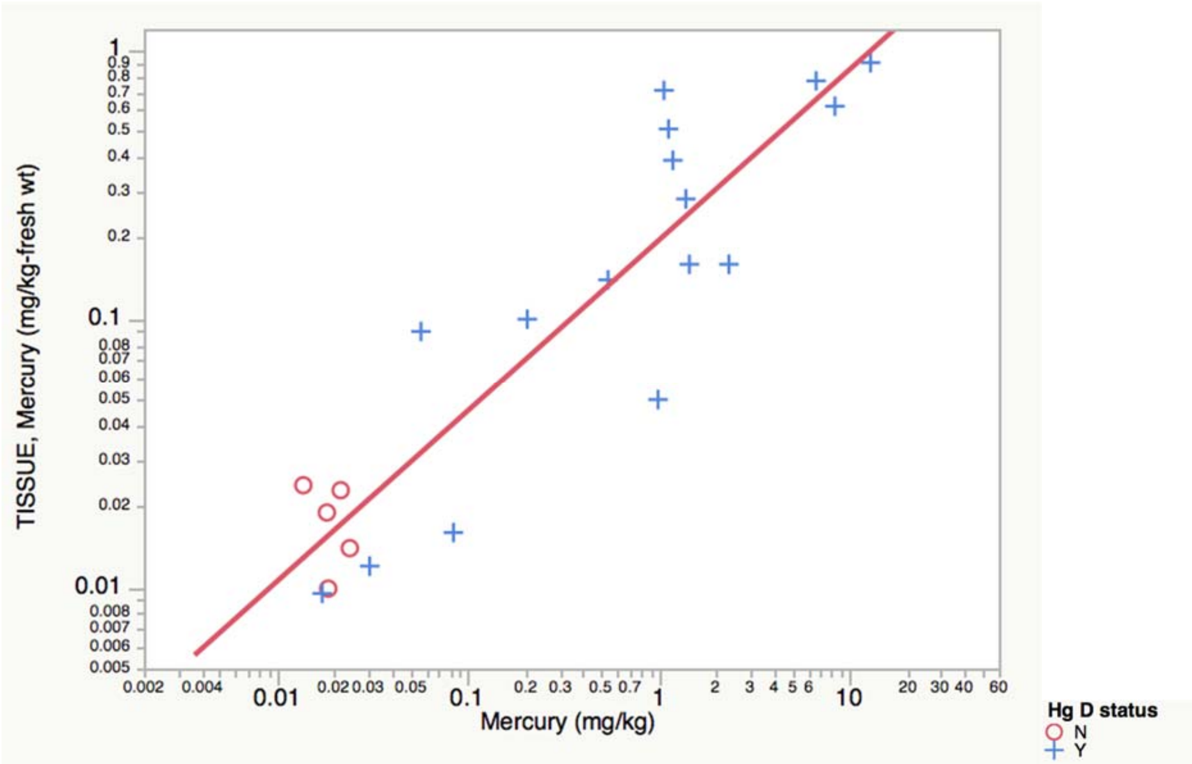


Figure H-6.2-24 Mercury tissue versus mercury soil concentration
Log(TISSUE, Mercury) = -1.62 + 0.636*Log(Mercury), r^2=0.83, n=21

Table H-2.3-1
EPCs at AOC 02-003(a) for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Cadmium	8	8	0.021	1.05	Gamma	0.762	95% Adjusted Gamma
Mercury	8	8	0.026	1.18	Normal	0.576	95% Student's-t
Perchlorate	7	2	0.000827	0.00565	n/a*	0.00565	Maximum detected concentration
Selenium	8	2	0.698	1.54(U)	n/a	0.821	Maximum detected concentration
Zinc	8	8	27	50.4	Normal	43.8	95% Student's-t
Organic Chemicals (mg/kg)							
Aroclor-1254	6	4	0.0094	0.171	n/a	0.171	Maximum detected concentration
Aroclor-1260	6	4	0.0109	0.74	n/a	0.74	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	8	8	0.139	5.7	Gamma	4.35	95% Adjusted Gamma
Plutonium-239/240	8	4	0.00708(U)	0.252	n/a	0.252	Maximum detected concentration
Tritium	8	1	-0.0122(U)	0.0118	n/a	0.0118	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-2
EPCs at AOC 02-003(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)							
Aluminum	24	24	1740	9980	Nonparametric	3620	95% Student's-t
Antimony	24	3	0.101	1.12(U)	n/a*	0.66	Maximum detected concentration
Arsenic	24	23	0.644	2.88	Lognormal	1.77	95% Student's-t
Cadmium	24	18	0.019(U)	2.23	Gamma	0.791	95% KM (Chebyshev)
Chromium (Total)	24	16	1.9	123	Nonparametric	19.8	95% KM (BCA)
Iron	24	24	5150	10300	Normal	7630	95% Student's-t
Manganese	24	24	170	330	Normal	276	95% Student's-t
Mercury	24	21	0.0017(U)	1.18	Gamma	0.391	95% KM (Chebyshev)
Nickel	24	15	1.9	22.4(U)	Nonparametric	3.33	95% KM (BCA)
Perchlorate	17	5	0.000596	0.00565	Normal	0.00168	95% KM (t)
Selenium	24	8	0.28(U)	1.61(U)	Normal	0.7	95% KM (t)
Vanadium	24	24	5.3	13	Normal	8.94	95% Student's-t
Zinc	24	24	27	170	Nonparametric	55.7	95% Student's-t
Organic Chemicals (mg/kg)							
Aroclor-1254	18	11	0.00347(U)	0.653	Gamma	0.182	95% KM (BCA)
Aroclor-1260	18	12	0.0018	1.25	Gamma	0.294	95% KM (BCA)
Bis(2-ethylhexyl)phthalate	18	1	0.149(U)	0.396(U)	n/a	0.153	Maximum detected concentration
Dichlorobenzene[1,4-]	28	1	0.000563	0.405(U)	n/a	0.000563	Maximum detected concentration
Methylene Chloride	10	2	0.00355	0.00608(U)	n/a	0.00452	Maximum detected concentration
Toluene	10	2	0.000362	0.00122U)	n/a	0.00037	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	23	20	-0.0385(U)	274	Nonparametric	69.1	95% KM (Chebyshev)
Plutonium-239/240	24	14	3.01E-10(U)	3.34	Lognormal	0.967	95% KM (Chebyshev)
Strontium-90	24	12	-0.133(U)	43	Gamma	8.05	95% KM (t)
Tritium	24	7	-0.0122(U)	0.107	Gamma	0.0533	95% KM Adjusted Gamma UCL

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-3
EPCs at AOC 02-003(b) for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Cadmium	5	1	0.172	0.521(U)	n/a*	0.172	Maximum detected concentration
Mercury	5	5	0.0086	0.443	n/a	0.443	Maximum detected concentration
Selenium	5	1	0.888	1.56(U)	n/a	0.888	Maximum detected concentration
Organic Chemicals (mg/kg)							
Aroclor-1254	5	5	0.0079	0.844	n/a	0.844	Maximum detected concentration
Aroclor-1260	5	5	0.0093	0.369	n/a	0.369	Maximum detected concentration
Radionuclides (pCi/g)							
Plutonium-239/240	5	3	0.0162(U)	0.768	n/a	0.768	Maximum detected concentration
Tritium	5	1	-0.00125(U)	0.0119(U)	n/a	0.0111	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-4
EPCs at AOC 02-003(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	15	15	1080	7190	Normal	3220	95% Student's-t
Antimony	12	0	0.398(U)	0.941(U)	n/a*	0.941(U)	Maximum detection limit
Arsenic	15	15	0.803	3.25	Normal	2.21	95% Student's-t
Barium	12	12	12.6	62.8	Normal	40.6	95% Student's-t
Cadmium	15	5	0.075	0.562(U)	Normal	0.244	95% KM (t)
Chromium (Total)	15	6	1.08(U)	16.6(U)	Normal	6.56	95% KM (t)
Copper	15	9	1.66(U)	6.07(U)	Normal	3.16	95% KM (t)
Iron	15	15	5100	9160	Normal	7350	95% Student's-t
Manganese	15	15	202	350	Normal	290	95% Student's-t
Mercury	15	12	0.004	0.443	Lognormal	0.179	95% KM (Chebyshev)
Nickel	15	12	1.08	5.02(U)	Normal	3.13	95% KM (t)
Selenium	15	5	0.203	1.69(U)	Normal	0.954	95% KM (t)
Vanadium	15	15	2.62	12.2	Normal	8.14	95% Student's-t
Organic Chemicals (mg/kg)							
Aroclor-1248	12	1	0.00342(U)	0.0701(U)	n/a	0.0076	Maximum detected concentration
Aroclor-1254	12	9	0.0035	0.844	Gamma	0.399	95% KM (Chebyshev)
Aroclor-1260	12	12	0.0022	0.369	Gamma	0.149	95% Adjusted Gamma
Butylbenzene[n-]	6	1	0.000661	0.00118(U)	n/a	0.000661	Maximum detected concentration
Isopropyltoluene[4-]	6	1	0.000403	0.00118(U)	n/a	0.000403	Maximum detected concentration
Trimethylbenzene[1,2,4-]	6	1	0.000229	0.00118(U)	n/a	0.000229	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	12	10	0.0278(U)	4.46	Nonparametric	3.04	95% KM (Chebyshev)
Plutonium-239/240	15	7	0.00652(U)	0.768	Normal	0.329	95% KM (t)
Stontium-90	15	3	-0.13(U)	0.96	n/a	0.96	Maximum detected concentration
Tritium	15	5	-0.00125(U)	0.0321	Normal	0.015	95% KM (t) UCL

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-5
EPCs at AOC 02-003(c) for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Barium	12	12	26.1	380	Gamma	196	95% Adjusted Gamma
Cadmium	12	6	0.136	0.59(U)	Normal	0.268	95% KM (t)
Copper	12	12	2.29	80	Nonparametric	47	95% Chebyshev (Mean, Sd)
Mercury	12	12	0.0254	1.11	Normal	0.503	95% Student's-t
Perchlorate	11	2	0.000591	0.00236(U)	n/a*	0.000591	Maximum detected concentration
Selenium	12	7	0.642	14.6	Normal	5.51	95% KM (t)
Organic Chemicals (mg/kg)							
Aroclor-1254	2	1	0.00347(U)	0.0065	n/a	0.0065	Maximum detected concentration
Aroclor-1260	2	2	0.0019	0.0077	n/a	0.0077	Maximum detected concentration
Toluene	1	1	0.000928(J)	0.000928(J)	n/a	0.000928(J)	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	11	10	-0.0326(U)	3.32	Normal	1.8	95% KM (t)
Cobalt-60	12	1	-0.0112(U)	0.24	n/a	0.24	Maximum detected concentration
Plutonium-239/240	12	9	0.00907(U)	0.327	Normal	0.175	95% KM (t)
Tritium	12	3	-0.00520(U)	0.138	n/a	0.138	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-6
EPCs at AOC 02-003(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	27	5	0.16	0.947(U)	Normal	0.188	95% KM (t)
Arsenic	27	26	0.547(U)	3.09	Normal	2.04	95% KM (t)
Barium	27	27	14.5	2230	Nonparametric	628	95% Chebyshev (Mean, Sd)
Cadmium	27	6	0.018(U)	0.59(U)	Normal	0.256	95% KM (t)
Chromium (Total)	27	27	1.71	23.2	Gamma	9.76	95% Adjusted Gamma
Copper	27	27	1.85	80	Nonparametric	24.2	95% Chebyshev (Mean, Sd)
Iron	27	27	5080	14400	Normal	8130	95% Student's-t
Manganese	27	27	162	360	Normal	259	95% Student's-t
Mercury	27	27	0.0028	2.43	Gamma	0.517	95% Adjusted Gamma
Perchlorate	24	3	0.000591	0.00236(U)	n/a*	0.00113	Maximum detected concentration
Selenium	27	17	0.28(U)	14.6	Nonparametric	7.22	95% KM (Chebyshev)
Thallium	27	14	0.0453(U)	8.21	Nonparametric	1.72	95% KM (Chebyshev)
Vanadium	27	27	3.67	12.7	Normal	8.99	95% Student's-t
Organic Chemicals (mg/kg)							
Acetone	14	1	0.00526(U)	0.0101	n/a	0.0101	Maximum detected concentration
Aroclor-1254	4	1	0.0035(U)	0.0065	n/a	0.0065	Maximum detected concentration
Aroclor-1260	4	3	0.0019	0.0077	n/a	0.0077	Maximum detected concentration
Chloroform	14	4	0.000257	0.00115(U)	n/a	0.000319	Maximum detected concentration
Toluene	14	6	0.00037	0.00116(U)	Normal	0.000798L	95% KM (t)
Radionuclides (pCi/g)							
Cesium-137	26	19	-0.0621(U)	3.32	Gamma	0.947	95% KM (Percentile Bootstrap)
Cobalt-60	27	1	-0.0287(U)	0.24	n/a	0.24	Maximum detected concentration
Plutonium-239/240	27	13	0.00158(U)	0.327	Normal	0.0902	95% KM (t)
Tritium	27	6	-0.0229(U)	0.160	Normal	0.0193	95% KM (t) UCL

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-7
EPCs at AOC 02-003(d) for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	13	0	0.28(UJ)	1.08(UJ)	n/a*	1.08(U)	Maximum detection limit
Cadmium	20	7	0.042	0.572(U)	Normal	0.156	95% KM (t)
Mercury	20	19	0.0047	0.139	Gamma	0.0616	95% Adjusted Gamma
Nitrate	16	15	1.07(U)	22.6	Normal	9.15	95% KM (t)
Perchlorate	16	12	0.000627	0.00243	Normal	0.00166	95% KM (t)
Selenium	20	13	0.27(U)	9.04	Nonparametric	4.22	95% KM Chebyshev
Zinc	20	20	23.8	71.2	Normal	50.1	95% Student's-t
Organic Chemicals (mg/kg)							
Aroclor-1254	6	3	0.0035	0.0082	n/a	0.0082	Maximum detected concentration
Aroclor-1260	6	3	0.0027	0.0053	n/a	0.0053	Maximum detected concentration
Radionuclides (pCi/g)							
Cobalt-60	20	1	-0.0314(U)	0.97	n/a	0.97	Maximum detected concentration
Plutonium-239/240	20	16	0.00153 (U)	0.198	Lognormal	0.0918	95% KM (BCA)
Tritium	19	2	-0.00716(U)	0.103	n/a	0.103	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-8
EPCs at AOC 02-003(d) 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	39	39	980	17,000	Lognormal	6720	95% Chebyshev (Mean, Sd)
Antimony	27	1	0.28(UJ)	1.08(U)	n/a*	0.32	Maximum detected concentration
Arsenic	39	37	0.777	3.85	Normal	2.09	95% KM (t)
Barium	39	39	12.4	78.4	Normal	43.2	95% Student's-t
Beryllium	39	39	0.274	5.84	Nonparametric	1.83	95% Chebyshev (Mean, Sd)
Cadmium	39	11	0.0402(UJ)	0.572(U)	Normal	0.149	95% KM (t)
Calcium	39	39	232	3850	Gamma	1590	95% Adjusted Gamma
Chromium (Total)	39	32	1.87	29.5	Gamma	6.88	95% KM (BCA)
Copper	39	36	0.886(U)	6.13	Normal	3.46	95% KM (t)
Iron	39	39	3590	10500	Normal	7920	95% Student's-t
Magnesium	39	39	167	2380	Nonparametric	893	95% Bootstrap-t
Manganese	39	39	142	426	Normal	287	95% Student's-t
Mercury	39	32	0.0032	0.139	Gamma	0.0397	95% KM (BCA)
Nickel	39	39	0.504	9.12	Gamma	3.46	95% Adjusted Gamma
Nitrate	30	24	0.888	22.6	Gamma	5.98	95% KM (BCA)
Perchlorate	30	18	0.000565	0.00271	Normal	0.00147	95% KM (t)
Selenium	39	23	0.27(U)	12	Nonparametric	3.96	95% KM (Chebyshev)
Vanadium	39	36	0.934	13.5	Normal	7.01	95% KM (t)
Zinc	39	39	9.96	78.2	Normal	46.5	95% Student's-t
Organic Chemicals (mg/kg)							
Aroclor-1254	17	5	0.0015	0.0302	Gamma	0.0106	95% Gamma Adjusted KM
Aroclor-1260	17	3	0.0027	0.0053	n/a	0.0053	Maximum detected concentration
Toluene	14	3	0.000375	0.00113(U)	n/a	0.000646	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	38	25	-0.0454(U)	1.15	Normal	0.391	95% KM (t)
Cobalt-60	39	1	-0.0776(U)	0.97	n/a	0.97	Maximum detected concentration
Plutonium-239/240	39	19	-0.00449(U)	0.198	Gamma	0.0534	95% KM (t)
Tritium	38	12	-0.00716(U)	0.103	Normal	0.0159	95% KM (t)

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-9
EPCs at AOC 02-003(d) for Ecological Receptors

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Aluminum	38	38	980	17,000	Lognormal	6720	95% Chebyshev (Mean, Sd)
Antimony	26	1	0.28(UJ)	1.08(U)	n/a*	0.32	Maximum detected concentration
Arsenic	38	36	0.831	3.85	Normal	2.09	95% KM (t)
Barium	38	38	12.4	78.4	Normal	43.2	95% Student's-t
Beryllium	38	38	0.274	5.84	Nonparametric	1.83	95% Chebyshev (Mean, Sd)
Cadmium	38	10	0.0402(U)	0.572(U)	Normal	0.149	95% KM (t)
Calcium	38	38	232	3850	Gamma	1590	95% Adjusted Gamma
Chromium (Total)	38	31	1.87	29.5	Gamma	6.79	95% KM (BCA)
Copper	38	35	0.886(U)	6.13	Normal	3.46	95% KM (t)
Iron	38	38	3590	10,500	Normal	7920	95% Student's-t
Magnesium	38	38	167	2380	Lognormal	862	95% Percentile Bootstrap
Manganese	38	38	142	426	Normal	287	95% Student's-t
Mercury	38	32	0.0032	0.139	Gamma	0.0397	95% KM (BCA)
Nickel	38	38	0.504	9.12	Gamma	3.46	95% Adjusted Gamma
Nitrate	30	24	0.888	22.6	Gamma	5.85	95% KM (BCA)
Perchlorate	30	18	0.000565	0.00271	Normal	0.00147	95% KM (t)
Selenium	38	23	0.27(U)	12	Nonparametric	3.96	95% KM Chebyshev
Vanadium	36	33	0.934	13.5	Normal	7.01	95% KM (t)
Zinc	36	36	9.96	76.4	Normal	46.5	95% Student's-t
Organic Chemicals (mg/kg)							
Aroclor-1254	16	4	0.0015	0.0082	n/a	0.0082	Maximum detected concentration
Aroclor-1260	16	3	0.0027	0.0053	n/a	0.0053	Maximum detected concentration
Toluene	14	3	0.000375	0.00113(U)	n/a	0.000646	Maximum detected concentration

Table H-2.3-9 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Radionuclides (pCi/g)							
Cesium-137	37	25	-0.0454(U)	1.15	Normal	0.391	95% KM (t)
Cobalt-60	38	1	-0.0776(U)	0.97	n/a	0.97	Maximum detected concentration
Plutonium-239/240	38	19	0.00449(U)	0.198	Gamma	0.0534	95% KM (t)
Tritium	37	11	-0.00716(U)	0.103	Normal	0.0153	95% KM (t)

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-10
EPCs at AOC 02-003(e) for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Cadmium	4	3	0.124	0.507(U)	n/a*	0.291	Maximum detected concentration
Mercury	4	4	0.0296	2.58	n/a	2.58	Maximum detected concentration
Perchlorate	4	1	0.000527	0.00207(U)	n/a	0.000527	Maximum detected concentration
Selenium	4	2	0.723	1.53(U)	n/a	0.743	Maximum detected concentration
Zinc	4	4	30.1	59.1	n/a	59.1	Maximum detected concentration
Organic Chemicals (mg/kg)							
Aroclor-1260	4	3	0.0216	0.611	n/a	0.611	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	4	1	0.0882	0.172(U)	n/a	0.0882	Maximum detected concentration
Radionuclides (pCi/g)							
Tritium	4	1	0.00280(U)	0.00996	n/a	0.00996	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-11
EPCs at AOC 02-003(e) for the Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	14	2	0.29(U)	2.3	n/a*	2.3	Maximum detected concentration
Cadmium	15	9	0.047	1.18	Normal	0.399	95% KM (t)
Chromium (Total)	15	9	2	72.9	Gamma	21	95% KM (BCA)
Lead	15	15	5.71	3400	Nonparametric	1220	95% Chebyshev (Mean, Sd)
Mercury	15	13	0.0016(U)	2.58	Gamma	0.997	95% KM (Chebyshev)
Perchlorate	12	3	0.000527	0.0296	n/a	0.0296	Maximum detected concentration
Selenium	15	9	0.28(U)	2.63	Normal	1.31	95% KM (t)
Zinc	15	15	26	543	Nonparametric	219	95% Chebyshev (Mean, Sd)
Organic Chemicals (mg/kg)							
Aroclor-1254	12	4	0.00355(U)	0.0974	n/a	0.0974	Maximum detected concentration
Aroclor-1260	12	8	0.0032	0.611	Gamma	0.177	95% KM (BCA)
Bis(2-ethylhexyl)phthalate	12	2	0.0882	0.183(U)	n/a	0.11	Maximum detected concentration
Toluene	8	1	0.00043	0.0011(U)	n/a	0.00043	Maximum detected concentration
Radionuclides (pCi/g)							
Americium-241	12	1	-0.0041(U)	0.0376	n/a	0.0376	Maximum detected concentration
Cesium-137	13	11	0.00203(U)	4550	Gamma	197	95% KM (Chebyshev)
Plutonium-239/240	15	7	0.0083(U)	2.9	Normal	0.81	95% KM (t)
Strontium-90	15	6	-0.000413(U)	10.4	Normal	3.41	95% KM (t)
Tritium	15	7	-0.000305(U)	0.0779	Normal	0.026	95% KM (t)

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-12
EPCs at AOC 02-004(a) for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Cadmium	32	10	0.113	14.8	Nonparametric	1.67	95% KM (BCA)
Chromium (Total)	32	25	3.06	44.9	Lognormal	12.8	95% KM (BCA)
Copper	32	31	2.25	43.4	Nonparametric	11.5	95% KM (Chebyshev)
Cyanide (Total)	32	11	0.085	2.59	Gamma	0.437	95% KM (t)
Mercury	32	32	0.0153	8.2	Lognormal	3.26	95% Chebyshev (Mean, Sd)
Perchlorate	32	6	0.000521	0.00251(U)	Normal	0.00108	95% KM (t)
Selenium	32	21	0.559	11.3	Nonparametric	7.31	95% KM Chebyshev
Zinc	32	32	26.9	90.5	Normal	51.6	95% Student's-t
Organic Chemicals (mg/kg)							
Aroclor-1254	29	15	0.002	0.659	Normal	0.165	95% KM (t)
Aroclor-1260	29	27	0.003	2.42	Gamma	0.899	95% KM (Chebyshev)
Dibenzofuran	32	1	0.00363(U)	0.697(U)	n/a*	0.174	Maximum detected concentration
Total Petroleum Hydrocarbons Diesel Range Organics	18	16	0.112(U)	454	Lognormal	151	95% KM Chebyshev
Radionuclides (pCi/g)							
Cesium-137	21	14	-0.0726(U)	4.76	Nonparametric	1.71	95% KM Chebyshev
Cobalt-60	24	2	-0.0267(U)	2.86	n/a	2.86	Maximum detected concentration
Plutonium-239/240	32	5	-0.00147(U)	0.806	Nonparametric	0.153	95% KM Chebyshev
Strontium-90	32	3	-0.0969(U)	1.61	n/a	1.61	Maximum detected concentration
Tritium	30	11	-0.0099(U)	0.0478(U)	Normal	0.00783	95% KM (t)

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-13
EPCs at AOC 02-004(a) for the Residential and Construction Worker Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Aluminum	75	75	964	5390	Normal	3490	95% Student's-t
Antimony	73	0	0.118(U)	1.21(U)	n/a*	1.21(U)	Maximum detection limit
Arsenic	75	70	0.644	3.97	Normal	2.18	95% KM (t)
Barium	75	75	11	128	Normal	44.6	95% Student's-t
Cadmium	75	17	0.058	14.8	Nonparametric	0.907	95% KM (BCA)
Chromium (Total)	75	66	3.06	44.9	Lognormal	10.3	95% KM (BCA)
Chromium hexavalent ion	5	4	0.0641	0.13	n/a	0.13	Maximum detected concentration
Copper	75	74	1.08	43.4	Lognormal	6.06	95% KM (BCA)
Cyanide (Total)	65	19	0.085	2.59	Lognormal	0.298	95% KM (t)
Iron	75	75	4700	11600	Normal	8240	95% Student's-t
Manganese	75	75	102	505	Normal	293	95% Student's-t
Mercury	75	73	0.002	40.6	Lognormal	4.07	95% KM (Chebyshev)
Nickel	75	65	0.955	14	Lognormal	3.88	95% KM (BCA)
Perchlorate	65	11	0.000521	0.00271(U)	Normal	0.00124	95% KM (t)
Selenium	75	45	0.233	11.3	Nonparametric	4.86	95% KM (Chebyshev)
Vanadium	75	75	2.05	16	Normal	9.69	95% Student's-t
Zinc	75	75	17	90.5	Normal	42.6	95% Student's-t

Table H-2.3-13 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Organic Chemicals (mg/kg)							
Acetone	33	2	0.004	0.00865	n/a	0.00865	Maximum detected concentration
Aroclor-1242	59	1	0.00342(U)	0.347(U)	n/a	0.0209	Maximum detected concentration
Aroclor-1248	59	2	0.00342(U)	0.347(U)	n/a	0.0867	Maximum detected concentration
Aroclor-1254	59	25	0.002	0.659	Lognormal	0.0869	95% KM (BCA)
Aroclor-1260	59	46	0.003	2.42	Lognormal	0.465	95% KM (Chebyshev)
Chloroform	33	2	0.000232	0.00136(U)	n/a	0.000242	Maximum detected concentration
Dibenzofuran	66	1	0.00363(U)	1.15(U)	n/a	0.174	Maximum detected concentration
Isopropyltoluene[4-]	33	1	6e-04	0.00136(U)	n/a	6e-04	Maximum detected concentration
Toluene	33	3	0.000569	0.00114(U)	n/a	0.00107	Maximum detected concentration
Total Petroleum Hydrocarbons Diesel Range Organics	34	26	0.112(U)	454	Lognormal	84.8	95% KM (Chebyshev)
Xylene[1,2-]	33	1	0.000353	0.00136(U)	n/a	0.000353	Maximum detected concentration
Xylene[1,3-]+Xylene[1,4-]	33	1	0.000839	0.00271(U)	n/a	0.000839	Maximum detected concentration
Radionuclides (pCi/g)							
Americium-241	64	1	-0.0162(U)	0.0532	n/a	0.0532	Maximum detected concentration
Cesium-137	57	23	-0.0726(U)	4.76	Nonparametric	0.68	95% KM (Chebyshev)
Cobalt-60	64	6	-0.0267(U)	4.29	Normal	0.346	95% KM (t)
Plutonium-239/240	74	11	-0.00638(U)	2.44	Nonparametric	0.203	95% KM (Chebyshev)
Strontium-90	69	3	-0.0969(U)	1.61	n/a	1.61	Maximum detected concentration
Tritium	72	44	-0.0104(U)	19.2	Nonparametric	1.73	95% KM (Chebyshev)

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-14
EPCs at AOC 02-004(b,c,d) for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Cadmium	9	4	0.109	0.525(U)	n/a*	0.371	Maximum detected concentration
Chromium (Total)	9	9	6.23	37.3	Normal	26.3	95% Student's-t
Perchlorate	9	6	0.000599	0.00208(U)	Normal	0.00139	95% KM (t)
Selenium	9	3	0.671	1.57(U)	n/a	0.76	Maximum detected concentration
Zinc	9	9	43.4	158	Gamma	101	95% Adjusted Gamma
Organic Chemicals (mg/kg)							
Aroclor-1254	9	7	0.0075	0.197	Normal	0.114	95% KM (t)
Aroclor-1260	9	9	0.0092	0.431	Normal	0.25	95% Student's-t
Dibenzofuran	9	1	0.163	0.35(U)	n/a	0.163	Maximum detected concentration
Radionuclides (pCi/g)							
Cobalt-60	7	2	0.000681(U)	0.884	n/a	0.884	Maximum detected concentration
Plutonium-239/240	9	7	0.0263(U)	0.756	Gamma	0.507	95% KM (Chebyshev)
Tritium	9	4	-0.0000611(U)	0.0166	n/a	0.0166	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-15
EPCs at AOC 02-004(b,c,d) 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	15	15	2180	3540	Nonparametric	3900	95% Student's-t
Arsenic	15	15	1.19	2.78	Normal	2.17	95% Student's-t
Cadmium	15	7	0.109	0.525(U)	n/a*	0.371	Maximum detected concentration
Chromium (Total)	15	13	6.23	37.3	Normal	20.9	95% KM (t)
Iron	15	15	7150	9040	Normal	8560	95% Student's-t
Manganese	15	15	214	297	Nonparametric	386	95% Student's-t
Nickel	15	12	2.94	4.58	Normal	3.6	95% KM (t)
Perchlorate	14	7	0.000599	0.00208(U)	Normal	0.0015	95% KM (t)
Selenium	15	7	0.671	1.57(U)	n/a	1.52	Maximum detected concentration
Vanadium	15	15	6.95	9.82	Normal	9.77	95% Student's-t
Zinc	15	15	43.4	158	Gamma	72.4	95% Adjusted Gamma
Organic Chemicals (mg/kg)							
Aroclor-1254	15	8	0.0075	0.197	Normal	0.0728	95% KM (t)
Aroclor-1260	15	13	0.0092	0.431	Gamma	0.254	95% KM (Chebyshev)
Dibenzofuran	15	1	0.163	0.35(U)	n/a	0.163	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	10	8	-0.0254(U)	1.29	Normal	0.651	95% KM (t)
Cobalt-60	10	2	0.000681(U)	0.884	n/a	0.884	Maximum detected concentration
Plutonium-239/240	12	7	0.0263(U)	0.756	Gamma	0.253	95% KM (BCA)
Tritium	13	6	-0000611(U)	0.916	n/a	0.916	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-16
EPCs at AOC 02-004(e) for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Chromium (Total)	3	2	29	66.2(U)	n/a*	31.6	Maximum detected concentration
Copper	3	3	6.59	19	n/a	19	Maximum detected concentration
Lead	3	3	10.3	23.2	n/a	23.2	Maximum detected concentration
Mercury	3	3	0.0633	1.2	n/a	1.2	Maximum detected concentration
Perchlorate	3	3	0.000536	0.00162	n/a	0.00162	Maximum detected concentration
Zinc	3	3	65.8	120	n/a	120	Maximum detected concentration
Organic Chemicals (mg/kg)							
Aroclor-1254	3	1	0.00346(U)	0.0736	n/a	0.0736	Maximum detected concentration
Aroclor-1260	3	3	0.00455	0.18	n/a	0.18	Maximum detected concentration
Radionuclides (pCi/g)							
Plutonium-239/240	3	2	0.00768(U)	0.392	n/a	0.392	Maximum detected concentration
Tritium	3	1	0.000645(U)	0.0111	n/a	0.0111	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-17
EPCs at AOC 02-004(e) for the Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Cadmium	6	4	0.116	0.573(U)	n/a*	0.284	Maximum detected concentration
Chromium (Total)	6	4	4.94	66.2(U)	n/a	31.6	Maximum detected concentration
Copper	6	5	2.22	19	n/a	19	Maximum detected concentration
Lead	6	6	6.36	23.2	n/a	23.2	Maximum detected concentration
Mercury	6	5	0.0042(U)	1.2	n/a	1.2	Maximum detected concentration
Perchlorate	5	3	0.000536	0.0023(U)	n/a	0.00162	Maximum detected concentration
Selenium	6	3	0.551	1.72(U)	n/a	1.51	Maximum detected concentration
Zinc	6	6	13	120	n/a	120	Maximum detected concentration
Organic Chemicals (mg/kg)							
Aroclor-1254	6	2	0.00346(U)	0.0736	n/a	0.0736	Maximum detected concentration
Aroclor-1260	6	6	0.0024	0.18	n/a	0.18	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	6	5	-0.0327(U)	0.447	n/a	0.447	Maximum detected concentration
Cobalt-60	5	1	-0.00235(U)	0.139	n/a	0.139	Maximum detected concentration
Plutonium-239/240	6	4	0.00768(U)	0.392	n/a	0.392	Maximum detected concentration
Tritium	6	3	0.000645(U)	0.217	n/a	0.217	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-18
EPCs at AOC 02-004(f) for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Cadmium	21	5	0.058	0.718	Normal	0.293	95% KM (t)
Chromium (Total)	21	15	2.37(U)	37	Normal	14	95% KM (t)
Chromium hexavalent ion	4	4	0.0666	0.327	n/a*	0.327	Maximum detected concentration
Copper	21	21	2.56	61.4	Lognormal	19.8	95% Chebyshev (Mean, Sd)
Mercury	21	20	0.00732	2.9	Lognormal	1.02	95% KM Chebyshev
Perchlorate	17	7	0.000556	0.00657	Normal	0.00214	95% KM (t)
Selenium	21	13	0.518(U)	1.84	Normal	1.15	95% KM (t)
Zinc	21	21	26.9	270	Gamma	79.6	95% Adjusted Gamma
Organic Chemicals (mg/kg)							
Aroclor-1254	17	10	0.00343(U)	0.24	Lognormal	0.0849	95% KM (t)
Aroclor-1260	17	14	0.0056	0.687	Gamma	0.404	95% KM (Chebyshev)
Bis(2-ethylhexyl)phthalate	17	1	0.166(U)	0.591	n/a	0.591	Maximum detected concentration
Di-n-butylphthalate	17	5	0.04	0.352(U)	Normal	0.0536	95% KM (t)
Pentachlorophenol	17	1	0.301	0.353(U)	n/a	0.301	Maximum detected concentration
Radionuclides (pCi/g)							
Cobalt-60	19	1	-0.0278(U)	0.11	n/a	0.11	Maximum detected concentration
Plutonium-239/240	21	8	-0.013(U)	0.115	Normal	0.0307	95% KM (t)
Tritium	21	10	0.0012600(U)	0.923	Gamma	0.156	95% KM (t)

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-19
EPCs at AOC 02-004(f) for the Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	31	1	0.104	1.05(U)	n/a*	0.104	Maximum detected concentration
Cadmium	44	11	0.058	0.718	Gamma	0.226	95% KM (t)
Chromium (Total)	44	33	2.37(U)	80.3	Lognormal	16.4	95% KM (BCA)
Chromium hexavalent ion	8	6	0.0666	0.327	Normal	0.206	95% KM (t)
Copper	44	40	1.32	85.9	Lognormal	18.2	95% KM (Chebyshev)
Mercury	44	39	0.0018(U)	2.9	Lognormal	0.662	95% KM (Chebyshev)
Perchlorate	36	8	0.000556	0.00657	Normal	0.00165	95% KM (t)
Selenium	44	26	0.518(U)	2.25	Normal	1.06	95% KM (t)
Zinc	44	44	22.8	270	Nonparametric	59	95% Student's-t
Organic Chemicals (mg/kg)							
Aroclor-1254	76	31	0.0025	0.822	Gamma	0.0934	95% KM (t)
Aroclor-1260	76	47	0.0014	1.11	Nonparametric	0.226	95% KM (Chebyshev)
Bis(2-ethylhexyl)phthalate	36	1	0.166(U)	0.591	n/a	0.591	Maximum detected concentration
Di-n-butylphthalate	36	9	0.04	0.382(U)	Normal	0.049	95% KM (t)
Methylene Chloride	19	4	0.00215(U)	0.00637(U)	n/a	0.00563	Maximum detected concentration
Pentachlorophenol	36	1	0.301	0.382(U)	n/a	0.301	Maximum detected concentration
Toluene	19	6	0.000411	0.00113(U)	n/a	0.00112	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	39	12	-0.0671(U)	1.29	Gamma	0.31	'95% Gamma Adjusted KM
Cobalt-60	40	1	-0.0463(U)	0.11	n/a	0.11	Maximum detected concentration
Plutonium-239/240	44	8	-0.013(U)	0.115	Normal	0.00849	95% KM (t)
Strontium-90	44	2	-0.192(U)	0.716	n/a	0.716	Maximum detected concentration
Tritium	44	26	0.00116(U)	3.81	Gamma	0.556	95% KM (BCA)

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-20
EPCs at AOC 02-004(g) for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Cadmium	12	7	0.0576	0.958	Lognormal	0.321	95% KM (t)
Chromium (Total)	12	12	2.56	56.4	Gamma	23.6	95% Adjusted Gamma
Chromium hexavalent ion	3	2	0.0661(U)	0.108	n/a*	0.108	Maximum detected concentration
Copper	12	7	1.38(U)	14.1(U)	Normal	10.5	95% KM (t)
Mercury	12	12	0.0124	0.415	Lognormal	0.285	95% Chebyshev (Mean, Sd)
Selenium	12	8	0.205(U)	14.7	Nonparametric	8.42	95% KM Chebyshev
Organic Chemicals (mg/kg)							
Aroclor-1254	9	5	0.0042	0.0528	Normal	0.0294	95% KM (t)
Aroclor-1260	9	5	0.00358(U)	0.0382	Normal	0.0199	95% KM (t)
Radionuclides (pCi/g)							
Americium-241	9	1	-0.00973(U)	0.165	n/a	0.165	Maximum detected concentration
Cesium-137	10	3	-0.0263(U)	2.88	n/a	2.88	Maximum detected concentration
Cobalt-60	12	1	-0.0421(U)	0.504	n/a	0.504	Maximum detected concentration
Plutonium-239/240	12	9	0.0108(U)	1.85	Lognormal	0.902	95% KM Chebyshev
Tritium	12	4	-0.852(U)	0.0753	n/a	0.0753	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-21
EPCs at AOC 02-004(g) for the Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	18	1	0.112	1.06(U)	n/a*	0.112	Maximum detected concentration
Cadmium	24	8	0.0557	0.958	Lognormal	0.208	95% KM (t)
Chromium (Total)	24	22	2.56	56.4	Gamma	24.2	95% KM (Chebyshev)
Chromium hexavalent ion	8	5	0.0661	0.262	Normal	0.148	95% KM (t)
Copper	24	19	1.38(U)	51.3	Lognormal	11.5	95% KM (BCA)
Mercury	24	21	0.0024	1.07	Lognormal	0.311	95% KM (Chebyshev)
Perchlorate	15	2	0.00062	0.0023(U)	n/a	0.000966	Maximum detected concentration
Selenium	24	15	0.195(U)	14.7	Lognormal	4.74	95% KM (Chebyshev)
Organic Chemicals (mg/kg)							
Aroclor-1254	16	5	0.00353(U)	0.0528	Normal	0.0179	95% KM (t)
Aroclor-1260	16	5	0.0034	0.0382	Normal	0.0125	95% KM (t)
Chloroform	6	1	0.000313	0.00115(U)	n/a	0.000313	Maximum detected concentration
Di-n-butylphthalate	16	1	0.0641	1.28(U)	n/a	0.0641	Maximum detected concentration
Methylene Chloride	6	1	0.00254	0.00575(U)	n/a	0.00254	Maximum detected concentration
Tetrachloroethene	6	1	0.000302	0.00115(U)	n/a	0.000302	Maximum detected concentration
Toluene	6	2	0.000583	0.00336	n/a	0.00336	Maximum detected concentration
Trichloroethene	6	1	0.000884	0.00115(U)	n/a	0.000884	Maximum detected concentration
Radionuclides (pCi/g)							
Americium-241	16	1	-0.00973(U)	0.165	n/a	0.165	Maximum detected concentration
Cesium-137	22	4	-0.0276(U)	2.88	n/a	2.88	Maximum detected concentration
Cobalt-60	24	1	-0.0421(U)	0.504	n/a	0.504	Maximum detected concentration
Plutonium-239/240	24	10	-0.00543(U)	1.85	Nonparametric	0.47	95% KM (Chebyshev)
Strontium-90	24	4	-0.091(U)	0.965	n/a	0.965	Maximum detected concentration
Tritium	24	10	-0.852(U)	0.0904	n/a	0.0904	UCL was negative, used maximum

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-22
EPCs at SWMU 02-005 for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	25	1	0.169	1.16(U)	n/a*	0.169	Maximum detected concentration
Chromium hexavalent ion	17	6	0.0353(U)	11.8(UJ)	Normal	0.298	95% KM (t)
Mercury	25	23	0.0049	2.17	Nonparametric	0.502	95% KM Chebyshev
Perchlorate	16	5	0.000622	0.00227(U)	Normal	0.000946	95% KM (t)
Selenium	25	14	0.799	8.37	Nonparametric	4.7	95% KM (t)
Zinc	25	25	30.9	164	Gamma	61.4	95% Adjusted Gamma
Organic Chemicals (mg/kg)							
Aroclor-1242	28	1	0.00342(U)	0.569(U)	n/a	0.0062	Maximum detected concentration
Aroclor-1254	28	9	0.0017	0.569(U)	Lognormal	0.0149	95% KM (BCA)
Aroclor-1260	28	25	0.002	6.31	Gamma	1.43	95% KM (Chebyshev)
Benzo(b)fluoranthene	2	2	0.0156	0.0182	n/a	0.0182	Maximum detected concentration
Fluoranthene	2	2	0.0173	0.0232	n/a	0.0232	Maximum detected concentration
Phenanthrene	2	1	0.0149	0.0337(U)	n/a	0.0149	Maximum detected concentration
Pyrene	2	2	0.0154	0.0283	n/a	0.0283	Maximum detected concentration
Radionuclides (pCi/g)							
Americium-241	25	2	-0.00841(U)	0.0304	n/a	0.0304	Maximum detected concentration
Plutonium-239/240	25	16	0.00135(U)	1.6	Lognormal	0.42	95% KM Chebyshev
Tritium	25	4	-0.0119(U)	0.251	n/a	0.251	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-23
EPCs at SWMU 02-005 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	47	1	0.169	1.16(U)	n/a*	0.169	Maximum detected concentration
Arsenic	47	47	0.384	4.59	Normal	1.98	95% Student's-t
Chromium (Total)	47	47	0.984	8.45	Gamma	3.98	95% Adjusted Gamma
Chromium hexavalent ion	31	12	11.8(UJ)	2.73(U)	Normal	0.318	95% KM (t)
Iron	47	47	3990	11700	Normal	7740	95% Student's-t
Manganese	47	47	131	402	Normal	288	95% Student's-t
Mercury	47	44	0.002	2.17	Nonparametric	0.286	95% KM (Chebyshev)
Nickel	47	47	0.453	4.72	Normal	2.61	95% Student's-t
Perchlorate	28	8	0.000622	0.00253	Gamma	0.00106	95% KM (t)
Selenium	47	22	0.799	8.37	Nonparametric	4.08	95% KM (t)
Zinc		47	25.6	164	Gamma	52.8	95% Adjusted Gamma
Organic Chemicals (mg/kg)							
Aroclor-1242	64	1	0.0034(U)	0.667(U)	n/a	0.0062	Maximum detected concentration
Aroclor-1254	64	13	0.0017	0.667(U)	Lognormal	0.028	95% KM (Chebyshev)
Aroclor-1260	64	49	0.002	8.23	Gamma	1.48	95% KM (Chebyshev)
Benzo(b)fluoranthene	5	2	0.0156	0.0358(U)	n/a	0.0182	Maximum detected concentration
Fluoranthene	5	2	0.0173	0.0358(U)	n/a	0.0232	Maximum detected concentration
Phenanthrene	5	1	0.0149	0.0358(U)	n/a	0.0149	Maximum detected concentration
Pyrene	5	2	0.0154	0.0358(U)	n/a	0.0283	Maximum detected concentration
Toluene	1	1	0.00142	0.00142	n/a	0.00142	Maximum detected concentration
Radionuclides (pCi/g)							
Americium-241	47	3	-0.00841(U)	0.139	n/a	0.139	Maximum detected concentration
Cesium-137	44	24	-0.0751(U)	1.01	Normal	0.261	95% KM (t)
Plutonium-238	47	1	-0.0102(U)	0.0198(U)	n/a	0.0138	Maximum detected concentration
Plutonium-239/240	47	22	-0.00148(U)	6.8	Nonparametric	0.924	95% KM (Chebyshev)
Tritium	47	11	-0.0119(U)	0.251	Gamma	0.0261	95% Gamma Adjusted KM

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-24
EPCs at SWMU 02-006(a) for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	31	6	0.165(U)	1.14(U)	Normal	0.361	95% KM (t)
Arsenic	31	31	0.867	5.4	Normal	2.9	95% Student's-t
Barium	31	31	19.3	395	Lognormal	143	95% Chebyshev (Mean, Sd)
Chromium (Total)	31	25	3.87(U)	18.4	Normal	8.53	95% KM (t)
Chromium hexavalent ion	11	6	0.0279	0.238(U)	Normal	0.0581	95% KM (t)
Cyanide (Total)	20	6	0.0785	1.4	Gamma	0.298	95% KM (t)
Lead	31	31	5.08	42.1	Normal	17.6	95% Student's-t
Nickel	31	30	2.03	10.3	Normal	6.69	95% KM (t)
Perchlorate	20	11	0.000772	0.00245(U)	Normal	0.00159	95% KM (t)
Selenium	31	20	0.628	14.1	Normal	8.34	95% KM (t)
Organic Chemicals (mg/kg)							
Aroclor-1242	20	2	0.0028	0.0042	n/a*	0.0042	Maximum detected concentration
Aroclor-1254	20	7	0.0019	0.011	Normal	0.00409	95% KM (t)
Aroclor-1260	20	3	0.0016	0.00408(U)	n/a	0.0028	Maximum detected concentration
Dichlorobenzene[1,4-]	28	1	0.000215	0.407(U)	n/a	0.000215	Maximum detected concentration
Toluene	8	1	0.000328	0.00117(U)	n/a	0.000328	Maximum detected concentration
Trichloroethene	8	2	0.000276	0.00117(U)	n/a	0.000313	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	18	16	-0.032(U)	29.8	Gamma	13.4	95% KM (Chebyshev)
Plutonium-239/240	20	1	-0.00311(U)	0.0626	n/a	0.0626	Maximum detected concentration
Strontium-90	20	4	-0.116(U)	2.69	n/a	2.69	Maximum detected concentration
Tritium	31	14	-0.01038(U)	1.73	Normal	0.456	95% KM (t)

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-25
EPCs at SWMU 02-006(a) for the Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	78	7	0.165(U)	1.14(U)	Normal	0.359	95% KM (t)
Arsenic	78	78	0.295	5.4	Normal	2.34	95% Student's-t
Barium	78	78	9.32	395	Gamma	72.2	95% Approximate Gamma
Chromium (Total)	78	57	1.43	28	Normal	6.93	95% KM (t)
Chromium hexavalent ion	46	15	0.0247	0.238(U)	Normal	0.0523	95% KM (t)
Copper	78	71	0.545	8.86	Normal	4.05	95% KM (t)
Cyanide (Total)	48	9	0.0728	2.89	Lognormal	0.319	95% KM (BCA)
Lead	78	78	1.69	116	Nonparametric	17.2	95% Standard Bootstrap
Nickel	78	66	0.928	12.7(U)	Normal	5.1	95% KM (t)
Perchlorate	48	36	0.000549	0.0147	Lognormal	0.00268	95% KM (BCA)
Selenium	78	44	0.304	14.1	Normal	5.5	95% KM (t)
Organic Chemicals (mg/kg)							
Aroclor-1242	48	3	0.0028	0.0043	n/a*	0.0043	Maximum detected concentration
Aroclor-1254	48	9	0.0019	0.011	Normal	0.00285	95% KM (t)
Aroclor-1260	48	3	0.0016	0.00408(U)	n/a	0.0028	Maximum detected concentration
Dichlorobenzene[1,4-]	84	1	0.000215	0.407(U)	n/a	0.000215	Maximum detected concentration
Toluene	36	1	0.000328	0.00117(U)	n/a	0.000328	Maximum detected concentration
Trichloroethene	36	3	0.000275	0.00117(U)	n/a	0.000313	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	53	27	-0.0711(U)	29.8	Nonparametric	5.15	95% KM (Chebyshev)
Plutonium-239/240	56	1	-0.00544(U)	0.0626	n/a	0.0626	Maximum detected concentration
Strontium-90	56	11	-0.116(U)	2.69	Gamma	0.148	95% KM (t)
Tritium	79	52	-0.01038(U)	168	Gamma	11.9	95% KM (BCA)
Uranium-235/236	56	14	0.0153(U)	0.128	Normal	0.0225	95% KM (t)

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-26
EPCs at SWMU 02-006(a) for the Ecological Receptors

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	53	6	0.165(U)	1.14(U)	Normal	0.273	95% KM (t)
Arsenic	53	53	0.867	5.4	Normal	2.68	95% Student's-t
Barium	53	53	11.6	395	Gamma	88.4	95% Approximate Gamma
Chromium (Total)	53	40	2.57(U)	28	Normal	8.32	95% KM (t)
Chromium hexavalent ion	33	12	0.0247	0.238(U)	Normal	0.0526	95% KM (t)
Copper	53	51	1.01	8.86	Normal	4.63	95% KM (t)
Cyanide (Total)	36	7	0.0728	1.4	Gamma	0.207	95% KM (t)
Lead	53	53	1.84	59.8	Gamma	16.7	95% Approximate Gamma
Nickel	53	47	1.25	12.7(U)	Normal	5.92	95% KM (t)
Perchlorate	36	26	0.000549	0.00814	Gamma	0.00814	95% KM (Percentile Bootstrap)
Selenium	53	35	0.304	14.1	Normal	6.63	95% KM (t)
Organic Chemicals (mg/kg)							
Aroclor-1242	36	3	0.0028	0.0043	n/a*	0.0043	Maximum detected concentration
Aroclor-1254	36	9	0.0019	0.011	Normal	0.0032	95% KM (t)
Aroclor-1260	36	3	0.0016	0.00408(U)	n/a	0.0028	Maximum detected concentration
Dichlorobenzene[1,4-]	24	1	0.000215	0.00117(U)	n/a	0.000215	Maximum detected concentration
Toluene	24	1	0.000328	0.00117(U)	n/a	0.000328	Maximum detected concentration
Trichloroethene	24	3	0.000275	0.00117(U)	n/a	0.000313	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	40	25	-0.0711(U)	29.8	Gamma	4.28	95% KM (BCA)
Plutonium-239/240	42	1	-0.00544(U)	0.0626	n/a	0.0626	Maximum detected concentration
Strontium-90	42	11	-0.116(U)	2.69	Gamma	0.235	95% KM (t)
Tritium	53	35	-0.010375(U)	67.61	Nonparametric	11	95% KM Chebyshev
Uranium-235/236	42	12	0.0153(U)	0.128	Normal	0.0513	95% KM (t)

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-27
EPCs at SWMU 02-006(b) for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Cadmium	19	14	0.119	2	Lognormal	0.657	95% KM (BCA)
Lead	19	19	8.17	31	Nonparametric	15	95% Student's-t
Mercury	19	19	0.179	6.04	Lognormal	1.55	95% Percentile Bootstrap
Nitrate	17	12	0.8	2.29	Normal	1.41	95% KM (t)
Perchlorate	19	3	0.000516	0.039(U)	n/a*	0.00135	Maximum detected concentration
Selenium	19	10	0.4	1.53(U)	Normal	0.911	95% KM (t)
Silver	19	18	0.0595	1.7	Nonparametric	0.629	95% KM (Chebyshev)
Zinc	19	19	37.2	140	Nonparametric	66.1	95% Student's-t
Organic Chemicals (mg/kg)							
Acenaphthene	19	13	0.0172	2.2(U)	Normal	0.191	95% KM (t)
Anthracene	19	16	0.0117	2.2(U)	Gamma	0.48	95% KM (Chebyshev)
Aroclor-1254	19	3	0.0168(U)	0.44(U)	n/a	0.0782	Maximum detected concentration
Aroclor-1260	19	19	0.0138	1	Lognormal	0.393	95% Chebyshev (Mean, Sd)
Benzo(a)anthracene	19	14	0.0347(U)	2.2(U)	Gamma	0.501	95% KM (Percentile Bootstrap)
Benzo(a)pyrene	19	18	0.0473	2.2(U)	Gamma	0.869	95% KM (Chebyshev)
Benzo(b)fluoranthene	19	19	0.0623	2.1	Lognormal	1.13	95% Chebyshev (Mean, Sd)
Benzo(g,h,i)perylene	19	16	0.0252	2.2(U)	Gamma	0.229	95% KM (BCA)
Benzo(k)fluoranthene	19	5	0.0336(U)	0.21	Normal	0.0788	95% KM (t)
Carbon Disulfide	3	1	0.004	0.008(U)	n/a	0.004	Maximum detected concentration
Chrysene	19	19	0.0415	1.3	Gamma	0.543	95% Adjusted Gamma
Di-n-butylphthalate	19	2	0.0343	2.2(U)	n/a	0.0356	Maximum detected concentration
Dibenzofuran	19	6	0.0704	2.2(U)	Normal	0.231	95% KM (t)
Diethylphthalate	19	1	0.336(U)	2.2(U)	n/a	0.37	Maximum detected concentration

Table H-2.3-27 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Fluoranthene	19	19	0.0629	2.52	Gamma	1.07	95% Adjusted Gamma
Fluorene	19	13	0.0158	2.2(U)	Normal	0.165	95% KM (t)
Indeno(1,2,3-cd)pyrene	19	18	0.0131	2.2(U)	Gamma	0.324	95% KM (Chebyshev)
Methylnaphthalene[2-]	19	12	0.0078	2.2(U)	Gamma	0.0988	95% KM (BCA)
Naphthalene	19	13	0.0128	2.2(U)	Gamma	0.229	95% KM (BCA)
Phenanthrene	19	18	0.0382	2.39	Gamma	1.33	95% KM (Chebyshev)
Pyrene	19	19	0.0759	2.9	Gamma	1.19	95% Adjusted Gamma
Styrene	3	1	0.007(U)	0.037	n/a	0.037	Maximum detected concentration
Total Petroleum Hydrocarbons Diesel Range Organics	5	5	12.2	66.7	n/a	66.7	Maximum detected concentration
Trichlorofluoromethane	3	1	0.002	0.008(U)	n/a	0.002	Maximum detected concentration
Radionuclides (pCi/g)							
Plutonium-239/240	19	3	-0.00857(U)	2.11	n/a	2.11	Maximum detected concentration
Tritium	19	9	0.00135(U)	0.277	Nonparametric	0.0478	95% KM (BCA)
Uranium-234	18	18	0.735	7.87	Nonparametric	3.1	95% Chebyshev (Mean, Sd)

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-28
EPCs at SWMU 02-006(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	52	52	923	8960	Lognormal	4000	95% Student's-t
Arsenic	52	45	0.641	3.69	Gamma	2	95% KM (BCA)
Barium	52	52	12.2	89.3	Normal	46.8	95% Student's-t
Cadmium	52	15	0.0901(U)	2	Lognormal	0.381	95% KM (t)
Chromium (Total)	48	27	2.2	39.5	Gamma	10.5	95% KM (t)
Chromium hexavalent ion	2	1	0.108(U)	0.158	n/a*	0.158	Maximum detected concentration
Copper	52	44	0.968(U)	12.9	Lognormal	6.14	95% KM (Chebyshev)
Iron	52	52	5160	14,000	Normal	8740	95% Student's-t
Lead	52	52	4.04	3970	Nonparametric	420	95% Chebyshev (Mean, Sd)
Manganese	52	52	102	441	Normal	287	95% Student's-t
Mercury	52	49	0.0056	6.04	Gamma	0.976	95% KM (Chebyshev)
Nickel	52	29	1.25	7.85(U)	Normal	3.24	95% KM (t)
Nitrate	47	28	0.8	25.8	Nonparametric	3.86	95% KM (t)
Perchlorate	51	11	0.000516	0.0437(U)	Gamma	0.00164	95% KM (t)
Selenium	52	32	0.248	1.99	Normal	1.04	95% KM (t)
Silver	52	40	0.0422	1.7	Nonparametric	0.213	95% KM (BCA)
Vanadium	52	52	4.09	21.7	Gamma	10.4	95% Approximate Gamma
Zinc	52	52	20.9	140	Gamma	47.8	95% Approximate Gamma

Table H-2.3-28 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Organic Chemicals (mg/kg)							
Acenaphthene	52	26	0.0164	2.2(U)	Gamma	0.111	95% KM (t)
Acetone	33	1	0.00434	0.088(UJ)	n/a	0.00434	Maximum detected concentration
Anthracene	52	29	0.0117	2.2(U)	Gamma	0.175	95% KM (BCA)
Aroclor-1248	50	1	0.00343(U)	0.44(U)	n/a	0.0287	Maximum detected concentration
Aroclor-1254	50	19	0.0014	0.44(U)	Gamma	0.0248	95% KM (t)
Aroclor-1260	50	36	0.0014	1	Lognormal	0.166	95% KM (Chebyshev)
Benzo(a)anthracene	52	26	0.0347(U)	2.2(U)	Gamma	0.283	95% KM (t)
Benzo(a)pyrene	52	34	0.022(U)	2.2(U)	Gamma	0.335	95% KM (Percentile Bootstrap)
Benzo(b)fluoranthene	52	36	0.0106	2.1	Gamma	0.419	95% KM (BCA)
Benzo(g,h,i)perylene	52	27	0.0155	2.2(U)	Gamma	0.144	95% KM (t)
Benzo(k)fluoranthene	52	11	0.0336(U)	0.462	Normal	0.0859	95% KM (t)
Bis(2-ethylhexyl)phthalate	52	2	0.0982	2.2(U)	n/a	0.109	Maximum detected concentration
Carbon Disulfide	19	1	0.004	0.008(U)	n/a	0.004	Maximum detected concentration
Chrysene	52	34	0.0199	1.3	Gamma	0.288	95% KM (Percentile Bootstrap)
Di-n-butylphthalate	52	5	0.0343	2.2(U)	n/a	0.155	Maximum detected concentration
Dibenz(a,h)anthracene	52	2	0.0336(U)	2.2(U)	n/a	0.194	Maximum detected concentration
Dibenzofuran	52	11	0.0269	2.2(U)	Normal	0.204	95% KM (t)
Dichlorobenzene[1,4-]	19	1	0.000282	0.008(U)	n/a	0.000282	Maximum detected concentration
Diethylphthalate	52	1	0.336(U)	2.2(U)	n/a	0.37	Maximum detected concentration
Ethylbenzene	33	1	0.000276	0.008(U)	n/a	0.000276	Maximum detected concentration
Fluoranthene	52	36	0.0352(U)	2.52	Gamma	0.591	95% KM (BCA)
Fluorene	52	26	0.005	2.2(U)	Gamma	0.0994	95% KM (t)
Indeno(1,2,3-cd)pyrene	52	29	0.0131	2.2(U)	Gamma	0.148	95% KM (t)
Isopropyltoluene[4-]	33	1	0.000507	0.008(U)	n/a	0.000507	Maximum detected concentration
Methyl-2-pentanone[4-]	33	1	0.00528(U)	0.034(UJ)	n/a	0.01	Maximum detected concentration
Methylene Chloride	33	2	0.003	0.031(UJ)	n/a	0.003	Maximum detected concentration

Table H-2.3-28 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Methylnaphthalene[2-]	52	23	0.0074	2.2(U)	Gamma	0.0663	95% KM (t)
Naphthalene	52	25	0.0128	2.2(U)	Gamma	0.15	95% KM (t)
Phenanthrene	52	35	0.0258	2.39	Gamma	0.526	95% KM (BCA)
Pyrene	52	36	0.0352(U)	2.9	Gamma	0.591	95% KM (BCA)
Styrene	33	2	0.00023	0.037	n/a	0.037	Maximum detected concentration
Toluene	33	1	0.000433	0.008(U)	n/a	0.000433	Maximum detected concentration
Total Petroleum Hydrocarbons Diesel Range Organics	14	11	3.87(U)	143(U)	Normal	31.4	95% KM (t)
Trichloroethene	33	1	0.000265	0.008(U)	n/a	0.000265	Maximum detected concentration
Trichlorofluoromethane	33	1	0.00106(U)	0.008(U)	n/a	0.002	Maximum detected concentration
Trimethylbenzene[1,2,4-]	33	2	0.000293	0.008(U)	n/a	0.000494	Maximum detected concentration
Trimethylbenzene[1,3,5-]	33	2	0.000232	0.008(U)	n/a	0.000234	Maximum detected concentration
Xylene[1,2-]	30	1	0.000493	0.00125(U)	n/a	0.000493	Maximum detected concentration
Xylene[1,3-]+Xylene[1,4-]	30	3	0.000305	0.00251(U)	n/a	0.000469	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	47	13	-0.0771(U)	1.83	Nonparametric	0.309	95% KM (Chebyshev)
Plutonium-239/240	52	5	-0.00857(U)	2.11	n/a	2.11	Maximum detected concentration
Strontium-90	52	6	-0.13(U)	1.29	Normal	0.0265	95% KM (t)
Tritium	52	29	-0.00868(U)	2.46	Gamma	0.229	95% KM (BCA)
Uranium-234	51	51	0.384	7.87	Nonparametric	1.46	95% Student's-t

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-29
EPCs at SWMU 02-006(c) for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Cadmium	7	5	0.115	0.515(U)	n/a*	0.37	Maximum detected concentration
Chromium hexavalent ion	5	1	0.0733	0.519(U)	n/a	0.0733	Maximum detected concentration
Copper	7	7	3.91	15	n/a	15	Maximum detected concentration
Mercury	7	7	0.183	1.36	n/a	1.36	Maximum detected concentration
Nitrate	7	5	1.04(U)	3.59	n/a	3.59	Maximum detected concentration
Perchlorate	7	1	0.00204(U)	0.00242	n/a	0.00242	Maximum detected concentration
Selenium	7	5	0.961	1.56(U)	n/a	1.12	Maximum detected concentration
Zinc	7	7	30.6	59.7	n/a	59.7	Maximum detected concentration
Organic Chemicals (mg/kg)							
Aroclor-1254	7	3	0.00369(U)	0.118	n/a	0.118	Maximum detected concentration
Aroclor-1260	7	7	0.019	0.169	n/a	0.169	Maximum detected concentration
Total Petroleum Hydrocarbons Diesel Range Organics	2	2	3.93	13.9	n/a	13.9	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	5	5	0.315	16.9	n/a	16.9	Maximum detected concentration
Plutonium-239/240	7	1	-0.0162(U)	0.112	n/a	0.112	Maximum detected concentration
Strontium-90	7	2	-0.0476(U)	3.86	n/a	3.86	Maximum detected concentration
Tritium	7	1	0.00122(U)	0.0162	n/a	0.0162	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-30
EPCs at SWMU 02-006(c) for the Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	19	0	0.393(U)	1.09(U)	n/a*	1.09(U)	Maximum detection limit
Cadmium	19	7	0.115	0.572(U)	Normal	0.283	95% KM (t)
Chromium (Total)	19	16	4.16	45.7	Gamma	16.5	95% KM (BCA)
Chromium hexavalent ion	11	5	0.0302	2.28(U)	n/a	0.214	Maximum detected concentration
Copper	19	16	2.34	15	Gamma	6.22	95% KM (BCA)
Mercury	19	18	0.0055	1.36	Gamma	0.607	95% KM (Chebyshev)
Nitrate	17	10	1.04(U)	6.67	Gamma	2.87	95% KM (t)
Perchlorate	17	3	0.00132	0.00242	n/a	0.00242	Maximum detected concentration
Selenium	19	13	0.657	2.3	Nonparametric	1.2	95% KM (BCA)
Zinc	19	19	25.5	92.7	Normal	48.1	95% Student's-t
Organic Chemicals (mg/kg)							
Aroclor-1242	19	1	0.00357(U)	0.0369(U)	n/a	0.0128	Maximum detected concentration
Aroclor-1254	19	4	0.00357(U)	0.118	n/a	0.118	Maximum detected concentration
Aroclor-1260	19	12	0.00357(U)	0.169	Gamma	0.0423	95% KM (BCA)
Di-n-butylphthalate	18	3	0.0451	1.16(U)	n/a	0.0522	Maximum detected concentration
Methylene Chloride	10	1	0.0023	0.00587(U)	n/a	0.0023	Maximum detected concentration
Toluene	10	1	0.00037	0.00117(U)	n/a	0.00037	Maximum detected concentration
Total Petroleum Hydrocarbons Diesel Range Organics	4	4	1.39	537	n/a	537	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	14	8	-0.0207(U)	16.9	Gamma	4.77	95% KM (BCA)
Plutonium-239/240	18	2	-0.0162(U)	0.112	n/a	0.112	Maximum detected concentration
Strontium-90	18	4	-0.122(U)	3.86	n/a	3.86	Maximum detected concentration
Tritium	19	9	0.00122(U)	0.506	Gamma	0.204	95% Gamma Adjusted KM

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-31
EPCs at SWMU AOC 02-006(e) for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Cadmium	13	5	0.106	0.551(U)	Normal	0.258	95% KM (t)
Chromium (Total)	13	13	4.39	48.2	Nonparametric	24.7	95% Chebyshev (Mean, Sd)
Chromium hexavalent ion	11	3	0.0431(U)	1.1(U)	n/a*	0.117	Maximum detected concentration
Copper	13	13	3.54	12	Normal	7.01	95% Student's-t
Lead	13	13	8.89	110	Nonparametric	53.4	95% Chebyshev (Mean, Sd)
Mercury	13	13	0.168	4.34	Normal	2.15	95% Student's-t
Perchlorate	13	5	0.000559	0.0156(U)	Normal	0.000772	95% KM (t)
Selenium	13	9	0.221	2.04(U)	Normal	1.15	95% KM (t)
Zinc	13	13	34.3	320	Nonparametric	164	95% Chebyshev (Mean, Sd)
Organic Chemicals (mg/kg)							
Aroclor-1242	12	1	0.0345(U)	0.33(U)	n/a	0.0627	Maximum detected concentration
Aroclor-1248	12	1	0.0345(U)	0.408	n/a	0.408	Maximum detected concentration
Aroclor-1254	12	6	0.0228	1.3	Lognormal	0.358	95% KM (BCA)
Aroclor-1260	12	9	0.0178	0.33(U)	Normal	0.063	95% KM (t)
Bis(2-ethylhexyl)phthalate	13	1	0.0822	3.4(U)	n/a	0.0822	Maximum detected concentration
Dibenzofuran	13	1	0.129	3.4(U)	n/a	0.129	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	11	9	0.0288(U)	1.75	Lognormal	1.03	95% KM (Chebyshev)
Cobalt-60	11	1	-0.0194(U)	0.116	n/a	0.116	Maximum detected concentration
Plutonium-239/240	13	8	-0.00651(U)	1.62	Nonparametric	0.915	95% KM Chebyshev
Tritium	13	9	0.00505(U)	0.294	Nonparametric	0.0841	95% KM (BCA)

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-32
EPCs at SWMU AOC 02-006(e) for the Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	34	1	0.127	1.03(U)	n/a*	0.127	Maximum detected concentration
Arsenic	37	37	0.67	4.74	Normal	2.64	95% Student's-t
Cadmium	37	10	0.106	0.551(U)	Normal	0.272	95% KM (t)
Chromium (Total)	37	37	3.01	59.1	Nonparametric	24.2	95% Chebyshev (Mean, Sd)
Chromium hexavalent ion	29	15	0.0361(U)	4.31(U)	Gamma	0.236	95% KM (t)
Copper	37	37	1.98	16	Gamma	5.95	95% Adjusted Gamma
Iron	37	37	3600	11100	Normal	8700	95% Student's-t
Lead	37	37	4.49	110	Nonparametric	24.1	95% Chebyshev (Mean, Sd)
Mercury	37	37	0.0043	5.03	Gamma	1.65	95% Adjusted Gamma
Nickel	37	37	1.71	24.4	Nonparametric	6.04	95% Student's-t
Perchlorate	31	6	0.000559	0.0156(U)	Normal	0.000748	95% KM (t)
Selenium	37	19	0.17	2.04(U)	Normal	0.893	95% KM (t)
Vanadium	37	37	5.3	18.6	Normal	11.4	95% Student's-t
Zinc	37	37	24.1	320	Nonparametric	62.7	95% Student's-t
Organic Chemicals (mg/kg)							
Aroclor-1242	31	1	0.00354(U)	0.33(U)	n/a	0.0627	Maximum detected concentration
Aroclor-1248	31	2	0.00354(U)	0.408	n/a	0.408	Maximum detected concentration
Aroclor-1254	31	16	0.0022	1.3	Lognormal	0.242	95% KM (Chebyshev)
Aroclor-1260	31	23	0.0023	0.33(U)	Gamma	0.053	95% KM (Chebyshev)
Bis(2-ethylhexyl)phthalate	32	1	0.0822	3.4(U)	n/a	0.0822	Maximum detected concentration
Chloroform	19	1	0.000279	0.006(U)	n/a	0.000279	Maximum detected concentration
Dibenzofuran	32	2	0.129	3.4(U)	n/a	0.13	Maximum detected concentration
Dichlorobenzene[1,4-]	51	2	0.000188(U)	3.4(U)	n/a	0.000322	Maximum detected concentration
Isopropylbenzene	19	3	0.000328	0.006(U)	n/a	0.000433	Maximum detected concentration

Table H-2.3-32 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Methylene Chloride	19	1	0.00224	0.013(U)	n/a	0.00224	Maximum detected concentration
Toluene	19	1	0.000522	0.006(U)	n/a	0.000522	Maximum detected concentration
Xylene[1,3-]+Xylene[1,4-]	17	1	0.000282	0.00225(U)	n/a	0.000282	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	30	12	-0.0198(U)	1.75	Gamma	0.259	95% KM (t)
Cobalt-60	33	6	-0.0196(U)	1.05	Normal	0.134	95% KM (t)
Plutonium-239/240	37	16	-0.0116(U)	1.62	Nonparametric	0.355	95% KM (Chebyshev)
Tritium	37	25	0.000162(U)	0.833	Nonparametric	0.222	95% KM (Chebyshev)

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-33
EPCs at SWMU 02-007 for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Nitrate	6	3	0.965	1.94	n/a*	1.94	Maximum detected concentration
Perchlorate	6	2	0.000706	0.00209(U)	n/a	0.000997	Maximum detected concentration
Organic Chemicals (mg/kg)							
Aroclor-1254	6	5	0.00348(U)	1.63	n/a	1.63	Maximum detected concentration
Aroclor-1260	6	5	0.00348(U)	0.859	n/a	0.859	Maximum detected concentration
Benzo(a)anthracene	6	1	0.0155	0.0353(U)	n/a	0.0155	Maximum detected concentration
Benzo(a)pyrene	6	1	0.0119	0.0353(U)	n/a	0.0119	Maximum detected concentration
Benzo(b)fluoranthene	6	1	0.0136	0.0353(U)	n/a	0.0136	Maximum detected concentration
Fluoranthene	6	4	0.0115	0.0353(U)	n/a	0.0238	Maximum detected concentration
Phenanthrene	6	2	0.0109	0.0353(U)	n/a	0.0131	Maximum detected concentration
Pyrene	6	3	0.015	0.0353(U)	n/a	0.02	Maximum detected concentration

Table H-2.3-33 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Radionuclides (pCi/g)							
Plutonium-239/240	6	1	0.00422(U)	0.0626	n/a	0.0626	Maximum detected concentration
Strontium-90	6	1	0.0256(U)	1.41	n/a	1.41	Maximum detected concentration
Tritium	6	1	0.00121(U)	0.0169	n/a	0.0169	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-34
EPCs at SWMU 02-007 for the Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	16	1	0.383	0.941(U)	n/a*	0.383	Maximum detected concentration
Cyanide (Total)	16	9	0.118	0.762	Nonparametric	0.253	95% KM (t)
Mercury	16	13	0.0023(U)	2.91	Lognormal	1.01	95% KM (Chebyshev)
Nitrate	16	5	0.959	1.94	Normal	1.26	95% KM (t)
Perchlorate	16	6	0.000673	0.0048	Lognormal	0.00164	95% KM (t)
Selenium	16	9	0.602	2.52	Lognormal	1.19	95% KM (t)
Organic Chemicals (mg/kg)							
Acenaphthene	16	1	0.0341(U)	0.0443	n/a	0.0443	Maximum detected concentration
Anthracene	16	1	0.0341(U)	0.079	n/a	0.079	Maximum detected concentration
Aroclor-1254	16	11	0.00348(U)	1.63	Gamma	0.349	95% KM (BCA)
Aroclor-1260	16	11	0.0025	0.859	Gamma	0.194	95% KM (BCA)
Benzo(a)anthracene	16	2	0.0155	0.102	n/a	0.102	Maximum detected concentration
Benzo(a)pyrene	16	2	0.0119	0.183	n/a	0.183	Maximum detected concentration
Benzo(b)fluoranthene	16	2	0.0136	0.163	n/a	0.163	Maximum detected concentration

Table H-2.3-34 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Benzo(g,h,i)perylene	16	1	0.0341(U)	0.101	n/a	0.101	Maximum detected concentration
Butylbenzylphthalate	16	1	0.254	0.368(U)	n/a	0.254	Maximum detected concentration
Chrysene	16	1	0.0341(U)	0.109	n/a	0.109	Maximum detected concentration
Fluoranthene	16	5	0.0115	0.225	Lognormal	0.0572	95% KM (BCA)
Fluorene	16	1	0.0341(U)	0.0471	n/a	0.0471	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	16	1	0.0341(U)	0.108	n/a	0.108	Maximum detected concentration
Methylnaphthalene[2-]	16	1	0.0281	0.0382(U)	n/a	0.0281	Maximum detected concentration
Naphthalene	16	1	0.0341(U)	0.0755	n/a	0.0755	Maximum detected concentration
Phenanthrene	16	3	0.0109	0.233	n/a	0.233	Maximum detected concentration
Pyrene	16	4	0.015	0.18	n/a	0.18	Maximum detected concentration
Toluene	9	1	0.000311	0.00115(U)	n/a	0.000311	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	14	4	-0.0544(U)	1.56	n/a	1.56	Maximum detected concentration
Plutonium-239/240	16	3	-2.81e-05(U)	0.0626	n/a	0.0626	Maximum detected concentration
Strontium-90	16	3	-0.115(U)	1.41	n/a	1.41	Maximum detected concentration
Tritium	16	4	0.00121(U)	0.073	n/a	0.073	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-35
EPCs at SWMU 02-008(a) for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Chromium (Total)	6	5	13.6(U)	37	n/a*	37	Maximum detected concentration
Chromium hexavalent ion	4	1	0.104(U)	0.524(U)	n/a	0.151	Maximum detected concentration
Copper	6	5	2.53	13	n/a	13	Maximum detected concentration
Cyanide (Total)	5	2	0.139	0.723	n/a	0.723	Maximum detected concentration
Selenium	6	2	0.282	2.01	n/a	0.282	Maximum detected concentration
Zinc	6	6	27	68	n/a	68	Maximum detected concentration
Organic Chemicals (mg/kg)							
Aroclor-1254	5	3	0.0354(U)	0.186	n/a	0.186	Maximum detected concentration
Aroclor-1260	5	5	0.0034	0.246	n/a	0.246	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	5	1	0.164	0.191(U)	n/a	0.164	Maximum detected concentration
Radionuclides (pCi/g)							
Plutonium-239/240	6	6	0.135	1.87	n/a	1.87	Maximum detected concentration
Tritium	6	2	-0.00142(U)	0.257	n/a	0.257	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-36
EPCs at SWMU 02-008(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)							
Aluminum	14	14	2140	6610	Lognormal	4170	95% Student's-t
Arsenic	14	12	0.89	3.1	Normal	2.45	95% KM (t)
Chromium (Total)	14	10	2.08(U)	104	Gamma	40.2	95% KM (Percentile Bootstrap)
Chromium hexavalent ion	12	3	0.104(U)	1.12	n/a*	1.12	Maximum detected concentration
Copper	14	12	1.71(U)	230	Lognormal	99.3	95% KM (Chebyshev)
Cyanide (Total)	13	2	0.139	0.723	n/a	0.723	Maximum detected concentration
Iron	14	14	4600	14,400	Normal	9470	95% Student's-t
Manganese	14	14	160	552	Normal	330	95% Student's-t
Selenium	14	8	0.282	10.2	Normal	5.33	95% KM (t)
Zinc	14	12	14.3(U)	78.9	Normal	55.4	95% KM (t)
Organic Chemicals (mg/kg)							
Aroclor-1254	13	6	0.00345(U)	0.186	Normal	0.0691	95% KM (t)
Aroclor-1260	13	11	0.0027	0.246	Gamma	0.168	95% KM (Chebyshev)
Bis(2-ethylhexyl)phthalate	13	1	0.164	0.205(U)	n/a	0.164	Maximum detected concentration
Methylene Chloride	8	3	0.00295	0.00571(U)	n/a	0.00385	Maximum detected concentration
Styrene	8	1	0.00107(U)	0.00589	n/a	0.00589	Maximum detected concentration
Toluene	8	1	0.000665	0.00123(U)	n/a	0.000665	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	13	7	-0.029(U)	0.353	Normal	0.186	95% KM (t)
Plutonium-239/240	14	11	0.00383(U)	1.87	Normal	0.599	95% KM (t)
Tritium	14	5	-0.00723(U)	0.257	Normal	0.0635	95% KM (t)

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-37
EPCs at SWMU AOC 02-008(c)(i) for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Cadmium	1	0	0.625(U)	0.625(U)	n/a*	0.625(U)	Maximum detection limit
Zinc	1	1	65.3	65.3	n/a	65.3	Maximum detected concentration
Organic Chemicals (mg/kg)							
Aroclor-1260	1	1	0.0158	0.0158	n/a	0.0158	Maximum detected concentration
Radionuclides (pCi/g)							
Plutonium-239/240	1	1	0.556	0.556	n/a	0.556	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-38
EPCs at SWMU AOC 02-008(c)(i) for the Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Cadmium	1	0	0.625(U)	0.625(U)	n/a*	0.625(U)	Maximum detection limit
Zinc	1	1	65.3	65.3	n/a	65.3	Maximum detected concentration
Organic Chemicals (mg/kg)							
Aroclor-1260	1	1	0.0158	0.0158	n/a	0.0158	Maximum detected concentration
Radionuclides (pCi/g)							
Plutonium-239/240	19	5	0.556	0.556	n/a	0.556	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-39
EPCs at SWMU AOC 02-008(c)(ii) for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Cadmium	5	3	0.047	0.517(U)	n/a*	0.112	Maximum detected concentration
Copper	5	5	3.31	22.5	n/a	22.5	Maximum detected concentration
Mercury	5	5	0.033	3.46	n/a	3.46	Maximum detected concentration
Perchlorate	5	2	0.000606	0.0156(U)	n/a	0.00168	Maximum detected concentration
Selenium	5	5	0.202	2.77	n/a	2.77	Maximum detected concentration
Silver	5	4	0.069	1.8	n/a	1.8	Maximum detected concentration
Vanadium	5	5	8.81	21	n/a	21	Maximum detected concentration
Organic Chemicals (mg/kg)							
Aroclor-1254	3	1	0.0171(U)	0.0788	n/a	0.0788	Maximum detected concentration
Aroclor-1260	3	3	0.0084	0.0872	n/a	0.0872	Maximum detected concentration
Radionuclides (pCi/g)							
Plutonium-239/240	5	4	0.0268(U)	0.808	n/a	0.808	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-40
EPCs at SWMU AOC 02-008(c)(ii) for the Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	7	1	0.354	1.08(U)	n/a*	0.354	Maximum detected concentration
Cadmium	9	4	0.047	0.566(U)	n/a	0.341	Maximum detected concentration
Chromium (Total)	9	9	4.45	30.7	Gamma	18.1	95% Adjusted Gamma
Chromium hexavalent ion	1	1	0.191	0.191	n/a	0.191	Maximum detected concentration
Copper	9	9	2.71	22.5	Normal	15.4	95% Student's-t
Mercury	9	9	0.0131	3.46	Gamma	2.23	95% Adjusted Gamma
Perchlorate	8	2	0.000606	0.0156(U)	n/a	0.00168	Maximum detected concentration
Selenium	9	7	0.202	2.77	Normal	1.97	95% KM (t)
Silver	9	7	0.057	1.8	Normal	0.718	95% KM (t)
Vanadium	9	9	6.48	21	Normal	12.9	95% Student's-t
Zinc	9	9	30.6	80.7	Normal	56.5	95% Student's-t
Organic Chemicals (mg/kg)							
Aroclor-1254	7	3	0.0018	0.0788	n/a	0.0788	Maximum detected concentration
Aroclor-1260	7	6	0.0018	0.0872	n/a	0.0872	Maximum detected concentration
Isopropyltoluene[4-]	3	1	0.00113(U)	0.0029	n/a	0.0029	Maximum detected concentration
Toluene	3	2	0.000475	0.00114(U)	n/a	0.000516	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	9	6	-0.000913(U)	1.28	Normal	0.576	95% KM (t)
Plutonium-239/240	9	6	0.00373(U)	0.808	Normal	0.334	95% KM (t)
Strontium-90	8	2	-0.18(U)	0.679	n/a	0.679	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-41
EPCs at SWMU 02-009(a) for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Cadmium	27	2	0.041	2.65(U)	n/a*	0.05	Maximum detected concentration
Cyanide (Total)	23	17	0.138	0.51	Normal	0.286	95% KM (t)
Iron	27	27	5200	63,200	Nonparametric	12,800	95% Student's-t
Mercury	27	19	0.0071(U)	0.35	Nonparametric	0.12	95% KM Chebyshev
Perchlorate	23	8	0.00061	0.00231(U)	Normal	0.00153	95% KM (t)
Selenium	27	26	0.144	70.5	Nonparametric	20.7	95% KM Chebyshev
Organic Chemicals (mg/kg)							
Aroclor-1254	23	8	0.0019	0.00716	Lognormal	0.00311	95% KM (t)
Aroclor-1260	23	11	0.0013	0.0144	Lognormal	0.00398	95% KM (t)
Butylbenzylphthalate	23	1	0.281	0.385(U)	n/a	0.281	Maximum detected concentration
Pentachlorophenol	23	1	0.257	0.385(U)	n/a	0.257	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	26	24	0.0648(U)	12.1	Gamma	3.96	95% KM (Chebyshev)
Plutonium-239/240	27	11	0(U)	0.142	Normal	0.0454	95% KM (t)
Tritium	27	2	-0.0131(U)	0.0774	n/a	0.0774	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-42
EPCs at SWMU 02-009(a) for the Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	69	1	0.103(U)	1.03(U)	n/a*	0.531	Maximum detected concentration
Cadmium	79	5	0.0406(U)	2.65(U)	Lognormal	0.07	95% KM (t)
Cyanide (Total)	67	36	0.0766	1.21(U)	Gamma	0.2	95% KM Approximate Gamma
Iron	79	79	5200	63200	Nonparametric	9920	95% Student's-t
Mercury	79	52	0.0023	0.35	Lognormal	0.0471	95% KM (Chebyshev)
Perchlorate	67	38	0.000535	0.00623	Gamma	0.0015	95% KM (t)
Selenium	79	71	0.106	70.5	Lognormal	11.5	95% KM (Chebyshev)
Organic Chemicals (mg/kg)							
Acetone	44	2	0.00513(U)	0.041	n/a	0.041	Maximum detected concentration
Aroclor-1248	69	1	0.00342(U)	0.0478	n/a	0.0478	Maximum detected concentration
Aroclor-1254	69	8	0.0019	0.00716	Lognormal	0.00272	95% KM (t)
Aroclor-1260	69	12	0.0013	0.0144	Lognormal	0.00297	95% KM (t)
Butylbenzylphthalate	69	1	0.281	0.385(U)	n/a	0.281	Maximum detected concentration
Chloroform	44	5	0.000231	0.00115(U)	Normal	0.000268	95% KM (t)
Chloromethane	44	1	0.00103(U)	0.00288	n/a	0.00288	Maximum detected concentration
Di-n-butylphthalate	69	3	0.0358	0.385(U)	n/a	0.0388	Maximum detected concentration
Dichlorobenzene[1,4-]	113	1	0.000364	0.00115(U)	n/a	0.000364	Maximum detected concentration
Isopropyltoluene[4-]	44	3	0.000324	0.00115(U)	n/a	0.000519	Maximum detected concentration
Pentachlorophenol	69	1	0.257	0.385(U)	n/a	0.257	Maximum detected concentration
Phenol	69	1	0.102	0.385(U)	n/a	0.102	Maximum detected concentration
Toluene	44	31	0.000308	0.00143	Nonparametric	0.000649	95% KM (BCA)
Trimethylbenzene[1,2,4-]	44	1	0.000843	0.00115(U)	n/a	0.000843	Maximum detected concentration
Trimethylbenzene[1,3,5-]	44	1	0.000535	0.00115(U)	n/a	0.000535	Maximum detected concentration
Xylene[1,2-]	44	2	0.000619	0.00115(U)	n/a	0.000648	Maximum detected concentration

Table H-2.3-42 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Radionuclides (pCi/g)							
Cesium-137	75	40	-0.0351(U)	12.1	Nonparametric	1.74	95% KM (Chebyshev)
Plutonium-238	79	1	-0.0231(U)	0.047	n/a	0.047	Maximum detected concentration
Plutonium-239/240	79	15	-0.00487(U)	4.17	Nonparametric	0.298	95% KM (Chebyshev)
Strontium-90	79	8	-0.139(U)	0.876	n/a	0.876	Calculated UCL was negative, used maximum
Tritium	79	25	-0.0131(U)	0.0775	Gamma	0.0227	95% KM Approximate Gamma

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-43
EPCs at SWMU 02-009(b) for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Cadmium	9	7	0.126	0.564(U)	Normal	0.34	95% KM (t)
Cyanide (Total)	9	3	0.0941	3.82(U)	n/a*	0.107	Maximum detected concentration
Mercury	9	9	0.0229	1.27	Lognormal	0.805	95% Hall's Bootstrap
Perchlorate	9	2	0.000669	0.00206(U)	n/a	0.0017	Maximum detected concentration
Zinc	9	8	35.2(U)	70.5	Normal	57.8	95% KM (t)
Organic Chemicals (mg/kg)							
Aroclor-1254	9	5	0.0139	0.0711	Lognormal	0.0334	95% KM (t)
Aroclor-1260	9	7	0.0088	0.14	Gamma	0.11	95% KM (Chebyshev)
Bis(2-ethylhexyl)phthalate	9	1	0.0684	0.192(U)	n/a	0.0684	Maximum detected concentration
Di-n-butylphthalate	9	2	0.0478	0.38(U)	n/a	0.0789	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	7	7	0.547	8.62	n/a	8.62	Maximum detected concentration
Plutonium-239/240	9	5	0.0267(U)	0.432	Normal	0.189	95% KM (t)
Strontium-90	9	3	-0.126(U)	2.49	n/a	2.49	Maximum detected concentration
Tritium	9	1	0.00023(U)	0.00728	n/a	0.00728	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-44
EPCs at SWMU 02-009(b) for the Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	20	1	0.29(U)	0.979(U)	n/a*	0.39	Maximum detected concentration
Cadmium	20	16	0.018(U)	0.564(U)	Normal	0.223	95% KM (t)
Cyanide (Total)	17	5	0.0941	3.82(U)	Lognormal	0.301	95% KM (t)
Mercury	20	18	0.0016(U)	1.27	Lognormal	0.531	95% KM (Chebyshev)
Perchlorate	17	4	0.000564	0.00219(U)	n/a	0.0017	Maximum detected concentration
Selenium	20	10	0.28(U)	1.57(U)	Normal	0.886	95% KM (t)
Zinc	20	19	32	70.5	Normal	49.6	95% KM (t)
Organic Chemicals (mg/kg)							
Aroclor-1248	18	1	0.00343(U)	0.0438	n/a	0.0438	Maximum detected concentration
Aroclor-1254	18	9	0.0023	0.0711	Gamma	0.0209	95% KM (t)
Aroclor-1260	18	14	0.0016	0.14	Lognormal	0.0619	95% KM (Chebyshev)
Bis(2-ethylhexyl)phthalate	18	1	0.0684	0.367(U)	n/a	0.0684	Maximum detected concentration
Di-n-butylphthalate	18	3	0.0461	0.38(U)	n/a	0.0789	Maximum detected concentration
Isopropylbenzene	8	1	0.000342	0.00109(U)	n/a	0.000342	Maximum detected concentration
Toluene	8	2	0.000653	0.00136	n/a	0.00136	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	18	17	-0.0227(U)	8.62	Nonparametric	5.88	95% KM (Chebyshev)
Plutonium-239/240	20	14	0(U)	0.432	Gamma	0.164	95% KM (Percentile Bootstrap)
Strontium-90	20	8	-0.126(U)	4.02	Normal	0.907	95% KM (t)
Tritium	20	7	-0.000194(U)	0.174	Normal	0.0328	95% KM (t)

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-45
EPCs at SWMU 02-009(c) for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Barium	28	28	16.8	636	Nonparametric	204	95% Chebyshev (Mean, Sd)
Cadmium	28	13	0.102	0.538(U)	Nonparametric	0.267	95% KM (t)
Chromium hexavalent ion	26	8	0.203(U)	1.33	Lognormal	0.447	95% KM (t)
Iron	28	28	5400	15200	Normal	8620	95% Student's-t
Mercury	28	28	0.0034	1.13	Lognormal	0.373	95% Chebyshev (Mean, Sd)
Perchlorate	26	11	0.000557	0.00224(U)	Normal	0.0013	95% KM (t)
Selenium	28	16	0.284	1.62(U)	Normal	0.824	95% KM (t)
Silver	28	21	0.0441	1.5	Nonparametric	0.304	95% KM (BCA)
Zinc	28	28	28.4	77.2	Gamma	46.5	95% Adjusted Gamma
Organic Chemicals (mg/kg)							
Aroclor-1248	19	1	0.0034(U)	0.037(U)	n/a*	0.0045	Maximum detected concentration
Aroclor-1254	19	14	0.0022	0.126	Lognormal	0.0613	95% KM Chebyshev
Aroclor-1260	19	16	0.0016	0.146	Lognormal	0.0728	95% KM Chebyshev
Dibenzofuran	27	1	0.061	0.373(U)	n/a	0.061	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	22	15	-0.0673(U)	15.2	Nonparametric	4.73	95% KM Chebyshev
Plutonium-239/240	28	17	0.000947(U)	0.934	Gamma	0.281	95% KM (Percentile Bootstrap)
Strontium-90	28	6	-0.124(U)	1.94	Normal	0.256	95% KM (t)
Tritium	28	5	0.00143(U)	0.0510	Normal	0.0119	95% KM (t)

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-46
EPCs at SWMU 02-009(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)							
Aluminum	89	89	616	15700	Nonparametric	3800	95% Bootstrap-t
Antimony	57	0	0.102(U)	1.06(U)	n/a*	1.06(U)	Maximum detection limit
Arsenic	89	85	0.539	4.2	Gamma	1.8	95% KM (BCA)
Barium	86	86	7.5	636	Nonparametric	111	95% Chebyshev (Mean, Sd)
Cadmium	89	34	0.0411(U)	0.73(U)	Lognormal	0.146	95% KM (t)
Chromium (Total)	83	73	0.57	43.5	Lognormal	9.71	95% KM (BCA)
Chromium hexavalent ion	57	22	0.0387	1.33	Gamma	0.242	95% KM (t)
Iron	89	89	1800	15200	Normal	7120	95% Student's-t
Manganese	83	83	73	905	Nonparametric	296	95% Student's-t
Mercury	89	66	0.0019	1.13	Lognormal	0.149	95% KM (Chebyshev)
Nickel	89	70	0.674(U)	7.15	Normal	2.96	95% KM (t)
Perchlorate	61	16	0.000557	0.00901	Lognormal	0.00162	95% KM (t)
Selenium	89	63	0.14	11.4	Lognormal	2.37	95% KM (Chebyshev)
Silver	89	65	0.0441	2.8	Lognormal	0.682	95% KM (Chebyshev)
Vanadium	89	89	1.1	15.6	Normal	7.29	95% Student's-t
Zinc	89	88	14	77.2	Normal	36	95% KM (t)

Table H-2.3-46 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Organic Chemicals (mg/kg)							
Acetone	35	1	0.00523(U)	0.133	n/a	0.133	Maximum detected concentration
Aroclor-1248	49	1	0.0034(U)	0.037(U)	n/a	0.0045	Maximum detected concentration
Aroclor-1254	49	27	0.0022	0.126	Lognormal	0.0298	95% KM (Chebyshev)
Aroclor-1260	49	32	0.0016	0.146	Lognormal	0.0342	95% KM (Chebyshev)
Bis(2-ethylhexyl)phthalate	88	6	0.02	1.9(U)	Lognormal	0.0547	95% KM Chebyshev
Chloroform	35	2	0.000223	0.00148(U)	n/a	0.000231	Maximum detected concentration
Di-n-butylphthalate	87	3	0.02(U)	1.9(U)	n/a	0.068	Maximum detected concentration
Dibenzofuran	87	1	0.061	1.9(U)	n/a	0.061	Maximum detected concentration
Isopropyltoluene[4-]	35	1	0.00105(U)	0.0505	n/a	0.0505	Maximum detected concentration
Phenol	87	1	0.04	1.9(U)	n/a	0.04	Maximum detected concentration
Styrene	35	1	0.000239	0.00148(U)	n/a	0.000239	Maximum detected concentration
Toluene	35	4	0.000418	0.00456	n/a	0.00456	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	77	59	-0.0697(U)	232	Nonparametric	26.1	95% KM (Chebyshev)
Plutonium-239/240	89	45	-0.0107(U)	0.992	Nonparametric	0.219	95% KM (Chebyshev)
Strontium-90	89	33	-0.124(U)	11.8	Gamma	0.718	95% KM (t)
Tritium	89	28	-0.0273(U)	0.573	Nonparametric	0.0409	95% KM Chebyshev
Uranium-234	89	89	0.285	4.37	Nonparametric	1.34	95% Student's-t
Uranium-235/236	89	64	0.0232(U)	0.161	Normal	0.074	95% KM (t)
Uranium-238	89	89	0.285	3.92	Nonparametric	1.29	95% Student's-t

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-47
EPCs at SWMU 02-009(d) for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Cadmium	11	8	0.131	0.773	Normal	0.49	95% KM (t)
Mercury	11	11	0.0198	1.75	Gamma	1.22	95% Adjusted Gamma
Perchlorate	11	7	0.000603	0.0021(U)	Normal	0.00132	95% KM (t)
Selenium	11	8	0.516	1.94	Normal	1.52	95% KM (t)
Zinc	11	11	38.3	56.1	Nonparametric	46.6	95% Student's-t
Organic Chemicals (mg/kg)							
Aroclor-1248	11	2	0.0059	0.0352(U)	n/a*	0.0086	Maximum detected concentration
Aroclor-1254	11	9	0.00343(U)	0.0581	Normal	0.0284	95% KM (t)
Aroclor-1260	11	11	0.0022	0.118	Normal	0.0629	95% Student's-t
Radionuclides (pCi/g)							
Cesium-137	10	10	0.393	7.69	Normal	4.1	95% Student's-t
Cobalt-60	9	1	-0.0299(U)	0.162	n/a	0.162	Maximum detected concentration
Plutonium-239/240	11	5	-0.00261(U)	0.102	Normal	0.0528	95% KM (t)
Strontium-90	11	7	-0.0833(U)	5.86	Nonparametric	3.67	95% KM Chebyshev
Tritium	11	3	-0.000293(U)	0.0421	n/a	0.0421	Maximum detected concentration
Uranium-234	11	11	0.964	12.8	Nonparametric	6.85	95% Chebyshev (Mean, Sd)
Uranium-235/236	11	9	0.0375(U)	0.901	Nonparametric	0.48	95% KM (Chebyshev)

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-48
EPCs at SWMU 02-009(d) for the Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Cadmium	24	13	0.131	0.773	Normal	0.4	95% KM (t)
Chromium hexavalent ion	8	1	0.0437(U)	0.538(U)	n/a*	0.156	Maximum detected concentration
Mercury	24	23	0.0017(U)	1.75	Gamma	0.718	95% KM (Chebyshev)
Perchlorate	22	12	0.000603	0.00227(U)	Normal	0.00111	95% KM (t)
Selenium	24	16	0.29(U)	2.14	Normal	1.32	95% KM (t)
Zinc	24	24	37.5	56.1	Normal	44.5	95% Student's-t
Organic Chemicals (mg/kg)							
Aroclor-1248	22	2	0.00345(U)	0.036(U)	n/a	0.0086	Maximum detected concentration
Aroclor-1254	22	16	0.0031	0.0734	Normal	0.026	95% KM (t)
Aroclor-1260	22	22	0.0022	0.118	Normal	0.0449	95% Student's-t
Di-n-butylphthalate	24	2	0.0385	1.8(U)	n/a	0.0421	Maximum detected concentration
Dichlorobenzene[1,4-]	11	2	0.000213	0.00113(U)	n/a	0.000595	Maximum detected concentration
Isopropyltoluene[4-]	11	1	0.00103(U)	0.0034	n/a	0.0034	Maximum detected concentration
Styrene	11	1	0.00103(U)	0.00113(U)	n/a	0.00111	Maximum detected concentration
Toluene	11	2	0.000533	0.00113(U)	n/a	0.000775	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	23	23	0.196	14	Normal	4.86	95% Student's-t
Cobalt-60	22	1	-0.0299(U)	0.162	n/a	0.162	Maximum detected concentration
Plutonium-239/240	24	10	-0.00261(U)	1.19	Nonparametric	0.299	95% KM (Chebyshev)
Strontium-90	24	18	-0.0833(U)	29.3	Gamma	7.8	95% KM (Chebyshev)
Tritium	2	8	-0.00258(U)	0.109	Normal	0.0218	95% KM (t)
Uranium-234	24	24	0.964	12.8	Nonparametric	4.04	95% Chebyshev (Mean, Sd)
Uranium-235/236	24	22	0.0375(U)	0.901	Nonparametric	0.278	95% KM (Chebyshev)

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-49
EPCs at SWMU 02-010 for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Barium	16	16	35.3	447	Lognormal	306	95% Chebyshev (Mean, Sd)
Cadmium	16	12	0.0889(U)	5.6	Lognormal	1.4	95% KM (BCA)
Chromium hexavalent ion	3	3	0.0652	0.26	n/a*	0.26	Maximum detected concentration
Cyanide (Total)	12	2	0.243(U)	14.4	n/a	14.4	Maximum detected concentration
Lead	16	16	6.41	134	Lognormal	55.6	95% Chebyshev (Mean, Sd)
Mercury	16	16	0.0149	0.556	Normal	0.279	95% Student's-t
Nitrate	12	9	0.849	9.77	Lognormal	3.42	95% KM (BCA)
Perchlorate	16	2	0.00203(U)	0.117	n/a	0.117	Maximum detected concentration
Selenium	16	12	0.28(UJ)	8.72	Gamma	2.31	95% KM (Percentile Bootstrap)
Zinc	16	16	23.9	152	Lognormal	65.4	95% Student's-t
Organic Chemicals (mg/kg)							
Aroclor-1254	12	3	0.0181(U)	0.199	n/a	0.199	Maximum detected concentration
Aroclor-1260	12	10	0.0133	0.329	Gamma	0.22	95% KM (Chebyshev)
Bis(2-ethylhexyl)phthalate	16	2	0.0429	0.35(U)	n/a	0.0534	Maximum detected concentration
Di-n-butylphthalate	16	2	0.0381	0.35(U)	n/a	0.983	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	16	16	0.28	17.2	Nonparametric	7.76	95% Chebyshev (Mean, Sd)
Plutonium-239/240	16	11	-0.0102(U)	1.43	Normal	0.59	95% KM (t)
Strontium-90	16	8	-0.173(U)	7.22	Normal	1.65	95% KM (t)
Tritium	16	3	-0.00497(U)	0.136	n/a	0.136	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-50
EPCs at SWMU 02-010 for the Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Barium	37	37	17.2	447	Nonparametric	166	95% Chebyshev (Mean, Sd)
Cadmium	37	20	0.02	5.6	Lognormal	1.07	95% KM (Chebyshev)
Chromium hexavalent ion	8	5	0.0652	0.26	Normal	0.162	95% KM (t)
Cyanide (Total)	27	3	0.109	14.4	n/a	14.4	Maximum detected concentration
Lead	37	37	3.9	134	Nonparametric	31.2	95% Chebyshev (Mean, Sd)
Mercury	37	32	0.0016	0.556	Gamma	0.205	95% KM (Chebyshev)
Nitrate	27	17	0.849	9.77	Lognormal	2.33	95% KM (BCA)
Perchlorate	37	5	0.00169	0.117	Normal	0.0135	95% KM (t)
Selenium	37	23	0.186	8.72	Lognormal	1.93	95% KM (BCA)
Zinc	37	37	20	152	Lognormal	47.9	95% Student's-t
Organic Chemicals (mg/kg)							
Aroclor-1248	27	1	0.00353(U)	0.0375(U)	n/a*	0.0066	Maximum detected concentration
Aroclor-1254	27	5	0.00353(U)	0.199	Normal	0.0301	95% KM (t)
Aroclor-1260	27	18	0.0013	0.329	Gamma	0.0624	95% KM (BCA)
Bis(2-ethylhexyl)phthalate	37	5	0.0353	3.5(U)	Lognormal	0.0688	95% KM (t)
Chloroform	15	1	0.000216(U)	0.00112(U)	n/a	0.000219	Maximum detected concentration
Di-n-butylphthalate	37	2	0.0381	3.5(U)	n/a	0.983	Maximum detected concentration
Methylene Chloride	15	1	0.00213	0.00575U)	n/a	0.00213	Maximum detected concentration
Toluene	15	4	0.000372	0.0011(U)	n/a	0.000593	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	54	40	-0.0772(U)	18.2	Nonparametric	4.71	95% KM (Chebyshev)
Plutonium-239/240	37	17	-0.0102(U)	2.93	Gamma	0.436	95% KM (t)
Strontium-90	37	16	-0.173(U)	7.22	Nonparametric	1.46	95% KM (Chebyshev)
Tritium	37	15	-0.00497(U)	0.136	Normal	0.0329	95% KM (t)

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-51
EPCs at AOC 02-011(a)(i-vi) for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Cadmium	6	3	0.113	0.526(U)	n/a*	0.208	Maximum detected concentration
Mercury	6	6	0.0243	6.57	n/a	6.57	Maximum detected concentration
Perchlorate	6	2	0.000599	0.00215(U)	n/a	0.00131	Maximum detected concentration
Zinc	6	6	30.2	59.8	n/a	59.8	Maximum detected concentration
Organic Chemicals (mg/kg)							
Aroclor-1254	6	2	0.0179(U)	0.0647	n/a	0.0647	Maximum detected concentration
Aroclor-1260	6	4	0.0179(U)	0.344	n/a	0.344	Maximum detected concentration
Di-n-butylphthalate	6	1	0.101	1.43(U)	n/a	0.101	Maximum detected concentration
Radionuclides (pCi/g)							
Americium-241	6	1	-0.00711(U)	0.0924	n/a	0.0924	Maximum detected concentration
Cobalt-60	6	1	-0.043(U)	0.762	n/a	0.762	Maximum detected concentration
Plutonium-239/240	6	2	0.0103(U)	0.182	n/a	0.182	Maximum detected concentration
Tritium	6	1	-0.00219(U)	0.00729(U)	n/a	0.00626	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-52
EPCs at AOC 02-011(a)(i-vi) for the Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	14	1	0.108	5.14(U)	n/a*	0.108	Maximum detected concentration
Cadmium	16	4	0.113	0.546(U)	n/a	0.208	Maximum detected concentration
Chromium (Total)	16	16	2.88	19.9	Normal	11.56	95% Student's-t
Mercury	16	13	0.0079	6.57	Gamma	4.603	95% KM Bootstrap t
Perchlorate	15	2	0.000599	0.00224(U)	n/a	0.00131	Maximum detected concentration
Selenium	16	6	0.505	2.41	Normal	1.211	95% KM (t)
Zinc	16	16	24.9	59.8	Normal	40..3	95% Student's-t
Organic Chemicals (mg/kg)							
Aroclor-1242	53	1	0.00337(U)	0.0709(U)	n/a	0.0162	Maximum detected concentration
Aroclor-1254	53	19	0.0023	0.356	Gamma	0.0624	95% KM Approximate Gamma
Aroclor-1260	53	46	0.0021	0.867	Gamma	0.247	95% KM Approximate Gamma
Chloroform	9	1	0.000237	0.00112(U)	n/a	0.000237	Maximum detected concentration
Di-n-butylphthalate	16	1	0.101	1.43(U)	n/a	0.101	Maximum detected concentration
Radionuclides (pCi/g)							
Americium-241	15	1	-0.00895(U)	0.0924	n/a	0.0924	Maximum detected concentration
Cobalt-60	16	1	-0.0446(U)	0.762	n/a	0.762	Maximum detected concentration
Plutonium-239/240	16	5	0.0014(U)	0.182	Normal	0.0814	95% KM (t)
Tritium	16	9	-0.00219(U)	0.097	Normal	0.0423	95% Gamma Adjusted KM

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-53
EPCs at SWMU 02-011(a)(viii) for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Cadmium	3	1	0.54(U)	0.63	n/a*	0.63	Maximum detected concentration
Chromium (Total)	3	2	5.55	13	n/a	13	Maximum detected concentration
Copper	3	2	4.59	17	n/a	17	Maximum detected concentration
Lead	3	3	8.85	40	n/a	40	Maximum detected concentration
Mercury	3	3	0.473	2.93	n/a	2.93	Maximum detected concentration
Zinc	3	3	37	390	n/a	390	Maximum detected concentration
Organic Chemicals (mg/kg)							
Aroclor-1254	2	1	0.00363(U)	0.0276	n/a	0.0276	Maximum detected concentration
Aroclor-1260	2	2	0.0429	0.0546	n/a	0.0546	Maximum detected concentration
Radionuclides (pCi/g)							
Cobalt-60	3	1	-0.00189(U)	0.598	n/a	0.598	Maximum detected concentration
Plutonium-239/240	3	1	0.009(U)	1.87	n/a	1.87	Maximum detected concentration
Tritium	3	2	0.00886(U)	0.279	n/a	0.279	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-54
EPCs at AOC 02-011(a)(viii) for the Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Cadmium	15	7	0.0538	0.63	Normal	0.367	95% KM (t)
Chromium (Total)	15	14	2.18	19.6	Normal	9.11	95% KM (t)
Chromium hexavalent ion	14	7	0.061	0.676	Gamma	0.227	95% KM (t)
Copper	15	13	1.87	17	Gamma	7.87	95% KM (BCA)
Lead	15	15	4.81	40	Nonparametric	22.2	95% Chebyshev (Mean, Sd)
Mercury	15	15	0.0025	5.26	Gamma	2.26	95% Adjusted Gamma
Selenium	15	8	0.252	1.64(U)	Normal	0.558	95% KM (t)
Zinc	15	15	20.5	390	Nonparametric	167	95% Chebyshev (Mean, Sd)
Organic Chemicals (mg/kg)							
Aroclor-1254	4	1	0.0036(U)	0.0276	n/a*	0.0276	Maximum detected concentration
Aroclor-1260	4	3	0.0036(U)	0.0546	n/a	0.0546	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	14	3	-0.0503(U)	0.828	n/a	0.828	Maximum detected concentration
Cobalt-60	14	2	-0.0116(U)	0.598	n/a	0.598	Maximum detected concentration
Plutonium-239/240	15	2	-0.00335(U)	1.87	n/a	1.87	Maximum detected concentration
Tritium	15	13	0.0088623(U)	0.773	Normal	0.416	95% KM (t)

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-55
EPCs at AOC 02-011(a)(ix) for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Cadmium	19	14	0.105	0.549(U)	Normal	0.285	95% KM (t)
Chromium hexavalent ion	14	4	0.0999(U)	1.01(U)	n/a*	0.349	Maximum detected concentration
Lead	19	19	7.26	20	Normal	12.7	95% Student's-t
Mercury	19	19	0.0144	6.45	Lognormal	2.52	95% Chebyshev (Mean, Sd)
Perchlorate	18	2	0.000556	0.00254(U)	n/a	0.000752	Maximum detected concentration
Selenium	19	6	0.274	1.63(U)	Normal	0.72	95% KM (t)
Zinc	19	19	26.3	214	Nonparametric	72.5	95% Student's-t
Organic Chemicals (mg/kg)							
Acenaphthene	18	5	0.0134	0.0481	Lognormal	0.0217	95% KM (t)
Anthracene	18	12	0.011	0.0877	Lognormal	0.0367	95% KM (BCA)
Aroclor-1248	18	1	0.00368(U)	0.197	n/a	0.197	Maximum detected concentration
Aroclor-1254	18	16	0.0142	0.232	Lognormal	0.128	95% KM (Chebyshev)
Aroclor-1260	18	18	0.0209	0.268	Lognormal	0.153	95% Chebyshev (Mean, Sd)
Benzo(a)anthracene	18	17	0.017	0.593	Lognormal	0.229	95% KM (Chebyshev)
Benzo(a)pyrene	18	16	0.0155	0.433	Gamma	0.138	95% KM (BCA)
Benzo(b)fluoranthene	18	16	0.0142	0.792	Lognormal	0.318	95% KM (Chebyshev)
Benzo(g,h,i)perylene	18	10	0.0155	0.158	Normal	0.0596	95% KM (t)
Benzo(k)fluoranthene	18	6	0.0129	0.0533	Normal	0.0382	95% KM (t)
Chrysene	18	17	0.0115	0.517	Lognormal	0.21	95% KM (Chebyshev)
Di-n-butylphthalate	18	2	0.0446	0.423(U)	n/a	0.0613	Maximum detected concentration
Fluoranthene	18	17	0.016	0.965	Lognormal	0.368	95% KM (Chebyshev)
Fluorene	18	5	0.0138	0.0423(U)	Nonparametric	0.019	95% KM (t)
Indeno(1,2,3-cd)pyrene	18	9	0.0213	0.145	Gamma	0.0548	95% KM (t)

Table H-2.3-55 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Methylnaphthalene[2-]	18	2	0.00962	0.0423(U)	n/a	0.0194	Maximum detected concentration
Naphthalene	18	3	0.0125	0.0423(U)	n/a	0.0278	Maximum detected concentration
Phenanthrene	18	15	0.016	0.317	Gamma	0.119	95% KM (BCA)
Pyrene	18	17	0.0203	1.3	Lognormal	0.496	95% KM (Chebyshev)
Total Petroleum Hydrocarbons Diesel Range Organics	3	2	13.8	36.8(U)	n/a	16.8	Maximum detected concentration
Radionuclides (pCi/g)							
Plutonium-239/240	19	4	-0.0015(U)	1.66	n/a	1.66	Maximum detected concentration
Tritium	19	3	-0.00574(U)	0.0471	n/a	0.0471	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-56
EPCs at AOC 02-011(a)(ix) for the Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Cadmium	42	20	0.105	0.567(U)	Normal	0.261	95% KM (t)
Chromium (Total)	42	33	3.4(U)	45.1	Lognormal	11.8	95% KM (BCA)
Chromium hexavalent ion	32	10	0.0575	1.14	Normal	0.244	95% KM (t)
Lead	42	42	3.86	2370	Nonparametric	341	95% Chebyshev (Mean, Sd)
Mercury	42	40	0.00334	6.45	Lognormal	1.24	95% KM (Chebyshev)
Perchlorate	36	4	0.000556	0.00254(U)	n/a*	0.0008	Maximum detected concentration
Selenium	42	20	0.19	4.6	Normal	1.11	95% KM (t)
Vanadium	42	42	4.41	69.5	Nonparametric	14.6	95% Student's-t
Zinc	42	42	16.2	296	Nonparametric	103	95% Chebyshev (Mean, Sd)

Table H-2.3-56 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Organic Chemicals (mg/kg)							
Acenaphthene	36	5	0.0134	0.118(U)	Lognormal	0.0195	95% KM (t)
Anthracene	36	14	0.0101	0.118(U)	Lognormal	0.0277	95% KM (t)
Aroclor-1242	36	1	0.00358(U)	0.0423(U)	n/a	0.0103	Maximum detected concentration
Aroclor-1248	36	1	0.00358(U)	0.197	n/a	0.197	Maximum detected concentration
Aroclor-1254	36	30	0.0036(U)	0.232	Lognormal	0.0806	95% KM (Chebyshev)
Aroclor-1260	36	32	0.0036(U)	0.268	Gamma	0.0915	95% KM (Chebyshev)
Benzo(a)anthracene	36	22	0.0142	0.593	Lognormal	0.094	95% KM (BCA)
Benzo(a)pyrene	36	20	0.0155	0.433	Lognormal	0.085	95% KM (t)
Benzo(b)fluoranthene	36	20	0.0142	0.792	Lognormal	0.119	95% KM (t)
Benzo(g,h,i)perylene	36	11	0.0155	0.158	Normal	0.0443	95% KM (t)
Benzo(k)fluoranthene	36	6	0.0129	0.118(U)	Normal	0.0366	95% KM (t)
Bis(2-ethylhexyl)phthalate	36	2	0.0789	0.592(U)	n/a	0.153	Maximum detected concentration
Chloroform	18	1	0.000218	0.00119(U)	n/a	0.000218	Maximum detected concentration
Chrysene	36	21	0.0115	0.517	Lognormal	0.0823	95% KM (t)
Di-n-butylphthalate	36	3	0.0446	1.18(U)	n/a	0.0736	Maximum detected concentration
Fluoranthene	36	23	0.0119	0.965	Lognormal	0.206	95% KM (Chebyshev)
Fluorene	36	5	0.0138	0.118(U)	Nonparametric	0.0165	95% KM (t)
Indeno(1,2,3-cd)pyrene	36	11	0.0147	0.145	Gamma	0.0388	95% KM (t)
Isopropylbenzene	18	1	0.000401	0.00119(U)	n/a	0.000401	Maximum detected concentration
Isopropyltoluene[4-]	18	1	0.000534	0.00119(U)	n/a	0.000534	Maximum detected concentration
Methylnaphthalene[2-]	36	2	0.00962	0.118(U)	n/a	0.0194	Maximum detected concentration
Naphthalene	36	4	0.0125	0.118(U)	n/a	0.0278	Maximum detected concentration
Phenanthrene	36	20	0.016	0.317	Gamma	0.0733	95% KM (t)
Pyrene	36	22	0.0202	1.3	Lognormal	0.274	95% KM (Chebyshev)
Toluene	18	1	0.000362	0.00119(U)	n/a	0.000362	Maximum detected concentration
Total Petroleum Hydrocarbons Diesel Range Organics	7	6	2.1	77.3	n/a	77.3	Maximum detected concentration

Table H-2.3-56 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Trimethylbenzene[1,2,4-]	18	1	0.000893(U)	0.00329	n/a	0.00329	Maximum detected concentration
Trimethylbenzene[1,3,5-]	18	1	0.000893(U)	0.00119(U)	n/a	0.00101	Maximum detected concentration
Xylene[1,2-]	18	1	0.000249	0.00119(U)	n/a	0.000249	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	35	19	-0.0649(U)	1.13	Gamma	0.278	95% KM Adjusted Gamma
Plutonium-239/240	42	7	-0.00409(U)	1.66	Nonparametric	0.264	95% KM (Chebyshev)
Tritium	42	15	-0.00574(U)	0.169	Gamma	0.0351	95% KM Adjusted Gamma
Uranium-234	42	42	0.647	2.66	Nonparametric	1.19	95% Student's-t

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-57
EPCs at AOC 02-011(a)(x) for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Arsenic	7	7	1.6	16.9	n/a*	16.9	Maximum detected concentration
Cadmium	7	3	0.135	2.54(U)	n/a	0.305	Maximum detected concentration
Chromium (Total)	7	6	3.66(U)	23.2	n/a	23.2	Maximum detected concentration
Chromium hexavalent ion	6	2	0.103(U)	0.693	n/a	0.693	Maximum detected concentration
Copper	7	7	3.19	52	n/a	52	Maximum detected concentration
Iron	7	7	5630	66,400	n/a	66,400	Maximum detected concentration
Lead	7	7	6.68	45	n/a	45	Maximum detected concentration
Mercury	7	7	0.061	0.267	n/a	0.267	Maximum detected concentration
Perchlorate	6	3	0.000609	0.0021(U)	n/a	0.00114	Maximum detected concentration
Selenium	7	1	0.572	5.71(U)	n/a	0.572	Maximum detected concentration
Zinc	7	7	28.1	98.7	n/a	98.7	Maximum detected concentration
Organic Chemicals (mg/kg)							
Aroclor-1254	8	6	0.0145	0.18(U)	Normal	0.0528	95% KM (t)
Aroclor-1260	8	8	0.0247	0.635	Lognormal	0.956	95% Hall's Bootstrap
Total Petroleum Hydrocarbons Diesel Range Organics	1	1	52.3	52.3	n/a	52.3	Maximum detected concentration
Radionuclides (pCi/g)							
Plutonium-239/240	7	5	0.02(U)	1.67	n/a	1.67	Maximum detected concentration
Tritium	7	4	0.00148(U)	0.104	n/a	0.104	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-58
EPCs at SWMU 02-011(a)(x) 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	26	26	1770	7510	Normal	4030	95% Student's-t
Antimony	13	1	0.11	5.05(U)	n/a*	0.11	Maximum detected concentration
Arsenic	26	23	0.668	16.9	Nonparametric	4.66	95% KM (Chebyshev)
Barium	26	26	23.8	968	Lognormal	314	95% Chebyshev (Mean, Sd)
Cadmium	26	12	0.0553	2.54(U)	Normal	0.204	95% KM (t)
Chromium (Total)	24	23	3.66(U)	24	Nonparametric	14.2	95% KM (Chebyshev)
Chromium hexavalent ion	23	12	0.0275(U)	0.693	Normal	0.26	95% KM (t)
Copper	26	23	1.74	52	Nonparametric	14.9	95% KM (Chebyshev)
Iron	26	26	5630	66,400	Nonparametric	14,900	95% Student's-t
Lead	26	26	2.37	45	Nonparametric	11.9	95% Standard Bootstrap
Manganese	26	26	122	566	Normal	304	95% Student's-t
Mercury	26	20	0.0017	0.656	Gamma	0.191	95% KM (Chebyshev)
Perchlorate	13	5	0.000609	0.00225(U)	n/a	0.00114	Maximum detected concentration
Selenium	26	8	0.184(U)	5.71(U)	Normal	0.693	95% KM (t)
Vanadium	26	26	4.99	19.5	Normal	13	95% Student's-t
Zinc	26	26	11.9	914	Lognormal	239	95% Chebyshev (Mean, Sd)
Organic Chemicals (mg/kg)							
Aroclor-1254	24	7	0.0029	0.18(U)	Normal	0.0212	95% KM (t)
Aroclor-1260	24	17	0.0016	0.635	Gamma	0.197	95% KM (Chebyshev)
Di-n-butylphthalate	14	1	0.0381	0.379(U)	n/a	0.0381	Maximum detected concentration
Toluene	7	1	0.00107(U)	0.00113(U)	n/a	0.00097	Maximum detected concentration
Total Petroleum Hydrocarbons Diesel Range Organics	2	1	3.59(U)	52.3	n/a	52.3	Maximum detected concentration

Table H-2.3-58 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Radionuclides (pCi/g)							
Cesium-137	26	10	-0.0902(U)	1.42	Normal	0.303	95% KM (t)
Plutonium-239/240	26	6	-0.0123(U)	1.67	Normal	0.287	95% KM (t)
Tritium	26	17	0.00148(U)	0.148	Gamma	0.0388	95% KM (Percentile Bootstrap)

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-59
EPCs at AOC 02-011(b) for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Cadmium	6	4	0.019	0.503(U)	n/a*	0.243	Maximum detected concentration
Chromium hexavalent ion	5	5	0.0852	0.693	n/a	0.693	Maximum detected concentration
Lead	6	6	4.6	23.2	n/a	23.2	Maximum detected concentration
Mercury	6	5	0.0016(UJ)	0.461	n/a	0.461	Maximum detected concentration
Selenium	6	1	0.27(U)	1.55(U)	n/a	0.845	Maximum detected concentration
Zinc	6	6	22	70.1	n/a	70.1	Maximum detected concentration
Organic Chemicals (mg/kg)							
Aroclor-1254	5	5	0.0043	0.159	n/a	0.159	Maximum detected concentration
Aroclor-1260	5	5	0.0045	0.212	n/a	0.212	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	5	1	0.137	0.182(U)	n/a	0.137	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	6	5	0.0509(U)	23.3	n/a	23.3	Maximum detected concentration
Plutonium-239/240	5	5	0.133	0.845	n/a	0.845	Maximum detected concentration
Tritium	6	1	-0.000984(U)	0.0707	n/a	0.0707	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-60
EPCs at AOC 02-011(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)							
Cadmium	11	6	0.018(U)	0.553(U)	Normal	0.257	95% KM (t)
Chromium hexavalent ion	8	7	0.0804	0.693	n/a*	0.693	Maximum detected concentration
Lead	11	11	4.6	23.2	Normal	17.3	95% Student's-t
Manganese	11	11	190	980	Gamma	486	95% Adjusted Gamma
Mercury	11	9	0.0016(UJ)	0.461	Normal	0.183	95% KM (t)
Selenium	11	3	0.27(U)	3.71	n/a	3.71	Maximum detected concentration
Uranium	3	3	0.858	6.83	n/a	6.83	Maximum detected concentration
Zinc	11	11	20	70.1	Normal	57	95% Student's-t
Organic Chemicals (mg/kg)							
Aroclor-1254	8	7	0.0043	0.159	n/a	0.159	Maximum detected concentration
Aroclor-1260	8	6	0.0045	0.212	n/a	0.212	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	8	1	0.137	0.19(U)	n/a	0.137	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	11	9	0.0509(U)	23.3	Normal	9.39	95% KM (t)
Plutonium-238	11	1	-0.0126(U)	0.0255	n/a	0.0255	Maximum detected concentration
Plutonium-239/240	11	10	0.0156(U)	4.41	Gamma	2.57	95% KM (Chebyshev)
Strontium-90	11	7	-0.0782(U)	2.46	Gamma	0.838	95% KM (Percentile Bootstrap)
Tritium	11	2	-0.000984(U)	0.0868	n/a	0.0868	Maximum detected concentration
Uranium-234	11	11	0.622	6.33	Gamma	3.22	95% Adjusted Gamma
Uranium-235/236	11	8	0.0253(U)	0.274	Normal	0.154	95% KM (t)
Uranium-238	11	11	0.622	6.09	Gamma	3.07	95% Adjusted Gamma

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-61
EPCs at AOC 02-011(c) for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Organic Chemicals (mg/kg)							
Aroclor-1254	1	1	0.0518	0.0518	n/a*	0.0518	Maximum detected concentration
Aroclor-1260	1	1	0.12	0.12	n/a	0.12	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-62
EPCs at AOC 02-011(c) for the Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	3	0	0.421(UJ)	0.996(U)	n/a*	0.996(U)	Maximum detection limit
Cadmium	4	2	0.132	0.535(U)	n/a	0.175	Maximum detected concentration
Nitrate	3	2	1.02(U)	31.9	n/a	31.9	Maximum detected concentration
Perchlorate	3	1	0.000559	0.00215(U)	n/a	0.000559	Maximum detected concentration
Selenium	4	2	1.06(U)	1.7	n/a	1.7	Maximum detected concentration
Organic Chemicals (mg/kg)							
Aroclor-1254	4	1	0.00358(U)	0.0518	n/a	0.0518	Maximum detected concentration
Aroclor-1260	4	2	0.00358(U)	0.12	n/a	0.12	Maximum detected concentration
Toluene	2	1	0.000674	0.000107(U)	n/a	0.000674	Maximum detected concentration
Radionuclides (pCi/g)							
Strontium-90	3	1	0.0624(U)	0.263	n/a	0.263	Maximum detected concentration
Tritium	4	1	0.00106(U)	0.0308	n/a	0.0308	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-63
EPCs at AOC 02-011(d) for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	1	0	0.986(U)	0.986(U)	n/a*	0.986(U)	Maximum detection limit
Arsenic	4	4	1.72	8.7	n/a	8.7	Maximum detected concentration
Cadmium	4	4	0.179	0.69	n/a	0.69	Maximum detected concentration
Calcium	4	4	1020	11,000	n/a	11,000	Maximum detected concentration
Chromium (Total)	4	4	15.8	240	n/a	240	Maximum detected concentration
Copper	4	4	7.46	41	n/a	41	Maximum detected concentration
Lead	4	4	14.7	44.4	n/a	44.4	Maximum detected concentration
Perchlorate	2	1	0.00111	0.00205(U)	n/a	0.00111	Maximum detected concentration
Silver	4	2	0.0756(U)	1.1	n/a	1.1	Maximum detected concentration
Zinc	4	4	46.2	190	n/a	190	Maximum detected concentration
Organic Chemicals (mg/kg)							
Aroclor-1254	2	1	0.0341(U)	0.12	n/a	0.12	Maximum detected concentration
Aroclor-1260	2	2	0.0831	0.182	n/a	0.0831	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	4	4	0.208	1.66	n/a	1.66	Maximum detected concentration
Cobalt-60	4	3	0.058(U)	2.19	n/a	2.19	Maximum detected concentration
Plutonium-239/240	4	4	0.049	1.28	n/a	1.28	Maximum detected concentration
Tritium	4	3	0.0093	1.08(U)	n/a	0.082	Maximum detected concentration
Uranium-234	4	4	0.956	2.66	n/a	2.66	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-64
EPCs at SWMU 02-011(d) for the Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	6	1	0.444(U)	1.06(U)	n/a*	0.722	Maximum detected concentration
Arsenic	9	9	1.38	8.7	Gamma	4.69	95% Adjusted Gamma
Cadmium	9	9	0.171	0.69	Normal	0.385	95% Student's-t
Calcium	9	9	1020	19,400	Lognormal	14,000	95% Chebyshev (Mean, Sd)
Chromium (Total)	9	9	10.6	240	Gamma	129	95% Adjusted Gamma
Chromium hexavalent ion	7	3	0.164	0.775	n/a	0.775	Maximum detected concentration
Copper	9	9	4.02	41	Normal	21.5	95% Student's-t
Lead	9	9	6.07	44.4	Normal	28.4	95% Student's-t
Perchlorate	7	4	0.000995	0.00215(U)	n/a	0.00172	Maximum detected concentration
Silver	9	3	0.0756(U)	1.1	n/a	1.1	Maximum detected concentration
Zinc	9	9	44.3	190	Lognormal	160	95% Chebyshev (Mean, Sd)
Organic Chemicals (mg/kg)							
Acetone	6	1	0.00512(U)	0.00917	n/a	0.00917	Maximum detected concentration
Aroclor-1254	7	6	0.00921	0.12	n/a	0.12	Maximum detected concentration
Aroclor-1260	7	7	0.0115	0.182	n/a	0.182	Maximum detected concentration
Butanone[2-]	6	1	0.0024	0.00569(U)	n/a	0.0024	Maximum detected concentration
Isophorone	7	1	0.145	0.379(U)	n/a	0.145	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	9	9	0.208	1.66	Gamma	1.12	95% Adjusted Gamma
Cobalt-60	9	6	0.058(U)	2.19	Normal	0.993	95% KM (t)
Plutonium-239/240	9	9	0.049	1.28	Nonparametric	0.685	95% Hall's Bootstrap
Tritium	9	3	-2.15(U)	1.63(U)	n/a	0.082	Maximum detected concentration
Uranium-234	9	9	0.735	2.66	Normal	1.69	95% Student's-t

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-65
EPCs at AOC 02-012 for the Industrial and Recreational Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Cadmium	11	2	0.202	0.883	n/a*	0.883	Maximum detected concentration
Chromium (Total)	11	1	2.61(U)	35.5	n/a	35.5	Maximum detected concentration
Mercury	11	10	0.0103(U)	4.65	Gamma	2.82	95% KM (Chebyshev)
Perchlorate	11	3	0.000514	0.0022(U)	n/a	0.00172	Maximum detected concentration
Selenium	11	11	0.708	2.33	Normal	1.54	95% Student's-t
Zinc	11	11	33.7	560	Nonparametric	298	95% Chebyshev (Mean, Sd)
Organic Chemicals (mg/kg)							
Acenaphthene	11	8	0.0116	0.181	Gamma	0.0701	95% KM (Percentile Bootstrap)
Anthracene	11	10	0.00779	0.282	Gamma	0.17	95% KM (Chebyshev)
Benzo(a)anthracene	11	9	0.0329(U)	0.477	Normal	0.236	95% KM (t)
Benzo(a)pyrene	11	9	0.0216	0.537	Normal	0.24	95% KM (t)
Benzo(b)fluoranthene	11	11	0.0406	0.787	Normal	0.421	95% Student's-t
Benzo(g,h,i)perylene	11	4	0.0329(U)	0.186	n/a	0.186	Maximum detected concentration
Chrysene	11	11	0.024	0.466	Normal	0.24	95% Student's-t
Di-n-butylphthalate	11	3	0.037	0.366(U)	n/a	0.049	Maximum detected concentration
Dibenzofuran	11	1	0.109	0.366(U)	n/a	0.109	Maximum detected concentration
Fluoranthene	11	11	0.0419	1.03	Gamma	0.528	95% Adjusted Gamma
Fluorene	11	7	0.0171	0.164	Normal	0.065	95% KM (t)
Indeno(1,2,3-cd)pyrene	11	4	0.0329(U)	0.189	n/a	0.189	Maximum detected concentration
Methylnaphthalene[2-]	11	6	0.0106	0.0975	Normal	0.0425	95% KM (t)
Naphthalene	11	6	0.0111	0.213	Normal	0.0929	95% KM (t)
Phenanthrene	11	11	0.015	0.977	Gamma	0.479	95% Adjusted Gamma
Pyrene	11	11	0.0387	0.968	Normal	0.527	95% Student's-t
Total Petroleum Hydrocarbons Diesel Range Organics	11	10	4.91	128	Lognormal	80.6	95% KM (Chebyshev)
Radionuclides (pCi/g)							
Tritium	11	4	-0.00250(U)	0.0138(U)	n/a	0.00971	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-66
EPCs at AOC 02-012 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	25	25	1780	9280	Gamma	3990	95% Adjusted Gamma
Antimony	25	2	0.127	0.506(U)	n/a*	0.172	Maximum detected concentration
Arsenic	25	25	0.953	3.19	Normal	2.25	95% Student's-t
Barium	25	25	16.2	92.7	Normal	48.8	95% Student's-t
Cadmium	25	5	0.137	0.883	n/a	0.883	Maximum detected concentration
Chromium (Total)	25	6	2.61(U)	35.5	n/a	35.5	Maximum detected concentration
Copper	25	12	1.23	43	Lognormal	8	95% KM (t)
Iron	25	25	5200	12200	Normal	8480	95% Student's-t
Manganese	25	25	203	688	Nonparametric	324	95% Student's-t
Mercury	25	20	0.0027	4.65	Gamma	1.33	95% KM (Chebyshev)
Nickel	25	18	1.74	6.88	Normal	3.09	95% KM (t)
Perchlorate	25	5	0.000514	0.00259(U)	Normal	0.00152	95% KM (t)
Selenium	25	22	0.643	2.67	Normal	1.51	95% KM (t)
Vanadium	25	25	3.3	13.6	Normal	9.38	95% Student's-t
Zinc	25	25	18.1	560	Nonparametric	159	95% Chebyshev (Mean, Sd)

Table H-2.3-66 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Organic Chemicals (mg/kg)							
Acenaphthene	25	10	0.0116	0.181	Gamma	0.0536	95% KM (t)
Anthracene	25	15	0.00779	0.282	Gamma	0.0738	95% KM (t)
Benzo(a)anthracene	25	16	0.0142	0.477	Normal	0.154	95% KM (t)
Benzo(a)pyrene	25	15	0.0164	0.537	Normal	0.16	95% KM (t)
Benzo(b)fluoranthene	25	18	0.0112	0.787	Normal	0.272	95% KM (t)
Benzo(g,h,i)perylene	25	9	0.0329(U)	0.186	Normal	0.0681	95% KM (t)
Chrysene	25	17	0.024	0.466	Normal	0.166	95% KM (t)
Di-n-butylphthalate	25	4	0.037	0.713(U)	n/a	0.0678	Maximum detected concentration
Dibenzofuran	25	2	0.108	0.713(U)	n/a	0.109	Maximum detected concentration
Dichlorobenzene[1,4-]	39	1	0.000252	0.00113(U)	n/a	0.000252	Maximum detected concentration
Fluoranthene	25	19	0.0132	1.03	Gamma	0.449	95% KM (Chebyshev)
Fluorene	25	8	0.0171	0.164	Normal	0.0497	95% KM (t)
Indeno(1,2,3-cd)pyrene	25	7	0.0329(U)	0.189	Normal	0.0636	95% KM (t)
Methylene Chloride	14	4	0.00217	0.00567(U)	n/a	0.00416	Maximum detected concentration
Methylnaphthalene[2-]	25	7	0.0106	0.14	Normal	0.038	95% KM (t)
Naphthalene	25	9	0.0111	0.381	Gamma	0.0806	95% KM (t)
Phenanthrene	25	17	0.015	0.977	Gamma	0.243	95% KM (BCA)
Pyrene	25	19	0.0147	0.968	Normal	0.341	95% KM (t)
Total Petroleum Hydrocarbons Diesel Range Organics	24	16	1.89	128	Gamma	24.3	95% KM (BCA)
Trichloroethene	14	1	0.000635	0.00113(U)	n/a	0.000635	Maximum detected concentration
Radionuclides (pCi/g)							
Americium-241	25	1	-0.0148(U)	0.0987	n/a	0.0987	Maximum detected concentration
Plutonium-239/240	25	1	-0.00446(U)	0.228	n/a	0.228	Maximum detected concentration
Tritium	25	13	-0.00250(U)	0.446	Gamma	0.144	95% Gamma Adjusted

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-67
EPCs at SWMU 21-006(e) and AOC 21-006(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)							
Antimony	37	15	0.085	2.9	Lognormal	0.48	95% KM (BCA)
Arsenic	37	37	0.698	5	Normal	2.07	95% Student's-t
Barium	37	37	11.3	528	Nonparametric	89.2	95% Standard Bootstrap
Calcium	37	37	443	18,600	Gamma	7060	95% Adjusted Gamma
Copper	37	9	1.1(U)	30.2(U)	Normal	2.72	95% KM (t)
Cyanide (Total)	25	1	0.44	0.57(U)	n/a	0.44	Maximum detected concentration
Lead	37	10	1.58	74.2	Normal	11.1	95% KM (t)
Mercury	25	18	0.00626	0.151	Normal	0.0483	95% KM (t)
Nickel	37	10	1.3(U)	68.4	Lognormal	7.78	95% KM (BCA)
Selenium	37	5	0.22	1.09(U)	Normal	0.372	95% KM (t)
Zinc	37	9	9.2(U)	87.6(U)	Normal	30.2	95% KM (t)
Organic Chemicals (mg/kg)							
Acetone	30	5	0.0053(U)	0.043(U)	Normal	0.0139	95% KM (t)
Aroclor-1254	7	2	0.00358(U)	0.14	n/a*	0.14	Maximum detected concentration
Aroclor-1260	7	3	0.00358(U)	0.159	n/a	0.159	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	30	2	0.14	0.38(U)	n/a	0.22	Maximum detected concentration
Bromobenzene	30	1	0.00047	0.0057(U)	n/a	0.00047	Maximum detected concentration
Butylbenzene[n-]	30	1	0.0011	0.0057(U)	n/a	0.0011	Maximum detected concentration
Butylbenzene[sec-]	30	1	0.00041	0.0057(U)	n/a	0.00041	Maximum detected concentration
Dichlorobenzene[1,2-]	60	4	0.00024	0.38(U)	n/a	0.00051	Maximum detected concentration
Dichlorobenzene[1,3-]	60	4	0.00025	0.38(U)	n/a	0.00047	Maximum detected concentration
Dichlorobenzene[1,4-]	60	3	4.00E-04	0.38(U)	n/a	0.00049	Maximum detected concentration
Ethylbenzene	30	2	0.00033	0.0057(U)	n/a	0.0016	Maximum detected concentration

Table H-2.3-67 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Isopropyltoluene[4-]	30	1	0.0021	0.0057(U)	n/a	0.0021	Maximum detected concentration
Methylene Chloride	30	5	0.0035	0.02(U)	Normal	0.00672	95% KM (t)
Toluene	30	9	0.00015(U)	0.0057(U)	Normal	0.000789	95% KM (t)
Trimethylbenzene[1,2,4-]	30	5	0.00029	0.0057(U)	Normal	0.000671	95% KM (t)
Trimethylbenzene[1,3,5-]	30	3	0.00027	0.0057(U)	n/a	0.0024	Maximum detected concentration
Xylene (Total)	30	1	0.0052(U)	0.0092	n/a	0.0092	Maximum detected concentration
Radionuclides (pCi/g)							
Americium-241	35	14	-0.0024(U)	6.55	Normal	0.942	95% KM (t)
Cesium-134	30	1	-0.079(U)	0.068	n/a	0.068	Maximum detected concentration
Cesium-137	30	2	-0.06(U)	0.269	n/a	0.269	Maximum detected concentration
Plutonium-238	37	9	-0.0013(U)	0.99(U)	Normal	0.0874	95% KM (t)
Plutonium-239/240	37	32	-0.00114(U)	133	Nonparametric	33.3	95% KM (Chebyshev)
Tritium	32	6	-0.13(U)	2.06	Normal	0.286	95% KM (t)
Uranium-234	36	35	0.036(U)	91.3	Nonparametric	30.3	95% KM (Chebyshev)
Uranium-235/236	35	23	0.029(U)	4.28	Lognormal	1.41	95% KM (Chebyshev)

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-68
EPCs at SWMU 21-006(e) and AOC 21-006(f) for Ecological Receptors

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	15	7	0.085	2.9	Lognormal	0.745	95% KM (BCA)
Arsenic	15	15	1.2	5	Normal	2.68	95% Student's-t
Barium	15	15	12.7	528	Lognormal	193	95% Chebyshev (MVUE)
Calcium	15	15	955	18,600	Normal	9450	95% Student's-t
Copper	15	1	1.1(U)	30.2(U)	n/a*	8	Maximum detected concentration
Cyanide (Total)	11	0	0.52(U)	0.57(U)	n/a	0.57(U)	Maximum detection limit
Lead	15	1	2.6(U)	27.1(U)	n/a	22.5	Maximum detected concentration
Mercury	9	8	0.008	0.151	Normal	0.0793	95% KM (t)
Nickel	15	2	1.3(U)	68.4	n/a	68.4	Maximum detected concentration
Selenium	15	2	0.25(U)	0.57(U)	n/a	0.54	Maximum detected concentration
Zinc	15	1	9.2(U)	87.6(U)	n/a	86	Maximum detected concentration
Organic Chemicals (mg/kg)							
Acetone	15	1	0.0053(U)	0.037(U)	n/a	0.033	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	15	2	0.14	0.38(U)	n/a	0.22	Maximum detected concentration
Bromobenzene	15	1	0.00047	0.0057(U)	n/a	0.00047	Maximum detected concentration
Butylbenzene[sec-]	15	1	0.00041	0.0057(U)	n/a	0.00041	Maximum detected concentration
Dichlorobenzene[1,2-]	30	2	0.00035	0.38(U)	n/a	0.00051	Maximum detected concentration
Dichlorobenzene[1,3-]	30	2	0.00033	0.38(U)	n/a	0.00047	Maximum detected concentration
Dichlorobenzene[1,4-]	30	1	4.00E-04	0.38(U)	n/a	0.0004	Maximum detected concentration
Ethylbenzene	15	1	0.00033	0.0057(U)	n/a	0.00033	Maximum detected concentration
Methylene Chloride	15	4	0.0035	0.018(U)	n/a	0.015	Maximum detected concentration
Toluene	15	4	0.00015(U)	0.0057(U)	n/a	0.0014	Maximum detected concentration
Trimethylbenzene[1,2,4-]	15	1	0.00045(U)	0.0057(U)	n/a	0.00069	Maximum detected concentration
Trimethylbenzene[1,3,5-]	15	1	0.00027	0.0057(U)	n/a	0.00027	Maximum detected concentration

Table H-2.3-68 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Radionuclides (pCi/g)							
Americium-241	15	7	-0.0024(U)	6.55	Normal	1.653	95% KM (t)
Cesium-137	15	1	-0.02(U)	0.269	n/a	0.269	Maximum detected concentration
Plutonium-238	15	5	-0.0013(U)	0.99(U)	Normal	0.146	95% KM (t)
Plutonium-239/240	15	14	0.0186(U)	133	Gamma	59.9	95% KM (Chebyshev)
Tritium	15	2	-0.13(U)	1.67	n/a	1.67	Maximum detected concentration
Uranium-234	15	14	0.036(U)	73.6	Lognormal	34.2	95% KM Chebyshev
Uranium-235/236	14	9	0.029(U)	3.59	Gamma	1.01	95% KM (BCA)

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-69
EPCs at AOC 21-028(c) for 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	48	38	0.087	5.28	Gamma	1.04	95% KM (BCA)
Barium	42	42	6.83	185	Normal	88.7	95% Student's-t
Calcium	48	48	580	46,200	Gamma	18,500	95% Adjusted Gamma
Chromium (Total)	48	48	1.87	17	Normal	9.47	95% Student's-t
Copper	48	17	0.802	62.4	Lognormal	6.77	95% KM (BCA)
Cyanide (Total)	34	1	0.16	0.6(U)	n/a*	0.16	Maximum detected concentration
Lead	48	18	3.1(U)	165	Nonparametric	16.7	95% KM (t)
Mercury	48	47	0.0121	1.31	Gamma	0.312	95% KM (Chebyshev)
Nickel	48	19	0.612	12.2	Gamma	4.39	95% KM (t)
Perchlorate	34	10	0.0025	0.0096	Normal	0.0048	95% KM (t)

Table H-2.3-69 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Selenium	48	1	0.19	1.17(U)	n/a	0.19	Maximum detected concentration
Vanadium	48	48	1.36	86.3	Gamma	22.1	95% Adjusted Gamma
Zinc	48	16	11.5(U)	163	Nonparametric	31.9	95% KM (t)
Organic Chemicals (mg/kg)							
Acetone	33	13	0.0052(U)	0.042	Normal	0.0153	95% KM (t)
Anthracene	34	1	0.048	0.4(U)	n/a	0.048	Maximum detected concentration
Aroclor-1242	15	1	0.00361(U)	0.0659	n/a	0.0659	Maximum detected concentration
Aroclor-1248	15	2	0.0028	0.0199(U)	n/a	0.01	Maximum detected concentration
Aroclor-1254	15	14	0.0024	0.273	Normal	0.106	95% KM (t)
Aroclor-1260	15	11	0.0027	0.0264	Normal	0.0151	95% KM (t)
Benzo(a)anthracene	34	16	0.034	0.4(U)	Normal	0.0828	95% KM (t)
Benzo(a)pyrene	34	16	0.036	0.4(U)	Normal	0.076	95% KM (t)
Benzo(b)fluoranthene	34	15	0.035	0.4(U)	Normal	0.0731	95% KM (t)
Benzo(g,h,i)perylene	34	10	0.038	0.4(U)	Normal	0.068	95% KM (t)
Benzo(k)fluoranthene	34	16	0.036	0.4(U)	Normal	0.0697	95% KM (t)
Benzoic Acid	34	1	0.4	1.9(U)	n/a	0.4	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	34	13	0.041	0.4(U)	Gamma	0.156	95% KM (t)
Bromobenzene	29	1	0.00053	0.006(U)	n/a	0.00053	Maximum detected concentration
Butylbenzylphthalate	34	3	0.038	0.4(U)	n/a	0.042	Maximum detected concentration
Chrysene	34	23	0.037	0.4(U)	Normal	0.105	95% KM (t)
Dichlorobenzene[1,2-]	29	2	0.00049	0.006(U)	n/a	0.00054	Maximum detected concentration
Dichlorobenzene[1,3-]	29	2	0.00015	0.006(U)	n/a	0.00049	Maximum detected concentration
Ethylbenzene	29	2	0.00027	0.006(U)	n/a	0.00036	Maximum detected concentration
Fluoranthene	34	23	0.039	0.4(U)	Normal	0.152	95% KM (t)
Indeno(1,2,3-cd)pyrene	34	7	0.037	0.4(U)	Normal	0.0715	95% KM (t)
Isopropyltoluene[4-]	29	2	0.00028	0.006(U)	n/a	0.0041	Maximum detected concentration
Methylene Chloride	31	8	0.0033	0.013	Nonparametric	0.00578	95% KM (t)

Table H-2.3-69 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Phenanthrene	34	17	0.039	0.4(U)	Normal	0.104	95% KM (t)
Pyrene	34	22	0.038	0.4(U)	Normal	0.132	95% KM (t)
Tetrachloroethene	29	2	0.00081	0.0059(U)	n/a	0.0014	Maximum detected concentration
Toluene	33	21	2.00E-04	0.0059(U)	Gamma	0.000598	95% KM (Percentile Bootstrap)
Trimethylbenzene[1,2,4-]	30	9	0.00026	0.006(U)	Normal	0.000457	95% KM (t)
Xylene (Total)	29	1	0.0018	0.006(U)	n/a	0.0018	Maximum detected concentration
Radionuclides (pCi/g)							
Americium-241	47	39	-6e-04(U)	2.73	Nonparametric	0.947	95% KM (Chebyshev)
Cesium-137	34	2	-0.031(U)	0.225	n/a	0.225	Maximum detected concentration
Plutonium-238	48	44	0.00227(U)	14.4	Lognormal	2.45	95% KM (Chebyshev)
Plutonium-239/240	48	46	0.0106(U)	28.4	Lognormal	7.26	95% KM (Chebyshev)
Tritium	34	2	-0.19(U)	0.27(U)	n/a	0.238	Maximum detected concentration
Uranium-234	34	34	0.731	4.91	Nonparametric	1.55	95% Student's-t
Uranium-235/236	34	18	0.0063(U)	0.176	Gamma	0.0589	95% KM (t)

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-70
EPCs at AOC 21-028(c) for the Ecological Receptors

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	17	17	0.32	2.3	Gamma	1.27	95% Adjusted Gamma
Barium	14	14	80.6	185	Normal	137	95% Student's-t
Calcium	17	17	3860	46,200	Normal	30,000	95% Student's-t
Chromium (Total)	17	17	5.7	16.5	Normal	11.5	95% Student's-t
Copper	17	1	4.5(U)	15.8(U)	n/a*	6.7	Maximum detected concentration
Cyanide (Total)	17	1	0.16	0.59(U)	n/a	0.16	Maximum detected concentration
Lead	17	3	9.6(U)	28.4	n/a	28.4	Maximum detected concentration
Mercury	17	17	0.0308	0.576	Normal	0.301	95% Student's-t
Nickel	17	4	5(U)	10.1	n/a	10.1	Maximum detected concentration
Perchlorate	17	6	0.0025	0.0096	Normal	0.00471	95% KM (t)
Selenium	17	0	0.53(U)	0.59(U)	n/a	0.59(U)	Maximum detection limit
Vanadium	17	17	12.8	86.3	Gamma	41.8	95% Adjusted Gamma
Zinc	17	1	20.2(U)	137(U)	n/a	28.6	Maximum detected concentration
Organic Chemicals (mg/kg)							
Acetone	17	5	0.0052(U)	0.03(U)	Normal	0.0146	95% KM (t)
Aroclor-1254	1	1	0.0808	0.0808	n/a	0.0808	Maximum detected concentration
Aroclor-1260	1	1	0.0219	0.0219	n/a	0.0219	Maximum detected concentration
Benzo(a)anthracene	17	12	0.034	0.39(U)	Normal	0.0813	95% KM (t)
Benzo(a)pyrene	17	12	0.036	0.39(U)	Normal	0.0741	95% KM (t)
Benzo(b)fluoranthene	17	11	0.035	0.39(U)	Normal	0.0746	95% KM (t)
Benzo(g,h,i)perylene	17	8	0.038	0.39(U)	Normal	0.0629	95% KM (t)
Benzo(k)fluoranthene	17	12	0.036	0.39(U)	Normal	0.0677	95% KM (t)
Benzoic Acid	17	1	0.4	1.9(U)	n/a	0.4	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	17	8	0.061	0.4	Normal	0.219	95% KM (t)

Table H-2.3-70 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Butylbenzylphthalate	17	2	0.038	0.39(U)	n/a	0.042	Maximum detected concentration
Chrysene	17	14	0.042	0.39(U)	Normal	0.117	95% KM (t)
Ethylbenzene	14	1	0.00036	0.0059(U)	n/a	0.00036	Maximum detected concentration
Fluoranthene	17	14	0.039	0.39(U)	Normal	0.169	95% KM (t)
Indeno(1,2,3-cd)pyrene	17	5	0.043	0.39(U)	Normal	0.063	95% KM (t)
Isopropyltoluene[4-]	14	1	0.0041	0.0059(U)	n/a	0.0041	Maximum detected concentration
Methylene Chloride	16	4	0.0054(U)	0.013	n/a	0.013	Maximum detected concentration
Phenanthrene	17	12	0.039	0.39(U)	Normal	0.104	95% KM (t)
Pyrene	17	14	0.041	0.39(U)	Normal	0.137	95% KM (t)
Tetrachloroethene	14	1	0.00081	0.0059(U)	n/a	0.00081	Maximum detected concentration
Toluene	17	11	0.00022(U)	0.0059(U)	Gamma	0.00078	95% KM (Percentile Bootstrap)
Trimethylbenzene[1,2,4-]	15	6	0.00031	0.0057(U)	Normal	0.000442	95% KM (t)
Xylene (Total)	14	1	0.0018	0.0059(U)	n/a	0.0018	Maximum detected concentration
Radionuclides (pCi/g)							
Americium-241	17	14	-6e-04(U)	2.73	Gamma	1.56	95% KM (Chebyshev)
Cesium-137	17	2	-0.031(U)	0.225	n/a	0.225	Maximum detected concentration
Plutonium-238	17	16	0.017(U)	14.4	Lognormal	5.55	95% KM Chebyshev
Plutonium-239/240	17	16	0.022(U)	28.4	Gamma	14	95% KM (Chebyshev)
Tritium	17	2	-0.19(U)	0.238	n/a	0. 238	Maximum detected concentration
Uranium-234	17	17	0.817	4.91	Nonparametric	1.89	95% Student's-t

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-71
EPCs at SWMU 26-001 for the Industrial Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	11	2	0.27(U)	15.5	n/a*	15.5	Maximum detected concentration
Arsenic	19	18	1.3	3.85	Normal	2.71	95% KM (t)
Calcium	19	19	1950	15,100	Normal	8100	95% Student's-t
Cyanide (Total)	12	3	0.0809(U)	0.74	n/a	0.74	Maximum detected concentration
Nitrate	19	18	1.04	7.3	Normal	2.957	95% KM (t)
Perchlorate	12	3	0.00066	0.00207(U)	n/a	0.0012	Maximum detected concentration
Selenium	19	19	1.2	11.4	Normal	6.78	95% Student's-t
Organic Chemicals (mg/kg)							
Aroclor-1248	12	1	0.00337(U)	0.073	n/a	0.073	Maximum detected concentration
Toluene	10	6	0.00101(U)	0.0012	Normal	0.000885	95% KM (t)
Radionuclides (pCi/g)							
Cesium-137	19	11	0.03(U)	0.828	Gamma	0.261	95% KM (t)
Strontium-90	12	1	-0.0148(U)	0.164	n/a	0.164	Maximum detected concentration
Tritium	12	8	-0.0014(U)	0.866(U)	Nonparametric	0.229	95% KM Chebyshev
Uranium-235/236	12	4	-0.0318(U)	0.139	n/a	0.139	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-72
EPCs at SWMU 26-001 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	5	0.093(U)	15.5	n/a*	15.5	Maximum detected concentration
Arsenic	52	49	0.63	3.85	Normal	2.06	95% KM (t)
Calcium	52	52	293	20,900	Lognormal	6600	95% Bootstrap-t
Chromium (Total)	52	49	0.97	16.8	Gamma	5.93	95% KM (BCA)
Copper	52	49	0.671	12	Gamma	5.17	95% KM (Chebyshev)
Cyanide (Total)	31	6	0.0809(U)	0.74	Normal	0.205	95% KM (t)
Nickel	52	49	0.722	10.7	Nonparametric	5.348	95% KM (Chebyshev)
Nitrate	52	48	0.15	50.6	Lognormal	4.972	95% KM (Percentile Bootstrap)
Perchlorate	31	8	0.00066	0.00209(U)	Normal	0.00136	95% KM (t)
Selenium	52	52	1.2	11.4	Nonparametric	6.29	95% Chebyshev (Mean, Sd)
Organic Chemicals (mg/kg)							
Aroclor-1248	31	1	0.00333(U)	0.073	n/a	0.073	Maximum detected concentration
Isopropyltoluene[4-]	29	1	0.001(U)	0.00237	n/a	0.00237	Maximum detected concentration
Toluene	29	14	0.000336	0.00123	Normal	0.000728	95% KM (t)
Radionuclides (pCi/g)							
Cesium-137	48	11	-0.0548(U)	0.828	Gamma	0.0728	95% KM (t)
Plutonium-238	31	1	-0.00746(U)	1.43	n/a	1.43	Maximum detected concentration
Plutonium-239/240	31	1	-0.00932(U)	0.154	n/a	0.154	Maximum detected concentration
Strontium-90	31	1	-0.169(U)	0.169(U)	n/a	0.164	Maximum detected concentration
Tritium	31	12	-1.26(U)	2.45(U)	Nonparametric	0.173	95% KM (Chebyshev)
Uranium-235/236	31	11	-0.0318(U)	0.173	Normal	0.0431	95% KM (t)

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-73
EPCs at SWMU 26-001 for Ecological Receptors

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	19	3	0.154	15.5	n/a*	15.5	Maximum detected concentration
Arsenic	37	34	0.708	3.85	Normal	2.3	95% KM (t)
Calcium	37	37	345	15,500	Gamma	6150	95% Adjusted Gamma
Chromium (Total)	37	34	1.86	9.25	Normal	5.18	95% KM (t)
Cyanide (Total)	30	6	0.0809(U)	0.74	Normal	0.207	95% KM (t)
Nitrate	37	33	0.946(U)	50.6	Nonparametric	9.656	95% KM (Chebyshev)
Perchlorate	30	8	0.00066	0.00209(U)	Normal	0.00136	95% KM (t)
Selenium	37	37	1.2	11.4	Normal	6.21	95% Student's-t
Organic Chemicals (mg/kg)							
Aroclor-1248	30	1	0.00333(U)	0.073	n/a	0.073	Maximum detected concentration
Isopropyltoluene[4-]	28	1	0.001(U)	0.00237	n/a	0.00237	Maximum detected concentration
Toluene	28	14	0.000336	0.00123	Normal	0.000732	95% KM (t)
Radionuclides (pCi/g)							
Cesium-137	33	11	-0.0548(U)	0.828	Gamma	0.128	95% KM (t)
Plutonium-238	30	1	-0.00746(U)	1.43	n/a	1.43	Maximum detected concentration
Plutonium-239/240	30	1	-0.00371(U)	0.154	n/a	0.154	Maximum detected concentration
Strontium-90	30	1	-0.169(U)	0.169(U)	n/a	0.164	Maximum detected concentration
Tritium	30	12	-1.26(U)	2.45(U)	Nonparametric	0.173	95% KM Chebyshev
Uranium-235/236	30	10	-0.0318(U)	0.173	Normal	0.0408	95% KM (t)

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-74
EPCs at SWMU 26-002(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	10	3	0.139	1.03(U)	n/a*	1.03(U)	Maximum detection limit
Arsenic	10	10	1.4	8.34	Normal	4.532	95% Student's-t
Barium	10	10	31	122	Normal	89.2	95% Student's-t
Calcium	10	10	3230	29,600	Normal	19,700	95% Student's-t
Chromium (Total)	10	9	3.08	26.6	Gamma	17.4	95% KM (Chebyshev)
Copper	10	10	1.94	13	Normal	8.15	95% Student's-t
Nickel	10	9	4.53	13.8	Normal	9.2	95% KM (t)
Perchlorate	6	2	0.000656	0.00218(U)	n/a	0.000665	Maximum detected concentration
Selenium	10	8	0.743	15.4	Normal	9.95	95% KM (t)
Thallium	10	6	0.0479(U)	1.066(U)	Gamma	0.206	95% KM Adjusted Gamma
Organic Chemicals (mg/kg)							
Toluene	6	1	0.000377	0.00108(U)	n/a	0.000377	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	7	2	-0.00762(U)	0.311	n/a	0.311	Maximum detected concentration
Tritium	6	2	0.000301(U)	0.0225	n/a	0.0225	Maximum detected concentration
Uranium-235/236	6	1	0.0555(U)	0.0918	n/a	0.0918	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-75
EPCs at SWMU 26-002(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	45	9	0.098(U)	1.03(U)	Normal	0.237	95% KM (t)
Arsenic	45	45	0.527	8.34	Normal	3.27	95% Student's-t
Barium	45	45	4.49	148	Lognormal	67	95% Chebyshev (Mean, Sd)
Calcium	38	38	236	30,400	Gamma	10,500	95% Adjusted Gamma
Chromium (Total)	45	34	1.67	48.9	Lognormal	9.6	95% KM (BCA)
Copper	45	44	0.76(U)	13	Gamma	4.24	95% KM (BCA)
Nickel	45	37	1.1	22.6	Gamma	5.9	95% KM (BCA)
Perchlorate	36	6	0.000656	0.00222(U)	Lognormal	0.00127	95% KM (t)
Selenium	45	41	0.743	16.3	Normal	8.52	95% KM (t)
Thallium	45	16	0.0462(U)	1.066(U)	Normal	0.128	95% KM (t)
Organic Chemicals (mg/kg)							
Aroclor-1260	36	1	0.00329(U)	0.0041	n/a*	0.0041	Maximum detected concentration
Hexanone[2-]	36	2	0.00163	0.00544(U)	n/a	0.00218	Maximum detected concentration
Toluene	36	7	0.000377	0.00524	Normal	0.00106	95% KM (t)
Radionuclides (pCi/g)							
Cesium-137	37	3	-0.0502(U)	0.415	n/a	0.415	Maximum detected concentration
Plutonium-239/240	36	1	-0.00575(U)	0.0769	n/a	0.0769	Maximum detected concentration
Strontium-90	36	1	-0.1679(U)	0.403(U)	n/a	0.13	Maximum detected concentration
Tritium	36	24	0.0003005(U)	1.45(U)	Lognormal	0.149	95% KM (Chebyshev)
Uranium-235/236	36	12	0.0392(U)	0.128	Normal	0.0679	95% KM (t)

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-76
EPCs at SWMU 26-002(a) for Ecological Receptors

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	28	9	0.105	1.03(U)	Normal	0.275	95% KM (t)
Arsenic	28	28	1.4	8.34	Normal	3.96	95% Student's-t
Barium	28	28	8.06	148	Normal	71.5	95% Student's-t
Calcium	25	25	498	30,400	Normal	13,300	95% Student's-t
Chromium (Total)	28	19	1.67	26.6	Gamma	8.21	95% KM (Percentile Bootstrap)
Copper	28	28	1	13	Gamma	5.6	95% Adjusted Gamma
Nickel	28	21	1.55(U)	13.8	Normal	6.3	95% KM (t)
Perchlorate	24	6	0.000656	0.00218(U)	Lognormal	0.00127	95% KM (t)
Selenium	28	26	0.743	16.3	Normal	9.9	95% KM (t)
Thallium	28	12	0.0462(U)	1.066(U)	Normal	0.15	95% KM (t)
Organic Chemicals (mg/kg)							
Aroclor-1260	24	1	0.00342(U)	0.0041	n/a*	0.0041	Maximum detected concentration
Hexanone[2-]	24	1	0.00163	0.00544(U)	n/a	0.00163	Maximum detected concentration
Toluene	24	7	0.000377	0.00524	Normal	0.00124	95% KM (t)
Radionuclides (pCi/g)							
Cesium-137	23	3	-0.0418(U)	0.415	n/a	0.415	Maximum detected concentration
Plutonium-239/240	24	1	-0.00569(U)	0.0769	n/a	0.0769	Maximum detected concentration
Strontium-90	24	1	-0.167(U)	0.154(U)	n/a	0.13	Maximum detected concentration
Tritium	24	16	0.000301(U)	0.157	Gamma	0.0485	95% KM Adjusted Gamma
Uranium-235/236	24	8	0.0447(U)	0.128	Normal	0.0752	95% KM (t)

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-77
EPCs at SWMU 26-002(b) for the Industrial Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Arsenic	3	3	2.12	4.27	n/a*	4.27	Maximum detected concentration
Calcium	3	3	2300	28,100	n/a	28,100	Maximum detected concentration
Nickel	3	3	6.36	7.62	n/a	7.62	Maximum detected concentration
Perchlorate	2	1	0.0014	0.00215(U)	n/a	0.0014	Maximum detected concentration
Selenium	3	2	1.2	17	n/a	17	Maximum detected concentration
Radionuclides (pCi/g)							
Tritium	2	1	0.00151(U)	0.0174	n/a	0.0174	Maximum detected concentration
Uranium-235/236	2	1	0.0611(U)	0.187	n/a	0.187	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-78
EPCs at SWMU 26-002(b) for the Residential Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Arsenic	9	9	1.22	4.27	Normal	3	95% Student's-t
Calcium	9	9	266	28,100	Normal	13,400	95% Student's-t
Chromium (Total)	9	6	2.45	16.7(U)	Normal	6.88	95% KM (t)
Nickel	9	7	0.975	7.62	Normal	5.65	95% KM (t)
Perchlorate	7	2	0.00131	0.00215(U)	n/a*	0.0014	Maximum detected concentration
Selenium	8	6	0.62	17	Normal	8.37	95% KM (t)
Thallium	9	1	0.091(U)	1.27(U)	n/a	0.128	Maximum detected concentration
Organic Chemicals (mg/kg)							
Acetone	7	1	0.00331	0.00536(U)	n/a	0.00331	Maximum detected concentration
Aroclor-1260	7	1	0.00339(U)	0.0073	n/a	0.0073	Maximum detected concentration
Toluene	7	1	0.000579	0.00107(U)	n/a	0.000579	Maximum detected concentration

Table H-2.3-78 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Radionuclides (pCi/g)							
Cesium-137	6	1	-0.0178(U)	0.2	n/a	0.2	Maximum detected concentration
Tritium	7	5	0.00151(U)	0.0233	n/a	0.0233	Maximum detected concentration
Uranium-235/236	7	4	0.0611(U)	0.187	n/a	0.187	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-79
EPCs at SWMU 26-002(b) for Ecological Receptors

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Arsenic	6	6	1.61	4.27	n/a*	4.27	Maximum detected concentration
Calcium	6	6	2220	28,100	n/a	28,100	Maximum detected concentration
Chromium (Total)	6	4	3.37	16.7(U)	n/a	9.7	Maximum detected concentration
Nickel	6	5	2.19	7.62	n/a	7.62	Maximum detected concentration
Perchlorate	5	2	0.00131	0.00215(U)	n/a	0.0014	Maximum detected concentration
Selenium	6	4	1.2	17	n/a	17	Maximum detected concentration
Organic Chemicals (mg/kg)							
Acetone	5	1	0.00331	0.00536(U)	n/a	0.00331	Maximum detected concentration
Aroclor-1260	5	1	0.00346(U)	0.0073	n/a	0.0073	Maximum detected concentration
Toluene	5	1	0.000579	0.00107(U)	n/a	0.000579	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	4	1	0.0202(U)	0.2	n/a	0.2	Maximum detected concentration
Tritium	5	3	0.00152(U)	0.0188	n/a	0.0188	Maximum detected concentration
Uranium-235/236	5	3	0.0611(U)	0.187	n/a	0.187	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-80
EPCs at SWMU 26-003 for the Industrial Scenario

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Arsenic	6	6	2.7	4.8	n/a*	4.8	Maximum detected concentration
Barium	6	6	37.3	115	n/a	115	Maximum detected concentration
Calcium	6	6	5310	18,700	n/a	18,700	Maximum detected concentration
Chromium (Total)	5	3	3.1(U)	18.8	n/a	18.8	Maximum detected concentration
Copper	6	6	2.57	6.75	n/a	6.75	Maximum detected concentration
Nitrate	6	5	1.05(U)	4.5	n/a	4.5	Maximum detected concentration
Perchlorate	5	2	0.000539	0.0021(U)	n/a	0.00194	Maximum detected concentration
Selenium	6	6	0.616	13.9	n/a	13.9	Maximum detected concentration
Organic Chemicals (mg/kg)							
Acetone	5	1	0.00452	0.00526(U)	n/a	0.00452	Maximum detected concentration
Aroclor-1260	5	1	0.00341(U)	0.0513	n/a	0.0513	Maximum detected concentration
Toluene	5	2	0.000485	0.00105(U)	n/a	0.000676	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	5	2	0.0532(U)	0.569	n/a	0.569	Maximum detected concentration
Plutonium-239/240	5	1	0.000464(U)	0.0269	n/a	0.0269	Maximum detected concentration
Tritium	5	2	0.00713(U)	0.178	n/a	0.178	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-81
EPCs at SWMU 26-003 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)							
Arsenic	24	24	0.79	6.48	Normal	3.83	95% Student's-t
Barium	24	24	6.36	194	Gamma	62.7	95% Adjusted Gamma
Calcium	24	24	669	23,900	Normal	10,200	95% Student's-t
Chromium (Total)	24	8	2.2(U)	34.4	Normal	8.26	95% KM (t)
Copper	24	24	0.89	6.84	Gamma	3.89	95% Adjusted Gamma
Cyanide (Total)	21	11	0.0812	1.86	Gamma	0.611	95% Gamma Adjusted KM
Nitrate	24	15	0.662	25.2	Gamma	6.10	95% Gamma Adjusted KM
Perchlorate	21	8	0.000521	0.0038	Normal	0.00166	95% KM (t)
Selenium	24	22	0.616	15.7	Normal	8.42	95% KM (t)
Organic Chemicals (mg/kg)							
Acetone	21	2	0.00452	0.00596	n/a*	0.00596	Maximum detected concentration
Aroclor-1248	21	1	0.00333(U)	0.0301	n/a	0.0301	Maximum detected concentration
Aroclor-1260	21	3	0.00333(U)	0.0513	n/a	0.0513	Maximum detected concentration
Isopropyltoluene[4-]	21	1	0.000896	0.00107(U)	n/a	0.000896	Maximum detected concentration
Toluene	21	4	0.000485	0.00107(U)	n/a	0.000915	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	22	3	-0.0314(U)	0.569	n/a	0.569	Maximum detected concentration
Plutonium-239/240	21	1	-0.00734(U)	0.0302(U)	n/a	0.0269	Maximum detected concentration
Tritium	21	11	-1.35(U)	1.62(U)	n/a	0.273	UCL was negative, used maximum
Uranium-235/236	21	5	0.0357(U)	0.125	Normal	0.0666	95% KM (Percentile Bootstrap)

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-2.3-82
EPCs at SWMU 26-003 for Ecological Receptors

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Arsenic	17	17	1.85	6.48	Normal	4.14	95% Student's-t
Barium	17	17	6.36	194	Gamma	81.7	95% Adjusted Gamma
Calcium	17	17	669	23,900	Normal	12,300	95% Student's-t
Chromium (Total)	17	5	2.2(U)	18.8	Normal	6.8	95% KM (t)
Copper	17	17	0.89	6.75	Normal	4.16	95% Student's-t
Nitrate	17	11	0.716	25.2	Lognormal	6.22	95% Percentile Bootstrap
Perchlorate	16	6	0.000539	0.0038	Normal	0.00195	95% KM (t)
Selenium	17	15	0.616	14.9	Normal	8.99	95% KM (t)
Organic Chemicals (mg/kg)							
Acetone	16	2	0.00452	0.00596	n/a*	0.00596	Maximum detected concentration
Aroclor-1260	16	3	0.00334(U)	0.0513	n/a	0.0513	Maximum detected concentration
Toluene	16	4	0.000485	0.00107(U)	n/a	0.000915	Maximum detected concentration
Radionuclides (pCi/g)							
Cesium-137	15	3	-0.0314(U)	0.569	n/a	0.569	Maximum detected concentration
Plutonium-239/240	16	1	-0.00432(U)	0.0302(U)	n/a	0.0269	Maximum detected concentration
Tritium	16	11	0.00248(U)	0.273	Normal	0.0901	95% KM (t)
Uranium-235/236	16	3	0.0431(U)	0.125	n/a	0.125	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.
* n/a = Not applicable.

Table H-2.3-83
EPCs at TA-02 Core Area

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Aluminum	632	626	616	10,800	Nonparametric	3310	95% KM (BCA)
Antimony	550	22	0.097(U)	1.14(U)	Nonparametric	0.218	95% KM (Chebyshev)
Arsenic	632	603	0.384	16.9	Lognormal	1.85	KM Student's t
Barium	632	629	6.38	2230	Nonparametric	87	95% KM (Chebyshev)
Cadmium	632	242	0.019	14.8	Nonparametric	0.368	95% KM (Chebyshev)
Calcium	632	627	14.8	35200	Nonparametric	3300	95% KM (Chebyshev)
Chromium	625	468	0.984	240	Nonparametric	10.9	95% KM (Chebyshev)
Chromium hexavalent ion	194	84	0.0302	2.73(U)	Lognormal	0.191	95% Percentile Bootstrap
Cobalt	632	611	0.199	9.67	Nonparametric	1.79	95% KM (BCA)
Copper	632	544	0.866	230	Nonparametric	8.35	95% KM (Chebyshev)
Cyanide (Total)	536	180	0.0668	14.4	Nonparametric	0.335	95% KM (Chebyshev)
Iron	632	632	2700	66400	Nonparametric	8260	95% Student's-t
Lead	632	627	2.95	3970	Nonparametric	53.9	95% KM (Chebyshev)
Magnesium	632	631	121	5170	Nonparametric	715	95% KM (BCA)
Manganese	632	631	89.2	552	Nonparametric	275	95% KM (BCA)
Mercury	632	578	0.0016	8.2	Nonparametric	0.51	95% KM (Chebyshev)
Nickel	632	505	0.453	24.4	Nonparametric	3.33	95% KM (BCA)
Nitrate	534	371	0.8	31.9	Nonparametric	2.46	95% KM (Chebyshev)
Perchlorate	540	169	0.000514	0.117	Nonparametric	0.0026	95% KM (Chebyshev)
Selenium	632	392	0.106	70.5	Nonparametric	2.9	95% KM (Chebyshev)
Silver	632	472	0.0158	1.8	Nonparametric	0.146	95% KM (Chebyshev)
Thallium	632	411	0.0416	8.21	Nonparametric	0.128	95% KM (BCA)
Uranium	37	37	0.263	6.83	Lognormal	1.2	95% Jackknife
Vanadium	632	632	1.75	69.5	Nonparametric	9.07	95% Student's-t
Zinc	632	630	12	914	Nonparametric	54.3	95% KM (BCA)

Table H-2.3-83 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Organic Chemicals (mg/kg)							
Acenaphthene	542	107	0.000363(U)	3.5(U)	Nonparametric	0.0392	95% KM (Chebyshev)
Acetone	234	6	0.00434	0.133	Gamma	0.0062	95% KM Approximate Gamma
Anthracene	542	185	0.000363(U)	3.5(U)	Nonparametric	0.0507	95% KM (Chebyshev)
Aroclor-1242	605	4	0.00114(U)	120(U)	n/a*	0.0627	Maximum detected value
Aroclor-1248	605	10	0.00114(U)	120(U)	Gamma	0.0045	95% KM Approximate Gamma
Aroclor-1254	605	258	0.00114(U)	120(U)	Lognormal	0.0488	95% Percentile Bootstrap
Aroclor-1260	605	450	0.0013	1520	Nonparametric	14.4	95% KM (Chebyshev)
Benzo(a)anthracene	542	219	0.000363(U)	3.5(U)	Lognormal	0.085	95% Percentile Bootstrap
Benzo(a)pyrene	542	232	0.000251	3.5(U)	Nonparametric	0.111	95% KM (Chebyshev)
Benzo(b)fluoranthene	542	277	0.000318	3.5(U)	Lognormal	0.131	95% Percentile Bootstrap
Benzo(g,h,i)perylene	542	153	0.00012	3.5(U)	Nonparametric	0.058	95% KM (Chebyshev)
Benzo(k)fluoranthene	542	54	0.000363(U)	3.5(U)	Lognormal	0.0234	95% Percentile Bootstrap
Bis(2-ethylhexyl)phthalate	527	13	0.00181(U)	3.5(U)	Gamma	0.0749	95% KM Approximate Gamma
Butanone[2-]	234	1	0.0024	0.034(U)	n/a	0.0024	Maximum detected value
Butylbenzene[n-]	234	1	0.000661	0.008(U)	n/a	0.0007	Maximum detected value
Butylbenzylphthalate	527	2	0.00363(U)	3.5(U)	n/a	0.281	Maximum detected value
Carbon Disulfide	234	1	0.004	0.008(U)	n/a	0.004	Maximum detected value
Chloroform	234	13	0.000216(U)	0.008(U)	Normal	0.0003	95% KM (t)
Chloromethane	234	1	0.001(U)	0.017(U)	n/a	0.0029	Maximum detected value
Chrysene	542	278	0.000201	3.5(U)	Nonparametric	0.108	95% KM (Chebyshev)
Di-n-butylphthalate	527	34	0.00363(U)	3.5(U)	Nonparametric	0.0683	95% KM (Chebyshev)
Dibenz(a,h)anthracene	542	8	0.000363(U)	3.5(U)	Normal	0.0125	95% KM (t)
Dibenzofuran	527	18	0.00363(U)	3.5(U)	Normal	0.161	95% KM (t)
Dichlorobenzene[1,4-]	234	7	0.000213	0.008(U)	Normal	0.0003	95% KM (t)
Diethylphthalate	527	1	0.00363(U)	3.5(U)	n/a	0.37	Maximum detected value
Ethylbenzene	234	1	0.000276	0.008(U)	n/a	0.0003	Maximum detected value

Table H-2.3-83 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Fluoranthene	542	330	0.000348	3.84	Nonparametric	0.198	95% KM (Chebyshev)
Fluorene	542	105	0.000363(U)	3.5(U)	Nonparametric	0.0348	95% KM (Chebyshev)
Indeno(1,2,3-cd)pyrene	542	146	0.000363(U)	3.5(U)	Lognormal	0.0477	95% Percentile Bootstrap
Isopropylbenzene	234	3	0.000342	0.008(U)	n/a	0.0004	Maximum detected value
Isopropyltoluene[4-]	234	8	0.000324	0.0505	Nonparametric	0.0017	95% KM (Chebyshev)
Methyl-2-pentanone[4-]	234	1	0.005(U)	0.034(U)	n/a	0.01	Maximum detected value
Methylene Chloride	234	12	0.00213	0.031(U)	Normal	0.0034	95% KM (t)
Methylnaphthalene[2-]	527	82	0.000363(U)	3.5(U)	Nonparametric	0.027	95% KM (Chebyshev)
Naphthalene	542	93	0.000363(U)	3.5(U)	Nonparametric	0.0448	95% KM (Chebyshev)
Pentachlorophenol	527	2	0.00363(U)	8.7(U)	n/a	0.301	Maximum detected value
Phenanthrene	542	277	0.000179	3.5(U)	Nonparametric	0.153	95% KM (Chebyshev)
Phenol	527	1	0.00363(U)	3.5(U)	n/a	0.102	Maximum detected value
Pyrene	542	322	0.000265	3.82	Nonparametric	0.213	95% KM (Chebyshev)
Styrene	234	4	0.00023	0.037	n/a	0.037	Maximum detected value
Tetrachlorodibenzodioxin[2,3,7,8-]	95	95	1.071E-10	0.000170903	Gamma	2E-05	95% Adjusted Gamma
Tetrachloroethene	234	1	0.000302	0.008(U)	n/a	0.0003	Maximum detected value
Toluene	234	73	0.000308	0.008(U)	Nonparametric	0.0007	95% KM (Chebyshev)
Total Petroleum Hydrocarbons Diesel Range Organics	73	60	0.112(U)	454	Lognormal	54.1	95% Percentile Bootstrap
Trichloroethene	234	3	0.000265	0.008(U)	n/a	0.0009	Maximum detected value
Trichlorofluoromethane	234	1	0.001(U)	0.008(U)	n/a	0.002	Maximum detected value
Trimethylbenzene[1,2,4-]	234	4	0.000229	0.008(U)	n/a	0.0008	Maximum detected value
Trimethylbenzene[1,3,5-]	234	3	0.000232	0.008(U)	n/a	0.0005	Maximum detected value
Xylene[1,2-]	229	3	0.000493	0.00127(U)	n/a	0.0006	Maximum detected value
Xylene[1,3-]+Xylene[1,4-]	229	3	0.000305	0.00255(U)	n/a	0.0005	Maximum detected value

Table H-2.3-83 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration	Distribution	EPC	EPC Method
Radionuclides (pCi/g)							
Americium-241	554	8	-0.0214(U)	0.165	Normal	0.165	UCL was negative, used maximum
Cesium-137	578	353	-0.137(U)	121	Nonparametric	4.43	99% KM (Chebyshev)
Cobalt-60	604	21	-0.101(U)	2.86	Gamma	2.86	UCL was negative, used maximum
Plutonium-238	631	3	-0.0307(U)	0.047	n/a	0.047	Maximum detected value
Plutonium-239/240	631	237	-0.0497(U)	6.8	Nonparametric	0.337	99% KM (Chebyshev)
Strontium-90	615	109	-0.27(U)	29.3	Nonparametric	0.685	99% KM (Chebyshev)
Tritium	623	260	-2.15(U)	3.80729	Nonparametric	3.81	UCL was negative, used maximum
Uranium-234	606	606	0.285	12.8	Nonparametric	1.19	95% Student's-t
Uranium-238	606	606	0.285	6.09	Nonparametric	1.13	95% Student's-t
Uranium-235/236	606	428	0.00673(U)	0.901	Lognormal	0.0518	KM Student's t

Note: Data qualifiers are defined in Appendix A.

* n/a = Not applicable.

Table H-3.2-1
Physical and Chemical Properties of Inorganic COPCs for Middle Los Alamos Aggregate Area Sites

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
Copper	35	Insoluble
Cyanide (Total)	9.9	na[c]
Hexavalent chromium	19	1690
Iron	25	Insoluble
Lead	900	Insoluble
Manganese	65	Insoluble
Mercury	52	Insoluble
Nickel	65	Insoluble
Nitrate	na[c]	Soluble
Perchlorate	na[c]	245
Selenium	5	Insoluble
Silver	8.3	Insoluble
Thallium	71	Insoluble
Uranium	450	Insoluble
Vanadium	1000	Insoluble
Zinc	62	Insoluble

[a] Information from http://rais.ornl.gov/cgi-bin/tools/TOX_search.

[b] Denotes reference information from http://www.epa.gov/superfund/sites/npl/hrsres/tools/scdm.htm.

[c] na = Not available.

Table H-3.2-2
Physical and Chemical Properties of Organic
COPCs for Middle Los Alamos Aggregate Area Sites

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	3.90E+00	5.03E+03	3.92E+00	2.15E-03
Acetone	1.00E+06	2.36E+00	-2.40E-01	2.32E+02
Anthracene	4.34E-02	1.64E+04	4.45E+00	6.53E-06
Aroclor-1242	2.77E-01	7.81E+04	6.34E+00	8.63E-05
Aroclor-1248	1.00E-01	7.65E+04	6.20E+00	4.94E-04
Aroclor-1254	4.30E-02	1.30E+05	6.50E+00	7.71E-05
Aroclor-1260	1.44E-02	3.50E+05	7.55E+00	4.05E-05
Benzo(a)anthracene	9.40E-03[b]	2.31E+05[b]	5.76+00[b]	1.90E-06[b]
Benzo(a)pyrene	1.62E-03	5.87E+05	6.13E+00	5.49E-09
Benzo(b)fluoranthene	1.50E-03	5.99E+05	5.78E+00	5.00E-07
Benzo(g,h,i)perylene	2.60E-04	1.95E+06	6.63E+00	1.00E-10
Benzo(k)fluoranthene	8.00E-04	5.87E+05	6.11E+00	9.65E-10
Benzoic acid	3.40E-03	6.00E-01	1.87E+00	7.00E-04
Bis(2-ethylhexyl)phthalate	2.70E-01	1.20E+05	7.60E+00	1.42E-07
Bromobenzene	4.46E+02	2.34E+02	2.99E+00	4.18E+00
Butanone[2-]	3.83E+00	2.9E-01	2.23E+05	9.06E+01
Butylbenzene[n-]	1.18E+01	1.48E+03	4.38E+00	1.06E+00
Butylbenzene[sec-]	1.76E+01	1.33E+03	4.57E+00	1.75E+00
Butylbenzylphthalate	2.69E+00	7.16E+03	4.73E+00	8.25E-06
Carbon Disulfide	2.16E+03	2.17E+01	1.94E+00	3.59E+02
Chloroform	7.95E+03	3.18E+01	1.97E+00	1.97E+02
Chloromethane	5.32E+03	1.32E+01	9.10E-01	4.30E+03
Chrysene	2.00E-03	1.80E+05	5.81E+00	6.23E-09
Di-n-butylphthalate	1.12E+01	1.16E+03	4.50E+00	2.01E-05
Dibenz(a,h)anthracene	2.49E-03	1.91E+06	6.75E+00	9.55E-10
Dibenzofuran	3.10E+00	9.16E+04	4.12E+00	2.48E-03
Dichlorobenzene[1,2]	1.56E+02	3.83E+02	3.43E+00	1.36E+00
Dichlorobenzene[1,3]	1.25E+02	3.75E+02	3.53E+00	2.15E+00
Dichlorobenzene[1,4]	8.13E+01	3.75E+02	3.44E+00	1.74E+00
Diethylphthalate	1.08E+03	1.05E+02	2.42E+00	2.10E-03
Ethylbenzene	1.69E+02	4.46E+02	3.15E+00	9.60E+00
Fluoranthene	2.60E-01	5.54E+04	5.16E+00	9.22E-06
Fluorene	1.69E+00	9.16E+03	4.18E+00	6.00E-04
Hexanone[2-]	1.72E+04	1.50E+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

Table H-3.2-2 (continued)

COPC	Water Solubility[a] (mg/L)	Organic Carbon Coefficient K_{oc}[a] (L/kg)	Log Octanol-Water Partition Coefficient K_{ow}[a]	Vapor Pressure[a] (mm Hg at 25°C)
Isophorone	1.20E+04	6.52E+01	1.70E+00	4.38E-01
Isopropylbenzene	6.13E+01	6.98E+02	3.66E+00	4.50E+00
Isopropyltoluene[4-]	2.34E+01	1.12E+03	4.10E+00	1.46E+00
Methylene Chloride	1.30E+04	2.17E+01	1.25E+00	4.30E+02
Methylnaphthalene[2-]	2.46E+01	2.48E+03	3.86E+00	4.35E-02
Methyl-2-pentanone[4-]	1.64E+04	8.15E+00	1.43E+00	5.30E+00
Naphthalene	3.10E+01	1.54E+03	3.30E+00	8.50E-02
Pentachlorophenol	1.40E+01	5.92E+02	5.12E+00	1.10E-04
Phenanthrene	1.15E+00	1.67E+04	4.46E+00	1.21E-04
Phenol	8.28E+04	1.87E+02	1.46E+00	3.50E-01
Pyrene	1.35E-01	5.43E+04	4.88E+00	4.50E-06
Styrene	3.10E+02	4.46E+02	2.95E+00	6.40E+00
Tetrachlorodibenzodioxin[2,3,7,8-]	2.00E-04	2.49E+05	6.80E+00	1.50E-09
Tetrachloroethene	2.06E+02	9.49E+01	3.40E+00	1.85E+01
Toluene	5.26E+02	2.34E+02	2.73E+00	2.84E+01
TPH-DRO	na[c]	na	na	na
Trichloroethene	1.28E+03	6.07E+01	2.42E+00	6.90E+01
Trichlorofluoromethane	4.86E+01	2.53E+00	1.1E+03	8.03E+02
Trimethylbenzene[1,2,4-]	5.70E+01	6.14E+02	3.63E+00	2.10E+00
Trimethylbenzene[1,3,5-]	4.82E+01	6.02E+02	3.42E+00	2.48E+00
Xylene[Total][d]	4.43E+02	3.12E+00	1.06E+02	7.99E+00
Xylene[1,2-]	1.61E+02	4.34E+02	3.20E+00	8.29E+00
Xylene[1,3-]+1,4-Xylene[c]	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] na = Not available.

[d] Xylenes used as a surrogate.

Table H-3.2-3
Physical and Chemical Properties of Radionuclide COPCs for Middle Los Alamos Aggregate Area Sites

COPC	Soil-Water Partition Coefficient, K_d[a] (cm^3/g)	Water Solubility[b] (g/L)
Americium-241	680	Insoluble
Cesium-134	1000	Insoluble
Cesium-137	1000	Insoluble
Cobalt-60	45	Insoluble
Plutonium-238	4500	Insoluble
Plutonium-239/240	4500	Insoluble
Strontium-90	35	Insoluble
Tritium	9.9	Soluble
Uranium-234	0.4	Insoluble
Uranium-235/236	0.4	Insoluble
Uranium-238	0.4	Insoluble

[a] Superfund Chemical Data Matrix (EPA 1996, 064708).

[b] Information from http://www.epa.gov/superfund/sites/npl/hrsres/tools/scdm.htm.

Table H-3.3-1
TEFs Used for Calculating TCDD-Equivalent Concentrations

Dioxin and Furan Congeners	TEFs*
Tetrachlorodibenzodioxin[2,3,7,8-]	1
Pentachlorodibenzodioxin[1,2,3,7,8-]	1
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	0.1
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	0.1
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	0.1
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	0.01
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	0.0003
Tetrachlorodibenzofuran[2,3,7,8-]	0.1
Pentachlorodibenzofuran[1,2,3,7,8-]	0.03
Pentachlorodibenzofuran[2,3,4,7,8-]	0.3
Hexachlorodibenzofuran[1,2,3,4,7,8-]	0.1
Hexachlorodibenzofuran[1,2,3,6,7,8-]	0.1
Hexachlorodibenzofuran[1,2,3,7,8,9-]	0.1
Hexachlorodibenzofuran[2,3,4,6,7,8-]	0.1
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	0.01
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	0.01
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	0.0003

*TEFs from NMED (2017, 602273).

Table H-4.1-1
Exposure Parameters Used to Calculate Chemical SSLs
for the Industrial, Recreational, Construction Worker, and Residential Scenarios

Parameters	Industrial Values	Recreational Values	Construction Worker Values	Residential Values
Target HQ	1	1	1	1
Target cancer risk	10^{-5}	10^{-5}	10^{-5}	10^{-5}
Averaging time (carcinogen/mutagen)	70 yr × 365 d	70 yr × 365 d	70 yr × 365 d	70 yr × 365 d
Averaging time (noncarcinogen)	ED × 365 d	Exposure duration × 365 d	ED × 365 d	ED × 365 d
Skin absorption factor	Semivolatile organic compound (SVOC) = 0.1	SVOC = 0.1	SVOC = 0.1	SVOC = 0.1
	Chemical-specific	Chemical-specific	Chemical-specific	Chemical-specific
Adherence factor–child	n/a[a]	0.2 mg/cm^2	n/a	0.2 mg/cm^2
Body weight–child	n/a	31 kg	(mg/kg-d)$^{-1}$	15 kg (0–6 yr of age)
Cancer slope factor–oral (chemical-specific)	(mg/kg-d)$^{-1}$	(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)	(µg/m^3)
Exposure frequency	225 d/yr	200 d/yr	250 d/yr	350 d/yr
Exposure time	8 h/day	1 h/d	n/a	24 h/d
Exposure duration–child	n/a	6 yr (6 to <12 yr of age)	n/a	6 yr[b]
Age-adjusted ingestion factor for carcinogens	n/a	n/a	n/a	36,750 mg/kg
Age-adjusted ingestion factor for mutagens	n/a	n/a	n/a	25,550 mg/kg
Soil ingestion rate–child	n/a	91 mg/d	n/a	200 mg/d
Particulate emission factor	6.61×10^9 m^3/kg	6.61×10^9 m^3/kg	2.1×10^6 m^3/kg	6.61×10^9 m^3/kg
Reference dose–oral (chemical-specific)	(mg/kg-d)	(mg/kg-d)	(mg/kg-d)	(mg/kg-d)
Reference dose–inhalation (chemical-specific)	(mg/kg-d)	(mg/kg-d)	(mg/kg-d)	(mg/kg-d)
Exposed surface area–child	n/a	4030 cm^2	n/a	2690 cm^2/d
Age-adjusted skin contact factor for carcinogens	n/a	n/a	n/a	112,266 mg/kg
Age-adjusted skin contact factor for mutagens	n/a	n/a	n/a	166,833 mg/kg
Volatilization factor for soil (chemical-specific)	(m^3/kg)	(m^3/kg)	(m^3/kg)	(m^3/kg)

Table H-4.1-1 (continued)

Parameters	Industrial Values	Recreational Values	Construction Worker Values	Residential Values
Body weight–adult	80 kg	80 kg[b]	80 kg	80 kg
Exposure duration[c]	25 yr	26 yr (20 yr carcinogens)	1 yr	30 yr[d]
Adherence factor–adult	0.12 mg/cm^2	0.07 mg/cm^2	0.3 mg/cm^2	0.07 mg/cm^2
Soil ingestion rate–adult	100 mg/d	30 mg/d	330 mg/d	100 mg/d
Exposed surface area–adult	3470 cm^2/d	6032 cm^2	3470 cm^2/d	6032 cm^2/d

Note: Parameter values from NMED (2017, 602273) and LANL (2017, 602581).

[a] n/a = Not applicable.

[b] The child exposure duration for mutagens is subdivided into 0–2 yr and 2–6 yr.

[c] Exposure duration for lifetime resident is 26 yr. For carcinogens, the exposures are combined for child (6 yr) and adult (20 yr).

[d] The adult exposure duration for mutagens is subdivided into 6–16 yr and 16–30 yr.

Table H-4.1-2
Parameter Values Used to Calculate Radionuclide SALs for the Residential Scenario

Parameters	Residential, Child	Residential, Adult
Inhalation rate (m^3/yr)	4712[a]	7780[b]
Mass loading (g/m^3)	1.5 × 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 2015, 600915).

[d] Calculated as (2.32 h/d × 350 d/yr)/8766 h/yr, where 2.32 h/d (139 min) is the largest amount of time spent outdoors for child age groups between 1 to less than 3 mo and 3 to less than 6 yr (EPA 2011, 208374, Table 16-1) and is comparable with the adult time spent outdoors at a residence.

[e] Calculated as (2.34 h/d × 350 d/yr)/8766 h/yr, where 4.68 h/d is the average total time spent outdoors for adults age 18 to less than 65 yr in all environments (EPA 2011, 208374, Table 16-1); 50% of this value (2.34 h/d) was applied to time spent outdoors at a residence and is similar to mean time outdoors at a residence for this age group (EPA 2011, 208374, Table 16-22).

[f] Calculated as [(24 h/d–2.32 h/d) × 350 d/yr]/8766 h/yr.

[g] Calculated as [(24 h/d–2.34 h/d) × 350 d/yr]/8766 h/yr.

[h] The soil ingestion rate compensates for the time-based occupancy factor applied by RESRAD in calculating exposure from the soil ingestion pathway. Calculated as [0.2 g/d × 350 d/yr]/[indoor + outdoor time fractions], where 0.2 g/d is the upper percentile site-related daily child soil ingestion rate (NMED 2015, 600915; EPA 2011, 208374, Table 5-1).

[i] The soil ingestion rate compensates for the time-based occupancy factor applied by RESRAD in calculating exposure from the soil ingestion pathway. Calculated as [0.1 g/d × 350 d/yr]/[indoor + outdoor time fractions], where 0.1 g/d is the site-related daily adult soil ingestion rate (NMED 2015, 600915).

Table H-4.1-3
Parameter Values Used to Calculate
Radionuclide SALs for the Industrial and Construction Worker Scenarios

Parameters	Industrial, Adult	Construction Worker, Adult
Inhalation rate (m^3/yr)	7780[a]	7780[a]
Mass loading (g/m^3)	1.51×10^{-7}[b]	4.76×10^{-7}[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 2015, 600915).

[c] Calculated as (1/2.1 × 10^6 m^3/kg) x 1000 g/kg, where 6.6 × 10^9 m^3/kg is the particulate emission factor (NMED 2015, 600915).

[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 2015, 600915).

[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 2015, 600915).

[f] The commercial/industrial worker is defined as someone who “spends most of the work day conducting maintenance or manual labor activities outdoors” (NMED 2015, 600915).

[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 2015, 600915).

[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 adult soil-ingestion rate (NMED 2015, 600915).

Table H-4.1-4
Parameters Used in the SAL Calculations for Radionuclide SALs for the Recreational Scenario

Parameters	Recreational, Child	Recreational, Adult
Inhalation rate (m^3/yr)	15,250[a]	19,460[b]
Mass loading (g/m^3)	1.5×10^{-7}[c]	1.5×10^{-7}[c]
Outdoor time fraction	0.0228[d]	0.0228[d]
Indoor time fraction	0	0
Soil ingestion (g/yr)	797[e]	244[f]

[a] Calculated as (0.029 m^3/min × 60 min/h × 24 h/d × 365.25 d/yr), where 0.029 m^3/min is the upper percentile child inhalation rate for moderate activity for 6 to <11 yr old (EPA 2011, 208374, Table 6-2).

[b] Calculated as (0.037 m^3/min × 60 min/h × 24 h/d × 365.25 d/yr), where 0.037 m^3/min is the age-weighted upper percentile adult inhalation rate for moderate activity (12 to 35 yr) (EPA 2011, 208374, Table 6-2).

[c] Calculated as (1/6.6 × 10^{+9} m^3/kg) × 1000 g/kg, where 6.6 × 10^{+9} m^3/kg is the particulate emission factor used for residential and industrial scenarios (NMED 2015, 600915).

[d] Calculated as (1 h/d × 200 d/yr)/8766 hr/yr, where 1 h/d is the exposure time for a recreational adult or child and 200 d/yr is the exposure frequency (LANL 2015, 600929).

[e] The soil ingestion rate is defined to compensate for the time-based occupancy factor applied by RESRAD in calculating exposure from the soil ingestion pathway. 100% of daily soil ingestion is protectively assumed to occur during outdoor activity. Calculated as [(0.2 g/d/2.2 h/d) × 1 h/d × 200 d/yr)]/[indoor + outdoor time fractions], where 2.2 h/d is the mean time spent outdoors per d for a 6 to <11 yr old child (EPA 2011, 208374, Table 16-1), and where 0.2 g/d is the upper bound child soil ingestion rate (EPA 2011, 208374, Table 5-1; NMED 2015, 600915).

[f] Calculated as [(0.1 g/d/3.6 h/d) × 1 h/d × 200 d/yr)]/[indoor + outdoor time fractions], where 3.6 h/d is the mean time spent outdoors per d for an adult (12 to 35 yr) (EPA 2011, 208374, Table 16-1) and where 0.1 g/d is the adult soil ingestion rate (NMED 2015, 600915).

Table H-4.2-1
Industrial Carcinogenic Screening Evaluation for AOC 02-003(a)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Cadmium	0.762	417,000	1.83E-11
Aroclor-1254	0.171	11	1.55E-07
Aroclor-1260	0.74	11.1	6.67E-07
		Total Excess Cancer Risk	**8E-07**

* SSLs from NMED (2017, 602273).

Table H-4.2-2
Industrial Noncarcinogenic Screening Evaluation for AOC 02-003(a)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Cadmium	0.762	1110	6.86E-04
Mercury	0.576	389	1.48E-03
Perchlorate	0.00565	908	6.22E-06
Selenium	0.821	6490	1.27E-04
Zinc	43.8	389,000	1.13E-04
Aroclor-1254	0.171	16.4	1.04E-02
		HI	**1E-02**

* SSLs from NMED (2017, 602273).

Table H-4.2-3
Industrial Radionuclide Screening Evaluation for AOC 02-003(a)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	4.35	41	2.65E+00
Plutonium-239/240	0.252	1200	5.25E-03
Tritium	0.0118	2,400,000	1.23E-07
		Total Dose	**3E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-4
Recreational Carcinogenic Screening Evaluation for AOC 02-003(a)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Cadmium	0.762	4,300,000	1.77E-12
Aroclor-1254	0.171	10	1.71E-07
Aroclor-1260	0.74	10	7.40E-07
		Total Excess Cancer Risk	**9E-07**

* SSLs from LANL (2017, 602581).

Table H-4.2-5
Recreational Noncarcinogenic Screening Evaluation for AOC 02-003(a)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	HQ
Cadmium	0.762	460	1.66E-03
Mercury	0.576	190	3.03E-03
Perchlorate	0.00565	430	1.31E-05
Selenium	0.821	3100	2.65E-04
Zinc	43.8	190,000	2.31E-04
Aroclor-1254	0.171	5.5	3.11E-02
		HI	**4E-02**

* SSLs from LANL (2017, 602581).

Table H-4.2-6
Recreational Radionuclide Screening Evaluation for AOC 02-003(a)

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	4.35	370	2.94E-01
Plutonium-239/240	0.252	1300	4.85E-03
Tritium	0.0118	5,700,000	5.18E-08
		Total Dose	**3E-01**

* SALs from LANL (2015, 600929).

Table H-4.2-7
Residential Carcinogenic Screening Evaluation for AOC 02-003(a)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Arsenic	1.77	7.07	2.50E-06
Cadmium	0.791	85,900	9.21E-11
Chromium (Total)	19.8	96.6	2.05E-06
Nickel	3.33	595,000	5.60E-11
Aroclor-1254	0.182	2.43	7.49E-07
Aroclor-1260	0.294	2.43	1.21E-06
Bis(2-ethylhexyl)phthalate	0.153	380	4.03E-09
Dichlorobenzene[1,4-]	0.000563	1290	4.36E-12
Methylene Chloride	0.00452	766	5.90E-11
		Total Excess Cancer Risk	**7E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-8
Residential Noncarcinogenic Screening Evaluation for AOC 02-003(a)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Aluminum	3620	78,000	4.64E-02
Antimony	0.66	31.3	2.11E-02
Arsenic	1.77	13	1.36E-01
Cadmium	0.791	70.5	1.12E-02
Chromium (Total)	19.8	45,200	4.38E-04
Iron	7630	54,800	1.39E-01
Manganese	276	10500	2.63E-02
Mercury	0.391	23.5	1.66E-02
Nickel	3.33	1560	2.13E-03
Perchlorate	0.00168	54.8	3.07E-05
Selenium	0.7	391	1.79E-03
Vanadium	8.94	394	2.27E-02
Zinc	55.7	23,500	2.37E-03
Aroclor-1254	0.182	1.14	1.60E-01
Bis(2-ethylhexyl)phthalate	0.153	1230	1.24E-04
Dichlorobenzene[1,4-]	0.000563	5480	1.03E-07
		HI	**6E-01**

* SSLs from NMED (2017, 602273).

Table H-4.2-9
Residential Radionuclide Screening Evaluation for AOC 02-003(a)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	69.1	12	1.44E+02
Plutonium-239/240	0.967	79	3.06E-01
Strontium-90	8.05	15	1.34E+01
Tritium	0.0533	1700	7.84E-04
		Total Dose	**1.58E+02**

* SALs from LANL (2015, 600929).

Table H-4.2-10
Construction Worker NoncarcinogenicScreening Evaluation for AOC 02-003(a)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	HQ
Aluminum	3620	41,400	8.74E-02
Antimony	0.66	142	4.65E-03
Arsenic	1.77	41.2	4.30E-02
Cadmium	0.791	72.1	1.10E-02
Chromium (Total)	19.8	134	1.48E-01
Iron	7630	248,000	3.08E-02
Manganese	276	464	5.95E-01
Mercury	0.391	77.1	5.07E-03
Nickel	3.33	753	4.42E-03
Perchlorate	0.00168	248	6.77E-06
Selenium	0.7	1750	4.00E-04
Vanadium	8.94	614	1.46E-02
Zinc	55.7	106,000	5.25E-04
Aroclor-1254	0.182	4.91	3.71E-02
Bis(2-ethylhexyl)phthalate	0.153	5380	2.84E-05
Dichlorobenzene[1,4-]	0.000563	24,800	2.27E-08
		HI	**1**

* SSLs from NMED (2017, 602273).

Table H-4.2-11
Industrial Carcinogenic Screening Evaluation for AOC 02-003(b)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Cadmium	0.172	417,000	4.12E-12
Aroclor-1254	0.844	11	7.67E-07
Aroclor-1260	0.369	11.1	3.32E-07
		Total Excess Cancer Risk	**1E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-12
Industrial Noncarcinogenic Screening Evaluation for AOC 02-003(b)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Cadmium	0.172	1110	1.55E-04
Mercury	0.443	389	1.14E-03
Selenium	0.888	6490	1.37E-04
Aroclor-1254	0.844	16.4	5.15E-02
		HI	**5E-02**

* SSLs from NMED (2017, 602273).

Table H-4.2-13
Industrial Radionuclide Screening Evaluation for AOC 02-003(b)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Plutonium-239/240	0.768	1200	1.60E-02
Tritium	0.0111	2,400,000	1.16E-07
		Total Dose	**2E-02**

* SALs from LANL (2015, 600929).

Table H-4.2-14
Recreational Carcinogenic Screening Evaluation for AOC 02-003(b)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Cadmium	0.172	4,300,000	4.00E-13
Aroclor-1254	0.844	10	8.44E-07
Aroclor-1260	0.369	10	3.69E-07
		Total Excess Cancer Risk	**1E-06**

* SSLs from LANL (2017, 602581).

Table H-4.2-15
Recreational Noncarcinogenic Screening Evaluation for AOC 02-003(b)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	HQ
Cadmium	0.172	460	3.74E-04
Mercury	0.443	190	2.33E-03
Selenium	0.888	3100	2.86E-04
Aroclor-1254	0.844	5.5	1.53E-01
		HI	**2E-01**

* SSLs from LANL (2017, 602581).

Table H-4.2-16
Recreational Radionuclide Screening Evaluation for AOC 02-003(b)

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Dose (mrem/yr)
Plutonium-239/240	0.768	1300	1.48E-02
Tritium	0.0111	5,700,000	4.87E-08
		Total Dose	**1E-02**

* SALs from LANL (2015, 600929).

Table H-4.2-17
Residential Carcinogenic Screening Evaluation for AOC 02-003(b)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Arsenic	2.21	7.07	3.13E-06
Cadmium	0.244	85,900	2.84E-11
Chromium (Total)	6.56	96.6	6.79E-07
Nickel	3.13	595,000	5.26E-11
Aroclor-1248	0.0076	2.43	3.13E-08
Aroclor-1254	0.399	2.43	1.64E-06
Aroclor-1260	0.149	2.43	6.13E-07
		Total Excess Cancer Risk	**6E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-18
Residential Noncarcinogenic Screening Evaluation for AOC 02-003(b)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Aluminum	3220	78,000	4.13E-02
Antimony	0.941(U)	31.3	3.01E-02
Arsenic	2.21	13	1.70E-01
Barium	40.6	15,600	2.60E-03
Cadmium	0.244	70.5	3.46E-03
Chromium (Total)	6.56	45,200	1.45E-04
Copper	3.16	3130	1.01E-03
Iron	7350	54,800	1.34E-01
Manganese	290	10,500	2.76E-02
Mercury	0.179	23.5	7.62E-03
Nickel	3.13	1560	2.01E-03
Selenium	0.954	391	2.44E-03
Vanadium	8.14	394	2.07E-02
Aroclor-1254	0.399	1.14	3.50E-01
Butylbenzene[n-]	0.000661	3900[b]	1.69E-07
Isopropyltoluene[4-]	0.000403	2360[c]	1.71E-07
Trimethylbenzene[1,2,4-]	0.000229	300[b]	7.63E-07
		HI	**8E-01**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] SSL from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables).

[c] Isopropyl benzene used as a surrogate based on structural similarity.

Table H-4.2-19
Residential Radionuclide Screening Evaluation for AOC 02-003(b)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	3.04	12	6.33E+00
Plutonium-239/240	0.329	79	1.04E-01
Strontium-90	0.96	15	1.60E+00
Tritium	0.015	1700	2.21E-04
		Total Dose	**8E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-20
Construction Worker Noncarcinogenic Screening Evaluation for AOC 02-003(b)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Aluminum	3220	41,400	7.78E-02
Antimony	0.941(U)	142	6.63E-03
Arsenic	2.21	41.2	5.36E-02
Barium	40.6	4390	9.25E-03
Cadmium	0.244	72.1	3.38E-03
Chromium (Total)	6.56	134	4.90E-02
Copper	3.16	14,200	2.23E-04
Iron	7350	248,000	2.96E-02
Manganese	290	464	6.25E-01
Mercury	0.179	77.1	2.32E-03
Nickel	3.13	753	4.16E-03
Selenium	0.954	1750	5.45E-04
Vanadium	8.14	614	1.33E-02
Aroclor-1254	0.399	4.91	8.13E-02
Butylbenzene[n-]	0.000661	15,500[b]	4.26E-08
Isopropyltoluene[4-]	0.000403	2740[c]	1.47E-07
Trimethylbenzene[1,2,4-]	0.000229	329[b]	6.96E-07
		HI	**1E+00**

[a] SSLs from NMED (2017, 602273).

[b] Construction worker SSL calculated using toxicity value from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables) and equation and parameters from NMED (2017, 602273).

[c] Isopropyl benzene used as a surrogate based on structural similarity.

Table H-4.2-21
Industrial Carcinogenic Screening Evaluation for AOC 02-003(c)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Cadmium	0.268	417,000	6.43E-12
Aroclor-1254	0.0065	11	5.91E-09
Aroclor-1260	0.0077	11.1	6.94E-09
		Total Excess Cancer Risk	**1E-08**

* SSLs from NMED (2017, 602273).

Table H-4.2-22
Industrial Noncarcinogenic Screening Evaluation for AOC 02-003(c)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Barium	196	255,000	7.69E-04
Cadmium	0.268	1110	2.41E-04
Copper	47	51,900	9.06E-04
Mercury	0.503	389	1.29E-03
Perchlorate	0.000591	908	6.51E-07
Selenium	5.51	6490	8.49E-04
Aroclor-1254	0.0065	16.4	3.96E-04
Toluene	0.000928	61100	1.52E-08
		HI	**4E-03**

* SSLs from NMED (2017, 602273).

Table H-4.2-23
Industrial Radionuclide Screening Evaluation for AOC 02-003(c)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	1.8	41	1.10E+00
Cobalt-60	0.24	9	6.67E-01
Plutonium-239/240	0.175	1200	3.65E-03
Tritium	0.138	2,400,000	1.44E-06
		Total Dose	**2E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-24
Recreational Carcinogenic Screening Evaluation for AOC 02-003(c)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Cadmium	0.268	4,300,000	6.23E-13
Aroclor-1254	0.0065	10	6.50E-09
Aroclor-1260	0.0077	10	7.70E-09
		Total Excess Cancer Risk	**1E-08**

* SSLs from LANL (2017, 602581).

Table H-4.2-25
Recreational Noncarcinogenic Screening Evaluation for AOC 02-003(c)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	HQ
Barium	196	120,000	1.63E-03
Cadmium	0.268	460	5.83E-04
Copper	47	25,000	1.88E-03
Mercury	0.503	190	2.65E-03
Perchlorate	0.000591	430	1.37E-06
Selenium	5.51	3100	1.78E-03
Aroclor-1254	0.0065	5.5	1.18E-03
Toluene	0.000928	48,000	1.93E-08
		HI	**1E-02**

* SSLs from LANL (2017, 602581).

Table H-4.2-26
Recreational Radionuclide Screening Evaluation for AOC 02-003(c)

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	1.8	370	1.22E-01
Cobalt-60	0.24	81	7.41E-02
Plutonium-239/240	0.175	1300	3.37E-03
Tritium	0.138	5,700,000	6.05E-07
		Total Dose	**2E-01**

* SALs from LANL (2015, 600929).

Table H-4.2-27
Residential Carcinogenic Screening Evaluation for AOC 02-003(c)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Arsenic	2.04	7.07	2.89E-06
Cadmium	0.256	85,900	2.98E-11
Chromium (Total)	9.76	96.6	1.01E-06
Aroclor-1254	0.0065	2.43	2.67E-08
Aroclor-1260	0.0077	2.43	3.17E-08
Chloroform	0.000319	5.85	5.45E-10
		Total Excess Cancer Risk	**4E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-28
Residential Noncarcinogenic Screening Evaluation for AOC 02-003(c)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Antimony	0.188	31.3	6.01E-03
Arsenic	2.04	13	1.57E-01
Barium	628	15,600	4.03E-02
Cadmium	0.256	70.5	3.63E-03
Chromium (Total)	9.76	45,200	2.16E-04
Copper	24.2	3130	7.73E-03
Iron	8130	54,800	1.48E-01
Manganese	259	10,500	2.47E-02
Mercury	0.517	23.5	2.20E-02
Perchlorate	0.00113	54.8	2.06E-05
Selenium	7.22	391	1.85E-02
Thallium	1.72	0.78	2.21E+00
Vanadium	8.99	394	2.28E-02
Acetone	0.0101	66,300	1.52E-07
Aroclor-1254	0.0065	1.14	5.70E-03
Chloroform	0.000319	304	1.05E-06
Toluene	0.000798	5220	1.53E-07
		HI	**3E+00**

* SSLs from NMED (2017, 602273).

Table H-4.2-29
Residential Radionuclide Screening Evaluation for AOC 02-003(c)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	0.947	12	1.97E+00
Cobalt-60	0.24	2.6	2.31E+00
Plutonium-239/240	0.0902	79	2.85E-02
Tritium	0.0193	1700	2.84E-04
		Total Dose	**4E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-30
Construction Worker Noncarcinogenic Screening Evaluation for AOC 02-003(c)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	HQ
Antimony	0.188	142	1.32E-03
Arsenic	2.04	41.2	4.95E-02
Barium	628	4390	1.43E-01
Cadmium	0.256	72.1	3.55E-03
Chromium (Total)	9.76	134	7.28E-02
Copper	24.2	14,200	1.70E-03
Iron	8130	248,000	3.28E-02
Manganese	259	464	5.58E-01
Mercury	0.517	77.1	6.71E-03
Perchlorate	0.00113	248	4.56E-06
Selenium	7.22	1750	4.13E-03
Thallium	1.72	3.54	4.86E-01
Vanadium	8.99	614	1.46E-02
Acetone	0.0101	241,000	4.19E-08
Aroclor-1254	0.0065	4.91	1.32E-03
Chloroform	0.000319	388	8.22E-07
Toluene	0.000798	14,000	5.70E-08
		HI	**1E+00**

* SSLs from NMED (2017, 602273).

Table H-4.2-31
Industrial Carcinogenic Screening Evaluation for AOC 02-003(d)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Cadmium	0.156	417,000	3.74E-12
Aroclor-1254	0.0082	11	7.45E-09
Aroclor-1260	0.0053	11.1	4.77E-09
		Total Excess Cancer Risk	**1E-08**

* SSLs from NMED (2017, 602273).

Table H-4.2-32
Industrial Noncarcinogenic Screening Evaluation for AOC 02-003(d)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Cadmium	0.156	1110	1.41E-04
Mercury	0.0616	389	1.58E-04
Nitrate	9.15	2,080,000	4.40E-06
Perchlorate	0.00166	908	1.83E-06
Selenium	4.22	6490	6.50E-04
Zinc	50.1	389,000	1.29E-04
Aroclor-1254	0.0082	16.4	5.00E-04
		HI	**2E-03**

* SSLs from NMED (2017, 602273).

Table H-4.2-33
Industrial Radionuclide Screening Evaluation for AOC 02-003(d)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Cobalt-60	0.97	9	2.69E+00
Plutonium-239/240	0.0918	1200	1.91E-03
Tritium	0.103	2,400,000	1.07E-06
		Total Dose	**3E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-34
Recreational Carcinogenic Screening Evaluation for AOC 02-003(d)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Cadmium	0.156	4,300,000	3.63E-13
Aroclor-1254	0.0082	10	8.20E-09
Aroclor-1260	0.0053	10	5.30E-09
		Total Excess Cancer Risk	**1.E-08**

* SSLs from LANL (2017, 602581).

Table H-4.2-35
Recreational Noncarcinogenic Screening Evaluation for AOC 02-003(d)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	HQ
Antimony	1.08(U)	250	4.32E-03
Cadmium	0.156	460	3.39E-04
Mercury	0.0616	190	3.24E-04
Nitrate	9.15	990,000	9.24E-06
Perchlorate	0.00166	430	3.86E-06
Selenium	4.22	3100	1.36E-03
Zinc	50.1	190,000	2.64E-04
Aroclor-1254	0.0082	5.5	1.49E-03
		HI	**4E-03**

* SSLs from LANL (2017, 602581).

Table H-4.2-36
Recreational Radionuclide Screening Evaluation for AOC 02-003(d)

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Dose (mrem/yr)
Cobalt-60	0.97	81	2.99E-01
Plutonium-239/240	0.0918	1300	1.77E-03
Tritium	0.103	5,700,000	4.52E-07
		Total Dose	**3E-01**

* SALs from LANL (2015, 600929).

Table H-4.2-37
Residential Carcinogenic Screening Evaluation for AOC 02-003(d)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Arsenic	2.09	7.07	2.96E-06
Beryllium	1.83	64,400	2.84E-10
Cadmium	0.149	85,900	1.73E-11
Chromium (Total)	6.88	96.6	7.12E-07
Nickel	3.46	595,000	5.82E-11
Aroclor-1254	0.0106	2.43	4.36E-08
Aroclor-1260	0.0053	2.43	2.18E-08
		Total Excess Cancer Risk	**4E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-38
Residential Noncarcinogenic Screening Evaluation for AOC 02-003(d)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Aluminum	6720	78,000	8.62E-02
Antimony	0.32	31.3	1.02E-02
Arsenic	2.09	13	1.61E-01
Barium	43.2	15,600	2.77E-03
Beryllium	1.83	156	1.17E-02
Cadmium	0.149	70.5	2.11E-03
Chromium (Total)	6.88	45,200	1.52E-04
Copper	3.46	3130	1.11E-03
Iron	7920	54,800	1.45E-01
Manganese	287	10,500	2.73E-02
Mercury	0.0397	23.5	1.69E-03
Nickel	3.46	1560	2.22E-03
Nitrate	5.98	125,000	4.78E-05
Perchlorate	0.00147	54.8	2.68E-05
Selenium	3.96	391	1.01E-02
Vanadium	7.01	394	1.78E-02
Zinc	46.5	23,500	1.98E-03
Aroclor-1254	0.0106	1.14	9.30E-03
Toluene	0.000646	5220	1.24E-07
		HI	**5E-01**

* SSLs from NMED (2017, 602273).

Table H-4.2-39
Residential Radionuclide Screening Evaluation for AOC 02-003(d)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	0.391	12	8.15E-01
Cobalt-60	0.97	2.6	9.33E+00
Plutonium-239/240	0.0534	79	1.69E-02
Tritium	0.0159	1700	2.34E-04
		Total Dose	**1E+01**

* SALs from LANL (2015, 600929).

Table H-4.2-40
Construction Worker Noncarcinogenic Screening Evaluation for AOC 02-003(d)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	HQ
Aluminum	6720	41,400	1.62E-01
Antimony	0.32	142	2.25E-03
Arsenic	2.09	41.2	5.07E-02
Barium	43.2	4390	9.84E-03
Beryllium	1.83	148	1.24E-02
Cadmium	0.149	72.1	2.07E-03
Chromium (Total)	6.88	134	5.13E-02
Copper	3.46	14,200	2.44E-04
Iron	7920	248,000	3.19E-02
Manganese	287	464	6.19E-01
Mercury	0.0397	77.1	5.15E-04
Nickel	3.46	753	4.59E-03
Nitrate	5.98	566,000	1.06E-05
Perchlorate	0.00147	248	5.93E-06
Selenium	3.96	1750	2.26E-03
Vanadium	7.01	614	1.14E-02
Zinc	46.5	106,000	4.39E-04
Aroclor-1254	0.0106	4.91	2.13E-03
Toluene	0.000646	14000	4.61E-08
		HI	**1E+00**

* SSLs from NMED (2017, 602273).

Table H-4.2-41
Industrial Carcinogenic Screening Evaluation for AOC 02-003(e)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Cadmium	0.291	417,000	6.98E-12
Aroclor-1260	0.611	11.1	5.50E-07
Bis(2-ethylhexyl)phthalate	0.0882	1830	4.82E-10
		Total Excess Cancer Risk	**6E-07**

* SSLs from NMED (2017, 602273).

Table H-4.2-42
Industrial Noncarcinogenic Screening Evaluation for AOC 02-003(e)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Cadmium	0.291	1110	2.62E-04
Mercury	2.58	389	6.63E-03
Perchlorate	0.000527	908	5.80E-07
Selenium	0.743	6490	1.14E-04
Zinc	59.1	389,000	1.52E-04
Bis(2-ethylhexyl)phthalate	0.0882	18,300	4.82E-06
		HI	**7E-03**

* SSLs from NMED (2017, 602273).

Table H-4.2-43
Industrial Radionuclide Screening Evaluation for AOC 02-003(e)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Tritium	0.00996	2,400,000	1.04E-07
		Total Dose	**1E-07**

* SALs from LANL (2015, 600929).

Table H-4.2-44
Recreational Carcinogenic Screening Evaluation for AOC 02-003(e)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Cadmium	0.291	4,300,000	6.77E-13
Aroclor-1260	0.611	10	6.11E-07
Bis(2-ethylhexyl)phthalate	0.0882	1800	4.90E-10
		Total Excess Cancer Risk	**6E-07**

* SSLs from LANL (2017, 602581).

Table H-4.2-45
Recreational Noncarcinogenic Screening Evaluation for AOC 02-003(e)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	HQ
Cadmium	0.291	460	6.33E-04
Mercury	2.58	190	1.36E-02
Perchlorate	0.000527	430	1.23E-06
Selenium	0.743	3100	2.40E-04
Zinc	59.1	190,000	3.11E-04
Bis(2-ethylhexyl)phthalate	0.0882	6600	1.34E-05
		HI	**1E-02**

* SSLs from LANL (2017, 602581).

Table H-4.2-46
Recreational Radionuclide Screening Evaluation for AOC 02-003(e)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Tritium	0.00996	5,700,000	4.37E-08
		Total Dose	**4E-08**

* SALs from LANL (2015, 600929).

Table H-4.2-47
Residential Carcinogenic Screening Evaluation for AOC 02-003(e)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Cadmium	0.399	85,900	4.64E-11
Chromium (Total)	21	96.6	2.17E-06
Aroclor-1254	0.0974	2.43	4.01E-07
Aroclor-1260	0.177	2.43	7.28E-07
Bis(2-ethylhexyl)phthalate	0.11	380	2.89E-09
		Total Excess Cancer Risk	**3E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-48
Residential Noncarcinogenic Screening Evaluation for AOC 02-003(e)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Antimony	2.3	31.3	7.35E-02
Cadmium	0.399	70.5	5.66E-03
Chromium (Total)	21	45,200	4.65E-04
Lead	1220	400	3.05E+00
Mercury	0.997	23.5	4.24E-02
Perchlorate	0.0296	54.8	5.40E-04
Selenium	1.31	391	3.35E-03
Zinc	219	23,500	9.32E-03
Aroclor-1254	0.0974	1.14	8.54E-02
Bis(2-ethylhexyl)phthalate	0.11	1230	8.94E-05
Toluene	0.00043	5220	8.24E-08
		HI	**3E+00**

* SSLs from NMED (2017, 602273).

Table H-4.2-49
Residential Radionuclide Screening Evaluation for AOC 02-003(e)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Americium-241	0.0376	83	1.13E-02
Cesium-137	197	12	4.10E+02
Plutonium-239/240	0.81	79	2.56E-01
Strontium-90	3.41	15	5.68E+00
Tritium	0.026	1700	3.82E-04
		Total Dose	**4.16E+02**

* SALs from LANL (2015, 600929).

Table H-4.2-50
Industrial Carcinogenic Screening Evaluation for AOC 02-004(a)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Cadmium	1.67	417,000	4.00E-11
Chromium (Total)	12.8	505	2.53E-07
Aroclor-1254	0.165	11	1.50E-07
Aroclor-1260	0.899	11.1	8.10E-07
		Total Excess Cancer Risk	**1E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-51
Industrial Noncarcinogenic Screening Evaluation for AOC 02-004(a)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Cadmium	1.67	1110	1.50E-03
Chromium (Total)	12.8	314,000	4.08E-05
Copper	11.5	51,900	2.22E-04
Cyanide (Total)	0.437	62.8	6.96E-03
Mercury	3.26	389	8.38E-03
Perchlorate	0.00108	908	1.19E-06
Selenium	7.31	6490	1.13E-03
Zinc	51.6	389,000	1.33E-04
Aroclor-1254	0.165	16.4	1.01E-02
Dibenzofuran	0.174	1000[b]	1.74E-04
		HI	**3E-02**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] SSL are from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables).

Table H-4.2-52
Industrial Radionuclide Screening Evaluation for AOC 02-004(a)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	1.71	41	1.04E+00
Cobalt-60	2.86	9	7.94E+00
Plutonium-239/240	0.153	1200	3.19E-03
Strontium-90	1.61	2400	1.68E-02
Tritium	0.00783	2,400,000	8.16E-08
		Total Dose	**9E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-53
Recreational Carcinogenic Screening Evaluation for AOC 02-004(a)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Cadmium	1.67	4,300,000	3.88E-12
Chromium (Total)	12.8	280	4.57E-07
Aroclor-1254	0.165	10	1.65E-07
Aroclor-1260	0.899	10	8.99E-07
		Total Excess Cancer Risk	**2E-06**

* SSLs from LANL (2017, 602581).

Table H-4.2-54
Recreational Noncarcinogenic Screening Evaluation for AOC 02-004(a)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	HQ
Cadmium	1.67	460	3.63E-03
Chromium (Total)	12.8	670,000	1.91E-05
Copper	11.5	25,000	4.60E-04
Cyanide (Total)	0.437	220	1.99E-03
Mercury	3.26	190	1.72E-02
Perchlorate	0.00108	430	2.51E-06
Selenium	7.31	3100	2.36E-03
Zinc	51.6	190,000	2.72E-04
Aroclor-1254	0.165	5.5	3.00E-02
		HI	**6E-02**

* SSLs from LANL (2017, 602581).

Table H-4.2-55
Recreational Radionuclide Screening Evaluation for AOC 02-004(a)

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	1.71	370	1.16E-01
Cobalt-60	2.86	81	8.83E-01
Plutonium-239/240	0.153	1300	2.94E-03
Strontium-90	1.61	4900	8.21E-03
Tritium	0.00783	5,700,000	3.43E-08
		Total Dose	**1E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-56
Residential Carcinogenic Screening Evaluation for AOC 02-004(a)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Arsenic	2.18	7.07	3.08E-06
Cadmium	0.907	85,900	1.06E-10
Chromium (Total)	10.3	96.6	1.07E-06
Chromium hexavalent ion	0.13	3.05	4.26E-07
Nickel	3.88	595,000	6.52E-11
Aroclor-1242	0.0209	2.43	8.60E-08
Aroclor-1248	0.0867	2.43	3.57E-07
Aroclor-1254	0.0869	2.43	3.58E-07
Aroclor-1260	0.465	2.43	1.91E-06
		Total Excess Cancer Risk	**7E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-57
Residential Noncarcinogenic Screening Evaluation for AOC 02-004(a)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Aluminum	3490	78,000	4.47E-02
Antimony	1.21(U)	31.3	3.87E-02
Arsenic	2.18	13	1.68E-01
Barium	44.6	15,600	2.86E-03
Cadmium	0.907	70.5	1.29E-02
Chromium (Total)	10.3	45,200	2.28E-04
Chromium hexavalent ion	0.13	235	5.53E-04
Copper	6.06	3130	1.94E-03
Cyanide (Total)	0.298	11.1	2.68E-02
Iron	8240	54,800	1.50E-01
Manganese	293	10,500	2.79E-02
Mercury	4.07	23.5	1.73E-01
Nickel	3.88	1560	2.49E-03
Perchlorate	0.00124	54.8	2.26E-05
Selenium	4.86	391	1.24E-02
Vanadium	9.69	394	2.46E-02
Zinc	42.6	23,500	1.81E-03
Acetone	0.00865	66,300	1.30E-07
Aroclor-1254	0.0869	1.14	7.62E-02
Chloroform	0.000242	304	7.96E-07
Dibenzofuran	0.174	73[b]	2.38E-03
Isopropyltoluene[4-]	0.0006	2360[c]	2.54E-07
Toluene	0.00107	5220	2.05E-07
Xylene[1,2-]	0.000353	798	4.42E-07
Xylene[1,3-]+Xylene[1,4-]	0.000839	863[d]	9.72E-07
		HI	**8E-01**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] SSL from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables).

[c] Isopropyl benzene used as a surrogate based on structural similarity.

[d] Xylenes used as a surrogate based on structural similarity.

Table H-4.2-58
Residential Radionuclide Screening Evaluation for AOC 02-004(a)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Americium-241	0.0532	83	1.60E-02
Cesium-137	0.68	12	1.42E+00
Cobalt-60	0.346	2.6	3.33E+00
Plutonium-239/240	0.203	79	6.42E-02
Strontium-90	1.61	15	2.68E+00
Tritium	1.73	1700	2.54E-02
		Total Dose	**8E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-59
Industrial TPH Screening Evaluation for AOC 02-004(a)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Total Petroleum Hydrocarbons Diesel Range Organics	151	3000	5.03E-02
		HI	**5E-02**

* SSLs from NMED (2017, 602273).

Table H-4.2-60
Residential TPH Screening Evaluation for AOC 02-004(a)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Total Petroleum Hydrocarbons Diesel Range Organics	84.8	1000	8.48E-02
		HI	**8E-02**

* SSLs from NMED (2017, 602273).

Table H-4.2-61
Construction Worker Noncarcinogenic Screening Evaluation for AOC 02-004(a)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Aluminum	3490	41,400	8.43E-02
Antimony	1.21(U)	142	8.52E-03
Arsenic	2.18	41.2	5.29E-02
Barium	44.6	4390	1.02E-02
Cadmium	0.907	72.1	1.26E-02
Chromium (Total)	10.3	134	7.69E-02
Chromium hexavalent ion	0.13	498	2.61E-04
Copper	6.06	14,200	4.27E-04
Cyanide (Total)	0.298	12	2.48E-02
Iron	8240	248,000	3.32E-02
Manganese	293	464	6.31E-01
Mercury	4.07	77.1	5.28E-02
Nickel	3.88	753	5.15E-03
Perchlorate	0.00124	248	5.00E-06
Selenium	4.86	1750	2.78E-03
Vanadium	9.69	614	1.58E-02
Zinc	42.6	106,000	4.02E-04
Acetone	0.00865	241,000	3.59E-08
Aroclor-1254	0.0869	4.91	1.77E-02
Chloroform	0.000242	388	6.24E-07
Dibenzofuran	0.174	354[b]	4.92E-04
Isopropyltoluene[4-]	0.0006	2740[c]	2.19E-07
Toluene	0.00107	14,000	7.64E-08
Xylene[1,2-]	0.000353	729	4.84E-07
Xylene[1,3-]+Xylene[1,4-]	0.000839	791[d]	1.06E-06
		HI	**1E+00**

[a] SSLs from NMED (2017, 602273).

[b] Construction worker SSL calculated using toxicity value from EPA regional screening tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables) and equation and parameters from NMED (2017, 602273).

[c] Isopropyl benzene used as a surrogate based on structural similarity.

[d] Xylenes used as a surrogate based on structural similarity.

Table H-4.2-62
Industrial Carcinogenic Screening Evaluation for AOCs 02-004(b,c,d)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Cadmium	0.371	417,000	8.90E-12
Chromium (Total)	26.3	505	5.21E-07
Aroclor-1254	0.114	11	1.04E-07
Aroclor-1260	0.25	11.1	2.25E-07
		Total Excess Cancer Risk	**8E-07**

* SSLs from NMED (2017, 602273).

Table H-4.2-63
Industrial Noncarcinogenic Screening Evaluation for AOCs 02-004(b,c,d)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Cadmium	0.371	1110	3.34E-04
Chromium (Total)	26.3	314,000	8.38E-05
Perchlorate	0.00139	908	1.53E-06
Selenium	0.76	6490	1.17E-04
Zinc	101	389,000	2.60E-04
Aroclor-1254	0.114	16.4	6.95E-03
Dibenzofuran	0.163	1000[b]	1.63E-04
		HI	**8E-03**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] SSL from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables).

Table H-4.2-64
Industrial Radionuclide Screening Evaluation for AOCs 02-004(b,c,d)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Cobalt-60	0.884	9	2.46E+00
Plutonium-239/240	0.507	1200	1.06E-02
Tritium	0.0166	2,400,000	1.73E-07
		Total Dose	**2.5E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-65
Recreational Carcinogenic Screening Evaluation for AOCs 02-004(b,c,d)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Cadmium	0.371	4,300,000	8.63E-13
Chromium (Total)	26.3	280	9.39E-07
Aroclor-1254	0.114	10	1.14E-07
Aroclor-1260	0.25	10	2.50E-07
		Total Excess Cancer Risk	**1E-06**

* SSLs from LANL (2017, 602581).

Table H-4.2-66
Recreational Noncarcinogenic Screening Evaluation for AOCs 02-004(b,c,d)

COPC	EPC (mg/kg)	Recreational SSL[a] (mg/kg)	HQ
Cadmium	0.371	460	8.07E-04
Chromium (Total)	26.3	670,000	3.93E-05
Perchlorate	0.00139	430	3.23E-06
Selenium	0.76	3100	2.45E-04
Zinc	101	190,000	5.32E-04
Aroclor-1254	0.114	5.5	2.07E-02
Dibenzofuran	0.163	490[b]	3.33E-04
		HI	**2E-01**

[a] SSLs from LANL (2017, 602581) unless otherwise noted.

[b] SSL from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables).

Table H-4.2-67
Recreational Radionuclide Screening Evaluation for AOCs 02-004(b,c,d)

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Dose (mrem/yr)
Cobalt-60	0.884	81	2.73E-01
Plutonium-239/240	0.507	1300	9.75E-03
Tritium	0.0166	5,700,000	7.28E-08
		Total Dose	**3E-01**

* SALs from LANL (2015, 600929).

Table H-4.2-68
Residential Carcinogenic Screening Evaluation for AOCs 02-004(b,c,d)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Arsenic	2.17	7.07	3.07E-06
Cadmium	0.371	85,900	4.32E-11
Chromium (Total)	20.9	96.6	2.16E-06
Nickel	3.6	595,000	6.05E-11
Aroclor-1254	0.0728	2.43	3.00E-07
Aroclor-1260	0.254	2.43	1.05E-06
		Total Excess Cancer Risk	**7E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-69
Residential Noncarcinogenic Screening Evaluation for AOCs 02-004(b,c,d)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Aluminum	3900	78,000	5.00E-02
Arsenic	2.17	13	1.67E-01
Cadmium	0.371	70.5	5.26E-03
Chromium (Total)	20.9	45,200	4.62E-04
Iron	8560	54,800	1.56E-01
Manganese	386	10,500	3.68E-02
Nickel	3.6	1560	2.31E-03
Perchlorate	0.0015	54.8	2.74E-05
Selenium	1.52	391	3.89E-03
Vanadium	9.77	394	2.48E-02
Zinc	72.4	23,500	3.08E-03
Aroclor-1254	0.0728	1.14	6.39E-02
Dibenzofuran	0.163	73[b]	2.23E-03
		HI	**5E-01**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] SSL from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables).

Table H-4.2-70
Residential Radionuclide Screening Evaluation for AOCs 02-004(b,c,d)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	0.651	12	1.36E+00
Cobalt-60	0.884	2.6	8.50E+00
Plutonium-239/240	0.253	79	8.01E-02
Tritium	0.916	1700	1.35E-02
		Total Dose	**1E+01**

* SALs from LANL (2015, 600929).

Table H-4.2-71
Construction Worker Noncarcinogenic Screening Evaluation for AOCs 02-004(b,c,d)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Aluminum	3900	41,400	9.42E-02
Arsenic	2.17	41.2	5.27E-02
Cadmium	0.371	72.1	5.15E-03
Chromium (Total)	20.9	134	1.56E-01
Iron	8560	248,000	3.45E-02
Manganese	386	464	8.32E-01
Nickel	3.6	753	4.78E-03
Perchlorate	0.0015	248	6.05E-06
Selenium	1.52	1750	8.69E-04
Vanadium	9.77	614	1.59E-02
Zinc	72.4	106,000	6.83E-04
Aroclor-1254	0.0728	4.91	1.48E-02
Dibenzofuran	0.163	354[b]	4.60E-04
		HI	**1E+00**

[a] SSLs from NMED (2017, 602273).

[b] Construction worker SSL calculated using toxicity value from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables) and equation and parameters from NMED (2017, 602273).

Table H-4.2-72
Industrial Carcinogenic Screening Evaluation for AOC 02-004(e)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Chromium (Total)	31.6	505	6.26E-07
Aroclor-1254	0.0736	11	6.69E-08
Aroclor-1260	0.18	11.1	1.62E-07
		Total Excess Cancer Risk	**9E-07**

* SSLs from NMED (2017, 602273).

Table H-4.2-73
Industrial Noncarcinogenic Screening Evaluation for AOC 02-004(e)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Chromium (Total)	31.6	314,000	1.01E-04
Copper	19	51,900	3.66E-04
Lead	23.2	800	2.90E-02
Mercury	1.2	389	3.08E-03
Perchlorate	0.00162	908	1.78E-06
Zinc	120	389,000	3.08E-04
Aroclor-1254	0.0736	16.4	4.49E-03
		HI	**4E-02**

* SSLs from NMED (2017, 602273).

Table H-4.2-74
Industrial Radionuclide Screening Evaluation for AOC 02-004(e)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Plutonium-239/240	0.392	1200	8.17E-03
Tritium	0.0111	2,400,000	1.16E-07
		Total Dose	**8E-03**

* SALs from LANL (2015, 600929).

Table H-4.2-75
Recreational Carcinogenic Screening Evaluation for AOC 02-004(e)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Chromium (Total)	31.6	280	1.13E-06
Aroclor-1254	0.0736	10	7.36E-08
Aroclor-1260	0.18	10	1.80E-07
		Total Excess Cancer Risk	**1E-06**

* SSLs from LANL (2017, 602581).

Table H-4.2-76
Recreational Noncarcinogenic Screening Evaluation for AOC 02-004(e)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	HQ
Chromium (Total)	31.6	670,000	4.72E-05
Copper	19	25,000	7.60E-04
Lead	23.2	1110	2.09E-02
Mercury	1.2	190	6.32E-03
Perchlorate	0.00162	430	3.77E-06
Zinc	120	190,000	6.32E-04
Aroclor-1254	0.0736	5.5	1.34E-02
		HI	**4E-02**

* SSLs from LANL (2017, 602581).

Table H-4.2-77
Recreational Radionuclide Screening Evaluation for AOC 02-004(e)

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Dose (mrem/yr)
Plutonium-239/240	0.392	1300	7.54E-03
Tritium	0.0111	5,700,000	4.87E-08
		Total Dose	**8E-03**

* SALs from LANL (2015, 600929).

Table H-4.2-78
Residential Carcinogenic Screening Evaluation for AOC 02-004(e)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Cadmium	0.284	85,900	3.31E-11
Chromium (Total)	31.6	96.6	3.27E-06
Aroclor-1254	0.0736	2.43	3.03E-07
Aroclor-1260	0.18	2.43	7.41E-07
		Total Excess Cancer Risk	**4E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-79
Residential Noncarcinogenic Screening Evaluation for AOC 02-004(e)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Cadmium	0.284	70.5	4.03E-03
Chromium (Total)	31.6	45,200	6.99E-04
Copper	19	3130	6.07E-03
Lead	23.2	400	5.80E-02
Mercury	1.2	23.5	5.11E-02
Perchlorate	0.00162	54.8	2.96E-05
Selenium	1.51	391	3.86E-03
Zinc	120	23,500	5.11E-03
Aroclor-1254	0.0736	1.14	6.46E-02
		HI	**2E-01**

* SSLs from NMED (2017, 602273).

Table H-4.2-80
Residential Radionuclide Screening Evaluation for AOC 02-004(e)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	0.447	12	9.31E-01
Cobalt-60	0.139	2.6	1.34E+00
Plutonium-239/240	0.392	79	1.24E-01
Tritium	0.217	1700	3.19E-03
		Total Dose	**2E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-81
Industrial Carcinogenic Screening Evaluation for AOC 02-004(f)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Cadmium	0.293	417,000	7.03E-12
Chromium (Total)	14	505	2.77E-07
Chromium hexavalent ion	0.327	72.1	4.54E-08
Aroclor-1254	0.0849	11	7.72E-08
Aroclor-1260	0.404	11.1	3.64E-07
Bis(2-ethylhexyl)phthalate	0.591	1830	3.23E-09
Pentachlorophenol	0.301	44.5	6.76E-08
		Total Excess Cancer Risk	**8E-07**

* SSLs from NMED (2017, 602273).

Table H-4.2-82
Industrial Noncarcinogenic Screening Evaluation for AOC 02-004(f)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Cadmium	0.293	1110	2.64E-04
Chromium (Total)	14	314,000	4.46E-05
Chromium hexavalent ion	0.327	3890	8.41E-05
Copper	19.8	51,900	3.82E-04
Mercury	1.02	389	2.62E-03
Perchlorate	0.00214	908	2.36E-06
Selenium	1.15	6490	1.77E-04
Zinc	79.6	389,000	2.05E-04
Aroclor-1254	0.0849	16.4	5.18E-03
Bis(2-ethylhexyl)phthalate	0.591	18,300	3.23E-05
Di-n-butylphthalate	0.0536	91,600	5.85E-07
Pentachlorophenol	0.301	3180	9.47E-05
		HI	**9E-03**

* SSLs from NMED (2017, 602273).

Table H-4.2-83
Industrial Radionuclide Screening Evaluation for AOC 02-004(f)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Cobalt-60	0.11	9	3.06E-01
Plutonium-239/240	0.0307	1200	6.40E-04
Tritium	0.156	2,400,000	1.63E-06
		Total Dose	**3E-01**

* SALs from LANL (2015, 600929).

Table H-4.2-84
Recreational Carcinogenic Screening Evaluation for AOC 02-004(f)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Cadmium	0.293	4,300,000	6.81E-13
Chromium (Total)	14	280	5.00E-07
Chromium hexavalent ion	0.327	40	8.18E-08
Aroclor-1254	0.0849	10	8.49E-08
Aroclor-1260	0.404	10	4.04E-07
Bis(2-ethylhexyl)phthalate	0.591	1800	3.28E-09
Pentachlorophenol	0.301	35	8.60E-08
		Total Excess Cancer Risk	**1E-06**

* SSLs from LANL (2017, 602581).

Table H-4.2-85
Recreational Noncarcinogenic Screening Evaluation for AOC 02-004(f)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	HQ
Cadmium	0.293	460	6.37E-04
Chromium (Total)	14	670,000	2.09E-05
Chromium hexavalent ion	0.327	1900	1.72E-04
Copper	19.8	25,000	7.92E-04
Mercury	1.02	430	4.98E-06
Perchlorate	0.00214	3100	3.71E-04
Selenium	1.15	190,000	4.19E-04
Zinc	79.6	5.5	1.54E-02
Aroclor-1254	0.0849	6600	8.95E-05
Bis(2-ethylhexyl)phthalate	0.591	33,000	1.62E-06
Di-n-butylphthalate	0.0536	460	6.37E-04
Pentachlorophenol	0.301	960	3.14E-04
		HI	**0.02**

* SSLs from LANL (2017, 602581).

Table H-4.2-86
Recreational Radionuclide Screening Evaluation for AOC 02-004(f)

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Dose (mrem/yr)
Cobalt-60	0.11	81	3.40E-02
Plutonium-239/240	0.0307	1300	5.90E-04
Tritium	0.156	5,700,000	6.84E-07
		Total Dose	**0.03**

* SALs from LANL (2015, 600929).

Table H-4.2-87
Residential Carcinogenic Screening Evaluation for AOC 02-004(f)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Cadmium	0.226	85,900	2.63E-11
Chromium (Total)	16.4	96.6	1.70E-06
Chromium hexavalent ion	0.206	3.05	6.75E-07
Aroclor-1254	0.0934	2.43	3.84E-07
Aroclor-1260	0.226	2.43	9.30E-07
Bis(2-ethylhexyl)phthalate	0.591	380	1.56E-08
Methylene Chloride	0.00563	766	7.35E-11
Pentachlorophenol	0.301	9.85	3.06E-07
		Total Excess Cancer Risk	**4E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-88
Residential Noncarcinogenic Screening Evaluation for AOC 02-004(f)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Cadmium	0.226	70.5	3.21E-03
Chromium (Total)	16.4	45,200	3.63E-04
Chromium hexavalent ion	0.206	235	8.77E-04
Copper	18.2	3130	5.81E-03
Mercury	0.662	23.5	2.82E-02
Perchlorate	0.00165	54.8	3.01E-05
Selenium	1.06	391	2.71E-03
Zinc	59	23,500	2.51E-03
Aroclor-1254	0.0934	1.14	8.19E-02
Bis(2-ethylhexyl)phthalate	0.591	1230	4.80E-04
Di-n-butylphthalate	0.049	6160	7.95E-06
Methylene Chloride	0.00563	409	1.38E-05
Pentachlorophenol	0.301	234	1.29E-03
Toluene	0.00112	5220	2.15E-07
		HI	**0.1**

* SSLs from NMED (2017, 602273).

Table H-4.2-89
Residential Radionuclide Screening Evaluation for AOC 02-004(f)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	0.31	12	6.46E-01
Cobalt-60	0.11	2.6	1.06E+00
Plutonium-239/240	0.00849	79	2.69E-03
Strontium-90	0.716	15	1.19E+00
Tritium	0.556	1700	8.18E-03
		Total Dose	**3**

* SALs from LANL (2015, 600929).

Table H-4.2-90
Industrial Carcinogenic Screening Evaluation for AOC 02-004(g)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Cadmium	0.321	417,000	7.70E-12
Chromium (Total)	23.6	505	4.67E-07
Chromium hexavalent ion	0.108	72.1	1.50E-08
Aroclor-1254	0.0294	11	2.67E-08
Aroclor-1260	0.0199	11.1	1.79E-08
		Total Excess Cancer Risk	**5E-07**

* SSLs from NMED (2017, 602273).

Table H-4.2-91
Industrial Noncarcinogenic Screening Evaluation for AOC 02-004(g)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Cadmium	0.321	1110	2.89E-04
Chromium (Total)	23.6	314,000	7.52E-05
Chromium hexavalent ion	0.108	3890	2.78E-05
Copper	10.5	51,900	2.02E-04
Mercury	0.285	389	7.33E-04
Selenium	8.42	6490	1.30E-03
Aroclor-1254	0.0294	16.4	1.79E-03
		HI	**0.004**

* SSLs from NMED (2017, 602273).

Table H-4.2-92
Industrial Radionuclide Screening Evaluation for AOC 02-004(g)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Americium-241	0.165	1000	4.13E-03
Cesium-137	2.88	41	1.76E+00
Cobalt-60	0.504	9	1.40E+00
Plutonium-239/240	0.902	1200	1.88E-02
Tritium	0.0753	2,400,000	7.84E-07
		Total Dose	**3**

* SALs from LANL (2015, 600929).

Table H-4.2-93
Recreational Carcinogenic Screening Evaluation for AOC 02-004(g)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Cadmium	0.321	4,300,000	7.47E-13
Chromium (Total)	23.6	280	8.43E-07
Chromium hexavalent ion	0.108	40	2.70E-08
Aroclor-1254	0.0294	10	2.94E-08
Aroclor-1260	0.0199	10	1.99E-08
		Total Excess Cancer Risk	**9E-07**

* SSLs from LANL (2017, 602581).

Table H-4.2-94
Recreational Noncarcinogenic Screening Evaluation for AOC 02-004(g)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	HQ
Cadmium	0.321	460	6.98E-04
Chromium (Total)	23.6	670,000	3.52E-05
Chromium hexavalent ion	0.108	1900	5.68E-05
Copper	10.5	25,000	4.20E-04
Mercury	0.285	190	1.50E-03
Selenium	8.42	3100	2.72E-03
Aroclor-1254	0.0294	5.5	5.35E-03
		HI	**0.01**

* SSLs from LANL (2017, 602581).

Table H-4.2-95
Recreational Radionuclide Screening Evaluation for AOC 02-004(g)

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Dose (mrem/yr)
Americium-241	0.165	1500	2.75E-03
Cesium-137	2.88	370	1.95E-01
Cobalt-60	0.504	81	1.56E-01
Plutonium-239/240	0.902	1300	1.73E-02
Tritium	0.0753	5,700,000	3.30E-07
		Total Dose	**0.4**

* SALs from LANL (2015, 600929).

Table H-4.2-96
Residential Carcinogenic Screening Evaluation for AOC 02-004(g)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Cadmium	0.208	85,900	2.42E-11
Chromium (Total)	24.2	96.6	2.51E-06
Chromium hexavalent ion	0.148	3.05	4.85E-07
Aroclor-1254	0.0179	2.43	7.37E-08
Aroclor-1260	0.0125	2.43	5.14E-08
Chloroform	0.000313	5.85	5.35E-10
Methylene Chloride	0.00254	766	3.32E-11
Tetrachloroethene	0.000302	335	9.01E-12
Trichloroethene	0.000884	15.4	5.74E-10
		Total Excess Cancer Risk	**3E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-97
Residential Noncarcinogenic Screening Evaluation for AOC 02-004(g)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Antimony	0.112	31.3	3.58E-03
Cadmium	0.208	70.5	2.95E-03
Chromium (Total)	24.2	45,200	5.35E-04
Chromium hexavalent ion	0.148	235	6.30E-04
Copper	11.5	3130	3.67E-03
Mercury	0.311	23.5	1.32E-02
Perchlorate	0.000966	54.8	1.76E-05
Selenium	4.74	391	1.21E-02
Aroclor-1254	0.0179	1.14	1.57E-02
Chloroform	0.000313	304	1.03E-06
Di-n-butylphthalate	0.0641	6160	1.04E-05
Methylene Chloride	0.00254	409	6.21E-06
Tetrachloroethene	0.000302	110	2.75E-06
Toluene	0.00336	5220	6.44E-07
Trichloroethene	0.000884	6.72	1.32E-04
		HI	**0.05**

* SSLs from NMED (2017, 602273).

Table H-4.2-98
Residential Radionuclide Screening Evaluation for AOC 02-004(g)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Americium-241	0.165	83	4.97E-02
Cesium-137	2.88	12	6.00E+00
Cobalt-60	0.504	2.6	4.85E+00
Plutonium-239/240	0.47	79	1.49E-01
Strontium-90	0.965	15	1.61E+00
Tritium	0.0904	1700	1.33E-03
		Total Dose	**13**

* SALs from LANL (2015, 600929).

Table H-4.2-99
Industrial Carcinogenic Screening Evaluation for SWMU 02-005

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Chromium hexavalent ion	0.298	72.1	4.13E-08
Aroclor-1242	0.0062	10.9	5.69E-09
Aroclor-1254	0.0149	11	1.35E-08
Aroclor-1260	1.43	11.1	1.29E-06
Benzo(b)fluoranthene	0.0182	32.3	5.63E-09
		Total Excess Cancer Risk	**1E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-100
Industrial Noncarcinogenic Screening Evaluation for SWMU 02-005

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Antimony	0.169	519	3.26E-04
Chromium hexavalent ion	0.298	3890	7.66E-05
Mercury	0.502	389	1.29E-03
Perchlorate	0.000946	908	1.04E-06
Selenium	4.7	6490	7.24E-04
Zinc	61.4	389,000	1.58E-04
Aroclor-1254	0.0149	16.4	9.09E-04
Fluoranthene	0.0173	33,700	5.13E-07
Phenanthrene	0.0149	25,300	5.89E-07
Pyrene	0.0154	25,300	6.09E-07
		HI	**3E-03**

* SSLs from NMED (2017, 602273).

Table H-4.2-101
Industrial Radionuclide Screening Evaluation for SWMU 02-005

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Americium-241	0.0304	1000	7.60E-04
Plutonium-239/240	0.42	1200	8.75E-03
Tritium	0.251	2,400,000	2.62E-06
		Total Dose	**1E-02**

* SALs from LANL (2015, 600929).

Table H-4.2-102
Recreational Carcinogenic Screening Evaluation for SWMU 02-005

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Chromium hexavalent ion	0.298	40	7.45E-08
Aroclor-1242	0.0062	10	6.20E-09
Aroclor-1254	0.0149	10	1.49E-08
Aroclor-1260	1.43	10	1.43E-06
Benzo(b)fluoranthene	0.0182	89	2.04E-09
		Total Excess Cancer Risk	**2E-06**

* SSLs from LANL (2017, 602581).

Table H-4.2-103
Recreational Noncarcinogenic Screening Evaluation for SWMU 02-005

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	HQ
Antimony	0.169	250	6.76E-04
Chromium hexavalent ion	0.298	1900	1.57E-04
Mercury	0.502	190	2.64E-03
Perchlorate	0.000946	430	2.20E-06
Selenium	4.7	3100	1.52E-03
Zinc	61.4	190,000	3.23E-04
Aroclor-1254	0.0149	5.5	2.71E-03
Fluoranthene	0.0173	12,000	1.93E-06
Phenanthrene	0.0149	8600	1.73E-06
Pyrene	0.0154	8600	3.29E-06
		HI	**8E-03**

* SSLs from LANL (2017, 602581).

Table H-4.2-104
Recreational Radionuclide Screening Evaluation for SWMU 02-005

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Dose (mrem/yr)
Americium-241	0.0304	1500	5.07E-04
Plutonium-239/240	0.42	1300	8.08E-03
Tritium	0.251	5,700,000	1.10E-06
		Total Dose	**9E-03**

* SALs from LANL (2015, 600929).

Table H-4.2-105
Residential Carcinogenic Screening Evaluation for SWMU 02-005

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Arsenic	1.98	7.07	2.80E-06
Chromium (Total)	3.98	96.6	4.12E-07
Chromium hexavalent ion	0.318	3.05	1.04E-06
Nickel	2.61	595,000	4.39E-11
Aroclor-1242	0.0062	2.43	2.55E-08
Aroclor-1254	0.028	2.43	1.15E-07
Aroclor-1260	1.48	2.43	6.09E-06
Benzo(b)fluoranthene	0.0182	1.53	1.19E-07
		Total Excess Cancer Risk	**1E-05**

* SSLs from NMED (2017, 602273).

Table H-4.2-106
Residential Noncarcinogenic Screening Evaluation for SWMU 02-005

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Antimony	0.169	31.3	5.40E-03
Arsenic	1.98	13	1.52E-01
Chromium (Total)	3.98	45,200	8.81E-05
Chromium hexavalent ion	0.318	235	1.35E-03
Iron	7740	54,800	1.41E-01
Manganese	288	10500	2.74E-02
Mercury	0.286	23.5	1.22E-02
Nickel	2.61	1560	1.67E-03
Perchlorate	0.00106	54.8	1.93E-05
Selenium	4.08	391	1.04E-02
Zinc	52.8	23,500	2.25E-03
Aroclor-1254	0.028	1.14	2.46E-02
Fluoranthene	0.0173	2320	7.46E-06
Phenanthrene	0.0149	1740	8.56E-06
Pyrene	0.0154	1740	8.85E-06
Toluene	0.00142	5220	2.72E-07
		HI	**4E-01**

* SSLs from NMED (2017, 602273).

Table H-4.2-107
Residential Radionuclide Screening Evaluation for SWMU 02-005

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Americium-241	0.139	83	4.19E-02
Cesium-137	0.261	12	5.44E-01
Plutonium-238	0.0138	84	4.11E-03
Plutonium-239/240	0.924	79	2.92E-01
Tritium	0.0261	1700	3.84E-04
		Total Dose	**9E-01**

* SALs from LANL (2015, 600929).

Table H-4.2-108
Construction Worker Noncarcinogenic Screening Evaluation for SWMU 02-005

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	HQ
Antimony	0.169	142	1.19E-03
Arsenic	1.98	41.2	4.81E-02
Chromium (Total)	3.98	134	2.97E-02
Chromium hexavalent ion	0.318	498	6.39E-04
Iron	7740	248,000	3.12E-02
Manganese	288	464	6.21E-01
Mercury	0.286	77.1	3.71E-03
Nickel	2.61	753	3.47E-03
Perchlorate	0.00106	248	4.27E-06
Selenium	4.08	1750	2.33E-03
Zinc	52.8	106,000	4.98E-04
Aroclor-1254	0.028	4.91	5.70E-03
Fluoranthene	0.0173	10,000	1.73E-06
Phenanthrene	0.0149	7530	1.98E-06
Pyrene	0.0154	7530	2.05E-06
Toluene	0.00142	14,000	1.01E-07
		HI	**1**

* SSLs from NMED (2017, 602273).

Table H-4.2-109
Industrial Carcinogenic Screening Evaluation for SWMU 02-006(a)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Arsenic	2.9	35.9	8.08E-07
Chromium (Total)	8.53	505	1.69E-07
Chromium hexavalent ion	0.0581	72.1	8.06E-09
Nickel	6.69	2,890,000	2.31E-11
Aroclor-1242	0.0042	10.9	3.85E-09
Aroclor-1254	0.00409	11	3.72E-09
Aroclor-1260	0.0028	11.1	2.52E-09
Dichlorobenzene[1,4-]	0.000215	6730	3.19E-13
Trichloroethene	0.000313	111	2.82E-11
		Total Excess Cancer Risk	**1E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-110
Industrial Noncarcinogenic Screening Evaluation for SWMU 02-006(a)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Antimony	0.361	519	6.96E-04
Arsenic	2.9	208	1.39E-02
Barium	143	255,000	5.61E-04
Chromium (Total)	8.53	314,000	2.72E-05
Chromium hexavalent ion	0.0581	3890	1.49E-05
Cyanide (Total)	0.298	62.8	4.75E-03
Lead	17.6	800	2.20E-02
Nickel	6.69	25,700	2.60E-04
Perchlorate	0.00159	908	1.75E-06
Selenium	8.34	6490	1.29E-03
Aroclor-1254	0.00409	16.4	2.49E-04
Toluene	0.000328	61100	5.37E-09
Trichloroethene	0.000313	36.1	8.67E-06
		HI	**4E-02**

* SSLs from NMED (2017, 602273).

Table H-4.2-111
Industrial Radionuclide Screening Evaluation for SWMU 02-006(a)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	13.4	41	8.17E+00
Plutonium-239/240	0.0626	1200	1.30E-03
Strontium-90	2.69	2400	2.80E-02
Tritium	0.456	2,400,000	4.75E-06
		Total Dose	**8E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-112
Recreational Carcinogenic Screening Evaluation for SWMU 02-006(a)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Arsenic	2.9	25.8	1.12E-06
Chromium (Total)	8.53	710	1.20E-07
Chromium hexavalent ion	0.0581	101	5.75E-09
Nickel	6.69	28,300,000	2.36E-12
Aroclor-1242	0.0042	10	4.20E-09
Aroclor-1254	0.00409	10.3	3.97E-09
Aroclor-1260	0.0028	10.3	2.72E-09
Dichlorobenzene[1,4-]	0.000215	1100	1.95E-12
Trichloroethene	0.000313	250	1.25E-11
		Total Excess Cancer Risk	**1E-06**

* SSLs from LANL (2017, 602581).

Table H-4.2-113
Recreational Noncarcinogenic Screening Evaluation for SWMU 02-006(a)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	HQ
Antimony	0.361	250	1.44E-03
Arsenic	2.9	88	3.30E-02
Barium	143	120,000	1.19E-03
Chromium (Total)	8.53	670,000	1.27E-05
Chromium hexavalent ion	0.0581	1900	3.06E-05
Cyanide (Total)	0.298	220	1.35E-03
Lead	17.6	1110	1.59E-02
Nickel	6.69	12,000	5.58E-04
Perchlorate	0.00159	430	3.70E-06
Selenium	8.34	3100	2.69E-03
Aroclor-1254	0.00409	5.5	7.44E-04
Dichlorobenzene[1,4-]	0.000215	39,000	5.51E-09
Toluene	0.000328	48,000	6.83E-09
Trichloroethene	0.000313	160	1.96E-06
		HI	**6E-02**

* SSLs from LANL (2017, 602581).

Table H-4.2-114
Recreational Radionuclide Screening Evaluation for SWMU 02-006(a)

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	13.4	370	9.05E-01
Plutonium-239/240	0.0626	1300	1.20E-03
Strontium-90	2.69	4900	1.37E-02
Tritium	0.456	5,700,000	2.00E-06
		Total Dose	**9E-01**

* SALs from LANL (2015, 600929).

Table H-4.2-115
Residential Carcinogenic Screening Evaluation for SWMU 02-006(a)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Arsenic	2.34	7.07	3.31E-06
Chromium (Total)	6.93	96.6	7.17E-07
Chromium hexavalent ion	0.0523	3.05	1.71E-07
Nickel	5.1	595,000	8.57E-11
Aroclor-1242	0.0043	2.43	1.77E-08
Aroclor-1254	0.00285	2.43	1.17E-08
Aroclor-1260	0.0028	2.43	1.15E-08
Dichlorobenzene[1,4-]	0.000215	1290	1.67E-12
Trichloroethene	0.000313	15.4	2.03E-10
		Total Excess Cancer Risk	**4E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-116
Residential Noncarcinogenic Screening Evaluation for SWMU 02-006(a)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Antimony	0.359	31.3	1.15E-02
Arsenic	2.34	13	1.80E-01
Barium	72.2	15,600	4.63E-03
Chromium (Total)	6.93	45,200	1.53E-04
Chromium hexavalent ion	0.0523	235	2.23E-04
Copper	4.05	3130	1.29E-03
Cyanide (Total)	0.319	11.1	2.87E-02
Lead	17.2	400	4.30E-02
Nickel	5.1	1560	3.27E-03
Perchlorate	0.00268	54.8	4.89E-05
Selenium	5.5	391	1.41E-02
Aroclor-1254	0.00285	1.14	2.50E-03
Dichlorobenzene[1,4-]	0.000215	5480	3.92E-08
Toluene	0.000328	5220	6.28E-08
Trichloroethene	0.000313	6.72	4.66E-05
		HI	**3E-01**

* SSLs from NMED (2017, 602273).

Table H-4.2-117
Residential Radionuclide Screening Evaluation for SWMU 02-006(a)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	5.15	12	1.07E+01
Plutonium-239/240	0.0626	79	1.98E-02
Strontium-90	0.148	15	2.47E-01
Tritium	11.9	1700	1.75E-01
Uranium-235/236	0.0225	42	1.34E-02
		Total Dose	**1.1E+01**

* SALs from LANL (2015, 600929).

Table H-4.2-118
Industrial Carcinogenic Screening Evaluation for SWMU 02-006(b)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Cadmium	0.657	417,000	1.58E-11
Aroclor-1254	0.0782	11	7.11E-08
Aroclor-1260	0.393	11.1	3.54E-07
Benzo(a)anthracene	0.501	32.3	1.55E-07
Benzo(a)pyrene	0.869	23.6	3.68E-07
Benzo(b)fluoranthene	1.13	32.3	3.50E-07
Benzo(k)fluoranthene	0.0788	323	2.44E-09
Chrysene	0.543	3230	1.68E-09
Indeno(1,2,3-cd)pyrene	0.324	32.3	1.00E-07
		Total Excess Cancer Risk	**1E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-119
Industrial Noncarcinogenic Screening Evaluation for SWMU 02-006(b)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Cadmium	0.657	1110	5.92E-04
Lead	15	800	1.88E-02
Mercury	1.55	389	3.98E-03
Nitrate	1.41	2,080,000	6.78E-07
Perchlorate	0.00135	908	1.49E-06
Selenium	0.911	6490	1.40E-04
Silver	0.629	6490	9.69E-05
Zinc	66.1	389,000	1.70E-04
Acenaphthene	0.191	50,500	3.78E-06
Anthracene	0.48	253,000	1.90E-06
Aroclor-1254	0.0782	16.4	4.77E-03
Benzo(g,h,i)perylene	0.229	25,300[b]	9.05E-06
Carbon Disulfide	0.004	8470	4.72E-07
Di-n-butylphthalate	0.0356	91,600	3.89E-07
Dibenzofuran	0.231	1000[c]	2.31E-04
Diethylphthalate	0.37	733,000	5.05E-07
Fluoranthene	1.07	33,700	3.18E-05
Fluorene	0.165	33,700	4.90E-06
Methylnaphthalene[2-]	0.0988	3370	2.93E-05
Naphthalene	0.229	16,800	1.36E-05
Phenanthrene	1.33	25,300	5.26E-05
Pyrene	1.19	25,300	4.70E-05
Styrene	0.037	50,900	7.27E-07
Trichlorofluoromethane	0.002	5980	3.34E-07
		HI	**3E-02**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSL are from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables).

Table H-4.2-120
Industrial Radionuclide Screening Evaluation for SWMU 02-006(b)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Plutonium-239/240	2.11	1200	4.40E-02
Tritium	0.0478	2,400,000	4.98E-07
Uranium-234	3.1	3100	2.50E-02
		Total Dose	**7E-02**

* SALs from LANL (2015, 600929).

Table H-4.2-121
Recreational Carcinogenic Screening Evaluation for SWMU 02-006(b)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Cadmium	0.657	4,300,000	1.53E-12
Aroclor-1254	0.0782	10	7.82E-08
Aroclor-1260	0.393	10	3.93E-07
Benzo(a)anthracene	0.501	89	5.63E-08
Benzo(a)pyrene	0.869	8.9	9.76E-07
Benzo(b)fluoranthene	1.13	89	1.27E-07
Benzo(k)fluoranthene	0.0788	890	8.85E-10
Chrysene	0.543	8900	6.10E-10
Indeno(1,2,3-cd)pyrene	0.324	89	3.64E-08
Naphthalene	0.229	1900	1.21E-09
		Total Excess Cancer Risk	**2E-06**

* SSLs from LANL (2017, 602581).

Table H-4.2-122
Recreational Noncarcinogenic Screening Evaluation for SWMU 02-006(b)

COPC	EPC (mg/kg)	Recreational SSL[a] (mg/kg)	HQ
Cadmium	0.657	460	1.43E-03
Lead	15	1110	1.35E-02
Mercury	1.55	190	8.16E-03
Nitrate	1.41	990,000	1.42E-06
Perchlorate	0.00135	430	3.14E-06
Selenium	0.911	3100	2.94E-04
Silver	0.629	3100	2.03E-04
Zinc	66.1	190,000	3.48E-04
Acenaphthene	0.191	17,000	1.12E-05
Anthracene	0.48	86,000	5.58E-06
Aroclor-1254	0.0782	5.5	1.42E-02
Benzo(g,h,i)perylene	0.229	8600[b]	2.66E-05
Carbon Disulfide	0.004	34,000	1.18E-07
Di-n-butylphthalate	0.0356	33,000	1.08E-06
Dibenzofuran	0.231	490	4.71E-04
Diethylphthalate	0.37	260,000	1.42E-06
Fluoranthene	1.07	12,000	8.92E-05
Fluorene	0.165	12,000	1.38E-05

Table H-4.2-122 (continued)

COPC	EPC (mg/kg)	Recreational SSL[a] (mg/kg)	HQ
Methylnaphthalene[2-]	0.0988	1200	8.23E-05
Naphthalene	0.229	3200	7.16E-05
Phenanthrene	1.33	8600	1.55E-04
Pyrene	1.19	8600	1.38E-04
Styrene	0.037	100,000	3.70E-07
Trichlorofluoromethane	0.002	40,000	5.00E-08
		HI	**4E-02**

[a] SSLs from LANL (2017, 602581).

[b] Pyrene used as a surrogate based on structural similarity.

Table H-4.2-123
Recreational Radionuclide Screening Evaluation for SWMU 02-006(b)

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Dose (mrem/yr)
Plutonium-239/240	2.11	1300	4.06E-02
Tritium	0.0478	5,700,000	2.10E-07
Uranium-234	3.1	3900	1.99E-02
		Total Dose	**6E-02**

* SALs from LANL (2015, 600929).

Table H-4.2-124
Residential Carcinogenic Screening Evaluation for SWMU 02-006(b)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Arsenic	2	7.07	2.83E-06
Cadmium	0.381	85,900	4.44E-11
Chromium (Total)	10.5	96.6	1.09E-06
Chromium hexavalent ion	0.158	3.05	5.18E-07
Nickel	3.24	595,000	5.45E-11
Aroclor-1248	0.0287	2.43	1.18E-07
Aroclor-1254	0.0248	2.43	1.02E-07
Aroclor-1260	0.166	2.43	6.83E-07
Benzo(a)anthracene	0.283	1.53	1.85E-06
Benzo(a)pyrene	0.335	1.12	2.99E-06
Benzo(b)fluoranthene	0.419	1.53	2.74E-06
Benzo(k)fluoranthene	0.0859	15.3	5.61E-08
Bis(2-ethylhexyl)phthalate	0.109	380	2.87E-09

Table H-4.2-124 (continued)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Chrysene	0.288	153	1.88E-08
Dibenz(a,h)anthracene	0.194	0.15	1.29E-05
Dichlorobenzene[1,4-]	0.000282	1290	2.19E-12
Ethylbenzene	0.000276	74.5	3.70E-11
Indeno(1,2,3-cd)pyrene	0.148	1.53	9.67E-07
Methylene Chloride	0.003	766	3.92E-11
Trichloroethene	0.000265	15.4	1.72E-10
		Total Excess Cancer Risk	**3E-05**

* SSLs from NMED (2017, 602273).

Table H-4.2-125
Residential Noncarcinogenic Screening Evaluation for SWMU 02-006(b)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Aluminum	4000	78,000	5.13E-02
Arsenic	2	13	1.54E-01
Barium	46.8	15,600	3.00E-03
Cadmium	0.381	70.5	5.40E-03
Chromium (Total)	10.5	45,200	2.32E-04
Chromium hexavalent ion	0.158	235	6.72E-04
Copper	6.14	3130	1.96E-03
Iron	8740	54,800	1.59E-01
Lead	420	400	1.05E+00
Manganese	287	10,500	2.73E-02
Mercury	0.976	23.5	4.15E-02
Nickel	3.24	1560	2.08E-03
Nitrate	3.86	125,000	3.09E-05
Perchlorate	0.00164	54.8	2.99E-05
Selenium	1.04	391	2.66E-03
Silver	0.213	391	5.45E-04
Vanadium	10.4	394	2.64E-02
Zinc	47.8	23,500	2.03E-03
Acenaphthene	0.111	3480	3.19E-05
Acetone	0.00434	66,300	6.55E-08
Anthracene	0.175	17,400	1.01E-05
Aroclor-1254	0.0248	1.14	2.18E-02

Table H-4.2-125 (continued)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Benzo(g,h,i)perylene	0.144	1740[b]	8.28E-05
Bis(2-ethylhexyl)phthalate	0.109	1230	8.86E-05
Carbon Disulfide	0.004	1540	2.60E-06
Di-n-butylphthalate	0.155	6160	2.52E-05
Dibenzofuran	0.204	73[c]	2.79E-03
Dichlorobenzene[1,4-]	0.000282	5480	5.15E-08
Diethylphthalate	0.37	49,300	7.51E-06
Ethylbenzene	0.000276	3920	7.04E-08
Fluoranthene	0.591	2320	2.55E-04
Fluorene	0.0994	2320	4.28E-05
Isopropyltoluene[4-]	0.000507	2360[d]	2.15E-07
Methyl-2-pentanone[4-]	0.01	5810	1.72E-06
Methylene Chloride	0.003	409	7.33E-06
Methylnaphthalene[2-]	0.0663	232	2.86E-04
Naphthalene	0.15	1160	1.29E-04
Phenanthrene	0.526	1740	3.02E-04
Pyrene	0.591	1740	3.40E-04
Styrene	0.037	7230	5.12E-06
Toluene	0.000433	5220	8.30E-08
Trichloroethene	0.000265	6.72	3.94E-05
Trichlorofluoromethane	0.002	1220	1.64E-06
Trimethylbenzene[1,2,4-]	0.000494	300[c]	1.65E-06
Trimethylbenzene[1,3,5-]	0.000234	270[c]	8.67E-07
Xylene[1,2-]	0.000493	798	6.18E-07
Xylene[1,3-]+Xylene[1,4-]	0.000469	863[e]	5.43E-07
		HI	**2E+00**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSL from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables).

[d] Isopropyl benzene used as a surrogate based on structural similarity.

[e] Xylenes used as a surrogate based on structural similarity.

Table H-4.2-126
Residential Radionuclide Screening Evaluation for SWMU 02-006(b)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	0.309	12	6.44E-01
Plutonium-239/240	2.11	79	6.68E-01
Strontium-90	0.0265	15	4.42E-02
Tritium	0.229	1700	3.37E-03
Uranium-234	1.46	290	1.26E-01
		Total Dose	**1E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-127
Industrial TPH Screening Evaluation for SWMU 02-006(b)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Total Petroleum Hydrocarbons Diesel Range Organics	66.7	3000	2.22E-02
		TPH	**2E-02**

* SSLs from NMED (2017, 602273).

Table H-4.2-128
Residential TPH Screening Evaluation for SWMU 02-006(b)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Total Petroleum Hydrocarbons Diesel Range Organics	31.4	1000	3.14E-02
		TPH	**3E-02**

* SSLs from NMED (2017, 602273).

Table H-4.2-129
Construction Worker Noncarcinogenic Screening Evaluation for SWMU 02-006(b)

COPC	EPC (pCi/g)	Construction Worker SSL[a] (pCi/g)	HQ (mrem/yr)
Aluminum	4000	41,400	9.66E-02
Arsenic	2	41.2	4.85E-02
Barium	46.8	4390	1.07E-02
Cadmium	0.381	72.1	5.28E-03
Chromium (Total)	10.5	134	7.84E-02
Chromium hexavalent ion	0.158	498	3.17E-04
Copper	6.14	14,200	4.32E-04
Iron	8740	248,000	3.52E-02
Lead	420	800	5.25E-01
Manganese	287	464	6.19E-01
Mercury	0.976	77.1	1.27E-02
Nickel	3.24	753	4.30E-03
Nitrate	3.86	566,000	6.82E-06
Perchlorate	0.00164	248	6.61E-06
Selenium	1.04	1750	5.94E-04
Silver	0.213	1770	1.20E-04
Vanadium	10.4	614	1.69E-02
Zinc	47.8	106,000	4.51E-04
Acenaphthene	0.111	15,100	7.35E-06
Acetone	0.00434	241,000	1.80E-08
Anthracene	0.175	75,300	2.32E-06
Aroclor-1254	0.0248	4.91	5.05E-03
Benzo(a)pyrene	0.335	106	3.16E-03
Benzo(g,h,i)perylene	0.144	7530[b]	1.91E-05
Bis(2-ethylhexyl)phthalate	0.109	5380	2.03E-05
Carbon Disulfide	0.004	1610	2.48E-06
Di-n-butylphthalate	0.155	26900	1.51E-06
Dibenzofuran	0.204	354[c]	5.76E-04
Dichlorobenzene[1,4-]	0.000282	24,800	1.14E-08
Diethylphthalate	0.37	215,000	1.72E-06
Ethylbenzene	0.000276	5750	4.80E-08
Fluoranthene	0.591	10,000	5.91E-05
Fluorene	0.0994	10,000	9.94E-06
Isopropyltoluene[4-]	0.000507	2740[d]	1.85E-07
Methyl-2-pentanone[4-]	0.01	20,200	4.95E-07
Methylene Chloride	0.003	1200	2.50E-06
Methylnaphthalene[2-]	0.0663	1000	6.63E-05

Table H-4.2-129 (continued)

COPC	EPC (pCi/g)	Construction Worker SSL[a] (pCi/g)	HQ (mrem/yr)
Naphthalene	0.15	5020	2.99E-05
Phenanthrene	0.526	7530	6.99E-05
Pyrene	0.591	7530	7.85E-05
Styrene	0.037	10,100	3.66E-06
Toluene	0.000433	14,000	3.09E-08
Trichloroethene	0.000265	6.84	3.87E-05
Trichlorofluoromethane	0.002	1120	1.79E-06
Trimethylbenzene[1,2,4-]	0.000494	329[b]	1.50E-06
Trimethylbenzene[1,3,5-]	0.000234	3100[b]	7.55E-08
Xylene[1,2-]	0.000493	729	6.76E-07
Xylene[1,3-]+Xylene[1,4-]	0.000469	791[e]	5.93E-07
		HI	**1**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] Construction worker SSL calculated using toxicity value from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables) and equation and parameters from NMED (2017, 602273).

[d] Isopropyl benzene used as a surrogate based on structural similarity.

[e] Xylenes used as a surrogate based on structural similarity.

Table H-4.2-130
Industrial Carcinogenic Screening Evaluation for AOC 02-006(c)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Cadmium	0.37	417,000	8.87E-12
Chromium hexavalent ion	0.0733	72.1	1.02E-08
Aroclor-1254	0.118	11	1.07E-07
Aroclor-1260	0.169	11.1	1.52E-07
		Total Excess Cancer Risk	**3E-07**

* SSLs from NMED (2017, 602273).

Table H-4.2-131
Industrial Noncarcinogenic Screening Evaluation for AOC 02-006(c)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Cadmium	0.37	1110	3.33E-04
Chromium hexavalent ion	0.0733	3890	1.88E-05
Copper	15	51,900	2.89E-04
Mercury	1.36	389	3.50E-03
Nitrate	3.59	2,080,000	1.73E-06
Perchlorate	0.00242	908	2.67E-06
Selenium	1.12	6490	1.73E-04
Zinc	59.7	389,000	1.53E-04
Aroclor-1254	0.118	16.4	7.20E-03
		HI	**1E-02**

* SSLs from NMED (2017, 602273).

Table H-4.2-132
Industrial Radionuclide Screening Evaluation for AOC 02-006(c)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	16.9	41	1.03E+01
Plutonium-239/240	0.112	1200	2.33E-03
Strontium-90	3.86	2400	4.02E-02
Tritium	0.0162	2,400,000	1.69E-07
		Total Dose	**1E+01**

* SALs from LANL (2015, 600929).

Table H-4.2-133
Recreational Carcinogenic Screening Evaluation for AOC 02-006(c)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Cadmium	0.37	4,300,000	8.60E-13
Chromium hexavalent ion	0.0733	40	1.83E-08
Aroclor-1254	0.118	10	1.18E-07
Aroclor-1260	0.169	10	1.69E-07
		Total Excess Cancer Risk	**3E-07**

* SSLs from LANL (2017, 602581).

Table H-4.2-134
Recreational Noncarcinogenic Screening Evaluation for AOC 02-006(c)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	HQ
Cadmium	0.37	460	8.04E-04
Chromium hexavalent ion	0.0733	1900	3.86E-05
Copper	15	25,000	6.00E-04
Mercury	1.36	190	7.16E-03
Nitrate	3.59	990,000	3.63E-06
Perchlorate	0.00242	430	5.63E-06
Selenium	1.12	3100	3.61E-04
Zinc	59.7	190,000	3.14E-04
Aroclor-1254	0.118	5.5	2.15E-02
		HI	**3E-02**

* SSLs from LANL (2017, 602581).

Table H-4.2-135
Recreational Radionuclide Screening Evaluation for AOC 02-006(c)

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	16.9	370	1.14E+00
Plutonium-239/240	0.112	1300	2.15E-03
Strontium-90	3.86	4900	1.97E-02
Tritium	0.0162	5,700,000	7.11E-08
		Total Dose	**1E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-136
Residential Carcinogenic Screening Evaluation for AOC 02-006(c)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Cadmium	0.283	85,900	3.29E-11
Chromium (Total)	16.5	96.6	1.71E-06
Chromium hexavalent ion	0.214	3.05	7.02E-07
Aroclor-1242	0.0128	2.43	5.27E-08
Aroclor-1254	0.118	2.43	4.86E-07
Aroclor-1260	0.0423	2.43	1.74E-07
Methylene Chloride	0.0023	766	3.00E-11
		Total Excess Cancer Risk	**3E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-137
Residential Noncarcinogenic Screening Evaluation for AOC 02-006(c)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Antimony	1.09(U)	31.3	3.48E-02
Cadmium	0.283	70.5	4.01E-03
Chromium (Total)	16.5	45,200	3.65E-04
Chromium hexavalent ion	0.214	235	9.11E-04
Copper	6.22	3130	1.99E-03
Mercury	0.607	23.5	2.58E-02
Nitrate	2.87	125,000	2.30E-05
Perchlorate	0.00242	54.8	4.42E-05
Selenium	1.2	391	3.07E-03
Zinc	48.1	23,500	2.05E-03
Aroclor-1254	0.118	1.14	1.04E-01
Di-n-butylphthalate	0.0522	6160	8.47E-06
Methylene Chloride	0.0023	409	5.62E-06
Toluene	0.00037	5220	7.09E-08
		HI	**2E-01**

* SSLs from NMED (2017, 602273).

Table H-4.2-138
Residential Radionuclide Screening Evaluation for AOC 02-006(c)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	4.77	12	9.94E+00
Plutonium-239/240	0.112	79	3.54E-02
Strontium-90	3.86	15	6.43E+00
Tritium	0.204	1700	3.00E-03
		Total Dose	**2E+01**

* SALs from LANL (2015, 600929).

Table H-4.2-139
Industrial TPH Screening Evaluation for AOC 02-006(c)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Total Petroleum Hydrocarbons Diesel Range Organics	13.9	3000	4.63E-03
		TPH	**5E-03**

* SSLs from NMED (2017, 602273).

Table H-4.2-140
Residential TPH Screening Evaluation for AOC 02-006(c)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Total Petroleum Hydrocarbons Diesel Range Organics	537	1000	5.37E-01
		TPH	**5E-01**

* SSLs from NMED (2017, 602273).

Table H-4.2-141
Industrial Carcinogenic Screening Evaluation for AOC 02-006(e)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Cadmium	0.258	417,000	6.19E-12
Chromium (Total)	24.7	505	4.89E-07
Chromium hexavalent ion	0.117	72.1	1.62E-08
Aroclor-1242	0.0627	10.9	5.75E-08
Aroclor-1248	0.408	10.7	3.81E-07
Aroclor-1254	0.358	11	3.25E-07
Aroclor-1260	0.063	11.1	5.68E-08
Bis(2-ethylhexyl)phthalate	0.0822	1830	4.49E-10
		Total Excess Cancer Risk	**1E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-142
Industrial Noncarcinogenic Screening Evaluation for AOC 02-006(e)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Cadmium	0.258	1110	2.32E-04
Chromium (Total)	24.7	314,000	7.87E-05
Chromium hexavalent ion	0.117	3890	3.01E-05
Copper	7.01	51,900	1.35E-04
Lead	53.4	800	6.68E-02
Mercury	2.15	389	5.53E-03
Perchlorate	0.000772	908	8.50E-07
Selenium	1.15	6490	1.77E-04
Zinc	164	389,000	4.22E-04
Aroclor-1254	0.358	16.4	2.18E-02
Bis(2-ethylhexyl)phthalate	0.0822	18300	4.49E-06
Dibenzofuran	0.129	1000[b]	1.29E-04
		HI	**1E-01**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] SSL are from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables).

Table H-4.2-143
Industrial Radionuclide Screening Evaluation for AOC 02-006(e)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	1.03	41	6.28E-01
Cobalt-60	0.116	9	3.22E-01
Plutonium-239/240	0.915	1200	1.91E-02
Tritium	0.0841	2,400,000	8.76E-07
		Total Dose	**1E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-144
Recreational Carcinogenic Screening Evaluation for AOC 02-006(e)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Cadmium	0.258	4,300,000	6.00E-13
Chromium (Total)	24.7	280	8.82E-07
Chromium hexavalent ion	0.117	40	2.93E-08
Aroclor-1242	0.0627	10	6.27E-08
Aroclor-1248	0.408	10	4.08E-07
Aroclor-1254	0.358	10	3.58E-07
Aroclor-1260	0.063	10	6.30E-08
Bis(2-ethylhexyl)phthalate	0.0822	1800	4.57E-10
		Total Excess Cancer Risk	**2E-06**

* SSLs from LANL (2017, 602581).

Table H-4.2-145
Recreational Noncarcinogenic Screening Evaluation for AOC 02-006(e)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	HQ
Cadmium	0.258	460	5.61E-04
Chromium (Total)	24.7	670,000	3.69E-05
Chromium hexavalent ion	0.117	1900	6.16E-05
Copper	7.01	25,000	2.80E-04
Lead	53.4	1110	4.81E-02
Mercury	2.15	190	1.13E-02
Perchlorate	0.000772	430	1.80E-06
Selenium	1.15	3100	3.71E-04
Zinc	164	190,000	8.63E-04
Aroclor-1254	0.358	5.5	6.51E-02
Bis(2-ethylhexyl)phthalate	0.0822	6600	1.25E-05
Dibenzofuran	0.129	490	2.63E-04
		HI	**1E-01**

* SSLs from LANL (2017, 602581).

Table H-4.2-146
Recreational Radionuclide Screening Evaluation for AOC 02-006(e)

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	1.03	370	6.96E-02
Cobalt-60	0.116	81	3.58E-02
Plutonium-239/240	0.915	1300	1.76E-02
Tritium	0.0841	5,700,000	3.69E-07
		Total Dose	**1E-01**

* SALs from LANL (2015, 600929).

Table H-4.2-147
Residential Carcinogenic Screening Evaluation for AOC 02-006(e)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Arsenic	2.64	7.07	3.73E-06
Cadmium	0.272	85,900	3.17E-11
Chromium (Total)	24.2	96.6	2.51E-06
Chromium hexavalent ion	0.236	3.05	7.74E-07
Nickel	6.04	595,000	1.02E-10
Aroclor-1242	0.0627	2.43	2.58E-07
Aroclor-1248	0.408	2.43	1.68E-06
Aroclor-1254	0.242	2.43	9.96E-07
Aroclor-1260	0.053	2.43	2.18E-07
Bis(2-ethylhexyl)phthalate	0.0822	380	2.16E-09
Chloroform	0.000279	5.85	4.77E-10
Dichlorobenzene[1,4-]	0.000322	1290	2.50E-12
Methylene Chloride	0.00224	766	2.92E-11
		Total Excess Cancer Risk	**1E-05**

* SSLs from NMED (2017, 602273).

Table H-4.2-148
Residential Noncarcinogenic Screening Evaluation for AOC 02-006(e)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	1.03(U)	31.3	3.29E-02
Arsenic	2.64	13	2.03E-01
Cadmium	0.272	70.5	3.86E-03
Chromium (Total)	24.2	45,200	5.35E-04
Chromium hexavalent ion	0.236	235	1.00E-03
Copper	5.95	3130	1.90E-03
Iron	8700	54,800	1.59E-01
Lead	24.1	400	6.03E-02
Mercury	1.65	23.5	7.02E-02
Nickel	6.04	1560	3.87E-03
Perchlorate	0.000748	54.8	1.36E-05
Selenium	0.893	391	2.28E-03
Vanadium	11.4	394	2.89E-02
Zinc	62.7	23,500	2.67E-03
Aroclor-1254	0.242	1.14	2.12E-01
Bis(2-ethylhexyl)phthalate	0.0822	1230	6.68E-05
Chloroform	0.000279	304	9.18E-07
Dibenzofuran	0.13	73[b]	1.78E-03
Dichlorobenzene[1,4-]	0.000322	5480	5.88E-08
Isopropylbenzene	0.000433	2350	1.84E-07
Methylene Chloride	0.00224	409	5.48E-06
Toluene	0.000522	5220	1.00E-07
Xylene[1,3-]+Xylene[1,4-]	0.000282	863[c]	3.27E-07
		HI	**8E-01**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] SSL are from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables).

[c] Xylenes used as surrogate based on structural similarity.

Table H-4.2-149
Residential Radionuclide Screening Evaluation for AOC 02-006(e)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	0.259	12	5.40E-01
Cobalt-60	0.134	2.6	1.29E+00
Plutonium-239/240	0.355	79	1.12E-01
Tritium	0.222	1700	3.26E-03
		Total Dose	**2E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-150
Industrial Carcinogenic Screening Evaluation for SWMU 02-007

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor-1254	1.63	11	1.48E-06
Aroclor-1260	0.859	11.1	7.74E-07
Benzo(a)anthracene	0.0155	32.3	4.80E-09
Benzo(a)pyrene	0.0119	23.6	5.04E-09
Benzo(b)fluoranthene	0.0136	32.3	4.21E-09
		Total Excess Cancer Risk	**2E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-151
Industrial Noncarcinogenic Screening Evaluation for SWMU 02-007

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Nitrate	1.94	2,080,000	9.33E-07
Perchlorate	0.000997	908	1.10E-06
Aroclor-1254	1.63	16.4	9.94E-02
Fluoranthene	0.0238	33,700	7.06E-07
Phenanthrene	0.0131	25,300	5.18E-07
Pyrene	0.02	25,300	7.91E-07
		HI	**1E-01**

* SSLs from NMED (2017, 602273).

Table H-4.2-152
Industrial Radionuclide Screening Evaluation for SWMU 02-007

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Plutonium-239/240	0.0626	1200	1.30E-03
Strontium-90	1.41	2400	1.47E-02
Tritium	0.0169	2,400,000	1.76E-07
		Total Dose	**2E-02**

* SALs from LANL (2015, 600929).

Table H-4.2-153
Recreational Carcinogenic Screening Evaluation for SWMU 02-007

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Aroclor-1254	1.63	10	1.63E-06
Aroclor-1260	0.859	10	8.59E-07
Benzo(a)anthracene	0.0155	89	1.74E-09
Benzo(a)pyrene	0.0119	8.9	1.34E-08
Benzo(b)fluoranthene	0.0136	89	1.53E-09
		Total Excess Cancer Risk	**3E-06**

* SSLs from LANL (2017, 602581).

Table H-4.2-154
Recreational Noncarcinogenic Screening Evaluation for SWMU 02-007

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	HQ
Nitrate	1.94	990,000	1.96E-06
Perchlorate	0.000997	430	2.32E-06
Aroclor-1254	1.63	5.5	2.96E-01
Fluoranthene	0.0238	12,000	1.98E-06
Phenanthrene	0.0131	8600	1.52E-06
Pyrene	0.02	8600	2.33E-06
		HI	**3E-01**

* SSLs from LANL (2017, 602581).

Table H-4.2-155
Recreational Radionuclide Screening Evaluation for SWMU 02-007

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Dose (mrem/yr)
Plutonium-239/240	0.0626	1300	1.20E-03
Strontium-90	1.41	4900	7.19E-03
Tritium	0.0169	2,400,000	7.41E-08
		Total Dose	**8E-03**

* SALs from LANL (2015, 600929).

Table H-4.2-156
Residential Carcinogenic Screening Evaluation for SWMU 02-007

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Cancer Risk
Aroclor-1254	0.349	2.43	1.44E-06
Aroclor-1260	0.194	2.43	7.98E-07
Benzo(a)anthracene	0.102	1.53	6.67E-07
Benzo(a)pyrene	0.183	1.12	1.63E-06
Benzo(b)fluoranthene	0.163	1.53	1.07E-06
Butylbenzylphthalate	0.254	2900[b]	8.76E-10
Chrysene	0.109	153	7.12E-09
Indeno(1,2,3-cd)pyrene	0.108	1.53	7.06E-07
		Total Excess Cancer Risk	**6E-06**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] SSL are from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables).

Table H-4.2-157
Residential Noncarcinogenic Screening Evaluation for SWMU 02-007

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Cyanide (Total)	0.253	11.1	2.28E-02
Mercury	1.01	23.5	4.30E-02
Nitrate	1.26	125,000	1.01E-05
Perchlorate	0.00164	54.8	2.99E-05
Selenium	1.19	391	3.04E-03
Acenaphthene	0.0443	3480	1.27E-05
Anthracene	0.079	17,400	4.54E-06
Aroclor-1254	0.349	1.14	3.06E-01
Benzo(g,h,i)perylene	0.101	1740[b]	5.80E-05
Fluoranthene	0.0572	2320	2.47E-05
Fluorene	0.0471	2320	2.03E-05
Methylnaphthalene[2-]	0.0281	232	1.21E-04
Naphthalene	0.0755	1160	6.51E-05
Phenanthrene	0.233	1740	1.34E-04
Pyrene	0.18	1740	1.03E-04
Toluene	0.000311	5220	5.96E-08
		HI	**4E-01**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] Pyrene used as surrogate based on structural similarity.

Table H-4.2-158
Residential Radionuclide Screening Evaluation for SWMU 02-007

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	1.56	12	3.25E+00
Plutonium-239/240	0.0626	79	1.98E-02
Strontium-90	1.41	15	2.35E+00
Tritium	0.073	1700	1.07E-03
		Total Dose	**6E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-159
Industrial Carcinogenic Screening Evaluation for SWMU 02-008(a)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Chromium (Total)	37	505	7.33E-07
Chromium hexavalent ion	0.151	72.1	2.09E-08
Aroclor-1254	0.186	11	1.69E-07
Aroclor-1260	0.246	11.1	2.22E-07
Bis(2-ethylhexyl)phthalate	0.164	1830	8.96E-10
		Total Excess Cancer Risk	**1E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-160
Industrial Noncarcinogenic Screening Evaluation for SWMU 02-008(a)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Chromium (Total)	37	314,000	1.18E-04
Chromium hexavalent ion	0.151	3890	3.88E-05
Copper	13	51,900	2.50E-04
Cyanide (Total)	0.723	62.8	1.15E-02
Selenium	0.282	6490	4.35E-05
Zinc	68	389,000	1.75E-04
Aroclor-1254	0.186	16.4	1.13E-02
Bis(2-ethylhexyl)phthalate	0.164	18,300	8.96E-06
		HI	**2E-02**

* SSLs from NMED (2017, 602273).

Table H-4.2-161
Industrial Radionuclide Screening Evaluation for SWMU 02-008(a)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Plutonium-239/240	1.87	1200	3.90E-02
Tritium	0.257	2,400,000	2.68E-06
		Total Dose	**4E-02**

* SALs from LANL (2015, 600929).

Table H-4.2-162
Recreational Carcinogenic Screening Evaluation for SWMU 02-008(a)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Chromium (Total)	37	280	1.32E-06
Chromium hexavalent ion	0.151	40	3.78E-08
Aroclor-1254	0.186	10	1.86E-07
Aroclor-1260	0.246	10	2.46E-07
Bis(2-ethylhexyl)phthalate	0.164	1800	9.11E-10
		Total Excess Cancer Risk	**2E-06**

* SSLs from LANL (2017, 602581).

Table H-4.2-163
Recreational Noncarcinogenic Screening Evaluation for SWMU 02-008(a)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	HQ
Chromium (Total)	37	670,000	5.52E-05
Chromium hexavalent ion	0.151	1900	7.95E-05
Copper	13	25,000	5.20E-04
Cyanide (Total)	0.723	220	3.29E-03
Selenium	0.282	3100	9.10E-05
Zinc	68	190,000	3.58E-04
Aroclor-1254	0.186	5.5	3.38E-02
Bis(2-ethylhexyl)phthalate	0.164	6600	2.48E-05
		HI	**4E-02**

* SSLs from LANL (2017, 602581).

Table H-4.2-164
Recreational Radionuclide Screening Evaluation for SWMU 02-008(a)

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Dose (mrem/yr)
Plutonium-239/240	1.87	1300	3.60E-02
Tritium	0.257	5,700,000	1.13E-06
		Total Dose	**4E-02**

* SALs from LANL (2015, 600929).

Table H-4.2-165
Residential Carcinogenic Screening Evaluation for SWMU 02-008(a)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Arsenic	2.45	7.07	3.47E-06
Chromium (Total)	40.2	96.6	4.16E-06
Chromium hexavalent ion	1.12	3.05	3.67E-06
Aroclor-1254	0.0691	2.43	2.84E-07
Aroclor-1260	0.168	2.43	6.91E-07
Bis(2-ethylhexyl)phthalate	0.164	380	4.32E-09
Methylene Chloride	0.00385	766	5.03E-11
		Total Excess Cancer Risk	**1E-05**

* SSLs from NMED (2017, 602273).

Table H-4.2-166
Residential Noncarcinogenic Screening Evaluation for SWMU 02-008(a)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Aluminum	4170	78,000	5.35E-02
Arsenic	2.45	13	1.88E-01
Chromium (Total)	40.2	45,200	8.89E-04
Chromium hexavalent ion	1.12	235	4.77E-03
Copper	99.3	3130	3.17E-02
Cyanide (Total)	0.723	11.1	6.51E-02
Iron	9470	54,800	1.73E-01
Manganese	330	10,500	3.14E-02
Selenium	5.33	391	1.36E-02
Zinc	55.4	23,500	2.36E-03
Aroclor-1254	0.0691	1.14	6.06E-02
Bis(2-ethylhexyl)phthalate	0.164	1230	1.33E-04
Methylene Chloride	0.00385	409	9.41E-06
Styrene	0.00589	7230	8.15E-07
Toluene	0.000665	5220	1.27E-07
HI			6E-01

* SSLs from NMED (2017, 602273).

Table H-4.2-167
Residential Radionuclide Screening Evaluation for SWMU 02-008(a)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	0.186	12	3.88E-01
Plutonium-239/240	0.599	79	1.90E-01
Tritium	0.0635	1700	9.34E-04
		Total Dose	**6E-01**

* SALs from LANL (2015, 600929).

Table H-4.2-168
Construction Worker Noncarcinogenic Screening Evaluation for SWMU 02-008(a)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	HQ
Aluminum	4170	41400	1.01E-01
Arsenic	2.45	41.2	5.95E-02
Chromium (Total)	40.2	134	3.00E-01
Chromium hexavalent ion	1.12	498	2.21E-03
Copper	99.3	14,200	6.99E-03
Cyanide (Total)	0.723	12	6.03E-02
Iron	9470	248,000	3.82E-02
Manganese	330	464	7.11E-01
Selenium	5.33	1750	3.05E-03
Zinc	55.4	106,000	5.23E-04
Aroclor-1254	0.0691	4.91	1.41E-02
Bis(2-ethylhexyl)phthalate	0.164	5380	3.05E-05
Methylene Chloride	0.00385	1200	2.55E-06
Styrene	0.00589	10100	5.83E-07
Toluene	0.000665	14000	4.75E-08
HI			1

* SSLs from NMED (2017, 602273).

Table H-4.2-169
Industrial Carcinogenic Screening Evaluation for AOC 02-008(c)(i)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Cadmium	0.625(U)	417,000	1.50E-11
Aroclor-1260	0.0158	11.1	1.42E-08
		Total Excess Cancer Risk	**1E-08**

* SSLs from NMED (2017, 602273).

Table H-4.2-170
Industrial Noncarcinogenic Screening Evaluation for AOC 02-008(c)(i)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Cadmium	0.625(U)	1110	5.63E-04
Zinc	65.3	389,000	1.68E-04
		HI	**7E-04**

* SSLs from NMED (2017, 602273).

Table H-4.2-171
Industrial Radionuclide Screening Evaluation for AOC 02-008(c)(i)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Plutonium-239/240	0.556	1200	1.16E-02
		Total Dose	**1E-02**

* SALs from LANL (2015, 600929).

Table H-4.2-172
Recreational Carcinogenic Screening Evaluation for AOC 02-008(c)(i)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Cadmium	0.625(U)	4,300,000	1.45E-12
Aroclor-1260	0.0158	10	1.58E-08
		Total Excess Cancer Risk	**2E-08**

* SSLs from LANL (2017, 602581).

Table H-4.2-173
Recreational Noncarcinogenic Screening Evaluation for AOC 02-008(c)(i)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	HQ
Cadmium	0.625(U)	460	1.36E-03
Zinc	65.3	190,000	3.44E-04
		HI	**2E-03**

* SSLs from LANL (2017, 602581).

Table H-4.2-174
Recreational Radionuclide Screening Evaluation for AOC 02-008(c)(i)

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Dose (mrem/yr)
Plutonium-239/240	0.556	1300	1.07E-02
		Total Dose	**1E-02**

* SALs from LANL (2015, 600929).

Table H-4.2-175
Residential Carcinogenic Screening Evaluation for AOC 02-008(c)(i)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Cadmium	0.625(U)	85,900	7.28E-11
Aroclor-1260	0.0158	2.43	6.50E-08
		Total Excess Cancer Risk	**7E-08**

* SSLs from NMED (2017, 602273).

Table H-4.2-176
Residential Noncarcinogenic Screening Evaluation for AOC 02-008(c)(i)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Cadmium	0.625(U)	70.5	8.87E-03
Zinc	65.3	23,500	2.78E-03
		HI	**1E-02**

* SSLs from NMED (2017, 602273).

Table H-4.2-177
Residential Radionuclide Screening Evaluation for AOC 02-008(c)(i)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	1.37	12	2.85E+00
Plutonium-239/240	0.556	79	1.76E-01
		Total Dose	**3E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-178
Industrial Carcinogenic Screening Evaluation for AOC 02-008(c)(ii)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Cadmium	0.112	417,000	2.69E-12
Aroclor-1254	0.0788	11	7.16E-08
Aroclor-1260	0.0872	11.1	7.86E-08
		Total Excess Cancer Risk	**2E-07**

* SSLs from NMED (2017, 602273).

Table H-4.2-179
Industrial Noncarcinogenic Screening Evaluation for AOC 02-008(c)(ii)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Cadmium	0.112	1110	1.01E-04
Copper	22.5	51,900	4.34E-04
Mercury	3.46	389	8.89E-03
Perchlorate	0.00168	908	1.85E-06
Selenium	2.77	6490	4.27E-04
Silver	1.8	6490	2.77E-04
Vanadium	21	6530	3.22E-03
Aroclor-1254	0.0788	16.4	4.80E-03
		HI	**2E-02**

* SSLs from NMED (2017, 602273).

Table H-4.2-180
Industrial Radionuclide Screening Evaluation for AOC 02-008(c)(ii)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Plutonium-239/240	0.808	1200	1.68E-02
		Total Dose	**2E-02**

* SALs from LANL (2015, 600929).

Table H-4.2-181
Recreational Carcinogenic Screening Evaluation for AOC 02-008(c)(ii)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Cadmium	0.112	4,300,000	2.60E-13
Aroclor-1254	0.0788	10	7.88E-08
Aroclor-1260	0.0872	10	8.72E-08
		Total Excess Cancer Risk	**2E-07**

* SSLs from LANL (2017, 602581).

Table H-4.2-182
Recreational Noncarcinogenic Screening Evaluation for AOC 02-008(c)(ii)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	HQ
Cadmium	0.112	460	2.43E-04
Copper	22.5	25,000	9.00E-04
Mercury	3.46	190	1.82E-02
Perchlorate	0.00168	430	3.91E-06
Selenium	2.77	3100	8.94E-04
Silver	1.8	3100	5.81E-04
Vanadium	21	3100	6.77E-03
Aroclor-1254	0.0788	5.5	1.43E-02
		HI	**4E-02**

* SSLs from LANL (2017, 602581).

Table H-4.2-183
Recreational Radionuclide Screening Evaluation for AOC 02-008(c)(ii)

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Dose (mrem/yr)
Plutonium-239/240	0.808	1300	1.55E-02
		Total Dose	**2E-02**

* SALs from LANL (2015, 600929).

Table H-4.2-184
Residential Carcinogenic Screening Evaluation for AOC 02-008(c)(ii)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Cadmium	0.341	85,900	3.97E-11
Chromium (Total)	18.1	96.6	1.87E-06
Chromium hexavalent ion	0.191	3.05	6.26E-07
Aroclor-1254	0.0788	2.43	3.24E-07
Aroclor-1260	0.0872	2.43	3.59E-07
		Total Excess Cancer Risk	**3E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-185
Residential Noncarcinogenic Screening Evaluation for AOC 02-008(c)(ii)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	0.354	31.3	1.13E-02
Cadmium	0.341	70.5	4.84E-03
Chromium (Total)	18.1	45,200	4.00E-04
Chromium hexavalent ion	0.191	235	8.13E-04
Copper	15.4	3130	4.92E-03
Mercury	2.23	23.5	9.49E-02
Perchlorate	0.00168	54.8	3.07E-05
Selenium	1.97	391	5.04E-03
Silver	0.718	391	1.84E-03
Vanadium	12.9	394	3.27E-02
Zinc	56.5	23,500	2.40E-03
Aroclor-1254	0.0788	1.14	6.91E-02
Isopropyltoluene[4-]	0.0029	2360[b]	1.23E-06
Toluene	0.000516	5220	9.89E-08
		HI	**2E-01**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] Isopropylbenzene used as surrogate based on structural similarity.

Table H-4.2-186
Residential Radionuclide Screening Evaluation for AOC 02-008(c)(ii)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	0.576	12	1.20E+00
Plutonium-239/240	0.334	79	1.06E-01
Stontium-90	0.679	15	1.13E+00
		Total Dose	**2E-+00**

* SALs from LANL (2015, 600929).

Table H-4.2-187
Industrial Carcinogenic Screening Evaluation for SWMU 02-009(a)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	Cancer Risk
Cadmium	0.05	417,000	1.20E-12
Aroclor-1254	0.00311	11	2.83E-09
Aroclor-1260	0.00398	11.1	3.59E-09
Butylbenzylphthalate	0.281	12,000[b]	2.34E-10
Pentachlorophenol	0.257	44.5	5.78E-08
		Total Excess Cancer Risk	**6E-08**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] SSL are from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables).

Table H-4.2-188
Industrial Noncarcinogenic Screening Evaluation for SWMU 02-009(a)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Cadmium	0.05	1110	4.50E-05
Cyanide (Total)	0.286	62.8	4.55E-03
Iron	12800	908,000	1.41E-02
Mercury	0.12	389	3.08E-04
Perchlorate	0.00153	908	1.69E-06
Selenium	20.7	6490	3.19E-03
Aroclor-1254	0.00311	16.4	1.90E-04
Pentachlorophenol	0.257	3180	8.08E-05
		HI	**2E-02**

* SSLs from NMED (2017, 602273).

Table H-4.2-189
Industrial Radionuclide Screening Evaluation for SWMU 02-009(a)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	3.96	41	2.41E+00
Plutonium-239/240	0.0454	1200	9.46E-04
Tritium	0.0774	2,400,000	8.06E-07
		Total Dose	**2E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-190
Recreational Carcinogenic Screening Evaluation for SWMU 02-009(a)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Cadmium	0.05	4,300,000	1.16E-13
Aroclor-1254	0.00311	10	3.11E-09
Aroclor-1260	0.00398	10	3.98E-09
Butylbenzylphthalate	0.281	13,000	2.16E-10
Pentachlorophenol	0.257	35	7.34E-08
		Total Excess Cancer Risk	**8E-08**

* SSLs from LANL (2017, 602581).

Table H-4.2-191
Recreational Noncarcinogenic Screening Evaluation for SWMU 02-009(a)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	HQ
Cadmium	0.05	460	1.09E-04
Cyanide (Total)	0.286	220	1.30E-03
Iron	12,800	220	1.30E-03
Mercury	0.12	430,000	2.98E-02
Perchlorate	0.00153	190	6.32E-04
Selenium	20.7	430	3.56E-06
Aroclor-1254	0.00311	3100	6.68E-03
Butylbenzylphthalate	0.281	5.5	5.65E-04
Pentachlorophenol	0.257	66,000	4.26E-06
		HI	**4E-02**

* SSLs from LANL (2017, 602581).

Table H-4.2-192
Recreational Radionuclide Screening Evaluation for SWMU 02-009(a)

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	3.96	370	2.68E-01
Plutonium-239/240	0.0454	1300	8.73E-04
Tritium	0.0774	5,700,000	3.39E-07
		Total Dose	**3E-01**

* SALs from LANL (2015, 600929).

Table H-4.2-193
Residential Carcinogenic Screening Evaluation for SWMU 02-009(a)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Cancer Risk
Cadmium	0.07	85,900	8.15E-12
Aroclor-1248	0.0478	2.43	1.97E-07
Aroclor-1254	0.00272	2.43	1.12E-08
Aroclor-1260	0.00297	2.43	1.22E-08
Butylbenzylphthalate	0.281	2900[b]	9.69E-10
Chloroform	0.000268	5.85	4.58E-10
Chloromethane	0.00288	40.8	7.06E-10
Dichlorobenzene[1,4-]	0.000364	1290	2.82E-12
Pentachlorophenol	0.257	9.85	2.61E-07
		Total Excess Cancer Risk	**5E-07**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] SSL are from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables).

Table H-4.2-194
Residential Noncarcinogenic Screening Evaluation for SWMU 02-009(a)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	0.531	31.3	1.70E-02
Cadmium	0.07	70.5	9.93E-04
Cyanide (Total)	0.286	11.1	2.58E-02
Iron	9920	54,800	1.81E-01
Mercury	0.0471	23.5	2.00E-03
Perchlorate	0.0015	54.8	2.74E-05
Selenium	11.5	391	2.94E-02
Acetone	0.041	66,300	6.18E-07
Aroclor-1254	0.00272	1.14	2.39E-03
Chloroform	0.000268	304	8.82E-07
Chloromethane	0.00288	266	1.08E-05
Di-n-butylphthalate	0.0388	6160[b]	6.30E-06
Dichlorobenzene[1,4-]	0.000364	5480	6.64E-08
Isopropyltoluene[4-]	0.000519	2360[c]	2.20E-07
Pentachlorophenol	0.257	234	1.10E-03
Phenol	0.102	18,500	5.51E-06
Toluene	0.000649	5220	1.24E-07
Trimethylbenzene[1,2,4-]	0.000843	300[b]	2.81E-06
Trimethylbenzene[1,3,5-]	0.000535	270[b]	1.98E-06
Xylene[1,2-]	0.000648	798	8.12E-07
		HI	**3E-01**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] SSL are from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables).

[c] Isopropylbenzene used as surrogate based on structural similarity.

Table H-4.2-195
Residential Radionuclide Screening Evaluation for SWMU 02-009(a)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	1.74	12	3.63E+00
Plutonium-238	0.047	84	1.40E-02
Plutonium-239/240	0.298	79	9.43E-02
Strontium-90	0.876	15	1.46E+00
Tritium	0.0774	1700	1.14E-03
		Total Dose	**5E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-196
Industrial Carcinogenic Screening Evaluation for SWMU 02-009(b)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Cadmium	0.34	417,000	8.15E-12
Aroclor-1254	0.0334	11	3.04E-08
Aroclor-1260	0.11	11.1	9.91E-08
Bis(2-ethylhexyl)phthalate	0.0684	1830	3.74E-10
		Total Excess Cancer Risk	**1E-07**

* SSLs from NMED (2017, 602273).

Table H-4.2-197
Industrial Noncarcinogenic Screening Evaluation for SWMU 02-009(b)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Cadmium	0.34	1110	3.06E-04
Cyanide (Total)	0.107	62.8	1.70E-03
Mercury	0.805	389	2.07E-03
Perchlorate	0.0017	908	1.87E-06
Zinc	57.8	389,000	1.49E-04
Aroclor-1254	0.0334	16.4	2.04E-03
Bis(2-ethylhexyl)phthalate	0.0684	18,300	3.74E-06
Di-n-butylphthalate	0.0478	91,600	5.22E-07
		HI	**6E-03**

* SSLs from NMED (2017, 602273).

Table H-4.2-198
Industrial Radionuclide Screening Evaluation for SWMU 02-009(b)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	8.62	41	5.26E+00
Plutonium-239/240	0.189	1200	3.94E-03
Strontium-90	2.49	2400	2.59E-02
Tritium	0.00728	2,400,000	7.58E-08
		Total Dose	**5E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-199
Recreational Carcinogenic Screening Evaluation for SWMU 02-009(b)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Cadmium	0.34	4,300,000	7.91E-13
Aroclor-1254	0.0334	10	3.34E-08
Aroclor-1260	0.11	10	1.10E-07
Bis(2-ethylhexyl)phthalate	0.0684	1800	3.80E-10
		Total Excess Cancer Risk	**1E-07**

* SSLs from LANL (2017, 602581).

Table H-4.2-200
Recreational Noncarcinogenic Screening Evaluation for SWMU 02-009(b)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	HQ
Cadmium	0.34	460	7.39E-04
Cyanide (Total)	0.107	220	4.86E-04
Mercury	0.805	190	4.24E-03
Perchlorate	0.0017	430	3.95E-06
Zinc	57.8	190,000	3.04E-04
Aroclor-1254	0.0334	5.5	6.07E-03
Bis(2-ethylhexyl)phthalate	0.0684	6600	1.04E-05
Di-n-butylphthalate	0.0478	33,000	2.39E-06
		HI	**1E-02**

* SSLs from LANL (2017, 602581).

Table H-4.2-201
Recreational Radionuclide Screening Evaluation for SWMU 02-009(b)

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	8.62	370	5.82E-01
Plutonium-239/240	0.189	1300	3.63E-03
Strontium-90	2.49	4900	1.27E-02
Tritium	0.00728	5,700,000	3.19E-08
		Total Dose	**6E-01**

* SALs from LANL (2015, 600929).

Table H-4.2-202
Residential Carcinogenic Screening Evaluation for SWMU 02-009(b)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Cadmium	0.223	85,900	2.60E-11
Aroclor-1248	0.0438	2.43	1.80E-07
Aroclor-1254	0.0209	2.43	8.60E-08
Aroclor-1260	0.0619	2.43	2.55E-07
Bis(2-ethylhexyl)phthalate	0.0684	380	1.80E-09
		Total Excess Cancer Risk	**5E-07**

* SSLs from NMED (2017, 602273).

Table H-4.2-203
Residential Noncarcinogenic Screening Evaluation for SWMU 02-009(b)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Antimony	0.39	31.3	1.25E-02
Cadmium	0.223	70.5	3.16E-03
Cyanide (Total)	0.301	11.1	2.71E-02
Mercury	0.531	23.5	2.26E-02
Perchlorate	0.0017	54.8	3.10E-05
Selenium	0.886	391	2.27E-03
Zinc	49.6	23,500	2.11E-03
Aroclor-1254	0.0209	1.14	1.83E-02
Bis(2-ethylhexyl)phthalate	0.0684	1230	5.56E-05
Di-n-butylphthalate	0.0789	6160	1.28E-05
Isopropylbenzene	0.000342	2350	1.46E-07
Toluene	0.00136	5220	2.61E-07
		HI	**9E-02**

* SSLs from NMED (2017, 602273).

Table H-4.2-204
Residential Radionuclide Screening Evaluation for SWMU 02-009(b)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	5.88	12	1.23E+01
Plutonium-239/240	0.164	79	5.19E-02
Strontium-90	0.907	15	1.51E+00
Tritium	0.0328	1700	4.82E-04
		Total Dose	**1.4E+01**

* SALs from LANL (2015, 600929).

Table H-4.2-205
Industrial Carcinogenic Screening Evaluation for SWMU 02-009(c)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Cadmium	0.267	417,000	6.40E-12
Chromium hexavalent ion	0.447	72.1	6.20E-08
Aroclor-1248	0.0045	10.7	4.21E-09
Aroclor-1254	0.0613	11	5.57E-08
Aroclor-1260	0.0728	11.1	6.56E-08
		Total Excess Cancer Risk	**2E-07**

* SSLs from NMED (2017, 602273).

Table H-4.2-206
Industrial Noncarcinogenic Screening Evaluation for SWMU 02-009(c)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Barium	204	255,000	8.00E-04
Cadmium	0.267	1110	2.41E-04
Chromium hexavalent ion	0.447	3890	1.15E-04
Iron	8620	908,000	9.49E-03
Mercury	0.373	389	9.59E-04
Perchlorate	0.0013	908	1.43E-06
Selenium	0.824	6490	1.27E-04
Silver	0.304	6490	4.68E-05
Zinc	46.5	389,000	1.20E-04
Aroclor-1254	0.0613	16.4	3.74E-03
Dibenzofuran	0.061	1000[b]	6.10E-05
		HI	**2E-02**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] SSL are from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables).

Table H-4.2-207
Industrial Radionuclide Screening Evaluation for SWMU 02-009(c)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	4.73	41	2.88E+00
Plutonium-239/240	0.281	1200	5.85E-03
Strontium-90	0.256	2400	2.67E-03
Tritium	0.0119	2,400,000	1.24E-07
		Total Dose	**3E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-208
Recreational Carcinogenic Screening Evaluation for SWMU 02-009(c)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Cadmium	0.267	4,300,000	6.21E-13
Chromium hexavalent ion	0.447	40	1.12E-07
Aroclor-1248	0.0045	10	4.50E-09
Aroclor-1254	0.0613	10	6.13E-08
Aroclor-1260	0.0728	10	7.28E-08
		Total Excess Cancer Risk	**3E-07**

* SSLs from LANL (2017, 602581).

Table H-4.2-209
Recreational Noncarcinogenic Screening Evaluation for SWMU 02-009(c)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	HQ
Barium	204	120,000	1.70E-03
Cadmium	0.267	460	5.80E-04
Chromium hexavalent ion	0.447	1900	2.35E-04
Iron	8620	430,000	2.00E-02
Mercury	0.373	190	1.96E-03
Perchlorate	0.0013	430	3.02E-06
Selenium	0.824	3100	2.66E-04
Silver	0.304	3100	9.81E-05
Zinc	46.5	190,000	2.45E-04
Aroclor-1254	0.0613	5.5	1.11E-02
Dibenzofuran	0.061	490	1.24E-04
		HI	**4E-02**

* SSLs from LANL (2017, 602581).

Table H-4.2-210
Recreational Radionuclide Screening Evaluation for SWMU 02-009(c)

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	4.73	370	3.20E-01
Plutonium-239/240	0.281	1300	5.40E-03
Strontium-90	0.256	4900	1.31E-03
Tritium	0.0119	5,700,000	5.22E-08
		Total Dose	**3E-01**

* SALs from LANL (2015, 600929).

Table H-4.2-211
Residential Carcinogenic Screening Evaluation for SWMU 02-009(c)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Arsenic	1.8	7.07	2.55E-06
Cadmium	0.146	85,900	1.70E-11
Chromium (Total)	9.71	96.6	1.01E-06
Chromium hexavalent ion	0.242	3.05	7.93E-07
Nickel	2.96	595,000	4.97E-11
Aroclor-1248	0.0045	2.43	1.85E-08
Aroclor-1254	0.0298	2.43	1.23E-07
Aroclor-1260	0.0342	2.43	1.41E-07
Bis(2-ethylhexyl)phthalate	0.0547	380	1.44E-09
Chloroform	0.000231	5.85	3.95E-10
		Total Excess Cancer Risk	**5E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-212
Residential Noncarcinogenic Screening Evaluation for SWMU 02-009(c)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Aluminum	3540	78,000	4.54E-02
Antimony	1.06(U)	31.3	3.39E-02
Arsenic	1.8	13	1.38E-01
Barium	111	15,600	7.12E-03
Cadmium	0.146	70.5	2.07E-03
Chromium (Total)	9.71	45,200	2.15E-04
Chromium hexavalent ion	0.242	235	1.03E-03
Iron	7120	54,800	1.30E-01

Table H-4.2-212 (continued)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Manganese	296	10,500	2.82E-02
Mercury	0.149	23.5	6.34E-03
Nickel	2.96	1560	1.90E-03
Perchlorate	0.00162	54.8	2.96E-05
Selenium	2.37	391	6.06E-03
Silver	0.682	391	1.74E-03
Vanadium	7.29	394	1.85E-02
Zinc	36	23,500	1.53E-03
Acetone	0.133	66,300	2.01E-06
Aroclor-1254	0.0298	1.14	2.61E-02
Bis(2-ethylhexyl)phthalate	0.0547	1230	4.45E-05
Chloroform	0.000231	304	7.60E-07
Di-n-butylphthalate	0.068	6160	1.10E-05
Dibenzofuran	0.061	73[b]	8.36E-04
Isopropyltoluene[4-]	0.0505	2360[c]	2.14E-05
Phenol	0.04	18,500	2.16E-06
Styrene	0.000239	7230	3.31E-08
Toluene	0.00456	5220	8.74E-07
		HI	**4E-01**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] SSL are from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables).

[c] Isopropylbenzene used as surrogate based on structural similarity.

Table H-4.2-213
Residential Radionuclide Screening Evaluation for SWMU 02-009(c)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	26.1	12	5.44E+01
Plutonium-239/240	0.219	79	6.93E-02
Strontium-90	0.718	15	1.20E+00
Tritium	0.0409	1700	6.01E-04
Uranium-234	1.34	290	1.16E-01
Uranium-235/236	0.074	42	4.40E-02
Uranium-238	1.29	150	2.15E-01
		Total Dose	**5.6E+01**

* SALs from LANL (2015, 600929).

Table H-4.2-214
Construction Worker Noncarcinogenic Screening Evaluation for SWMU 02-009(c)

COPC	EPC (pCi/g)	Construction Worker SSL[a] (pCi/g)	Dose (mrem/yr)
Aluminum	3540	41,400	8.55E-02
Antimony	1.06(U)	142	7.46E-03
Arsenic	1.8	41.2	4.37E-02
Barium	111	4390	2.53E-02
Cadmium	0.146	72.1	2.02E-03
Chromium (Total)	9.71	134	7.25E-02
Chromium hexavalent ion	0.242	498	4.86E-04
Iron	7120	248,000	2.87E-02
Manganese	296	464	6.38E-01
Mercury	0.149	77.1	1.93E-03
Nickel	2.96	753	3.93E-03
Perchlorate	0.00162	248	6.53E-06
Selenium	2.37	1750	1.35E-03
Silver	0.682	1770	3.85E-04
Vanadium	7.29	614	1.19E-02
Zinc	36	106,000	3.40E-04
Acetone	0.133	241,000	5.52E-07
Aroclor-1254	0.0298	4.91	6.07E-03
Bis(2-ethylhexyl)phthalate	0.0547	5380	1.02E-05
Chloroform	0.000231	388	5.75E-07
Di-n-butylphthalate	0.068	26,900	2.53E-06
Dibenzofuran	0.061	354[b]	1.72E-04
Isopropyltoluene[4-]	0.0505	2740[c]	1.84E-05
Phenol	0.04	77,400	5.17E-07
Styrene	0.000239	10,100	2.37E-08
Toluene	0.00456	14,000	3.26E-07
		HI	**1**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] Construction worker SSL calculated using toxicity value from EPA regional screening tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables) and equation and parameters from NMED (2017, 602273).

[c] Isopropyl benzene used as a surrogate based on structural similarity.

Table H-4.2-215
Industrial Carcinogenic Screening Evaluation for AOC 02-009(d)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Cadmium	0.49	417,000	1.18E-11
Aroclor-1248	0.0086	10.7	8.04E-09
Aroclor-1254	0.0284	11	2.58E-08
Aroclor-1260	0.0629	11.1	5.67E-08
		Total Excess Cancer Risk	**9E-08**

* SSLs from NMED (2017, 602273).

Table H-4.2-216
Industrial Noncarcinogenic Screening Evaluation for AOC 02-009(d)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Cadmium	0.49	1110	4.41E-04
Mercury	1.22	389	3.14E-03
Perchlorate	0.00132	908	1.45E-06
Selenium	1.52	6490	2.34E-04
Zinc	46.6	389,000	1.20E-04
Aroclor-1254	0.0284	16.4	1.73E-03
		HI	**6E-03**

* SSLs from NMED (2017, 602273).

Table H-4.2-217
Industrial Radionuclide Screening Evaluation for AOC 02-009(d)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	4.1	41	2.50E+00
Cobalt-60	0.162	9	4.50E-01
Plutonium-239/240	0.0528	1200	1.10E-03
Strontium-90	3.67	2400	3.82E-02
Tritium	0.0421	2,400,000	4.39E-07
Uranium-234	6.85	3100	5.52E-02
Uranium-235/236	0.48	160	7.50E-02
		Total Dose	**3E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-218
Recreational Carcinogenic Screening Evaluation for AOC 02-009(d)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Cadmium	0.49	4,300,000	1.14E-12
Aroclor-1248	0.0086	10	8.60E-09
Aroclor-1254	0.0284	10	2.84E-08
Aroclor-1260	0.0629	10	6.29E-08
		Total Excess Cancer Risk	**1E-07**

* SSLs from LANL (2017, 602581).

Table H-4.2-219
Recreational Noncarcinogenic Screening Evaluation for AOC 02-009(d)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	HQ
Cadmium	0.49	460	1.07E-03
Mercury	1.22	190	6.42E-03
Perchlorate	0.00132	430	3.07E-06
Selenium	1.52	3100	4.90E-04
Zinc	46.6	190,000	2.45E-04
Aroclor-1254	0.0284	5.5	5.16E-03
		HI	**1E-02**

* SSLs from LANL (2017, 602581).

Table H-4.2-220
Recreational Radionuclide Screening Evaluation for AOC 02-009(d)

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	4.1	370	2.77E-01
Cobalt-60	0.162	81	5.00E-02
Plutonium-239/240	0.0528	1300	1.02E-03
Strontium-90	3.67	4900	1.87E-02
Tritium	0.0421	5,700,000	1.85E-07
Uranium-234	6.85	3900	4.39E-02
Uranium-235/236	0.48	1000	1.20E-02
		Total Dose	**4E-01**

* SALs from LANL (2015, 600929).

Table H-4.2-221
Residential Carcinogenic Screening Evaluation for AOC 02-009(d)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Cadmium	0.4	85,900	4.66E-11
Chromium hexavalent ion	0.156	3.05	5.11E-07
Aroclor-1248	0.0086	2.43	3.54E-08
Aroclor-1254	0.026	2.43	1.07E-07
Aroclor-1260	0.0449	2.43	1.85E-07
Dichlorobenzene[1,4-]	0.000595	1290	4.61E-12
		Total Excess Cancer Risk	**8E-07**

* SSLs from NMED (2017, 602273).

Table H-4.2-222
Residential Noncarcinogenic Screening Evaluation for AOC 02-009(d)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Cadmium	0.4	70.5	5.67E-03
Chromium hexavalent ion	0.156	235	6.64E-04
Mercury	0.718	23.5	3.06E-02
Perchlorate	0.00111	54.8	2.03E-05
Selenium	1.32	391	3.38E-03
Zinc	44.5	23,500	1.89E-03
Aroclor-1254	0.026	1.14	2.28E-02
Di-n-butylphthalate	0.0421	6160	6.83E-06
Dichlorobenzene[1,4-]	0.000595	5480	1.09E-07
Isopropyltoluene[4-]	0.0034	2360[b]	1.44E-06
Styrene	0.00111	7230	1.54E-07
Toluene	0.000775	5220	1.48E-07
		HI	**6E-02**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] Isopropyl benzene used as a surrogate based on structural similarity.

Table H-4.2-223
Residential Radionuclide Screening Evaluation for AOC 02-009(d)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	4.86	12	1.01E+01
Cobalt-60	0.162	2.6	1.56E+00
Plutonium-239/240	0.299	79	9.46E-02
Strontium-90	7.8	15	1.30E+01
Tritium	0.0218	1700	3.21E-04
Uranium-234	4.04	290	3.48E-01
Uranium-235/236	0.278	42	1.65E-01
		Total Dose	**3E+01**

* SALs from LANL (2015, 600929).

Table H-4.2-224
Industrial Carcinogenic Screening Evaluation for AOC 02-010

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Cadmium	1.4	417,000	3.36E-11
Chromium hexavalent ion	0.26	72.1	3.61E-08
Aroclor-1254	0.199	11	1.81E-07
Aroclor-1260	0.22	11.1	1.98E-07
Bis(2-ethylhexyl)phthalate	0.0534	1830	2.92E-10
		Total Excess Cancer Risk	**4E-07**

* SSLs from NMED (2017, 602273).

Table H-4.2-225
Industrial Noncarcinogenic Screening Evaluation for AOC 02-010

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Barium	306	255,000	1.20E-03
Cadmium	1.4	1110	1.26E-03
Chromium hexavalent ion	0.26	3890	6.68E-05
Cyanide (Total)	14.4	62.8	2.29E-01
Lead	55.6	800	6.95E-02
Mercury	0.279	389	7.17E-04
Nitrate	3.42	2,080,000	1.64E-06
Perchlorate	0.117	908	1.29E-04
Selenium	2.31	6490	3.56E-04
Zinc	65.4	389,000	1.68E-04
Aroclor-1254	0.199	16.4	1.21E-02
Bis(2-ethylhexyl)phthalate	0.0534	18,300	2.92E-06
Di-n-butylphthalate	0.983	91,600	1.07E-05
		HI	**3E-01**

* SSLs from NMED (2017, 602273).

Table H-4.2-226
Industrial Radionuclide Screening Evaluation for AOC 02-010

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	7.76	41	4.73E+00
Plutonium-239/240	0.59	1200	1.23E-02
Strontium-90	1.65	2400	1.72E-02
Tritium	0.136	2,400,000	1.42E-06
		Total Dose	**5E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-227
Recreational Carcinogenic Screening Evaluation for AOC 02-010

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Cadmium	1.4	4,300,000	3.26E-12
Chromium hexavalent ion	0.26	40	6.50E-08
Aroclor-1254	0.199	10	1.99E-07
Aroclor-1260	0.22	10	2.20E-07
Bis(2-ethylhexyl)phthalate	0.0534	1800	2.97E-10
		Total Excess Cancer Risk	**5E-07**

* SSLs from LANL (2017, 602581).

Table H-4.2-228
Recreational Noncarcinogenic Screening Evaluation for AOC 02-010

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	HQ
Barium	306	120,000	2.55E-03
Cadmium	1.4	460	3.04E-03
Chromium hexavalent ion	0.26	1900	1.37E-04
Cyanide (Total)	14.4	220	6.55E-02
Lead	55.6	1110	5.01E-02
Mercury	0.279	190	1.47E-03
Nitrate	3.42	990,000	3.45E-06
Perchlorate	0.117	430	2.72E-04
Selenium	2.31	3100	7.45E-04
Zinc	65.4	190,000	3.44E-04
Aroclor-1254	0.199	5.5	3.62E-02
Bis(2-ethylhexyl)phthalate	0.0534	6600	8.09E-06
Di-n-butylphthalate	0.983	33,000	2.98E-05
		HI	**2E-01**

* SSLs from LANL (2017, 602581).

Table H-4.2-229
Recreational Radionuclide Screening Evaluation for AOC 02-010

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	7.76	370	5.24E-01
Plutonium-239/240	0.59	1300	1.13E-02
Strontium-90	1.65	4900	8.42E-03
Tritium	0.136	5,700,000	5.96E-07
		Total Dose	**5E-01**

* SALs from LANL (2015, 600929).

Table H-4.2-230
Residential Carcinogenic Screening Evaluation for AOC 02-010

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Cadmium	1.07	85,900	1.25E-10
Chromium hexavalent ion	0.162	3.05	5.31E-07
Aroclor-1248	0.0066	2.43	2.72E-08
Aroclor-1254	0.0301	2.43	1.24E-07
Aroclor-1260	0.0624	2.43	2.57E-07
Bis(2-ethylhexyl)phthalate	0.0688	380	1.81E-09
Chloroform	0.000219	5.85	3.74E-10
Methylene Chloride	0.00213	766	2.78E-11
		Total Excess Cancer Risk	**9E-07**

* SSLs from NMED (2017, 602273).

Table H-4.2-231
Residential Noncarcinogenic Screening Evaluation for AOC 02-010

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Barium	166	15,600	1.06E-02
Cadmium	1.07	70.5	1.52E-02
Chromium hexavalent ion	0.162	235	6.89E-04
Cyanide (Total)	14.4	11.1	1.30E+00
Lead	31.2	400	7.80E-02
Mercury	0.205	23.5	8.72E-03
Nitrate	2.33	125,000	1.86E-05
Perchlorate	0.0135	54.8	2.46E-04
Selenium	1.93	391	4.94E-03
Zinc	47.9	23,500	2.04E-03

Table H-4.2-231 (continued)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Aroclor-1254	0.0301	1.14	2.64E-02
Bis(2-ethylhexyl)phthalate	0.0688	1230	5.59E-05
Chloroform	0.000219	304	7.20E-07
Di-n-butylphthalate	0.983	6160	1.60E-04
Methylene Chloride	0.00213	409	5.21E-06
Toluene	0.000593	5220	1.14E-07
		HI	**1E+00**

* SSLs from NMED (2017, 602273).

Table H-4.2-232
Residential Radionuclide Screening Evaluation for AOC 02-010

COPC	EPC (mg/kg)	Residential SAL* (mg/kg)	Dose (mrem/yr)
Cesium-137	4.71	12	9.81E+00
Plutonium-239/240	0.436	79	1.38E-01
Strontium-90	1.46	15	2.43E+00
Tritium	0.0329	1700	4.84E-04
		Total Dose	**1.2E+01**

* SALs from LANL (2015, 600929).

Table H-4.2-233
Industrial Carcinogenic Screening Evaluation for AOCs 02-011(a)(i–vi)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Cadmium	0.208	417,000	4.99E-12
Aroclor-1254	0.0647	11	5.88E-08
Aroclor-1260	0.344	11.1	3.10E-07
		Total Excess Cancer Risk	**4E-07**

* SSLs from NMED (2017, 602273).

Table H-4.2-234
Industrial Noncarcinogenic Screening Evaluation for AOCs 02-011(a)(i–vi)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Cadmium	0.208	1110	1.87E-04
Mercury	6.57	389	1.69E-02
Perchlorate	0.00131	908	1.44E-06
Zinc	59.8	389,000	1.54E-04
Aroclor-1254	0.0647	16.4	3.95E-03
Di-n-butylphthalate	0.101	91,600	1.10E-06
		HI	**2E-02**

* SSLs from NMED (2017, 602273).

Table H-4.2-235
Industrial Radionuclide Screening Evaluation for AOCs 02-011(a)(i–vi)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Americium-241	0.0924	1000	2.31E-03
Cobalt-60	0.762	9	2.12E+00
Plutonium-239/240	0.182	1200	3.79E-03
Tritium	0.00626	2,400,000	6.52E-08
		Total Dose	**2E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-236
Recreational Carcinogenic Screening Evaluation for AOCs 02-011(a)(i–vi)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Cadmium	0.208	4,300,000	4.84E-13
Aroclor-1254	0.0647	10	6.47E-08
Aroclor-1260	0.344	10	3.44E-07
		Total Excess Cancer Risk	**4E-07**

* SSLs from LANL (2017, 602581).

Table H-4.2-237
Recreational Noncarcinogenic Screening Evaluation for AOCs 02-011(a)(i–vi)

COPC	EPC (pCi/g)	Recreational SSL* (pCi/g)	Dose (mrem/yr)
Cadmium	0.208	457	4.55E-04
Mercury	6.57	186	3.53E-02
Perchlorate	0.00131	434	3.02E-06
Zinc	59.8	186,000	3.22E-04
Aroclor-1254	0.0647	5.53	1.17E-02
Di-n-butylphthalate	0.101	32,800	3.08E-06
		HI	**5E-02**

* SSLs from LANL (2017, 602581).

Table H-4.2-238
Recreational Radionuclide Screening Evaluation for AOCs 02-011(a)(i–vi)

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Dose (mrem/yr)
Americium-241	0.0924	1500	1.54E-03
Cobalt-60	0.762	81	2.35E-01
Plutonium-239/240	0.182	1300	3.50E-03
Tritium	0.00626	5,700,000	2.75E-08
		Total Dose	**2E-01**

* SALs from LANL (2015, 600929).

Table H-4.2-239
Residential Carcinogenic Screening Evaluation for AOCs 02-011(a)(i–vi)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Cadmium	0.208	85,900	2.42E-11
Chromium (Total)	10.4	96.6	1.08E-06
Aroclor-1242	0.0162	2.43	6.67E-08
Aroclor-1254	0.0508	2.43	2.09E-07
Aroclor-1260	0.303	2.43	1.25E-06
Chloroform	0.000237	5.85	4.05E-10
		Total Excess Cancer Risk	**3E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-240
Residential Noncarcinogenic Screening Evaluation for AOCs 02-011(a)(i–vi)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Antimony	0.108	31.3	3.45E-03
Cadmium	0.208	70.5	2.95E-03
Chromium (Total)	10.4	45,200	2.30E-04
Mercury	1.27	23.5	5.40E-02
Perchlorate	0.00131	54.8	2.39E-05
Selenium	1.11	391	2.84E-03
Zinc	42.4	23,500	1.80E-03
Aroclor-1254	0.0508	1.14	4.46E-02
Chloroform	0.000237	304	7.80E-07
Di-n-butylphthalate	0.101	6160	1.64E-05
		HI	**3E-01**

* SSLs from NMED (2017, 602273).

Table H-4.2-241
Residential Radionuclide Screening Evaluation for AOCs 02-011(a)(i–vi)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Americium-241	0.0924	83	2.78E-02
Cobalt-60	0.762	2.6	7.33E+00
Plutonium-239/240	0.182	79	5.76E-02
Tritium	0.0423	1700	6.22E-04
		Total Dose	**7E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-242
Industrial Carcinogenic Screening Evaluation for AOC 02-011(a)(viii)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Cadmium	0.63	417,000	1.51E-11
Chromium (Total)	13	505	2.57E-07
Aroclor-1254	0.0276	11	2.51E-08
Aroclor-1260	0.0546	11.1	4.92E-08
		Total Excess Cancer Risk	**3E-07**

* SSLs from NMED (2017, 602273).

Table H-4.2-243
Industrial Noncarcinogenic Screening Evaluation for AOC 02-011(a)(viii)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Cadmium	0.63	1110	5.68E-04
Chromium (Total)	13	314,000	4.14E-05
Copper	17	51,900	3.28E-04
Lead	40	800	5.00E-02
Mercury	2.93	389	7.53E-03
Zinc	390	389,000	1.00E-03
Aroclor-1254	0.0276	16.4	1.68E-03
		HI	**6E-02**

* SSLs from NMED (2017, 602273).

Table H-4.2-244
Industrial Radionuclide Screening Evaluation for AOC 02-011(a)(viii)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Cobalt-60	0.598	9	1.66E+00
Plutonium-239/240	1.87	1200	3.90E-02
Tritium	0.279	2,400,000	2.91E-06
		Total Dose	**2E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-245
Recreational Carcinogenic Screening Evaluation for AOC 02-011(a)(viii)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Cadmium	0.63	4,300,000	1.47E-12
Chromium (Total)	13	280	4.64E-07
Aroclor-1254	0.0276	10	2.76E-08
Aroclor-1260	0.0546	10	5.46E-08
		Total Excess Cancer Risk	**5E-07**

* SSLs from LANL (2017, 602581).

Table H-4.2-246
Recreational Noncarcinogenic Screening Evaluation for AOC 02-011(a)(viii)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	HQ
Cadmium	0.63	460	1.37E-03
Chromium (Total)	13	670,000	1.94E-05
Copper	17	25,000	6.80E-04
Lead	40	1110	3.60E-02
Mercury	2.93	190	1.54E-02
Zinc	390	190,000	2.05E-03
Aroclor-1254	0.0276	5.5	5.02E-03
		HI	**6E-02**

* SSLs from LANL (2017, 602581).

Table H-4.2-247
Recreational Radionuclide Screening Evaluation for AOC 02-011(a)(viii)

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Dose (mrem/yr)
Cobalt-60	0.598	81	1.85E-01
Plutonium-239/240	1.87	1300	3.60E-02
Tritium	0.279	5,700,000	1.22E-06
		Total Dose	**2E-01**

* SALs from LANL (2015, 600929).

Table H-4.2-248
Residential Carcinogenic Screening Evaluation for AOC 02-011(a)(viii)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Cadmium	0.367	85,900	4.27E-11
Chromium (Total)	9.11	96.6	9.43E-07
Chromium hexavalent ion	0.227	3.05	7.44E-07
Aroclor-1254	0.0276	2.43	1.14E-07
Aroclor-1260	0.0546	2.43	2.25E-07
		Total Excess Cancer Risk	**2E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-249
Residential Noncarcinogenic Screening Evaluation for AOC 02-011(a)(viii)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Cadmium	0.367	70.5	5.21E-03
Chromium (Total)	9.11	45,200	2.02E-04
Chromium hexavalent ion	0.227	235	9.66E-04
Copper	7.87	3130	2.51E-03
Lead	22.2	400	5.55E-02
Mercury	2.26	23.5	9.62E-02
Selenium	0.558	391	1.43E-03
Zinc	167	23,500	7.11E-03
Aroclor-1254	0.0276	1.14	2.42E-02
		HI	**2E-01**

* SSLs from NMED (2017, 602273).

Table H-4.2-250
Residential Radionuclide Screening Evaluation for AOC 02-011(a)(viii)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	0.828	12	1.73E+00
Cobalt-60	0.598	2.6	5.75E+00
Plutonium-239/240	1.87	79	5.92E-01
Tritium	0.416	1700	6.12E-03
		Total Dose	**8E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-251
Industrial Carcinogenic Screening Evaluation for AOC 02-011(a)(ix)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Cadmium	0.285	417,000	6.83E-12
Chromium hexavalent ion	0.349	72.1	4.84E-08
Aroclor-1248	0.197	10.7	1.84E-07
Aroclor-1254	0.128	11	1.16E-07
Aroclor-1260	0.153	11.1	1.38E-07
Benzo(a)anthracene	0.229	32.3	7.09E-08
Benzo(a)pyrene	0.138	23.6	5.85E-08
Benzo(b)fluoranthene	0.318	32.3	9.85E-08
Benzo(k)fluoranthene	0.0382	323	1.18E-09
Chrysene	0.21	3230	6.50E-10
Indeno(1,2,3-cd)pyrene	0.0548	32.3	1.70E-08
		Total Excess Cancer Risk	**7E-07**

* SSLs from NMED (2017, 602273).

Table H-4.2-252
Industrial Noncarcinogenic Screening Evaluation for AOC 02-011(a)(ix)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Cadmium	0.285	1110	2.57E-04
Chromium hexavalent ion	0.349	3890	8.97E-05
Lead	12.7	800	1.59E-02
Mercury	2.52	389	6.48E-03
Perchlorate	0.000752	908	8.28E-07
Selenium	0.72	6490	1.11E-04
Zinc	72.5	389,000	1.86E-04
Acenaphthene	0.0217	50,500	4.30E-07
Anthracene	0.0367	253,000	1.45E-07
Aroclor-1254	0.128	16.4	7.80E-03
Benzo(g,h,i)perylene	0.0596	25,300[b]	2.36E-06
Di-n-butylphthalate	0.0613	91,600	6.69E-07
Fluoranthene	0.368	33,700	1.09E-05
Fluorene	0.019	33,700	5.64E-07
Methylnaphthalene[2-]	0.0194	3370	5.76E-06
Naphthalene	0.0278	16,800	1.65E-06
Phenanthrene	0.119	25,300	4.70E-06
Pyrene	0.496	25,300	1.96E-05
		HI	**3E-02**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

Table H-4.2-253
Industrial Radionuclide Screening Evaluation for AOC 02-011(a)(ix)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Plutonium-239/240	1.66	1200	3.46E-02
Tritium	0.0471	2,400,000	4.91E-07
		Total Dose	**3E-02**

* SALs from LANL (2015, 600929).

Table H-4.2-254
Recreational Carcinogenic Screening Evaluation for AOC 02-011(a)(ix)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Cadmium	0.285	4,300,000	6.63E-13
Chromium hexavalent ion	0.349	40	8.73E-08
Aroclor-1248	0.197	10	1.97E-07
Aroclor-1254	0.128	10	1.28E-07
Aroclor-1260	0.153	10	1.53E-07
Benzo(a)anthracene	0.229	89	2.57E-08
Benzo(a)pyrene	0.138	8.9	1.55E-07
Benzo(b)fluoranthene	0.318	89	3.57E-08
Benzo(k)fluoranthene	0.0382	890	4.29E-10
Chrysene	0.21	8900	2.36E-10
Indeno(1,2,3-cd)pyrene	0.0548	89	6.16E-09
Naphthalene	0.0278	1900	1.46E-10
		Total Excess Cancer Risk	**8E-07**

* SSLs from LANL (2017, 602581).

Table H-4.2-255
Recreational Noncarcinogenic Screening Evaluation for AOC 02-011(a)(ix)

COPC	EPC (mg/kg)	Recreational SSL[a] (mg/kg)	HQ
Cadmium	0.285	460	6.20E-04
Chromium hexavalent ion	0.349	1900	1.84E-04
Lead	12.7	1110	1.14E-02
Mercury	2.52	190	1.33E-02
Perchlorate	0.000752	430	1.75E-06
Selenium	0.72	3100	2.32E-04
Zinc	72.5	190,000	3.82E-04
Acenaphthene	0.0217	17,000	1.28E-06
Anthracene	0.0367	86,000	4.27E-07
Aroclor-1254	0.128	5.5	2.33E-02
Benzo(g,h,i)perylene	0.0596	8600[b]	6.93E-06
Di-n-butylphthalate	0.0613	33,000	1.86E-06
Fluoranthene	0.368	12,000	3.07E-05
Fluorene	0.019	12,000	1.58E-06
Methylnaphthalene[2-]	0.0194	1200	1.62E-05
Naphthalene	0.0278	3200	8.69E-06
Phenanthrene	0.119	8600	1.38E-05
Pyrene	0.496	8600	5.77E-05
		HI	**5E-02**

[a] SSLs from LANL (2017, 602581).

[b] Pyrene used as a surrogate based on structural similarity.

Table H-4.2-256
Recreational Radionuclide Screening Evaluation for AOC 02-011(a)(ix)

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Dose (mrem/yr)
Plutonium-239/240	1.66	1300	3.19E-02
Tritium	0.0471	5,700,000	2.07E-07
		Total Dose	**3E-02**

* SALs from LANL (2015, 600929).

Table H-4.2-257
Residential Carcinogenic Screening Evaluation for AOC 02-011(a)(ix)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Cadmium	0.261	85,900	3.04E-11
Chromium (Total)	11.8	96.6	1.22E-06
Chromium hexavalent ion	0.244	3.05	8.00E-07
Aroclor-1242	0.0103	2.43	4.24E-08
Aroclor-1248	0.197	2.43	8.11E-07
Aroclor-1254	0.0806	2.43	3.32E-07
Aroclor-1260	0.0915	2.43	3.77E-07
Benzo(a)anthracene	0.094	1.53	6.14E-07
Benzo(a)pyrene	0.085	1.12	7.59E-07
Benzo(b)fluoranthene	0.119	1.53	7.78E-07
Benzo(k)fluoranthene	0.0366	15.3	2.39E-08
Chloroform	0.000218	5.85	3.73E-10
Chrysene	0.0823	153	5.38E-09
Indeno(1,2,3-cd)pyrene	0.0388	1.53	2.54E-07
		Total Excess Cancer Risk	**6E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-258
Residential Noncarcinogenic Screening Evaluation for AOC 02-011(a)(ix)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Cadmium	0.261	70.5	3.70E-03
Chromium (Total)	11.8	45,200	2.61E-04
Chromium hexavalent ion	0.244	235	1.04E-03
Lead	341	400	8.53E-01
Mercury	1.24	23.5	5.28E-02
Perchlorate	0.0008	54.8	1.46E-05
Selenium	1.11	391	2.84E-03
Vanadium	14.6	394	3.71E-02
Zinc	103	23,500	4.38E-03
Acenaphthene	0.0195	3480	5.60E-06
Anthracene	0.0277	17,400	1.59E-06
Aroclor-1254	0.0806	1.14	7.07E-02
Benzo(g,h,i)perylene	0.0443	1740[b]	2.55E-05
Bis(2-ethylhexyl)phthalate	0.153	1230	1.24E-04
Chloroform	0.000218	304	7.17E-07
Di-n-butylphthalate	0.0736	6160	1.19E-05
Fluoranthene	0.206	2320	8.88E-05
Fluorene	0.0165	2320	7.11E-06
Isopropylbenzene	0.000401	2350	1.71E-07
Isopropyltoluene[4-]	0.000534	2360[c]	2.26E-07
Methylnaphthalene[2-]	0.0194	232	8.36E-05
Naphthalene	0.0278	1160	2.40E-05
Phenanthrene	0.0733	1740	4.21E-05
Pyrene	0.274	1740	1.57E-04
Trimethylbenzene[1,2,4-]	0.00329	300[d]	1.10E-05
Trimethylbenzene[1,3,5-]	0.00101	270[d]	3.74E-06
Toluene	0.000362	5220	6.93E-08
Xylene[1,2-]	0.000249	798	3.12E-07
		HI	**1E+00**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] Isopropyl benzene used as a surrogate based on structural similarity.

[d] SSL are from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables).

Table H-4.2-259
Residential Radionuclide Screening Evaluation for AOC 02-011(a)(ix)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	0.278	12	5.79E-01
Plutonium-239/240	0.264	79	8.35E-02
Tritium	0.0351	1700	5.16E-04
Uranium-234	1.19	290	1.03E-01
		Total Dose	**8E-01**

* SALs from LANL (2015, 600929).

Table H-4.2-260
Industrial TPH Screening Evaluation for AOC 02-011(a)(ix)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Total Petroleum Hydrocarbons Diesel Range Organics	16.8	3000	5.60E-03
		TPH	**6E-03**

* SSLs from NMED (2017, 602273).

Table H-4.2-261
Residential TPH Screening Evaluation for AOC 02-011(a)(ix)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Total Petroleum Hydrocarbons Diesel Range Organics	77.3	1000	7.73E-02
		TPH	**8E-02**

* SSLs from NMED (2017, 602273).

Table H-4.2-262
Industrial Carcinogenic Screening Evaluation for AOC 02-011(a)(x)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Arsenic	16.9	35.9	4.71E-06
Cadmium	0.305	417,000	7.31E-12
Chromium (Total)	23.2	505	4.59E-07
Chromium hexavalent ion	0.693	72.1	9.61E-08
Aroclor-1254	0.0528	11	4.80E-08
Aroclor-1260	0.956	11.1	8.61E-07
		Total Excess Cancer Risk	**6E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-263
Industrial Noncarcinogenic Screening Evaluation for AOC 02-011(a)(x)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Arsenic	16.9	208	8.13E-02
Cadmium	0.305	1110	2.75E-04
Chromium (Total)	23.2	314,000	7.39E-05
Chromium hexavalent ion	0.693	3890	1.78E-04
Copper	52	51,900	1.00E-03
Iron	66,400	908,000	7.31E-02
Lead	45	800	5.63E-02
Mercury	0.267	389	6.86E-04
Perchlorate	0.00114	908	1.26E-06
Selenium	0.572	6490	8.81E-05
Zinc	98.7	389,000	2.54E-04
Aroclor-1254	0.0528	16.4	3.22E-03
		HI	**2E-01**

* SSLs from NMED (2017, 602273).

Table H-4.2-264
Industrial Radionuclide Screening Evaluation for AOC 02-011(a)(x)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Plutonium-239/240	1.67	1200	3.48E-02
Tritium	0.104	2,400,000	1.08E-06
		Total Dose	**3E-02**

* SALs from LANL (2015, 600929).

Table H-4.2-265
Recreational Carcinogenic Screening Evaluation for AOC 02-011(a)(x)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Arsenic	16.9	43	3.93E-06
Cadmium	0.305	4,300,000	7.09E-13
Chromium (Total)	23.2	280	8.29E-07
Chromium hexavalent ion	0.693	40	1.73E-07
Aroclor-1254	0.0528	10	5.28E-08
Aroclor-1260	0.956	10	9.56E-07
		Total Excess Cancer Risk	**6E-06**

* SSLs from LANL (2017, 602581).

Table H-4.2-266
Recreational Noncarcinogenic Screening Evaluation for AOC 02-011(a)(x)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	HQ
Arsenic	16.9	88	1.92E-01
Cadmium	0.305	460	6.63E-04
Chromium (Total)	23.2	670,000	3.46E-05
Chromium hexavalent ion	0.693	1900	3.65E-04
Copper	52	25,000	2.08E-03
Iron	66400	430,000	1.54E-01
Lead	45	1110	4.05E-02
Mercury	0.267	190	1.41E-03
Perchlorate	0.00114	430	2.65E-06
Selenium	0.572	3100	1.85E-04
Zinc	98.7	190,000	5.19E-04
Aroclor-1254	0.0528	5.5	9.60E-03
		HI	**4E-01**

* SSLs from LANL (2017, 602581).

Table H-4.2-267
Recreational Radionuclide Screening Evaluation for AOC 02-011(a)(x)

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Dose (mrem/yr)
Plutonium-239/240	1.67	1300	3.21E-02
Tritium	0.104	5,700,000	4.56E-07
		Total Dose	**3E-02**

* SALs from LANL (2015, 600929).

Table H-4.2-268
Residential Carcinogenic Screening Evaluation for AOC 02-011(a)(x)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Arsenic	4.66	7.07	6.59E-06
Cadmium	0.204	85,900	2.37E-11
Chromium (Total)	14.2	96.6	1.47E-06
Chromium hexavalent ion	0.26	3.05	8.52E-07
Aroclor-1254	0.0212	2.43	8.72E-08
Aroclor-1260	0.197	2.43	8.11E-07
		Total Excess Cancer Risk	**1E-05**

* SSLs from NMED (2017, 602273).

Table H-4.2-269
Residential Noncarcinogenic Screening Evaluation for AOC 02-011(a)(x)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Aluminum	4030	78,000	5.17E-02
Antimony	0.11	31.3	3.51E-03
Arsenic	4.66	13	3.58E-01
Barium	314	15,600	2.01E-02
Cadmium	0.204	70.5	2.89E-03
Chromium (Total)	14.2	45,200	3.14E-04
Chromium hexavalent ion	0.26	235	1.11E-03
Copper	14.9	3130	4.76E-03
Iron	14900	54,800	2.72E-01
Lead	11.8	400	2.95E-02
Manganese	304	10,500	2.90E-02
Mercury	0.191	23.5	8.13E-03
Perchlorate	0.00114	54.8	2.08E-05
Selenium	0.693	391	1.77E-03
Vanadium	13	394	3.30E-02
Zinc	239	23,500	1.02E-02
Aroclor-1254	0.0212	1.14	1.86E-02
Di-n-butylphthalate	0.0381	6160	6.19E-06
Toluene	0.00097	5220	1.86E-07
		HI	**8E-01**

* SSLs from NMED (2017, 602273).

Table H-4.2-270
Residential Radionuclide Screening Evaluation for AOC 02-011(a)(x)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	0.303	12	6.31E-01
Plutonium-239/240	0.287	79	9.08E-02
Tritium	0.0388	1700	5.71E-04
		Total Dose	**7E-01**

* SALs from LANL (2015, 600929).

Table H-4.2-271
Industrial TPH Screening Evaluation for AOC 02-011(a)(x)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Total Petroleum Hydrocarbons Diesel Range Organics	52.3	3000	1.74E-02
		TPH	**2E-02**

* SSLs from NMED (2017, 602273).

Table H-4.2-272
Residential TPH Screening Evaluation for AOC 02-011(a)(x)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Total Petroleum Hydrocarbons Diesel Range Organics	52.3	1000	5.23E-02
		TPH	**5E-02**

* SSLs from NMED (2017, 602273).

Table H-4.2-273
Construction Worker Noncarcinogenic Screening Evaluation for AOC 02-011(a)(x)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	HQ
Aluminum	4030	41,400	9.73E-02
Antimony	0.11	142	7.75E-04
Arsenic	4.66	41.2	1.13E-01
Barium	314	4390	7.15E-02
Cadmium	0.204	72.1	2.83E-03
Chromium (Total)	14.2	134	1.06E-01
Chromium hexavalent ion	0.26	498	5.22E-04
Copper	14.9	14,200	1.05E-03
Iron	14,900	248,000	6.01E-02
Lead	11.8	800	1.48E-02
Manganese	304	464	6.55E-01
Mercury	0.191	77.1	2.48E-03
Perchlorate	0.00114	248	4.60E-06
Selenium	0.693	1750	3.96E-04
Vanadium	13	614	2.12E-02
Zinc	239	106,000	2.25E-03
Aroclor-1254	0.0212	4.91	4.32E-03
Di-n-butylphthalate	0.0381	26,900	1.42E-06
Toluene	0.00097	14,000	6.93E-08
		HI	**1**

* SSLs from NMED (2017, 602273).

Table H-4.2-274
Industrial Carcinogenic Screening Evaluation for AOC 02-011(b)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Cadmium	0.243	417,000	5.83E-12
Chromium hexavalent ion	0.693	72.1	9.61E-08
Aroclor-1254	0.159	11	1.45E-07
Aroclor-1260	0.212	11.1	1.91E-07
Bis(2-ethylhexyl)phthalate	0.137	1830	7.49E-10
		Total Excess Cancer Risk	**4E-07**

* SSLs from NMED (2017, 602273).

Table H-4.2-275
Industrial Noncarcinogenic Screening Evaluation for AOC 02-011(b)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Cadmium	0.243	1110	2.19E-04
Chromium hexavalent ion	0.693	3890	1.78E-04
Lead	23.2	800	2.90E-02
Mercury	0.461	389	1.19E-03
Selenium	0.845	6490	1.30E-04
Zinc	70.1	389,000	1.80E-04
Aroclor-1254	0.159	16.4	9.70E-03
Bis(2-ethylhexyl)phthalate	0.137	18300	7.49E-06
		HI	**4E-02**

* SSLs from NMED (2017, 602273).

Table H-4.2-276
Industrial Radionuclide Screening Evaluation for AOC 02-011(b)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	23.3	41	1.42E+01
Plutonium-239/240	0.845	1200	1.76E-02
Tritium	0.0707	2,400,000	7.36E-07
		Total Dose	**1.4E+01**

* SALs from LANL (2015, 600929).

Table H-4.2-277
Recreational Carcinogenic Screening Evaluation for AOC 02-011(b)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Cadmium	0.243	4,300,000	5.65E-13
Chromium hexavalent ion	0.693	40	1.73E-07
Aroclor-1254	0.159	10	1.59E-07
Aroclor-1260	0.212	10	2.12E-07
Bis(2-ethylhexyl)phthalate	0.137	1800	7.61E-10
		Total Excess Cancer Risk	**5E-07**

* SSLs from LANL (2017, 602581).

Table H-4.2-278
Recreational Noncarcinogenic Screening Evaluation for AOC 02-011(b)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	HQ
Cadmium	0.243	460	5.28E-04
Chromium hexavalent ion	0.693	1900	3.65E-04
Lead	23.2	1110	2.09E-02
Mercury	0.461	190	2.43E-03
Selenium	0.845	3100	2.73E-04
Zinc	70.1	190,000	3.69E-04
Aroclor-1254	0.159	5.5	2.89E-02
Bis(2-ethylhexyl)phthalate	0.137	6600	2.08E-05
		HI	**5E-02**

* SSLs from LANL (2017, 602581).

Table H-4.2-279
Recreational Radionuclide Screening Evaluation for AOC 02-011(b)

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	23.3	370	1.57E+00
Plutonium-239/240	0.845	1300	1.63E-02
Tritium	0.0707	5,700,000	3.10E-07
		Total Dose	**2E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-280
Residential Carcinogenic Screening Evaluation for AOC 02-011(b)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Cadmium	0.257	85,900	2.99E-11
Chromium hexavalent ion	0.693	3.05	2.27E-06
Aroclor-1254	0.159	2.43	6.54E-07
Aroclor-1260	0.212	2.43	8.72E-07
Bis(2-ethylhexyl)phthalate	0.137	380	3.61E-09
		Total Excess Cancer Risk	**4E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-281
Residential Noncarcinogenic Screening Evaluation for AOC 02-011(b)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Cadmium	0.257	70.5	3.65E-03
Chromium hexavalent ion	0.693	235	2.95E-03
Lead	17.3	400	4.33E-02
Manganese	486	10,500	4.63E-02
Mercury	0.183	23.5	7.79E-03
Selenium	3.71	391	9.49E-03
Uranium	6.83	234	2.92E-02
Zinc	57	23,500	2.43E-03
Aroclor-1254	0.159	1.14	1.39E-01
Bis(2-ethylhexyl)phthalate	0.137	1230	1.11E-04
		HI	**3E-01**

* SSLs from NMED (2017, 602273).

Table H-4.2-282
Residential Radionuclide Screening Evaluation for AOC 02-011(b)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	9.39	12	1.96E+01
Plutonium-238	0.0255	84	7.59E-03
Plutonium-239/240	2.57	79	8.13E-01
Strontium-90	0.838	15	1.40E+00
Tritium	0.0868	1700	1.28E-03
Uranium-234	3.22	290	2.78E-01
Uranium-235/236	0.154	42	9.17E-02
Uranium-238	3.07	150	5.12E-01
		Total Dose	**2E+01**

* SALs from LANL (2015, 600929).

Table H-4.2-283
Construction Worker Noncarcinogenic Screening Evaluation for AOC 02-011(b)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	HQ
Cadmium	0.257	72.1	3.56E-03
Chromium hexavalent ion	0.693	498	1.39E-03
Lead	17.3	800	2.16E-02
Manganese	486	464	1.05E+00
Mercury	0.183	77.1	2.37E-03
Selenium	3.71	1750	1.19E-03
Uranium	6.83	277	2.47E-02
Zinc	57	106,000	5.38E-04
Aroclor-1254	0.159	4.91	3.24E-02
Bis(2-ethylhexyl)phthalate	0.137	5380	2.55E-05
		HI	**1**

* SSLs from NMED (2017, 602273).

Table H-4.2-284
Industrial Carcinogenic Screening Evaluation for AOC 02-011(c)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Aroclor-1254	0.0518	11	4.71E-08
Aroclor-1260	0.12	11.1	1.08E-07
		Total Excess Cancer Risk	**2E-07**

* SSLs from NMED (2017, 602273).

Table H-4.2-285
Industrial Noncarcinogenic Screening Evaluation for AOC 02-011(c)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Aroclor-1254	0.0518	16.4	3.16E-03
		HI	**3E-03**

* SSLs from NMED (2017, 602273).

Table H-4.2-286
Recreational Carcinogenic Screening Evaluation for AOC 02-011(c)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Aroclor-1254	0.0518	10	5.18E-08
Aroclor-1260	0.12	10	1.20E-07
Total Excess Cancer Risk			**2E-07**

* SSLs from LANL (2017, 602581).

Table H-4.2-287
Recreational Noncarcinogenic Screening Evaluation for AOC 02-011(c)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	HQ
Aroclor-1254	0.0518	5.53	9.37E-03
HI			**9E-03**

* SSLs from LANL (2017, 602581).

Table H-4.2-288
Residential Carcinogenic Screening Evaluation for AOC 02-011(c)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Cadmium	0.175	85,900	2.04E-11
Aroclor-1254	0.0518	2.43	2.13E-07
Aroclor-1260	0.12	2.43	4.94E-07
Total Excess Cancer Risk			**7E-07**

* SSLs from NMED (2017, 602273).

Table H-4.2-289
Residential Noncarcinogenic Screening Evaluation for AOC 02-011(c)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Antimony	0.996(U)	31.3	3.18E-02
Cadmium	0.175	70.5	2.48E-03
Nitrate	31.9	125,000	2.55E-04
Perchlorate	0.000559	54.8	1.02E-05
Selenium	1.7	391	4.35E-03
Aroclor-1254	0.0518	1.14	4.54E-02
Toluene	0.000674	5220	1.29E-07
HI			**8E-02**

* SSLs from NMED (2017, 602273).

Table H-4.2-290
Residential Radionuclide Screening Evaluation for AOC 02-011(c)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Strontium-90	0.263	15	4.38E-01
Tritium	0.0308	1700	4.53E-04
		Total Dose	**4E-01**

* SALs from LANL (2015, 600929).

Table H-4.2-291
Industrial Carcinogenic Screening Evaluation for AOC 02-011(d)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Arsenic	8.7	35.9	2.42E-06
Cadmium	0.69	417,000	1.65E-11
Chromium (Total)	240	505	4.75E-06
Aroclor-1254	0.12	11	1.09E-07
Aroclor-1260	0.0831	11.1	7.49E-08
		Total Excess Cancer Risk	**7E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-292
Industrial Noncarcinogenic Screening Evaluation for AOC 02-011(d)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Antimony	0.986(U)	519	1.90E-03
Arsenic	8.7	208	4.18E-02
Cadmium	0.69	1110	6.22E-04
Chromium (Total)	240	314,000	7.64E-04
Copper	41	51,900	7.90E-04
Lead	44.4	800	5.55E-02
Perchlorate	0.00111	908	1.22E-06
Silver	1.1	6490	1.69E-04
Zinc	190	389,000	4.88E-04
Aroclor-1254	0.12	16.4	7.32E-03
		HI	**1E-01**

* SSLs from NMED (2017, 602273).

Table H-4.2-293
Industrial Radionuclide Screening Evaluation for AOC 02-011(d)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	1.66	41	1.01E+00
Cobalt-60	2.19	9	6.08E+00
Plutonium-239/240	1.28	1200	2.67E-02
Tritium	0.082	2,400,000	8.54E-07
Uranium-234	2.66	3100	2.15E-02
		Total Dose	**7E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-294
Recreational Carcinogenic Screening Evaluation for AOC 02-011(d)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Arsenic	8.7	43	2.02E-06
Cadmium	0.69	4,300,000	1.60E-12
Chromium (Total)	240	280	8.57E-06
Aroclor-1254	0.12	10	1.20E-07
Aroclor-1260	0.0831	10	8.31E-08
		Total Excess Cancer Risk	**1E-05**

* SSLs from LANL (2017, 602581).

Table H-4.2-295
Recreational Noncarcinogenic Screening Evaluation for AOC 02-011(d)

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	HQ
Antimony	0.986(U)	250	3.94E-03
Arsenic	8.7	88	9.89E-02
Cadmium	0.69	460	1.50E-03
Chromium (Total)	240	670,000	3.58E-04
Copper	41	25,000	1.64E-03
Lead	44.4	1110	4.00E-02
Perchlorate	0.00111	430	2.58E-06
Silver	1.1	3100	3.55E-04
Zinc	190	190,000	1.00E-03
Aroclor-1254	0.12	5.5	2.18E-02
		HI	**2E-01**

* SSLs from LANL (2017, 602581).

Table H-4.2-296
Recreational Radionuclide Screening Evaluation for AOC 02-011(d)

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	1.66	370	1.12E-01
Cobalt-60	2.19	81	6.76E-01
Plutonium-239/240	1.28	1300	2.46E-02
Tritium	0.082	5,700,000	3.60E-07
Uranium-234	2.66	3900	1.71E-02
		Total Dose	**8E-01**

* SALs from LANL (2015, 600929).

Table H-4.2-297
Residential Carcinogenic Screening Evaluation for AOC 02-011(d)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Arsenic	4.69	7.07	6.63E-06
Cadmium	0.385	85,900	4.48E-11
Chromium (Total)	129	96.6	1.34E-05
Chromium hexavalent ion	0.775	3.05	2.54E-06
Aroclor-1254	0.12	2.43	4.94E-07
Aroclor-1260	0.182	2.43	7.49E-07
Isophorone	0.145	5610	2.58E-10
		Total Excess Cancer Risk	**2E-05**

* SSLs from NMED (2017, 602273).

Table H-4.2-298
Residential Noncarcinogenic Screening Evaluation for AOC 02-011(d)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Antimony	0.722	31.3	2.31E-02
Arsenic	4.69	13	3.61E-01
Cadmium	0.385	70.5	5.46E-03
Chromium (Total)	129	45,200	2.85E-03
Chromium hexavalent ion	0.775	235	3.30E-03
Copper	21.5	3130	6.87E-03
Lead	28.4	400	7.10E-02
Perchlorate	0.00172	54.8	3.14E-05
Silver	1.1	391	2.81E-03
Zinc	160	23,500	6.81E-03
Acetone	0.00917	66,300	1.38E-07
Aroclor-1254	0.12	1.14	1.05E-01
Butanone[2-]	0.0024	37,300	6.43E-08
Isophorone	0.145	12,300	1.18E-05
		HI	**6E-01**

* SSLs from NMED (2017, 602273).

Table H-4.2-299
Residential Radionuclide Screening Evaluation for AOC 02-011(d)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	1.12	12	2.33E+00
Cobalt-60	0.993	2.6	9.55E+00
Plutonium-239/240	0.685	79	2.17E-01
Tritium	0.082	1700	1.21E-03
Uranium-234	1.69	290	1.46E-01
		Total Dose	**1.2E+01**

* SALs from LANL (2015, 600929).

Table H-4.2-300
Industrial Carcinogenic Screening Evaluation for AOC 02-012

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Cadmium	0.883	417,000	2.12E-11
Chromium (Total)	35.5	505	7.03E-07
Benzo(a)anthracene	0.236	32.3	7.31E-08
Benzo(a)pyrene	0.24	23.6	1.02E-07
Benzo(b)fluoranthene	0.421	32.3	1.30E-07
Chrysene	0.24	3230	7.43E-10
Indeno(1,2,3-cd)pyrene	0.189	32.3	5.85E-08
		Total Excess Cancer Risk	**1E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-301
Industrial Noncarcinogenic Screening Evaluation for AOC 02-012

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Cadmium	0.883	1110	7.95E-04
Chromium (Total)	35.5	314,000	1.13E-04
Mercury	2.82	389	7.25E-03
Perchlorate	0.00172	908	1.89E-06
Selenium	1.54	6490	2.37E-04
Zinc	298	389,000	7.66E-04
Acenaphthene	0.0701	50500	1.39E-06
Anthracene	0.17	25,3000	6.72E-07
Benzo(g,h,i)perylene	0.186	25,300[b]	7.35E-06
Di-n-butylphthalate	0.049	91,600	5.35E-07
Dibenzofuran	0.109	1000[c]	1.09E-04
Fluoranthene	0.528	33,700	1.57E-05
Fluorene	0.065	33,700	1.93E-06
Methylnaphthalene[2-]	0.0425	3370	1.26E-05
Naphthalene	0.0929	16,800	5.53E-06
Phenanthrene	0.479	25,300	1.89E-05
Pyrene	0.527	25,300	2.08E-05
		HI	**9E-03**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSL are from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables).

Table H-4.2-302
Industrial Radionuclide Screening Evaluation for AOC 02-012

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Tritium	0.00971	2,400,000	1.01E-07
		Total Dose	**1E-07**

* SALs from LANL (2015, 600929).

Table H-4.2-303
Recreational Carcinogenic Screening Evaluation for AOC 02-012

COPC	EPC (mg/kg)	Recreational SSL* (mg/kg)	Cancer Risk
Cadmium	0.883	4,300,000	2.05E-12
Chromium (Total)	35.5	280	1.27E-06
Benzo(a)anthracene	0.236	89	2.65E-08
Benzo(a)pyrene	0.24	8.9	2.70E-07
Benzo(b)fluoranthene	0.421	89	4.73E-08
Chrysene	0.24	8900	2.70E-10
Indeno(1,2,3-cd)pyrene	0.189	89	2.12E-08
Naphthalene	0.0929	1900	4.89E-10
		Total Excess Cancer Risk	**2E-06**

* SSLs from LANL (2017, 602581).

Table H-4.2-304
Recreational Noncarcinogenic Screening Evaluation for AOC 02-012

COPC	EPC (mg/kg)	Recreational SSL[a] (mg/kg)	HQ
Cadmium	0.883	457	1.93E-03
Chromium (Total)	35.5	669,000	5.31E-05
Mercury	2.82	186	1.52E-02
Perchlorate	0.00172	434	3.96E-06
Selenium	1.54	3100	4.97E-04
Zinc	298	186,000	1.60E-03
Acenaphthene	0.0701	17,300	4.05E-06
Anthracene	0.17	86,300	1.97E-06
Benzo(g,h,i)perylene	0.186	8630[b]	2.16E-05
Di-n-butylphthalate	0.049	32,800	1.49E-06
Dibenzofuran	0.109	619	1.76E-04
Fluoranthene	0.528	11,500	4.59E-05
Fluorene	0.065	11,500	5.65E-06
Methylnaphthalene[2-]	0.0425	1150	3.70E-05
Naphthalene	0.0929	3320	2.80E-05
Phenanthrene	0.479	8630	5.55E-05
Pyrene	0.527	8630	6.11E-05
		HI	**2E-02**

[a] SSLs from LANL (2017, 602581).

[b] Pyrene used as a surrogate based on structural similarity.

Table H-4.2-305
Recreational Radionuclide Screening Evaluation for AOC 02-012

COPC	EPC (pCi/g)	Recreational SAL* (pCi/g)	Dose (mrem/yr)
Tritium	0.00971	5,700,000	4.26E-08
		Total Dose	**4E-08**

* SALs from LANL (2015, 600929).

Table H-4.2-306
Residential Carcinogenic Screening Evaluation for AOC 02-012

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Arsenic	2.25	7.07	3.18E-06
Cadmium	0.883	85,900	1.03E-10
Chromium (Total)	35.5	96.6	3.67E-06
Nickel	3.09	595,000	5.19E-11
Benzo(a)anthracene	0.154	1.53	1.01E-06
Benzo(a)pyrene	0.16	1.12	1.43E-06
Benzo(b)fluoranthene	0.272	1.53	1.78E-06
Chrysene	0.166	153	1.08E-08
Dichlorobenzene[1,4-]	0.000252	1290	1.95E-12
Indeno(1,2,3-cd)pyrene	0.0636	1.53	4.16E-07
Methylene Chloride	0.00416	766	5.43E-11
Trichloroethene	0.000635	15.4	4.12E-10
		Total Excess Cancer Risk	**1E-05**

* SSLs from NMED (2017, 602273).

Table H-4.2-307
Residential Noncarcinogenic Screening Evaluation for AOC 02-012

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Aluminum	3990	78,000	5.12E-02
Antimony	0.172	31.3	5.50E-03
Arsenic	2.25	13	1.73E-01
Barium	48.8	15,600	3.13E-03
Cadmium	0.883	70.5	1.25E-02
Chromium (Total)	35.5	45,200	7.85E-04
Copper	8	3130	2.56E-03
Iron	8480	54,800	1.55E-01
Manganese	324	10,500	3.09E-02

Table H-4.2-307 (continued)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Mercury	1.33	23.5	5.66E-02
Nickel	3.09	1560	1.98E-03
Perchlorate	0.00152	54.8	2.77E-05
Selenium	1.51	391	3.86E-03
Vanadium	9.38	394	2.38E-02
Zinc	159	23,500	6.77E-03
Acenaphthene	0.0536	3480	1.54E-05
Anthracene	0.0738	17,400	4.24E-06
Benzo(g,h,i)perylene	0.0681	1740[b]	3.91E-05
Di-n-butylphthalate	0.0678	6160	1.10E-05
Dibenzofuran	0.109	73[c]	1.49E-03
Dichlorobenzene[1,4-]	0.000252	5480	4.60E-08
Fluoranthene	0.449	2320	1.94E-04
Fluorene	0.0497	2320	2.14E-05
Methylene Chloride	0.00416	409	1.02E-05
Methylnaphthalene[2-]	0.038	232	1.64E-04
Naphthalene	0.0806	1160	6.95E-05
Phenanthrene	0.243	1740	1.40E-04
Pyrene	0.341	1740	1.96E-04
Trichloroethene	0.000635	6.72	9.45E-05
		HI	**5E-01**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] Isopropyl benzene used as a surrogate based on structural similarity.

Table H-4.2-308
Residential Radionuclide Screening Evaluation for AOC 02-012

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Americium-241	0.0987	83	2.97E-02
Plutonium-239/240	0.228	79	7.22E-02
Tritium	0.144	1700	2.12E-03
		Total Dose	**1E-01**

* SALs from LANL (2015, 600929).

Table H-4.2-309
Industrial TPH Screening Evaluation for AOC 02-012

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Total Petroleum Hydrocarbons Diesel Range Organics	80.6	3000	2.69E-02
		TPH	**3E-02**

* SSLs from NMED (2017, 602273).

Table H-4.2-310
Residential TPH Screening Evaluation for AOC 02-012

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Total Petroleum Hydrocarbons Diesel Range Organics	24.3	1000	2.43E-02
		TPH	**2E-02**

* SSLs from NMED (2017, 602273).

Table H-4.2-311
Construction Worker Noncarcinogenic Screening Evaluation for AOC 02-012

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Aluminum	3990	41,400	9.64E-02
Antimony	0.172	142	1.21E-03
Arsenic	2.25	41.2	5.46E-02
Barium	48.8	4390	1.11E-02
Cadmium	0.883	72.1	1.22E-02
Chromium (Total)	35.5	134	2.65E-01
Copper	8	14,200	5.63E-04
Iron	8480	248,000	3.42E-02
Manganese	324	464	6.98E-01
Mercury	1.33	77.1	1.73E-02
Nickel	3.09	753	4.10E-03
Perchlorate	0.00152	248	6.13E-06
Selenium	1.51	1750	8.63E-04
Vanadium	9.38	614	1.53E-02
Zinc	159	106,000	1.50E-03
Acenaphthene	0.0536	15,100	3.55E-06
Anthracene	0.0738	753,00	9.80E-07
Benzo(a)pyrene	0.16	106	1.51E-03

Table H-4.2-311 (continued)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Benzo(g,h,i)perylene	0.0681	7530[b]	9.04E-06
Di-n-butylphthalate	0.0678	26,900	2.52E-06
Dibenzofuran	0.109	354[c]	3.08E-04
Dichlorobenzene[1,4-]	0.000252	24,800	1.02E-08
Fluoranthene	0.449	10,000	4.49E-05
Fluorene	0.0497	10,000	4.97E-06
Methylene Chloride	0.00416	1200	1.81E-06
Methylnaphthalene[2-]	0.038	1000	3.80E-05
Naphthalene	0.0806	5020	1.61E-05
Phenanthrene	0.243	7530	3.23E-05
Pyrene	0.341	7530	4.53E-05
Trichloroethene	0.000635	6.84	9.28E-05
		HI	**1**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] Construction worker SSL calculated using toxicity value from EPA regional screening tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables) and equation and parameters from NMED (2017, 602273).

Table H-4.2-312
Construction Worker Carcinogenic Screening Evaluation for SWMU 21-006(e) and AOC 21-006(f)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Arsenic	2.07	216	9.58E-08
Nickel	7.78	25,000	3.11E-09
Aroclor-1254	0.14	85.3	1.64E-08
Aroclor-1260	0.159	85.3	1.86E-08
Bis(2-ethylhexyl)phthalate	0.22	13,400	1.64E-10
Dichlorobenzene[1,4-]	0.00049	45,900	1.07E-13
Ethylbenzene	0.0016	1760	9.09E-12
Methylene Chloride	0.00672	89,300	7.53E-13
		Total Excess Cancer Risk	**1E-07**

* SSLs from NMED (2017, 602273).

Table H-4.2-313
Construction Worker Noncarcinogenic Screening Evaluation for SWMU 21-006(e) and AOC 21-006(f)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Antimony	0.48	142	3.38E-03
Arsenic	2.07	41.2	5.02E-02
Barium	86.5	4390	1.97E-02
Copper	2.72	14,200	1.92E-04
Cyanide (Total)	0.44	12	3.67E-02
Lead	11.1	800	1.39E-02
Mercury	0.0483	77.1	6.26E-04
Nickel	7.78	753	1.03E-02
Selenium	0.372	1750	2.13E-04
Zinc	30.2	106,000	2.85E-04
Acetone	0.0139	241,000	5.77E-08
Aroclor-1254	0.14	4.91	2.85E-02
Bis(2-ethylhexyl)phthalate	0.22	5380	4.09E-05
Bromobenzene	0.00047	1520[b]	3.09E-07
Butylbenzene[n-]	0.0011	15,500[b]	7.10E-08
Butylbenzene[sec-]	0.00041	15,500[b]	2.65E-08
Dichlorobenzene[1,2-]	0.00051	2470	2.06E-07
Dichlorobenzene[1,3-]	0.00047	2470[c]	1.90E-07
Dichlorobenzene[1,4-]	0.00049	24,800	1.98E-08
Ethylbenzene	0.0016	5750	2.78E-07
Isopropyltoluene[4-]	0.0021	2740[d]	7.66E-07
Methylene Chloride	0.00672	1200	5.60E-06
Toluene	0.000789	14,000	5.64E-08
Trimethylbenzene[1,2,4-]	0.000671	329[b]	2.04E-06
Trimethylbenzene[1,3,5-]	0.0024	3100[b]	7.74E-07
Xylene (Total)	0.0092	791	1.16E-05
		HI	**2E-01**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] Construction worker SSL calculated using toxicity value from EPA regional screening tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables) and equation and parameters from NMED (2017, 602273).

[c] Dichlorobenzene[1,2-] used as a surrogate based on structural similarity.

[d] Isopropyl benzene used as a surrogate based on structural similarity.

Table H-4.2-314
Construction Worker Radionuclide Screening Evaluation for SWMU 21-006(e) and AOC 21-006(f)

COPC	EPC (pCi/g)	Construction Worker SAL* (pCi/g)	Dose (mrem/yr)
Americium-241	0.942	230	1.02E-01
Cesium-134	0.068	15	1.13E-01
Cesium-137	0.269	37	1.82E-01
Plutonium-238	0.0874	230	9.50E-03
Plutonium-239/240	33.3	200	4.16E+00
Tritium	0.286	1,600,000	4.47E-06
Uranium-234	30.3	1000	7.58E-01
Uranium-235/236	1.41	130	2.71E-01
		Total Dose	**6E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-315
Residential Carcinogenic Screening Evaluation for SWMU 21-006(e) and AOC 21-006(f)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Arsenic	2.07	7.07	2.93E-06
Nickel	7.78	595,000	1.31E-10
Aroclor-1254	0.14	2.43	5.76E-07
Aroclor-1260	0.159	2.43	6.54E-07
Bis(2-ethylhexyl)phthalate	0.22	380	5.79E-09
Dichlorobenzene[1,4-]	0.00049	1290	3.80E-12
Ethylbenzene	0.0016	74.5	2.15E-10
Methylene Chloride	0.00672	766	8.77E-11
		Total Excess Cancer Risk	**4E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-316
Residential Noncarcinogenic Screening
Evaluation for SWMU 21-006(e) and AOC 21-006(f)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	0.48	31.3	1.53E-02
Arsenic	2.07	13	1.59E-01
Barium	86.5	15,600	5.54E-03
Copper	2.72	3130	8.69E-04
Cyanide (Total)	0.44	11.1	3.96E-02
Lead	11.1	400	2.78E-02
Mercury	0.0483	23.5	2.06E-03
Nickel	7.78	1560	4.99E-03
Selenium	0.372	391	9.51E-04
Zinc	30.2	23,500	1.29E-03
Acetone	0.0139	66,300	2.10E-07
Aroclor-1254	0.14	1.14	1.23E-01
Bis(2-ethylhexyl)phthalate	0.22	1230	1.79E-04
Bromobenzene	0.00047	290[b]	1.62E-06
Butylbenzene[n-]	0.0011	3900[b]	2.82E-07
Butylbenzene[sec-]	0.00041	7800[b]	5.26E-08
Dichlorobenzene[1,2-]	0.00051	2140	2.38E-07
Dichlorobenzene[1,3-]	0.00047	2140[c]	2.20E-07
Dichlorobenzene[1,4-]	0.00049	5480	8.94E-08
Ethylbenzene	0.0016	3920	4.08E-07
Isopropyltoluene[4-]	0.0021	2360[d]	8.90E-07
Methylene Chloride	0.00672	409	1.64E-05
Toluene	0.000789	5220	1.51E-07
Trimethylbenzene[1,2,4-]	0.000671	300[b]	2.24E-06
Trimethylbenzene[1,3,5-]	0.0024	270[b]	8.89E-06
Xylene (Total)	0.0092	863	1.07E-05
		HI	**4E-01**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] SSL are from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables).

[c] Dichlorobenzene[1,2-] used as a surrogate based on structural similarity.

[d] Isopropyl benzene used as a surrogate based on structural similarity.

Table H-4.2-317
Residential Radionuclide Screening Evaluation for SWMU 21-006(e) and AOC 21-006(f)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Americium-241	0.942	83	2.84E-01
Cesium-134	0.068	5	3.40E-01
Cesium-137	0.269	12	5.60E-01
Plutonium-238	0.0874	84	2.60E-02
Plutonium-239/240	33.3	79	1.05E+01
Tritium	0.286	1700	4.21E-03
Uranium-234	30.3	290	2.61E+00
Uranium-235/236	1.41	42	8.39E-01
		Total Dose	**2E+01**

* SALs from LANL (2015, 600929).

Table H-4.2-318
Construction Worker Carcinogenic Screening Evaluation for AOC 21-028(c)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	Cancer Risk
Chromium (Total)	9.47	468	2.02E-07
Nickel	4.39	25,000	1.76E-09
Aroclor-1242	0.0659	85.3	7.73E-09
Aroclor-1248	0.01	85.3	1.17E-09
Aroclor-1254	0.106	85.3	1.24E-08
Aroclor-1260	0.0151	85.3	1.77E-09
Benzo(a)anthracene	0.0828	240	3.45E-09
Benzo(a)pyrene	0.076	173	4.39E-09
Benzo(b)fluoranthene	0.0731	240	3.05E-09
Benzo(k)fluoranthene	0.0697	2310	3.02E-10
Bis(2-ethylhexyl)phthalate	0.156	13,400	1.16E-10
Butylbenzylphthalate	0.042	5380[b]	7.81E-11
Chrysene	0.105	23,100	4.55E-11
Ethylbenzene	0.00036	1760	2.05E-12
Indeno(1,2,3-cd)pyrene	0.0715	240	2.98E-09
Methylene Chloride	0.00578	89,300	6.47E-13
Tetrachloroethene	0.0014	7840	1.79E-12
		Total Excess Cancer Risk	**2E-07**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] Construction worker SSL calculated using toxicity value from EPA regional screening tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables) and equation and parameters from NMED (2017, 602273).

Table H-4.2-319
Construction Worker Noncarcinogenic Screening Evaluation for AOC 21-028(c)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Antimony	1.04	142	7.32E-03
Barium	88.7	4390	2.02E-02
Chromium (Total)	9.47	134	7.07E-02
Copper	6.77	14,200	4.77E-04
Cyanide (Total)	0.16	12	1.33E-02
Lead	16.7	800	2.09E-02
Mercury	0.312	77.1	4.05E-03
Nickel	4.39	753	5.83E-03
Perchlorate	0.0048	248	1.94E-05
Selenium	0.19	1750	1.09E-04
Vanadium	22.1	614	3.60E-02
Zinc	31.9	106,000	3.01E-04
Acetone	0.0153	241,000	6.35E-08
Anthracene	0.048	75,300	6.37E-07
Aroclor-1254	0.106	4.91	2.16E-02
Benzo(a)pyrene	0.076	106	7.17E-04
Benzo(g,h,i)perylene	0.068	7530[b]	9.03E-06
Benzoic Acid	0.4	1,080,000[c]	3.70E-07
Bis(2-ethylhexyl)phthalate	0.156	5380	2.90E-05
Bromobenzene	0.00053	1520[c]	3.49E-07
Dichlorobenzene[1,2-]	0.00054	2470	2.19E-07
Dichlorobenzene[1,3-]	0.00049	2470[d]	1.98E-07
Ethylbenzene	0.00036	5750	6.26E-08
Fluoranthene	0.152	10,000	1.52E-05
Isopropyltoluene[4-]	0.0041	2740[e]	1.50E-06
Methylene Chloride	0.00578	1200	4.82E-06
Phenanthrene	0.104	7530	1.38E-05
Pyrene	0.132	7530	1.75E-05
Tetrachloroethene	0.0014	119	1.18E-05
Toluene	0.000598	14,000	4.27E-08
Trimethylbenzene[1,2,4-]	0.000457	329[c]	1.39E-06
Xylene (Total)	0.0018	791	2.28E-06
		HI	**2E-01**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] Construction worker SSL calculated using toxicity value from EPA regional screening tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables) and equation and parameters from NMED (2017, 602273).

[d] Dichlorobenzene[1,2-] used as a surrogate based on structural similarity.

[e] Isopropyl benzene used as a surrogate based on structural similarity.

Table H-4.2-320
Construction Worker Radionuclide Screening Evaluation for AOC 21-028(c)

COPC	EPC (pCi/g)	Construction Worker SAL* (pCi/g)	Dose (mrem/yr)
Americium-241	0.947	230	1.03E-01
Cesium-137	0.225	37	1.52E-01
Plutonium-238	2.45	230	2.66E-01
Plutonium-239/240	7.26	200	9.08E-01
Tritium	0.238	1,600,000	3.72E-06
Uranium-234	1.55	1000	3.88E-02
Uranium-235/236	0.0589	130	1.13E-02
		Total Dose	**2E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-321
Residential Carcinogenic Screening Evaluation for AOC 21-028(c)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Cancer Risk
Chromium (Total)	9.47	96.6	9.80E-07
Nickel	4.39	595,000	7.38E-11
Aroclor-1242	0.0659	2.43	2.71E-07
Aroclor-1248	0.01	2.43	4.12E-08
Aroclor-1254	0.106	2.43	4.36E-07
Aroclor-1260	0.0151	2.43	6.21E-08
Benzo(a)anthracene	0.0828	1.53	5.41E-07
Benzo(a)pyrene	0.076	1.12	6.79E-07
Benzo(b)fluoranthene	0.0731	1.53	4.78E-07
Benzo(k)fluoranthene	0.0697	15.3	4.56E-08
Bis(2-ethylhexyl)phthalate	0.156	380	4.11E-09
Butylbenzylphthalate	0.042	2900[b]	1.45E-10
Chrysene	0.105	153	6.86E-09
Ethylbenzene	0.00036	74.5	4.83E-11
Indeno(1,2,3-cd)pyrene	0.0715	1.53	4.67E-07
Methylene Chloride	0.00578	766	7.55E-11
Tetrachlorodibenzodioxin[2,3,7,8-]	0.000000313	0.000049	6.39E-08
Tetrachloroethene	0.0014	335	4.18E-11
		Total Excess Cancer Risk	**4E-06**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] SSL are from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables).

Table H-4.2-322
Residential Noncarcinogenic Screening Evaluation for AOC 21-028(c)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	1.04	31.3	3.32E-02
Barium	88.7	15,600	5.69E-03
Chromium (Total)	9.47	45,200	2.10E-04
Copper	6.77	3130	2.16E-03
Cyanide (Total)	0.16	11.1	1.44E-02
Lead	16.7	400	4.18E-02
Mercury	0.312	23.5	1.33E-02
Nickel	4.39	1560	2.81E-03
Perchlorate	0.0048	54.8	8.76E-05
Selenium	0.19	391	4.86E-04
Vanadium	22.1	394	5.61E-02
Zinc	31.9	23,500	1.36E-03
Acetone	0.0153	66,300	2.31E-07
Anthracene	0.048	17,400	2.76E-06
Aroclor-1254	0.106	1.14	9.30E-02
Benzo(g,h,i)perylene	0.068	1740[b]	3.91E-05
Benzoic Acid	0.4	250,000[c]	1.60E-06
Bis(2-ethylhexyl)phthalate	0.156	1230	1.27E-04
Bromobenzene	0.00053	290[c]	1.83E-06
Dichlorobenzene[1,2-]	0.00054	2140	2.52E-07
Dichlorobenzene[1,3-]	0.00049	2140[d]	2.29E-07
Ethylbenzene	0.00036	3920	9.18E-08
Fluoranthene	0.152	2320	6.55E-05
Isopropyltoluene[4-]	0.0041	2360[e]	1.74E-06
Methylene Chloride	0.00578	409	1.41E-05
Phenanthrene	0.104	1740	5.98E-05
Pyrene	0.132	1740	7.59E-05
Tetrachloroethene	0.0014	110	1.27E-05
Toluene	0.000598	5220	1.15E-07
Trimethylbenzene[1,2,4-]	0.000457	300[c]	1.52E-06
Xylene (Total)	0.0018	863	2.09E-06
		HI	**3E-01**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSL are from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables).

[d] Dichlorobenzene[1,2-] used as a surrogate based on structural similarity.

[e] Isopropyl benzene used as a surrogate based on structural similarity.

Table H-4.2-323
Residential Radionuclide Screening Evaluation for AOC 21-028(c)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Americium-241	0.947	83	2.85E-01
Cesium-137	0.225	12	4.69E-01
Plutonium-238	2.45	84	7.29E-01
Plutonium-239/240	7.26	79	2.30E+00
Tritium	0.238	1700	3.50E-03
Uranium-234	1.55	290	1.34E-01
Uranium-235/236	0.0589	42	3.51E-02
		Total Dose	**4E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-324
Industrial Carcinogenic Screening Evaluation for SWMU 26-001

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Arsenic	2.71	35.9	7.55E-07
Aroclor-1248	0.073	10.7	6.82E-08
		Total Excess Cancer Risk	**8E-07**

* SSLs from NMED (2017, 602273).

Table H-4.2-325
Industrial Noncarcinogenic Screening Evaluation for SWMU 26-001

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Antimony	15.5	519	2.99E-02
Arsenic	2.71	208	1.30E-02
Cyanide (Total)	0.74	62.8	1.18E-02
Nitrate	2.96	2,080,000	1.42E-06
Perchlorate	0.0012	908	1.32E-06
Selenium	6.78	6490	1.04E-03
		HI	**6E-02**

* SSLs from NMED (2017, 602273).

Table H-4.2-326
Industrial Radionuclide Screening Evaluation for SWMU 26-001

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	0.261	41	1.59E-01
Strontium-90	0.164	2400	1.71E-03
Tritium	0.229	2,400,000	2.39E-06
Uranium-235/236	0.139	160	2.17E-02
		Total Dose	**2E-01**

* SALs from LANL (2015, 600929).

Table H-4.2-327
Construction Worker Carcinogenic Screening Evaluation for SWMU 26-001

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Arsenic	2.06	216	9.54E-08
Chromium (Total)	5.93	468	1.27E-07
Nickel	5.35	25,000	2.14E-09
Aroclor-1248	0.073	85.3	8.56E-09
		Total Excess Cancer Risk	**2E-07**

* SSLs from NMED (2017, 602273).

Table H-4.2-328
Construction Worker Noncarcinogenic Screening Evaluation for SWMU 26-001

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Antimony	15.5	142	1.09E-01
Arsenic	2.06	41.2	5.00E-02
Chromium (Total)	5.93	134	4.43E-02
Copper	5.17	14,200	3.64E-04
Cyanide (Total)	0.205	12	1.71E-02
Nickel	5.35	753	7.10E-03
Nitrate	4.97	566,000	8.78E-06
Perchlorate	0.00136	248	5.48E-06
Selenium	6.29	1750	3.59E-03
Isopropyltoluene[4-]	0.00237	2740[b]	8.65E-07
Toluene	0.000728	14000	5.20E-08
		HI	**2E-01**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] Isopropyl benzene used as a surrogate based on structural similarity.

Table H-4.2-329
Construction Worker Radionuclide Screening Evaluation for SWMU 26-001

COPC	EPC (pCi/g)	Construction Worker SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	0.0728	37	4.92E-02
Plutonium-238	1.43	230	1.55E-01
Plutonium-239/240	0.154	200	1.93E-02
Strontium-90	0.164	1400	2.93E-03
Tritium	0.173	1,600,000	2.70E-06
Uranium-235/236	0.0431	130	8.29E-03
		Total Dose	**2E-01**

* SALs from LANL (2015, 600929).

Table H-4.2-330
Residential Carcinogenic Screening Evaluation for SWMU 26-001

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Arsenic	2.06	7.07	2.91E-06
Chromium (Total)	5.93	96.6	6.14E-07
Nickel	5.35	595,000	8.99E-11
Aroclor-1248	0.073	2.43	3.00E-07
		Total Excess Cancer Risk	**4E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-331
Residential Noncarcinogenic Screening Evaluation for SWMU 26-001

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	15.5	31.3	4.95E-01
Arsenic	2.06	13	1.58E-01
Chromium (Total)	5.93	45,200	1.31E-04
Copper	5.17	3130	1.65E-03
Cyanide (Total)	0.205	11.1	1.85E-02
Nickel	5.35	1560	3.43E-03
Nitrate	4.97	125,000	3.98E-05
Perchlorate	0.00136	54.8	2.48E-05
Selenium	6.29	391	1.61E-02
Isopropyltoluene[4-]	0.00237	2360[b]	1.00E-06
Toluene	0.000728	5220	1.39E-07
		HI	**7E-01**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] Isopropyl benzene used as a surrogate based on structural similarity.

Table H-4.2-332
Residential Radionuclide Screening Evaluation for SWMU 26-001

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	0.0728	12	1.52E-01
Plutonium-238	1.43	84	4.26E-01
Plutonium-239/240	0.154	79	4.87E-02
Strontium-90	0.164	15	2.73E-01
Tritium	0.173	1700	2.54E-03
Uranium-235/236	0.0431	42	2.57E-02
		Total Dose	**9E-01**

* SALs from LANL (2015, 600929).

Table H-4.2-333
Industrial Carcinogenic Screening Evaluation for SWMU 26-002(a)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Arsenic	4.53	35.9	1.26E-06
Chromium (Total)	17.4	505	3.45E-07
Nickel	9.2	2,890,000	3.18E-11
		Total Excess Cancer Risk	**2E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-334
Industrial Noncarcinogenic Screening Evaluation for SWMU 26-002(a)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Antimony	1.03(U)	519	1.98E-03
Arsenic	4.53	208	2.18E-02
Barium	89.2	255,000	3.50E-04
Cadmium	0.123	1110	1.11E-04
Chromium (Total)	17.4	314,000	5.54E-05
Copper	8.15	51,900	1.57E-04
Nickel	9.2	25,700	3.58E-04
Perchlorate	0.000665	908	7.32E-07
Selenium	9.95	6490	1.53E-03
Thallium	0.206	13	1.58E-02
Toluene	0.000377	61,100	6.17E-09
		HI	**4E-02**

* SSLs from NMED (2017, 602273).

Table H-4.2-335
Industrial Radionuclide Screening Evaluation for SWMU 26-002(a)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	0.311	41	1.90E-01
Tritium	0.0225	2,400,000	2.34E-07
Uranium-235/236	0.0918	160	1.43E-02
		Total Dose	**2E-01**

* SALs from LANL (2015, 600929).

Table H-4.2-336
Construction Worker Carcinogenic Screening Evaluation for SWMU 26-002(a)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Arsenic	3.27	216	1.51E-07
Chromium (Total)	9.6	468	2.05E-07
Nickel	5.9	25,000	2.36E-09
Aroclor-1260	0.0041	85.3	4.81E-10
		Total Excess Cancer Risk	**4E-07**

* SSLs from NMED (2017, 602273).

Table H-4.2-337
Construction Worker Noncarcinogenic Screening Evaluation for SWMU 26-002(a)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Antimony	0.237	142	1.67E-03
Arsenic	3.27	41.2	7.94E-02
Barium	67	4390	1.53E-02
Chromium (Total)	9.6	134	7.16E-02
Copper	4.24	14,200	2.99E-04
Nickel	5.9	753	7.84E-03
Perchlorate	0.00127	248	5.12E-06
Selenium	8.52	1750	4.87E-03
Thallium	0.128	3.54	3.62E-02
Hexanone[2-]	0.00218	1760[b]	1.24E-06
Toluene	0.00106	14,000	7.57E-08
		HI	**2E-01**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] Construction worker SSL calculated using toxicity value from EPA regional screening tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables) and equation and parameters from NMED (2017, 602273).

Table H-4.2-338
Construction Worker Radionuclide Screening Evaluation for SWMU 26-002(a)

COPC	EPC (pCi/g)	Construction Worker SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	0.415	37	2.80E-01
Plutonium-239/240	0.0769	200	9.61E-03
Strontium-90	0.13	1400	2.32E-03
Tritium	0.149	1,600,000	2.33E-06
Uranium-235/236	0.0679	130	1.31E-02
		Total Dose	**3E-01**

* SALs from LANL (2015, 600929).

Table H-4.2-339
Residential Carcinogenic Screening Evaluation for SWMU 26-002(a)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Arsenic	3.27	7.07	4.63E-06
Chromium (Total)	9.6	96.6	9.94E-07
Nickel	5.9	5950,00	9.92E-11
Aroclor-1260	0.0041	2.43	1.69E-08
		Total Excess Cancer Risk	**6E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-340
Residential Noncarcinogenic Screening Evaluation for SWMU 26-002(a)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	0.237	31.3	7.57E-03
Arsenic	3.27	13	2.52E-01
Barium	67	15,600	4.29E-03
Chromium (Total)	9.6	45,200	2.12E-04
Copper	4.24	3130	1.35E-03
Nickel	5.9	1560	3.78E-03
Perchlorate	0.00127	54.8	2.32E-05
Selenium	8.52	391	2.18E-02
Thallium	0.128	0.78	1.64E-01
Hexanone[2-]	0.00218	200[b]	1.09E-05
Toluene	0.00106	5220	2.03E-07
		HI	**5E-01**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] SSL are from EPA regional screening tables (https://www.epa.gov/regional-screening-levels-rsls-generic-tables).

Table H-4.2-341
Residential Radionuclide Screening Evaluation for SWMU 26-002(a)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	0.415	12	8.65E-01
Plutonium-239/240	0.0769	79	2.43E-02
Strontium-90	0.13	15	2.17E-01
Tritium	0.149	1700	2.19E-03
Uranium-235/236	0.0679	42	4.04E-02
		Total Dose	**1E+00**

* SALs from LANL (2015, 600929).

Table H-4.2-342
Industrial Carcinogenic Screening Evaluation for SWMU 26-002(b)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Arsenic	4.27	35.9	1.19E-06
Nickel	7.62	2,890,000	2.64E-11
		Total Excess Cancer Risk	**1E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-343
Industrial Noncarcinogenic Screening Evaluation for SWMU 26-002(b)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Arsenic	4.27	208	2.05E-02
Nickel	0.0014	25,700	1.54E-06
Perchlorate	0.0014	908	1.54E-06
Selenium	17	6490	2.62E-03
		HI	**2E-02**

* SSLs from NMED (2017, 602273).

Table H-4.2-344
Industrial Radionuclide Screening Evaluation for SWMU 26-002(b)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Tritium	0.0174	2,400,000	1.81E-07
Uranium-235/236	0.187	160	2.92E-02
		Total Dose	**3E-02**

* SALs from LANL (2015, 600929).

Table H-4.2-345
Construction Worker Carcinogenic Screening Evaluation for SWMU 26-002(b)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Arsenic	3	216	1.39E-07
Chromium (Total)	6.88	468	1.47E-07
Nickel	5.65	25,000	2.26E-09
Aroclor-1260	0.0073	85.3	8.56E-10
		Total Excess Cancer Risk	**3E-07**

* SSLs from NMED (2017, 602273).

Table H-4.2-346
Construction Worker Noncarcinogenic Screening Evaluation for SWMU 26-002(b)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	HQ
Arsenic	3	41.2	7.28E-02
Chromium (Total)	6.88	134	5.13E-02
Nickel	5.65	753	7.50E-03
Perchlorate	0.0014	248	5.65E-06
Thallium	0.128	3.54	3.62E-02
Selenium	8.37	1750	4.78E-03
Acetone	0.00331	24,1000	1.37E-08
Toluene	0.000579	14,000	4.14E-08
		HI	**2E-01**

* SSLs from NMED (2017, 602273).

Table H-4.2-347
Construction Worker Radionuclide Screening Evaluation for SWMU 26-002(b)

COPC	EPC (pCi/g)	Construction Worker SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	0.2	37	1.35E-01
Tritium	0.0233	1,600,000	3.64E-07
Uranium-235/236	0.187	130	3.60E-02
Total Dose			1E-01

* SALs from LANL (2015, 600929).

Table H-4.2-348
Residential Carcinogenic Screening Evaluation for SWMU 26-002(b)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Arsenic	3	7.07	4.24E-06
Chromium (Total)	6.88	96.6	7.12E-07
Nickel	5.65	595,000	9.50E-11
Aroclor-1260	0.0073	2.43	3.00E-08
		Total Excess Cancer Risk	**5E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-349
Residential Noncarcinogenic Screening Evaluation for SWMU 26-002(b)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	HQ
Arsenic	3	13	2.31E-01
Chromium (Total)	6.88	45,200	1.52E-04
Nickel	5.65	1560	3.62E-03
Perchlorate	0.0014	54.8	2.55E-05
Selenium	8.37	391	2.14E-02
Thallium	0.128	0.78	1.64E-01
Acetone	0.00331	66,300	4.99E-08
Toluene	0.000579	5220	1.11E-07
		HI	**4E-01**

* SSLs from NMED (2017, 602273).

Table H-4.2-350
Residential Radionuclide Screening Evaluation for SWMU 26-002(b)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	0.2	12	4.17E-01
Tritium	0.0233	1700	3.43E-04
Uranium-235/236	0.187	42	1.11E-01
		Total Dose	**4E-01**

* SALs from LANL (2015, 600929).

Table H-4.2-351
Industrial Carcinogenic Screening Evaluation for SWMU 26-003

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	Cancer Risk
Arsenic	2.7	35.9	7.52E-07
Chromium (Total)	6.2	505	1.23E-07
Aroclor-1260	0.0513	11.1	4.62E-08
		Total Excess Cancer Risk	**2E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-352
Industrial Noncarcinogenic Screening Evaluation for SWMU 26-003

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Arsenic	2.7	208	1.30E-02
Barium	115	255,000	4.51E-04
Chromium (Total)	6.2	314,000	1.97E-05
Copper	5.7	51,900	1.10E-04
Nitrate	4.5	2,080,000	2.16E-06
Perchlorate	0.00194	908	2.14E-06
Selenium	2.3	6490	3.54E-04
Acetone	0.00452	959,000	4.71E-09
Toluene	0.000676	61100	1.11E-08
		HI	**3E-02**

* SSLs from NMED (2017, 602273).

Table H-4.2-353
Industrial Radionuclide Screening Evaluation for SWMU 26-003

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	0.569	41	3.47E-01
Plutonium-239/240	0.0269	1200	5.60E-04
Tritium	0.178	2,400,000	1.85E-06
		Total Dose	**3E-01**

* SALs from LANL (2015, 600929).

Table H-4.2-354
Construction Worker Carcinogenic Screening Evaluation for SWMU 26-003

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Arsenic	3.83	216	1.77E-07
Chromium (Total)	8.26	468	1.76E-07
Aroclor-1248	0.0301	85.3	3.53E-09
Aroclor-1260	0.0513	85.3	6.01E-09
		Total Excess Cancer Risk	**4E-07**

* SSLs from NMED (2017, 602273).

Table H-4.2-355
Construction Worker Noncarcinogenic Screening Evaluation for SWMU 26-003

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Arsenic	3.83	41.2	9.30E-02
Barium	62.7	4390	1.43E-02
Chromium (Total)	8.26	134	6.16E-02
Copper	3.89	14,200	2.74E-04
Cyanide (Total)	0.611	12	5.09E-02
Nitrate	6.1	566,000	1.08E-05
Perchlorate	0.00166	248	6.69E-06
Selenium	8.42	1750	4.81E-03
Acetone	0.00596	241,000	2.47E-08
Isopropyltoluene[4-]	0.000896	2740[b]	3.27E-07
Toluene	0.000915	14,000	6.54E-08
		HI	**2E-01**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] Isopropyl benzene used as a surrogate based on structural similarity.

Table H-4.2-356
Construction Worker Radionuclide Screening Evaluation for SWMU 26-003

COPC	EPC (pCi/g)	Construction Worker SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	0.569	37	3.84E-01
Plutonium-239/240	0.0269	200	3.36E-03
Tritium	0.273	1,600,000	4.27E-06
Uranium-235/236	0.0666	130	1.28E-02
		Total Dose	**4E-01**

* SALs from LANL (2015, 600929).

Table H-4.2-357
Residential Carcinogenic Screening Evaluation for SWMU 26-003

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Arsenic	3.83	7.07	5.42E-06
Chromium (Total)	8.26	96.6	8.55E-07
Aroclor-1248	0.0301	2.43	1.24E-07
Aroclor-1260	0.0513	2.43	2.11E-07
		Total Excess Cancer Risk	**7E-06**

* SSLs from NMED (2017, 602273).

Table H-4.2-358
Residential Noncarcinogenic Screening Evaluation for SWMU 26-003

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Arsenic	3.83	13	2.95E-01
Barium	62.7	15,600	4.02E-03
Chromium (Total)	8.26	45,200	1.83E-04
Copper	3.89	3130	1.24E-03
Cyanide (Total)	0.611	11.1	5.50E-02
Nitrate	6.1	125,000	4.88E-05
Perchlorate	0.00166	54.8	3.03E-05
Selenium	8.42	391	2.15E-02
Acetone	0.00596	66,300	8.99E-08
Isopropyltoluene[4-]	0.000896	2360[b]	3.80E-07
Toluene	0.000915	5220	1.75E-07
		HI	**4E-01**

[a] SSLs from NMED (2017, 602273) unless otherwise noted.

[b] Isopropyl benzene used as a surrogate based on structural similarity.

Table H-4.2-359
Residential Radionuclide Screening Evaluation for SWMU 26-003

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Cesium-137	0.569	12	1.19E+00
Plutonium-239/240	0.0269	79	8.51E-03
Tritium	0.273	1700	4.01E-03
Uranium-235/236	0.0666	42	3.98E-02
		Total Dose	**1E+00**

* SALs from LANL (2015, 600929).

Table H-4.4-1
Essential Nutrient Screening Assessment

SWMU/AOC	Scenario	COPC	Maximum Concentration (mg/kg)	SSL (mg/kg)*	Ratio
02-003(d)	Construction worker	Calcium	3850	11,100,000	3.47E-04
02-003(d)	Resident	Calcium	3850	13,000,000	2.96E-04
02-003(d)	Resident	Magnesium	2380	20,900,000	1.14E-04
02-011(d)	Industrial worker	Calcium	11,000	40,600,000	2.71E-04
02-011(d)	Construction worker	Calcium	19,400	11,100,000	1.75E-03
02-011(d)	Resident	Calcium	19,400	13,000,000	1.49E-03
21-006(e) AOC 21-006(f)	Construction worker	Calcium	18,600	11,100,000	1.68E-03
21-006(e) AOC 21-006(f)	Resident	Calcium	18,600	13,000,000	1.43E-03
21-028(c)	Construction worker	Calcium	46,200	11,100,000	4.16E-03
21-028(c)	Resident	Calcium	46,200	13,000,000	3.55E-03
26-001	Industrial worker	Calcium	15,100	40,600,000	3.72E-04
26-001	Construction worker	Calcium	20,900	11,100,000	1.88E-03
26-001	Resident	Calcium	20,900	13,000,000	1.61E-03
26-002(a)	Industrial worker	Calcium	29,600	40,600,000	7.29E-04
26-002(a)	Construction worker	Calcium	30,400	11,100,000	2.74E-03
26-002(a)	Resident	Calcium	30,400	13,000,000	2.34E-03
26-002(b)	Industrial worker	Calcium	28,100	40,600,000	6.92E-04
26-002(b)	Construction worker	Calcium	28,100	11,100,000	2.53E-03
26-002(b)	Resident	Calcium	28,100	13,000,000	2.16E-03
26-003	Industrial worker	Calcium	18,700	40,600,000	4.61E-04
26-003	Construction worker	Calcium	23,900	11,100,000	2.15E-03
26-003	Resident	Calcium	23,900	13,000,000	1.84E-03

* SSLs from NMED (2017, 602273).

Table H-5.3-1
Ecological Screening Levels for Terrestrial Receptors

COPEC	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)	Cottontail (mammalian herbivore)	Deer Mouse (mammalian omnivore)	Montane Shrew (mammalian insectivore)	Earthworm (soil dwelling invertebrate)	Generic Plant (terrestrial autotroph-producer)
Inorganic Chemicals (mg/kg)											
Aluminum	na*	na	na	na	na	na	na	na	na	na	na
Antimony	46	na	na	na	na	na	2.7	2.3	7.9	78	11
Arsenic	820	740	100	34	21	15	110	32	19	6.8	18
Barium	41,000	24,000	7500	720	770	820	2900	1800	2100	330	110
Beryllium	420	na	na	na	na	na	89	56	35	40	2.5
Cadmium	550	430	1.3	4.3	0.54	0.29	10	0.5	0.27	140	32
Calcium	na	na	na	na	na	na	na	na	na	na	na
Chromium (Total)	1800	860	170	51	32	23	410	110	63	na	na
Chromium hexavalent ion	7200	3600	1400	210	160	140	1600	850	510	0.34	0.35
Copper	4000	1100	80	34	20	14	260	63	42	80	70
Cyanide (Total)	3300	0.59	0.36	0.1	0.099	0.098	790	330	330	na	na
Iron	na	na	na	na	na	na	na	na	na	na	na
Lead	3700	540	83	18	14	11	310	120	93	1700	120
Magnesium	na	na	na	na	na	na	na	na	na	na	na
Manganese	40,000	60,000	24,000	1300	1600	2200	2000	1400	2800	450	220
Mercury	76	0.32	0.058	0.067	0.022	0.013	23	3	1.7	0.05	34
Nickel	1200	2000	110	120	35	20	270	20	10	280	38

Table H-5.3-1 (continued)

COPEC	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)	Cottontail (mammalian herbivore)	Deer Mouse (mammalian omnivore)	Montane Shrew (mammalian insectivore)	Earthworm (soil dwelling invertebrate)	Generic Plant (terrestrial autotroph-producer)
Nitrate	na	na	na	na	na	na	na	na	na	na	na
Perchlorate	3.3	2	3.9	0.12	0.24	31	0.26	0.21	31	3.5	40
Selenium	92	74	3.7	0.98	0.83	0.71	2.2	0.82	0.7	4.1	0.52
Silver	4400	600	13	10	4.1	2.6	150	24	14	na	560
Thallium	5	100	48	6.9	5.5	4.5	1.2	0.72	0.42	na	0.05
Vanadium	3200	110	56	6.8	5.5	4.7	740	470	290	na	60
Zinc	9600	2600	220	330	83	47	1800	170	99	120	160
Organic Chemicals (mg/kg)											
Acetone	7800	66,000	840	7.5	14	170	1.6	1.2	15	na	na
Aroclor-1242	100	6.2	0.19	0.92	0.078	0.041	27	0.75	0.39	na	na
Aroclor-1248	1.9	6.3	0.19	0.94	0.078	0.041	0.53	0.014	0.0073	na	na
Aroclor-1254	7.2	7.6	0.19	1.1	0.079	0.041	44	0.87	0.45	na	160
Aroclor-1260	15	400	4.2	37	1.7	0.88	1800	20	10	na	na
Benzo(a)anthracene	110	28	6.4	0.73	0.8	0.88	6.1	3.4	4	na	18
Benzo(a)pyrene	3400	na	na	na	na	na	260	84	62	na	na
Benzo(b)fluoranthene	2400	na	na	na	na	na	130	51	44	na	18
Benzo(g,h,i)perylene	3600	na	na	na	na	na	470	46	25	na	na
Benzo(k)fluoranthene	4300	na	na	na	na	na	330	99	71	na	na
Benzoic Acid	2000	na	na	na	na	na	4.6	1.3	1	na	na
Bis(2-ethylhexyl)phthalate	500	9.3	0.096	16	0.04	0.02	1900	1.1	0.6	na	na
Bromobenzene	na	na	na	na	na	na	na	na	na	na	na
Butylbenzene[sec-]	na	na	na	na	na	na	na	na	na	na	na

Table H-5.3-1 (continued)

COPEC	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)	Cottontail (mammalian herbivore)	Deer Mouse (mammalian omnivore)	Montane Shrew (mammalian insectivore)	Earthworm (soil dwelling invertebrate)	Generic Plant (terrestrial autotroph-producer)
Butylbenzylphthalate	23,000	na	na	na	na	na	2400	160	90	na	na
Chrysene	110	na	na	na	na	na	6.3	3.1	3.1	na	na
Dichlorobenzene[1,2-]	480	na	na	na	na	na	12	1.5	0.92	na	na
Dichlorobenzene[1,3-]	380	na	na	na	na	na	13	1.2	0.74	na	na
Dichlorobenzene[1,4-]	470	na	na	na	na	na	12	1.5	0.89	1.2	na
Ethylbenzene	na	na	na	na	na	na	na	na	na	na	na
Fluoranthene	3900	na	na	na	na	na	270	38	22	10	na
Hexanone[2-]	5900	290	1.7	0.47	0.41	0.36	17	6.1	5.4	na	na
Indeno(1,2,3-cd)pyrene	4600	na	na	na	na	na	510	110	71	na	na
Isopropyltoluene[4-]	na	na	na	na	na	na	na	na	na	na	na
Methylene Chloride	4300	na	na	na	na	na	3.8	2.6	9.2	na	1600
Phenanthrene	1900	na	na	na	na	na	62	15	11	5.5	na
Pyrene	3100	3000	160	68	44	33	110	31	23	10	na
Tetrachlorodibenzodioxin[2,3,7,8-]	0.0001	na	na	na	na	na	0.00004	0.00000058	0.00000029	5	na
Tetrachloroethene	120	na	na	na	na	na	9.5	0.35	0.18	na	10
Toluene	12,000	na	na	na	na	na	66	25	23	na	200
Trichloroethene	42,000	na	na	na	na	na	190	54	42	na	na
Trimethylbenzene[1,2,4-]	na	na	na	na	na	na	na	na	na	na	na
Trimethylbenzene[1,3,5-]	na	na	na	na	na	na	na	na	na	na	na
Xylene (Total)	750	13,000	190	89	56	41	7.6	1.9	1.4	na	100

Table H-5.3-1 (continued)

COPEC	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)	Cottontail (mammalian herbivore)	Deer Mouse (mammalian omnivore)	Montane Shrew (mammalian insectivore)	Earthworm (soil dwelling invertebrate)	Generic Plant (terrestrial autotroph-producer)
Radionuclides (pCi/g)											
Americium-241	26,000	57,000	43,000	4600	6100	10000	26,000	33,000	34,000	190	500
Cesium-137	1500	3700	4200	1400	2600	4500	1700	2300	2400	2300	1500
Cobalt-60	760	1500	1500	1500	1500	1500	760	760	760	760	760
Plutonium-238	45,000	110,000	100,000	4300	5900	10,000	75,000	170,000	190,000	820	1800
Plutonium-239/240	51,000	130,000	120,000	4400	6100	10,000	94,000	280,000	320,000	870	1900
Strontium-90	800	1700	2400	340	790	2800	1300	1600	1700	1700	1100
Tritium	240,000	550,000	610,000	300,000	440,000	600,000	270,000	330,000	340,000	48,000	36,000
Uranium-234	110,000	260,000	260,000	14,000	27,000	69,000	36,000	120,000	140,000	2200	440
Uranium-235/236	5200	10,000	10000	6300	7900	9500	4700	5200	5200	1600	440

*na = Not available.

Table H-5.3-2
Minimum ESL Comparison for AOC 02-003(d)

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Arsenic	2.09	6.8	Earthworm	**0.31**
Antimony	0.32	2.3	Deer mouse	0.14
Barium	43.2	110	Plant	**0.39**
Beryllium	1.83	2.5	Plant	**0.73**
Cadmium	0.149	0.27	Shrew	**0.55**
Chromium (Total)	6.79	23	Robin (insectivore)	0.3
Copper	3.46	14	Robin (insectivore)	0.25
Manganese	287	220	Plant	**1.3**
Mercury	0.0397	0.013	Robin (insectivore)	**3.05**
Nickel	3.46	10	Shrew	**0.35**
Perchlorate	0.00147	0.12	Robin (herbivore)	0.012
Selenium	3.96	0.52	Plant	**7.62**
Vanadium	7.01	4.7	Robin (insectivore)	**1.49**
Zinc	46.5	47	Robin (insectivore)	**0.99**
Organic Chemicals (mg/kg)				
Aroclor-1254	0.0082	0.041	Robin (insectivore)	0.2
Aroclor-1260	0.0053	0.88	Robin (insectivore)	0.0061
Toluene	0.000646	23	Shrew	0.000028
Radionuclides (pCi/g)				
Cesium-137	0.391	1400	Robin (herbivore)	0.00028
Cobalt-60	0.97	760	Deer mouse	0.0013
Cobalt-60	0.97	760	Earthworm	0.0013
Cobalt-60	0.97	760	Plant	0.0013
Cobalt-60	0.97	760	Fox	0.0013
Cobalt-60	0.97	760	Shrew	0.0013
Cobalt-60	0.97	760	Cottontail	0.0013
Plutonium-239/240	0.0534	870	Earthworm	0.000061
Tritium	0.0153	36,000	Plant	0.00000043

Notes: Bolded values indicate HQs greater than 0.3. Data qualifiers are defined in Appendix A.

Table H-5.3-3
HI Analysis for AOC 02-003(d)

COPEC	EPC (mg/kg)	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)	Cottontail (mammalian herbivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate)	Plant (terrestrial autotroph-producer)
Arsenic	2.09	0.0025	0.0028	0.021	0.061	0.1	0.14	0.019	0.11	0.065	**0.31**	0.12
Barium	43.2	0.0011	0.0018	0.0058	0.06	0.056	0.053	0.015	0.021	0.024	0.13	**0.39**
Beryllium	1.83	0.0044	na*	na	na	na	na	0.021	0.052	0.033	0.046	**0.73**
Cadmium	0.149	2.7E-04	3.5E-04	0.11	0.035	0.28	**0.51**	0.015	**0.55**	0.3	0.0011	0.0047
Manganese	287	0.0072	0.0048	0.012	0.22	0.18	0.13	0.14	0.1	0.21	**0.64**	**1.3**
Mercury	0.0397	5.2E-04	0.12	**0.68**	**0.59**	**1.8**	**3.05**	0.0017	0.023	0.013	**0.79**	0.0012
Nickel	3.46	0.0029	0.0017	0.031	0.029	0.099	0.17	0.013	**0.35**	0.17	0.012	0.091
Selenium	3.96	0.043	0.054	**1.07**	**4.04**	**4.77**	**5.58**	**1.8**	**5.66**	**4.83**	**0.97**	**7.62**
Vanadium	7.01	0.0022	0.064	0.13	**1.03**	**1.27**	**1.49**	0.0095	0.024	0.015	na	0.12
Zinc	46.5	0.0048	0.018	0.21	0.14	**0.56**	**0.99**	0.026	**0.47**	0.27	**0.39**	0.29
	HI	0.07	0.3	**2**	**6**	**9**	**12**	**2**	**7**	**6**	**3**	**11**

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.
*na = Not available.

Table H-5.3-4
Minimum ESL Comparison for SWMU 02-006(a)

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	0.273	2.3	Deer mouse	0.12
Arsenic	2.68	6.8	Earthworm	**0.39**
Barium	88.4	110	Plant	**0.8**
Chromium (Total)	8.32	23	Robin (insectivore)	**0.36**
Chromium hexavalent ion	0.0526	0.34	Earthworm	0.15
Copper	4.63	14	Robin (insectivore)	**0.33**
Cyanide (Total)	0.207	0.098	Robin (insectivore)	**2.11**
Lead	16.7	11	Robin (insectivore)	**1.52**
Nickel	5.92	10	Shrew	**0.59**
Perchlorate	0.00814	0.12	Robin (herbivore)	0.068
Selenium	6.63	0.52	Plant	**12.8**
Organic Chemicals (mg/kg)				
Aroclor-1242	0.0042	0.041	Robin (insectivore)	0.1
Aroclor-1254	0.0032	0.041	Robin (insectivore)	0.078
Aroclor-1260	0.0028	0.88	Robin (insectivore)	0.0032
Dichlorobenzene[1,4-]	0.000215	0.89	Shrew	0.00024
Toluene	0.000328	23	Shrew	0.000014
Radionuclides (pCi/g)				
Cesium-137	4.28	1400	Robin (herbivore)	0.0031
Plutonium-239/240	0.0626	870	Earthworm	0.000072
Strontium-90	0.235	340	Robin (herbivore)	0.00069
Tritium	11	36,000	Plant	0.00031
Uranium-235/236	0.0513	440	Plant	0.00012

Notes: Bolded values indicate HQs greater than 0.3. Data qualifiers are defined in Appendix A.

Table H-5.3-5
HI Analysis for SWMU 02-006(a)

COPEC	EPC (mg/kg)	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)	Cottontail (mammalian herbivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate)	Plant (terrestrial autotroph-producer)
Arsenic	2.68	0.0033	0.0036	0.027	0.079	0.13	0.18	0.024	0.14	0.084	**0.39**	0.15
Barium	88.4	0.0022	0.0037	0.012	0.12	0.11	0.11	0.03	0.042	0.049	0.27	**0.8**
Chromium (Total)	8.32	0.0046	0.0097	0.049	0.16	0.26	**0.36**	0.02	0.13	0.076	na*	na
Copper	4.63	0.0012	0.0042	0.058	0.14	0.23	**0.33**	0.018	0.11	0.073	0.058	0.066
Cyanide (Total)	0.207	6.3E-05	**0.35**	**0.58**	**2.07**	**2.09**	**2.11**	2.6E-04	6.3E-04	6.3E-04	na	na
Lead	16.7	0.0045	0.031	0.2	**0.93**	**1.19**	**1.52**	0.054	0.18	0.14	0.0098	0.14
Nickel	5.92	0.0049	0.003	0.054	0.049	0.17	0.3	0.022	**0.59**	0.3	0.021	0.16
Selenium	6.63	0.072	0.09	**1.79**	**6.77**	**7.99**	**9.34**	**3.01**	**9.47**	**8.09**	**1.62**	**12.8**
	HI	0.09	0.5	**3**	**10**	**12**	**14**	**3**	**11**	**9**	**2**	**14**

Notes: Bolded values indicate HQs greater than 0.3 or HI greater than 1. Data qualifiers are defined in Appendix A.

*na = Not available.

Table H-5.3-6
Minimum ESL Comparison for SWMU 21-006(e) and AOC 21-006(f)

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	0.745	2.3	Deer mouse	**0.32**
Arsenic	2.68	6.8	Earthworm	**0.39**
Barium	193	110	Plant	**1.75**
Copper	8	14	Robin (insectivore)	**0.57**
Cyanide (Total)	0.57(U)	0.098	Robin (insectivore)	**5.82**
Lead	22.5	11	Robin (insectivore)	**2.05**
Mercury	0.0793	0.013	Robin (insectivore)	**6.1**
Nickel	68.4	10	Shrew	**6.84**
Selenium	0.54	0.52	Plant	**1.04**
Zinc	86	47	Robin (insectivore)	**1.83**
Organic Chemicals (mg/kg)				
Acetone	0.033	1.2	Deer mouse	0.028
Bis(2-ethylhexyl)phthalate	0.22	0.02	Robin (insectivore)	**11**
Dichlorobenzene[1,2-]	0.00051	0.92	Shrew	0.00055
Dichlorobenzene[1,3-]	0.00047	0.74	Shrew	0.00064
Dichlorobenzene[1,4-]	0.0004	0.89	Shrew	0.00045
Methylene Chloride	0.015	2.6	Deer mouse	0.0058
Toluene	0.0014	23	Shrew	0.000061
Radionuclides (pCi/g)				
Americium-241	1.653	190	Earthworm	0.0087
Cesium-137	0.269	1400	Robin (herbivore)	0.00019
Plutonium-238	0.146	820	Earthworm	0.00018
Plutonium-239/240	59.9	870	Earthworm	0.069
Tritium	1.67	36,000	Plant	0.000046
Uranium-234	34.2	440	Plant	0.078
Uranium-235/236	1.01	440	Plant	0.0023

Notes: Bolded values indicate HQs greater than 0.3. Data qualifiers are defined in Appendix A.

Table H-5.3-7
HI Analysis for SWMU 21-006(e) and AOC 21-006(f)

COPEC	EPC (mg/kg)	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)	Cottontail (mammalian herbivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate)	Plant (terrestrial autotroph-producer)
Antimony	0.745	0.016	na*	na	na	na	na	0.28	0.094	**0.32**	0.0096	0.068
Arsenic	2.68	0.0033	0.0036	0.027	0.079	0.13	0.18	0.024	0.14	0.084	**0.39**	0.15
Barium	193	0.0047	0.008	0.026	0.27	0.25	0.24	0.067	0.092	0.11	**0.58**	**1.75**
Copper	8	0.002	0.0073	0.1	0.24	**0.4**	**0.57**	0.031	0.19	0.13	0.1	0.11
Cyanide (Total)	0.57(U)	1.7E-04	**0.97**	**1.58**	**5.7**	**5.76**	**5.82**	7.2E-04	0.0017	0.0017	na	na
Lead	22.5	0.0061	0.042	0.27	**1.25**	**1.61**	**2.05**	0.073	0.24	0.19	0.013	0.19
Mercury	0.0793	0.001	0.25	**1.37**	**1.18**	**3.6**	**6.1**	0.0034	0.047	0.026	**1.59**	0.0023
Nickel	68.4	0.057	0.034	**0.62**	**0.57**	**1.95**	**3.42**	0.25	**6.84**	**3.42**	0.24	**1.8**
Selenium	0.54	0.0059	0.0073	0.15	0.55	0.65	0.76	0.25	**0.77**	**0.66**	0.13	**1.04**
Zinc	86	0.009	0.033	**0.39**	0.26	**1.04**	**1.83**	0.048	**0.87**	**0.51**	**0.72**	**0.54**
Bis(2-ethylhexyl)phthalate	0.22	4.4E-04	0.024	**2.29**	0.014	5.5	**11**	1.2E-04	**0.37**	**0.2**	**na**	**na**
	HI	0.1	1	**7**	**10**	**21**	**32**	**1**	**10**	**6**	**4**	**6**

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.
*na = Not available.

Table H-5.3-8
Minimum ESL Comparison for AOC 21-028(c)

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	1.27	2.3	Deer mouse	**0.55**
Barium	137	110	Plant	**1.25**
Chromium (Total)	11.5	23	Robin (insectivore)	**0.5**
Copper	6.7	14	Robin (insectivore)	**0.48**
Cyanide (Total)	0.16	0.098	Robin (insectivore)	**1.63**
Lead	28.4	11	Robin (insectivore)	**2.58**
Mercury	0.301	0.013	Robin (insectivore)	**23.2**
Nickel	10.1	10	Shrew	**1.01**
Perchlorate	0.00471	0.12	Robin (herbivore)	0.039
Selenium	0.59(U)	0.52	Plant	**1.13**
Vanadium	41.8	4.7	Robin (insectivore)	**8.89**
Zinc	28.6	47	Robin (insectivore)	**0.61**
Organic Chemicals (mg/kg)				
Acetone	0.0146	1.2	Deer mouse	0.012
Aroclor-1254	0.0808	0.041	Robin (insectivore)	**1.97**
Aroclor-1260	0.0219	0.88	Robin (insectivore)	0.025
Benzo(a)anthracene	0.0813	0.73	Robin (herbivore)	0.11
Benzo(a)pyrene	0.0741	62	Shrew	0.0012
Benzo(b)fluoranthene	0.0746	18	Plant	0.0041
Benzo(g,h,i)perylene	0.0629	25	Shrew	0.0025
Benzo(k)fluoranthene	0.0677	71	Shrew	0.00095
Benzoic Acid	0.4	1	Shrew	**0.4**
Bis(2-ethylhexyl)phthalate	0.219	0.02	Robin (insectivore)	**11**
Butylbenzylphthalate	0.042	90	Shrew	0.00047
Chrysene	0.117	3.1	Shrew	0.038
Fluoranthene	0.169	10	Earthworm	0.017
Indeno(1,2,3-cd)pyrene	0.063	71	Shrew	0.00089
Methylene Chloride	0.013	2.6	Deer mouse	0.005
Phenanthrene	0.104	5.5	Earthworm	0.019
Pyrene	0.137	10	Earthworm	0.014
Tetrachloroethene	0.00081	0.18	Shrew	0.0045
Toluene	0.00078	23	Shrew	0.000034
Xylene (Total)	0.0018	1.4	Shrew	0.0013
Radionuclides (pCi/g)				
Americium-241	1.56	190	Earthworm	0.0082
Cesium-137	0.225	1400	Robin (herbivore)	0.0016
Plutonium-238	5.55	820	Earthworm	0.0068
Plutonium-239/240	14	870	Earthworm	0.016
Tritium	0.238	36,000	Plant	6.6E-06
Uranium-234	1.89	440	Plant	0.0043

Notes: Bolded values indicate HQs greater than 0.3. Data qualifiers are defined in Appendix A.

Table H-5.3-9
HI Analysis for AOC 21-028(c)

COPEC	EPC (mg/kg)	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)	Cottontail (mammalian herbivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate)	Plant (terrestrial autotroph-producer)
Antimony	1.27	0.028	na*	na	na	na	na	**0.47**	0.16	**0.55**	0.016	0.12
Barium	137	0.0033	0.0057	0.018	0.19	0.18	0.17	0.047	0.065	0.076	**0.42**	**1.25**
Chromium (Total)	11.5	0.0064	0.013	0.068	0.23	**0.36**	**0.5**	0.028	0.18	0.1	na	na
Copper	6.7	0.0017	0.0061	0.084	0.2	**0.34**	**0.48**	0.026	0.16	0.11	0.084	0.096
Cyanide (Total)	0.16	4.8E-05	0.27	**0.44**	**1.6**	**1.62**	**1.63**	2.0E-04	4.8E-04	4.8E-04	na	na
Lead	28.4	0.0077	0.053	**0.34**	**1.58**	**2.03**	**2.58**	0.092	0.31	0.24	0.017	0.24
Mercury	0.301	0.004	**0.94**	**5.19**	**4.49**	**13.7**	**23.2**	0.013	0.18	0.1	**6.02**	0.0089
Nickel	10.1	0.0084	0.0051	0.092	0.084	0.29	**0.51**	0.037	**1.01**	**0.51**	0.036	0.27
Selenium	0.59(U)	0.0064	0.008	0.16	**0.6**	**0.71**	**0.83**	0.27	**0.84**	**0.72**	0.14	**1.13**
Vanadium	41.8	0.013	**0.38**	**0.75**	**6.15**	**7.6**	**8.89**	0.056	0.14	0.089	na	**0.7**
Zinc	28.6	0.003	0.011	0.13	0.087	**0.34**	**0.61**	0.016	0.29	0.17	0.24	0.18
Aroclor-1254	0.0808	0.011	0.011	**0.43**	0.073	**1.02**	**1.97**	0.0018	0.18	0.093	na	5.1E-04
Benzoic Acid	0.4	2.0E-04	na	na	na	na	na	0.087	**0.4**	**0.31**	na	na
Bis(2-ethylhexyl)phthalate	0.219	4.4E-04	0.024	**2.28**	0.014	**5.48**	**11**	1.2E-04	**0.37**	0.2	na	na
	HI	0.09	**2**	**10**	**15**	**34**	**52**	1	**4**	**3**	**7**	**4**

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.
*na = Not available.

Table H-5.3-10
Minimum ESL Comparison for SWMU 26-001

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	15.5	2.3	Deer mouse	**6.74**
Arsenic	2.3	6.8	Earthworm	**0.34**
Chromium (Total)	5.18	23	Robin (insectivore)	0.23
Cyanide (Total)	0.207	0.098	Robin (insectivore)	**2.11**
Perchlorate	0.00136	0.12	Robin (herbivore)	0.011
Selenium	6.21	0.52	Plant	**11.9**
Organic Chemicals (mg/kg)				
Aroclor-1248	0.073	0.0073	Shrew	**10**
Toluene	0.000732	23	Shrew	0.000032
Radionuclides (pCi/g)				
Cesium-137	0.128	1400	Robin (herbivore)	0.000091
Plutonium-238	1.43	820	Earthworm	0.0017
Plutonium-239/240	0.154	870	Earthworm	0.00018
Strontium-90	0.164	340	Robin (herbivore)	0.00048
Tritium	0.173	36,000	Plant	0.0000048
Uranium-235/236	0.0408	440	Plant	0.000093

Notes: Bolded values indicate HQs greater than 0.3. Data qualifiers are defined in Appendix A.

Table H-5.3-11
HI Analysis for SWMU 26-001

COPEC	EPC (mg/kg)	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)	Cottontail (mammalian herbivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate)	Plant (terrestrial autotroph-producer)
Antimony	15.5	0.34	na*	na	na	na	na	**5.74**	**1.96**	**6.74**	0.2	**1.41**
Arsenic	2.3	0.0028	0.0031	0.023	0.068	0.11	0.15	0.021	0.12	0.072	**0.34**	0.13
Cyanide (Total)	0.207	0.000063	0.35	0.58	2.07	2.09	2.11	0.00026	0.00063	0.00063	na	na
Selenium	6.21	0.068	0.084	**1.68**	**6.34**	**7.48**	**8.75**	**2.82**	**8.87**	**7.57**	**1.51**	**11.9**
Aroclor-1248	0.073	0.038	0.012	**0.38**	0.078	**0.94**	**1.78**	0.14	**10**	**5.21**	na	na
	HI	0.4	**0.4**	**3**	**9**	**11**	**13**	**9**	**21**	**20**	**2**	**13**

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.
*na = Not available.

Table H-5.3-12
Minimum ESL Comparison for SWMU 26-002(a)

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	0.275	2.3	Deer mouse	0.12
Arsenic	3.96	6.8	Earthworm	**0.58**
Barium	71.5	110	Plant	**0.65**
Chromium (Total)	8.21	23	Robin (insectivore)	**0.36**
Copper	5.6	14	Robin (insectivore)	**0.4**
Nickel	6.3	10	Shrew	**0.63**
Perchlorate	0.00127	0.12	Robin (herbivore)	0.011
Selenium	9.9	0.52	Plant	**19**
Thallium	0,15	0.05	Plant	**3**
Organic Chemicals (mg/kg)				
Aroclor-1260	0.0041	0.88	Robin (insectivore)	0.0047
Hexanone[2-]	0.00163	0.36	Robin (insectivore)	0.0045
Toluene	0.00124	23	Shrew	0.000054
Radionuclides (pCi/g)				
Cesium-137	0.415	1400	Robin (herbivore)	0.0003
Plutonium-239/240	0.0769	870	Earthworm	0.000088
Strontium-90	0.13	340	Robin (herbivore)	0.00038
Tritium	0.0485	36,000	Plant	1.4E-06
Uranium-235/236	0.0752	440	Plant	0.00017

Notes: Bolded values indicate HQs greater than 0.3. Data qualifiers are defined in Appendix A.

Table H-5.3-13
HI Analysis for SWMU 26-002(a)

COPEC	EPC (mg/kg)	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)	Cottontail (mammalian herbivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate)	Plant (terrestrial autotroph-producer)
Arsenic	3.96	0.0048	0.0054	0.04	0.12	0.19	0.26	0.036	0.21	0.12	**0.58**	0.22
Barium	71.5	0.0017	0.003	0.0095	0.099	0.093	0.087	0.025	0.034	0.04	0.22	**0.65**
Chromium (Total)	8.21	0.0046	0.0095	0.048	0.16	0.26	**0.36**	0.02	0.13	0.075	na*	na
Copper	5.6	0.0014	0.0051	0.07	0.16	0.28	**0.4**	0.022	0.13	0.089	0.07	0.08
Nickel	6.3	0.0053	0.0032	0.057	0.053	0.18	**0.32**	0.023	**0.63**	**0.32**	0.023	0.17
Selenium	9.9	0.11	0.13	**2.68**	**10.1**	**11.9**	**13.9**	**4.5**	**14.1**	**12.1**	**2.41**	**19**
Thallium	0.15	0.03	0.0015	0.0031	0.022	0.027	0.033	0.13	0.21	0.36	na	**3**
	HI	0.2	0.2	**3**	**11**	**13**	**15**	**5**	**16**	**13**	**3**	**23**

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.

*na = Not available.

Table H-5.3-14
Minimum ESL Comparison for SWMU 26-002(b)

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Arsenic	4.27	6.8	Earthworm	**0.63**
Chromium (Total)	9.7	23	Robin (insectivore)	**0.42**
Nickel	7.62	10	Shrew	**0.76**
Perchlorate	0.0014	0.12	Robin (herbivore)	0.012
Selenium	17	0.52	Plant	**32.7**
Organic Chemicals (mg/kg)				
Acetone	0.00331	1.2	Deer mouse	0.0028
Aroclor-1260	0.0073	0.88	Robin (insectivore)	0.0083
Hexanone[2-]	0.00163	0.36	Robin (insectivore)	0.0045
Toluene	0.000579	23	Shrew	0.000025
Radionuclides (pCi/g)				
Cesium-137	0.2	1400	Robin (herbivore)	0.00014
Tritium	0.0188	36,000	Plant	5.2E-07
Uranium-235/236	0.187	440	Plant	0.00043

Notes: Bolded values indicate HQs greater than 0.3. Data qualifiers are defined in Appendix A.

Table H-5.3-15
HI Analysis for SWMU 26-002(b)

COPEC	EPC (mg/kg)	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)	Cottontail (mammalian herbivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate)	Plant (terrestrial autotroph-producer)
Arsenic	4.27	0.0052	0.0058	0.043	0.13	0.2	0.28	0.039	0.22	0.13	0.63	0.24
Chromium (Total)	9.7	0.0054	0.011	0.057	0.19	0.3	**0.42**	0.024	0.15	0.088	na*	na
Nickel	7.62	0.0064	0.0038	0.069	0.064	0.22	**0.38**	0.028	**0.76**	**0.38**	0.027	0.2
Selenium	17	0.18	0.23	**4.59**	**17.3**	**20.5**	**23.9**	**7.73**	**24.3**	**20.7**	**4.15**	**32.7**
	HI	0.2	0.2	**5**	**18**	**21**	**25**	**8**	**25**	**21**	**5**	**33**

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.
*na = Not available.

Table H-5.3-16
Minimum ESL Comparison for SWMU 26-003

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Arsenic	4.14	6.8	Earthworm	**0.61**
Barium	81.7	110	Plant	**0.74**
Chromium (Total)	6.8	23	Robin (insectivore)	0.3
Copper	4.16	14	Robin (insectivore)	0.3
Perchlorate	0.00195	0.12	Robin (herbivore)	0.016
Selenium	8.99	0.52	Plant	**17.3**
Organic Chemicals (mg/kg)				
Acetone	0.00596	1.2	Deer mouse	0.005
Aroclor-1260	0.0513	0.88	Robin (insectivore)	0.058
Toluene	0.000915	23	Shrew	0.00004
Radionuclides (pCi/g)				
Cesium-137	0.569	1400	Robin (herbivore)	0.00041
Plutonium-239/240	0.0269	870	Earthworm	3.1E-05
Tritium	0.0901	36,000	Plant	2.5E-06
Uranium-235/236	0.124	440	Plant	0.00028

Notes: Bolded values indicate HQs greater than 0.3. Data qualifiers are defined in Appendix A.

Table H-5.3-17
HI Analysis for SWMU 26-003

COPEC	EPC (mg/kg)	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)	Cottontail (mammalian herbivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate)	Plant (terrestrial autotroph-producer)
Arsenic	4.14	0.005	0.0056	0.041	0.12	0.2	0.28	0.038	0.22	0.13	**0.61**	0.23
Barium	81.7	0.002	0.0034	0.011	0.11	0.11	0.1	0.028	0.039	0.045	0.25	**0.74**
Selenium	8.99	0.098	0.12	**2.43**	**9.17**	**10.8**	**12.7**	**4.09**	**12.8**	**11**	**2.19**	**17.3**
	HI	0.1	0.1	**2**	**9**	**11**	**13**	**4**	**13**	**11**	**3**	**18**

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.

Table H-5.4-1
Mexican Spotted Owl AUFs for
Middle Los Alamos Canyon Aggregate Area

Site	Site Area (ha)	AUF*
02-003(d)	0.125	0.000341
02-006(a)	0.226	0.000618
21-006(e) AOC 21-006(f)	0.06	0.000164
21-028(c)	0.0501	0.000137
26-001	0.0939	0.000256
26-002(a)	0.047	0.000128
26-002(b)	0.0112	0.0000305
26-003	0.0196	0.0000536

*AUF is calculated as the area of the site divided by the owl HR of 366 ha.

Table H-5.4-2
PAUFs for Ecological Receptors for AOC 02-003(d)

Receptor	HR (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	2.95E-05
American Robin	0.42	16.8	7.44E-03
Deer Mouse	0.077	3	4.16E-02
Cottontail	3.1	124	1.01E-03
Montane Shrew	0.39	15.6	8.01E-03
Fox	1038	41,520	3.01E-06

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.125 ha) divided by the population area.

Table H-5.4-3
Adjusted HIs for AOC 02-003(d)

COPEC	EPC (mg/kg)	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)	Cottontail (mammalian herbivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate)	Plant (terrestrial autotroph-producer)
Arsenic	2.09	7.7E-09	8.3E-08	6.2E-07	4.6E-04	7.4E-04	0.001	1.9E-05	8.8E-04	0.0027	**0.31**	0.12
Barium	43.2	3.2E-09	5.3E-08	1.7E-07	4.5E-04	4.2E-04	3.9E-04	1.5E-05	1.6E-04	0.001	0.13	**0.39**
Beryllium	1.83	1.3E-08	na*	na	na	na	na	2.1E-05	4.2E-04	0.0014	0.046	**0.73**
Cadmium	0.149	8.2E-10	1.0E-08	3.4E-06	2.6E-04	0.0021	0.0038	1.5E-05	0.0044	0.012	0.0011	0.0047
Manganese	287	2.2E-08	1.4E-07	3.5E-07	0.0016	0.0013	9.7E-04	1.4E-04	8.2E-04	0.0085	**0.64**	1.3
Mercury	0.0397	1.6E-09	3.7E-06	2.0E-05	0.0044	0.013	0.023	1.7E-06	1.9E-04	5.5E-04	**0.79**	0.0012
Nickel	3.46	8.7E-09	5.1E-08	9.3E-07	2.1E-04	7.4E-04	0.0013	1.3E-05	0.0028	0.0072	0.012	0.091
Selenium	3.96	1.3E-07	1.6E-06	3.2E-05	0.03	0.035	0.041	0.0018	0.045	0.2	**0.97**	**7.62**
Vanadium	7.01	6.6E-09	1.9E-06	3.7E-06	0.0077	0.0095	0.011	9.5E-06	1.9E-04	6.2E-04	na	0.12
Zinc	46.5	1.5E-08	5.3E-07	6.2E-06	0.001	0.0042	0.0074	2.6E-05	0.0038	0.011	**0.39**	0.29
	Adjusted HI	2E-07	8E-06	7E-05	0.05	0.07	0.09	2E-03	0.06	0.2	**3**	**11**

Note: Bolded values indicate HQs greater than 0.1 or HI greater than 1.

*na = Not available.

Table H-5.4-4
PAUFs for Ecological Receptors for AOC 02-006(a)

Receptor	HR (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	5.33E-05
American Robin	0.42	16.8	1.35E-02
Deer Mouse	0.077	3	7.54E-02
Cottontail	3.1	124	1.82E-03
Montane Shrew	0.39	15.6	1.45E-02
Fox	1038	41,520	5.45E-06

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.226 ha) divided by the population area.

Table H-5.4-5
Adjusted HIs for AOC 02-006(a)

COPEC	EPC (mg/kg)	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)	Cottontail (mammalian herbivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate)	Plant (terrestrial autotroph-producer)
Arsenic	2.68	1.8E-08	1.9E-07	1.4E-06	0.0011	0.0017	0.0024	4.4E-05	0.002	0.0063	**0.39**	0.15
Barium	88.4	1.2E-08	2.0E-07	6.3E-07	0.0017	0.0015	0.0015	5.6E-05	6.1E-04	0.0037	0.27	**0.8**
Chromium (Total)	8.32	2.5E-08	5.2E-07	2.6E-06	0.0022	0.0035	0.0049	3.7E-05	0.0019	0.0057	na*	na
Copper	4.63	6.3E-09	2.2E-07	3.1E-06	0.0018	0.0031	0.0045	3.2E-05	0.0016	0.0055	0.058	0.066
Cyanide (Total)	0.207	3.4E-10	1.9E-05	3.1E-05	0.028	0.028	0.028	4.8E-07	9.1E-06	4.7E-05	na	na
Lead	16.7	2.5E-08	1.6E-06	1.1E-05	0.012	0.016	0.02	9.8E-05	0.0026	0.01	0.0098	0.14
Nickel	5.92	2.7E-08	1.6E-07	2.9E-06	6.6E-04	0.0023	0.004	4.0E-05	0.0086	0.022	0.021	0.16
Selenium	6.63	3.9E-07	4.8E-06	9.6E-05	0.091	**0.11**	**0.13**	0.0055	**0.14**	**0.61**	**1.62**	**12.8**
Adjusted HI		5E-07	3E-05	1E-04	0.1	0.2	0.2	6E-03	0.2	0.7	**2**	**14**

Note: Bolded values indicate HQs greater than 0.1 or HI greater than 1.
*na = Not available.

Table H-5.4-6
PAUFs for Ecological Receptors for SWMU 21-006(e) and AOC 21-006(f)

Receptor	HR (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	1.41E-05
American Robin	0.42	16.8	3.57E-03
Deer Mouse	0.077	3	2.00E-02
Cottontail	3.1	124	4.83E-04
Montane Shrew	0.39	15.6	3.84E-03
Fox	1038	41,520	1.44E-06

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.06 ha) divided by the population area.

Table H-5.4-7
Adjusted HIs for SWMU 21-006(e) and AOC 21-006(f)

COPEC	EPC (mg/kg)	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)	Cottontail (mammalian herbivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate)	Plant (terrestrial autotroph-producer)
Antimony	0.745	2.3E-08	na*	na	na	na	na	1.3E-04	3.6E-04	0.0065	0.0096	0.068
Arsenic	2.68	4.7E-09	5.1E-08	3.8E-07	2.8E-04	4.6E-04	6.4E-04	1.2E-05	5.4E-04	0.0017	**0.39**	**0.15**
Barium	193	6.8E-09	1.1E-07	3.6E-07	9.6E-04	8.9E-04	8.4E-04	3.2E-05	3.5E-04	0.0021	**0.58**	**1.75**
Copper	8	2.9E-09	1.0E-07	1.4E-06	8.4E-04	0.0014	0.002	1.5E-05	7.3E-04	0.0025	0.1	**0.11**
Cyanide (Total)	0.57(U)	2.5E-10	1.4E-05	2.2E-05	0.02	0.021	0.021	3.5E-07	6.6E-06	3.5E-05	na	na
Lead	22.5	8.8E-09	5.9E-07	3.8E-06	0.0045	0.0057	0.0073	3.5E-05	9.3E-04	0.0037	0.013	**0.19**

Table H-5.4-7 (continued)

COPEC	EPC (mg/kg)	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)	Cottontail (mammalian herbivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate)	Plant (terrestrial autotroph-producer)
Mercury	0.0793	1.5E-09	3.5E-06	1.9E-05	0.0042	0.013	0.022	1.7E-06	1.8E-04	5.3E-04	**1.59**	0.0023
Nickel	68.4	8.2E-08	4.8E-07	8.8E-06	0.002	0.007	0.012	1.2E-04	0.026	0.068	**0.24**	**1.8**
Selenium	0.54	8.5E-09	1.0E-07	2.1E-06	0.002	0.0023	0.0027	1.2E-04	0.003	0.013	**0.13**	**1.04**
Zinc	86	1.3E-08	4.7E-07	5.5E-06	9.3E-04	0.0037	0.0065	2.3E-05	0.0033	0.01	**0.72**	**0.54**
Bis(2-ethylhexyl)phthalate	0.22	6.4E-10	3.3E-07	3.2E-05	4.9E-05	0.02	0.039	5.6E-08	0.0014	0.004	na	na
Adjusted HI		2E-07	2E-05	1E-04	0.04	0.08	0.1	5E-04	0.04	0.1	**4**	**6**

Note: Bolded values indicate HQs greater than 0.1 or HI greater than 1.

*na = Not available.

Table H-5.4-8
PAUFs for Ecological Receptors for AOC 21-028(c)

Receptor	HR (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	1.18E-05
American Robin	0.42	16.8	2.98E-03
Deer Mouse	0.077	3	1.67E-02
Cottontail	3.1	124	4.04E-04
Montane Shrew	0.39	15.6	3.21E-03
Fox	1038	41,520	1.21E-06

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.0501 ha) divided by the population area.

Table H-5.4-9
Adjusted HIs for AOC 21-028(c)

COPEC	EPC (mg/kg)	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)	Cottontail (mammalian herbivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate)	Plant (terrestrial autotroph-producer)
Antimony	1.27	3.3E-08	na*	na	na	na	na	1.9E-04	5.2E-04	0.0092	0.016	**0.12**
Barium	137	4.0E-09	6.7E-08	2.2E-07	5.7E-04	5.3E-04	5.0E-04	1.9E-05	2.1E-04	0.0013	**0.42**	**1.25**
Chromium (Total)	11.5	7.7E-09	1.6E-07	8.0E-07	6.7E-04	0.0011	0.0015	1.1E-05	5.9E-04	0.0017	na	na
Copper	6.7	2.0E-09	7.2E-08	9.9E-07	5.9E-04	0.001	0.0014	1.0E-05	5.1E-04	0.0018	0.084	0.096
Cyanide (Total)	0.16	5.9E-11	3.2E-06	5.3E-06	0.0048	0.0048	0.0049	8.2E-08	1.6E-06	8.1E-06	na	na
Lead	28.4	9.3E-09	6.2E-07	4.0E-06	0.0047	0.0061	0.0077	3.7E-05	9.8E-04	0.004	0.017	**0.24**
Mercury	0.301	4.8E-09	1.1E-05	6.1E-05	0.013	0.041	0.069	5.3E-06	5.7E-04	0.0017	**6.02**	0.0089
Nickel	10.1	1.0E-08	6.0E-08	1.1E-06	2.5E-04	8.6E-04	0.0015	1.5E-05	0.0032	0.0084	0.036	**0.27**
Selenium	0.59(U)	7.7E-09	9.4E-08	1.9E-06	0.0018	0.0021	0.0025	1.1E-04	0.0027	0.012	0.14	**1.13**
Vanadium	41.8	1.6E-08	4.5E-06	8.8E-06	0.018	0.023	0.027	2.3E-05	4.6E-04	0.0015	na	**0.7**
Zinc	28.6	3.6E-09	1.3E-07	1.5E-06	2.6E-04	0.001	0.0018	6.4E-06	9.3E-04	0.0028	**0.24**	**0.18**
Aroclor-1254	0.0808	1.4E-08	1.3E-07	5.0E-06	2.2E-04	0.0031	0.0059	7.4E-07	5.8E-04	0.0016	na	5.1E-04
Benzoic Acid	0.4	2.4E-10	na	na	na	na	na	3.5E-05	0.0013	0.0051	na	na
Bis(2-ethylhexyl)phthalate	0.219	5.3E-10	2.8E-07	2.7E-05	4.1E-05	0.016	0.033	4.7E-08	0.0012	0.0033	na	na
Adjusted HI		1E-07	2E-05	1E-04	0.04	0.1	0.2	5E-04	0.01	0.05	**7**	**4**

Note: Bolded values indicate HQs greater than 0.1 or HI greater than 1.
*na = Not available.

Table H-5.4-10
PAUFs for Ecological Receptors for SWMU 26-001

Receptor	HR (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	2.21E-05
American Robin	0.42	16.8	5.59E-03
Deer Mouse	0.077	3	3.13E-02
Cottontail	3.1	124	7.57E-04
Montane Shrew	0.39	15.6	6.02E-03
Fox	1038	41,520	2.26E-06

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.0939 ha) divided by the population area.

Table H-5.4-11
Adjusted HIs for SWMU 26-001

COPEC	EPC (mg/kg)	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)	Cottontail (mammalian herbivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate)	Plant (terrestrial autotroph-producer)
Antimony	15.5	7.6E-07	na*	na	na	na	na	0.0043	0.012	**0.21**	**0.2**	**1.41**
Arsenic	2.3	6.3E-09	6.9E-08	5.1E-07	3.8E-04	6.1E-04	8.6E-04	1.6E-05	7.3E-04	0.0022	**0.34**	**0.13**
Cyanide (Total)	0.207	1.4E-10	7.8E-06	1.3E-05	1.2E-02	1.2E-02	1E-02	2.0E-07	3.8E-06	0.00002	na	na
Selenium	6.21	1.5E-07	1.9E-06	3.7E-05	0.035	0.042	0.049	0.0021	0.053	**0.24**	**1.51**	**11.9**
Aroclor-1248	0.073	8.7E-08	2.6E-07	8.5E-06	4.3E-04	0.0052	0.0099	1.0E-04	0.06	**0.16**	na	na
Adjusted HI		1E-06	1E-05	6E-05	0.05	0.06	0.07	7E-03	0.1	0.6	**2**	**13**

Note: Bolded values indicate HQs greater than 0.1 or HI greater than 1.

*na = Not available.

Table H-5.4-12
PAUFs for Ecological Receptors for SWMU 26-002(a)

Receptor	HR (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	1.11E-05
American Robin	0.42	16.8	2.80E-03
Deer Mouse	0.077	3	1.57E-02
Cottontail	3.1	124	3.79E-04
Montane Shrew	0.39	15.6	3.01E-03
Fox	1038	41,520	1.13E-06

[a] Values from EPA (1993, 059384).
[b] PAUF is calculated as the area of the site (0.047 ha) divided by the population area.

Table H-5.4-13
Adjusted HIs for SWMU 26-002(a)

COPEC	EPC (mg/kg)	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)	Cottontail (mammalian herbivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate)	Plant (terrestrial autotroph-producer)
Arsenic	3.96	5.5E-09	5.9E-08	4.4E-07	3.3E-04	5.3E-04	7.4E-04	1.4E-05	6.3E-04	0.0019	**0.58**	**0.22**
Barium	71.5	2.0E-09	3.3E-08	1.1E-07	2.8E-04	2.6E-04	2.4E-04	9.3E-06	1.0E-04	6.2E-04	**0.22**	**0.65**
Chromium (Total)	8.21	5.2E-09	1.1E-07	5.4E-07	4.5E-04	7.2E-04	0.001	7.6E-06	3.9E-04	0.0012	na*	na
Copper	5.6	1.6E-09	5.6E-08	7.8E-07	4.6E-04	7.8E-04	0.0011	8.2E-06	4.0E-04	0.0014	0.07	0.08
Nickel	6.3	5.9E-09	3.5E-08	6.3E-07	1.5E-04	5.0E-04	8.8E-04	8.8E-06	0.0019	0.0049	0.023	**0.17**
Selenium	9.9	1.2E-07	1.5E-06	3.0E-05	0.028	0.033	0.039	0.0017	0.043	**0.19**	**2.41**	**19**
Thallium	0.15	3.4E-08	1.7 E-08	3.5E-08	6.2E-05	7.6E-05	9.2E-05	4.9E-05	6.3E-04	0.0056	na	**3**
Adjusted HI		2E-07	2E-06	3E-05	0.03	0.04	0.04	2E-03	0.05	0.2	**3**	**23**

Note: Bolded values indicate HQs greater than 0.1 or HI greater than 1.
*na = Not available.

Table H-5.4-14
PAUFs for Ecological Receptors for SWMU 26-002(b)

Receptor	HR (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	2.63E-06
American Robin	0.42	16.8	6.64E-04
Deer Mouse	0.077	3	3.72E-03
Cottontail	3.1	124	9.00E-05
Montane Shrew	0.39	15.6	7.15E-04
Fox	1038	41,520	2.69E-07

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.0112 ha) divided by the population area.

Table H-5.4-15
Adjusted HIs for SWMU 26-002(b)

COPEC	EPC (mg/kg)	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)	Cottontail (mammalian herbivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate)	Plant (terrestrial autotroph-producer)
Arsenic	4.27	1.4E-09	1.5E-08	1.1E-07	8.3E-05	1.4E-04	1.9E-04	3.5E-06	1.6E-04	5.0E-04	**0.63**	**0.24**
Chromium (Total)	9.7	1.4E-09	3.0E-08	1.5E-07	1.3E-04	2.0E-04	2.8E-04	2.1E-06	1.0E-04	3.3E-04	na*	na
Nickel	7.62	1.7E-09	1.0E-08	1.8E-07	4.2E-05	1.4E-04	2.5E-04	2.5E-06	5.5E-04	0.0014	0.027	**0.2**
Selenium	17	5.0E-08	6.0E-07	1.2E-05	0.012	0.014	0.016	7.0E-04	0.017	0.077	**4.15**	**32.7**
Adjusted HI		5E-08	7E-07	1E-05	0.01	0.01	0.02	7E-04	0.02	0.08	**5**	**33**

Note: Bolded values indicate HQs greater than 0.1 or HI greater than 1.

*na = Not available.

Table H-5.4-16
PAUFs for Ecological Receptors for SWMU 26-003

Receptor	HR (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	4.63E-06
American Robin	0.42	16.8	1.17E-03
Deer Mouse	0.077	3	6.54E-03
Cottontail	3.1	124	1.58E-04
Montane Shrew	0.39	15.6	1.26E-03
Fox	1038	41,520	4.72E-07

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (0.0196 ha) divided by the population area.

Table H-5.4-17
Adjusted HIs for SMWU 26-003

COPEC	EPC (mg/kg)	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)	Cottontail (mammalian herbivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate)	Plant (terrestrial autotroph-producer)
Arsenic	4.14	2.4E-09	2.6E-08	1.9E-07	1.4E-04	2.3E-04	3.2E-04	6.0E-06	2.7E-04	8.5E-04	**0.61**	**0.23**
Barium	81.7	9.4E-10	1.6E-08	5.0E-08	1.3E-04	1.2E-04	1.2E-04	4.5E-06	4.9E-05	3.0E-04	**0.25**	**0.74**
Selenium	8.99	4.6E-08	5.6E-07	1.1E-05	0.011	0.013	0.015	6.5E-04	0.016	0.072	**2.19**	**17.3**
	Adjusted HI	5E-08	6E-07	1E-05	0.01	0.01	0.02	7E-04	0.02	0.07	**3**	**18**

Note: Bolded values indicate HQs greater than 0.1 or HI greater than 1.

Table H-5.4-18
Summary of LOAEL-Based ESLs for Terrestrial Receptors

COPEC	Receptor	LOAEL-Based ESL* (mg/kg)
Antimony	Plant	58
Antimony	Earthworm	780
Arsenic	Plant	91
Arsenic	Earthworm	68
Barium	Plant	260
Barium	Earthworm	3200
Beryllium	Plant	25
Copper	Plant	490
Lead	Plant	570
Manganese	Plant	1100
Manganese	Earthworm	4500
Mercury	Earthworm	0.5
Nickel	Plant	270
Nickel	Earthworm	1300
Selenium	Plant	3
Selenium	Earthworm	41
Vanadium	Plant	80
Thallium	Plant	0.5
Zinc	Plant	810
Zinc	Earthworm	930

* LOAEL-based ESLs from ECORISK Database, Release 4.1 (LANL 2017, 602538)

Table H-5.4-19
HI Analysis Using LOAEL-Based ESLs for AOC 02-003(d)

COPEC	EPC (mg/kg)	Earthworm	Plant
Arsenic	2.09	0.031	0.023
Barium	43.2	0.014	**0.17**
Beryllium	1.83	n/a*	0.073
Manganese	287	0.064	0.26
Mercury	0.0397	0.079	n/a
Selenium	3.96	0.097	**1.32**
Vanadium	7.01	na	0.088
Zinc	46.5	0.05	0.057
	HI	0.3	**2**

Note: Bolded values indicate HQ greater than 0.1 or HI greater than 1.
* n/a = Not applicable.

Table H-5.4-20
HI Analysis Using LOAEL-Based ESLs for SMWU 02-006(a)

COPEC	EPC (mg/kg)	Earthworm	Plant
Arsenic	2.68	0.039	0.029
Barium	88.4	0.028	**0.34**
Lead	16.7	n/a*	0.029
Nickel	5.92	n/a	0.022
Selenium	6.63	0.16	**2.21**
HI		0.2	**3**

Note: Bolded values indicate HQ greater than 0.1 or HI greater than 1.
* n/a = Not applicable.

Table H-5.4-21
HI Analysis Using LOAEL-Based
ESLs for SWMU 21-006(e) and AOC 21-006(f)

COPEC	EPC (mg/kg)	Earthworm	Plant
Arsenic	2.68	0.039	0.029
Barium	193	0.06	**0.74**
Copper	8	n/a*	0.016
Lead	22.5	n/a	0.039
Mercury	0.0793	**0.16**	n/a
Nickel	68.4	0.053	**0.25**
Selenium	0.54	0.013	**0.18**
Zinc	86	0.092	**0.11**
HI		0.4	1

Note: Bolded values indicate HQ greater than 0.1 or HI greater than 1.
* n/a = Not applicable.

Table H-5.4-22
HI Analysis Using LOAEL-Based ESLs for AOC 21-028(c)

COPEC	EPC (mg/kg)	Earthworm	Plant
Antimony	1.27	n/a*	0.022
Barium	137	0.043	**0.53**
Lead	28.4	n/a	0.05
Mercury	0.301	**0.6**	n/a
Nickel	10.1	n/a	0.037
Selenium	0.59(U)	0.014	**0.2**
Vanadium	41.8	na	**0.52**
Zinc	28.6	0.031	0.035
HI		0.7	1

Note: Bolded values indicate HQ greater than 0.1 or HI greater than 1.
* n/a = Not applicable.

Table H-5.4-23
HI Analysis Using LOAEL-Based ESLs for SWMU 26-001

COPEC	EPC (mg/kg)	Earthworm	Plant
Antimony	15.5	0.02	**0.27**
Arsenic	2.3	0.034	0.025
Selenium	6.21	0.15	**2.07**
	HI	0.2	**2**

Note: Bolded values indicate HQ greater than 0.1 or HI greater than 1.

Table H-5.4-24
HI Analysis Using LOAEL-Based ESLs for SWMU 26-002(a)

COPEC	EPC (mg/kg)	Earthworm	Plant
Arsenic	3.96	0.058	0.044
Barium	71.5	0.022	**0.28**
Nickel	6.3	n/a*	0.023
Selenium	9.9	**0.24**	**3.3**
Thallium	0.15	na	0.3
	HI	0.3	**4**

Note: Bolded values indicate HQ greater than 0.1 or HI greater than 1.
* n/a = Not applicable.

Table H-5.4-25
HI Analysis Using LOAEL-Based ESLs for SWMU 26-002(b)

COPEC	EPC (mg/kg)	Earthworm	Plant
Arsenic	4.27	0.063	0.047
Nickel	7.62	n/a*	0.028
Selenium	17	**0.41**	**5.67**
HI		0.5	6

Note: Bolded values indicate HQ greater than 0.1 or HI greater than 1.
* n/a = Not applicable.

Table H-5.4-26
HI Analysis Using LOAEL-Based ESLs for SWMU 26-003

COPEC	EPC (mg/kg)	Earthworm	Plant
Arsenic	4.14	0.061	0.045
Barium	81.7	0.026	**0.31**
Selenium	8.99	0.22	**3**
	HI	0.3	**3**

Note: Bolded values indicate HQ greater than 0.1 or HI greater than 1.

Table H-6.1-1
Minimum ESL Comparison for the TA-02 Core Area

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	0.218	2.3	Deer mouse	0.095
Arsenic	1.85	6.8	Earthworm	0.27
Barium	87	110	Plant	**0.79**
Cadmium	0.368	0.27	Shrew	**1.36**
Chromium (Total)	10.9	23	Robin (insectivore)	**0.47**
Chromium hexavalent ion	0.191	0.34	Earthworm	**0.56**
Cobalt	1.79	13	Plant	0.14
Copper	8.35	14	Robin (insectivore)	**0.6**
Cyanide (Total)	0.335	0.098	Robin (insectivore)	**3.42**
Lead	53.9	11	Robin (insectivore)	**4.9**
Manganese	275	220	Plant	**1.25**
Mercury	0.51	0.013	Robin (insectivore)	**39.2**
Nickel	3.33	10	Shrew	**0.33**
Perchlorate	0.00261	0.12	Robin (herbivore)	0.022
Selenium	2.9	0.52	Plant	**5.58**
Silver	0.146	2.6	Robin (insectivore)	0.056
Thallium	0.128	0.05	Plant	**2.56**
Uranium	1.2	25	Plant	0.048
Vanadium	9.07	4.7	Robin (insectivore)	**1.93**
Zinc	54.3	47	Robin (insectivore)	**1.16**
Organic Chemicals (mg/kg)				
Acenaphthene	0.0392	0.25	Plant	0.16
Acetone	0.0062	1.2	Deer mouse	0.0052
Anthracene	0.0507	6.8	Plant	0.0075
Aroclor-1242	0.0627	0.041	Robin (insectivore)	**1.53**
Aroclor-1248	0.00454	0.0073	Shrew	**0.62**
Aroclor-1254	0.0488	0.041	Robin (insectivore)	**1.19**
Aroclor-1260	14.4	0.88	Robin (insectivore)	**16.4**
Benzo(a)anthracene	0.085	0.73	Robin (herbivore)	0.12
Benzo(a)pyrene	0.111	62	Shrew	0.0018
Benzo(b)fluoranthene	0.131	18	Plant	0.0073
Benzo(g,h,i)perylene	0.058	25	Shrew	0.0023
Benzo(k)fluoranthene	0.0234	71	Shrew	0.00033
Bis(2-ethylhexyl)phthalate	0.0749	0.02	Robin (insectivore)	**3.75**
Butanone[2-]	0.0024	350	Deer mouse	0.0000069

Table H-6.1-1 (continued)

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	HQ
Butylbenzylphthalate	0.281	90	Shrew	0.0031
Carbon Disulfide	0.004	0.81	Deer mouse	0.0049
Chloroform	0.000267	8	Deer mouse	0.000033
Chrysene	0.108	3.1	Shrew	0.035
Di-n-butylphthalate	0.0683	0.011	Robin (insectivore)	**6.21**
Dibenz(a,h)anthracene	0.0125	14	Shrew	0.00089
Dibenzofuran	0.161	6.1	Plant	0.026
Dichlorobenzene[1,4-]	0.000338	0.89	Shrew	0.00038
Diethylphthalate	0.37	100	Plant	0.0037
Fluoranthene	0.198	10	Earthworm	0.02
Fluorene	0.0348	3.7	Earthworm	0.0094
Indeno(1,2,3-cd)pyrene	0.0477	71	Shrew	0.00067
Methyl-2-pentanone[4-]	0.01	9.7	Deer mouse	0.001
Methylene Chloride	0.00337	2.6	Deer mouse	0.0013
Methylnaphthalene[2-]	0.027	16	Shrew	0.0017
Naphthalene	0.0448	1	Plant	0.045
Pentachlorophenol	0.301	0.36	Robin (insectivore)	**0.84**
Phenanthrene	0.153	5.5	Earthworm	0.028
Phenol	0.102	0.79	Plant	0.13
Pyrene	0.213	10	Earthworm	0.021
Styrene	0.037	1.2	Earthworm	0.031
Tetrachlorodibenzodioxin[2,3,7,8-]	0.0000175	0.00000029	Shrew	**60.3**
Tetrachloroethene	0.000302	0.18	Shrew	0.0017
Toluene	0.000711	23	Shrew	0.000031
Trichloroethene	0.000884	42	Shrew	0.000021
Trichlorofluoromethane	0.002	52	Shrew	0.000038
Xylene[1,3-]+Xylene[1,4-]	0.000469	1.4	Shrew	0.00034
Radionuclides (pCi/g)				
Americium-241	0.165	190	Earthworm	0.00087
Cesium-137	4.43	1400	Robin (herbivore)	0.0032
Cobalt-60	2.86	760	Deer mouse	0.0038
Cobalt-60	2.86	760	Earthworm	0.0038
Cobalt-60	2.86	760	Plant	0.0038
Cobalt-60	2.86	760	Fox	0.0038
Cobalt-60	2.86	760	Shrew	0.0038
Cobalt-60	2.86	760	Cottontail	0.0038
Plutonium-238	0.047	820	Earthworm	0.000057
Plutonium-239/240	0.337	870	Earthworm	0.00039

Table H-6.1-1 (continued)

COPC	EPC (mg/kg)	ESL (mg/kg)	Receptor	HQ
Strontium-90	0.685	340	Robin (herbivore)	0.002
Tritium	3.81	36,000	Plant	0.00011
Uranium-234	1.19	440	Plant	0.0027
Uranium-235/236	0.0518	440	Plant	0.00012
Uranium-238	1.13	400	Plant	0.0028

Notes: Bolded values indicate HQs greater than 0.3. Data qualifiers are defined in Appendix A.

Table H-6.1-2
HI Analysis for the TA-02 Core Area

COPEC	EPC (mg/kg)	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)	Cottontail (mammalian herbivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate)	Plant (terrestrial autotroph-producer)
Barium	87	0.0021	0.0036	0.012	0.12	0.11	0.11	0.03	0.041	0.048	0.26	**0.79**
Cadmium	0.368	6.7E-04	8.6E-04	0.28	0.086	**0.68**	**1.27**	0.037	**1.36**	**0.74**	0.0026	0.012
Chromium (Total)	10.9	0.0061	0.013	0.064	0.21	**0.34**	**0.47**	0.027	0.17	0.099	na*	na
Chromium hexavalent ion	0.191	2.7E-05	5.3E-05	1.3E-04	9.1E-04	0.0012	0.0013	1.2E-04	3.8E-04	2.2E-04	**0.56**	**0.54**
Copper	8.35	0.0021	0.0076	0.1	0.25	**0.42**	**0.6**	0.032	0.2	0.13	0.1	0.12
Cyanide (Total)	0.335	1.0E-04	**0.57**	**0.93**	**3.35**	**3.38**	**3.42**	4.2E-04	0.001	0.001	na	na
Lead	53.9	0.015	0.1	**0.65**	**2.99**	**3.85**	**4.9**	0.17	**0.58**	**0.45**	0.032	**0.45**
Manganese	275	0.0069	0.0046	0.011	0.21	0.17	0.13	0.14	0.098	0.2	**0.61**	**1.25**
Mercury	0.51	0.0067	**1.59**	**8.79**	**7.61**	**23.2**	**39.2**	0.022	0.3	0.17	**10.2**	0.015
Nickel	3.33	0.0028	0.0017	0.03	0.028	0.095	0.17	0.012	**0.33**	0.17	0.012	0.088
Selenium	2.9	0.032	0.039	**0.78**	**2.96**	**3.49**	**4.08**	**1.32**	**4.14**	**3.54**	**0.71**	**5.58**
Thallium	0.128	0.026	0.0013	0.0027	0.019	0.023	0.028	0.11	0.3	0.18	na	**2.56**
Vanadium	9.07	0.0028	0.082	0.16	**1.33**	**1.65**	**1.93**	0.012	0.031	0.019	na	0.15
Zinc	54.3	0.0057	0.021	0.25	0.16	**0.65**	**1.16**	0.03	**0.55**	**0.32**	**0.45**	**0.34**
Aroclor-1242	0.0627	6.3E-04	0.01	**0.33**	0.068	**0.8**	**1.53**	0.0023	0.16	0.084	na	na
Aroclor-1248	0.00454	0.0024	7.2E-04	0.024	0.0048	0.058	0.11	0.0086	**0.62**	**0.32**	na	na
Aroclor-1254	0.0488	6.8E-03	6.5E-03	0.26	0.044	**0.62**	**1.19**	0.0011	0.11	0.057	na	3.0E-04
Aroclor-1260	14.4	**0.96**	0.036	**3.43**	**0.39**	**8.47**	**16.4**	0.008	**1.44**	**0.72**	na	na

Table H-6.1-2 (continued)

COPEC	EPC (mg/kg)	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)	Cottontail (mammalian herbivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate)	Plant (terrestrial autotroph-producer)
Bis(2-ethylhexyl)phthalate	0.0749	1.5E-04	0.0081	**0.78**	0.0047	**1.87**	**3.75**	3.9E-05	0.12	0.068	na	na
Di-n-butylphthalate	0.0683	1.1E-06	0.034	**1.31**	0.18	**3.25**	**6.21**	4.0E-06	3.8E-04	1.9E-04	na	4.3E-04
Pentachlorophenol	0.301	0.0013	0.0053	0.18	0.01	**0.42**	**0.84**	0.0017	**0.37**	0.2	0.0097	0.06
Tetrachlorodibenzodioxin[2,3,7,8-]	1.75E-05	0.18	na	na	na	na	na	**0.44**	**60.3**	**30.2**	3.5E-06	na
	HI	1	**3**	**18**	**20**	**53**	**87**	**2**	**71**	**38**	**13**	**12**

Note: Bolded values indicate HQs greater than 0.3 or HI greater than 1.

*na = Not available.

Table H-6.1-3
PAUFs for Ecological Receptors for the TA-02 Core Area

Receptor	HR (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	1.25E-03
American Robin	0.42	16.8	3.16E-01
Deer Mouse	0.077	3	1.00E+00
Desert Cottontail	3.1	124	4.28E-02
Montane Shrew	0.39	15.6	3.40E-01
Red Fox	1038	41,520	1.28E-04

[a] Values from EPA (1993, 059384).

[b] PAUF is calculated as the area of the site (5.3 ha) divided by the population area.

Table H-6.1-4
Adjusted HIs for the TA-02 Core Area

COPEC	EPC (mg/kg)	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)	Cottontail (mammalian herbivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate)	Plant (terrestrial autotroph-producer)
Barium	87	2.7E-07	4.5E-06	1.5E-05	0.038	0.036	0.033	0.0013	0.014	0.048	**0.26**	**0.79**
Cadmium	0.368	8.5E-08	1.1E-06	3.5E-04	0.027	**0.22**	**0.4**	0.0016	**0.46**	**0.74**	0.0026	0.012
Chromium (Total)	10.9	7.7E-07	1.6E-05	8.0E-05	0.067	**0.11**	**0.15**	0.0011	0.059	0.099	na*	na
Chromium hexavalent ion	0.191	3.4E-09	6.6E-08	1.7E-07	2.9E-04	3.8E-04	4.3E-04	5.1E-06	1.2E-04	2.2E-04	**0.56**	**0.54**
Copper	8.35	2.7E-07	9.5E-06	1.3E-04	0.078	**0.13**	**0.19**	0.0014	0.068	**0.13**	0.1	**0.12**
Cyanide (Total)	0.335	1.3E-08	7.1E-04	0.0012	**1.06**	**1.07**	**1.08**	1.8E-05	3.5E-04	0.001	na	na
Lead	53.9	1.9E-06	1.2E-04	8.1E-04	**0.95**	**1.22**	**1.55**	0.0074	**0.2**	**0.45**	0.032	**0.45**
Manganese	275	8.8E-07	5.7E-06	1.4E-05	0.067	0.054	0.039	0.0059	0.033	**0.2**	**0.61**	**1.25**
Mercury	0.51	8.6E-07	0.002	0.011	**2.4**	**7.32**	**12.4**	9.5E-04	0.1	**0.17**	**10.2**	0.015
Nickel	3.33	3.5E-07	2.1E-06	3.8E-05	0.0088	0.03	0.053	5.3E-04	**0.11**	**0.17**	0.012	0.088
Selenium	2.9	4.0E-06	4.9E-05	9.8E-04	**0.93**	**1.1**	**1.29**	0.056	**1.41**	**3.54**	**0.71**	**5.58**
Thallium	0.128	3.3E-06	1.6E-06	3.3E-06	0.0059	0.0073	0.009	0.0046	0.1	**0.18**	na	**2.56**
Vanadium	9.07	3.6E-07	1.0E-04	2.0E-04	**0.42**	**0.52**	**0.61**	5.2E-04	0.011	0.019	na	**0.15**
Zinc	54.3	7.2E-07	2.6E-05	3.1E-04	0.052	**0.21**	**0.36**	0.0013	**0.19**	**0.32**	**0.45**	**0.34**
Aroclor-1242	0.0627	8.0E-08	1.3E-05	4.1E-04	0.022	**0.25**	**0.48**	9.9E-05	0.055	0.084	na	na
Aroclor-1248	0.00454	3.1E-07	9.0E-07	3.0E-05	0.0015	0.018	0.035	3.7E-04	**0.21**	**0.32**	na	na
Aroclor-1254	0.0488	8.7E-07	8.0E-06	3.2E-04	1.4E-02	**1.9E-01**	**3.7E-01**	4.7E-05	0.037	0.057	na	3.0E-04
Aroclor-1260	14.4	1.2E-04	4.5E-05	0.0043	**0.12**	**2.67**	**5.17**	3.4E-04	**0.49**	**0.72**	na	na

Table H-6.1-4 (continued)

COPEC	EPC (mg/kg)	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)	Cottontail (mammalian herbivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate)	Plant (terrestrial autotroph-producer)
Bis(2-ethylhexyl)phthalate	0.0749	1.9E-08	1.0E-05	9.8E-04	0.0015	**0.59**	**1.18**	1.7E-06	0.042	0.068	na	na
Di-n-butylphthalate	0.0683	1.4E-10	4.3E-05	0.0016	0.057	**1.03**	**1.96**	1.7E-07	1.3E-04	1.9E-04	na	4.3E-04
Pentachlorophenol	0.301	1.7E-07	6.6E-06	2.2E-04	0.0033	**0.13**	**0.26**	7.2E-05	**0.13**	**0.2**	0.0097	0.06
Tetrachlorodibenzodioxin[2,3,7,8-]	1.75E-05	2.2E-05	na	na	na	na	na	0.019	**20.5**	**30.2**	3.5E-06	na
Adjusted HI		0.0002	0.003	0.02	**6**	**17**	**28**	0.1	**24**	**38**	**13**	**12**

Note: Bolded values indicate HQs greater than 0.1 or HI greater than 1.

*na = Not available.

Table H-6.1-5
HI Analysis using LOAEL-based ESLs for the TA-02 Core Area

COPEC	EPC (mg/kg)	American Robin (avian herbivore)	American Robin (avian omnivore)	American Robin (avian insectivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate)	Plant (terrestrial autotroph-producer)
Barium	87	0.073	0.067	0.062	0.0087	0.01	0.027	**0.33**
Cadmium	0.368	0.016	**0.12**	**0.23**	0.1	0.054	0.00048	0.0023
Chromium (Total)	10.9	0.068	**0.11**	**0.15**	0.0017	0.00099	na*	na
Chromium hexavalent ion	0.191	9.1E-05	1.2E-04	1.3E-04	5.8E-05	3.5E-05	0.056	0.048
Copper	8.35	0.084	**0.14**	**0.19**	**0.12**	0.084	0.016	0.017
Cyanide (Total)	0.335	**0.34**	**0.34**	**0.34**	0.0001	0.0001	na	na
Lead	53.9	**1.5**	**1.93**	**2.34**	**0.32**	**0.23**	0.0064	0.095
Manganese	275	0.1	0.079	0.059	0.028	0.051	0.061	**0.25**
Mercury	0.51	**0.76**	**2.32**	**3.92**	0.03	0.017	**1.02**	0.008
Nickel	3.33	0.0067	0.026	0.041	**0.16**	0.083	0.0026	0.012
Selenium	2.9	**1.53**	**1.81**	**2.07**	**2.9**	**2.42**	0.071	**0.97**
Thallium	0.128	0.0019	0.0023	0.0028	0.03	0.018	na	**0.26**
Vanadium	9.07	**0.7**	**0.82**	**0.95**	0.015	0.0091	na	**0.11**
Zinc	54.3	**0.45**	**0.25**	**0.45**	0.055	0.032	0.058	0.067
Aroclor-1242	0.0627	0.0068	0.08	**0.15**	0.042	0.021	na	na
Aroclor-1248	0.00454	4.8E-04	0.0058	0.011	0.062	0.032	na	na
Aroclor-1254	0.0488	0.0044	0.062	0.12	0.021	0.01	na	7.9E-05
Aroclor-1260	14.4	**0.28**	**6**	**12**	**0.6**	**0.3**	na	na

Table H-6.1-5 (continued)

COPEC	EPC (mg/kg)	American Robin (avian herbivore)	American Robin (avian omnivore)	American Robin (avian insectivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil dwelling invertebrate)	Plant (terrestrial autotroph-producer)
Bis(2-ethylhexyl)phthalate	0.0749	4.7E-04	**0.19**	**0.37**	0.012	0.0068	na	na
Di-n-butylphthalate	0.0683	0.018	**0.33**	**0.62**	1.5E-04	7.9E-05	na	0.00011
Pentachlorophenol	0.301	0.001	0.042	0.084	0.037	0.02	0.002	0.006
Tetrachlorodibenzodioxin[2,3,7,8-]	1.75E-05	na	na	na	**9.21**	**4.61**	2E-06	na
	HI	**6**	**15**	**24**	**14**	**8**	1	**2**

Note: Bolded values indicate HQs greater than 0.1 or HI greater than 1.

*na = Not available.

Table H-6.1-6
Adjusted HI Analysis using LOAEL-based ESLs for the TA-02 Core Area

COPEC	EPC (mg/kg)	American Robin (avian herbivore)	American Robin (avian omnivore)	American Robin (avian insectivore)	Montane Shrew (mammalian insectivore)
Barium	87	0.023	0.021	0.02	0.003
Cadmium	0.368	0.0051	0.039	0.073	0.035
Chromium (Total)	10.9	0.022	0.034	0.047	5.9E-04
Chromium hexavalent ion	0.191	2.9E-05	3.8E-05	4.3E-05	1.9E-05
Copper	8.35	0.026	0.044	0.061	0.041
Cyanide (Total)	0.335	**0.11**	**0.11**	**0.11**	3.5E-05
Lead	53.9	**0.47**	**0.61**	**0.74**	**0.11**
Manganese	275	0.032	0.025	0.018	0.0094
Mercury	0.51	**0.24**	**0.73**	**1.24**	0.01
Nickel	3.33	0.0021	0.0081	0.013	0.054
Selenium	2.9	**0.48**	**0.57**	**0.65**	**0.99**
Thallium	0.128	5.9E-04	7.3E-04	9.0E-04	0.01
Vanadium	9.07	**0.22**	**0.26**	**0.3**	0.0051
Zinc	54.3	**0.14**	0.078	**0.14**	0.019
Aroclor-1242	0.0627	0.0022	0.025	0.048	0.014
Aroclor-1248	0.00454	1.5E-04	0.0018	0.0035	0.021
Aroclor-1254	0.0488	0.0014	0.019	0.037	0.0069
Aroclor-1260	14.4	0.087	**1.89**	**3.79**	**0.2**
Bis(2-ethylhexyl)phthalate	0.0749	1.5E-04	0.059	**0.12**	0.0042
Di-n-butylphthalate	0.0683	0.0057	0.1	**0.2**	5.2E-05
Pentachlorophenol	0.301	3.3E-04	0.013	0.026	0.013
Tetrachlorodibenzodioxin[2,3,7,8-]	1.75E-05	na*	na	na	**3.13**
	HI	**2**	**5**	**8**	**5**

Note: Bolded values indicate HQs greater than 0.1 or HI greater than 1.
*na = Not available.

Attachment H-1

Dioxin and Furan Toxicity Equivalency Factor Calculations
(on CD included with this document)

Attachment H-2

ProUCL Files
(on CD included with this document)

Attachment H-3

Ecological Scoping Checklists for
Middle Los Alamos Canyon Aggregate Area

H3-1.0 TECHNICAL AREA 02

H3-1.1 Part A—Scoping Meeting Documentation

Site IDs	Technical Area 02 (TA-02) Core Area: Area of Concern (AOC) 02-003(a), AOC 02-003(b), AOC 02-003(c), AOC 02-003(e), AOC 02-004(a), AOCs 02-004(b,c,d), AOC 02-004(e), AOC 02-004(f), AOC 02-004(g), Solid Waste Management Unit (SWMU) 02-005, SWMU 02-006(b), AOC 02-006(c), AOC 02-006(e), SWMU 02-007, SWMU 02-008(a), AOC 02-008(c), SWMU 02-009(a), SWMU 02-009(b), SWMU 02-009(c), AOC 02-009(d), AOC 02-010, AOC 02-011(a), AOC 02-011(b), AOC 02-011(c), AOC 02-011(d), AOC 02-012, SWMU 02-012
Form of site releases (solid, liquid, vapor). Describe all relevant known or suspected mechanisms of release (spills, dumping, material disposal, outfall, explosive testing, etc.) and describe potential areas of release. Reference locations on a map as appropriate.	TA-02 was used to house a series of research reactors from 1943 to 2003 when decontamination and decommissioning (D&D) of the site occurred. The TA-02 Core Area includes the following sites: AOC 02-003(a), Soil Contamination from Stack-Gas Valve House and Gaseous Effluent Line. Line 117 and the stack-gas valve house remained in use until 1974 when they became inactive and were removed and disposed of during D&D efforts in 1985. AOC 02-003(b), Soil Contamination at Condensate Trap and Line. The units were inactive from 1974 to 1985 and were removed and disposed of during D&D efforts in 1985. AOC 02-003(c), Soil Contamination at Gaseous Effluent Delay Tanks. The tanks were removed and disposed of during D&D efforts in 1985. AOC 02-003(e), Soil Contamination. The holding tank was removed and disposed of during D&D activities in 1985. AOC 02-004(a) is the Omega West Reactor (OWR) facility (building 02-001) and is composed of the OWR, the OWR fuel-handling area, the OWR cooling-liquid recirculating piping, the OWR gaseous effluent vent line, the OWR material storage area, and the WBR. OWR experienced a cooling system water leak in January 1993. As a result, the reactor was put on standby status in 1993 and remained inactive until it was decommissioned in 2003. AOCs 02-004(b,c,d), Former Storage Tanks for Effluent from OWR and Equipment Building. In 2003, these tanks and associated lines were removed and disposed. AOC 02-004(e), Former Acid Pit/Transfer Sump. All liquid waste was drained from the system in 1995, and in 2000 the structure and equipment were decommissioned and removed. All remaining buried pipes and drains were removed and disposed in 2003. AOC 02-004(f), Former Equipment Building and Acid Waste Line to TA-50. In 2003, the building and all remaining buried pipes and drains were removed and disposed. AOC 02-004(g), Soil Contamination. The platform and portable aboveground storage tank were removed by 1993, but removal and disposal details are not available. SWMU 02-005 consists of an area of soil contamination potentially affected by airborne drift of potassium dichromate. The cooling tower and lines were removed in 2000 and 2003. SWMU 02-006(b), Former Acid Waste Line, Laboratory Effluent. All lines and connections were removed and disposed in 2003. AOC 02-006(c), Former Drainline from Offices, Restrooms, Control Room. The sewer line was removed and disposed during D&D activities in 2003.

	AOC 02-006(e), Former Sump for Reactor Room Floor Drains and Mezzanine. The original and second sump and associated drainlines were removed and disposed during D&D activities in 2003. SWMU 02-007, Septic System for Floor Drains in OWR Building and Chemical Shack. The septic tank and overflow outfall and surrounding soils were removed and disposed in 1986. SWMU 02-008(a), OWR Cooling Tower Water Outfall. The cooling tower and lines were removed in 2000 and 2003. The outfall was removed from the Laboratory's permit in July 1990. AOC 02-008(c), Outfall for Seepage into Basement of OWR Building. Both drainpipes and outfalls were removed and disposed during D&D activities in 2003. SWMU 02-009(a), Radioactive Soil Contamination. A limited amount of soil was removed at the site, and the soil was disposed in 1986. SWMU 02-009(b), Radioactive Soil Contamination. A limited amount of soil was removed at the site, and the soil was disposed in 1986. SWMU 02-009(c), Radioactive Soil Contamination. All structures (pipes) and adjacent soils down to the saturated zone were removed and disposed during the 1985–1986 D&D activities. AOC 02-009(d), Radioactive Soil Contamination. Beta and gamma radioactivity were identified during decommissioning and removal of inactive WBR structures at TA-02 during 1985 and 1986. AOC 02-010 is residual soil contamination associated with a small chemical handling building (the chemical waste shack, 02-003) that contained a small underground chamber for working with various radioactive and chemical materials. The chemical waste shack was decommissioned, removed, and disposed in 1971. OC 02-011(a), Storm Drains and Outfalls. AOC 02-011(a) consists of 11 drain segments and associated outfalls across TA 02. These individual segments drain either directly or indirectly to Los Alamos Creek. Several of the drains were removed in either the 2000 or 2003 D&D activities, but five of the drains, or some portion of them, remained in place. AOC 02-011(b), Former Drainlines from Stack-Gas Valve House. The drains and outfalls remained in place until they were removed and disposed during 2003 D&D activities. AOC 02-011(c), Storm Drain. The AOC 02-011(c) outfall piping was removed and disposed in 2003. AOC 02-011(d), Outfall from Equipment Building. Discharge was rerouted through the OWR effluent storage tanks and disposed of through the liquid acid waste line to TA-50 beginning in 1963. The outfall was removed from the permit in 1995. AOC 02-012 consists of the potential soil contamination associated with two removed fuel underground storage tanks. The diesel tank and associated lines were removed and disposed in 1998 in accordance with NMED requirements. SWMU 02-012, polychlorinated biphenyl (PCB) soil contamination. Potential areas of release were to surface soil/water/sediment and subsurface soil/tuff.

List of Primary Impacted Media **(Indicate all that apply.)**	**Surface soil** – X **Surface water/sediment** – X (Sediment, Water from Historic Outfalls) **Subsurface** – X **Groundwater** – N/A **Other, explain** – None
FIMAD vegetation class based on Arcview vegetation coverage **(Indicate all that apply.)**	**Water** – N/A **Bare ground/unvegetated** – N/A **Spruce/fir/aspen/mixed conifer** – N/A **Ponderosa pine** – N/A **Piñon juniper/juniper savannah** – N/A **Grassland/shrubland** – X **Developed** – N/A **Burned –** NA
Is T&E Habitat Present? **If applicable, list species known or suspected to use the site for breeding or foraging.**	No threatened and endangered (T&E) species nesting habitat is present at the site. However, the area is within the foraging range of the Mexican spotted owl.
Provide list of Neighboring/ Contiguous/ Up-gradient sites, include a brief summary of COPCs and form of releases for relevant sites and reference map as appropriate. **(Use information to evaluate need to aggregate sites for screening.)**	Sites in the Upper Los Alamos Canyon Aggregate Area are upgradient of the TA-02 Core Area.
Surface Water Erosion Potential Information Surface water erosion potential is based on site observations	Surface water transport and erosion potential varies at these sites. Some locations are in close proximity to the stream in Los Alamos Canyon. Los Alamos Canyon is the terminal point for surface water transport via runoff.

H3-1.2 Part B—Site Visit Documentation

Site ID	TA-02 Core Area
Dates of Site Visit	06/27/2018
Site Visit Conducted by	Randall Ryti, Tracy McFarland, Brenda Bowlby, Robert Dickerson, Larry Salazar

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)** = Low
Field Notes on the GIS Vegetation Class to Assist in Verifying the Arcview Information	The sites exhibit a low to moderate amount of variable vegetative cover throughout. Vegetation from the ponderosa pine zone and piñon/juniper zone is established on the perimeter of the site, and limited amounts of secondary successional grass and shrub species in the area.
Are ecological receptors present at the site? **(yes/no/uncertain)** **Describe the general types of receptors present at the site (terrestrial and aquatic), and make notes on the quality of habitat present at the site.**	Yes. Receptors are present at the TA-02 Core Area. The general types of receptors are terrestrial biota such as reptiles, small mammals, invertebrate insects, birds, and plants. The quality of habitat at the sites is presently limited for native plant and animal species due to the disturbance from D&D and remediation activities in the TA-02 Core Area.

Contaminant Transport Information:

Surface Water Transport/Field Notes on the Erosion Potential, Including a Discussion of the Terminal Point of Surface Water Transport (if applicable)	The sites contain low to moderate vegetation, resulting in some instability of the media at the site. In addition, part of the site is located near the stream channel, thus decreasing the likelihood of surface water transport. However, the area adjacent to the stream channel has been armored to mitigate surface water transport. The transport of surface water terminates downstream in Los Alamos Canyon.
Are there any off-site transport pathways (surface water, air, or groundwater)? **(yes/no/uncertain)** **Provide explanation**	Storm events may produce ephemeral surface drainage downgradient. No groundwater transport pathway exists. Surface contamination may be dispersed by wind although moderate vegetation cover inhibits this process.

Ecological Effects Information:

Physical Disturbance **(Provide list of major types of disturbances, including erosion and construction activities, review historical aerial photos where appropriate.)**	The site has a moderate amount of physical disturbance, primarily from demolition of former TA-02 facilities.
Are there obvious ecological effects? **(yes/no/uncertain)** **Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).**	No.

No Exposure/Transport Pathways:

If there are no complete exposure pathways to ecological receptors onsite and no transport pathways to offsite receptors, the remainder of the checklist should not be completed. Stop here and provide additional explanation/justification for proposing an ecological No Further Action recommendation (if needed). At a minimum, the potential for future transport should include likelihood that future construction activities could make contamination more available for exposure or transport. Not Applicable.

Adequacy of Site Characterization:

Do existing or proposed data provide information on the nature, rate and extent of contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if the maximum value was captured by existing sample data.)**	The Middle Los Alamos Canyon Aggregate Area investigation was designed to provide data to define nature and extent of contamination in the TA-02 Core Area. The nature and extent of contamination is defined for these sites.
Do existing or proposed data for the site address potential transport pathways of site contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if other sites should aggregated to characterize potential ecological risk.)**	Yes. The data include sites downgradient of the contamination to accommodate for potential transport pathways of site contamination.

Additional Field Notes:

Provide additional field notes on the site setting and potential ecological receptors. **TA-02 Core Area**. The core area has been disturbed due to the D&D of the former TA-02 facilities. However, revegetation is ongoing with forbs and grasses noted. There are ponderosa pine and larger shrubs in the area adjacent to the core area. Some fossorial activity is also noted. In 2017, small mammal trapping surveys captured deer mice, piñon mice, and brush mice. In addition, one of the avian nest boxes deployed in 2017 had a successful nest for the ash-throated flycatcher.

H3-1.3 Part C—Ecological Pathways Conceptual Exposure Model

Question A:

Could soil contaminants reach receptors via vapors?

- **Volatility of the hazardous substance (volatile chemicals generally have Henry's Law constant >10^{-5} atm-me/mol and molecular weight <200 g/mol).**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Volatile organic compounds are infrequently detected, in the subsurface, and are at low concentrations.

Question B:

Could the soil contaminants reach receptors through fugitive dust carried in air?

- **Soil contamination would have to be on the actual surface of the soil to become available for dust.**
- **In the case of dust exposures to burrowing animals, the contamination would have to occur in the depth interval where these burrows occur.**

Answer (likely/unlikely/uncertain): Likely

Provide explanation: Low percentage of vegetative cover makes the likelihood of soil contaminants reaching receptors through fugitive dust likely.

Question C:

Can contaminated soil be transported to aquatic ecological communities (use SOP 2.01 run-off score and terminal point of surface water runoff to help answer this question)?

- **If the SOP 2.01 run-off score* for each SWMU included in the site is equal to zero, this suggests that erosion at the site is not a transport pathway. (* Note that the runoff score is not the entire erosion potential score, rather it is a subtotal of this score with a maximum value of 46 points).**
- **If erosion is a transport pathway, evaluate the terminal point to see if aquatic receptors could be affected by contamination from this site.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no aquatic ecological communities on or within close proximity to the sites and there is limited runoff from the sites.

Question D:

Is contaminated groundwater potentially available to biological receptors through seeps or springs or shallow groundwater?

- **Known or suspected presence of contaminants in groundwater.**
- **The potential for contaminants to migrate via 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 (~1 m depth).**
- **Terrestrial wildlife receptors generally will not contact 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 regional groundwater is greater than 500 ft below ground surface.

<u>**Question E**</u>**:**

Is infiltration/percolation from contaminated subsurface material a viable transport and exposure pathway?

- **Suspected ability of contaminants to migrate to groundwater.**
- **The potential for contaminants to migrate via 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 (~1 m depth).**
- **Terrestrial wildlife receptors generally will not contact 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 only applicable to release sites located on or near the mesa edge.**
- **Consider the erodability of surficial material and the geologic processes of canyon/mesa edges.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: No perched aquifers exist on or near these sites. No evidence of mass wasting events in the area was found, and the erosion potential is minimal.

<u>**Question G**</u>**:**

Could airborne contaminants interact with receptors through respiration of vapors?

- **Contaminants must be present as volatiles in the air.**
- **Consider the importance of inhalation of vapors for burrowing animals.**
- **Foliar uptake of organic 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

Terrestrial Animals: 1

Provide explanation: Volatile organic compounds are detected infrequently and at low concentrations.

Question H:

Could airborne contaminants interact with plants through deposition of particulates or with animals through inhalation of fugitive dust?

- **Contaminants must be present as particulates in the air or as dust for this exposure pathway to be complete.**
- **Exposure via 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: 2

Terrestrial Animals: 2

Provide explanation: Moderate vegetative ground cover, along with the burrowing activities of ground-dwelling terrestrial animals may create a minor pathway for fugitive dust in air to reach receptors.

Question I:

Could contaminants interact with plants through root uptake or rain splash from surficial soils?

- **Contaminants in bulk soil may partition into soil solution, making them available to roots.**
- **Exposure of terrestrial plants to contaminants present in particulates deposited on leaf and stem surfaces by rain striking contaminated soils (i.e., rain splash).**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Provide explanation: Low concentrations of chemicals of potential concern (COPCs) were detected in surficial soil.

Question J:

Could contaminants interact with receptors through food web transport from surficial soils?

- **The chemicals may bioaccumulate in animals.**
- **Animals may ingest contaminated food items.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: Some bioaccumulating contaminants are present but at low enough concentrations so the transport pathway through the food webs to receptors is minimal.

Question K:

Could contaminants interact with receptors via incidental ingestion of surficial soils?

- **Incidental ingestion of contaminated soil could occur while animals grub for food resident in the soil, feed on plant matter covered with contaminated soil or while grooming themselves clean of soil.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: COPCs in surface and subsurface are at low levels.

Question L:

Could contaminants interact with receptors through dermal contact with surficial soils?

- **Significant exposure via dermal contact would generally be limited to organic contaminants that are lipophilic and can cross epidermal barriers.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: Lipophilic chemicals were detected at low concentrations at these sites.

Question M:

Could contaminants interact with plants or animals through external irradiation?

- **External irradiation effects are most relevant for gamma emitting radionuclides.**
- **Burial of contamination attenuates radiological exposure.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Terrestrial Animals: 2

Provide explanation: Radionuclides were detected at low to moderate levels.

<u>Question N</u>:

Could contaminants interact with plants through direct uptake from water and sediment or sediment rain splash?

- **Contaminants may be taken-up by terrestrial plants whose roots are in contact with surface waters.**
- **Terrestrial plants may be exposed to particulates deposited on leaf and stem surfaces by rain striking contaminated sediments (i.e., rain splash) in an area that is only periodically inundated with water.**
- **Contaminants in sediment may partition into soil solution, making them available to roots.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Provide explanation: No aquatic habitat exists 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 items.**
- **Animals may ingest contaminated food items.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: No aquatic habitat exists on-site.

<u>Question P</u>:

Could contaminants interact with receptors via ingestion of water and suspended sediments?

- **If sediments are present in an area that is only periodically inundated with water, terrestrial receptors may incidentally ingest sediments.**
- **Terrestrial receptors may ingest water-borne contaminants if contaminated surface waters are used as a drinking water source.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: No aquatic habitat exists on-site.

<u>Question Q</u>:

Could contaminants interact with receptors through dermal contact with water and sediment?

- **If sediments are present in an area that is only periodically inundated with water, terrestrial species may be dermally exposed during dry periods.**
- **Terrestrial organisms may be dermally exposed to water-borne contaminants as a result of wading or swimming in contaminated waters.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: No aquatic habitat exists on-site.

<u>Question R</u>:

Could contaminants interact with plants or animals through external irradiation?

- **External irradiation effects are most relevant for gamma emitting radionuclides.**
- **Burial of contamination attenuates radiological exposure.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Terrestrial Animals: 0

Provide explanation: No aquatic habitat exists on-site.

<u>Question S</u>:

Could contaminants bioconcentrate in free floating aquatic, attached aquatic plants, or emergent vegetation?

- **Aquatic plants are in direct contact with water.**
- **Contaminants in sediment may partition into pore water, making them available to submerged roots.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Plants/Emergent Vegetation: 0

Provide explanation: No aquatic habitat exists 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 sediments or may be exposed to contaminants through osmotic exchange, respiration, or ventilation of sediment pore waters.**
- **Aquatic receptors may be exposed through osmotic exchange, respiration, or ventilation of surface waters.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation: No aquatic habitat exists 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 items may result in contaminant bioaccumulation through the food web.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation: No aquatic habitat exists on-site.

<u>Question V</u>:

Could contaminants interact with aquatic plants or animals through external irradiation?

- **External irradiation effects are most relevant for gamma emitting radionuclides.**
- **The water column acts to absorb radiation, thus external irradiation is typically more important for sediment dwelling organisms.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

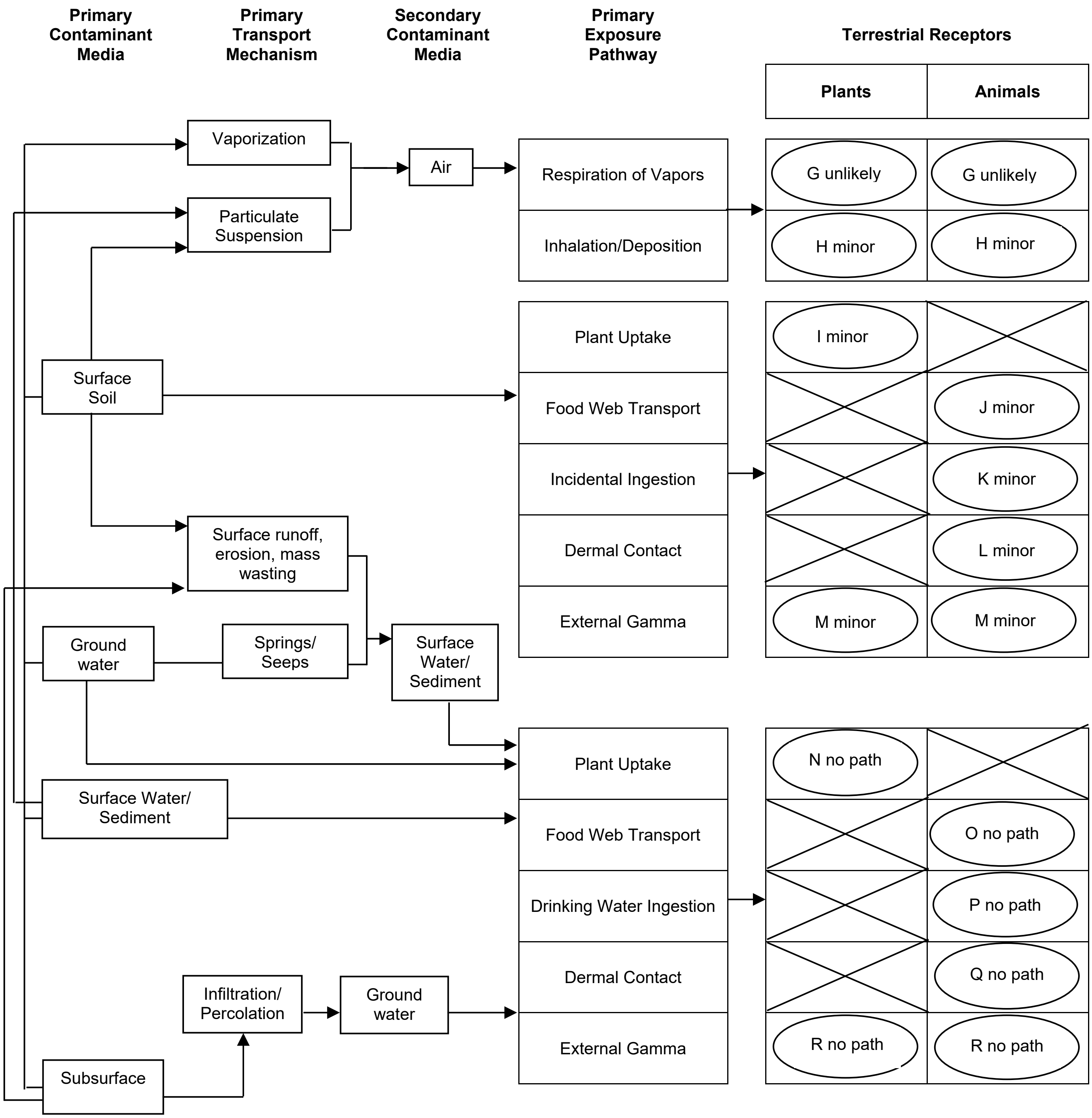
Aquatic Plants: 0

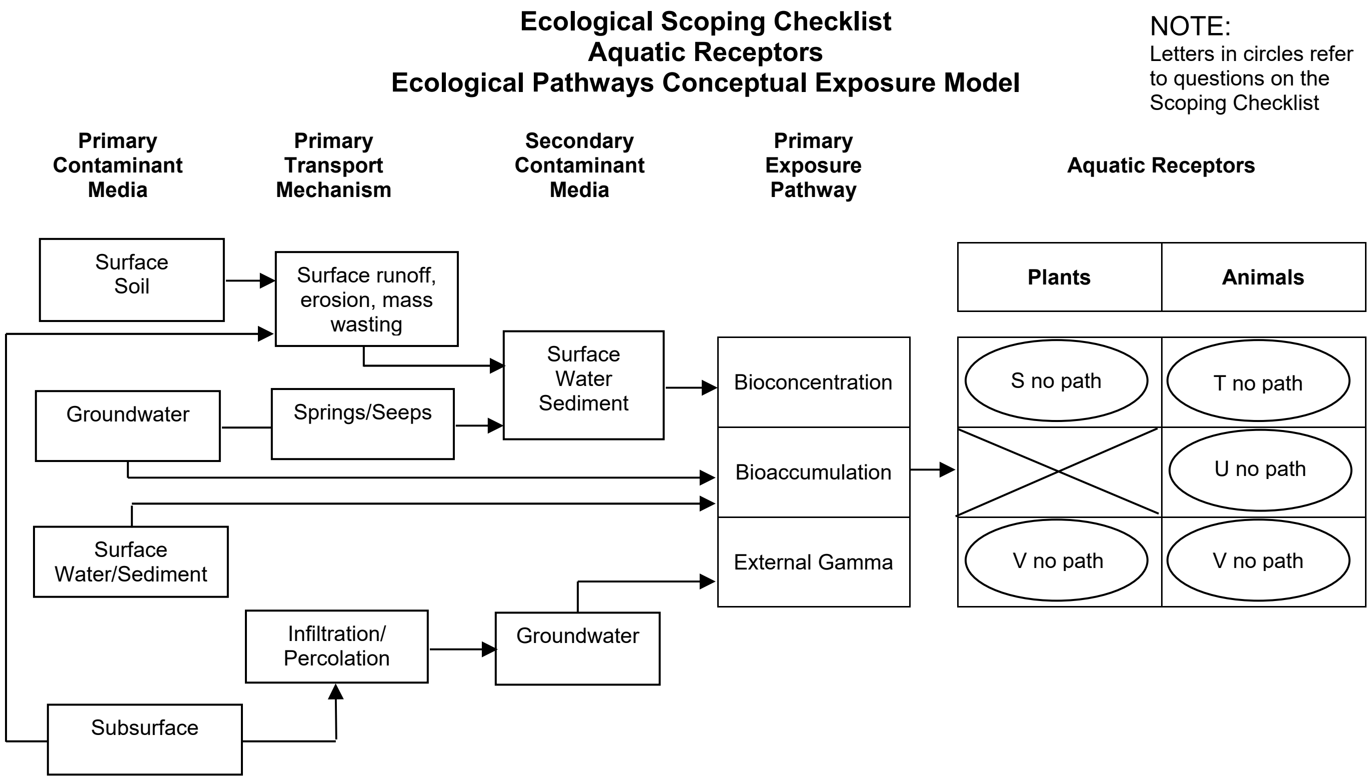
Aquatic Animals: 0

Provide explanation: No aquatic habitat exists on-site.

NOTE:
Letters in circles refer to questions on the Scoping Checklist

Ecological Scoping Checklist
Terrestrial Receptors
Ecological Pathways Conceptual Exposure Model




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
Surface runoff, erosion, mass wasting
Surface Water Sediment
Groundwater
Springs/Seeps
Surface Water/Sediment
Infiltration/ Percolation
Groundwater
Subsurface
Bioconcentration
Bioaccumulation
External Gamma
Plants
Animals
S no path
T no path
U no path
V no path
V no path

SIGNATURES AND CERTIFICATION

Checklist completed by:

Name (printed): Randall Ryti
Name (signature): Randall Ryti
Organization: Neptune and Company, Inc.
Date completed: June 30, 2018

Checklist reviewed by:

Name (printed): Tracy McFarland
Name (signature): Tracy McFarland
Organization: N3B
Date reviewed: 9/11/18

H3-2.0 AOC 02-003(d) AND SWMU 02-006(a)

H3-2.1 Part A—Scoping Meeting Documentation

Site IDs	AOC 02-003(d), SWMU 02-006(a)
Form of site releases (solid, liquid, vapor). Describe all relevant known or suspected mechanisms of release (spills, dumping, material disposal, outfall, explosive testing, etc.) and describe potential areas of release. Reference locations on a map as appropriate.	AOC 02-003(d) and SWMU 02-006(a) are located on the canyon bottom, the slope, and the mesa top above TA-02. SWMU 02-006(a) is on the south rim of Los Alamos Canyon in TA-61. AOC 02-003(d), Soil Contamination at Site of Upper Part of Line 119 and Temporary Vent Line. One area is the potential soil contamination area associated with a temporary gaseous effluent vent, the garden hose that reportedly served as a temporary vent line for the WBR during initial operations. The primary area of AOC 02-003(d) is the 1200-ft gaseous effluent vent line from the delay tanks (structure 02-131) to the mesa-top stack SWMU 02-006(a). The stack became inactive in 1993 when the OWR was deactivated, and the stack was removed and disposed of in November 2002. Line 119 was removed in April 2003. SWMU 02-006(a) is a French drain associated with a mesa top stack. The French drain system was designed to collect condensate that collected as reactor gases cooled while venting through the exhaust stack. The form of site release from SWMU 02-006(a) is liquid leaking, spilling, or discharging from the French drain system. Potential areas of release were to surface and subsurface soil and tuff.
List of Primary Impacted Media **(Indicate all that apply.)**	**Surface soil** – X **Surface water/sediment** – N/A **Subsurface** – X **Groundwater** – N/A **Other, explain** – None
FIMAD vegetation class based on Arcview vegetation coverage **(Indicate all that apply.)**	**Water** – N/A **Bare Ground/Unvegetated** – N/A **Spruce/fir/aspen/mixed conifer** – X **Ponderosa pine** – X **Piñon juniper/juniper savannah** – N/A **Grassland/shrubland** – X **Developed** – N/A **Burned –** NA
Is T&E Habitat Present? **If applicable, list species known or suspected to use the site for breeding or foraging.**	No T&E species nesting habitat is present at the site. However, the area is within the foraging range of the Mexican spotted owl.
Provide list of Neighboring/ Contiguous/Up-gradient sites, include a brief summary of COPCs and form of releases for relevant sites and reference map as appropriate. **(Use information to evaluate need to aggregate sites for screening.)**	There are no upgradient sites from SWMU 02-006(a). AOC 02-003(d) is partially within the TA-02 Core Area and partially downgradient from SWMU 02-006(a).

Site IDs	AOC 02-003(d), SWMU 02-006(a)
Surface Water Erosion Potential Information Surface water erosion potential is based on site observations	Surface water transport and erosion potential at SWMU 02-006(a), on the mesa top, is considered low because of the relatively flat terrain (<10% slope). AOC 02-003(d) is located primarily on the canyon slope and has potential for erosion into Los Alamos Canyon. Los Alamos Canyon is the terminal point for surface water transport via runoff from the mesa top.

H3-2.2 Part B—Site Visit Documentation

Site ID	AOC 02-003(d), SWMU 02-006(a)
Dates of Site Visit	02/18/2011, 06/26/2018
Site Visits Conducted by	John Branch; Randall Ryti, Tracy McFarland, Brenda Bowlby, Robert Dickerson, Larry Salazar

Receptor Information:

Estimate cover	**Relative vegetative cover (high, medium, low, none)** = Low to High **Relative wetland cover (high, medium, low, none)** = None **Relative structures/asphalt, etc., cover (high, medium, low, none)** = Low
Field Notes on the GIS Vegetation Class to Assist in Verifying the Arcview Information	The SWMU exhibits a moderate amount of variable vegetative cover throughout. Vegetation from the ponderosa pine zone and piñon/juniper zone is established throughout the site, and limited amounts of secondary successional grass and shrub species in the areas resulting from disturbances and erosion are also present.
Are ecological receptors present at the site? **(yes/no/uncertain)** **Describe the general types of receptors present at the site (terrestrial and aquatic), and make notes on the quality of habitat present at the site.**	Yes. Receptors are present at AOC 02-003(d) and SWMU 02-006(a). The general types of receptors are terrestrial biota such as reptiles, small mammals, invertebrate insects, birds, and plants. The quality of habitat at the sites is sustainable for native plant and animal species present in the area.

Contaminant Transport Information:

Surface water transport **Field notes on the erosion potential, including a discussion of the terminal point of surface water transport (if applicable).**	AOC 02-003(d) and SWMU 02-006(a) primarily contain moderate vegetation, resulting in greater stability of the media at the site. AOC 02-003(d) has greater potential for erosion and surface water transport as it is located on the north-facing slope of Los Alamos Canyon. The transport of surface water terminates at the bottom of Los Alamos Canyon.
Are there any off-site transport pathways (surface water, air, or groundwater)? **(yes/no/uncertain)** **Provide explanation**	Storm events may produce ephemeral surface drainage downgradient. No groundwater transport pathway exists. Surface contamination may be dispersed by wind although moderate vegetation cover inhibits this process.

Ecological Effects Information:

Physical Disturbance **(Provide list of major types of disturbances, including erosion and construction activities, review historical aerial photos where appropriate.)**	The site has a low amount of physical disturbance, primarily from erosion and the installation of dirt roads, a fence, and power lines.
Are there obvious ecological effects? **(yes/no/uncertain)** **Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).**	No.

No Exposure/Transport Pathways:

If there are no complete exposure pathways to ecological receptors onsite and no transport pathways to offsite receptors, the remainder of the checklist should not be completed. Stop here and provide additional explanation/justification for proposing an ecological No Further Action recommendation (if needed). At a minimum, the potential for future transport should include likelihood that future construction activities could make contamination more available for exposure or transport.

Not Applicable.

Adequacy of Site Characterization:

Do existing or proposed data provide information on the nature, rate and extent of contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if the maximum value was captured by existing sample data.)**	The Middle Los Alamos Canyon Aggregate Area investigation was designed to provide data to define nature and extent of contamination at AOC 02-003(d) and SMWU 02-006(a). The nature and extent of contamination is defined for AOC 02-003(d) and SWMU 02-006(a).
Do existing or proposed data for the site address potential transport pathways of site contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if other sites should aggregated to characterize potential ecological risk.)**	Yes. The data include sites downgradient of the contamination to accommodate for potential transport pathways of site contamination.

Additional Field Notes:

Provide additional field notes on the site setting and potential ecological receptors.

AOC 02-003(d). Part of this site is the former drainline that runs up the north-facing slope of Los Alamos from the former TA-02 to the French drain on the mesa top. The remainder of this site is in the TA-02 Core Area. Because part of this AOC is substantially beyond the Core Area it is screened for ecological risks separately from the Core Area. The habitat is fairly typical of north-facing slopes but is dominated by scrub oaks along the former drainline path.

SMWU 02-006(a). This site was visited in 2011. Access restrictions due the heightened risk of wildfire did not permit a site visit in June 2018.

H3-2.3 Part C—Ecological Pathways Conceptual Exposure Model

<u>Question A</u>:

Could soil contaminants reach receptors via vapors?

- **Volatility of the hazardous substance (volatile chemicals generally have Henry's Law constant >10^{-5} atm-me/mol and molecular weight <200 g/mol).**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Volatile organic compounds are infrequently detected, in the subsurface, and are at low concentrations.

<u>Question B</u>:

Could the soil contaminants reach receptors through fugitive dust carried in air?

- **Soil contamination would have to be on the actual surface of the soil to become available for dust.**
- **In the case of dust exposures to burrowing animals, the contamination would have to occur in the depth interval where these burrows occur.**

Answer (likely/unlikely/uncertain): Likely

Provide explanation: Low percentage of vegetative cover makes the likelihood of soil contaminants reaching receptors through fugitive dust likely.

<u>Question C</u>:

Can contaminated soil be transported to aquatic ecological communities (use SOP 2.01 run-off score and terminal point of surface water runoff to help answer this question)?

- **If the SOP 2.01 run-off score* for each SWMU included in the site is equal to zero, this suggests that erosion at the site is not a transport pathway. (* Note that the runoff score is not the entire erosion potential score, rather it is a subtotal of this score with a maximum value of 46 points).**
- **If erosion is a transport pathway, evaluate the terminal point to see if aquatic receptors could be affected by contamination from this site.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no aquatic ecological communities on or within close proximity to the sites and there is limited runoff from the sites.

<u>Question D</u>:

Is contaminated groundwater potentially available to biological receptors through seeps or springs or shallow groundwater?

- **Known or suspected presence of contaminants in groundwater.**
- **The potential for contaminants to migrate via 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 (~1 m depth).**
- **Terrestrial wildlife receptors generally will not contact 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 500 ft below ground surface at the bottom of Los Alamos Canyon.

Question E:

Is infiltration/percolation from contaminated subsurface material a viable transport and exposure pathway?

- **Suspected ability of contaminants to migrate to groundwater.**
- **The potential for contaminants to migrate via 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 (~1 m depth).**
- **Terrestrial wildlife receptors generally will not contact 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 only applicable to release sites located on or near the mesa edge.**
- **Consider the erodability of surficial material and the geologic processes of canyon/mesa edges.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: No perched aquifers exist on or near these sites. No evidence of mass wasting events in the area was found, and the erosion potential is minimal.

Question G:

Could airborne contaminants interact with receptors through respiration of vapors?

- **Contaminants must be present as volatiles in the air.**
- **Consider the importance of inhalation of vapors for burrowing animals.**
- **Foliar uptake of organic 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

Terrestrial Animals: 1

Provide explanation: Volatile organic compounds are detected infrequently and at low concentrations.

<u>Question H</u>:

Could airborne contaminants interact with plants through deposition of particulates or with animals through inhalation of fugitive dust?

- **Contaminants must be present as particulates in the air or as dust for this exposure pathway to be complete.**
- **Exposure via 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: 2

Terrestrial Animals: 2

Provide explanation: There is moderate to high vegetative ground cover, and coupled with with the burrowing activities of ground-dwelling terrestrial animals this may create a minor pathway for fugitive dust in air to reach receptors.

<u>Question I</u>:

Could contaminants interact with plants through root uptake or rain splash from surficial soils?

- **Contaminants in bulk soil may partition into soil solution, making them available to roots.**
- **Exposure of terrestrial plants to contaminants present in particulates deposited on leaf and stem surfaces by rain striking contaminated soils (i.e., rain splash).**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Provide explanation: Low concentrations of COPCs were detected in surficial soil.

<u>Question J</u>:

Could contaminants interact with receptors through food web transport from surficial soils?

- **The chemicals may bioaccumulate in animals.**
- **Animals may ingest contaminated food items.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: Some bioaccumulating contaminants are present but at low enough concentrations so the transport pathway through the food webs to receptors is minimal.

<u>Question K</u>:

Could contaminants interact with receptors via incidental ingestion of surficial soils?

- **Incidental ingestion of contaminated soil could occur while animals grub for food resident in the soil, feed on plant matter covered with contaminated soil or while grooming themselves clean of soil.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: COPCs in surface and subsurface are at low levels.

<u>Question L</u>:

Could contaminants interact with receptors through dermal contact with surficial soils?

- **Significant exposure via dermal contact would generally be limited to organic contaminants that are lipophilic and can cross epidermal barriers.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: 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 effects are most relevant for gamma emitting radionuclides.**
- **Burial of contamination attenuates radiological exposure.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Terrestrial Animals: 2

Provide explanation: Radionuclides were detected infrequently and at low levels.

<u>Question N</u>:

Could contaminants interact with plants through direct uptake from water and sediment or sediment rain splash?

- **Contaminants may be taken-up by terrestrial plants whose roots are in contact with surface waters.**
- **Terrestrial plants may be exposed to particulates deposited on leaf and stem surfaces by rain striking contaminated sediments (i.e., rain splash) in an area that is only periodically inundated with water.**
- **Contaminants in sediment may partition into soil solution, making them available to roots.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Provide explanation: No aquatic habitat exists 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 items.**
- **Animals may ingest contaminated food items.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: No aquatic habitat exists on-site.

<u>Question P</u>:

Could contaminants interact with receptors via ingestion of water and suspended sediments?

- **If sediments are present in an area that is only periodically inundated with water, terrestrial receptors may incidentally ingest sediments.**
- **Terrestrial receptors may ingest water-borne contaminants if contaminated surface waters are used as a drinking water source.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: No aquatic habitat exists on-site.

Question Q:

Could contaminants interact with receptors through dermal contact with water and sediment?

- **If sediments are present in an area that is only periodically inundated with water, terrestrial species may be dermally exposed during dry periods.**
- **Terrestrial organisms may be dermally exposed to water-borne contaminants as a result of wading or swimming in contaminated waters.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: No aquatic habitat exists on-site.

Question R:

Could contaminants interact with plants or animals through external irradiation?

- **External irradiation effects are most relevant for gamma emitting radionuclides.**
- **Burial of contamination attenuates radiological exposure.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Terrestrial Animals: 0

Provide explanation: No aquatic habitat exists on-site.

Question S:

Could contaminants bioconcentrate in free floating aquatic, attached aquatic plants, or emergent vegetation?

- **Aquatic plants are in direct contact with water.**
- **Contaminants in sediment may partition into pore water, making them available to submerged roots.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Plants/Emergent Vegetation: 0

Provide explanation: No aquatic habitat exists 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 sediments or may be exposed to contaminants through osmotic exchange, respiration, or ventilation of sediment pore waters.**
- **Aquatic receptors may be exposed through osmotic exchange, respiration, or ventilation of surface waters.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation: No aquatic habitat exists 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 items may result in contaminant bioaccumulation through the food web.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation: No aquatic habitat exists on-site.

<u>Question V</u>:

Could contaminants interact with aquatic plants or animals through external irradiation?

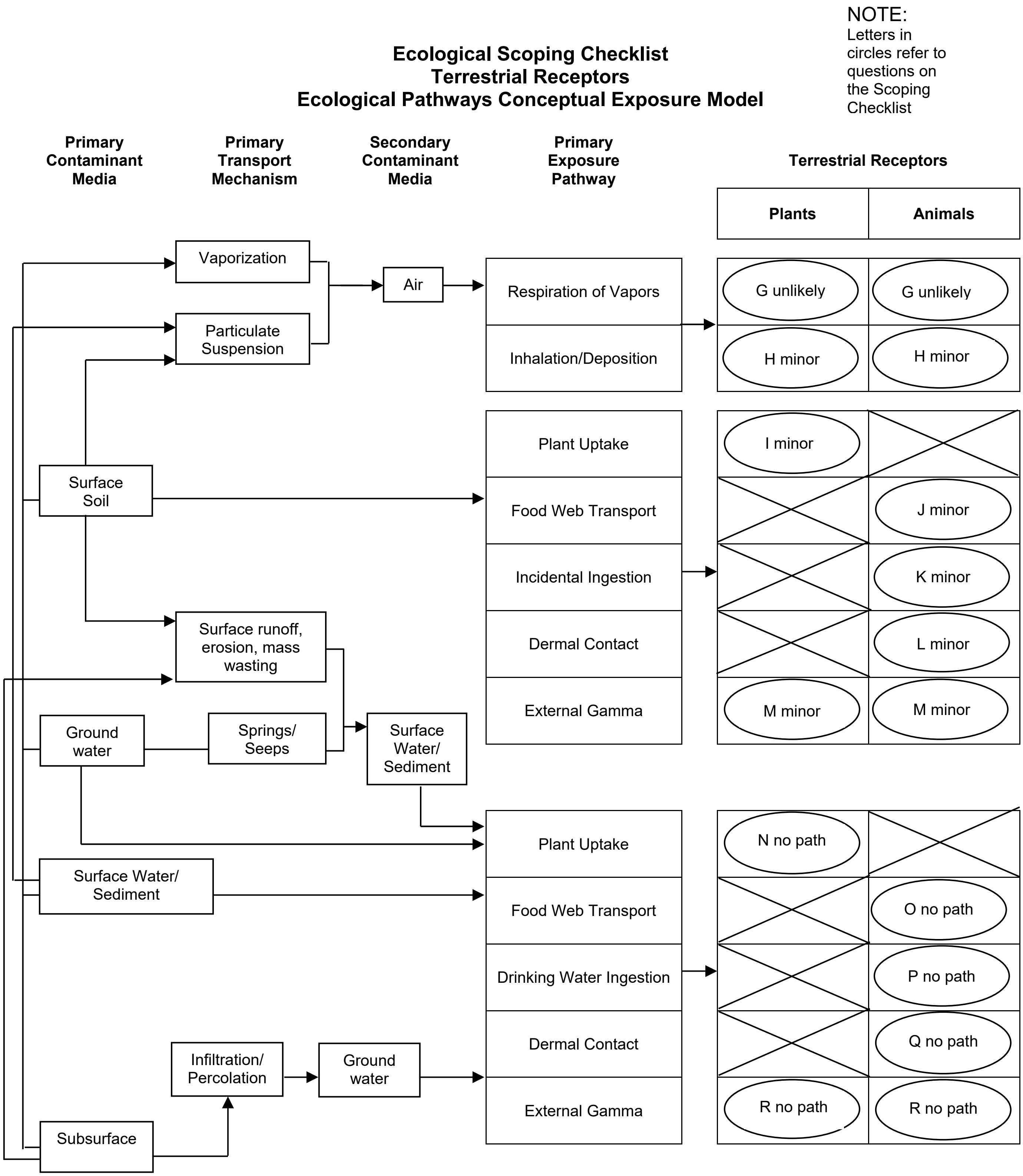
- **External irradiation effects are most relevant for gamma emitting radionuclides.**
- **The water column acts to absorb radiation, thus external irradiation is typically more important for sediment dwelling organisms.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Plants: 0

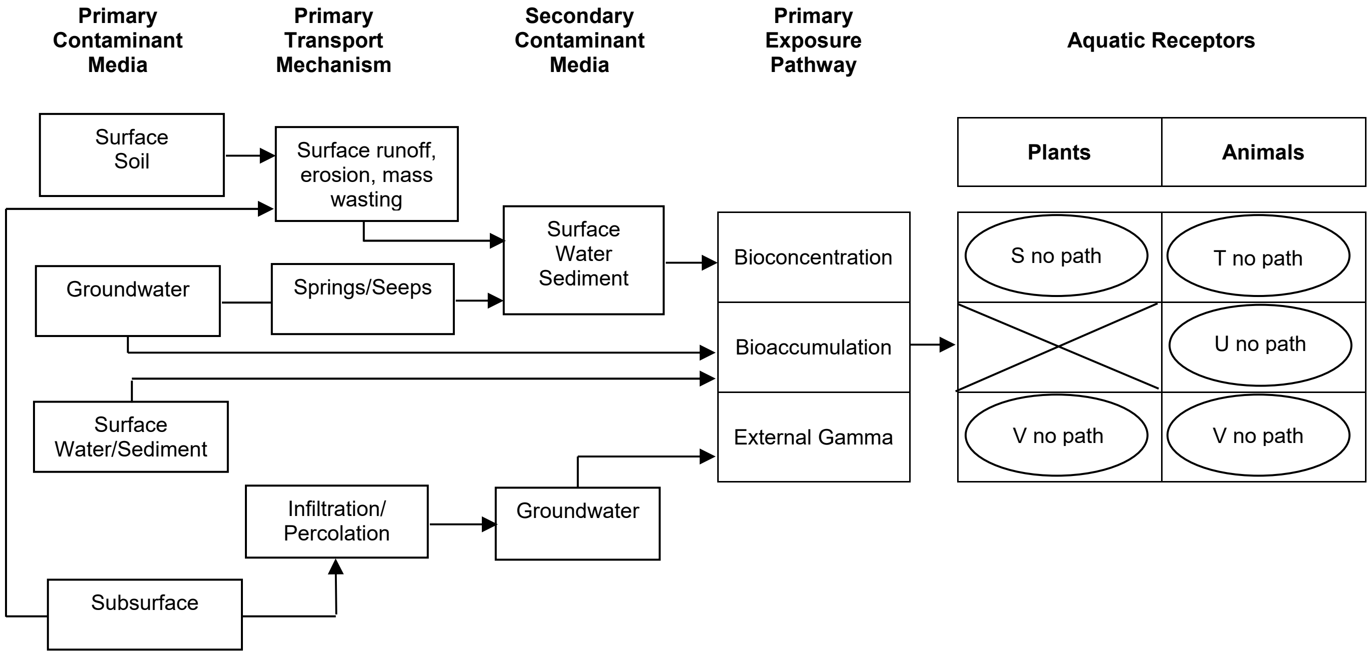
Aquatic Animals: 0

Provide explanation: No aquatic habitat exists on-site.


NOTE:
Letters in circles refer to questions on the Scoping Checklist
Ecological Scoping Checklist
Terrestrial Receptors
Ecological Pathways Conceptual Exposure Model
Primary Contaminant Media
Primary Transport Mechanism
Secondary Contaminant Media
Primary Exposure Pathway
Terrestrial Receptors
Plants
Animals
Vaporization
Particulate Suspension
Air
Respiration of Vapors
Inhalation/Deposition
G unlikely
G unlikely
H minor
H minor
Surface Soil
Plant Uptake
Food Web Transport
Incidental Ingestion
Dermal Contact
External Gamma
I minor
J minor
K minor
L minor
M minor
M minor
Surface runoff, erosion, mass wasting
Ground water
Springs/ Seeps
Surface Water/ Sediment
Plant Uptake
Food Web Transport
Drinking Water Ingestion
Dermal Contact
External Gamma
N no path
O no path
P no path
Q no path
R no path
R no path
Surface Water/ Sediment
Infiltration/ Percolation
Ground water
Subsurface

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): Randall Ryti

Name (signature): Randall Ryti

Organization: Neptune and Company, Inc.

Date completed: June 30, 2018

Checklist reviewed by:

Name (printed): Tracy McFarland

Name (signature): Tracy McFarland

Organization: N3B

Date reviewed: 9/11/18

H3-3.0 SOLID WASTE MANAGEMENT UNIT 21-006(e) AND AOC 21-028(c)

H3-3.1 Part A—Scoping Meeting Documentation

Site IDs	SWMU 21-006(e); AOC 21-028(c)
Form of site releases (solid, liquid, vapor). Describe all relevant 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 locations on a map as appropriate.	Operations at TA-21 started in 1945 for establishing the chemical and metallurgical properties of the nuclear material necessary to achieve and sustain the required nuclear fission reaction. SWMU 21-006(e), Seepage pits. The seepage pit(s) may have received up to 4000 L per day of hydrogen fluoride wastewater effluent. During repair work on the drain system under Room 413, a hole in the ground was identified under the drainlines. It was evident that acid waste had escaped from the drain system into the ground. AOC 21-028(c) consists of four satellite container storage areas that were located around building 21-003. These areas have stored a wide variety of chemicals including depleted uranium salts, metal salts, organic chemicals, synthetic inorganic chemicals, and other reagents. Potential areas of release were to surface and subsurface soil and tuff.
List of Primary Impacted Media **(Indicate all that apply.)**	**Surface soil** – X **Surface water/sediment** – N/A **Subsurface** – X **Groundwater** – N/A **Other, explain** – None
FIMAD vegetation class based on Arcview vegetation coverage **(Indicate all that apply.)**	**Water** – N/A **Bare Ground/Unvegetated** – X **Spruce/fir/aspen/mixed conifer** – N/A **Ponderosa pine** – N/A **Piñon juniper/juniper savannah** – N/A **Grassland/shrubland** – X **Developed** – X **Burned –** NA
Is T&E Habitat Present? **If applicable, list species known or suspected to use the site for breeding or foraging.**	No T&E species nesting habitat is present at the site. However, the area is within the foraging range of the Mexican spotted owl.
Provide list of Neighboring/ Contiguous/ Up-gradient sites, include a brief summary of COPCs and form of releases for relevant sites and reference map as appropriate. **(Use information to evaluate need to aggregate sites for screening.)**	Some sites in DP West are upgradient sites SWMU 21-006(e) and AOC 21-028(c).
Surface Water Erosion Potential Information Surface water erosion potential is based on site observations	Surface water transport and erosion potential at SWMU 21-006(e) and AOC 21-028(c), on the mesa top, is considered low because of the relatively flat terrain (<10% slope). Los Alamos Canyon is the terminal point for surface water transport via runoff from the mesa top.

H3-3.2 Part B—Site Visit Documentation

Site ID	SWMU 21-006(e); AOC 21-028(c)
Dates of Site Visit	06/27/2018
Site Visit Conducted by	Randall Ryti, Tracy McFarland, Brenda Bowlby, Robert Dickerson, Larry Salazar

Receptor Information:

Estimate cover	**Relative vegetative cover (high, medium, low, none)** = Low **Relative wetland cover (high, medium, low, none)** = None **Relative structures/asphalt, etc., cover (high, medium, low, none)** = Low to High
Field Notes on the GIS Vegetation Class to Assist in Verifying the Arcview Information	The sites exhibit mostly low amount of variable vegetative cover throughout. One site is developed and the other is developed with some shrub-grass-forb cover.
Are ecological receptors present at the site? **(yes/no/uncertain)** **Describe the general types of receptors present at the site (terrestrial and aquatic), and make notes on the quality of habitat present at the site.**	Yes. Receptors are present at SWMU 21-006(e). The general types of receptors are terrestrial biota such as reptiles, small mammals, invertebrate insects, birds, and plants. Some receptors are also present at AOC 21-028(c), but their abundance will be limited by the lack of vegetative cover. This site located on a former building concrete pad. The quality of habitat at the sites is low for native plant and animal species present in the area.

Contaminant Transport Information:

Surface water transport **Field notes on the erosion potential, including a discussion of the terminal point of surface water transport (if applicable).**	SWMU 21-006(e) and AOC 21-028(c) contain zero to low vegetation. However, the sites are located away the slope on the relatively flat part of the mesa, thus decreasing the likelihood of surface water transport. The transport of surface water terminates at the bottom of Los Alamos Canyon.
Are there any off-site transport pathways (surface water, air, or groundwater)? **(yes/no/uncertain)** **Provide explanation**	Storm events may produce ephemeral surface drainage downgradient. No groundwater transport pathway exists. Surface contamination may be dispersed by wind.

Ecological Effects Information:

Physical Disturbance **(Provide list of major types of disturbances, including erosion and construction activities, review historical aerial photos where appropriate.)**	The site has a high amount of physical disturbance, primarily from the presence of the former building footprints and activities associated with the demolition of these former buildings.
Are there obvious ecological effects? **(yes/no/uncertain)** **Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).**	No.

No Exposure/Transport Pathways:

If there are no complete exposure pathways to ecological receptors onsite and no transport pathways to offsite receptors, the remainder of the checklist should not be completed. Stop here and provide additional explanation/justification for proposing an ecological No Further Action recommendation (if needed). At a minimum, the potential for future transport should include likelihood that future construction activities could make contamination more available for exposure or transport. Not Applicable.

Adequacy of Site Characterization:

Do existing or proposed data provide information on the nature, rate and extent of contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if the maximum value was captured by existing sample data.)**	The Middle Los Alamos Canyon Aggregate Area investigation was designed to provide data to define nature and extent of contamination at SWMU 21-006(e) and AOC 21-028(c). The nature and extent of contamination is defined for SWMU 21-006(e) and AOC 21-028(c).
Do existing or proposed data for the site address potential transport pathways of site contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if other sites should aggregated to characterize potential ecological risk.)**	Yes. The data include sites downgradient of the contamination to accommodate for potential transport pathways of site contamination.

Additional Field Notes:

Provide additional field notes on the site setting and potential ecological receptors. **SWMU 21-006(e)**. There are some shrubs present at this site but there is some disturbed ground. Some gravel was noted indicating some previous mixing of the surface intervals. There is some activity by soil biota noted. **AOC 21-028(c)**. This site is a former building footprint with limited ecological habitat at present. There is some vegetation growing in the foundation cracks.

H3-3.3 Part C—Ecological Pathways Conceptual Exposure Model

Question A:

Could soil contaminants reach receptors via vapors?

- **Volatility of the hazardous substance (volatile chemicals generally have Henry's Law constant >10^{-5} atm-me/mol and molecular weight <200 g/mol).**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Volatile organic compounds are infrequently detected, in the subsurface, and are at low concentrations.

Question B:

Could the soil contaminants reach receptors through fugitive dust carried in air?

- **Soil contamination would have to be on the actual surface of the soil to become available for dust.**
- **In the case of dust exposures to burrowing animals, the contamination would have to occur in the depth interval where these burrows occur.**

Answer (likely/unlikely/uncertain): Likely

Provide explanation: Low percentage of vegetative cover makes the likelihood of soil contaminants reaching receptors through fugitive dust likely.

Question C:

Can contaminated soil be transported to aquatic ecological communities (use SOP 2.01 run-off score and terminal point of surface water runoff to help answer this question)?

- **If the SOP 2.01 run-off score* for each SWMU included in the site is equal to zero, this suggests that erosion at the site is not a transport pathway. (* Note that the runoff score is not the entire erosion potential score, rather it is a subtotal of this score with a maximum value of 46 points).**
- **If erosion is a transport pathway, evaluate the terminal point to see if aquatic receptors could be affected by contamination from this site.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no aquatic ecological communities on or within close proximity to the sites and there is limited runoff from the sites.

Question D:

Is contaminated groundwater potentially available to biological receptors through seeps or springs or shallow groundwater?

- **Known or suspected presence of contaminants in groundwater.**
- **The potential for contaminants to migrate via 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 (~1 m depth).**
- **Terrestrial wildlife receptors generally will not contact 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 below ground surface.

Question E:

Is infiltration/percolation from contaminated subsurface material a viable transport and exposure pathway?

- **Suspected ability of contaminants to migrate to groundwater.**
- **The potential for contaminants to migrate via 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 (~1 m depth).**
- **Terrestrial wildlife receptors generally will not contact 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 only applicable to release sites located on or near the mesa edge.**
- **Consider the erodability of surficial material and the geologic processes of canyon/mesa edges.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: No perched aquifers exist on or near these sites. No evidence of mass wasting events in the area was found, and the erosion potential is minimal.

Question G:

Could airborne contaminants interact with receptors through respiration of vapors?

- **Contaminants must be present as volatiles in the air.**
- **Consider the importance of inhalation of vapors for burrowing animals.**
- **Foliar uptake of organic 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

Terrestrial Animals: 1

Provide explanation: Volatile organic compounds are detected infrequently and at low concentrations.

Question H:

Could airborne contaminants interact with plants through deposition of particulates or with animals through inhalation of fugitive dust?

- **Contaminants must be present as particulates in the air or as dust for this exposure pathway to be complete.**
- **Exposure via 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: 2

Terrestrial Animals: 2

Provide explanation: Low vegetative ground cover coupled with the burrowing activities of ground-dwelling terrestrial animals may create a minor pathway for fugitive dust in air to reach receptors.

Question I:

Could contaminants interact with plants through root uptake or rain splash from surficial soils?

- **Contaminants in bulk soil may partition into soil solution, making them available to roots.**
- **Exposure of terrestrial plants to contaminants present in particulates deposited on leaf and stem surfaces by rain striking contaminated soils (i.e., rain splash).**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Provide explanation: Low concentrations of COPCs were detected in surficial soil.

Question J:

Could contaminants interact with receptors through food web transport from surficial soils?

- **The chemicals may bioaccumulate in animals.**
- **Animals may ingest contaminated food items.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: Some bioaccumulating contaminants are present but at low enough concentrations so the transport pathway through the food webs to receptors is minimal.

Question K:

Could contaminants interact with receptors via incidental ingestion of surficial soils?

- **Incidental ingestion of contaminated soil could occur while animals grub for food resident in the soil, feed on plant matter covered with contaminated soil or while grooming themselves clean of soil.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: COPCs in surface and subsurface are at low levels.

Question L:

Could contaminants interact with receptors through dermal contact with surficial soils?

- **Significant exposure via dermal contact would generally be limited to organic contaminants that are lipophilic and can cross epidermal barriers.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: Lipophilic chemicals were detected at low concentrations at these sites.

Question M:

Could contaminants interact with plants or animals through external irradiation?

- **External irradiation effects are most relevant for gamma emitting radionuclides.**
- **Burial of contamination attenuates radiological exposure.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Terrestrial Animals: 2

Provide explanation: Radionuclides were detected infrequently and generally at low levels.

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 sediments (i.e., rain splash) in an area that is only periodically inundated with water.**
- **Contaminants in sediment may partition into soil solution, making them available to roots.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Provide explanation: No aquatic habitat exists on-site.

Question O:

Could contaminants interact with receptors through food web transport from water and sediment?

- **The chemicals may bioconcentrate in food items.**
- **Animals may ingest contaminated food items.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: No aquatic habitat exists on-site.

Question P:

Could contaminants interact with receptors via ingestion of water and suspended sediments?

- **If sediments are present in an area that is only periodically inundated with water, terrestrial receptors may incidentally ingest sediments.**
- **Terrestrial receptors may ingest water-borne contaminants if contaminated surface waters are used as a drinking water source.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: No aquatic habitat exists on-site.

<u>Question Q:</u>

Could contaminants interact with receptors through dermal contact with water and sediment?

- **If sediments are present in an area that is only periodically inundated with water, terrestrial species may be dermally exposed during dry periods.**
- **Terrestrial organisms may be dermally exposed to water-borne contaminants as a result of wading or swimming in contaminated waters.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: No aquatic habitat exists on-site.

<u>Question R:</u>

Could contaminants interact with plants or animals through external irradiation?

- **External irradiation effects are most relevant for gamma emitting radionuclides.**
- **Burial of contamination attenuates radiological exposure.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Terrestrial Animals: 0

Provide explanation: No aquatic habitat exists on-site.

<u>Question S:</u>

Could contaminants bioconcentrate in free floating aquatic, attached aquatic plants, or emergent vegetation?

- **Aquatic plants are in direct contact with water.**
- **Contaminants in sediment may partition into pore water, making them available to submerged roots.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Plants/Emergent Vegetation: 0

Provide explanation: No aquatic habitat exists 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 sediments or may be exposed to contaminants through osmotic exchange, respiration, or ventilation of sediment pore waters.**
- **Aquatic receptors may be exposed through osmotic exchange, respiration, or ventilation of surface waters.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation: No aquatic habitat exists 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 items may result in contaminant bioaccumulation through the food web.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation: No aquatic habitat exists on-site.

<u>Question V:</u>

Could contaminants interact with aquatic plants or animals through external irradiation?

- **External irradiation effects are most relevant for gamma emitting radionuclides.**
- **The water column acts to absorb radiation, thus external irradiation is typically more important for sediment dwelling organisms.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

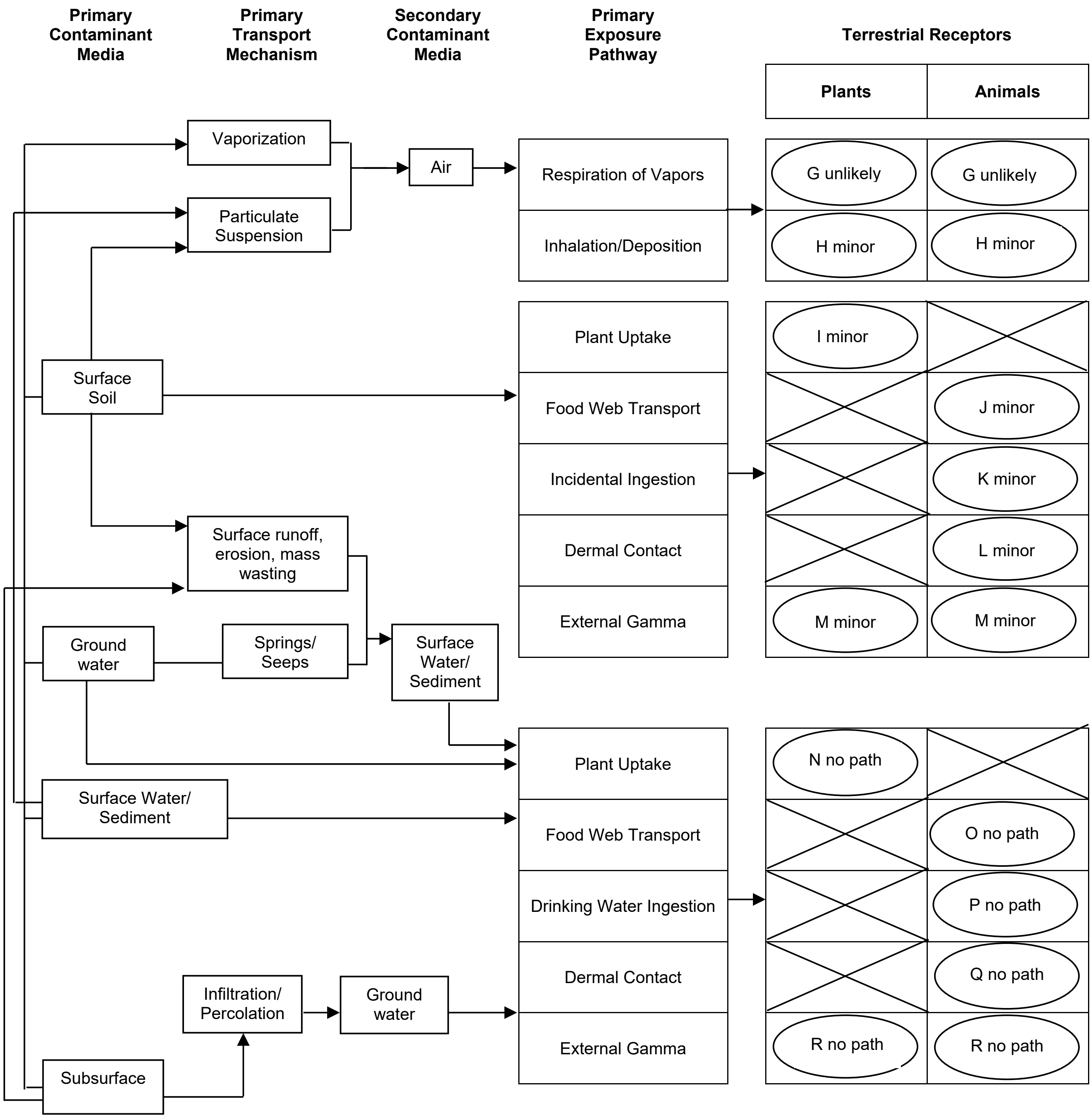
Aquatic Plants: 0

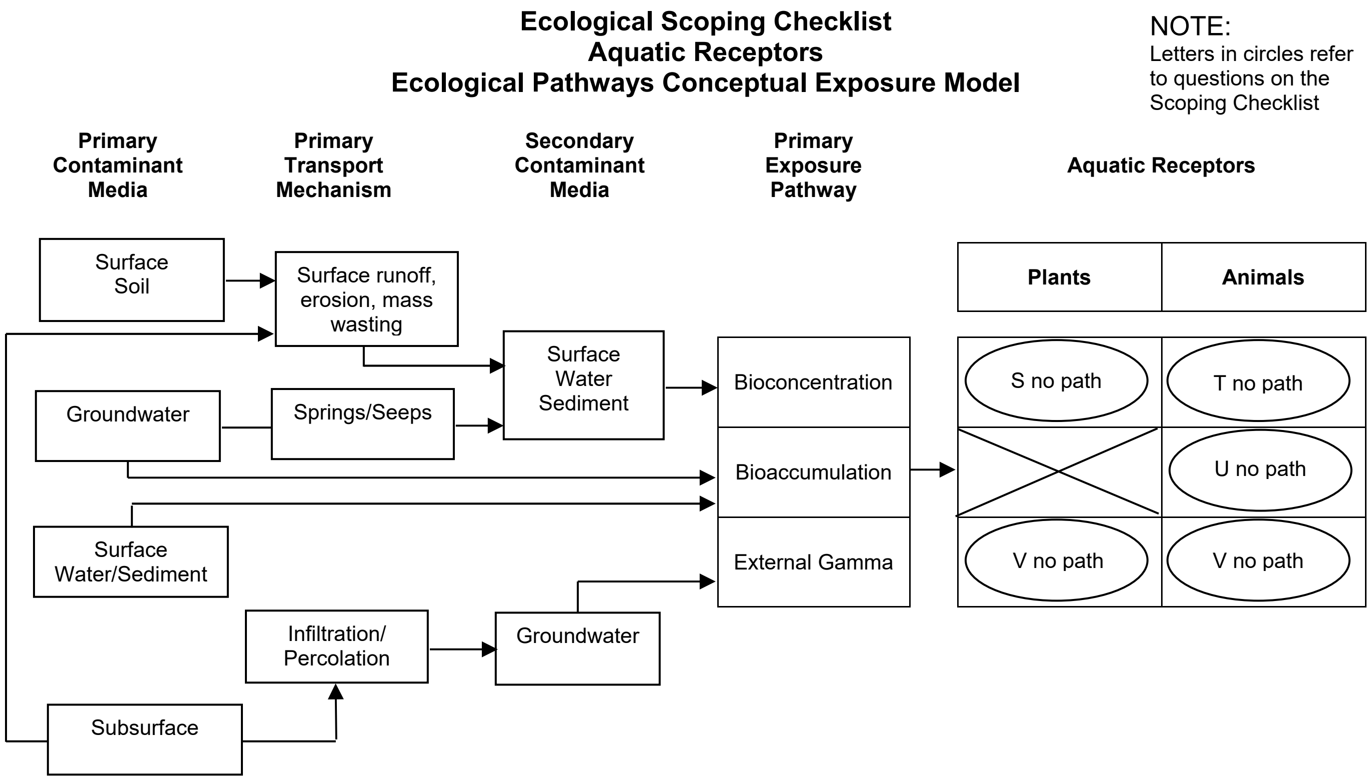
Aquatic Animals: 0

Provide explanation: No aquatic habitat exists on-site.

NOTE:
Letters in circles refer to questions on the Scoping Checklist

Ecological Scoping Checklist
Terrestrial Receptors
Ecological Pathways Conceptual Exposure Model

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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
Surface runoff, erosion, mass wasting
Surface Water Sediment
Groundwater
Springs/Seeps
Surface Water/Sediment
Infiltration/ Percolation
Groundwater
Subsurface
Bioconcentration
Bioaccumulation
External Gamma
Plants
Animals
S no path
T no path
U no path
V no path
V no path

SIGNATURES AND CERTIFICATION

Checklist completed by:

Name (printed): Randall Ryti

Name (signature):

Organization: Neptune and Company, Inc.

Date completed: June 30, 2018

Checklist reviewed by:

Name (printed): Tracy McFarland

Name (signature):

Organization: N3B

Date reviewed: 9/11/18

H3-4.0 TECHNICAL AREA 26

H3-4.1 Part A—Scoping Meeting Documentation

Site IDs	SWMU 26-001, SWMU 26-002(a), SWMU 26-002(b), SWMU 26-003
Form of site releases (solid, liquid, vapor). Describe all relevant known or suspected mechanisms of release (spills, dumping, material disposal, outfall, explosive testing, etc.) and describe potential areas of release. Reference locations on a map as appropriate.	TA 26 is a former technical area located south of NM 502, east and south of the Los Alamos County airport and west of the East Gate Industrial Park. The area is restricted to D Site, which contained the East Gate vault. D-Site was established for Los Alamos Scientific Laboratory's Chemistry and Metallurgical Research division for the purpose of storing radioactive materials. SWMU 26-001 is a surface disposal area on the south-facing slope of Los Alamos Canyon that contains debris from a five-room concrete storage vault. The vault was constructed in 1946 and was decommissioned and dismantled in 1966. SWMU 26-002(a) is the acid sump system that served the concrete storage vault at TA-26 from 1946 to 1965. The vault was decommissioned and dismantled in 1966. SWMU 26-002(b) was the equipment room drainage system constructed in 1946 for the concrete storage vault at TA-26. The drainlines were removed before demolition of the vault structure in 1966. SWMU 26-003 is the septic system that served sanitary facilities in the east room of the concrete storage vault at TA-26. The septic tank system may have been removed at the same time as the sump system [SWMU 26-002(a)] and other removable material in 1966, but no clear documentation is available. Potential areas of release were to surface and subsurface soil and tuff.
List of Primary Impacted Media **(Indicate all that apply.)**	**Surface soil** – X **Surface water/sediment** – N/A **Subsurface** – X **Groundwater** – N/A **Other, explain** – None
FIMAD vegetation class based on Arcview vegetation coverage **(Indicate all that apply.)**	**Water** – N/A **Bare Ground/Unvegetated** – X **Spruce/fir/aspen/mixed conifer** – N/A **Ponderosa pine** – N/A **Piñon juniper/juniper savannah** – X **Grassland/shrubland** – X **Developed** – X **Burned –** NA
Is T&E Habitat Present? **If applicable, list species known or suspected to use the site for breeding or foraging.**	No T&E species nesting habitat is present at the site. However, the area is within the foraging range of the Mexican spotted owl.

Site IDs	SWMU 26-001, SWMU 26-002(a), SWMU 26-002(b), SWMU 26-003
Provide list of Neighboring/ Contiguous/ Up-gradient sites, include a brief summary of COPCs and form of releases for relevant sites and reference map as appropriate. **(Use information to evaluate need to aggregate sites for screening.)**	There are no upgradient sites from these former TA-26 sites.
Surface Water Erosion Potential Information Surface water erosion potential is based on site observations	Surface water transport and erosion potential is considered low to moderate because of the relatively flat terrain of the mesa top portion of these sites and the moderate slope towards Los Alamos Canyon for some of the location. Los Alamos Canyon is the terminal point for surface water transport via runoff from the mesa top.

H3-4.2 Part B—Site Visit Documentation

Site ID	SWMU 26-001, SWMU 26-002(a), SWMU 26-002(b), SWMU 26-003
Dates of Site Visit	06/27/2018
Site Visit Conducted by	Randall Ryti, Tracy McFarland, Brenda Bowlby, Robert Dickerson, Larry Salazar

Receptor Information:

Estimate cover	**Relative vegetative cover (high, medium, low, none)** = Low to High **Relative wetland cover (high, medium, low, none)** = None **Relative structures/asphalt, etc., cover (high, medium, low, none)** = Low
Field Notes on the GIS Vegetation Class to Assist in Verifying the Arcview Information	The sites exhibit a moderate amount of variable vegetative cover throughout. Vegetation from the piñon/juniper zone and shrub/grassland is established throughout the site, and limited amounts of secondary successional grass and shrub species in the areas resulting from disturbances and erosion are also present.
Are ecological receptors present at the site? **(yes/no/uncertain)** **Describe the general types of receptors present at the site (terrestrial and aquatic), and make notes on the quality of habitat present at the site.**	Yes. Receptors are present at former TA-26. The general types of receptors are terrestrial biota such as reptiles, small mammals, invertebrate insects, birds, and plants. The quality of habitat at the sites is sustainable for native plant and animal species present in the area.

Contaminant Transport Information:

Surface water transport **Field notes on the erosion potential, including a discussion of the terminal point of surface water transport (if applicable).**	Former TA-26 contains moderate vegetation, resulting in greater stability of the media at the site. Part of TA-26 is on the upper south-facing slope of Los Alamos Canyon. The transport of surface water terminates at the bottom of Los Alamos Canyon.
Are there any off-site transport pathways (surface water, air, or groundwater)? **(yes/no/uncertain)** **Provide explanation**	Storm events may produce ephemeral surface drainage downgradient. No groundwater transport pathway exists. Surface contamination may be dispersed by wind although moderate vegetation cover inhibits this process.

Ecological Effects Information:

Physical Disturbance **(Provide list of major types of disturbances, including erosion and construction activities, review historical aerial photos where appropriate.)**	The site has a low amount of physical disturbance, primarily from the installation of erosion run on and run off controls.
Are there obvious ecological effects? **(yes/no/uncertain)** **Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).**	No.

No Exposure/Transport Pathways:

If there are no complete exposure pathways to ecological receptors onsite and no transport pathways to offsite receptors, the remainder of the checklist should not be completed. Stop here and provide additional explanation/justification for proposing an ecological No Further Action recommendation (if needed). At a minimum, the potential for future transport should include likelihood that future construction activities could make contamination more available for exposure or transport. Not Applicable.

Adequacy of Site Characterization:

Do existing or proposed data provide information on the nature, rate and extent of contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if the maximum value was captured by existing sample data.)**	The Middle Los Alamos Canyon Aggregate Area investigation was designed to provide data to define nature and extent of contamination at these sites. The nature and extent of contamination is defined for SWMU 26-001, SWMU 26-002(a), SWMU 26-002(b), SWMU 26-003.
Do existing or proposed data for the site address potential transport pathways of site contamination? **(yes/no/uncertain)** **Provide explanation** **(Consider if other sites should aggregated to characterize potential ecological risk.)**	Yes. The data include sites downgradient of the contamination to accommodate for potential transport pathways of site contamination.

Additional Field Notes:

Provide additional field notes on the site setting and potential ecological receptors. Due to the access restrictions based on a heightened risk of wildfire, the site visit primarily viewed the mesa top part of these sites. However, the vegetation on the hill slope appears to generally similar to that found on the south-facing slope of Los Alamos Canyon (based on reviewing aerial imagery). Both run on and run off controls for storm water were noted. These controls included mulching and berms. Piñon-juniper were noted along with forbs and grasses. Vegetative cover is low-moderate overall. Some evidence of fossorial animals (ant nests, burrows) was noted.

H3-4.3 Part C—Ecological Pathways Conceptual Exposure Model

Question A:

Could soil contaminants reach receptors via vapors?

- **Volatility of the hazardous substance (volatile chemicals generally have Henry's Law constant >10^{-5} atm-me/mol and molecular weight <200 g/mol).**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Volatile organic compounds are infrequently detected, in the subsurface, and are at low concentrations.

Question B:

Could the soil contaminants reach receptors through fugitive dust carried in air?

- **Soil contamination would have to be on the actual surface of the soil to become available for dust.**
- **In the case of dust exposures to burrowing animals, the contamination would have to occur in the depth interval where these burrows occur.**

Answer (likely/unlikely/uncertain): Likely

Provide explanation: Low percentage of vegetative cover makes the likelihood of soil contaminants reaching receptors through fugitive dust likely.

Question C:

Can contaminated soil be transported to aquatic ecological communities (use SOP 2.01 run-off score and terminal point of surface water runoff to help answer this question)?

- **If the SOP 2.01 run-off score* for each SWMU included in the site is equal to zero, this suggests that erosion at the site is not a transport pathway. (* Note that the runoff score is not the entire erosion potential score, rather it is a subtotal of this score with a maximum value of 46 points).**
- **If erosion is a transport pathway, evaluate the terminal point to see if aquatic receptors could be affected by contamination from this site.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: There are no aquatic ecological communities on or within close proximity to the sites and there is limited runoff from the sites.

Question D:

Is contaminated groundwater potentially available to biological receptors through seeps or springs or shallow groundwater?

- **Known or suspected presence of contaminants in groundwater.**
- **The potential for contaminants to migrate via 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 (~1 m depth).**
- **Terrestrial wildlife receptors generally will not contact 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 below ground surface.

Question E:

Is infiltration/percolation from contaminated subsurface material a viable transport and exposure pathway?

- **Suspected ability of contaminants to migrate to groundwater.**
- **The potential for contaminants to migrate via 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 (~1 m depth).**
- **Terrestrial wildlife receptors generally will not contact 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 only applicable to release sites located on or near the mesa edge.**
- **Consider the erodability of surficial material and the geologic processes of canyon/mesa edges.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: No perched aquifers exist on or near these sites. No evidence of mass wasting events in the area was found, and the erosion potential is minimal.

Question G:

Could airborne contaminants interact with receptors through respiration of vapors?

- **Contaminants must be present as volatiles in the air.**
- **Consider the importance of inhalation of vapors for burrowing animals.**
- **Foliar uptake of organic 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

Terrestrial Animals: 1

Provide explanation: Volatile organic compounds are detected infrequently and at low concentrations.

Question H:

Could airborne contaminants interact with plants through deposition of particulates or with animals through inhalation of fugitive dust?

- **Contaminants must be present as particulates in the air or as dust for this exposure pathway to be complete.**
- **Exposure via 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: 2

Terrestrial Animals: 2

Provide explanation: Moderate vegetative ground cover, along with the burrowing activities of ground-dwelling terrestrial animals may create a minor pathway for fugitive dust in air to reach receptors.

Question I:

Could contaminants interact with plants through root uptake or rain splash from surficial soils?

- **Contaminants in bulk soil may partition into soil solution, making them available to roots.**
- **Exposure of terrestrial plants to contaminants present in particulates deposited on leaf and stem surfaces by rain striking contaminated soils (i.e., rain splash).**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Provide explanation: Low concentrations of COPCs were detected in surficial soil.

Question J:

Could contaminants interact with receptors through food web transport from surficial soils?

- **The chemicals may bioaccumulate in animals.**
- **Animals may ingest contaminated food items.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: Some bioaccumulating contaminants are present but at low enough concentrations so the transport pathway through the food webs to receptors is minimal.

Question K:

Could contaminants interact with receptors via incidental ingestion of surficial soils?

- **Incidental ingestion of contaminated soil could occur while animals grub for food resident in the soil, feed on plant matter covered with contaminated soil or while grooming themselves clean of soil.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: COPCs in surface and subsurface are at low levels.

Question L:

Could contaminants interact with receptors through dermal contact with surficial soils?

- **Significant exposure via dermal contact would generally be limited to organic contaminants that are lipophilic and can cross epidermal barriers.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 2

Provide explanation: Lipophilic chemicals were detected at low concentrations at these sites.

Question M:

Could contaminants interact with plants or animals through external irradiation?

- **External irradiation effects are most relevant for gamma emitting radionuclides.**
- **Burial of contamination attenuates radiological exposure.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 2

Terrestrial Animals: 2

Provide explanation: Radionuclides were detected infrequently and at low levels.

<u>**Question N**</u>**:**

Could contaminants interact with plants through direct uptake from water and sediment or sediment rain splash?

- **Contaminants may be taken-up by terrestrial plants whose roots are in contact with surface waters.**
- **Terrestrial plants may be exposed to particulates deposited on leaf and stem surfaces by rain striking contaminated sediments (i.e., rain splash) in an area that is only periodically inundated with water.**
- **Contaminants in sediment may partition into soil solution, making them available to roots.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Provide explanation: No aquatic habitat exists 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 items.**
- **Animals may ingest contaminated food items.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: No aquatic habitat exists on-site.

<u>**Question P**</u>**:**

Could contaminants interact with receptors via ingestion of water and suspended sediments?

- **If sediments are present in an area that is only periodically inundated with water, terrestrial receptors may incidentally ingest sediments.**
- **Terrestrial receptors may ingest water-borne contaminants if contaminated surface waters are used as a drinking water source.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: No aquatic habitat exists on-site.

<u>Question Q</u>:

Could contaminants interact with receptors through dermal contact with water and sediment?

- **If sediments are present in an area that is only periodically inundated with water, terrestrial species may be dermally exposed during dry periods.**
- **Terrestrial organisms may be dermally exposed to water-borne contaminants as a result of wading or swimming in contaminated waters.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Animals: 0

Provide explanation: No aquatic habitat exists on-site.

<u>Question R</u>:

Could contaminants interact with plants or animals through external irradiation?

- **External irradiation effects are most relevant for gamma emitting radionuclides.**
- **Burial of contamination attenuates radiological exposure.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Terrestrial Plants: 0

Terrestrial Animals: 0

Provide explanation: No aquatic habitat exists on-site.

<u>Question S</u>:

Could contaminants bioconcentrate in free floating aquatic, attached aquatic plants, or emergent vegetation?

- **Aquatic plants are in direct contact with water.**
- **Contaminants in sediment may partition into pore water, making them available to submerged roots.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Plants/Emergent Vegetation: 0

Provide explanation: No aquatic habitat exists 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 sediments or may be exposed to contaminants through osmotic exchange, respiration, or ventilation of sediment pore waters.**
- **Aquatic receptors may be exposed through osmotic exchange, respiration, or ventilation of surface waters.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation: No aquatic habitat exists 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 items may result in contaminant bioaccumulation through the food web.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

Aquatic Animals: 0

Provide explanation: No aquatic habitat exists on-site.

<u>Question V</u>:

Could contaminants interact with aquatic plants or animals through external irradiation?

- **External irradiation effects are most relevant for gamma emitting radionuclides.**
- **The water column acts to absorb radiation, thus external irradiation is typically more important for sediment dwelling organisms.**

Provide quantification of exposure pathway (0=no pathway, 1=unlikely pathway, 2=minor pathway, 3=major pathway):

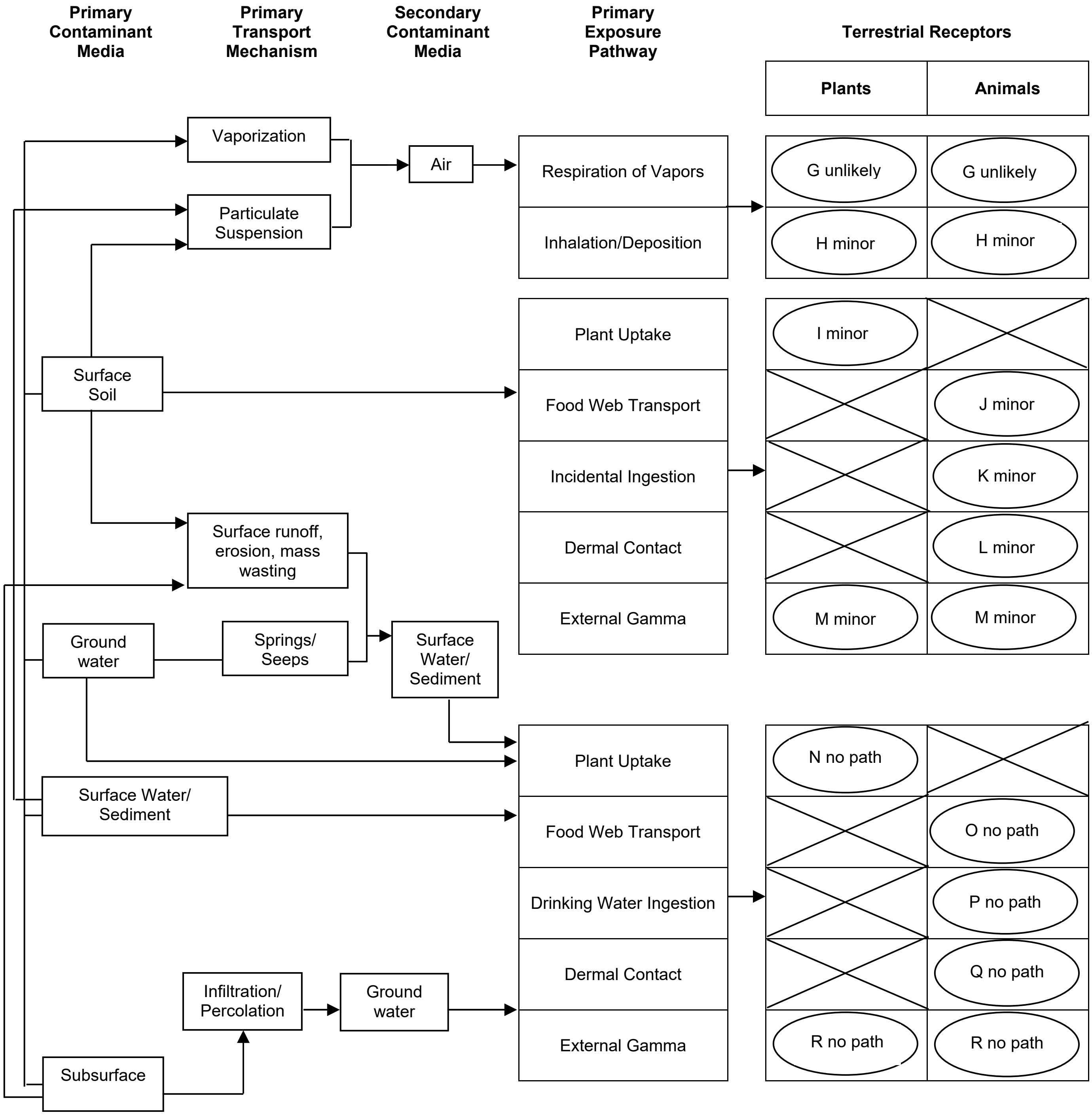
Aquatic Plants: 0

Aquatic Animals: 0

Provide explanation: No aquatic habitat exists on-site.

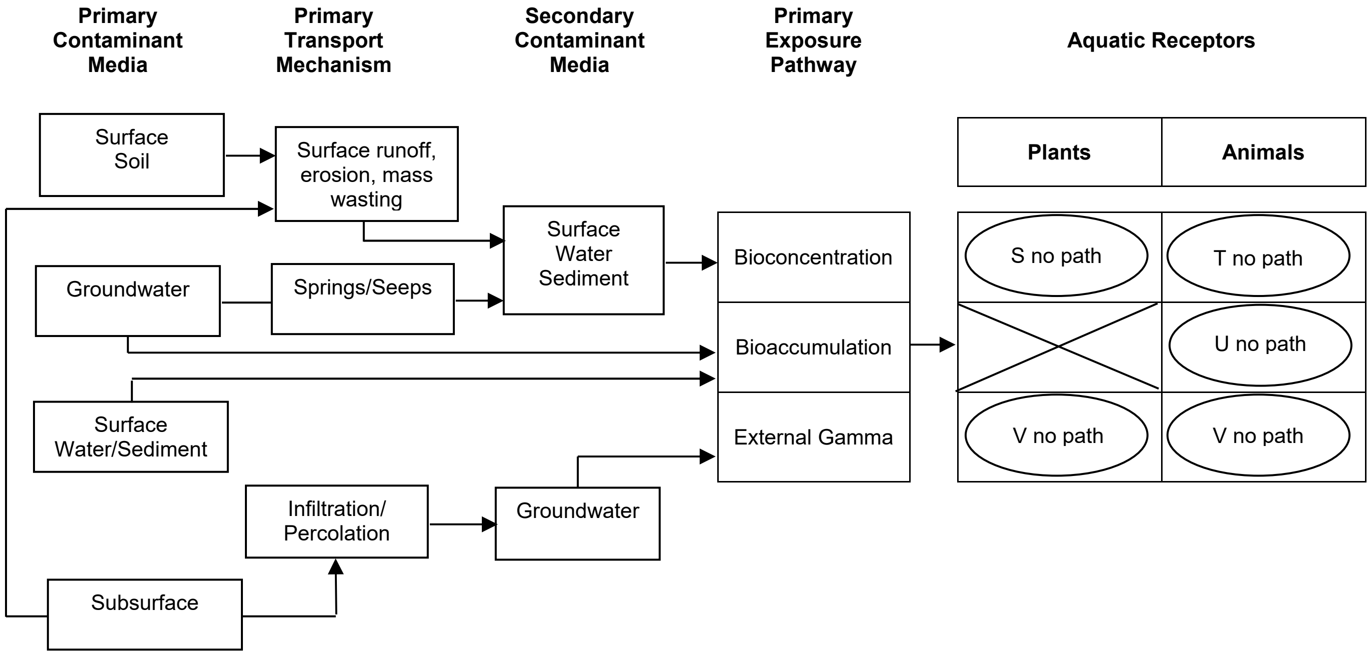
NOTE:
Letters in circles refer to questions on the Scoping Checklist

Ecological Scoping Checklist
Terrestrial Receptors
Ecological Pathways Conceptual Exposure Model



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): Randall Ryti

Name (signature): Randall Ryti

Organization: Neptune and Company, Inc.

Date completed: June 30, 2018

Checklist reviewed by:

Name (printed): Tracy McFarland

Name (signature): Tracy McFarland

Organization: N3B

Date reviewed: 9/11/18