EMID-701606

DEPARTMENT OF ENERGY

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

EMLA-2021-BF153-02-001

August 31, 2021

Mr. Ricardo Maestas
Acting Bureau Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6313

Subject: Submittal of the Phase II Investigation Report for Chaquehui Canyon Aggregate Area

Dear Mr. Maestas:

Enclosed please find two hard copies with electronic files of the "Phase II Investigation Report for Chaquehui Canyon Aggregate Area." This Phase II investigation report evaluates the nature and extent of contamination for 16 solid waste management units (SWMUs) and areas of concern (AOCs) in the Chaquehui Canyon Aggregate Area at Los Alamos National Laboratory (LANL or the Laboratory). For those sites for which nature and extent of contamination are defined or no further sampling is warranted, this Phase II investigation report also evaluates potential human health and ecological risks. This Phase II investigation report is being submitted to fulfill a proposed fiscal year 2021 milestone in Appendix B of the 2016 Compliance Order on Consent.

The Chaquehui Canyon Aggregate Area is located in Technical Area 33 at the Laboratory and consists of 51 SWMUs and AOCs. Of these 51 sites, 8 have been previously investigated and/or remediated and have been approved for no further action. In 2019–2020, the remaining 43 sites were investigated, and the results were reported in the investigation report for the Chaquehui Canyon Aggregate Area submitted to the New Mexico Environment Department (NMED) in September 2020. Of these 43 sites, 16 required additional sampling to define extent of contamination, and 8 of the 16 sites required soil removal. The scope for this additional sampling and remediation was documented in the Phase II investigation work plan for Chaquehui Canyon Aggregate Area approved by NMED on July 26, 2021. The Phase II investigation work plan was implemented in 2021, and the results are presented in this report.

A pre-submission meeting between NMED, the U.S. Department of Energy Environmental Management Field Office Los Alamos (EM-LA), and Newport News Nuclear BWXT-Los Alamos, LLC (N3B) was held on August 10, 2021, to present a summary of the information provided in this report.

If you have any questions, please contact Brenda Bowlby at (360) 930-4353 (brenda.bowlby@em-la.doe.gov) or Cheryl Rodriguez at (505) 414-0450 (cheryl.rodriguez@em.doe.gov).

Sincerely,

ARTURO DURAN

Digitally signed by ARTURO DURAN
Date: 2021.08.30 17:05:38 -06'00'

Arturo Q. Duran
Compliance and Permitting Manager
Environmental Management
Los Alamos Field Office

Enclosure(s):

1. Two hard copies with electronic files:
   Phase II Investigation Report for Chaquehui Canyon Aggregate Area (EM2021-0421)

cc (letter with hard-copy enclosure[s]):
Brenda Bowlby, N3B
Cheryl Rodriguez, EM-LA

cc (letter with CD/DVD enclosure[s]):
Laurie King, EPA Region 6, Dallas, TX
Chris Catechis, NMED-DOE-OB/-RPD
Steve Yanicak, NMED-DOE-OB
emla.docs@em.doe.gov
n3brecords@em-la.doe.gov
Public Reading Room (EPRR)
PRS website

cc (letter emailed):
Jennifer Payne, LANL
William Alexander, N3B
Emily Day, N3B
Michael Erickson, N3B
Jeff Holland, N3B
Kim Lebak, N3B
Joseph Legare, N3B
Dana Lindsay, N3B
Pamela Maestas, N3B
Tracy McFarland, N3B
Joseph Murdock, N3B

Kent Rich, N3B
Joseph Sena, N3B
Troy Thomson, N3B
Peter Maggiore, NA-LA
M. Lee Bishop, EM-LA
John Evans, EM-LA
Stephen Hoffman, EM-LA
Michael Mikolanis, EM-LA
David Nickless, EM-LA

August 2021
EM2021-0421

Phase II Investigation Report for Chaquehui Canyon Aggregate Area

EM2021-0421

Phase II Investigation Report for Chaquehui Canyon Aggregate Area

August 2021

Responsible program director:

Printed Name	Signature	Title	Organization	Date
Michael O. Erickson		Program Director	RCRA Remediation Program	8/19/21

Responsible N3B representative:

Printed Name	Signature	Title	Organization	Date
Troy Thomson	For	Acting Program Manager	N3B Environmental Remediation Program	8/19/21

Responsible DOE EM-LA representative:

Printed Name	Signature	Title	Organization	Date
Arturo Q. Duran	ARTURO DURAN Digitally signed by ARTURO DURAN Date: 2021.08.30 17:06:13 -06'00'	Compliance and Permitting Manager	Office of Quality and Regulatory Compliance	

EXECUTIVE SUMMARY

This Phase II investigation report evaluates the nature and extent of contamination for 16 solid waste management units (SWMUs) and areas of concern (AOCs) in the Chaquehui Canyon Aggregate Area at Los Alamos National Laboratory (LANL or the Laboratory). For those sites for which nature and extent of contamination are defined or no further sampling is warranted, this Phase II investigation report also evaluates potential human health and ecological risks. The Chaquehui Canyon Aggregate Area is located in Technical Area 33 at Los Alamos National Laboratory and consists of 51 SWMUs and AOCs. Of these 51 sites, 8 have been previously investigated and/or remediated and have been approved for no further action. Forty-three of the sites were investigated in 2019–2020, and the results were reported in the investigation report for the Chaquehui Canyon Aggregate Area. Of these 43 sites, 16 required additional sampling to define extent of contamination, and 8 of the 16 sites required soil removal. The scope for this additional sampling and remediation was documented in the approved Phase II investigation work plan for Chaquehui Canyon Aggregate Area. The Phase II investigation work plan was implemented in 2021 and the results are presented in this report.

Based on the results of data evaluations presented in this investigation report, the U.S. Department of Energy Environmental Management Los Alamos Field Office and Newport News Nuclear BWXT-Los Alamos, LLC, recommend the following:

- Corrective action complete without controls for SWMU 33-010(c), for which extent is defined and which poses no potential unacceptable human health risk under the residential, industrial, and construction worker scenarios and no unacceptable ecological risk.
- Corrective action complete with controls for SWMUs 33-007(c) and 33-011(d), 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.
- Further sampling for SWMUs 33-001(a), 33-001(b), 33-001(c), 33-001(d), 33-001(e), 33-004(a), 33-004(i), 33-006(a), 33-008(c), 33-011(a), 33-012(a), and 33-017 and AOC C-33-001, for which nature and/or extent are not defined.
- Remediation for SWMUs 33-004(i), 33-008(c), and 33-012(a) and AOC C-33-001 because of potential unacceptable human health risk or dose under two or more scenarios and/or unacceptable ecological risk.

CONTENTS

Figures

Tables

Appendixes

Plates

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 36 mi^2 of the Pajarito Plateau, which consists of a series of fingerlike mesas separated by deep canyons that contain perennial and intermittent streams running from west to east. Mesa tops range in elevation from approximately 6200 ft to 7800 ft above mean sea level.

Newport News Nuclear BWXT-Los Alamos, LLC (N3B) is participating in a national effort by DOE to clean up Laboratory 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, N3B is investigating sites potentially contaminated by past Laboratory operations. These sites are designated as either solid waste management units (SWMUs) or areas of concern (AOCs).

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

Corrective actions at Laboratory sites are subject to the 2016 Compliance Order on Consent (the Consent Order). This investigation report describes work activities that were completed in accordance with the Consent Order.

1.1 General Site Information

The Chaquehui Canyon Aggregate Area is located in Technical Area 33 (TA-33) at the Laboratory (Figure 1.0-1 and Plate 1) and consists of 51 SWMUs and AOCs, 7 of which were investigated and/or remediated by the Laboratory and were approved for no further action (NFA) before the effective date of the March 2005 Consent Order and 1 of which was remediated and received a certificate of completion under the 2005 Consent Order (NMED 2006, 093526). The remaining 43 SWMUs and AOCs were addressed in the approved investigation work plan for Chaquehui Canyon Aggregate Area (LANL 2010, 111298.9; NMED 2011, 201242). The AOCs and SWMUs investigated are listed in Table 1.1-1 and shown on Plate 2.

1.2 Purpose of Investigation

Sixteen SWMUs and AOCs within the Chaquehui Canyon Aggregate Area were addressed by the 2021 investigation conducted by N3B because these sites are potentially contaminated with hazardous chemicals and radionuclides, and final assessments of site contamination, associated risks, and recommendations for additional corrective actions remained incomplete. For each site, the objectives of the 2021 investigation were to (1) establish the nature and extent of contamination, (2) determine whether current site conditions pose a potential unacceptable risk/dose to human health or the environment, and (3) assess whether any additional sampling and/or corrective actions are required.

All analytical data collected from the 2021 investigation activities are presented and evaluated in this report, along with decision-level data from previous investigations.

1.3 Document Organization

This report is organized into nine sections, including this introduction, with multiple supporting appendixes. Section 2.0 provides details on the aggregate area site conditions (surface and subsurface). Section 3 provides an overview of the scope of the activities performed during implementation of the approved Phase II investigation work plan (N3B 2021, 701355; NMED 2021, 701546). Section 4.0 describes the regulatory criteria used to evaluate potential risk/dose to ecological and human health receptors. Section 5.0 describes the data review methods. Section 6.0 presents an overview of the operational history of each site and historical releases, summaries of previous investigations, results of the field activities performed during the 2021 investigation, site contamination, evaluation of the nature and extent of contamination, and summaries of the results of the human health and ecological risk-screening assessments for TA-33. Section 7.0 presents the conclusions of the nature and extent of contamination investigation and risk-screening assessments. Section 8.0 discusses recommendations based on applicable data and the risk-screening assessments. Section 9.0 includes a list of references cited and the map data sources used in all the figures and plates.

The appendixes include acronyms, abbreviations, a glossary, a metric conversion table, and definitions of data qualifiers used in this report (Appendix A), field methods (Appendix B), a summary of investigation-derived waste (IDW) management (Appendix C), an analytical program description (Appendix D), analytical suites and results and analytical reports (Appendix E, on DVD included with this document), box plots and statistical results (Appendix F), and risk-screening assessments (Appendix G). Because of security restrictions at TA-33, site photographs were not allowed.

2.0 AGGREGATE AREA SITE CONDITIONS

2.1 Surface Conditions

2.1.1 Soils

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

Soil at TA-33 Main Site and the surrounding mesa top is classified as Hackroy Rock Complex (Nyhan et al. 1978, 005702). Field logs from sampling conducted at Material Disposal Area (MDA) K indicate that soil ranges in depth from 0 to 8 ft (LANL 1997, 071478, p. 9). Soil may be sandy and contain pumice pebbles ranging up to 0.5 in. in size. Clay lenses may be intermixed with pulverized tuff. Soil in the drainages is sandy, with some clay and many small pebbles. Bedrock is exposed at many areas on the lower (eastern) part of the site, including the drainage east of the septic system [SMWU 33-004(a)].

Soil at TA-33 South Site is classified as Hackroy Rock Complex (Nyhan et al. 1978, 005702). Parent Hackroy soil is shallow, well-drained soil that forms on mesa tops from weathered tuff. The surface layer is a brown, sandy loam approximately 4 in. thick. Hackroy subsoil is a reddish-brown clay mixed with gravel or loam approximately 8 in. deep. The Hackroy Rock outcrop complex contains 20% Hackroy soil, 10% Nyjack soil, and 70% rock outcrop. Nyjack soil is similar to Hackroy but deeper and loamier (LANL 1997, 071478, p. 9). Much of the soil at South Site was scraped to bedrock to build the berms near the firing sites.

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

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

2.1.2 Surface Water

Most surface water in the Los Alamos area occurs as ephemeral, intermittent, or interrupted streams in canyons cut into the Pajarito Plateau. Springs on the flanks of the Jemez Mountains, west of the Laboratory's western boundary, supply flow to the upper reaches of Cañon de Valle and to Guaje, Los Alamos, Pajarito, and Water Canyons (Purtymun 1975, 011787; Stoker 1993, 056021). These springs discharge water perched in the Bandelier Tuff and Tschicoma Formation at rates from 2 to 135 gal./min (Abeele et al. 1981, 006273). The volume of flow from the springs maintains natural perennial reaches of varying lengths in each of the canyons. The Rio Grande flows through White Rock Canyon immediately to the southeast of TA-33.

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

At TA-33, ephemeral surface water flow from the mesa top to the surrounding canyons may be expected during spring snowmelt and summer thunderstorms. Surface water does not collect on the mesa top at any of the SWMUs or AOCs in the Chaquehui Canyon Aggregate Area. Chaquehui Canyon has a total drainage area of approximately 1.6 mi^2 with a drainage channel length of 3.4 mi, which runs across approximately 2 mi of TA-33. Three springs are located near the confluence of Chaquehui Canyon with the Rio Grande: Doe Spring is located 0.5 mi upstream of the confluence, and Springs 9 and 9A are located 0.25 mi upstream of the Rio Grande. All three springs support perennial flow at the end of Chaquehui Canyon to the Rio Grande (LANL 1998, 059599).

2.2 Subsurface Conditions

2.2.1 Stratigraphic Units

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

The stratigraphy of the Chaquehui 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).

The geology of the area near TA-33, including White Rock Canyon, has been described as part of an evaluation of potential landslides and mass movements (Reneau et al. 1995, 054405). Descriptions of the geologic units in that evaluation are summarized below. Principal units, from oldest to youngest, include sedimentary rocks of the Santa Fe Group; volcaniclastic and quartzite-rich gravels of the Puye Formation; older alluvial deposits, basaltic flows, and phreatomagmatic deposits of the Cerros del Rio volcanic field; and the lower and upper Bandelier Tuff (Griggs and Hem 1964, 092516; Dethier 1997, 049843). The stratigraphy and selected characteristics of these units are summarized below.

2.2.1.1 Santa Fe Group

The Miocene Santa Fe Group exposed in White Rock Canyon is composed primarily of pinkish-grey to buff-colored, poorly to moderately lithified silty sandstone and pebbly sand with an arkosic matrix (Griggs and Hem 1964, 092516; Galusha and Blick 1971, 021526; Dethier 1997, 049843). Thin beds of altered dacitic tephra are locally abundant. These rocks record mainly fluvial deposition on the distal margins of alluvial fans constructed when the Española basin was internally drained. The sandstone, locally cemented with sparry calcite, crops out extensively near the site of the former Buckman village east of the Rio Grande but is poorly exposed west of the Rio Grande. The southernmost exposure in northern White Rock Canyon is at the confluence with Ancho Canyon, to the north of TA-33.

2.2.1.2 The Puye Formation

The Puye Formation is principally a Pliocene volcanogenic alluvial fan sequence derived from the Jemez Mountains (Turbeville et al. 1989, 021587), but it includes ancestral Rio Grande gravels and lacustrine deposits, particularly along and west of White Rock Canyon. The Puye Formation is informally divided into a fanglomerate facies and an axial Rio Grande facies (Dethier 1997, 049843). Along White Rock Canyon and tributary canyons south of Otowi Bridge, these facies are interfingered laterally and in vertical sequences. The fanglomerate facies is mainly pinkish-grey to grey, locally cemented, weakly lithified pebble-to-boulder size gravel, boulder-rich debris flows, and sand. Highly weathered dacitic pumice-rich layers also occur, which have weathered to clay. The ancestral Rio Grande facies is mainly grey, poorly to moderately lithified, locally cemented quartzite-rich pebble-to-cobble gravel, but it includes beds of silt and silty sand. In Ancho Canyon, to the north of TA-33, the Puye Formation is at least 200 ft thick, including 80 ft of Rio Grande gravels underlain by at least 115 ft of fanglomerate.

2.2.1.3 Pliocene Fluvial and Lacustrine Deposits

Unlithified and generally uncemented Pliocene sedimentary deposits interlayered with basalt flows and phreatomagmatic deposits are exposed within a few miles of the Rio Grande. These rocks include buff to brownish-yellow sand and pebbly sand, silt, silty sand, and beds of cinders and debris flows. They are the temporal equivalent, in part, of the ancestral Rio Grande facies of the Puye Formation, but the presence of granitic clasts indicates they were derived from the southern Sangre de Cristo Range (Dethier 1997, 049843). They correlate with the older alluvium of Griggs and Hem (1964, 092516) and, in part, with the Ancha Formation of Spiegel and Baldwin (1963, 054259). Fine-grained units are locally rich in swelling clays that were probably produced from the alteration of basaltic glass derived from Cerros del Rio volcanism. Lacustrine deposits record a Rio Grande dammed south of Water Canyon contemporaneous with eruptions from maars and emplacement of basaltic flows.

2.2.1.4 Cerros del Rio Volcanic Field

Mafic Lavas

Lava flows of basalt, hawaiite, basaltic andesite, andesite, and related intrusive rocks of the Pliocene Cerros del Rio volcanic field form surface exposures along White Rock Canyon and east of the Rio Grande from Otowi Bridge to Cochiti Dam. Volcanic landforms include maars, shields, fissure vents, cinder cones near the Rio Grande, and a cinder cone at TA-33 Area 6. Near Otowi Bridge, mesa-capping flows are about 130 ft thick, whereas south of Water Canyon the flow sequence is greater than 260 ft thick, and near Chaquehui Canyon massive flows are greater than 400 ft thick. East of the Rio Grande, the sequence of basaltic flows also thickens to the south. The thickest flows appear to fill paleovalleys or craters greater than 200 ft deep, whereas some of the thinner flows apparently spread out over surfaces of little relief. Flow bases are smooth to rubble-rich; locally a few tens of inches to a few feet of alluvium separate the flows.

Ages of 2.3 to 2.7 Ma (millions of years) have been obtained from rock dating of the Cerros del Rio volcanic field near northern White Rock Canyon, including argon-40/argon-39 ages of 2.4 to 2.6 Ma from basalt flows and dikes at the TA-33 cinder cone (Laughlin et al. 1993, 054424; Dethier 1997, 049843). A topographically low flow in lower Water Canyon yielded a similar age of about 2.47 Ma, indicating a relatively short period of intense volcanism and over 650 ft of local aggradation occurred at about 2.4 to 2.6 Ma.

Phreatomagmatic Deposits

Thin-bedded to massive matrix-supported flow and fall deposits crop out at La Mesita, along Chino Mesa, between Chaquehui Canyon and Water Canyon, and in several other zones south to Cochiti Dam, mainly along the Rio Grande. These deposits were produced at maar volcanoes that formed when rising magmas reacted with groundwater along the Pliocene course of the Rio Grande (Aubele 1978, 054426; Heiken et al. 1989, 054425; Dethier 1997, 049843). At several of these volcanic centers, lava flows are interlayered with the upper portions of the phreatomagmatic sequences, and some maars probably were the source of thick flows of basaltic andesite (Dethier 1997, 049843). For instance, 100 ft of phreatomagmatic deposits along the southwest side of Chaquehui Canyon near the Rio Grande are overlain by a 200-ft-thick volcanic section that includes seven flows and interlayered phreatomagmatic deposits; these rocks are in turn capped by a package of flows 400 ft thick that may reflect a single cooling unit.

“Pajarito Plateau” Tholeiitic Basalt

Thin flows of tholeiitic basalt typically form the western rim of White Rock Canyon in the TA-33 area, extending north to Los Alamos Canyon. The flows were derived from vents to the west and northwest of White Rock, and one of these vents is exposed south of Pajarito Canyon, southwest of the intersection of Pajarito Road and NM 4. In late Pliocene time, the basalts entered a lake dammed in White Rock Canyon at an elevation of about 6200 ft. Deltas of pillow basalt and palagonitic breccia formed at the edge of the paleolake and are best exposed in Los Alamos and Mortandad Canyons. Available data indicate these tholeiitic flows can be distinguished from other Cerros del Rio lavas by their chemistry (Laughlin et al. 1993, 054424; Dethier 1997, 049843) in addition to their higher stratigraphic position and flow direction. Ages of 1.8 to 2.5 Ma have been obtained from these basalts (Laughlin et al. 1993, 054424; Dethier 1997, 049843; WoldeGabriel et al. 2001, 092523), including argon-40/argon-39 ages of 2.46 to 2.49 Ma near TA-33.

2.2.1.5 Early Quaternary Alluvium

Early Quaternary alluvium is locally exposed near TA-33 below the Tshirege Member of the Bandelier Tuff. Volcanic fallout units of the Cerro Toledo rhyolite, which fill this stratigraphic interval to the northwest (Heiken et al. 1986, 048638), are apparently sparse in the vicinity of White Rock Canyon. In Ancho Canyon near NM 4, about 20 ft of dacite-rich bouldery stream gravels derived from a stream draining the Sierra de los Valles occurs between the Otowi and Tshirege Members. In lower Water Canyon and a northeastern tributary to lower Ancho Canyon, alluvial deposits composed largely of quartzite-rich gravels and river-polished basalt boulders occur beneath the Tshirege Member and indicate that the early Quaternary position of the Rio Grande was at an elevation of about 5700 to 5800 ft above sea level.

2.2.1.6 Tshirege Member Bandelier Tuff

The Tshirege Member of the Bandelier Tuff at TA-33 consists of light-grey nonwelded to slightly welded pumiceous pyroclastic flows and a thin basal pumiceous fall unit, the Tsankawi Pumice Bed (Bailey et al. 1969, 021498). These rocks were erupted from the Jemez Mountains about 1.22 Ma (Izett and Obradovich 1994, 048817). The Tshirege Member is the uppermost rock unit at TA-33 and underlies the SWMUs and AOCs within Chaquehui Canyon Aggregate Area. This unit is typically about 200 to

250 ft thick at TA-33 but pinches out over paleotopographic highs, such as the TA-33 cinder cone, and reaches a thickness of about 750 ft where it fills the early Quaternary paleocanyon.

The Tshirege Member can be divided into mapping units that reflect distinct flow units or cooling units and variations in alteration. Four mapping units modified from the units of Baltz et al. (1963, 008402) and Vaniman and Wohletz (1990, 009995.2) in other parts of the Pajarito Plateau are described below.

The lowest unit, unit 1g, consists of nonwelded ignimbrite with glassy pumice (Vaniman and Wohletz 1990, 009995.2). The second lowest unit, unit 1v, consists of nonwelded vapor-phase-altered ignimbrite (Vaniman and Wohletz 1990, 009995.2). Unit 2 is the primary cliff-former at TA-33, consisting of slightly welded ignimbrite with discontinuous surge beds at the base. The contact of unit 2 with the overlying nonwelded to slightly welded ignimbrites of unit 3 is poorly defined and is here considered to be the approximate break in slope at the base of the upper, relatively steep tuff step.

2.2.2 Hydrogeology

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

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

2.2.2.1 Groundwater

In the Los Alamos area, groundwater occurs as (1) water in shallow alluvium in some of the larger canyons, (2) intermediate perched groundwater (a perched groundwater body lies above a less permeable layer and is separated from the underlying aquifer by an unsaturated zone), and (3) the regional aquifer.

No groundwater wells are located in or near TA-33. Drilling to a depth of 315 ft during the investigation of MDA K in 1993 did not encounter perched water. Groundwater discharges from four springs (Springs 8A, 9, 9A, and Doe Spring) located in lower Chaquehui Canyon east of South Site and above the Rio Grande. At South Site (elevation 6400 ft above sea level), the depth to groundwater is assumed to be 800 ft, based on the elevation of Doe Spring (5600 ft above sea level).

2.2.2.2 Vadose Zone

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

The following sections describe the scope of activities conducted during the Phase II investigation of the Chaquehui Canyon Aggregate Area. Appendix B describes the methods and procedures used in completing the scope.

This section presents an overview of field activities performed during the implementation of the approved Phase II investigation work plan for Chaquehui Canyon Aggregate Area (N3B 2021, 701355; NMED 2021, 701546); the field investigation results and observations are presented in detail in section 6.0 and in the appendixes. The scope of activities for the 2021 Chaquehui Canyon Aggregate Area investigation included site access activities, geodetic surveys, surface and subsurface sampling, borehole abandonment, remediation and site restoration, debris removal, health and safety monitoring, and waste management activities.

3.1 Site Access Activities

The Chaquehui Canyon Aggregate Area is closed to the public and is accessible only to Laboratory employees, and some areas are accessible only with a clearance or under supervision of an escort. Before implementation of Phase II field activities, efforts were made to provide a secure and safe work area and to reduce impacts to workers, cultural resources, and the environment.

Other activities included reviewing the permit requirements identification form, completing excavation permits and utility locates, requesting sampling paperwork from the N3B Sample Management Office (SMO), and staging waste containers.

3.2 Field Activities

This section describes the field activities conducted during the 2021 investigation. Additional details regarding the field methods and procedures used to perform these field activities are presented in Appendix B.

3.2.1 Geodetic Surveys

Geodetic surveys were conducted during the Phase II investigation to identify surface and subsurface sampling locations. The planned sampling locations for the 2021 investigation are described in the approved investigation work plan (N3B 2021, 701355; NMED 2021, 701546). A geodetic survey was performed to establish and mark the planned sampling locations in the field and to document excavation boundaries.

Geodetic surveys were conducted by a licensed State of New Mexico surveyor, using a differential global positioning system (GPS) unit. Horizontal accuracy of the GPS unit 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 2021 sampling locations are presented in Table 3.2-1. All coordinates are expressed as State Plane Coordinate System 83, New Mexico Central, U.S. All surveyed coordinates for sampling locations were uploaded to the Environmental Information Management database.

3.2.2 Field Screening

Surface and subsurface samples and excavated environmental media were screened for gross-alpha and gross-beta radioactivity by an N3B radiological control technician (RCT) using appropriately calibrated instruments. Field response checks of radiological instruments were performed and documented by the RCTs. All calibration checks were performed in accordance with N3B-P330-2, "Control of Measuring and Test Equipment." Screening was performed using an Eberline E600 with either a 380AB or ThermoFisher Scientific, Inc., RadEye SX survey meter with dual scintillator probe. The probe was held less than 1 in. away from the medium. Measurements were made by conducting a quick scan to find the location with the highest initial reading and then collecting a 1-min reading at that location to determine levels of gross-alpha and gross-beta radioactivity.

After field-screening measurements were established, samples from the soil and tuff material were collected and logged. The RCT collected and recorded background level measurements for gross-alpha and gross-beta radioactivity daily.

All samples were screened for gross-alpha, gross-beta, and gross-gamma radioactivity by on-site RCTs before transport to the SMO. All samples submitted for volatile organic compound (VOC) analysis were field screened using a photoionization detector (PID). Results were recorded on each sample collection log (SCL)/chain of custody (COC) form.

Screening measurements were recorded on the SCLs/COCs and are provided in Appendix E (on DVD included with this document).

3.2.3 Surface and Shallow-Subsurface Soil Investigation

Surface and subsurface samples were collected according to the approved Phase II investigation work plan (N3B 2021, 701355; NMED 2021, 701546). Soil, tuff, and sediment samples were collected in accordance with N3B-SOP-ER-2001, "Soil, Tuff, and Sediment Sampling." Samples were collected using stainless-steel augers or spoons and placed in stainless-steel bowls and transferred to sterile sample collection jars or bags for transport to the SMO. Samples for VOC analysis were transferred immediately from the sampler to the sample container to minimize the loss of VOCs during the sample-collection process.

Quality assurance/quality control samples (field duplicates, field trip blanks, and rinsate blanks) were collected in accordance with N3B-SOP-SDM-1100, “Sample Containers, Preservation, and Field Quality Control.” 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 always remained in the controlled custody of the field team until they were delivered to the SMO. Sample custody was then relinquished to the SMO for delivery to a preapproved off-site contract analytical laboratory for the analyses specified by the approved investigation work plan (N3B 2021, 701355; NMED 2021, 701546). The SCLs/COC forms for all samples are provided in Appendix E (on DVD included with this document).

3.2.4 Borehole Abandonment

No boreholes were drilled during the 2021 investigation. However, hand-auger sampling locations deeper than 15 ft bgs were abandoned in accordance with N3B-SOP-ER-6005, “Monitoring Well and Borehole Abandonment,” by filling the boreholes with bentonite chips up to 2 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 other sample borings were filled with clean fill to the ground surface before demobilization.

3.2.5 Excavation

Excavation of contaminated environmental media was performed at eight sites during the 2021 investigation at SWMUs 33-004(a), 33-004(i), 33-006(a), 33-008(c), 33-010(c), 33-012(a), and 33-017 and AOC C-33-001. Excavation of contaminated environmental media (soil and tuff), site restoration, waste disposition, and confirmation sampling was completed at these sites. Excavations were completed using a track excavator, backhoe, or by hand. The general sequence of activities for excavation and site restoration, waste management, and confirmation sampling is summarized below. Specific details are provided in Appendix B.

SWMU 33-004(a): A total of approximately 9.8 yd^3 of contaminated soil was removed from three locations at SWMU 33-004(a) to address potential unacceptable ecological risk and human health risk. Soil with elevated mercury concentrations was removed at location 33-60596; soil with elevated mercury and polychlorinated-biphenyl (PCB) concentrations was removed at location 33-60597; and soil with elevated polycyclic-aromatic-hydrocarbon (PAH) concentrations was removed at location 33-60601. Excavated soil was placed in 3.5-yd^3 or 5-yd^3 type IP-1 bags. Each excavation was backfilled with clean fill material and topped with base course from an off-site source to restore the area to the approximate original grade.

SWMU 33-004(i): Approximately 14.25 yd^3 of PCB-contaminated soil was removed from location 33-01058 at SWMU 33-004(i) to address potential unacceptable human health risks. Excavated soil was placed in 3.5-yd^3 or 5-yd^3 type IP-1 bags. The excavation was backfilled with clean fill material and topped with base course from an off-site source to restore the area to the approximate original grade.

SWMU 33-006(a): Approximately 4.28 yd^3 of contaminated soil was removed from SMWU 33-006(a) to address potential high-explosives (HE) contamination and potential unacceptable ecological risk. Soil with elevated HE field screening measurements was removed at 11 locations (33-60945 through 33-60955). Soil with elevated copper and di-n-butylphthalate concentrations was removed at location 33-60415. Soil with elevated copper concentrations was also removed at locations 33-60416, 33-60417, and 33-60423.

Excavated soil and tuff was placed in 3.5-yd^3 or 5-yd^3 type IP-1 bags. Each excavation was backfilled with clean fill material and topped with base course from an off-site source to restore the area to the approximate original grade.

SWMU 33-008(c): Approximately 67 yd^3 of contaminated soil and 4 yd^3 of buried landfill debris was removed from SWMU 33-008(c) to address potential unacceptable human health risk and ecological risk. Soil with elevated chromium, copper, lead, mercury, zinc, and PAH concentrations was removed at locations 33-01671, 33-01672, 33-01673, 33-01674, 33-01680, 33-01681, 33-01682, 33-01684, and 33-01685. Landfill debris was encountered within the excavation wall near location 33-01681 and the excavation was expanded to the west until all visible debris was removed. Excavated soil and tuff was placed in 3.5-yd^3 or 5-yd^3 type IP-1 bags. Each excavation was backfilled with clean fill material and topped with base course from an off-site source to restore the area to the approximate original grade.

SWMU 33-010(c): Approximately 1 yd^3 of soil with elevated copper, lead, and zinc concentrations was removed from location 33-60474 at SWMU 33-010(c) to address potential unacceptable ecological risk. Excavated soil was placed in 3.5-yd^3 or 5-yd^3 type IP-1 bags. The excavation was backfilled with clean fill material and topped with base course from an off-site source to restore the area to the approximate original grade.

SWMU 33-012(a): Approximately 2.2 yd^3 of soil with elevated PAH concentrations was removed from locations 33-60659 and 33-60661 at SWMU 33-012(a) to address potential unacceptable human health risk and ecological risk. Excavated soil was placed in 3.5-yd^3 or 5-yd^3 type IP-1 bags. Each excavation was backfilled with clean fill material and topped with base course from an off-site source to restore the area to the approximate original grade.

SWMU 33-017: Approximately 17.25 yd^3 of soil with elevated copper, lead, mercury, zinc, and selenium concentrations was removed from locations, 33-01106, 33-01107, 33-01114, and 33-01612 at SWMU 33-017 to address potential unacceptable ecological risk. Excavated soil was placed in 3.5-yd^3 or 5-yd^3 type IP-1 bags. The excavation area was backfilled with clean fill material and topped with base course from an off-site source to restore the area to the approximate original grade.

AOC C-33-001: Approximately 0.01 yd^3 of soil with elevated Aroclor-1260 concentrations was removed from location 33-01749 at AOC C-33-001 to address potential unacceptable human health risk. Excavated soil was placed in 3.5-yd^3 or 5-yd^3 type IP-1 bags. The excavation was backfilled with clean fill material from an off-site source to restore the area to the approximate original grade. An asphalt patch was also placed on top of the clean fill.

3.2.6 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, and bowls) was decontaminated to prevent cross-contamination of samples and locations. Dry decontamination was performed in accordance with N3B-SOP-ER-2002, “Field Decontamination of Equipment.” The dry decontamination methods used are described in Appendix B. Rinsate blanks were used to check the effectiveness of decontamination.

3.2.7 Health and Safety Measures

All 2021 investigation activities were conducted in accordance with a site-specific environmental safety and health plan, an integrated work control document, and a beryllium field implementation plan that detailed work steps, potential hazards, hazard controls, and required training to conduct work. These health and safety measures generally included the use of modified level-D personal protective equipment (PPE) and field monitoring for noise and dust using portable monitoring systems. Organic vapor monitoring was performed for health and safety purposes only and was not part of field screening (section 3.2.2). Beryllium sites required specific PPE based on work activities. For hand-augering and excavation activities, industrial hygiene exposure assessment reports concluded donning respiratory protection was not needed.

3.2.8 Waste Management

All waste generated during the Phase II investigation was managed in accordance with the waste management plan in the approved Phase II investigation work plan (N3B 2021, 701355, Appendix B; NMED 2021, 701546) and the N3B-approved project waste characterization strategy form (WCSF) (Attachment C-1 [on CD included with this document]). These documents incorporate the requirements of all applicable U.S. Environmental Protection Agency (EPA) and NMED regulations and DOE orders. Characterization and management of waste was performed in accordance with N3B-P409-0, "N3B Waste Management."

The waste streams associated with the investigation included contact IDW, municipal solid waste, environmental media, and excavated debris.

IDW included PPE such as gloves, disposable sampling supplies, decontamination towels, and other solid waste that may have come in contact with potentially contaminated environmental media. Contact waste was stored 3.5-yd^3 or 5-yd^3 type IP-1 bags placed on pallets in the waste staging area pending transport to an approved off-site treatment, storage, and disposal facility (TSDF) for disposal. As described in the WCSF (Attachment C-1 [on CD included with this document]), the contact waste was characterized using samples collected during the investigation. Contact IDW was disposed of as nonhazardous low-level waste (LLW) at Energy Solutions, Clive Disposal Facility, Clive, Utah.

Environmental media from surface and subsurface sampling activities were collected and containerized in 3.5-yd^3 or 5-yd^3 type IP-1 bags, placed on pallets, and covered and stored in a registered radioactive waste storage area pending transport to an approved off-site TSDF for disposal. This waste stream was characterized in accordance with the N3B-approved WCSF (Attachment C-1 [on CD included with this document]). The sample cuttings from all SWMUs/AOCs were disposed of as LLW at Energy Solutions, Clive Disposal Facility, Clive, Utah.

Environmental media from contaminated soil and tuff excavated from SWMUs 33-004(a), 33-004(i), 33-006(a), 33-008(c), 33-012(a), and 33-017 and AOC C-33-001 was containerized in 3.5-yd^3 or 5-yd^3 type IP-1 bags, placed on pallets, and covered and stored in a registered radioactive waste storage area pending transport to an approved off-site TSDF for disposal. This waste stream was characterized in accordance with the N3B-approved WCSF (Attachment C-1 [on CD included with this document]). All excavated material was disposed of as LLW at Energy Solutions, Clive Disposal Facility, Clive, Utah.

Landfill debris from SWMU 33-008(c) was stockpiled and then stored in a rolloff or B-25 container in a registered radioactive waste storage area pending transport to an approved off-site TSDF for disposal. This waste stream was characterized in accordance with the N3B-approved WCSF (Attachment C-1 [on CD included with this document]). All excavated material was disposed of as LLW at Energy Solutions, Clive Disposal Facility, Clive, Utah.

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

3.3 Sample Analyses

The SMO shipped all investigation samples to off-site contract analytical laboratories for the requested analyses. The analyses requested were specified in the approved Phase II investigation work plan (LANL 2021, 701355; NMED 2021, 701546) and were analyzed for all or a subset of the following: target analyte list (TAL) metals, total cyanide, nitrate, perchlorate, explosive compounds, PCBs, semivolatile organic compounds (SVOCs), VOCs, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, tritium, and pH. For SWMU 33-012(a), the analytical laboratory reported results for total PAHs with SVOC results. Total PAHs were not identified as a data need in the approved investigation work plan (LANL 2021, 701355; NMED 2021, 701546), and these results are included in the data tables provided in Appendix E (on DVD included with this document) but are not otherwise evaluated. 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 results meet the N3B minimum data quality objectives as outlined in N3B-PLN-SDM-1000, “Sample and Data Management Plan.” N3B-PLN-SDM-1000 sets the validation frequency criteria at 100% Level 1 examination and Level 2 verification of data, and at 10% minimum Level 3 validation of data. A Level 1 examination assesses the completeness of the data as delivered from the analytical laboratory, identifies any reporting errors, and checks the usability of the data based on the analytical laboratory’s evaluation of the data. A Level 2 verification evaluates the data to determine the extent to which the laboratory met the analytical method and the contract-specific quality control and reporting requirements. A Level 3 validation includes Level 1 and 2 criteria and determines the effect of potential anomalies encountered during analysis and possible effects on data quality and usability. A Level 3 validation is performed manually with method-specific data validation procedures. Laboratory analytical data were validated by N3B personnel as outlined in N3B-PLN-SDM-1000; N3B-AP-SDM-3000, “General Guidelines for Data Validation”; N3B-AP-SDM-3014, “Examination and Verification of Analytical Laboratory Data”; and additional method-specific analytical data validation procedures. All associated validation procedures were developed, where applicable, from the EPA QA/G-8 “Guidance on Environmental Data Verification and Data Validation”; the Department of Defense/Department of Energy “Consolidated Quality Systems Manual for Environmental Laboratories”; the EPA National Functional Guidelines for Data Validation; and the American National Standards Institute/American Nuclear Society 41.5-2012, “Verification and Validation of Radiological Data For Use in Waste Management and Environmental Remediation.”

3.4 Deviations

Deviations from the scope of activities defined in the approved Phase II investigation work plan (N3B 2021, 701355; NMED 2021, 701546) occurred during the implementation of the Chaquehui Canyon Aggregate Area investigation. Specific deviations are described in greater detail in section B-9.0 of Appendix B.

4.0 REGULATORY CRITERIA

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

Human health risk-screening evaluations were conducted for the Chaquehui Canyon Aggregate Area using NMED guidance (NMED 2019, 700550). 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 Chaquehui Canyon Aggregate Area is currently industrial and is expected to remain industrial for the reasonably foreseeable future. The residential scenario is evaluated for comparison purposes per the Consent Order and is the decision scenario for sites that do not require future controls. For sites to be recommended for corrective action complete without controls, both the residential scenario and construction worker scenario were evaluated in order to identify sites where the residential scenario is not protective of the construction worker.

4.2 Screening Levels

Human health and ecological risk-screening evaluations were conducted for the chemicals of potential concern (COPCs) and radionuclides detected in solid media at sites within the Chaquehui Canyon Aggregate Area in accordance with N3B-SOP-ER-2009, "Performing Human and Ecological Risk Screening Assessments." The human health risk-screening assessments (Appendix G) were performed on inorganic and organic COPCs using NMED soil screening levels (SSLs) for the industrial, construction worker, and residential scenarios (NMED 2019, 700550). When an NMED SSL was not available for a COPC, industrial and residential SSLs were obtained from EPA regional tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables) (adjusted to a risk level of 1 × 10–5 for carcinogens) and construction worker SSLs were calculated using the equations outlined in the NMED soil screening guidance (2019, 700550), incorporating toxicity and chemical-specific parameters from EPA regional tables. 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 and industrial scenarios (NMED 2019, 700550). Because the toxicity of chromium strongly depends on its oxidation state, NMED and EPA have SSLs for trivalent chromium and hexavalent chromium. For screening purposes, the NMED SSLs for total chromium are typically used for comparison with total chromium results unless there is a known or suspected source of hexavalent chromium at the SWMU or AOC or site conditions could alter the speciation of chromium in the environment. Total chromium screening levels are appropriate for low-level releases to soil from sources not associated with hexavalent chromium. However, NMED and EPA recommend collecting valence-specific data for chromium when chromium is likely to be an important contaminant at a site and when hexavalent chromium may exist.

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 with 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).

There are no known sources of hexavalent chromium use (e.g., cooling towers, electroplating) at SWMUs and AOCs in the Chaquehui Canyon Aggregate Area. Samples from all 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 are compared with the trivalent chromium SSLs for the purpose of evaluating extent of contamination. Total chromium results are screened using the NMED SSLs for total chromium for the purpose of evaluating potential human health risk because of exposure to chromium.

4.3 Ecological Screening Levels

The ecological risk-screening assessments (Appendix G) were conducted using ecological screening levels (ESLs) obtained from the ECORISK Database, Version 4.2 (N3B 2020, 701067) in accordance with N3B SOP-ER-2009, “Performing Human and Ecological Risk Screening Assessments.” 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 equations, bioconcentration factors, transfer factors, and toxicity reference values are presented in the ECORISK Database, Version 4.2 (N3B 2020, 701067).

4.4 Cleanup Standards

As specified in the Consent Order, SSLs for inorganic and organic chemicals (NMED 2019, 700550) are used as soil cleanup levels unless they are determined to be impracticable or values do not exist for the current and reasonably foreseeable future land uses. SALs are used as soil cleanup levels for radionuclides (LANL 2015, 600929). Screening assessments compare COPC concentrations for each site with industrial, construction worker, and residential SSLs and SALs.

The cleanup goals specified in Section IX of 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 for the risk-screening assessments in Appendix G are based on these cleanup goals.

For ecological risk, remediation of contaminated sites or media requires information on concentrations of chemicals in the environment that are protective of ecological receptors. These concentrations can be considered ecological preliminary remediation goals (EcoPRGs) and differ from ESLs. The EcoPRGs have been developed for use as ecological cleanup levels in soil at the Los Alamos Legacy Cleanup program sites. The methodology for developing the EcoPRGs is documented in “Development of Ecological Preliminary Remediation Goals for Los Alamos National Laboratory” (LANL 2017, 602228). EcoPRGs for sediment are recommended to be calculated on a site-specific basis.

5.0 DATA REVIEW METHODOLOGY

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

5.1 Identification of COPCs

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

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

5.1.1 Inorganic Chemical and Radionuclide Background Comparisons

The COPCs are identified for inorganic chemicals and radionuclides in accordance with N3B-SOP-ER-2004, “Background Comparisons for Inorganic Chemicals,” and N3B-SOP-ER-2005, “Background Comparisons for Radionuclides.” Inorganic COPCs are identified by comparing site data with BVs, statistical comparisons, and other lines of evidence, as applicable (LANL 1998, 059730). The upper end of the background data set may be used for comparison if one or more of the following conditions exist:

- Statistically determined BV is significantly greater than the maximum background concentration.
- Statistical tests cannot be performed because of insufficient data (fewer than eight samples and/or five detections per medium) or a high percentage of nondetections.
- Sufficient numbers of samples have been collected to determine nature and extent, but results are predominately nondetections.

- Site history does not indicate the constituent is directly related to site activities or to a dominant waste stream.
- Spatial analyses do not show a pattern or trend indicating contamination.
- The maximum detected concentration is statistically determined to be an outlier. (Note: A sufficient number of samples must be collected to show a point is an outlier and is not indicative of a hot spot.)

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

Background data are generally available for inorganic chemicals in soil, sediment, and tuff (LANL 1998, 059730). However, some analytes (e.g., nitrate, perchlorate, and hexavalent chromium) have no BVs. A BV may be either a calculated value from the background data set (upper tolerance limit [UTL] or the 95% upper confidence bound on the 95th quantile) or a 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 results with BVs. If sampling results are above a BV and sufficient data are available (eight or more sampling results and five or more detections), statistical tests are used to compare the site sample data with the background data set for the appropriate media. If statistical tests cannot be performed because of insufficient data or a high percentage of nondetections, the sampling results are compared with the BV and the upper end of background concentration for the appropriate media. If concentrations are above the BV but no results are greater than the upper end of the background data set, lines of evidence are presented to determine whether the inorganic chemical is or is not a COPC. If at least one sampling result is above the BV and the upper end of the background data set, the inorganic chemical is identified as a COPC. The same evaluation is performed using DLs when an inorganic chemical is not detected but has a DL above the BV. If no BV is available, detected inorganic chemicals are identified as COPCs.

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

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

The FVs for the fallout radionuclides apply to the top 0.0 to 1.0 ft of soil and fill and to sediment regardless of depth. If a fallout radionuclide is detected in soil or fill samples collected below 1.0 ft or in tuff samples, the radionuclide is identified as a COPC. For soil and fill samples from 1.0 ft bgs or less, if the activity of a fallout radionuclide is greater than the FV, comparisons of the top 0.0-to-1.0-ft sample data are made with the fallout data set. The radionuclide is eliminated as a COPC if activities are similar to fallout activities or lines of evidence can be presented to establish the radionuclide is not a COPC. Sediment results are evaluated in the same manner, although all data are included, not just the data from 0.0 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 at Chaquehui Canyon Aggregate Area include soil (all soil horizons, designated by the media code ALLH or SOIL), fill material (media code FILL), alluvial sediment (media code SED), and Bandelier Tuff (media codes Qbt 1v, Qbt 1g, Qbt 2, Qbt 3, and Qbt 4). Because no separate BVs are available for fill material, fill samples are evaluated by comparison with soil BVs (LANL 1998, 059730). In this report, the discussions of site contamination in soil include fill samples along with soil samples in sample counts and comparisons with background. Fill samples are not discussed separately from soil. The units of the Upper Bandelier Tuff (Qbt 2, Qbt 3, and Qbt 4) are likewise evaluated together with respect to background, as are the units of the Lower Bandelier Tuff (Qbo, Qct, and Qbt 1g) (LANL 1998, 059730).

5.1.2 Statistical Methods Overview

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

5.1.2.1 Distributional Comparisons

Comparisons between site-specific data and Laboratory background data are performed using a variety of statistical methods. These methods begin with a simple comparison of site data with a UTL estimated from the background data (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 most environmental data sets and its recognition and recommendation in EPA-sponsored workshops and publications.

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

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

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

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

5.1.2.2 Graphical Presentation

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

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

5.2 Extent of Contamination

Spatial concentration trends are initially used to determine whether the extent of contamination is defined. Evaluation of spatial concentration data considers the conceptual site model (CSM) of the release and subsequent migration. Specifically, the CSM 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 CSM, it could indicate that no release has occurred or there are other sources of contamination.

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

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

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

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

Calcium, magnesium, potassium, and sodium may be COPCs for some sites. These constituents are essential nutrients, and their maximum concentrations are compared with NMED's essential nutrient screening levels (NMED 2019, 700550). 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-33 GENERAL SITE INFORMATION AND OPERATIONAL HISTORY

6.1 Background of TA-33

6.1.1 Operational History

TA-33, also known as Hot Point (HP) Site, is located on the Lower Pajarito Plateau in the southeastern corner of the Laboratory (Plate 1). TA-33 was initially developed in 1947 as a test site for implosion-type initiator experiments using conventional HE, depleted uranium, and beryllium. Polonium-210 was prepared off-site and used as the radiation source for the experiments. The experiments were performed in underground chambers, on surface firing pads, and at firing sites equipped with large guns that fired projectiles into earthen berms. Initiator testing at TA-33 ceased in 1972. After 1972, TA-33 has been used for offices, laboratories, and storage in support of electronics design and fabrication and experiments formerly conducted at the Hot Dry Rock Program. An antenna for the National Radio Astronomy Observatory (NRAO) Very Long Baseline Array radio telescope was sited at TA-33 in 1985 and is operational. The high-pressure tritium facility (former building 33-86) was constructed in 1955 and operated until 1990. The tritium facility was decommissioned and demolished in the mid-1990s. The sites in the Chaquehui Canyon Aggregate Area are located in four geographical areas (Main Site, South Site, Area 6, and NRAO) on the mesa top at TA-33.

Fifteen SWMUs and one AOC within the Chaquehui Canyon Aggregate Area are located at TA-33 (Plate 2) and are addressed in this Phase II investigation report.

- SWMU 33-001(a) is disposal pit 1 located inside the west fenced area around MDA E.
- SWMU 33-001(b) is disposal pit 2 located inside the south fenced area around MDA E.
- SWMU 33-001(c) is disposal pit 3 located inside the southeast corner of the fenced area around MDA E.
- SWMU 33-001(d) is disposal pit 4 located inside the east fenced area around MDA E.
- SWMU 33-001(e) is former underground chamber 3 (former structure 33-29) and a former associated underground elevator shaft (former structure 33-03) located inside the northern fenced area around MDA E.
- SWMU 33-004(a) is an active septic system that consists of a septic tank (structure 33-31), associated inlet and outlet drainlines, three manholes, two seepage pits, and a drain field in the northwest portion of Main Site at TA-33.
- SWMU 33-004(i) reportedly consists of two inactive outfalls located approximately 30 ft east (northernmost outfall) and 40 ft east (southernmost outfall) of building 33-39 at the end of the associated vitrified-clay pipe (VCP) outlet drainlines.

- SWMU 33-006(a) is an inactive shot pad at South Site where implosion tests were conducted at the southern end of TA-33.
- SWMU 33-007(c) consists of an abandoned firing area (including building 33-16), three former shot pads, and two former catcher boxes associated with the initiator tests conducted at Area 6 in the west-central portion of TA-33.
- SWMU 33-008(c) is a former landfill located east of Main Site buildings 33-39 and 33-113 outside of the Main Site security fence at TA-33.
- SWMU 33-010(c) is a former surface disposal area located at South Site on the northern rim of Chaquehui Canyon at the southern end of TA-33.
- SWMU 33-011(a) is a former 0.25-acre drum storage area directly within the footprint and south of former building 33-21 in the central portion of TA-33.
- SWMU 33-011(d) consists of a former storage area that was located on an asphalt pad around a warehouse (building 33-20) in the southwest corner of Main Site at TA-33.
- SWMU 33-012(a) is a former storage area for drums from a former machine shop in building 33-39 at Main Site at TA-33.
- SWMU 33-017 consists of areas potentially impacted by operational releases from former operations within Main Site at TA-33.
- AOC C-33-001 consists of a former PCB transformer (former structure 33-124) in the northern portion of Main Site at TA-33.

6.1.2 Summary of Releases

Potential contaminants at TA-33 may have been released into the environment through operational releases at and downgradient of former firing sites and associated facilities, subsurface disposal pits, septic systems, surface disposal areas, former storage areas, a former transformer, and drainlines and outfalls.

6.1.3 Current Site Usage and Status

TA-33 is currently used for experimental research activities that support the creation, delivery, and maintenance of innovative detection and energy-projection systems for remote applications in space and around the world and is expected to remain active for the foreseeable future. TA-33 is not accessible to the public.

6.2 SWMU 33-001(a), Disposal Pit (MDA E)

6.2.1 Site Description and Operational History

SWMU 33-001(a), disposal pit 1, is located inside the western edge of the fenced area of MDA E at South Site (Figure 6.2-1). The pit dimensions are approximately 15 ft wide × 75 ft long × 7 ft deep. Documentation indicates that pit 1 contains polonium- and beryllium-contaminated targets. The pit may also contain spent projectiles, uranium components, beryllium, and explosive test shot debris. The pit was backfilled and compacted in 1963 (Rogers 1977, 005708, p. E-1). MDA E consists of waste disposal pits and an underground test chamber and shaft and is located at the south end of TA-33 near the edge of Chaquehui Canyon. MDA E occupies an area approximately 140 ft long × 220 ft wide and is enclosed by an 8-ft-high fence. Based upon 1962 recommendations, radiation control area signs were posted on the fence around MDA E, and all excess equipment and debris were removed from the site. Currently, the fence remains around MDA E and the area is vegetated with trees, shrubs, and grasses.

MDA E consists of waste disposal pits and an underground test chamber and shaft and is located at the south end of TA-33 near the edge of Chaquehui Canyon. MDA E occupies an area approximately 140 ft × 220 ft and is enclosed by an 8-ft fence. Based upon 1962 recommendations, radiation control area signs were posted on the fence around MDA E, and all excess equipment and debris were removed from the site. Currently, the fence remains around MDA E and the area is vegetated with trees, shrubs, and grasses.

6.2.2 Relationship to Other SWMUs and AOCs

SWMU 33-001(a) is one of four inactive disposal pits (pits 1–4) located within MDA E. SWMU 33-001(a) is located approximately 65 ft northwest of SWMU 33-001(b), approximately 75 ft southwest of SWMU 33-001(e), approximately 165 ft west of SWMU 33-001(d), and approximately 160 ft northwest of SWMU 33-001(c) (Plate 2).

6.2.3 Summary of Previous Investigations

In 1982 and 1983, the Laboratory Environmental Surveillance Program conducted surface and subsurface sampling at MDA E; additional subsurface sampling was conducted in 1989 (LANL 1992, 007671, pp. 3-55–3-60). These sampling efforts were undertaken to determine whether releases from MDA E had occurred. Data from samples collected at MDA E in 1982, 1983, and 1989 are screening-level data and summarized below.

In 1982, samples were collected from two 50-ft boreholes, located outside the MDA E fence, at multiple depth intervals and submitted for analysis of tritium, total uranium, and cesium-137. Tritium was detected, but these results were suspect because of the low moisture content of the samples. Uranium was detected above the BV and cesium-137 was detected slightly above the FV. In 1983, 90 samples were collected within the MDA E fence from 45 random locations on a 30-ft × 30-ft sampling grid. Samples were submitted for analysis of tritium, total uranium, and cesium-137. Uranium was detected above the BV, cesium-137 was detected above the FV, and tritium was detected but has no BV or FV. In 1989, 19 samples were collected from 6 boreholes advanced within the MDA E fence to depths ranging from 9 ft to 59 ft bgs. Samples were submitted for analysis of tritium, total uranium, and lead. Tritium was detected, and lead and uranium were detected above BVs. These data were not used to evaluate the nature and extent of contamination and are not discussed further in this report.

During the 1996 Phase I Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) conducted at SWMU 33-001(a), four samples were collected from one borehole drilled approximately 15 ft south of the south end of disposal pit 1 within the fenced area around MDA E. Samples were submitted for analysis of HE, TAL metals, VOCs, SVOCs, gamma-emitting radionuclides, isotopic plutonium, and tritium. Data from the 1996 Phase I RFI meet the current data-validation standards and are decision-level data included in this report.

During the 2019–2020 investigation seven samples were collected from one borehole located directly adjacent to the outside edge of SWMU 33-001(a) and the MDA E fence. At this location, seven samples were collected from the depth interval 9.0 ft bgs to 70.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, nitrate, perchlorate, VOCs, SVOCs, explosive compounds, isotopic uranium, isotopic plutonium, tritium, and gamma-emitting radionuclides. In addition, one sample was analyzed for PCBs.

6.2.4 Site Contamination

6.2.4.1 Soil, Rock, and Sediment Sampling

The sampling was performed outside the fenced area of MDA E to determine whether releases from the disposal pit had occurred outside the fenced area. The radiological walkover and geophysical surveys proposed in the approved Phase II investigation work plan (N3B 2021, 701355; NMED 2021, 701546) were not completed because access inside the MDA E fenced area was not authorized by Triad National Security, LLC., (Triad) until July 8, 2021 (see Attachment B-1 [on CD included with this document]). The proposed surface and subsurface sampling at nine locations inside the MDA E fenced area were also not completed because of access restrictions.

Based on previous investigation results, further characterization was required to assess potential contamination at SWMUs 33-001(a–e). As a result, the following activities were completed as part of the 2021 investigation.

- Ninety samples were collected from 45 locations outside the MDA E fence. Surface samples (0.0–0.5 ft bgs) and shallow subsurface samples (typically 1.0–1.5 ft bgs) were collected. All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, nitrate, perchlorate, pH, explosive compounds, isotopic uranium, isotopic plutonium, tritium, and gamma-emitting radionuclides.

The sampling locations at SWMUs 33-001(a–e) are shown in Figure 6.2-1. Table 6.2-1 presents the samples collected and analyses requested for SWMUs 33-001(a–e). The geodetic coordinates of sample locations are presented in Table 3.2-1.

6.2.4.2 Soil, Rock, and Sediment Field-Screening Results

No radiological screening results exceeded twice the maximum site background levels. No changes were made to sampling or other activities based on field-screening results. Field-screening results are presented in Appendix E (on DVD included with this document).

6.2.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data at MDA E consist of results from 125 samples (72 tuff and 53 soil) collected from 50 locations outside the fence at MDA E.

Inorganic Chemicals

A total of 125 samples (72 tuff and 53 soil) were collected and analyzed for TAL metals. A total of 125 soil and tuff samples were analyzed for cyanide, nitrate, and perchlorate. Table 6.2-2 presents the inorganic chemicals detected above BVs and detected inorganic chemicals with no BVs. Plate 3 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Aluminum was detected above the Qbt 2,3,4 BV (7340 mg/kg) in five tuff samples with a maximum concentration of 14,300 mg/kg. The Gehan and quantile tests indicated site concentrations of aluminum in tuff are not statistically different from background (Figure F-1 and Table F-1). 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, respectively) in 2 soil and 2 tuff samples with a maximum concentration of 1.77 mg/kg and was not detected above the soil and Qbt 2,3,4 BVs but had DLs (maximum 5.69 mg/kg) above BVs in 6 soil samples and 15 Qbt 3 samples. The quantile and slippage tests indicated site concentrations of antimony in soil are not statistically different from background (Figure F-2 and Table F-2); however, the quantile and slippage tests indicated site concentrations of antimony in tuff are statistically different from background (Figure F-3 and Table F-1). Antimony is retained as a COPC.

Arsenic was detected above the Qbt 1v and Qbt 2,3,4 BVs (1.81 mg/kg and 2.79 mg/kg, respectively) in 1 Qbt 1v sample and 10 Qbt 2,3,4 samples with a maximum concentration of 5.23 mg/kg. The Gehan and quantile tests indicated site concentrations of arsenic in Qbt 2,3,4 are statistically different from background (Figure F-4 and Table F-1); and the Gehan and quantile tests indicated site concentrations of arsenic in Qbt 1v are statistically different from background (Figure F-5 and Table F-3). Arsenic is retained as a COPC.

Barium was detected above the Qbt 2,3,4 BV (46 mg/kg) in 27 tuff samples with a maximum concentration of 282 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in tuff are statistically different from background (Figure F-6 and Table F-1). Barium is retained as a COPC.

Beryllium was detected above the soil and Qbt 2,3,4 BVs (1.83 mg/kg and 1.21 mg/kg, respectively) in two soil samples and six Qbt 2,3,4 samples with a maximum concentration of 4.99 mg/kg. The Gehan and quantile tests indicated site concentrations of beryllium in soil and Qbt 3 are not statistically different from background (Figure F-7 and Table F-2, and Figure F-8 and Table F-1, respectively). Beryllium is not a COPC.

Cadmium was not detected above the soil BV (0.4 mg/kg) but had a DL (0.506 mg/kg) above BV in 1 soil sample. The maximum DL was only 0.106 mg/kg above the BV and was less than the 3 highest concentrations (2.6 mg/kg, 1.4 mg/kg, and 0.6 mg/kg) and 3 highest DLs (all 2 mg/kg) in the background data set. Cadmium had DLs below BV in 124 other 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, respectively) in 10 soil samples and 23 tuff samples with a maximum concentration of 82,600 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in soil are not statistically different from background (Figure F-9 and Table F-2); however, the Gehan and quantile tests indicated site concentrations of calcium in tuff are statistically different from background (Figure F-10 and Table F-1). Calcium is retained as a COPC.

Chromium was detected above the Qbt 1v and Qbt 2,3,4 BVs (2.24 mg/kg and 7.14, respectively) in three Qbt 1v samples and three Qbt 3 samples at a maximum concentration of 11.6 mg/kg. The quantile and slippage tests indicated site concentrations of chromium in Qbt 3 are not statistically different from background (Figure F-11 and Table F-1), and the Gehan and quantile tests indicated site concentrations of chromium in Qbt 1v are not statistically different from background (Figure F-12 and Table F-3). Chromium is not a COPC.

Cobalt was detected above the Qbt 2,3,4 BV (3.14 mg/kg) in six tuff samples with a maximum concentration of 4.6 mg/kg. The Gehan and quantile tests indicated site concentrations of cobalt in tuff are not statistically different from background (Figure F-13 and Table F-1). Cobalt is not a COPC.

Copper was detected above the soil and Qbt 2,3,4 BVs (14.7 mg/kg and 4.66, respectively) in 22 soil samples and 24 tuff samples at a maximum concentration of 421 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in soil and Qbt 3 are statistically different from background (Figure F-14 and Table F-2, and Figure F-15 and Table F-1, respectively).Copper is retained as a COPC.

Iron was detected above the Qbt 2,3,4 BV (14,500 mg/kg) in one tuff sample with a concentration of 16,100 mg/kg. The quantile and slippage tests indicated site concentrations of iron in Qbt 3 are not statistically different from background (Figure F-16 and Table F-1). Iron is not a COPC.

Lead was detected above the Qbt 1v and Qbt 2,3,4 BVs (18.4 mg/kg and 11.2 mg/kg, respectively) in four Qbt 1v samples and two Qbt 3 samples with a maximum concentration of 27.5 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in Qbt 3 and Qbt 1v are not statistically different from background (Figure F-17 and Table F-1, and Figure F-18 and Table F-3, respectively). Lead is not a COPC.

Magnesium was detected above the soil; Qbt 1v; and Qbt 2,3,4 BVs (4610 mg/kg, 780 mg/kg, and 1690 mg/kg, respectively) in 1 soil sample, 1 Qbt 1v sample, and 13 Qbt 3 samples with a maximum concentration of 5800 mg/kg. The Gehan and quantile tests indicated site concentrations of magnesium in soil and Qbt 1v are not statistically different from background (Figure F-19 and Table F-2, and Figure F-20 and Table F-3, respectively); however, the Gehan and quantile tests indicated site concentrations of magnesium in Qbt 3 are statistically different from background (Figure F-21 and Table F-1). Magnesium is retained as a COPC.

Manganese was detected above the Qbt 1v BV (408 mg/kg) in one tuff sample with a maximum concentration of 599 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in Qbt 1v are statistically different from background (Figure F-22 and Table F-3). Manganese is retained as a COPC.

Mercury was detected above the Qbt 2,3,4 BV (0.1 mg/kg) in one tuff sample with a maximum concentration of 0.926 mg/kg. Mercury is retained as a COPC.

Nickel was detected above the Qbt 2,3,4 BV (6.58 mg/kg) in 12 tuff samples with a maximum concentration of 16.6 mg/kg. The quantile and slippage tests indicated site concentrations of nickel in Qbt 3 are statistically different from background (Figure F-23 and Table F-1). Nickel is retained as a COPC.

Nitrate was detected in 66 samples with a maximum concentration of 9.11 mg/kg. Nitrate is retained as a COPC.

Perchlorate was detected in 22 samples with a maximum concentration of 0.00237 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the soil; Qbt 1v; and Qbt 2,3,4 BVs (1.52 mg/kg, 0.3 mg/kg, and 0.3 mg/kg, respectively) in 21 soil samples, 20 Qbt 1v samples, 12 Qbt 2 samples, and 40 Qbt 3 samples with a maximum concentration of 3.35 mg/kg. The Gehan and quantile tests indicated site concentrations of selenium in soil are statistically different from background (Figure F-24 and Table F-2). Selenium is retained as a COPC.

Silver was not detected above the soil; Qbt 1v; and Qbt 2,3,4 BVs (1.0 mg/kg for each) but had DLs (1.01 mg/kg to 1.67 mg/kg) above BVs in six soil samples, five Qbt 1v samples, eight Qbt 2 samples, and two Qbt 3 samples. The quantile test indicated site concentrations of silver in Qbt 2,3,4 are statistically different from background (Figure F-25 and Table F-1). Silver is retained as a COPC.

Sodium was detected above the soil BV (915 mg/kg) in one soil sample at a concentration of 957 mg/kg. The Gehan and quantile tests indicated site concentrations of sodium in soil are not statistically different from background (Figure F-26 and Table F-2). Sodium is not a COPC.

Vanadium was detected above the Qbt 1v and Qbt 2,3,4 BVs (4.48 mg/kg and 17 mg/kg, respectively) in one Qbt 1v sample and three Qbt 3 samples at a maximum concentration of 31.3 mg/kg. The Gehan and quantile tests indicated site concentrations of vanadium in Qbt 1v are not statistically different from background (Figure F-27 and Table F-3); however, the Gehan and quantile tests indicated site concentrations of vanadium in Qbt 3 are statistically different from background (Figure F-28 and Table F-1). Vanadium is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in five soil samples at a maximum concentration of 81 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are statistically different from background (Figure F-29 and Table F-2). Zinc is retained as a COPC.

Organic Chemicals

A total of 35 tuff samples were collected and analyzed for VOCs and 34 tuff samples were collected and analyzed for SVOCs. A total of 125 samples (72 tuff and 53 soil) were analyzed for explosive compounds. In addition, 8 tuff samples were analyzed for PCBs. Table 6.2-3 presents the detected organic chemicals. Plate 4 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMUs 33-001(a–e) include acetone, bis(2-ethylhexyl)phthalate, di-n-butylphthalate, diethylphthalate, and 4-isopropyltoluene. The detected organic chemicals are retained as COPCs.

Radionuclides

A total of 125 samples (72 tuff and 53 soil) were collected and analyzed for isotopic plutonium, isotopic uranium, tritium, and gamma-emitting radionuclides. Table 6.2-4 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 in 1 soil sample and 13 Qbt 3 samples with a maximum activity of 0.354 pCi/g. Cesium-137 is retained as a COPC.

Plutonium-239/240 was detected in one Qbt 1v sample with a maximum activity of 0.0606 pCi/g. Plutonium-239/240 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, respectively) in eight soil samples and two Qbt 3 samples with a maximum activity of 13.4 pCi/g. Uranium-234 is retained as a COPC.

Uranium-235/236 was detected above the soil; Qbt 1v; and Qbt 2,3,4 BVs (0.20 pCi/g, 0.14 pCi/g, and 0.09 pCi/g, respectively) in six soil samples, two Qbt 1v samples, seven Qbt 3 samples, and two Qbt 2 samples with a maximum activity of 0.849 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, respectively) in nine soil samples and two Qbt 3 samples with a maximum activity of 14.1 pCi/g. Uranium-238 is retained as a COPC.

6.2.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at MDA E are discussed below. The spatial distribution of COPCs was evaluated using the data presented in Tables 6.2-2, 6.2-3, and 6.2-4 and Plates 3, 4, and 5.

The approved investigation work plan for Chaquehui Canyon Aggregate Area (LANL 2010, 111298.9; NMED 2011, 201242) stated the objective of investigation activities at the five SWMUs associated with MDA E [SWMUs 33-001(a–e)] was to determine if there were releases from these sites. Samples were collected outside the fence but were not collected inside the fence. Based on the current data, sampling results do not indicate a release from the site.

Inorganic Chemicals

Inorganic COPCs at SWMUs 33-001(a–e) include antimony, arsenic, barium, calcium, copper, magnesium, manganese, mercury, nickel, nitrate, perchlorate, selenium, silver, vanadium, and zinc.

Antimony was detected above the soil and Qbt 2,3,4 BVs in 2 soil and 2 tuff samples with a maximum concentration of 1.77 mg/kg and was not detected but had DLs (0.535 to 5.69 mg/kg) above BV in 6 soil samples and 15 Qbt 3 samples. Concentrations increased with depth at locations 33-61898 and 33-61900, decreased with depth at location 33-61894, and decreased laterally. The residential SSL was approximately 17 times the maximum concentration. The residential SSL was approximately 5.5 times and the industrial SSL was approximately 91 times the maximum DL. Further sampling for extent of antimony is not warranted.

Arsenic was detected above the Qbt 1v and Qbt 2,3,4 BVs in 1 Qbt 1v sample and 10 Qbt 2,3,4 samples with a maximum concentration of 5.23 mg/kg. Arsenic concentrations increased with depth at locations 33-60397, 33-61883, 33-61886, 33-61900, 33-61901, 33-61902, 33-61905, 33-61907, and 33-61909; did not change substantially with depth (0.05 mg/kg) at location 33-61903; decreased with depth at location 33-61898; and increased laterally to the west. Arsenic detections in shallow subsurface tuff samples were well below the soil BV (8.17 mg/kg). The maximum concentration was 1.84 mg/kg below the NMED residential SSL. The NMED industrial SSL was approximately 6.9 times the maximum concentration. Further sampling for extent of arsenic is not warranted.

Barium was detected above the Qbt 2,3,4 BV in 27 tuff samples with a maximum concentration of 282 mg/kg. Barium concentrations increased with depth at locations 33-61883, 33-61886, 33-61890, 33-61896, 33-61899, 33-61900, 33-61901, 33-61902, 33-61903, 33-61905, 33-61908, 33-61909, and 33-61910 and decreased laterally. Concentrations decreased with depth at all other locations (the concentrations in the shallow samples at locations 33-61877, 33-61879, 33-61882, 33-61887, 33-61889, 33-61891, 33-61913, 33-61914, 33-61915, and 33-61920 were below the soil BV [Appendix E, Pivot Tables]). The residential SSL was approximately 55 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 10 soil samples and 23 tuff samples with a maximum concentration of 82,600 mg/kg. Concentrations increased with depth at locations 33-61877, 33-61881, 33-61883, 33-61886, 33-61889, 33-61890, 33-61891, 33-61896, 33-61898, 33-61900, 33-61901, 33-61902, 33-61903, 33-61905, 33-61907, 33-61909, and 33-61913; decreased at the other locations; and increased laterally to the west. The residential essential nutrient SSL was approximately 157 times the maximum concentration. Further sampling for extent of calcium is not warranted.

Copper was detected above the soil and Qbt 2,3,4 BVs in 22 soil samples and 24 tuff samples at a maximum concentration of 421 mg/kg. Concentrations did not change substantially with depth (9 mg/kg) at location 33-61915. At all other locations, concentrations decreased with depth; the concentrations in some of the shallow samples were below the soil BV (Appendix E, Pivot Tables). Concentrations increased laterally to the north. The residential SSL was approximately 7.4 times and the industrial SSL was approximately 123 times the maximum concentration. Further sampling for extent of copper is not warranted.

Magnesium was detected above the soil; Qbt 1v; and Qbt 2,3,4 BVs in 1 soil sample, 1 Qbt 1v sample, and 13 Qbt 3 samples with a maximum concentration of 5800 mg/kg. Concentrations decreased with depth at locations 33-60396 and 33-61898; did not change substantially (40 mg/kg) with depth at locations 33-61902 and 33-61907; increased with depth at locations 33-61879, 33-61882, 33-61883, 33-61886, 33-61900, 33-61901, 33-61903, 33-61905, and 33-61909; and decreased laterally. The residential essential nutrient SSL was approximately 2690 times the maximum concentration. Further sampling for extent of magnesium is not warranted.

Manganese was detected above the Qbt 1v BV in one tuff sample with a maximum concentration of 599 mg/kg. Concentrations increased with depth at location 33-60396 and decreased laterally. The residential SSL was approximately 17 times the maximum concentration. Further sampling for vertical extent of manganese is not warranted.

Mercury was detected above the Qbt 2,3,4 BV in one tuff sample with a maximum concentration of 0.926 mg/kg. The concentration increased with depth at location 33-61886 and increased laterally to the east. The residential SSL was approximately 25 times the maximum concentration. Further sampling for extent of mercury is not warranted.

Nickel was detected above the Qbt 2,3,4 BV in 12 tuff samples with a maximum concentration of 16.6 mg/kg. Concentrations increased with depth at locations 33-61882, 33-61883, 33-61886, 33-61900, 33-61901, 33-61902, 33-61905, 33-61909, and 33-61910.Concentrations decreased with depth at locations 33-61898, 33-61903, and 33-61907 (the concentrations in the shallow samples at locations 33-61903 and 33-61907 were below the soil BV [Appendix E, Pivot Tables]). Concentrations increased laterally to the west. The residential SSL was approximately 94 times the maximum concentration. Further sampling for extent of nickel is not warranted.

Nitrate was detected in 66 samples with a maximum concentration of 9.11 mg/kg. Concentrations did not change substantially with depth (0.00 mg/kg to 0.42 mg/kg) at locations 33-61886, 33-61905, 33-61909, 33-61912, and 33-61915; increased with depth at locations 33-61884, 33-61885, 33-61889, 33-61892, 33-61893, 33-61907, 33-61908, and 33-61917; decreased with depth at all other locations; and increased laterally to the east and south. The residential SSL was approximately 1370 times the maximum concentration. Further sampling for extent of nitrate is not warranted.

Perchlorate was detected in 22 samples with a maximum concentration of 0.00237 mg/kg. Concentrations decreased with depth at locations 33-60393, 33-60394, 33-60395, 33-60397, 33-61879, 33-61906, and 33-61916; increased with depth at locations 33-61878, 33-61882, 33-61892, 33-61900, 33-61901, 33-61905, and 33-61920; and decreased laterally. The residential SSL was approximately 23,100 times the maximum concentration. Further sampling for extent of perchlorate is not warranted.

Selenium was detected above the soil; Qbt 1v; and Qbt 2,3,4 BVs in 21 soil samples, 20 Qbt 1v samples, 12 Qbt 2 samples, and 40 Qbt 3 samples with a maximum concentration of 3.35 mg/kg. Concentrations decreased with depth at locations 33-60393, 33-60395, 33-060396, 33-60397, 33-61891, 33-61898, and 33-61900; increased with depth at locations 33-60394, 33-61877, 33-61879, 33-61882, 33-61884, 33-61886, 33-61892, 33-61902, 33-61903, 33-61904, 33-61905, 33-61907, 33-61909, 33-61910, and 33-61920; and increased laterally to the west. Concentrations did not change substantially with depth (0.00 mg/kg to 0.30 mg/kg) at the other locations. The concentration in the shallow samples at locations 33-61876, 33-61879, 33-61880, 33-61881, 33-61882, 33-61883, 33-61884, 33-61888, 33-61890, 33-61892, 33-61895, 33-61896, 33-61899, 33-618901, 33-61904, 33-61905, 33-61906, 33-61908, 33-61912, 33-61913, 33-61914, 33-61915, 33-61916, and 33-61919 was below the soil BV (Appendix E, Pivot Tables). The residential SSL was approximately 117 times the maximum concentration. Further sampling for extent of selenium is not warranted.

Silver was not detected above the soil; Qbt 1v; and Qbt 2,3,4 BVs but had DLs (1.01 mg/kg to 1.67 mg/kg) above BVs in six soil samples, five Qbt 1v samples, eight Qbt 2 samples, and two Qbt 3 samples. The residential SSL was approximately 362 times the maximum DL. Further sampling for extent of silver is not warranted.

Vanadium was detected above the Qbt 1v and Qbt 2,3,4 BVs in one Qbt 1v sample and three Qbt 3 samples at a maximum concentration of 31.3 mg/kg. Concentrations increased with depth at locations 33-61901, 33-61905, and 33-61909; decreased with depth at location 33-60396 (the concentration in the shallow sample at location 33-61909 was 22.6 mg/kg and below the soil BV [Appendix E, Pivot Tables]); and increased laterally to the west. The residential SSL was approximately 12.6 times the maximum concentration. Further sampling for extent of vanadium is not warranted.

Zinc was detected above the soil BV in five soil samples at a maximum concentration of 81 mg/kg. Concentrations decreased with depth at locations 33-61876, 33-61890, 33-61893, 33-61895, and 33-61900 and decreased laterally. The lateral and vertical extent of zinc are defined.

Organic Chemicals

Organic COPCs at SWMUs 33-001(a–e) include acetone, bis(2-ethylhexyl)phthalate, di-n-butylphthalate, diethylphthalate, and 4-isopropyltoluene.

Acetone was detected in one sample at a concentration of 0.00203 mg/kg. Concentrations decreased with depth at location 33-60393. The residential SSL was approximately 32,660,000 times the maximum concentration. The vertical extent of acetone is defined and further sampling for lateral extent is not warranted.

Bis(2-ethylhexyl)phthalate was detected in 13 samples with a maximum concentration of 0.0537 mg/kg. Concentrations decreased with depth at locations 33-60393 and 33-60395 and increased with depth at location 33-60394. The residential SSL was approximately 7076 times the maximum concentration. Further sampling for extent of bis(2-ethylhexyl)phthalate is not warranted.

Di-n-butylphthalate was detected in one sample at a concentration of 0.0177 mg/kg. Concentrations decreased with depth at location 33-60393. The residential SSL was approximately 348,000 times the maximum concentration. The vertical extent of di-n-butylphthalate is defined and further sampling for lateral extent is not warranted.

Diethylphthalate was detected in one sample at a concentration of 0.0147 mg/kg. Concentrations decreased with depth at location 33-60393. The residential SSL was approximately 3,353,000 times the maximum concentration. The vertical extent of diethylphthalate is defined and further sampling for lateral extent is not warranted.

Isopropyltoluene[4-] was detected in one sample at a concentration of 0.00514 mg/kg. Concentrations decreased with depth at location 33-60394. The residential SSL was approximately 459,000 times the maximum concentration. The vertical extent of 4-isopropyltolune is defined and further sampling for lateral extent is not warranted.

Radionuclides

Radionuclide COPCs at SWMUs 33-001(a–e) include cesium-137, plutonium-239/240, uranium-234, uranium-235/236, and uranium-238.

Cesium-137 was detected in 1 soil sample and 13 Qbt 3 samples with a maximum activity of 0.354 pCi/g. Activities decreased with depth at locations 33-61898, 33-61899, 33-61900, 33-61902, 33-61903, 33-61906, 33-61907, 33-61909, 33-61910, 33-61913, 33-61914, and 33-61915 (the concentration in the shallow samples were below the soil BV [Appendix E, Pivot Tables]); increased with depth at location 33-61892; and decreased downgradient. The residential SAL was approximately 34 times the maximum activity. The lateral extent of cesium-137 is defined and further sampling for vertical extent is not warranted.

Plutonium-239/240 was detected in one Qbt 1v sample with a maximum activity of 0.0606 pCi/g. Activities decreased with depth at location 33-60393 and decreased laterally. The vertical and lateral extent of plutonium-239/240 are defined, and further sampling is not warranted.

Uranium-234 was detected above the soil and Qbt 2,3,4 BVs in eight soil samples and two Qbt 3 samples with a maximum activity of 13.4 pCi/g. Activities decreased with depth at locations 33-61876, 33-61877, 33-61901, 33-61906, 33-61909, 33-61912, and 33-61915; increased with depth at location 33-61892; and increased laterally to the north and northwest. The residential SAL was approximately 21 times the maximum activity. Further sampling for extent of uranium-234 is not warranted.

Uranium-235/236 was detected above the soil; Qbt 1v; and Qbt 2,3,4 BVs in six soil samples, two Qbt 1v samples, seven Qbt 3 samples, and two Qbt 2 samples with a maximum activity of 0.849 pCi/g. Activities increased with depth at locations 33-60397, 33-61886, 33-61892, 33-61909, and 33-61910; decreased with depth at locations 33-60395, 33-60396, 33-61876, 33-61877, 33-61897, 33-61901, 33-61912, and 33-61915; and increased laterally to the north and northwest. The residential SAL was approximately 49 times the maximum activity. Further sampling for extent of uranium-235/236 is not warranted.

Uranium-238 was detected above the soil and Qbt 2,3,4 BVs in nine soil samples and two Qbt 3 samples with a maximum activity of 14.1 pCi/g. Activities increased with depth at location 33-61892; decreased with depth at locations 33-61876, 33-61877, 33-61881, 33-61901, 33-61906, 33-61909, 33-61912, and 33-61915; and increased laterally to the north and northwest. The residential SAL was approximately 10.6 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 are defined or no further sampling for extent is warranted at SWMUs 33-001(a–e) for the area that was characterized outside the fence at MDA E. Additional sampling is required to define the nature and extent of potential contamination inside the fence at MDA E associated with SWMUs 33-001(a–e).

6.2.5 Summary of Human Health Risk Screening

A human health risk-screening assessment was not performed for SWMU 33-001(a) because the nature and extent of contamination inside the MDA E fence have not been defined.

6.2.6 Summary of Ecological Risk Screening

An ecological risk-screening assessment was not performed for SWMU 33-001(a) because the nature and extent of contamination inside the MDA E fence have not been defined.

6.3 SWMU 33-001(b), Disposal Pit (MDA E)

6.3.1 Site Description and Operational History

SWMU 33-001(b), disposal pit 2, is located along the southern edge of the fenced area of MDA E at South Site (Figure 6.2-1). Pit dimensions are approximately 15 ft wide × 45 ft long × 7 ft deep. Explosive test shot debris and a spent explosives device were buried in pit 2. According to engineering drawing R-3644, pit 2 was open in November 1962 and was backfilled sometime during 1963 (Rogers 1977, 005708, p. E-1). MDA E consists of waste disposal pits and an underground test chamber and shaft and is located at the south end of TA-33 near the edge of Chaquehui Canyon. MDA E occupies an area approximately 140 ft long × 220 ft wide and is enclosed by an 8-ft-high fence. Based upon 1962 recommendations, radiation control area signs were posted on the fence around MDA E, and all excess equipment and debris were removed from the site. Currently, the fence remains around MDA E and the area is vegetated with trees, shrubs, and grasses.

6.3.2 Relationship to Other SWMUs and AOCs

SWMU 33-001(b) is one of four inactive disposal pits (pits 1–4) located within MDA E. SWMU 33-001(b) is located approximately 65 ft southeast of SWMU 33-001(a), approximately 85 ft south of SWMU 33-001(e), approximately 65 ft southwest of SWMU 33-001(d), and approximately 40 ft northwest of SWMU 33-001(c) (Plate 2).

6.3.3 Summary of Previous Investigations

In 1982 and 1983, the Laboratory Environmental Surveillance Program conducted surface and subsurface sampling at MDA E; additional subsurface sampling was conducted in 1989 (LANL 1992, 007671, pp. 3-55–3-60). These sampling efforts were undertaken to determine whether releases from MDA E had occurred. Data from samples collected at MDA E in 1982, 1983, and 1989 are screening-level data and summarized below.

In 1982, samples were collected from two 50-ft boreholes, located outside the MDA E fence, at multiple depth intervals and submitted for analysis of tritium, total uranium, and cesium-137. Tritium was detected, but these results were suspect because of the low moisture content of the samples. Uranium was detected above the BV and cesium-137 was detected slightly above the FV. In 1983, 90 samples were collected within the MDA E fence from 45 random locations on a 30-ft × 30-ft sampling grid. Samples were submitted for analysis of tritium, total uranium, and cesium-137. Uranium was detected above the BV, cesium-137 was detected above the FV, and tritium was detected but has no BV or FV. In 1989, 19 samples were collected from 6 boreholes advanced within the MDA E fence to depths ranging from 9 ft to 59 ft bgs. Samples were submitted for analysis of tritium, total uranium, and lead. Tritium was detected, and lead and uranium were detected above BVs. These data were not used to evaluate the nature and extent of contamination and are not discussed further in this report.

During the 2019–2020 investigation, sampling at SWMU 33-001(b) was performed outside the fenced area of MDA E to determine whether releases from the disposal pit had occurred and if the site posed unacceptable risks or doses under current conditions outside the fenced area. Seven samples were collected from one borehole located directly adjacent to the southern edge of SWMU 33-001(b) from depth interval 9.0 ft bgs to 70.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, nitrate, perchlorate, VOCs, SVOCs, explosive compounds, isotopic uranium, isotopic plutonium, tritium, and gamma-emitting radionuclides. In addition, two samples were analyzed for PCBs. No investigation to characterize the nature of the wastes in the disposal pit was performed.

6.3.4 Site Contamination

6.3.4.1 Soil, Rock, and Sediment Sampling

Sampling was conducted outside the MDA E fence to evaluate if a release had occurred from the disposal pits, underground chamber, and shaft [SWMUs 33-001(a–e)]. The radiological walkover and geophysical surveys proposed in the approved Phase II investigation work plan (N3B 2021, 701355; NMED 2021, 701546) were not completed because access inside the MDA E fenced area was not authorized by Triad until July 8, 2021 (see Attachment B-1 [on CD included with this document]). The proposed surface and subsurface sampling at nine locations inside the fence at MDA E was also not completed because of the access restrictions. Nature and extent of potential contamination located outside the MDA E fence is discussed in section 6.2. Additional sampling is required to define the nature and extent of potential contamination inside the fence at MDA E associated with SWMU 33-001(b).

6.3.5 Summary of Human Health Risk Screening

A human health risk-screening assessment was not performed for SWMU 33-001(b) because the nature and extent of contamination inside the MDA E fence have not been defined.

6.3.6 Summary of Ecological Risk Screening

An ecological risk-screening assessment was not performed for SWMU 33-001(b) because the nature and extent of contamination inside the MDA E fence have not been defined.

6.4 SWMU 33-001(c), Disposal Pit (MDA E)

6.4.1 Site Description and Operational History

SWMU 33-001(c), disposal pit 3, is located near the southeast corner of the fenced area of MDA E at South Site (Figure 6.2-1). Pit dimensions are approximately 5 ft in diameter and 7 ft deep. Pit 3 reportedly contains a can of beryllium dust immersed in kerosene and may have contained other explosive test shot debris (Rogers 1977, 005708, p. E-1). Pit 3 was closed in September 1951 and backfilled. MDA E consists of waste disposal pits and an underground test chamber and shaft and is located at the south end of TA-33 near the edge of Chaquehui Canyon. MDA E occupies an area approximately 140 ft long × 220 ft wide and is enclosed by an 8-ft-high fence. Based upon 1962 recommendations, radiation control area signs were posted on the fence around MDA E, and all excess equipment and debris were removed from the site. Currently, the fence remains around MDA E and the area is vegetated with trees, shrubs, and grasses.

6.4.2 Relationship to Other SWMUs and AOCs

SWMU 33-001(c) is one of four inactive disposal pits (pits 1–4) located within MDA E. SWMU 33-001(c) is located approximately 160 ft southeast of SWMU 33-001(a), approximately 125 ft southeast of SWMU 33-001(e), approximately 10 ft southwest of SWMU 33-001(d), and approximately 40 ft southeast of SWMU 33-001(b) (Plate 2).

6.4.3 Summary of Previous Investigations

In 1982 and 1983, the Laboratory Environmental Surveillance Program conducted surface and subsurface sampling at MDA E; additional subsurface sampling was conducted in 1989 (LANL 1992, 007671, pp. 3-55–3-60). These sampling efforts were undertaken to determine whether releases from

MDA E had occurred. Data from samples collected at MDA E in 1982, 1983, and 1989 are screening-level data and summarized below.

In 1982, samples were collected from two 50-ft boreholes, located outside the MDA E fence, at multiple depth intervals and submitted for analysis of tritium, total uranium, and cesium-137. Tritium was detected, but these results were suspect because of the low moisture content of the samples. Uranium was detected above the BV and cesium-137 was detected slightly above the FV. In 1983, 90 samples were collected within the MDA E fence from 45 random locations on a 30-ft × 30-ft sampling grid. Samples were submitted for analysis of tritium, total uranium, and cesium-137. Uranium was detected above the BV, cesium-137 was detected above the FV, and tritium was detected but has no BV or FV. In 1989, 19 samples were collected from 6 boreholes advanced within the MDA E fence to depths ranging from 9 ft to 59 ft bgs. Samples were submitted for analysis of tritium, total uranium, and lead. Tritium was detected, and lead and uranium were detected above BVs. These data were not used to evaluate the nature and extent of contamination and are not discussed further in this report.

During the 2019–2020 investigation, sampling at SWMU 33-001(c) was performed outside the fenced area of MDA E to determine whether releases from the disposal pit had occurred and if the site posed unacceptable risks or doses under current conditions outside the fenced area. Seven samples were collected from one borehole located directly adjacent to the southern edge of SWMU 33-001(c) from depth interval 9.0 ft bgs to 70.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, nitrate, perchlorate, VOCs, SVOCs, explosive compounds, isotopic uranium, isotopic plutonium, tritium, and gamma-emitting radionuclides. In addition, two samples were analyzed for PCBs. No investigation to characterize the nature of the wastes in the disposal pit was performed. Therefore, additional investigation at SWMU 33-001(c) is required.

6.4.4 Site Contamination

6.4.4.1 Soil, Rock, and Sediment Sampling

Sampling was conducted outside the MDA E fence to evaluate if a release had occurred from the disposal pits, underground chamber, and shaft [SWMUs 33-001(a-e)]. The radiological walkover and geophysical surveys proposed in the approved Phase II investigation work plan (N3B 2021, 701355; NMED 2021, 701546) were not completed because access inside the MDA E fenced area was not authorized by Triad until July 8, 2021 (see Attachment B-1 [on CD included with this document]). The proposed surface and subsurface sampling at nine locations inside the fence at MDA E was also not completed because of the access restrictions. Nature and extent of potential contamination located outside the MDA E fence is discussed in section 6.2. Additional sampling is required to define the nature and extent of potential contamination inside the fence at MDA E associated with SWMU 33-001(c).

6.4.5 Summary of Human Health Risk Screening

A human health risk-screening assessment was not performed for SWMU 33-001(c) because the nature and extent of contamination inside the MDA E fence have not been defined.

6.4.6 Summary of Ecological Risk Screening

An ecological risk-screening assessment was not performed for SWMU 33-001(c) because the nature and extent of contamination inside the MDA E fence have not been defined.

6.5 SWMU 33-001(d), Disposal Pit (MDA E)

6.5.1 Site Description and Operational History

SWMU 33-001(d), disposal pit 4, is located along the east fenceline of MDA E at South Site (Figure 6.2-1). The pit dimensions are approximately 15 ft wide × 100 ft long × 7 ft deep. Pit 4 contains explosive test shot debris, a spent explosives device, and miscellaneous radioactive material (Rogers 1977, 005708, p. E-1). Pit 4 was reportedly still used for disposal during the 1960s (Rogers 1977, 005708, p. E-1). It was backfilled sometime before 1977. MDA E consists of waste disposal pits and an underground test chamber and shaft and is located at the south end of TA-33 near the edge of Chaquehui Canyon. MDA E occupies an area approximately 140 ft wide × 220 ft long and is enclosed by an 8-ft-high fence. Based upon 1962 recommendations, radiation control area signs were posted on the fence around MDA E, and all excess equipment and debris were removed from the site. Currently, the fence remains around MDA E and the area is vegetated with trees, shrubs, and grasses.

6.5.2 Relationship to Other SWMUs and AOCs

SWMU 33-001(d) is one of four inactive disposal pits (pits 1–4) located within MDA E. SWMU 33-001(d) is located approximately 165 ft east of SWMU 33-001(a), approximately 75 ft southeast of SWMU 33-001(e), approximately 10 ft northeast of SWMU 33-001(c), and approximately 85 ft north of SWMU 33-001(b) (Plate 2).

6.5.3 Summary of Previous Investigations

In 1982 and 1983, the Laboratory Environmental Surveillance Program conducted surface and subsurface sampling at MDA E; additional subsurface sampling was conducted in 1989 (LANL 1992, 007671, pp. 3-55–3-60). These sampling efforts were undertaken to determine whether releases from MDA E had occurred. Data from samples collected at MDA E in 1982, 1983, and 1989 are screening-level data and summarized below.

In 1982, samples were collected from two 50-ft boreholes, located outside the MDA E fence, at multiple depth intervals and submitted for analysis of tritium, total uranium, and cesium-137. Tritium was detected, but these results were suspect because of the low moisture content of the samples. Uranium was detected above the BV and cesium-137 was detected slightly above the FV. In 1983, 90 samples were collected within the MDA E fence from 45 random locations on a 30-ft × 30-ft sampling grid. Samples were submitted for analysis of tritium, total uranium, and cesium-137. Uranium was detected above the BV, cesium-137 was detected above the FV, and tritium was detected but has no BV or FV. In 1989, 19 samples were collected from 6 boreholes advanced within the MDA E fence to depths ranging from 9 ft to 59 ft bgs. Samples were submitted for analysis of tritium, total uranium, and lead. Tritium was detected, and lead and uranium were detected above BVs. These data were not used to evaluate the nature and extent of contamination and are not discussed further in this report.

During the 1996 Phase I RFI conducted at SWMU 33-001(d), four samples were collected from one borehole drilled approximately 30 ft northeast of the northeast corner of disposal pit 4 within the fenced area around MDA E. Samples were submitted for analysis of HE, TAL metals, VOCs, SVOCs, gamma-emitting radionuclides, isotopic plutonium, and tritium. Data from the 1996 Phase I RFI meet the current data-validation standards and are decision-level data included in this report.

During the 2019–2020 investigation, sampling at SWMU 33-001(d) was performed outside the fenced area of MDA E to determine whether releases from the disposal pit had occurred and if the site posed unacceptable risks or doses under current conditions outside the fenced area. Seven samples were collected from one borehole located directly adjacent to the eastern edge of SWMU 33-001(d) from depth interval 9.0 ft bgs to 70.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, nitrate, perchlorate, VOCs, SVOCs, explosive compounds, isotopic uranium, isotopic plutonium, tritium, and gamma-emitting radionuclides. In addition, one sample was analyzed for PCBs. No investigation to characterize the nature of the wastes in the disposal pit was performed.

6.5.4 Site Contamination

6.5.4.1 Soil, Rock, and Sediment Sampling

Sampling was conducted outside the MDA E fence to evaluate if a release had occurred from the disposal pits, underground chamber, and shaft [SWMUs 33-001(a-e)]. The radiological walkover and geophysical surveys proposed in the approved Phase II investigation work plan (N3B 2021, 701355; NMED 2021, 701546) were not completed because access inside the MDA E fenced area was not authorized by Triad until July 8, 2021 (see Attachment B-1 [on CD included with this document]). The proposed surface and subsurface sampling at nine locations inside the fence at MDA E was also not completed because of the access restrictions. Nature and extent of potential contamination located outside the MDA E fence is discussed in section 6.2. Additional sampling is required to define the nature and extent of potential contamination inside the fence at MDA E associated with SWMU 33-001(d).

6.5.5 Summary of Human Health Risk Screening

A human health risk-screening assessment was not performed for SWMU 33-001(d) because the nature and extent of contamination inside the MDA E fence have not been defined.

6.5.6 Summary of Ecological Risk Screening

An ecological risk-screening assessment was not performed for SWMU 33-001(d) because the nature and extent of contamination inside the MDA E fence have not been defined.

6.6 SWMU 33-001(e), Soil Contamination from Underground Chamber and Shaft (MDA E)

6.6.1 Site Description and Operational History

SWMU 33-001(e) consists of an underground chamber, designated chamber 3 (former structure 33-29), and an associated underground elevator shaft (former structure 33-03) at MDA E at South Site (Figure 6.2-1). A portable cable building (former building 33-30) was attached to the elevator shaft and housed electrical and ventilation equipment for both the chamber and the shaft. The chamber and shaft were constructed between 1949 and 1950. The chamber was constructed of 2-ft-thick concrete walls with dimensions of 11 ft long × 14 ft wide. The chamber was situated 46 ft bgs. The elevator shaft was constructed of wood, iron, and concrete with dimensions of 6 ft wide × 8 ft long × 60 ft tall. The bottom of the shaft was 48 ft bgs. Chamber 33-29 collapsed during an experiment conducted in April 1950 and was left in place. According to engineering drawing R-152, the portable cable building (former building 33-30) and the aboveground portions of the elevator shaft were removed in 1954. The chamber was used to conduct tests involving explosives, beryllium, and tungsten (LANL 1992, 007671, p. 3-51). MDA E occupies an area approximately 140 ft wide × 220 ft long and is enclosed by an 8-ft-high fence. Based upon 1962 recommendations, radiation control area signs were posted on the fence around MDA E, and all excess equipment and debris were removed from the site. Currently, the fence remains around MDA E and the area is vegetated with trees, shrubs, and grasses.

6.6.2 Relationship to Other SWMUs and AOCs

SWMU 33-001(e) is one of four inactive disposal pits (pits 1–4) located within MDA E. SWMU 33-001(e) is located approximately 75 ft northeast of SWMU 33-001(a), approximately 75 ft northwest of SWMU 33-001(d), approximately 125 ft northwest of SWMU 33-001(c), and approximately 65 ft northeast of SWMU 33-001(b) (Plate 2).

6.6.3 Summary of Previous Investigations

In 1982 and 1983, the Laboratory Environmental Surveillance Program conducted surface and subsurface sampling at MDA E; additional subsurface sampling was conducted in 1989 (LANL 1992, 007671, pp. 3-55–3-60). These sampling efforts were undertaken to determine whether releases from MDA E had occurred. Data from samples collected at MDA E in 1982, 1983, and 1989 are screening-level data and summarized below.

In 1982, samples were collected from two 50-ft boreholes, located outside the MDA E fence, at multiple depth intervals and submitted for analysis of tritium, total uranium, and cesium-137. Tritium was detected, but these results were suspect because of the low moisture content of the samples. Uranium was detected above the BV and cesium-137 was detected slightly above the FV. In 1983, 90 samples were collected within the MDA E fence from 45 random locations on a 30-ft × 30-ft sampling grid. Samples were submitted for analysis of tritium, total uranium, and cesium-137. Uranium was detected above the BV, cesium-137 was detected above the FV, and tritium was detected but has no BV or FV. In 1989, 19 samples were collected from 6 boreholes advanced within the MDA E fence to depths ranging from 9 ft to 59 ft bgs. Samples were submitted for analysis of tritium, total uranium, and lead. Tritium was detected, and lead and uranium were detected above BVs. These data were not used to evaluate the nature and extent of contamination and are not discussed further in this report.

During the 2019–2020 investigation, sampling at SWMU 33-001(e) was performed outside the fenced area of MDA E to determine whether releases from the underground chamber and shaft had occurred and if the site posed unacceptable risks or doses under current conditions outside the fenced area. Seven samples were collected from one borehole located 45 ft north of the outside edge of SWMU 33-001(e) from depth interval 9.0 ft bgs to 70.0 ft bgs. All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, nitrate, perchlorate, VOCs, SVOCs, explosive compounds, isotopic uranium, isotopic plutonium, tritium, and gamma-emitting radionuclides. In addition, one sample was analyzed for PCBs. No investigation to characterize the nature of the materials in the chamber and shaft was performed.

6.6.4 Site Contamination

6.6.4.1 Soil, Rock, and Sediment Sampling

Sampling was conducted outside the MDA E fence to evaluate if a release had occurred from the disposal pits, underground chamber, and shaft [SWMUs 33-001(a-e)]. The radiological walkover and geophysical surveys proposed in the approved Phase II investigation work plan (N3B 2021, 701355; NMED 2021, 701546) were not completed because access inside the MDA E fenced area was not authorized by Triad until July 8, 2021 (see Attachment B-1 [on CD included with this document]). The proposed surface and subsurface sampling at nine locations inside the fence at MDA E was also not completed because of the access restrictions. Nature and extent of potential contamination located outside the MDA E fence is discussed in section 6.2. Additional sampling is required to define the nature and extent of potential contamination inside the fence at MDA E associated with SWMU 33-001(e).

6.6.5 Summary of Human Health Risk Screening

A human health risk-screening assessment was not performed for SWMU 33-001(e) because the nature and extent of contamination inside the MDA E fence have not been defined.

6.6.6 Summary of Ecological Risk Screening

An ecological risk-screening assessment was not performed for SWMU 33-001(e) because the nature and extent of contamination inside the MDA E fence have not been defined.

6.7 SWMU 33-004(a), Septic System

6.7.1 Site Description and Operational History

SWMU 33-004(a) is an active septic system consisting of a septic tank (structure 33-31), associated inlet and outlet drainlines, three manholes, two seepage pits, and a drain field in the northwest portion of Main Site (Figure 6.7-1). The septic tank has a capacity of 1360 gal. and is located 50 ft northeast of building 33-39. This septic tank is in use and serves all major buildings at the TA-33 Main Site at the north end of TA-33. Septic tank 33-31 received sanitary wastewater from a laboratory/office building (33-19) and a storage building (33-27). Industrial liquid wastes from building 33-19 were discharged to a separate outfall. Septic tank 33-31 discharged to a 90-ft-long × 80-ft-wide drain field located approximately 200 ft northeast of the septic tank. This drain field was constructed of rows of 4-in. vitrified-clay tiles spaced approximately 10 ft apart. In 1951, the septic system was redesigned to accept industrial wastes from laboratories in buildings 33-19, 33-113, and 33-114 and from the machine shop in building 33-39. Also, two 4-ft-diameter × 50-ft-deep gravel-filled seepage pits were constructed to receive the discharge from septic tank 33-31, and the drain field was disconnected and removed from service. The seepage pits continue to receive the effluent from the septic tank. Components of the SWMU 33-004(a) septic system are shown in engineering drawings AB1114 (2 of 7) (LANL 2006, 110681) and ENG C-25512 (LASL 1958, 107488).

A 1992 study of drains and discharges at TA-33 identified the following sources of discharges to this septic system: restrooms, water fountains, showers, laboratory floor drains and sink drains in building 33-19; janitor’s closet sink drains in buildings 33-19 and 33-113; a floor drain in a shop in building 33-39; a sink drain in a shop in building 33-113; and roof drains from building 33-19 (Santa Fe Engineering Ltd. 1992, 062036, Tables 2, 6, 7, and 13). The specific materials discharged to these drains are not well documented.

A 1954 memorandum mentions occurrences of mercury spills in the electronics laboratory in building 33-19, and spilled mercury could potentially have been released to the drains (Jordan 1954, 007918). The shop in building 33-113 was primarily used to machine uranium but was also used for processing plastics and spray-painting (Hyatt 1956, 007929).

6.7.2 Relationship to Other SWMUs

SWMU 33-004(a) is located approximately 100 ft west and 100 ft northwest of the two SWMU 33-008(c) surface disposal areas and 100 ft north of SWMU 33-004(i). SWMU 33-004(a) is also located within and west of SWMU 33-017 and approximately 50 ft north of SWMU 33-012(a) (Plate 2).

6.7.3 Summary of Previous Investigations

During the 1993 Phase I RFI conducted at SWMU 33-004(a), one sludge sample and one liquid sample were collected from septic tank 33-31 and submitted for analysis of TAL metals, SVOCs, VOCs, uranium, tritium, and gamma-emitting radionuclides (LANL 1995, 071300). One surface sample and two subsurface samples were collected from one borehole drilled to a depth of 15 ft bgs next to the septic tank. Samples were submitted for analysis of TAL metals, SVOCs, tritium, uranium, and gamma-emitting radionuclides. The two subsurface samples were also analyzed for VOCs. One borehole was drilled next to each seepage pit to a depth of 50 ft, and four samples were collected at four depths from each of these boreholes. Samples were submitted for analysis of TAL metals, SVOCs, VOCs, tritium, and gamma-emitting radionuclides, and all but one of the samples were also analyzed for uranium. Four surface and two subsurface samples were collected from random locations in the drain field and submitted for analysis of TAL metals, SVOCs, uranium, tritium, and gamma-emitting radionuclides. Two surface samples were also analyzed for herbicides, pesticides, and PCBs, and the subsurface samples were also analyzed for VOCs. Data from the 1993 Phase I RFI are screening-level data and showed numerous inorganic chemicals detected above BVs; numerous detected organic chemicals including VOCs, SVOCs, PAHs, and Aroclor-1254; and cesium-137 and tritium detected above FVs. These data were not used to evaluate the nature and extent of contamination and are not discussed further in this report.

In 1994, 4 additional samples were collected from the drain field to better characterize potential releases (LANL 1995, 071300). These subsurface samples were collected at joints in the vitrified-clay tiles and submitted for analysis of TAL metals, SVOCs, VOCs, tritium, uranium, and gamma-emitting radionuclides. Data from the 1994 sampling are screening-level data and showed numerous inorganic chemicals detected above BVs, 17 detected organic chemicals (primarily SVOCs/PAHs), and cesium-137 and tritium detected above FVs. These data were not used to evaluate the nature and extent of contamination and are not discussed further in this report.

In 1997, the Laboratory’s Environmental Restoration (ER) Project collected one soil sample at each of three locations (below the tank, under the inlet, and under the outlet). Samples were submitted for analysis of TAL metals and VOCs (Michelotti and Kidman 1997, 074002). Data from the 1997 sampling event meet data-validation standards and are decision-level data included in this report.

During the 2019–2020 investigation, a total of 10 samples were collected from 5 locations beneath septic system structures to determine extent. At each location, samples were collected from 2 depths below the structures. A total of 14 samples were collected from 2 locations drilled next to 2 active seepage pits. At each location, samples were collected from 7 depths. A total of 24 samples were collected from 8 locations within the inactive drain field in order to determine extent. At each location samples were collected from 3 depths below the drainpipes. All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, perchlorate, nitrate, VOCs, SVOCs, isotopic uranium, and isotopic plutonium. In addition, 12 samples were analyzed for PCBs.

During the 2019–2020 investigation, the sampling crew potholed in the drain field and determined the individual tile drainlines were 10 ft apart from each other. Additional trenching was conducted to the east and west of the drainlines and no evidence of additional drainlines was found. The drainlines are shown in Figure 6.7-1.

6.7.4 Site Contamination

6.7.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at SWMU 33-004(a). As a result, the following activities were completed as part of the 2021 investigation.

- Six samples were collected from existing locations 33-60595, 33-60597, and 33-60599 to define the vertical extent of PCBs. Two samples were collected over the interval 4.1 ft bgs to 6.7 ft bgs at each location and analyzed at an off-site fixed laboratory for PCBs.
- Three samples were collected from existing locations 33-60590, 33-60592, and 33-60597 to define the vertical extent of PAHs. Samples were collected at a depth interval of 9.0–10.0 ft bgs at location 33-60597 and at a depth interval of 15.0–16.0 ft bgs at locations 33-60590 and 33-60592 and analyzed at an off-site fixed laboratory for PAHs.
- Twelve samples were collected from four new locations within the portion the drain field that had not been previously sampled to define the nature and extent of potential contamination in this area. Three subsurface samples were collected over the depth interval of 1.6 ft bgs to 7.1 ft bgs at locations 33-60961, 33-60962, 33-60963, and 33-60964. All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, nitrate, perchlorate, SVOCs, VOCs, PCBs, isotopic uranium, isotopic plutonium, tritium, and gamma-emitting radionuclides.
- Three samples were collected from one new location (east of the eastern seepage pit) to define the vertical and lateral extent of potential contamination. Three subsurface samples were collected over the interval 5.0 ft bgs to 19.8 ft bgs at location 33-61124. All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, nitrate, perchlorate, SVOCs, VOCs, PCBs, isotopic uranium, isotopic plutonium, tritium, and gamma-emitting radionuclides.
- Six samples were collected from two new locations north of location 33-60595 to define the lateral extent of PCBs. Three subsurface samples were collected over the interval 1.7 ft bgs to 7.1 ft bgs at locations 33-60965 and 33-60966 and analyzed at an off-site fixed laboratory for PCBs.
- Corrective actions at SWMU 33-004(a) to address potential unacceptable ecological risk and human-health risk was performed by removing soil with elevated mercury concentrations at location 33-60596 to 3.6 ft bgs, removing soil with elevated mercury and PCB concentrations at location 33-60597 to 3.7 ft bgs, and removing soil with elevated PAH concentrations at location 33-60601 to 3.8 ft bgs. A total of approximately 9.8 yd^3 was removed. No confirmation samples were required at locations 33-60596 and 33-60601 because the vertical extent of contamination was defined by deeper samples previously collected at these two locations.
- A total of 48 samples were collected from 16 new locations around existing locations 33-60596 and 33-60597 to define the vertical and lateral extent of mercury. Three subsurface samples were collected over the interval 1.6 ft bgs to 6.7 ft bgs at each location and analyzed at an off-site fixed laboratory for mercury.
- Fifteen samples were collected from five new locations around existing location 33-60597 to define the vertical and lateral extent of PCBs. Three subsurface samples were collected over the interval 1.7 ft bgs to 6.7 ft bgs at each location and analyzed at an off-site fixed laboratory for PCBs.
- A total of 27 samples were collected from 9 new locations around existing location 33-60601 to define the vertical and lateral extent of PAHs. Three subsurface samples were collected over the interval 1.8 ft bgs to 6.8 ft bgs at each location and analyzed at an off-site fixed laboratory for PAHs.

The sampling locations at SWMU 33-004(a) are shown in Figure 6.7-1. Table 6.7-1 presents the samples collected and analyses requested for SWMU 33-004(a). The geodetic coordinates of sample locations are presented in Table 3.2-1.

6.7.4.2 Soil, Rock, and Sediment Field Screening Results

During headspace screening for organic vapors at SWMU 33-004(a) a maximum concentration of 1.4 ppm was detected at location 33-60694 from 1.6 to 2.6 ft bgs. For the radiological-screening results, 83 samples exceeded twice the maximum site background levels for alpha-emitting radionuclides and 3 samples exceeded twice the maximum site background levels for beta/gamma-emitting radionuclides. No changes were made to sampling or other activities based on field-screening results. Field-screening results are included in Appendix E (on DVD included with this document).

6.7.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data at SWMU 33-004(a) consist of results from 153 samples (125 tuff and 28 soil/fill) collected from 48 locations.

Inorganic Chemicals

A total of 60 samples (49 tuff and 11 soil) were collected and analyzed for TAL metals, cyanide, perchlorate, and nitrate, and 48 samples (40 tuff and 8 soil) were analyzed for mercury only. Table 6.7-2 presents the inorganic chemicals above BVs and the detected inorganic chemicals with no BVs. Plate 6 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was detected above the Qbt 2,3,4 BV (0.5 mg/kg) in one sample at a concentration of 0.655 mg/kg and was not detected above the Qbt 2,3,4 BV but had DLs (0.501 mg/kg and 0.903 mg/kg) above BV in two tuff samples. Antimony is retained as a COPC.

Barium was detected above the Qbt 2,3,4 BV (46 mg/kg) in one sample at a concentration of 55.6 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in tuff are not statistically different from background (Figure F-30 and Table F-4). Barium is not a COPC.

Cadmium was detected above the soil and Qbt 2,3,4 BVs (0.4 mg/kg and 1.63 mg/kg, respectively) in four soil samples and one tuff sample with a maximum concentration of 7.99 mg/kg. Cadmium is retained as a COPC.

Calcium was detected above the Qbt 2,3,4 BV (2200 mg/kg) in two tuff samples with a maximum concentration of 2630 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in tuff are not statistically different from background (Figure F-31 and Table F-4). Calcium is not a COPC.

Chromium was detected above the soil and Qbt 2,3,4 BVs (19.3 mg/kg and 7.14 mg/kg, respectively) in 1 soil sample and 23 tuff samples with a maximum concentration of 64.1 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in soil and tuff are statistically different from background (Figure F-32 and Table F-5, and Figure F-33 and Table F-4, respectively). Chromium is retained as a COPC.

Copper was detected above the soil and Qbt 2,3,4 BVs (14.7 mg/kg and 4.66 mg/kg, respectively) in six soil samples and four tuff samples with a maximum concentration of 101 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in soil are statistically different from background (Figure F-34 and Table F-5). Copper is retained as a COPC.

Cyanide was detected above the Qbt 2,3,4 BV (0.5 mg/kg) in 1 sample at a concentration of 0.532 mg/kg. The detected concentration was only 0.032 mg/kg above the BV and cyanide was not detected or detected above BV in 59 other samples (detected below BV in 7 samples). Cyanide 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, respectively) in six soil samples and two tuff samples with a maximum concentration of 155 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil are statistically different from background (Figure F-35 and Table F-5). Lead is retained as a COPC.

Mercury was detected above the soil and Qbt 2,3,4 BVs (0.1 mg/kg for each) in 14 soil samples and 2 tuff samples with a maximum concentration of 1.34 mg/kg. Mercury is retained as a COPC.

Nitrate was detected in 55 samples with a maximum concentration of 103 mg/kg. Nitrate is retained as a COPC.

Perchlorate was detected in nine samples with a maximum concentration of 0.00111 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, respectively) in 5 soil samples, 12 Qbt 2 samples, and 37 Qbt 3 samples with a maximum concentration of 2.51 mg/kg. The Gehan and quantile tests indicated site concentrations of selenium in soil are statistically different from background (Figure F-36 and Table F-5). Selenium is retained as a COPC.

Silver was detected above the soil BV (1 mg/kg) in three samples with a maximum concentration of 3.35 mg/kg. Silver is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in seven samples with a maximum concentration of 85.4 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are statistically different from background (Figure F-37 and Table F-5). Zinc is retained as a COPC.

Organic Chemicals

A total of 90 samples (72 tuff and 18 soil/fill) were collected and analyzed for SVOCs, 60 samples (49 tuff and 11 soil) were analyzed for VOCs, and 53 samples (43 tuff and 10 soil) were analyzed for PCBs. Table 6.7-3 presents the detected organic chemicals. Plate 7 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 33-004(a) include acenaphthene; acenaphthylene; acetone; acrylonitrile; 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; carbazole; 2-chloronaphthalene; chrysene; dibenz(a,h)anthracene; di-n-butylphthalate; fluoranthene; fluorene; 2-hexanone; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; styrene; and toluene. The detected organic chemicals listed are retained as COPCs.

Radionuclides

A total of 60 samples (49 tuff and 11 soil) were collected and analyzed for isotopic uranium, isotopic plutonium, tritium, and gamma-emitting radionuclides; and 10 samples (7 tuff and 3 soil) were analyzed for americium-241. Table 6.7-4 presents the radionuclides detected or detected above BVs/FVs. Figure 6.7-2 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Cesium-137 was detected in two soil samples below 1.0 ft bgs with a maximum activity of 0.146 pCi/g. Cesium-137 is retained as a COPC.

Tritium was detected in one soil sample at an activity of 10.2 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 eight tuff samples with a maximum activity of 0.138 pCi/g. Uranium-235/236 is retained as a COPC.

Uranium-238 was detected above the soil BV (2.29 pCi/g) in two samples with a maximum activity of 2.41 pCi/g. Uranium-238 is retained as a COPC.

6.7.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 33-004(a) are discussed below. The spatial distribution of COPCs was evaluated using the data presented in Tables 6.7-2, 6.7-3, and 6.7-4; Plates 6 and 7; and Figure 6.7-2.

Inorganic Chemicals

Inorganic COPCs at SWMU 33-004(a) include antimony, cadmium, chromium, copper, lead, mercury, nitrate, perchlorate, selenium, silver, and zinc.

Antimony was detected above the Qbt 2,3,4 BV in one sample at a concentration of 0.655 mg/kg and was not detected above the Qbt 2,3,4 BV but had DLs (0.501 mg/kg and 0.903 mg/kg) above BV in two tuff samples. Concentrations increased with depth at location 33-60961 and decreased laterally. The residential SSL was approximately 48 times the maximum concentration and 35 times the maximum DL. Further sampling for extent of antimony is not warranted.

Cadmium was detected above the soil and Qbt 2,3,4 BVs in four soil samples and one tuff sample with a maximum concentration of 7.99 mg/kg. Concentrations decreased with depth at locations 33-60593, 33-60602, 33-60961, 33-60963, and 33-60964 and decreased laterally. The lateral and vertical extent of cadmium are defined.

Chromium was detected above the soil and Qbt 2,3,4 BVs in 1 soil sample and 23 tuff samples with a maximum concentration of 64.1 mg/kg. Concentrations increased with depth at locations 33-60588, 33-60590, 33-60591, 33-60592, 33-60598, 33-60600, and 33-60602; decreased with depth at locations 33-60595, 33-60596, 33-60597, 33-60599, 33-60601, and 33-60964; and decreased laterally along drainlines. As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with the residential SSL for trivalent chromium (117,000 mg/kg). The residential trivalent chromium SSL was approximately 1820 times the maximum concentration. The lateral extent of chromium is defined and further sampling for vertical extent is not warranted.

Copper was detected above the soil and Qbt 2,3,4 BVs in six soil samples and four tuff samples with a maximum concentration of 101 mg/kg. Concentrations increased with depth at location 33-60597; decreased with depth at locations 33-60590, 33 60595, 33-60596, 33-60599, 33-60602, 33-60961, 33-60962, 33-60963, and 33-60964; and increased laterally (the concentration in the shallow sample at location 33-60597 before excavation was 108 mg/kg). The residential SSL was approximately 31 times the maximum concentration. The vertical extent of copper is defined and further sampling for lateral extent is not warranted.

Lead was detected above the soil and Qbt 2,3,4 BVs in six soil samples and two tuff samples with a maximum concentration of 155 mg/kg. Concentrations decreased with depth at locations 33-60595, 33-60597, 33-60599, 33-60602, 33-60961, 33-60962, 33-60963, and 33-60964 and increased laterally at the east side of the drain field (the concentration in the shallow sample at location 33-60597 before excavation was 279 mg/kg). The residential SSL was approximately 2.6 times and the industrial SSL was approximately 5.2 times the maximum concentration. The vertical extent of lead is defined and further sampling for lateral extent to the east of the drain field is warranted.

Mercury was detected above the soil and Qbt 2,3,4 BVs in 14 soil samples and 2 tuff samples with a maximum concentration of 1.34 mg/kg. Concentrations decreased with depth at locations 33-60589, 33-60595, 33-60598, 33-60599, 33-60602, 33-60961, 33-60962, 33-60963, 33-60964, 33-60968, 33-60970, 33-60971, 33-60974, 33-61113, and 33-61116 and increased laterally. The residential SSL was approximately 18 times the maximum concentration. The vertical extent of mercury is defined and further sampling for lateral extent is not warranted.

Nitrate was detected in 55 samples with a maximum concentration of 103 mg/kg. Concentrations did not change substantially with depth (0.07 mg/kg and 0.083 mg/kg) at locations 33-60593 and 33-60594, decreased with depth at all other locations, and decreased laterally (the concentration in the shallow sample at location 33-60597 before excavation was 45.2 mg/kg). The residential SSL was approximately 1210 times the maximum concentration. The lateral extent of nitrate is defined and further sampling for vertical extent is not warranted.

Perchlorate was detected in nine samples with a maximum concentration of 0.00111 mg/kg. Concentrations decreased with depth at locations 33-60593, 33-60594, 33-60601, 33-60961, and 33-61124 and decreased laterally. The lateral and vertical extent of perchlorate are defined.

Selenium was detected above the soil and Qbt 2,3,4 BVs in 2 soil samples, 12 Qbt 2 samples, and 37 Qbt 3 samples with a maximum concentration of 2.51 mg/kg. Concentrations increased with depth at location 33-60588; did not change substantially with depth (0.021 mg/kg to 0.12 mg/kg) at locations 33-60589, 33-605900, 33-60591, 33-60594, 33-60595, 33-60596, 33-60597, 33-60598, 33-60599, 33-60601, 33-60602, 33-60961, 33-60962, 33-60963, and 33-60964; and decreased with depth at locations 33-60592, 33-60593, 33-60600, and 33-61124 (concentrations in the shallow samples at 33-60591, 33-60595, 33-60596, 33-60597, 33-60598, 33-60599, 33-60600, 33-60602, 33-60961, 33-60963, and 33-60964 were 0.85 mg/kg, 0.867 mg/kg, 1.36 mg/kg, 1.07 mg/kg, 1.03 mg/kg, 1.26 mg/kg, 0.974 mg/kg, 1.15 mg/kg, 1.26 mg/kg, 1.19 mg/kg, and 1.3 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]). Concentrations decreased laterally. The residential SSL was approximately 156 times the maximum concentration. The lateral extent of selenium is defined and further sampling for vertical extent is not warranted.

Silver was detected above the soil BV in three samples with a maximum concentration of 3.35 mg/kg. Concentrations decreased with depth at locations 33-60595, 33-60961, and 33-60964 and increased laterally. The residential SSL was approximately 117 times the maximum concentration. The vertical extent of silver is defined and further sampling for lateral extent is not warranted.

Zinc was detected above the soil BV in seven samples with a maximum concentration of 85.4 mg/kg. Concentrations decreased with depth at locations 33-60591, 33-60595, 33-60598, 33-60599, 33-60602, 33-60963, and 33-60964 and increased laterally. The residential SSL was approximately 275 times the maximum concentration. The vertical extent of zinc is defined and further sampling for lateral extent is not warranted.

Organic Chemicals

Organic COPCs at SWMU 33-004(a) include acenaphthene; acenaphthylene; acetone; acrylonitrile; 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; carbazole; 2-chloronaphthalene; chrysene; dibenz(a,h)anthracene; di-n-butylphthalate; fluoranthene; fluorene; 2-hexanone; indeno(1,2,3-cd)pyrene; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; styrene; and toluene.

Acenaphthene was detected in two samples with a maximum concentration of 0.0119 mg/kg. Concentrations increased with depth at locations 33-60592 and 33-61120 and decreased laterally. The residential SSL was approximately 292,000 times the maximum concentration. The lateral extent of acenaphthene is defined and further sampling for vertical extent is not warranted.

Acenaphthylene was detected in four samples with a maximum concentration of 0.146 mg/kg. Concentrations decreased with depth at locations 33-61120 and 33-61122 and decreased laterally. The lateral and vertical extent of acenaphthylene are defined.

Acetone was detected in five samples with a maximum concentration of 0.0274 mg/kg. Concentrations increased with depth at location 33-60591; decreased with depth at locations 33-60590, 33-60592, and 33-60597; and decreased laterally along drainlines. The residential SSL was approximately 2,420,000 times the maximum concentration. The lateral extent of acetone is defined and further sampling for vertical extent is not warranted.

Acrylonitrile was detected in one sample at a concentration of 0.00187 mg/kg. Concentrations decreased with depth at location 33-60961 and decreased laterally. The lateral and vertical extent of acrylonitrile are defined.

Anthracene was detected in 17 samples with a maximum concentration of 0.686 mg/kg. Concentrations increased with depth at location 33-60592; decreased with depth at locations 33-60595, 33-60599, 33-60600, 33-60601, 33-60602, 33-60961 through 33-60964, 33-60977, 33-60979, 33-61120, 33-61122, and 33-61123; and decreased laterally. The residential SSL was approximately 25,360 times the maximum concentration. The lateral extent of anthracene is defined and further sampling for vertical extent is not warranted.

Aroclor-1254 was detected in 42 samples with a maximum concentration of 4.96 mg/kg. Concentrations increased with depth at location 33-60972; only one depth was sampled at locations 33-60589, 33-60596, and 33-60600; concentrations decreased with depth at locations 33-60595, 33-60597, 33-60599, 33-60961 through 33-60966, 33-60971, and 33-60973 through 33-60975; and concentrations decreased laterally along drainlines from the location of the maximum concentration (33-60595). The residential SSL was approximately 19 times the maximum concentration where vertical extent is not defined (0.0595 mg/kg at location 33-60589). The 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 1.8 mg/kg. Concentrations increased with depth at location 33-60972; only one depth was sampled at locations 33-60589, 33-60596, and 33-60598; concentrations decreased with depth at locations 33-60595, 33-60597, 33-60599, 33-60961 through 33-60966, 33-60971, 33-60973, 33-60974,and 33-60975; and concentrations decreased laterally along drainlines from the location of the maximum concentration (33-60595). The residential SSL was approximately 74 times the maximum concentration where vertical extent is not defined (0.0326 mg/kg at location 33-60589). The lateral extent of Aroclor-1260 is defined and further sampling for vertical extent is not warranted.

Benzo(a)anthracene was detected in 37 samples with a maximum concentration of 3.77 mg/kg. Concentrations increased with depth at locations 33-60590 and 33-60592 and decreased with depth at locations 33-60588, 33-60589, 33-60591, 33-60595, 33-60597 through 33-60602, 33-60961 through 33-60964, 33-60976, 33-60977, 33-60979, and 33-61120 through 33-61123. The residential SSL was approximately 28 times the maximum concentration where vertical extent is not defined (0.0543 mg/kg at location 33-60592). Concentrations increased laterally along drainlines at locations 33-60599, 33-60600, 33-60602, and 33-60961. Concentrations at these locations were 2.0 times to 2.4 times the residential SSL, and the industrial SSL was 9.0 to 10.5 times the concentrations at these locations. Further sampling for vertical extent of benzo(a)anthracene is not warranted, but further sampling for lateral extent of benzo(a)anthracene south of locations 33-60599, 33-60600, 33-60602, and 33-60961 is warranted.

Benzo(a)pyrene was detected in 34 samples with a maximum concentration of 3.37 mg/kg. Concentrations increased with depth at locations 33-60590 and 33-60592 and decreased with depth at locations 33-60589, 33-60595, 33-60597 through 33-60602, 33-60961 through 33-60964, 33-60976, 33-60977, 33-60979, and 33-61120 through 33-61123. The residential SSL was approximately 18 times the maximum concentration where vertical extent is not defined (0.0628 mg/kg at location 33-60592). Concentrations increased laterally along drainlines at locations 33-60599, 33-60600, 33-60602, and 33-60961. Concentrations at these locations were 2.6 times to 2.7 times the residential SSL, and the industrial SSL was 7.3 to 8.0 times the concentrations at these locations. Further sampling for vertical extent of benzo(a)pyrene is not warranted, but further sampling for lateral extent of benzo(a)pyrene south of locations 33-60599, 33-60600, 33-60602, and 33-60961 is warranted.

Benzo(b)fluoranthene was detected in 35 samples with a maximum concentration of 4.61 mg/kg. Concentrations increased with depth at locations 33-60590 and 33-60592 and decreased with depth at locations 33-60589, 33-60591, 33-60595, 33-60597 through 33-60602, 33-60961 through 33-60964, 33-60976, 33-60977, 33-60979, and 33-61120 through 33-61123. The residential SSL was approximately 23 times the maximum concentration where vertical extent is not defined (0.0662 mg/kg at location 33-60592). Concentrations increased laterally along drainlines at locations 33-60599, 33-60600, 33-60602, and 33-60961. Concentrations at these locations were 2.6 times to 2.7 times the residential SSL, and the industrial SSL was 7.8 to 8.2 times the concentrations at these locations. Further sampling for vertical extent of benzo(b)fluoranthene is not warranted, but further sampling for lateral extent of benzo(b)fluoranthene south of locations 33-60599, 33-60600, 33-60602, and 33-60961 is warranted.

Benzo(g,h,i)perylene was detected in 32 samples, with maximum concentration of 1.82 mg/kg. Concentrations increased with depth at locations 33-60590 and 33-60592; decreased with depth at locations 33-60589, 33-60595, 33-60597 through 33-60602, 33-60961 through 33-60964, 33-60976, 33-60977, 33-60979, and 33-61120 through 33-61123; and increased laterally along drainlines. The residential SSL was approximately 956 times the maximum concentration. The vertical extent of benzo(g,h,i)perylene is defined and further sampling for lateral extent is not warranted.

Benzo(k)fluoranthene was detected in 24 samples with a maximum concentration of 1.7 mg/kg. Concentrations increased with depth at location 33-60592; decreased with depth at locations 33-60595, 33-60597 through 33-60602, 33-60961 through 33-60964, 33-60977, 33-60979, and 33-61120 through 33-61123; and increased laterally along drainlines. The residential SSL was approximately 9 times and the industrial SSL was approximately 190 times the maximum concentration. Further sampling for extent of benzo(k)fluoranthene is not warranted.

Bis(2-ethylhexyl)phthalate was detected in 22 samples with a maximum concentration of 0.561 mg/kg. Concentrations increased with depth at location 33-60597; decreased with depth at locations 33-60589, 33-60593, 33-60594, 33-60595, 33-60599, 33-60600, and 33-60962; and decreased laterally along drainlines. The residential SSL was approximately 677 times the maximum concentration. Lateral extent of bis(2-ethylhexyl)phthalate is defined and further sampling for vertical extent is not warranted.

Carbazole was detected in five samples with a maximum concentration of 0.215 mg/kg. Concentrations decreased with depth at locations 33-60599, 33-60600, 33-60601, 33-60602, and 33-60964 and increased laterally along drainlines. The residential SSL was approximately 363 times the maximum concentration. Vertical extent of carbazole is defined and further sampling for lateral extent is not warranted.

Chloronaphthalene[2-] was detected in one sample at a concentration of 0.00339 mg/kg. Concentrations decreased with depth at location 33-60976 and decreased laterally. The lateral and vertical extent of 2-chloronaphthalene are defined.

Chrysene was detected in 34 samples with a maximum concentration of 3.58 mg/kg. Concentrations increased with depth at locations 33-60590 and 33-60592; decreased with depth at locations 33-60589, 33-60595, 33-60597 through 33-60602, 33-60961 through 33-60964, 33-60976, 33-60977, 33-60979, and 33-61120 through 33-61123; and increased laterally along drainlines. The residential SSL was approximately 43 times the maximum concentration. Further sampling for extent of chrysene is not warranted.

Dibenz(a,h)anthracene was detected in 17 samples with a maximum concentration of 0.601 mg/kg. Concentrations increased with depth at location 33-60592 and decreased with depth at locations 33-60595, 33-60599 through 33-60602, 33-60961, 33-60963, 33-60964, 33-60976, 33-60977, 33-60979, 33-61120, 33-61122, and 33-61123. The residential SSL was approximately 11 times the maximum concentration where vertical extent is not defined (0.0136 mg/kg at location 33-60592). Concentrations increased laterally along drainlines at locations 33-60599, 33-60600, 33-60602, and 33-60961. Concentrations at these locations were 3.2 times to 3.9 times the residential SSL and the industrial SSL was 5.4 to 6.7 times the concentrations at these locations. Further sampling for vertical extent of dibenz(a,h)anthracene is not warranted, but further sampling for lateral extent of dibenz(a,h)anthracene south of locations 33-60599, 33-60600, 33-60602, and 33-60961 is warranted.

Di-n-butylphthalate was detected in five samples with a maximum concentration of 0.352 mg/kg. Concentrations increased with depth at location 33-60597; decreased with depth at locations 33-60595, 33-60602, and 33-60962; and increased laterally along drainlines. The residential SSL was approximately 17,500 times the maximum concentration. Further sampling for extent of di-n-butylphthalate is not warranted.

Fluoranthene was detected in 41 samples with a maximum concentration of 7.89 mg/kg. Concentrations increased with depth at locations 33-60590 and 33-60592; decreased with depth at locations 33-60588, 33-60589, 33-60591, 33-60595, 33-60597 through 33-60602, 33-60961 through 33-60964, 33-60976, 33-60977, 33-60979, and 33-61120 through 33-61123; and increased laterally along drainlines. The residential SSL was approximately 294 times the maximum concentration. Further sampling for extent of fluoranthene is not warranted.

Fluorene was detected in nine samples with a maximum concentration of 0.132 mg/kg. Concentrations increased with depth at location 33-60592; decreased with depth at locations 33-60600, 33-60602, 33-60961, 33-60964, 33-61120, and 33-61122; and increased laterally along drainlines. The residential SSL was approximately 17,600 times the maximum concentration. Further sampling for extent of fluorene is not warranted.

Hexanone-2 was detected in three samples with a maximum concentration of 0.0545 mg/kg. Concentrations decreased with depth at locations 33-60963 and 33-60964 and increased laterally along drainlines. The residential SSL was approximately 3670 times the maximum concentration. Furhter sampling for extent of 2-hexanone is not warranted.

Indeno(1,2,3-cd)pyrene was detected in 30 samples with a maximum concentration of 2.26 mg/kg. Concentrations increased with depth at locations 33-60590 and 33-60592 and decreased with depth at locations 33-60589, 33-60595, 33-60597 through 33-60602, 33-60961 through 33-60964, 33-60976, 33-60977, 33-60979, and 33-61120 through 33-61123. The residential SSL was approximately 27 times the maximum concentration where vertical extent is not defined (0.056 mg/kg at location 33-60592). Concentrations increased laterally along drainlines at locations 33-60599, 33-60600, 33-60602, 33-60961. Concentrations at these locations were 1.1 to 1.3 times the residential SSL and the industrial SSL was 17 to 18 times the concentrations at these locations. Further sampling for vertical extent of indeno(1,2,3-cd)pyrene is not warranted, but further sampling for lateral extent of indeno(1,2,3-cd)pyrene south of locations 33-60599, 33-60600, 33-60602, and 33-60961 is warranted.

Methylnaphthalene[2-] was detected in one sample at a concentration of 0.00437 mg/kg. Concentrations increased with depth at location 33-61120 and decreased laterally. The residential SSL was approximately 53,100 times the maximum concentration. The lateral extent of 2-methylnaphthalene is defined and further sampling for vertical extent is not warranted.

Naphthalene was detected in four samples with a maximum concentration of 0.0375 mg/kg. Concentrations increased with depth at location 33-60592, decreased with depth at locations 33-60961 and 33-61120, and increased laterally. The residential SSL was approximately 1320 times the maximum concentration. Further sampling for extent of naphthalene is not warranted.

Phenanthrene was detected in 41 samples with a maximum concentration of 2.09 mg/kg. Concentrations increased with depth at locations 33-60590, 33-60592, and 33-60978; decreased with depth at locations 33-60588, 33-60589, 33-60591, 33-60595, 33-60597 through 33-60602, 33-60961 through 33-60964, 33-60976, 33-60977, 33-60979, 33-60980, and 33-61120 through 33-61123; and increased laterally along drainlines. The residential SSL was approximately 830 times the maximum concentration. Further sampling for extent of phenanthrene is not warranted.

Pyrene was detected in 40 samples with a maximum concentration of 7.4 mg/kg. Concentrations increased with depth at locations 33-60590 and 33-60592; decreased with depth at locations 33-60588, 33-60589, 33-60591, 33-60595, 33-60597 through 33-60602, 33-60961 through 33-60964, 33-60976, 33-60977, 33-60979, and 33-61120 through 33-61123; and increased laterally along drainlines. The residential SSL was approximately 235 times the maximum concentration. Further sampling for extent of pyrene is not warranted.

Styrene was detected in one sample at a concentration of 0.00194 mg/kg. Concentrations decreased with depth at location 33-60961 and increased laterally. The residential SSL was approximately 3,740,000 times the maximum concentration. The vertical extent of styrene is defined and further sampling for lateral extent is not warranted.

Toluene was detected in five samples with a maximum concentration of 0.00094 mg/kg. Concentrations decreased with depth at locations 33-60595, 33-60598, 33-60599, 33-60601, and 33-60602 and decreased laterally along drainlines. The lateral and vertical extent of toluene are defined.

Radionuclides

Radionuclide COPCs at SWMU 33-004(a) include cesium-137, tritium, uranium-235/236, and uranium-238.

Cesium-137 was detected in two soil samples below 1.0 ft bgs with a maximum activity of 0.146 pCi/g. Activities decreased with depth at locations 33-60595 and 33-60599 and decreased laterally along drainlines. The lateral and vertical extent of cesium-137 are defined.

Tritium was detected in one soil sample at an activity of 10.2 pCi/g. Activities decreased with depth at location 33-60964 and increased laterally. The residential SAL was approximately 167 times the maximum activity. The vertical extent of tritium is defined and further sampling for lateral extent is not warranted.

Uranium-235/236 was detected above the Qbt 2,3,4 BV in eight tuff samples with a maximum activity of 0.138 pCi/g. Activities did not change substantially with depth (0.008 pCi/g) at location 33-60595; decreased with depth at locations 33-60590, 33-60592, 33-60593, and 33-60594; and decreased laterally along drainlines. The residential SAL was approximately 304 times the maximum activity. The lateral extent of uranium-235/236 is defined and further sampling for vertical extent is not warranted.

Uranium-238 was detected above the soil BV in two samples with a maximum activity of 2.41 pCi/g. Activities decreased with depth at locations 33-60961 and 33-60964 and increased laterally. The residential SAL was approximately 62 times the maximum activity. The vertical extent of uranium-238 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 are defined or no further sampling for extent is warranted at SWMU 33-004(a) except for lateral extent of lead east of the drain field and lateral extent of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene south of locations 33-60599, 33-60600, 33-60602, and 33-60961.

6.7.5 Summary of Human Health Risk Screening

A human health risk-screening assessment was not performed for SWMU 33-004(a) because the nature and extent of contamination have not been defined at this site.

6.7.6 Summary of Ecological Risk Screening

An ecological risk-screening assessment was not performed for SWMU 33-004(a) because the nature and extent of contamination have not defined at this site.

6.8 SWMU 33-004(i), Drainline and Outfall Associated with Building 33-39

6.8.1 Site Description and Operational History

SWMU 33-004(i) consists of two inactive drainlines and outfalls associated with a former machine shop (building 33-39) located near the east side of Main Site (Figure 6.8-1). Construction of building 33-39 was completed in 1951. The building housed a welding and soldering bench that used cadmium and silver, a lead-melting facility, a beryllium-machining room, and a sand blaster. Cadmium, uranium, stainless steel, and polystyrene plastic also were machined in the building. Machine shop operations in building 33-29 ceased in the late 1990s. Floor drains in the building were tied into two 4-in.-diameter VCPs that discharged to outfalls east of building 33-39. The northernmost of the two outfalls is located approximately 30 ft east of the building, and the southern outfall is located approximately 40 ft east of the building. However, the sources of the discharges to these outfalls cannot be confirmed because a study of building drains at TA-33 confirmed that all wastewater discharges from building 33-39 are connected to the SWMU 33-004(a) septic system (Santa Fe Engineering, 1993, 062036, p. 7). The 1990 SWMU report confirms that the SWMU 33-004(a) septic system received discharges from building 33-39 beginning in 1951 (LANL 1990, 007513).

6.8.2 Relationship to Other SWMUs

SWMU 33-004(i) is located approximately 125 ft south of SWMU 33-004(h), approximately 90 ft west of the southern portion of SWMU 33-008(c), and approximately 100 ft northwest of SWMU 33-015 (Plate 2).

6.8.3 Summary of Previous Investigations

During the 1993 Phase I RFI conducted at SWMU 33-004(i), a geophysical survey was performed and the drainlines and outfalls east of building 33-39 were located. Six samples were collected at each outfall and at two locations in the drainages downstream of each outfall. Samples were submitted for analysis of TAL metals, SVOCs, herbicides, pesticides, tritium, total uranium, and gamma-emitting radionuclides. Data from the 1993 Phase I RFI are screening-level data and showed inorganic chemicals detected above BVs and detected organic chemicals (PAHs). Radionuclides were not detected or detected above BVs/FVs. These data were not used to evaluate the nature and extent of contamination and are not discussed further in this report.

During the 2019–2020 investigation, a total of 29 samples were collected from 6 previous RFI locations and 4 new locations downgradient of the outfalls. At each location, samples were collected at the surface and from 2 subsurface depths. All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, nitrate, perchlorate, VOCs, SVOCs, and isotopic uranium. In addition, 5 samples were analyzed for PCBs.

6.8.4 Site Contamination

6.8.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at SWMU 33-004(i). As a result, the following activities were completed as part of the 2021 investigation.

- Nine samples were collected from existing locations 33-01055, 33-01057, 33-10159, and 33-10160 to define the vertical extent of PCBs. Six samples were collected from the depth intervals of 2.0–3.0 ft bgs and 4.0–5.0 ft bgs at locations 33-01055, 33-01057, and 33-10159, and three samples were collected from the depth intervals of 0.0–1.0 ft bgs, 2.0–3.0 ft bgs, and 6.0–7.0 ft bgs at location 33-01060. All samples were analyzed at an off-site fixed laboratory for PCBs.
- Corrective actions at SWMU 33-004(i) to address potential unacceptable human health risks were performed by removing approximately 14.25 yd^3 of soil with elevated PCB concentrations at location 33-01058 to 6.0 ft bgs (Figure 6.8-1).

- Two confirmation samples were collected at location 33-01058 to define the vertical extent of PCBs. Samples were collected from the depth intervals of 6.0–7.0 ft and 8.0–9.0 ft bgs and were analyzed at an off-site fixed laboratory for PCBs.
- A total of 35 samples were collected from 7 new locations around existing location 33-01058 to define the lateral extent of PCBs. Samples were collected from the depth intervals of 0.0–1.0 ft bgs, 2.0–3.0 ft bgs, 4.0–5.0 ft bgs, 6.0–7.0 ft bgs, and 8.0–9.0 ft bgs. All samples were analyzed at an off-site fixed laboratory for PCBs.

The sampling locations at SWMU 33-004(i) are shown in Figure 6.8-1. Table 6.8-1 presents the samples collected and analyses requested for SWMU 33-004(i). The geodetic coordinates of sample locations are presented in Table 3.2-1.

6.8.4.2 Soil, Rock, and Sediment Field Screening Results

During headspace screening for organic vapors at SWMU 33-004(i) a maximum concentration of 44.1 ppm was detected at location 33-60987 from 6.0 to 7.0 ft bgs. For the radiological-screening results, 17 samples exceeded twice the maximum site background levels for alpha-emitting radionuclides and no samples exceeded twice the maximum site background levels for beta/gamma-emitting radionuclides. No changes were made to sampling or other activities based on field-screening results. Field-screening results are included in Appendix E (on DVD included with this document).

6.8.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data at SWMU 33-004(i) consist of results from 72 samples (8 tuff and 64 soil) collected from 17 locations.

Inorganic Chemicals

A total of 26 samples (6 tuff and 20 soil) were collected and analyzed for TAL metals, cyanide, perchlorate, and nitrate. Table 6.8-2 presents the inorganic chemicals above BVs and the detected inorganic chemicals with no BVs. Plate 8 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was detected above the soil BV (0.83 mg/kg) in 1 sample at a concentration of 6.14 mg/kg and was not detected but had DLs (0.613 mg/kg to 1.57 mg/kg) above the soil BV and Qbt 2,3,4 BV (0.5 mg/kg) in 12 soil samples and 5 tuff samples. Antimony is retained as a COPC.

Barium was detected above the Qbt 2,3,4 BV (46 mg/kg) in one sample at a concentration of 57.5 mg/kg. Barium is retained as a COPC.

Cadmium was detected above the soil BV (0.4 mg/kg) in 3 samples with a maximum concentration of 0.678 mg/kg. The maximum concentration was only 0.278 mg/kg above the BV and less than the 2 highest concentrations (2.6 mg/kg and 1.4 mg/kg) in the background data set. Cadmium was not detected or detected above BV in 23 other samples (detected below BV in 9 samples). Cadmium is not a COPC.

Calcium was detected above the soil BV (6120 mg/kg) in two samples with a maximum concentration of 9320 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in soil are statistically different from background (Figure F-38 and Table F-6). 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, respectively) in one soil sample and four tuff samples with a maximum concentration of 289 mg/kg. Chromium is retained as a COPC.

Copper was detected above the soil BV (14.7 mg/kg) in eight soil samples with a maximum concentration of 153 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in soil are statistically different from background (Figure F-39 and Table F-6). Copper is retained as a COPC.

Iron was detected above the soil BV (21,500 mg/kg) in one sample at a concentration of 22,600 mg/kg. The Gehan and quantile tests indicated site concentrations of iron in soil are not statistically different from background (Figure F-40 and Table F-6). Iron is not a COPC.

Lead was detected above the soil BV (22.3 mg/kg) in seven samples with a maximum concentration of 75.9 mg/kg. The Gehan and slippage tests indicated site concentrations of lead in soil are statistically different from background (Figure F-41 and Table F-6). Lead is retained as a COPC.

Mercury was detected above the soil BV (0.1 mg/kg) in 1 sample at a concentration of 0.132 mg/kg. The maximum concentration was only 0.032 mg/kg above BV and mercury was not detected or detected above BV in 25 other samples (detected below BV in 24 samples). Mercury is not a COPC.

Nickel was detected above the soil and Qbt 2,3,4 BVs (15.4 mg/kg and 6.58 mg/kg, respectively) in one soil sample and one tuff sample with a maximum concentration of 35.9 mg/kg. Nickel is retained as a COPC.

Nitrate was detected in 18 samples with a maximum concentration of 8.05 mg/kg. Nitrate is retained as a COPC.

Perchlorate was detected in 19 samples with a maximum concentration of 0.018 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the Qbt 2,3,4 BV (0.3 mg/kg) in six samples with a maximum concentration of 0.733 mg/kg. Selenium is retained as a COPC.

Silver was detected above the soil BV (1 mg/kg) in four samples with a maximum concentration of 2.89 mg/kg. Silver is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in seven samples with a maximum concentration of 195 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are statistically different from background (Figure F-42 and Table F-6). Zinc is retained as a COPC.

Organic Chemicals

A total of 26 samples (6 tuff and 20 soil) were collected and analyzed for VOCs and SVOCs, and 50 samples (2 tuff and 48 soil) were analyzed for PCBs. Table 6.8-3 presents the detected organic chemicals. Plate 9 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 33-004(i) include acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; carbazole; chrysene; dibenz(a,h)anthracene; di-n-butylphthalate; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 1-methylnaphthalene; 2-methylnaphthalene; naphthalene; phenanthrene; and pyrene. The detected organic chemicals are retained as COPCs.

Radionuclides

A total of 26 samples (6 tuff and 20 soil) were collected and analyzed for isotopic uranium. Table 6.8-4 presents the radionuclides detected or detected above BVs/FVs. Figure 6.8-2 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Uranium-235/236 was detected above the Qbt 2,3,4 BV (0.09 pCi/g) in one sample at an activity of 0.12 pCi/g. Uranium-235/236 is retained as a COPC.

6.8.4.4 Nature and Extent of Soil and Rock Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 33-004(i) are discussed below. The spatial distribution of COPCs was evaluated using the data presented in Tables 6.8-2, 6.8-3, and 6.8-4; Plates 8 and 9; and Figure 6.8-2.

Inorganic Chemicals

Inorganic COPCs at SWMU 33-004(i) include antimony, barium, calcium, chromium, copper, lead, nickel, nitrate, perchlorate, selenium, silver, and zinc.

Antimony was detected above the soil BV in 1 sample at a concentration of 6.14 mg/kg and was not detected but had DLs (0.613 mg/kg to 1.57 mg/kg) above the soil and Qbt 2,3,4 BVs in 12 soil samples and 5 tuff samples. Concentrations decreased with depth at location 33-60613 and increased downgradient. The residential SSL was approximately 5 times and the industrial SSL was approximately 85 times the maximum concentration, and the residential SSL was approximately 20 times the maximum DL. Further sampling for extent of antimony is not warranted.

Barium was detected above the Qbt 2,3,4 BV in one sample at a concentration of 57.5 mg/kg. Concentrations decreased with depth at location 33-60615 (the concentration in the intermediate sample at location 33-60615 was 102 mg/kg and below the soil BV [Appendix E, Pivot Tables]) and increased downgradient. The residential SSL was approximately 271 times the maximum concentration. The vertical extent of barium is defined and further sampling for lateral extent is not warranted.

Calcium was detected above the soil BV in two samples with a maximum concentration of 9320 mg/kg. Concentrations increased with depth at locations 33-01059 and 33-01060 and decreased downgradient. The residential essential nutrient SSL was approximately 1390 times the maximum concentration. The lateral extent of calcium is defined and further sampling for vertical extent is not warranted.

Chromium was detected above the soil and Qbt 2,3,4 BVs in one soil sample and four tuff samples with a maximum concentration of 289 mg/kg Concentrations increased with depth at locations 33-01057, 33-60612, and 33-60615; decreased with depth at location 33-60613; and increased downgradient. As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with the residential SSL for trivalent chromium (117,000 mg/kg). The residential trivalent chromium SSL was approximately 405 times the maximum concentration. Further sampling for extent of chromium is not warranted.

Copper was detected above the soil BV in eight soil samples with a maximum concentration of 153 mg/kg. Concentrations increased with depth at location 33-01059; decreased with depth at locations 33-01055, 33-01056, 33-01057, 33-01060, and 33-60612; and decreased downgradient. The residential SSL was approximately 20 times the maximum concentration. The lateral extent of copper is defined and further sampling for vertical extent is not warranted.

Lead was detected above the soil BV in seven samples with a maximum concentration of 75.9 mg/kg. Concentrations decreased with depth at all locations and decreased downgradient. The lateral and vertical extent of lead are defined.

Nickel was detected above the soil and Qbt 2,3,4 BVs in one soil sample and one tuff sample with a maximum concentration of 35.9 mg/kg. Concentrations increased with depth at location 33-60615, decreased with depth at location 33-01056, and decreased downgradient. The residential SSL was approximately 43 times the maximum concentration. The lateral extent of nickel is defined and further sampling for vertical extent is not warranted.

Nitrate was detected in 18 samples with a maximum concentration of 8.05 mg/kg. Concentrations decreased with depth at all locations and decreased downgradient. The lateral and vertical extent of nitrate are defined.

Perchlorate was detected in 19 samples with a maximum concentration of 0.018 mg/kg. Concentrations increased with depth at locations 33-01055, 33-01056, 33-01057, and 33-01060; decreased with depth at all other locations; and decreased downgradient. The residential SSL was approximately 3040 times the maximum concentration. The lateral extent of perchlorate is defined and further sampling for vertical extent is not warranted.

Selenium was detected above the Qbt 2,3,4 BV in six samples with a maximum concentration of 0.733 mg/kg. Concentrations increased with depth at location 33-60615, did not change substantially with depth (0.029 mg/kg) at location 33-60613, decreased with depth at locations 33-01057 and 33-60612 (concentrations in surface samples at locations 33-01057 and 33-60612 were 0.869 mg/kg and 0.586 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]), and increased downgradient. The residential SSL was approximately 533 times the maximum concentration. Further sampling for extent of selenium is not warranted.

Silver was detected above the soil BV in four samples with a maximum concentration of 2.89 mg/kg. Concentrations decreased with depth at all locations and decreased downgradient. The lateral and vertical extent of silver are defined.

Zinc was detected above the soil BV in seven samples with a maximum concentration of 195 mg/kg. Concentrations increased with depth at location 33-01059; decreased with depth at locations 33-01055, 33-01056, 33-01057, 33-01060, and 33-60613; and decreased downgradient. The residential SSL was approximately 120 times the maximum concentration. The lateral extent of zinc is defined and further sampling for vertical extent is not warranted.

Organic Chemicals

Organic COPCs at SWMU 33-004(i) include acenaphthene; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; carbazole; chrysene; dibenz(a,h)anthracene; di-n-butylphthalate; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 1-methylnaphthalene; 2-methylnaphthalene; naphthalene; phenanthrene; and pyrene.

Acenaphthene and anthracene were detected in 8 samples and 11 samples, respectively, with maximum concentrations of 1.48 mg/kg and 2.32 mg/kg, respectively. Concentrations decreased with depth at locations 33-01055, 33-01056, 33-01059, 33-60612, and 33-60613 and decreased downgradient. The lateral and vertical extent of acenaphthene and anthracene are defined.

Aroclor-1254 was detected in 44 samples with a maximum concentration of 47 mg/kg. Concentrations increased with depth at location 33-01059 and decreased with depth at all other locations. The residential SSL was approximately 2.8 times and the industrial SSL was approximately 27 times the maximum concentration where vertical extent is not defined (0.401 mg/kg at location 33-01059). Concentrations decreased downgradient but increased laterally north of location 33-60990. The maximum concentration at this location was 8.8 times the residential SSL and the industrial SSL was approximately 1.1 times the maximum concentration. Further sampling for vertical extent of Aroclor-1254 is not warranted, but further sampling for lateral extent of Aroclor-1254 to the north of location 33-60990 is warranted.

Aroclor-1260 was detected in 43 samples with a maximum concentration of 16 mg/kg. Concentrations increased with depth at location 33-01059 and decreased with depth at all other locations. The residential SSL was approximately 17 times and the industrial SSL was approximately 79 times the maximum concentration where vertical extent is not defined (0.141 mg/kg at location 33-01059). Concentrations decreased downgradient but increased laterally north of location 33-60990. The maximum concentration at this location was 1.7 times the residential SSL and the industrial SSL was approximately 2.6 times the maximum concentration. Further sampling for vertical extent of Aroclor-1260 is not warranted, but further sampling for lateral extent of Aroclor-1260 to the north of location 33-60990 is warranted.

Benzo(a)anthracene and benzo(b)fluoranthene were each detected in 17 samples with maximum concentrations of 3.39 mg/kg and 3.44 mg/kg, respectively. Concentrations increased with depth at location 33-01056, decreased with depth at all other locations, and decreased downgradient. Vertical extent at location 33-01056 is defined by decreasing concentrations in a deeper sample at adjacent location 33-01055. The lateral and vertical extent of benzo(a)anthracene and benzo(b)fluoranthene are defined.

Benzo(a)pyrene and chrysene were each detected in 16 samples with maximum concentrations of 2.8 mg/kg and 3.22 mg/kg, respectively. Concentrations increased with depth at location 33-01056, decreased with depth at all other locations, and decreased downgradient. Vertical extent at location 33-01056 is defined by decreasing concentrations in a deeper sample at adjacent location 33-01055. The lateral and vertical extent of benzo(a)pyrene and chrysene are defined.

Benzo(g,h,i)perylene, benzo(k)fluoranthene, and indeno(1,2,3-cd)pyrene were each detected in 15 samples with maximum concentrations of 1.2 mg/kg, 1.37 mg/kg, and 1.43 mg/kg, respectively. Concentrations increased with depth at location 33-01056, decreased with depth at all other locations, and decreased downgradient. Vertical extent at location 33-01056 is defined by decreasing concentrations in a deeper sample at adjacent location 33-01055. The lateral and vertical extent of benzo(g,h,i)perylene, benzo(k)fluoranthene, and indeno(1,2,3-cd)pyrene are defined.

Carbazole was detected in nine samples with a maximum concentration of 1.02 mg/kg. Concentrations decreased with depth at locations 33-01055, 33-01056, 33-01059, 33-60612, and 33-60613 and decreased downgradient. The lateral and vertical extent of carbazole are defined.

Dibenz(a,h)anthracene was detected in seven samples with a maximum concentration of 0.366 mg/kg. Concentrations increased with depth at location 33-01056; decreased with depth at locations 33-01055, 33-01059, 33-60612, and 33-60613; and decreased downgradient. Vertical extent at location 33-01056 is defined by decreasing concentrations in a deeper sample at adjacent location 33-01055. The lateral and vertical extent of dibenz(a,h)anthracene are defined.

Di-n-butylphthalate was detected in two samples with a maximum concentration of 0.0729 mg/kg. Concentrations decreased with depth at locations 33-01055 and 33-60612 and decreased downgradient. The lateral and vertical extent of di-n-butylphthalate are defined.

Fluoranthene, phenanthrene, and pyrene were each detected in 17 samples with maximum concentrations of 6.6 mg/kg, 7.72 mg/kg, and 6.99 mg/kg, respectively. Concentrations decreased with depth at all locations and decreased downgradient. The lateral and vertical extent of fluoranthene, phenanthrene, and pyrene are defined.

Fluorene was detected in seven samples with a maximum concentration of 1.36 mg/kg. Concentrations decreased with depth at all locations and decreased downgradient. The lateral and vertical extent of fluorene are defined.

Methylnaphthalene[1-] and 2-methylnaphthalene were each detected in one sample at concentrations of 0.284 mg/kg and 0.414 mg/kg, respectively. Concentrations decreased with depth at location 33-01059 and decreased downgradient. The lateral and vertical extent of 1-methylnaphthalene and 2-methylnaphthalene are defined.

Naphthalene was detected in six samples with a maximum concentration of 1.09 mg/kg. Concentrations decreased with depth at locations 33-01055, 33-01059, 33-60612, and 33-60613 and decreased downgradient. The lateral and vertical extent of naphthalene are defined.

Radionuclides

Radionuclide COPCs at SWMU 33-004(i) include uranium-235/236.

Uranium-235/236 was detected above the Qbt 2,3,4 BV in one sample at an activity of 0.12 pCi/g. Activities increased with depth at location 33-60612 and decreased downgradient. The residential SAL was approximately 350 times the maximum activity. The 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 are defined or no further sampling for extent is warranted at SWMU 33-004(i) except for lateral extent of Aroclor-1254 and Aroclor-1260 to the north of location 33-60990.

6.8.5 Summary of Human Health Risk Screening

A human health risk-screening assessment was not performed for SWMU 33-004(i) because the nature and extent of contamination have not been defined at this site.

6.8.6 Summary of Ecological Risk Screening

An ecological risk-screening assessment was not performed for SWMU 33-004(i) because the nature and extent of contamination have not been defined at this site.

6.9 SWMU 33-006(a), Firing Site

6.9.1 Site Description and Operational History

SWMU 33-006(a) is an inactive shot pad at South Site where implosion tests were conducted at the southern end of TA-33 (Plate 10). The shot pad is a 50-ft-diameter circular area located immediately north of and next to the roof of structure 33-26, an x-unit chamber (i.e., a control chamber that housed a firing voltage distribution system used for the remote detonation of test firings). The SWMU 33-006(a) shot pad was built in 1948, and the associated support building, known as an x-unit vault (structure 33-26), was constructed in 1950. Implosion tests performed at the shot pad contained up to 5000 lb of HE. Before detonations, wooden boxes covered the assemblages. Use of the site ceased in 1956, and structure 33-26 has remained vacant since then. The detonations conducted at the SWMU 33-006(a) shot pad scattered debris, shrapnel, and wood fragments over the mesa top of South Site and into Chaquehui Canyon. Shrapnel has been found at distances up to a mile away from the shot pad. The shot pad has not been used since 1955 when implosion testing was discontinued at TA-33. Currently, the pad is covered with up to a foot or more of sand (LANL 1995, 051903, p.58).

6.9.2 Relationship to Other SWMUs

SWMU 33-006(a) is located directly north of SWMU 33-004(j), approximately 425 ft south of the northern SWMU 33-007(b) gun site and SWMU 33-008(a), approximately 325 ft southwest of SWMU 33-010(h), and approximately 250 ft southwest of SWMU 33-014. SWMU 33-006(a) is located approximately 225 ft north of SWMU 33-010(g), approximately 250 ft east of SWMU 33-011(c) and 250 ft north of SWMU 33-010(c), and approximately 300 ft northwest of MDA E (Plate 2).

6.9.3 Summary of Previous Investigations

During the 1994 Phase I RFI conducted at the SWMU 33-006(a) shot pad and surrounding area, 46 surface soil samples were collected from 42 randomly selected locations across the site. In addition, 11 surface soil samples were collected from 10 locations in the drainage that receives runoff from the site. Samples were submitted for analysis of TAL metals, PCBs, pesticides, herbicides, gamma-emitting radionuclides, and HE. Data from the 1994 Phase I RFI are screening-level data and showed numerous inorganic chemicals detected above BVs; several detected HE; and cesium-137, plutonium-238, plutonium-239/240, and tritium activities detected or detected above FVs. These data were not used to evaluate the nature and extent of contamination and are not discussed further in this report.

An interim action (IA) was performed at SWMU 33-006(a) in 1996 to remove contaminated debris within a half-mile radius from the SWMU 33-006(a) shot pad and to prevent the off-site migration from Chaquehui Canyon to the Rio Grande. Firing site shrapnel and debris were removed from mesa-top areas and drainages along the southern rim of Chaquehui Canyon within Bandelier National Monument, from drainage channels along the northern rim of Chaquehui Canyon, and from the canyon bottom. A total of 1261 lb of debris was removed during the IA. Of the total, 770 lb was radioactively contaminated. For waste management purposes, all the debris was screened with an x-ray fluorescence detector to determine whether hazardous metals were present. A total of 20 lb of the debris contained lead and was handled as hazardous waste. Approximately 20 lb of the debris contained lead, was radioactively contaminated, and was handled as mixed waste. The remaining 451 lb of debris was considered nonhazardous and nonradioactive waste and was recycled.

In 1996, eight surface samples (0 to 0.5 ft) were collected from eight locations that had been sampled previously during the 1994 Phase I RFI at SWMU 33-006(a) because holding times for the HE analyses had been missed. The eight samples were submitted for analysis of HE. Two organic chemicals, 1,3-dinitrobenzene and 1,3,5-trinitrobenzene, were detected (1.5 mg/kg and 1.9 mg/kg, respectively) in one sample (0333-96-0588) from sampling location 33-01448 in SWMU 33-007(b), directly south of building 33-25. Since 1996, the entire area south of building 33-25 (including former sampling location 33-01448) has been significantly disturbed by the installation of new utilities for the complete renovation of building 33-25. This area was investigated as part of the characterization of SWMU 33-007(b). Although the 1996 data are of decision-level quality, the sampling depths and locations and analytical suites were not sufficient to define the extent of contamination. In addition, the 1996 data may not be representative of current conditions because of disturbance to the site. As a result, the 1996 data were not used to evaluate the nature and extent of contamination and are not discussed further in this report.

During the 2019–2020 investigation, a total of 20 samples were collected from 10 locations within and around the former shot pad. At each location, samples were collected at the surface and from the subsurface. All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, nitrate, perchlorate, VOCs, SVOCs, explosive compounds, isotopic uranium, isotopic plutonium, tritium, and gamma-emitting radionuclides. In addition, 6 samples were analyzed for PCBs.

Residual surface debris was removed from SWMU 33-006(a) during the 2019–2020 investigation. A total of 38 pieces of firing site debris was observed, flagged, removed, containerized, and characterized for disposal. Each location was screened for radioactivity, VOCs, and HE (Appendix E, on DVD included with this document). Per the approved investigation work plan, Revision 1 (LANL 2010, 111298.9; NMED 2011, 201242), the locations with detected HE will be excavated and confirmation samples will be collected from 2 depths in the bottom of the excavation.

6.9.4 Site Contamination

6.9.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at SWMU 33-006(a). As a result, the following activities were completed as part of the 2021 investigation.

- Corrective actions at SWMU 33-006(a) to address potential unacceptable ecological risk were performed by removing soil with elevated copper and di-n-butylphthalate concentrations at location 33-60415 (Plate 10). Soil was removed to 3.0 ft bgs. The maximum detected concentration of di-n-butylphthalate occurred in the 2.0–3.0-ft sample. Two samples were collected at location 33-60415 from the depth intervals of 4.0–5.0 ft and 7.0–8.0 ft bgs to define the vertical extent of di-n-butylphthalate. Samples were analyzed at an off-site fixed laboratory for copper and di-n-butylphthalate.
- Sixteen samples were collected from four new locations, 33-61068, 33-61069, 33-61070, and 33-61071 placed 5 ft upgradient, downgradient, east, and west of existing location 33-60415, to define the vertical and lateral extent of copper and di-n-butylphthalate. Samples were collected from the depth intervals of 0.0–1.0 ft and 2.0–3.0 ft bgs and 0.0–1.0 ft and 2.0–3.0 ft into tuff. Samples were analyzed at an off-site fixed laboratory for copper and di-n-butylphthalate.
- Soil with elevated copper concentrations was removed at locations 33-60416, 33-60417, and 33-60423 (Plate 10). At locations 33-60416 and 33-60417, soil was removed to 2.0 ft bgs. Copper concentrations decreased with depth at these locations from 0.0–1.0 ft to 2.0–3.0 ft bgs. At location 33-60423, soil was removed to 2.25 ft bgs, where the copper concentration of 6610 mg/kg occurred. Three samples were collected from existing location 33-60423 to define vertical extent of copper. Samples were collected from the depth intervals of 3.0–4.0, 5.0–6.0, and 6.0–7.0 ft bgs and analyzed at an off-site fixed laboratory for copper.
- Twelve samples were collected from four new locations, 33-61072, 33-61073, 33-61074, and 33-61075 placed 5 ft upgradient, downgradient, east, and west of existing location 33-60416, to define the vertical and lateral extent of copper. Samples were collected from the depth intervals of 0.0–1.0 ft bgs and 0.0–1.0 ft and 2.0–3.0 ft into tuff. Samples were analyzed at an-off-site fixed laboratory for copper.

- Ten samples were collected from four new locations, 33-61076, 33-61077, 33-61078, and 33-61079 placed 5 ft upgradient, downgradient, east, and west of existing location 33-60417, to define the vertical and lateral extent of copper. Samples were collected from the depth intervals of 0.0–0.4 ft bgs at location 33-61076, 0.0–0.2 ft bgs at location 33-61078, and 0.0–1.0 ft and 2.0–3.0 ft into tuff at all four locations. Samples were analyzed at an off-site fixed laboratory for copper.
- Twenty-eight samples were collected from eight new locations, 33-61041, 33-61043, 33-61057, 33-61059, 33-61080, 33-61081, 33-61082, and 33-61083 placed 5 ft and 10 ft upgradient, downgradient, east, and west of existing location 33-60423, to define the vertical and lateral extent of copper. Samples were collected from the depth intervals of 0.0–1.0 ft and 2.0–3.0 ft bgs and 0.0–1.0 ft and 2.0–3.0 ft into tuff. Samples were analyzed at an off-site fixed laboratory for copper.
- Fifteen samples were collected from four new locations, 33-60942, 33-60944, 33-60958, and 33-61060 placed 25 ft upgradient, downgradient, east, and west of existing location 33-60423, to define the vertical and lateral extent of copper. Samples were collected from the depth intervals of 0.0–1.0 ft and 2.0–3.0 ft bgs and 0.0–1.0 ft and 2.0–3.0 ft into tuff. Samples were analyzed at an off-site fixed laboratory for copper.
- Corrective actions to address potential HE contamination were performed by removing soil to 1.0 ft bgs at 11 locations: 33-60945, 33-60946, 33-60947, 33-60948, 33-60949, 33-60950, 33-60951, 33-60952, 33-60953, 33-60954, and 33-60955. These locations were selected based on EnSys immunoassay test kit field-screening results for Royal Demolition Explosive (RDX [hexahydro-1,3,5-trinitro-1,3,5-triazine]) and 2,4,6-trinitrotoluene (TNT) conducted during the 2019–2020 investigation. RDX and/or TNT field-screening concentrations exceeded 2 ppm at these locations. A 1-ft × 1-ft area was excavated at each location and samples were collected at the base of the excavation to define the nature and extent of contamination. A total of 22 samples were collected from the 11 locations. Samples were collected from the depth intervals of 0.0–1.0 ft and 2.0–3.0 ft below the excavation and analyzed at an off-site fixed laboratory for TAL metals, cyanide, nitrate, perchlorate, VOCs, SVOCs, explosive compounds, isotopic uranium, isotopic plutonium, and gamma-emitting radionuclides.
- A total of approximately 4.28 yd^3 of contaminated soil was removed at SMWU 33-006(a) to address potential HE contamination and potential unacceptable ecological risk.

The sampling locations at SWMU 33-006(a) are shown on Plate 10. Table 6.9-1 presents the samples collected and analyses requested for SWMU 33-006(a). The geodetic coordinates of sample locations are presented in Table 3.2-1.

6.9.4.2 Soil, Rock, and Sediment Field Screening Results

During headspace screening for organic vapors at SWMU 33-006(a) a maximum concentration of 2.2 ppm was detected at location 33-60423 from 3.0 to 4.0 ft bgs. For the radiological-screening results, 74 samples exceeded twice the maximum site background levels for alpha-emitting radionuclides and 1 sample exceeded twice the maximum site background levels for beta/gamma-emitting radionuclides. No changes were made to sampling or other activities based on field-screening results. Field-screening results are included in Appendix E (on DVD included with this document).

6.9.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data at SWMU 33-006(a) consist of results from 122 samples (46 soil, 3 sediment, and 73 tuff) collected from 45 locations.

Inorganic Chemicals

A total of 36 samples (16 soil and 20 tuff) were collected and analyzed for TAL metals, cyanide, nitrate, and perchlorate. An additional 84 samples were collected and analyzed for copper. Table 6.9-2 presents the inorganic chemicals detected above BVs and detected inorganic chemicals with no BVs. Plate 11 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was not detected above the Qbt 2,3,4 BV (0.5 mg/kg) but had DLs (0.601 mg/kg and 0.638 mg/kg) above BV in two samples. Antimony is retained as a COPC.

Barium was detected above the Qbt 2,3,4 BV (46 mg/kg) in two tuff samples with a maximum concentration of 123 mg/kg. The quantile and slippage tests indicate barium concentrations in tuff are not statistically different from background (Figure F-43 and Table F-7). Barium is not a COPC.

Calcium was detected above the soil and Qbt 2,3,4 BVs (6120 mg/kg and 2200 mg/kg, respectively) in one soil sample and three tuff samples with a maximum concentration of 33,800 mg/kg. Calcium is retained as a COPC.

Chromium was detected above the Qbt 2,3,4 BV (7.14 mg/kg) in four samples with a maximum concentration of 21.7 mg/kg. The Gehan and quantile tests indicate chromium concentrations in tuff are not statistically different from background (Figure F-44 and Table F-7). Chromium is not a COPC.

Cobalt was detected above the Qbt 2,3,4 BV (3.14 mg/kg) in one sample at a concentration of 3.36 mg/kg. The Gehan and quantile tests indicate cobalt concentrations in tuff are not statistically different from background (Figure F-45 and Table F-7). Cobalt is not a COPC.

Copper was detected above the soil; sediment; and Qbt 2,3,4 BVs (14.7 mg/kg, 11.2 mg/kg, and 4.66 mg/kg, respectively) in 32 soil samples, in 3 sediment samples, and in 43 tuff samples with a maximum concentration of 2660 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in soil are statistically different from background (Figure F-46 and Table F-8). Copper is retained as a COPC.

Lead was detected above the soil BV (22.3 mg/kg) in two samples with a maximum concentration of 36.8 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil are not statistically different from background (Figure F-47 and Table F-8). 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 3820 mg/kg. The Gehan and quantile tests indicate magnesium concentrations in tuff are not statistically different from background (Figure F-48 and Table F-7). Magnesium is not a COPC.

Nickel was detected above the Qbt 2,3,4 BV (6.58 mg/kg) in one sample at a concentration of 7.52 mg/kg. The quantile and slippage tests indicate nickel concentrations in tuff are not statistically different from background (Figure F-49 and Table F-7). Nickel is not a COPC.

Nitrate was detected in 12 samples with a maximum concentration of 1.55 mg/kg. Nitrate is retained as a COPC.

Perchlorate was detected in six samples with a maximum concentration of 0.00247 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the Qbt 2,3,4 BV (0.3 mg/kg) in 20 tuff samples with a maximum concentration of 1.46 mg/kg. 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 58.4 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are not statistically different from background (Figure F-50 and Table F-8). Zinc is not a COPC.

Organic Chemicals

A total of 37 samples (17 soil and 20 tuff) were collected and analyzed for VOCs, SVOCs, and explosive compounds. Additionally, 9 samples (4 soil and 5 tuff) were analyzed for PCBs. Table 6.9-3 presents the detected organic chemicals. Plate 12 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 33-006(a) include acenaphthene, anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; carbazole; chrysene; di-n-butylphthalate; di-n-octylphthalate; dibenz(a,h)anthracene; dibenzofuran; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; 1-methylnaphthalene; 2-methylnaphthalene; naphthalene; phenanthrene; and pyrene. The detected organic chemicals are retained as COPCs.

Radionuclides

A total of 37 samples (17 soil and 20 tuff) were collected and analyzed for isotopic uranium, isotopic plutonium, tritium, and gamma-emitting radionuclides. Table 6.9-4 presents the radionuclides detected or detected above BVs/FVs. Plate 13 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Uranium-234 was detected above the soil and Qbt 2,3,4 BVs (2.59 pCi/g and 1.98 pCi/g, respectively) in six soil samples and three tuff samples with a maximum activity of 49.3 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, respectively) in seven soil samples and six tuff samples with a maximum activity of 3.95 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, respectively) in seven soil samples and three tuff samples with a maximum activity of 52.3 pCi/g. Uranium-238 is retained as a COPC.

6.9.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 33-006(a) are discussed below. The spatial distribution of COPCs was evaluated using the data presented in Tables 6.9-2, 6.9-3, and 6.9-4 and Plates 11, 12, and 13.

Inorganic Chemicals

Inorganic COPCs at SWMU 33-006(a) include antimony, calcium, copper, nitrate, perchlorate, and selenium.

Antimony was not detected above the Qbt 2,3,4 BV but had DLs (0.601 mg/kg and 0.638 mg/kg) above BV in two samples. The residential SSL was approximately 49 times the maximum DL. Further sampling for extent of antimony is not warranted.

Calcium was detected above the soil and Qbt 2,3,4 BVs in one soil sample and three tuff samples with a maximum concentration of 33,800 mg/kg. Concentrations increased with depth at locations 33-60945 and 33-60946, did not change substantially with depth (130 mg/kg) at location 33-60421 (the concentration in the shallow sample at location 33-60421 was 2140 mg/kg and less than the soil BV [Appendix E, Pivot Tables]), decreased with depth at location 33-60414, and decreased laterally. The residential essential nutrient SSL was approximately 385 times the maximum concentration. The lateral extent of calcium is defined and further sampling for vertical extent is not warranted.

Copper was detected above the soil; sediment; and Qbt 2,3,4 BVs in 32 soil samples, in 3 sediment samples, and in 43 tuff samples with a maximum concentration of 2660 mg/kg. Concentrations decreased with depth at all locations. Concentrations decreased laterally around locations 33-60415, 33-60416, 33-60417, and 33-60423 with respect to the concentrations originally present before excavation (897 mg/kg, 1790 mg/kg, 9270 mg/kg, and 6610 mg/kg, respectively), but the lateral extent of substantially elevated copper concentrations around location 33-60423 has not been defined. Concentrations decreased downgradient of the site. The vertical extent of copper is defined and further sampling for lateral extent of copper around locations 33-60415 and 33-60423 is warranted.

Nitrate was detected in 12 samples with a maximum concentration of 1.55 mg/kg. Concentrations increased at location 33-60497, decreased with depth at all other locations, and decreased laterally. The residential SSL was approximately 80,600 times the maximum concentration. The 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 0.00247 mg/kg. Concentrations increased with depth at locations 33-60422, 33-60946, 33-60947, 33-60948, and 33-60949; decreased with depth at location 33-60420; and increased laterally. The residential SSL was approximately 22,200 times the maximum concentration. Further sampling for extent of perchlorate is not warranted.

Selenium was detected above the Qbt 2,3,4 BV in 20 tuff samples with a maximum concentration of 1.46 mg/kg. Concentrations increased with depth at locations 33-60416, 33-60417, 33-60420, 33-60421, 33-60951, and 33-60954; concentrations did not change substantially with depth (0.02 mg/kg to 0.1 mg/kg) at locations 33-60945, 33-60946, 33-60948, 33-60953, and 33-60955; and concentrations decreased with depth at locations 33-60418, 33-60950, and 33-60952 (the concentrations in the shallow samples at locations 33-60418, 33-60945, 33-60946, and 33-60950 were 1.21 mg/kg, 1.16 mg/kg, 1.05 mg/kg, and 1.45 mg/kg, respectively, and less than the soil BV [Appendix E, Pivot Tables]). Concentrations decreased laterally. The residential SSL was approximately 281 times the maximum concentration. The lateral extent of selenium is defined and further sampling for extent of selenium is not warranted.

Organic Chemicals

Organic COPCs at SWMU 33-006(a) include acenaphthene; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; carbazole; chrysene; di-n-butylphthalate; di-n-octylphthalate; dibenz(a,h)anthracene; dibenzofuran; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; 1-methylnaphthalene; 2-methylnaphthalene; naphthalene; phenanthrene; and pyrene.

Acenaphthene was detected in three samples with a maximum concentration of 0.495 mg/kg. Concentrations increased with depth at locations 33-60419 and 33-60947 and decreased laterally. The residential SSL was approximately 7030 times the maximum concentration. The lateral extent of acenaphthene is defined and further sampling for vertical extent is not warranted.

Anthracene, benzo(k)fluoranthene, carbazole, dibenzofuran, fluorene, indeno(1,2,3-cd)pyrene, 1-methylnapthalene, and 2-methylnapthalene were each detected in two samples at maximum concentrations of 0.707 mg/kg, 0.546 mg/kg, 0.388 mg/kg, 0.509 mg/kg, 0.794 mg/kg, 0.536 mg/kg, 0.268 mg/kg, and 0.455 mg/kg, respectively. Concentrations decreased with depth at location 33-60947 and decreased laterally. The lateral and vertical extent of anthracene, benzo(k)fluoranthene, carbazole, dibenzofuran, fluorene, indeno(1,2,3-cd)pyrene, 1-methylnapthalene, and 2-methylnapthalene are defined.

Benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, chrysene, and phenanthrene were each detected in three samples with maximum concentrations of 1.13 mg/kg, 1.3 mg/kg, 0.618 mg/kg, 1.06 mg/kg, and 2.87 mg/kg, respectively. Concentrations decreased with depth at locations 33-60946 and 33-60947 and decreased laterally. The lateral and vertical extent of benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, chrysene, and phenanthrene are defined.

Benzo(b)fluoranthene and fluoranthene were each detected in four samples with maximum concentrations of 1.26 mg/kg and 1.64 mg/kg, respectively. Concentrations decreased with depth at locations 33-60421, 33-60946, and 33-60947 and decreased laterally. The lateral and vertical extent of benzo(b)fluoranthene and fluoranthene are defined.

Benzoic acid was detected in one sample at a concentration of 0.385 mg/kg. Concentrations decreased with depth at location 33-60955 and increased laterally. The residential SSL was approximately 649,000 times the maximum concentration. The vertical extent of benzoic acid is defined and further sampling for lateral extent is not warranted.

Bis(2-ethylhexyl)phthalate was detected in two samples with a maximum concentration of 0.107 mg/kg. Concentrations increased with depth at locations 33-60950 and 33-60951 and decreased laterally. The residential SSL was approximately 3560 times the maximum concentration. The lateral extent of bis(2-ethylhexyl)phthalate is defined and further sampling for vertical extent is not warranted.

Butylbenzylphthalate was detected in one sample at a concentration of 0.0271 mg/kg. Concentrations decreased with depth at location 33-60421 and increased laterally. The residential SSL was approximately 107,000 times the maximum concentration. Vertical extent of butylbenzylphthalate is defined and further sampling for lateral extent is not warranted.

Di-n-butylphthalate was detected in seven samples with a maximum concentration of 0.524 mg/kg. Concentrations decreased with depth at locations 33-60414, 33-60418, 33-60419, 33-60420, and 33-61071 and decreased laterally. The lateral and vertical extent of di-n-butylphthalate are defined.

Di-n-octylphthalate was detected in one sample at a concentration of 0.0406 mg/kg. Concentrations increased with depth at location 33-60950 and decreased laterally. The residential SSL was approximately 15,500 times the maximum concentration. The lateral extent of di-n-octylphthalate is defined and further sampling for vertical extent is not warranted.

Dibenz(a,h)anthracene was detected in one sample at a concentration of 0.0523 mg/kg. Concentrations increased with depth at location 33-60947 and decreased laterally. The residential SSL was approximately 2.9 times and the industrial SSL was approximately 62 times the maximum concentration. The lateral extent of dibenz(a,h)anthracene is defined and further sampling for vertical extent is not warranted.

Isopropyltoluene[4-] was detected in one sample at a concentration of 0.00108 mg/kg. Concentrations decreased with depth at location 33-60950 and decreased laterally. The lateral and vertical extent of 4-isopropyltoluene are defined.

Naphthalene was detected in two samples with a maximum concentration of 1.67 mg/kg. Concentrations decreased with depth at locations 33-60947 and 33-60948 and decreased laterally. The lateral and vertical extent of naphthalene are defined.

Pyrene was detected in five samples with a maximum concentration of 2.18 mg/kg. Concentrations decreased with depth at locations 33-60421, 33-60946, 33-60947, and 33-60950 and increased laterally. The residential SSL was approximately 798 times the maximum concentration. Further sampling for extent of pyrene is not warranted.

Radionuclides

Radionuclide COPCs at SWMU 33-006(a) include uranium-234, uranium-235/236, and uranium-238.

Uranium-234 was detected above the soil and Qbt 2,3,4 BVs in six soil samples and three tuff samples with a maximum activity of 49.3 pCi/g. Activities increased with depth at location 33-60948, decreased with depth at all other locations, and decreased laterally. The residential SAL was approximately 124 times the maximum activity where vertical extent is not defined (2.33 pCi/g at location 33-60948). The lateral extent of uranium-234 is defined and further sampling for vertical extent is not warranted.

Uranium-235/236 was detected above the soil and Qbt 2,3,4 BVs in seven soil samples and in six tuff samples with a maximum activity of 3.95 pCi/g. Activities increased with depth at locations 33-60420 and 33-60948, decreased with depth at all other locations, and decreased laterally. The residential SAL was approximately 215 times the maximum activity where vertical extent is not defined (0.195 pCi/g at location 33-60420). The lateral extent of uranium-235/236 is defined and further sampling for vertical extent is not warranted.

Uranium-238 was detected above the soil and Qbt 2,3,4 BVs in seven soil samples and three tuff samples with a maximum activity of 52.3 pCi/g. Activities increased with depth at location 33-60948, decreased with depth at all other locations, and decreased laterally. The residential SAL was approximately 61 times the maximum activity where vertical extent is not defined (2.44 pCi/g at location 33-60948). The lateral extent of uranium-238 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 are defined or no further sampling for extent is warranted at SWMU 33-006(a) except for lateral extent of copper around locations 33-60415 and 33-60423.

6.9.5 Summary of Human Health Risk Screening

A human health risk-screening assessment was not performed for SWMU 33-006(a) because the nature and extent of contamination have not been defined at this site.

6.9.6 Summary of Ecological Risk Screening

An ecological risk-screening assessment was not performed for SWMU 33-006(a) because the nature and extent of contamination have not been defined at this site.

6.10 SWMU 33-007(c), Firing Sites

6.10.1 Site Description and Operational History

SWMU 33-007(c) consists of two abandoned gun firing areas associated with the initiator tests conducted at Area 6 in the west-central portion of TA-33 (Figure 6.10-1). The first gun firing area included a gun building (former structure 33-16), a gun mount (structure 33-64), and an earthen berm (structure 33-60). Structure 33-16 was completed in 1949 and housed an air gun, and then electronic equipment, to measure neutron production in “gun-type” initiators containing beryllium and polonium-210. Gun sizes with bore diameters ranging from 4-in. to 8-in. fired projectiles into berms where two 6-ft × 6-ft catcher boxes constructed of wood timbers were embedded in the north end of berm structure 33-60. Each catcher box contained soil, wood chips, and vermiculite. The second gun firing area included a large gun (structure 33-65), a hillside embankment (structure 33-61), and two barricades (structures 33-62 and 33-72) located north and east of the gun.

One concrete firing pad was located immediately west of structure 33-16, on which a large bore gun was mounted. The pad measured 6 ft × 10 ft and was surrounded by a concrete apron. The other two concrete firing pads were located in a level area excavated into a basaltic cinder cone approximately 100 ft southwest of structure 33-16. Two wooden barricades constructed of 8-in. × 8-in. timbers are located north and east of the shot pads. This area was used to test nuclear gun mockups. A 4-in. to 5-in. bore gun was used to fire projectiles into the back of the excavation. The back of the excavation currently extends about 75 ft farther back than when the site was used (Hoard 1991, 009734). The two catcher boxes were located approximately 20 ft south of structure 33-16 and measured approximately 6 ft × 6 ft, were constructed of timber, and were filled with soil, wood chips, and vermiculite. Guns with a 2-in. to 5-in. bore diameter were placed on the concrete pads and used to fire projectiles containing test assemblies into targets placed in front of the catcher boxes. Materials used in the projectiles included beryllium, polonium-210, uranium, copper, lead, tungsten, and stainless steel (Hoard 1991, 009733). The projectiles frequently cracked open, contaminating the pads and surrounding area with polonium-210. Contaminated areas on the guns and pads were painted with lead-based paint to fix surface contamination (LANL 1992, 007671, p. 3-42).

A 1951 memorandum describes a test at Area 6 that resulted in a release of radioactive material from a projectile. The site was cleaned up using a bulldozer to scrape away the contaminated soil and embankment (Buckland 1951, 007845). A 1954 memorandum describes decontamination of one of the Area 6 gun barrels. The memorandum describes removing loose material and leaving impregnated spots as high as 1 million counts per minute. Contaminated surface soil was bulldozed from the shot area into the adjacent canyon (LASL 1954, 107465). Shots were discontinued at Area 6 by 1955. In 1956, structure 33-16 was used to make and machine laminating materials containing barium, titanium, lead, and zinc using epoxy resins. An exhaust blower and stack were installed along with an emissions stack. The buildings in Area 6 have been vacant since the late 1950s. The cinder cone has been further excavated. Currently, an aluminum tower (structure 33-192) is used for atmospheric physics monitoring within the excavated portion of the cinder cone.

6.10.2 Relationship to Other SWMUs

The southwest former gun site at SWMU 33-007(c) is located approximately 35 ft east of SWMU 33-009, and the northeast former gun site is located approximately 75 ft northeast of SWMU 33-009. SWMU 33-004(g) is located on the northwest side of structure 33-16, a component of SWMU 33-007(c), and SWMU 33-004(d) is located approximately 70 ft east of the northeast former gun site at SWMU 33-007(c) (Plate 2).

6.10.3 Summary of Previous Investigations

During the 1993 Phase I RFI conducted at SWMU 33-007(c), 14 samples were collected from 14 locations around the firing areas (LANL 1992, 007671). Samples were submitted for analysis of TAL metals, herbicides, pesticides, PCBs, HE, total uranium, and gamma-emitting radionuclides. Data from the 1993 Phase I RFI are screening-level data and showed numerous detected inorganic chemicals above BVs and detected organic chemicals (Aroclor-1254; Aroclor-1260; and 2,4-dichlorophenoxyacetic acid). No radionuclides were detected or detected above BVs/FVs. These data were not used to evaluate the nature and extent of contamination.

In 1994, additional RFI activities were conducted at SWMU 33-007(c), including trenching through the catcher box area. Chunks of uranium and several experimental devices were discovered. No external radiation was measured from the experimental devices. Eight soil samples were collected from six locations within the trench, and one additional soil sample was collected next to the trench. Samples were submitted for analysis of TAL metals, total uranium, and isotopic uranium. Data from the 1994 Phase I RFI are screening-level data and showed inorganic chemicals detected above BVs and uranium isotope activities detected above BVs. These data were not used to evaluate the nature and extent of contamination. RFI sampling locations were subsequently excavated during the 1996 voluntary corrective action (VCA) described below.

During the 1995 IA conducted at SWMU 33-007(c), the site was stabilized to prevent migration of the contamination identified during the RFI (LANL 1996, 052919). A high-density polyethylene cover was placed over the catcher boxes to prevent run-on and runoff of precipitation. Additionally, the culvert west of structure 33-16 was dammed with sandbags. No samples were collected during the 1995 IA.

In April and May 1996, a pilot test of the segmented gate system (SGS) and containerized vat leach (CVL) system was conducted using soil in the catcher boxes. The SGS unit was used to radiologically screen the soil in the catcher boxes and separate radioactively contaminated soil and debris from soil and debris meeting dose-based cleanup levels. The CVL was then used to treat the contaminated soil by leaching uranium from the soil. Approximately 200 yd^3 of soil was removed from the catcher boxes and processed. A total of 56 experimental projectiles weighing 1720 lb total were discovered as the soil was screened before it was placed in the SGS. These projectiles were disposed of off-site.

In 1996, a VCA plan for SWMU 33-007(c) was prepared in conjunction with the pilot test (LANL 1996, 054906). The objective of the VCA was to verify the effectiveness of the SGS and CVL processes for remediating uranium-contaminated soil. The VCA plan also included developing cleanup levels for uranium-contaminated soil.

During the 1996 VCA implemented at SWMU 33-007(c), the clean soil separated using the SGS was sampled to determine whether it met the dose-based cleanup levels (114 pCi/g for uranium-234, 72 pCi/g for uranium-235, and 116 pCi/g for uranium-238) (LANL 1996, 062541). Thirteen samples were collected from the stockpile of clean soil processed through the SGS. An additional eight confirmation samples were collected from eight locations in the bottoms and sides of the catcher-box excavations. All samples were submitted for analysis of isotopic uranium. After sampling confirmed the clean soil met the dose-based cleanup levels for isotopic uranium, the soil was returned to the site. The projectiles previously placed into storage were characterized and disposed of as LLW. Data from the 1996 VCA confirmation samples collected from the bottoms and sides of the catcher-box excavations meet data-validation standards and are decision-level data included in this report.

During the 2019–2020 investigation, a total of 7 samples were collected from 3 locations within the footprint of the former catcher boxes to determine nature and extent. Samples were collected at the surface at each location and from 2 subsurface intervals at 2 locations. A total of 12 samples were collected from 4 locations around the former catcher boxes to determine extent. At each location, samples were collected from the surface and from 2 subsurface depths. A total of 18 samples were collected from 6 locations at previous RFI locations within and around the cinder cone to determine extent. At each location samples were collected from the surface and 2 subsurface depths. All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, perchlorate, nitrate, VOCs, SVOCs, explosive compounds, and isotopic uranium. In addition, 22 samples were analyzed for PCBs.

6.10.4 Site Contamination

6.10.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at SWMU 33-007(c). As a result, the following activities were completed as part of the 2021 investigation.

- Six samples were collected from existing locations 33-60541, 33-60543, and 33-60547 to define vertical extent of cobalt. Samples were collected from depth intervals of 6.0–7.0 ft and 8.0–9.0 ft bgs at locations 33-60541 and 33-60547 and from depth intervals of 9.0–10.0 ft and 11.0–12.0 ft bgs at location 33-60543 and analyzed at an off-site fixed laboratory for cobalt.
- Six samples were collected from existing locations 33-60541, 33-60544, and 33-60545 to define vertical extent of PCBs. Samples were collected from the depth intervals of 2.0–3.0 and 4.0–5.0 ft bgs at each location and analyzed at an off-site fixed laboratory for PCBs. No additional samples were collected at location 33-60542.

The sampling locations at SWMU 33-007(c) are shown in Figure 6.10-1. Table 6.10-1 presents the samples collected and analyses requested for SWMU 33-007(c). The geodetic coordinates of sample locations are presented in Table 3.2-1.

6.10.4.2 Soil, Rock, and Sediment Field Screening Results

During headspace screening for organic vapors at SWMU 33-007(c) a maximum concentration of 0.3 ppm was detected at location 33-60541 from 6.0 to 7.0 ft bgs. For the radiological-screening results, seven samples exceeded twice the maximum site background levels for alpha-emitting radionuclides and no samples exceeded twice the maximum site background levels for beta/gamma-emitting radionuclides. No changes were made to sampling or other activities based on field-screening results. Field-screening results are included in Appendix E (on DVD included with this document).

6.10.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data at SWMU 33-007(c) consist of results from 49 samples (21 basalt and 28 soil) collected from 13 locations.

Inorganic Chemicals

A total of 37 samples (13 basalt and 24 soil) were collected and analyzed for TAL metals, cyanide, perchlorate, and nitrate and 6 basalt samples were analyzed for cobalt only. Table 6.10-2 presents the inorganic chemicals above BVs and the detected inorganic chemicals with no BVs. Plate 14 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

A total of 19 samples were collected in the media Tertiary Cerros Basalt (TCB). There is currently not a published BV for this media code. However, the material that was sampled is described as unconsolidated cinder cone or basaltic pumice material. All inorganic chemicals were not presumed to be COPCs; instead, the results of the background comparisons and statistical tests were reviewed and the soil background data, soil site data, and TCB site data were compared to identify the inorganic chemicals that appear to be elevated above the soil background data set. The soil background data was used because all of the samples collected at SWMU 33-007(c) were either soil/fill or TCB; no tuff samples were collected. Therefore, TCB results were compared with soil background data so that all results from SWMU 33-007(c) would be compared with the same background data, thereby helping determine if TCB results appeared elevated compared with soil results.

Aluminum was detected in 13 TCB samples with a maximum concentration of 21,000 mg/kg. The maximum concentration is less than the soil BV for aluminum (29,200 mg/kg), and TCB concentrations are similar to or less than soil concentrations. Aluminum is not a COPC.

Antimony was detected above the soil BV (0.83 mg/kg) in 4 soil samples with a maximum concentration of 7.58 mg/kg and was not detected but had DLs (0.919 mg/kg to 2.53 mg/kg) above BV in 10 soil samples. The quantile and slippage tests indicated site concentrations of antimony in soil are statistically different from background (Figure F-51 and Table F-9). Antimony is retained as a COPC.

Arsenic was detected in 12 TCB samples with a maximum concentration of 3.63 mg/kg. The maximum concentration is less than the soil BV for arsenic (8.17 mg/kg), and TCB concentrations are similar to or less than soil concentrations. Arsenic is not a COPC.

Barium was detected in 13 TCB samples and above the soil BV (295 mg/kg) in 2 soil samples with a maximum concentration of 454 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in soil are not statistically different from background (Figure F-52 and Table F-9). The maximum concentration in TCB (454 mg/kg) is greater than the soil BV, but all other concentrations in TCB are similar to or less than site concentrations in soil, which are not statistically different from background. Barium is not a COPC.

Beryllium was detected in 13 TCB samples with a maximum concentration of 1.46 mg/kg. The maximum concentration is less than the soil BV for beryllium (1.83 mg/kg), and TCB concentrations are similar to or less than soil concentrations. Beryllium is not a COPC.

Cadmium was detected in three TCB samples and detected above the soil BV (0.4 mg/kg) in one soil sample with a maximum concentration of 0.816 mg/kg. Cadmium was not detected but had a DL (0.538 mg/kg) above BV in one soil sample. The detected cadmium concentration in soil (0.409 mg/kg) was only 0.09 mg/kg above the BV, and the DL in the soil sample was only 0.138 mg/kg above the BV. Only one cadmium result in TCB was greater than the soil BV, and this result was less than the two highest concentrations in the soil background data set (2.6 mg/kg and 1.4 mg/kg) and less than the three highest DLs in the background data set (all 2 mg/kg). Cadmium is not a COPC.

Calcium was detected in 13 TCB samples and above the soil BV (6120 mg/kg) in 8 soil samples with a maximum concentration of 81,800 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in soil are statistically different from background (Figure F-53 and Table F-9). Calcium is retained as a COPC.

Chromium was detected in 13 TCB samples and above the soil BV (19.3 mg/kg) in 3 soil samples with a maximum concentration of 39.5 mg/kg. The Gehan and slippage tests indicated site concentrations of chromium in soil are not statistically different from background (Figure F-54 and Table F-9). The maximum concentration in TCB is greater than the soil BV but similar to or less than site concentrations in soil, which are not statistically different from background. Chromium is not a COPC.

Cobalt was detected in 19 TCB samples and above the soil BV (8.64 mg/kg) in 5 soil samples with a maximum concentration of 225 mg/kg. The Gehan and quantile tests indicated site concentrations of cobalt in soil are not statistically different from background (Figure F-55 and Table F-9). However, cobalt concentrations in TCB were greater than the soil BV. Also, the TCB concentration distribution is different from the soil and soil background distributions, and most TCB concentrations are greater than the maximum soil BV. Cobalt is retained as a COPC.

Copper was detected in 13 TCB samples and above the soil BV (14.7 mg/kg) in 13 soil samples with a maximum concentration of 50.1 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in soil are statistically different from background (Figure F-56 and Table F-9). Copper is retained as a COPC.

Iron was detected in 13 TCB samples and above the soil BV (21,500 mg/kg) in 2 soil samples with a maximum concentration of 25,600 mg/kg. The Gehan and quantile tests indicated site concentrations of iron in soil are not statistically different from background (Figure F-57 and Table F-9). However, the concentration distribution of the TCB data is elevated compared with soil and soil background even though the range of detected concentrations is similar. Iron is retained as a COPC.

Lead was detected in nine TCB samples and above the soil BV (22.3 mg/kg) in one soil sample with a maximum concentration of 26.5 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil are not statistically different from background (Figure F-58 and Table F-9). The maximum concentration in TCB is greater than the soil BV but similar to or less than site concentrations in soil, which are not statistically different from background. Lead is not a COPC.

Magnesium was detected in 13 TCB samples and above the soil BV (4610 mg/kg) in 8 soil samples with a maximum concentration of 22,700 mg/kg. The Gehan and quantile tests indicated site concentrations of magnesium in soil are statistically different from background (Figure F-59 and Table F-9). Magnesium is retained as a COPC.

Manganese was detected in 13 TCB samples with a maximum concentration of 408 mg/kg. The maximum concentration is less than the soil BV (671 mg/kg) for manganese, and TCB concentrations are similar to or less than soil concentrations. Manganese is not a COPC.

Mercury was detected in seven TCB samples and above the soil BV (0.1 mg/kg) in four soil samples with a maximum concentration of 0.174 mg/kg. Mercury is retained as a COPC.

Nickel was detected in 13 TCB samples and above the soil BV (15.4 mg/kg) in 18 soil samples with a maximum concentration of 84 mg/kg. The Gehan and quantile tests indicated site concentrations of nickel in soil are statistically different from background (Figure F-60 and Table F-9). Nickel is retained as a COPC.

Nitrate was detected in 23 samples with a maximum concentration of 112 mg/kg. Nitrate is retained as a COPC.

Perchlorate was detected in six samples with a maximum concentration of 0.0117 mg/kg. Perchlorate is retained as a COPC.

Potassium was detected in 13 TCB samples with a maximum concentration of 2830 mg/kg. The maximum concentration is less than the soil BV for potassium (3460 mg/kg), and TCB concentrations are similar to or less than soil concentrations. Potassium is not a COPC.

Selenium was detected in 13 TCB samples and above the soil BV (1.52 mg/kg) in 5 soil samples with a maximum concentration of 1.71 mg/kg. The Gehan and quantile tests indicated site concentrations of selenium in soil are statistically different from background (Figure F-61 and Table F-9). Selenium is retained as a COPC.

Silver was detected in four TCB samples with a maximum concentration of 18.5 mg/kg. Although silver was not detected in soil above the BV (1 mg/kg), silver was detected substantially above the soil BV in three TCB samples at concentrations ranging from 10.3 to 18.5 mg/kg. Silver is retained as a COPC.

Sodium was detected in 13 TCB samples with a maximum concentration of 4750 mg/kg. Although sodium was not detected in soil above the BV (915 mg/kg), the distribution of sodium concentrations in TCB is different from the soil and soil background distributions, and 3 detected concentrations in TCB are above the maximum soil background concentrations. Sodium is retained as a COPC.

Thallium was detected in two TCB samples with a maximum concentration of 0.192 mg/kg. The maximum concentration is less than the soil BV for thallium (0.73 mg/kg), and TCB concentrations are similar to or less than soil concentrations. Thallium is not a COPC.

Vanadium was detected in 13 TCB samples and above the soil BV (39.6 mg/kg) in 1 soil sample with a maximum concentration of 44.2 mg/kg. The Gehan and quantile tests indicated site concentrations of vanadium in soil are not statistically different from background (Figure F-62 and Table F-9). The maximum concentration in TCB (39.1 mg/kg) is less than the soil BV and less than site concentrations in soil, which are not statistically different from background. Vanadium is not a COPC.

Zinc was detected in 13 TCB samples with a maximum concentration of 36.7 mg/kg. The detected concentrations are less than the soil BV (48.8 mg/kg) for zinc, and TCB concentrations are similar to or less than soil concentrations. Zinc is not a COPC.

Organic Chemicals

A total of 37 samples (13 basalt and 24 soil) were collected and analyzed for explosive compounds, VOCs and SVOCs; and 28 samples (11 basalt and 17 soil) were analyzed for PCBs. Table 6.10-3 presents the detected organic chemicals. Plate 15 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 33-007(c) include acetone; Aroclor-1254; Aroclor-1260; benzene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; chrysene; diethylphthalate; di-n-butylphthalate; 2,4-dinitrotoluene; 2-hexanone; isophorone; methylene chloride; 1-methylnaphthalene; 2-methylnaphthalene; naphthalene; RDX; toluene; trichloroethene (TCE); and 1,3-xylene+1,4-xylene. The detected organic chemicals are retained as COPCs.

Radionuclides

A total of 37 samples (13 basalt and 24 soil) were collected and analyzed for isotopic uranium. Table 6.10-4 presents the radionuclides detected or detected above BVs/FVs. Plate 16 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Uranium-234 was detected in 13 TCB samples and above the soil BV (2.59 pCi/g) in 9 soil samples with a maximum activity of 6.82 pCi/g. Uranium-234 is retained as a COPC.

Uranium-235/236 was detected in four TCB samples and above the soil BV (0.2 pCi/g) in seven soil samples with a maximum activity of 0.452 pCi/g. Uranium-235/236 is retained as a COPC.

Uranium-238 was detected in 13 TCB samples and above the soil BV (2.29 pCi/g) in 10 soil samples with a maximum activity of 6.93 pCi/g. Uranium-238 is retained as a COPC.

6.10.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 33-007(c) are discussed below. The spatial distribution of COPCs was evaluated using the data presented in Tables 6.10-2, 6.10-3, and 6.10-4 and Plates 14, 15, and 16.

Inorganic Chemicals

Inorganic COPCs at SWMU 33-007(c) include antimony, calcium, cobalt, copper, iron, magnesium, mercury, nickel, nitrate, perchlorate, selenium, silver, and sodium.

Antimony was detected above the soil BV in 4 soil samples with a maximum concentration of 7.58 mg/kg and was not detected but had DLs (0.919 mg/kg to 2.53 mg/kg) above BV in 10 soil samples. Concentrations increased with depth at location 33-60546; decreased with depth at locations 33-60541, 33-60543, and 33-60547; and increased laterally. The residential SSL was approximately 4.1 times and the industrial SSL was approximately 68 times the maximum concentration, and the residential SSL was approximately 12 times the maximum DL. Further sampling for extent of antimony is not warranted.

Calcium was detected in 13 TCB samples and above the soil BV in 8 soil samples with a maximum concentration of 81,800 mg/kg. Concentrations increased with depth at locations 33-01203, 33-01204, 33-01206, and 33-01211; decreased with depth at locations 33-01212, 33-60541, 33-60543, 33-60544, 33-60546, and 33-60547; and increased laterally. The residential essential nutrient SSL was approximately 159 times the maximum concentration. Further sampling for extent of calcium is not warranted.

Cobalt was detected in 19 TCB samples and above the soil BV in 5 soil samples with a maximum concentration of 225 mg/kg. Concentrations increased with depth at locations 33-01203, 33-01211, and 33-01212; decreased with depth at locations 33-01199, 33-01204, 33-01206, 33-60541, 33-60543, and 33-60547; and decreased laterally. The residential SSL was approximately 1.8 times and the industrial SSL was approximately 29 times the maximum concentration where vertical extent is not defined (13.2 mg/kg at location 33-01203). The lateral extent of cobalt is defined and further sampling for vertical extent is not warranted.

Copper was detected in 13 TCB samples and above the soil BV in 13 soil samples with a maximum concentration of 50.1 mg/kg. Concentrations increased with depth at locations 33-01203, 33-01204, 33-01212, and 33-60541; did not change substantially with depth (0.2 mg/kg) at location 33-01199; decreased with depth at locations 33-01206, 33-01211, 33-60543, 33-60544, 33-60545, 33-60546, and 33-60547; and decreased laterally. The residential SSL was approximately 62 times the maximum concentration. The lateral extent of copper is defined and further sampling for vertical extent is not warranted.

Iron was detected in 13 TCB samples and above the soil BV in 2 soil samples with a maximum concentration of 25,600 mg/kg. Concentrations increased with depth at locations 33-01203, 33-01211, 33-01212, 33-60541, and 33-60547; decreased with depth at locations 33-01204, 33-01206, 33-60543, and 33-60544 (the concentrations in the surface sample at locations 33-60543 and 33-60544 were 11,800 mg/kg and 9330 mg/kg, respectively and below the soil BV [Appendix E, Pivot Tables]); and increased laterally. The residential SSL was approximately 2.1 times and the industrial SSL was approximately 35 times the maximum concentration. Further sampling for extent of iron is not warranted.

Magnesium was detected in 13 TCB samples and above the soil BV in 8 soil samples with a maximum concentration of 22,700 mg/kg. Concentrations increased with depth at locations 33-01203, 33-01204, 33-01211, 33-01212, 33-60541, 33-60543, 33-60544, 33-60546, and 33-60547; decreased with depth at locations 33-01199 and 33-01206; and increased laterally. The residential essential nutrient SSL was approximately 687 times the maximum concentration. Further sampling for extent of magnesium is not warranted.

Mercury was detected in seven TCB samples and above the soil BV in four soil samples with a maximum concentration of 0.174 mg/kg. Concentrations did not change substantially with depth (0.0001 mg/kg) at location 33-01206; decreased with depth at locations 33-01203, 33-01204, 33-60541, 33-60544, 33-60546, and 33-60547; and increased laterally. The residential SSL was approximately 135 times the maximum concentration. Further sampling for extent of mercury is not warranted.

Nickel was detected in 13 TCB samples and above the soil BV in 18 soil samples with a maximum concentration of 84 mg/kg. Concentrations increased with depth at location 33-60541, only one depth was sampled at location 33-60542, concentrations did not change substantially with depth (1.1 mg/kg) at location 33-60543, concentrations decreased with depth at all other locations, and concentrations decreased laterally. The residential SSL was approximately 19 times the maximum concentration. The lateral extent of nickel is defined and further sampling for vertical extent is not warranted.

Nitrate was detected in 23 samples with a maximum concentration of 112 mg/kg. Concentrations increased with depth at locations 33-01203, 33-60543, 33-60544, and 33-60546; only one depth was sampled at location 33-60542; concentrations did not change substantially with depth (0.01 mg/kg) at location 33-60545; concentrations decreased with depth at all other locations; and concentrations increased laterally. The residential SSL was approximately 1120 times the maximum concentration. Further sampling for extent of nitrate is not warranted.

Perchlorate was detected in six samples with a maximum concentration of 0.0117 mg/kg. Concentrations increased with depth at locations 33-01204, 33-01206, and 33-60546; decreased with depth at location 33-01211; and increased laterally. The residential SSL was approximately 4680 times the maximum concentration. Further sampling for extent of perchlorate is not warranted.

Selenium was detected in 13 TCB samples and above the soil BV in 5 soil samples with a maximum concentration of 1.71 mg/kg. Concentrations decreased with depth at all locations (the concentrations in shallow samples at locations 33-01211 and 33-60541 were 0.816 mg/kg and 1.29 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]) and increased laterally. The residential SSL was approximately 229 times the maximum concentration. Further sampling for extent of selenium is not warranted.

Silver was detected in four TCB samples with a maximum concentration of 18.5 mg/kg. Concentrations increased with depth at locations 33-01211, 33-60541, 33-60543, and 33-60547 and decreased laterally. The residential SSL was approximately 21 times the maximum concentration. The lateral extent of silver is defined and further sampling for vertical extent is not warranted.

Sodium was detected in 13 TCB samples with a maximum concentration of 4750 mg/kg. Concentrations increased with depth at locations 33-01203, 33-01204, 33-01206, 33-01211, 33-01212, 33-60541, 33-60543, 33-60544, and 33-60547 and increased laterally. The residential essential nutrient SSL was approximately 1650 times the maximum concentration. Further sampling for extent of sodium is not warranted.

Organic Chemicals

Organic COPCs at SWMU 33-007(c) include acetone; Aroclor-1254; Aroclor-1260; benzene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; chrysene; diethylphthalate; di-n-butylphthalate; 2,4-dinitrotoluene; 2-hexanone; isophorone; methylene chloride; 1-methylnaphthalene; 2-methylnaphthalene; naphthalene; RDX; toluene; TCE; and 1,3-xylene+1,4-xylene.

Acetone was detected in one sample at a concentration of 0.00656 mg/kg. Concentrations increased with depth at location 33-01212 and decreased laterally. The residential SSL was approximately 10,100,000 times the maximum concentration. The lateral extent of acetone is defined and further sampling for vertical extent is not warranted.

Aroclor-1254 was detected in 13 samples with a maximum concentration of 1.18 mg/kg. Only one depth was sampled at location 33-60542 because of concrete refusal; concentrations decreased with depth at locations 33-01199, 33-01203, 33-01206, 33-01211, 33-01212, 33-60541, 33-60544, and 33-60545; and concentrations increased laterally. Vertical extent at location 33-60542 is defined by decreasing concentrations in deeper samples from adjacent locations 33-60541 and 33-60544. The residential SSL was approximately 7 times and the industrial SSL was approximately 67 times the maximum concentration where vertical extent is not defined (0.164 mg/kg at location 33-60542). Further sampling for lateral and vertical extent of Aroclor-1254 is not warranted.

Aroclor-1260 was detected in 10 samples with a maximum concentration of 0.292 mg/kg. Only one depth was sampled at location 33-60542; concentrations decreased with depth at locations 33-01199, 33-01203, 33-01211, 33-01212, 33-60541, 33-60544, and 33-60545; and concentrations increased laterally. The residential SSL was approximately 8.3 times and the industrial SSL was approximately 38 times the maximum concentration. Further sampling for lateral and vertical extent of Aroclor-1260 is not warranted.

Benzene was detected in one sample at a concentration of 0.000727 mg/kg. Concentrations decreased with depth at location 33-60546 and increased laterally. The residential SSL was approximately 24,500 times the maximum concentration. The vertical extent of benzene is defined and further sampling for lateral extent is not warranted.

Benzo(a)pyrene and 1,3-xylene+1,4-xylene were each detected in one sample at concentrations of 0.014 mg/kg and 0.000806 mg/kg, respectively. Concentrations decreased with depth at location 33-60541 and decreased laterally. The lateral and vertical extent of benzo(a)pyrene and 1,3-xylene+1,4-xylene are defined.

Benzo(b)fluoranthene and benzo(g,h,i)perylene were each detected in two samples with maximum concentrations of 0.0535 mg/kg and 0.108 mg/kg, respectively. Concentrations decreased with depth at locations 33-60541 and 33-60543 and decreased laterally. The lateral and vertical extent of benzo(b)fluoranthene and benzo(g,h,i)perylene are defined.

Benzo(k)fluoranthene and chrysene were each detected in one sample at concentrations of 0.0292 mg/kg and 0.0358 mg/kg, respectively. Concentrations increased with depth at location 33-01212 and decreased laterally. The residential SSLs were approximately 524 times and 4270 times the maximum concentrations, respectively. The lateral extent of benzo(k)fluoranthene and chrysene is defined and further sampling for vertical extent is not warranted.

Bis(2-ethylhexyl)phthalate was detected in six samples with a maximum concentration of 0.085 mg/kg. Concentrations increased with depth at locations 33-01204, 33-60543, and 33-60547; decreased with depth at location 33-60541; and increased laterally. The residential SSL was approximately 4470 times the maximum concentration. Further sampling for extent of bis(2-ethylhexyl)phthalate is not warranted.

Diethylphthalate was detected in two samples with a maximum concentration of 0.0262 mg/kg. Concentrations decreased with depth at location 33-60547 and increased laterally. The residential SSL was approximately 1,880,000 times the maximum concentration. The vertical extent of diethylphthalate is defined and further sampling for lateral extent is not warranted.

Di-n-butylphthalate was detected in eight samples with a maximum concentration of 1 mg/kg. Concentrations increased with depth at locations 33-60543 and 33-60545; decreased with depth at locations 33-60544, 33-60546, and 33-60547; and increased laterally. The residential SSL was approximately 6160 times the maximum concentration. Further sampling for extent of di-n-butylphthalate is not warranted.

Dinitrotoluene[2,4-] and methylene chloride were each detected in one sample with maximum concentrations of 1.88 mg/kg and 0.00256 mg/kg, respectively. Concentrations decreased with depth at location 33-60547 and increased laterally. The residential SSL for 2,4-dinitrotolune was approximately 9 times and the industrial SSL was approximately 44 times the maximum concentration. The residential SSL for methylene chloride was approximately 160,000 times the maximum concentration. The vertical extent of 2,4-dinitrotoluene and methylene chloride is defined and further sampling for lateral extent is not warranted.

Hexanone[2-] was detected in two samples with a maximum concentration of 0.157 mg/kg. Concentrations increased with depth at locations 33-01211 and 33-01212 and decreased laterally. The residential SSL was approximately 1270 times the maximum concentration. The lateral extent of 2-hexanone is defined and further sampling for vertical extent is not warranted.

Isophorone was detected in three samples with a maximum concentration of 0.287 mg/kg. Concentrations increased with depth at location 33-60545, decreased with depth at location 33-60547, and increased laterally. The residential SSL was approximately 19,500 times the maximum concentration. Further sampling for lateral and vertical extent of isophorone is not warranted.

Methylnaphthalene[1-], 2-methylnaphthalene, naphthalene, and TCE were each detected in one sample at concentrations of 0.0149 mg/kg, 0.0213 mg/kg, 0.0181 mg/kg, and 0.000484 mg/kg, respectively. Concentrations decreased with depth at location 33-60546 and increased laterally. The residential SSLs were approximately 2740 times to 14,000 times the maximum concentrations. The vertical extent of 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, and TCE is defined and further sampling for lateral extent is not warranted.

RDX was detected in one sample at a concentration of 0.182 mg/kg. Concentrations increased with depth at location 33-60543 and decreased laterally. The residential SSL was approximately 457 times the maximum concentration. The lateral extent of RDX is defined and further sampling for vertical extent is not warranted.

Toluene was detected in eight samples with a maximum concentration of 0.00458 mg/kg. Concentrations decreased with depth at locations 33-01203, 33-01204, 33-01206, 33-01211, 33-60544, and 33-60546 and increased laterally. The residential SSL was approximately 1,140,000 times the maximum concentration. The vertical extent of toluene is defined and further sampling for lateral extent is not warranted.

Radionuclides

Radionuclide COPCs at SWMU 33-007(c) include uranium-234, uranium-235/236, and uranium-238.

Uranium-234 was detected in 13 TCB samples and above the soil BV in 9 soil samples with a maximum activity of 6.82 pCi/g. Activities increased with depth at locations 33-01204, 33-01206, and 33-01212; only one depth was sampled at location 33-60542; activities did not change substantially with depth (0.16 pCi/g) at location 33-01203; activities decreased with depth at all other locations; and activities increased laterally. The residential SAL was approximately 43 times the maximum activity. Further sampling for extent of uranium-234 is not warranted.

Uranium-235/236 was detected in four TCB samples and above the soil BV in seven soil samples with a maximum activity of 0.452 pCi/g. Activities increased with depth at location 33-01212; only one depth was sampled at location 33-60542; activities decreased with depth at locations 33-60541, 33-60543, 33-60544, 33-60545, 33-60546, and 33-60547; and activities decreased laterally. The residential SAL was approximately 93 times the maximum activity. The lateral extent of uranium-235/236 is defined and further sampling for vertical extent is not warranted.

Uranium-238 was detected in 13 TCB samples and above the soil BV in 10 soil samples with a maximum activity of 6.93 pCi/g. Activities increased with depth at locations 33-01204 and 33-01206, only one depth was sampled at location 33-60542, activities did not change substantially with depth (0.05 pCi/g and 0.08 pCi/g) at locations 33-01203 and 33-01212, activities decreased with depth at all other locations, and activities increased laterally. The residential SAL was approximately 22 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 are defined or no further sampling for extent is warranted at SWMU 33-007(c).

6.10.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess chemical cancer risk for the industrial scenario is 1×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The industrial HI is 0.1, which is less than the NMED target HI of 1. Radionuclide exposure point concentrations (EPCs) were less than SALs and the total estimated dose is 0.3 mrem/yr.

Construction Worker Scenario

The total excess chemical cancer risk for the construction worker scenario is 7×10^{-7}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 1, which is equivalent to the NMED target HI of 1. Radionuclide EPCs were less than SALs and the total estimated dose is 0.3 mrem/yr.

Residential Scenario

The total excess chemical cancer risk for the residential scenario is 3×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The residential HI is 2, which is greater than the NMED target HI of 1. Radionuclide EPCs were less than SALs and the total estimated dose is 1 mrem/yr.

Based on the risk-screening assessment results, there is no potential unacceptable chemical cancer risk, noncarcinogenic hazard, or dose for the industrial or construction worker scenarios at SWMU 33-007(c). However, there is a potential unacceptable noncarcinogenic hazard for the residential scenario, but no unacceptable cancer risk or dose.

6.10.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and multiple lines of evidence, no potential unacceptable ecological risk exists for SWMU 33-007(c).

6.11 SWMU 33-008(c), Landfill

6.11.1 Site Description and Operational History

SWMU 33-008(c) is a former surface disposal area located east of Main Site buildings 33-39 and 33-113 outside of the Main Site security fence (Figure 6.11-1). This former disposal site consists of two areas: one near a culvert outfall directly east of building 33-39 where glass bottles and other debris were discovered and the other consisting of surface debris situated north of the culvert. The culvert receives storm water runoff from the Main Site and is located in a drainage channel that leads to a tributary of Chaquehui Canyon. Debris observed at the site included machined metal turnings, cables, glass bottles, and general trash on the ground surface and in the channel downstream of the culvert. The outlines of a possible trenched area are visible in aerial photographs from 1958 (USAF 1958, 015987). A small asphalt pad is located at the west end of the northern area and a partially full bottle was present on the ground surface. In 1999, a best management practice (BMP) was performed at the site, during which all visible debris was removed from the watercourse (LANL 2000, 068748, p. 5). Residual debris was removed from SWMU 33-008(c) during the 2019–2020 investigation.

6.11.2 Relationship to Other SWMUs

SWMU 33-008(c) is located directly east of SWMUs 33-004(a), 33-004(i), 33-015, and 33-017 and AOC C-33-001 and is approximately 200 ft north of SWMUs 33-002(c) and 33-002(d) (Plate 2).

6.11.3 Summary of Previous Investigations

During the 1996 Phase I RFI implemented at SWMU 33-008(c), geophysical surveys using metal detection and electromagnetic induction were conducted at the suspected fill areas. Survey results showed the presence of shallow metallic debris but did not indicate the presence of a landfill or buried debris (LANL 1996, 054963, p. 8). Survey results for the trench area did not identify geophysical anomalies. A total of 21 samples were collected from 13 locations in the surface debris areas and the drainage channel, at the culvert, and 40 ft downgradient of the culvert. The samples were submitted for analysis of TAL metals, cyanide, SVOCs, VOCs, and total uranium (LANL 1996, 054963, p. 6). Data from the 1996 Phase I RFI meet data-validation standards and are decision-level data included in this report.

During the 1999 BMP performed at SWMU 33-008(c), all visible debris was removed from surface disposal area and from the watercourse (LANL 2000, 068748, p. 5). A partially full 55-gal. drum of debris was removed from the area. Two sediment catchments were constructed within the drainage below the culvert to prevent migration of contaminated sediments. The first catchment was constructed 15 ft below the culvert, and the second was constructed 200 ft below the culvert.

During the 2019–2020 investigation, a total of 12 samples were collected from 6 locations—2 former RFI sample locations and 4 new locations at deeper depths—to determine extent. At each location, samples were collected from the surface and from the subsurface. A total of 30 samples were collected from 6 former RFI sample locations and from 4 new locations, downgradient of the area, in order to determine extent. At each location, samples were collected from the surface and from the subsurface. All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, VOCs, SVOCs, isotopic uranium, isotopic plutonium, tritium, and gamma-emitting radionuclides. In addition, 8 samples were analyzed for PCBs. Residual debris was removed from SWMU 33-008(c) during the 2019–2020 investigation.

6.11.4 Site Contamination

6.11.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at SWMU 33-008(c). As a result, the following activities were completed as part of the 2021 investigation.

- Three samples were collected from existing location 33-01671 to define the vertical extent of antimony, copper, lead, and zinc. Samples were collected from depth intervals 1.8–2.8 ft bgs, 3.8–4.8 ft bgs, and 5.0–6.0 ft bgs and analyzed at an off-site fixed laboratory for antimony, copper, lead, and zinc.
- Two samples were also collected from existing location 33-01671 to define the vertical extent of PAHs. Samples were collected from depth intervals 3.0–4.0 ft bgs and 5.0–6.0 ft bgs and analyzed at an off-site fixed laboratory for PAHs.

- Fifteen samples were collected from existing locations 33-01672, 33-01679, 33-01680, 33-01681, 33-01682, 33-01684, and 33-60676 to define the vertical extent of PCBs. Samples at locations 33-01672, 33-01679, 33-01684, and 33-60676 were collected from depth intervals 4.0–5.0 ft and 6.0–7.0 ft bgs. Samples from locations 33-01680, 33-01681, and 33-01682 were collected from depth intervals 6.0–7.0 ft and 9.0–10.0 ft bgs. All samples were analyzed at an off-site fixed laboratory for PCBs.
- Corrective actions at SWMU 33-008(c) to address potential unacceptable human health and ecological risks were performed by removing soil with elevated chromium, copper, lead, mercury, zinc, and PAH concentrations at locations 33-01671, 33-01673, 33-01674, 33-01680, 33-01681, 33-01682, and 33-01684.
- A total of 72 samples were collected from 24 locations around the perimeter of the excavation to define the vertical and lateral extent of chromium, copper, lead, mercury, zinc, and PAHs at locations 33-01671, 33-01673, 33-01674, 33-01680, 33-01681, 33-01682, and 33-01684. Samples were collected from the depth intervals of 0.0–1.0 ft, 5.0–6.0 ft, and 9.0–10.0 ft bgs, corresponding to the depth intervals sampled previously at this site. Samples were analyzed at an off-site analytical laboratory for chromium, copper, lead, mercury, and zinc, and PAHs.
- Two samples were collected from existing locations 33-01673 and 33-01674 to define vertical extent of copper, lead, and zinc. Samples were collected from depth interval 2.0–3.0 ft bgs at each location and analyzed at an off-site analytical laboratory for copper, lead, and zinc.
- Soil with elevated copper, lead, mercury, zinc, and PAH concentrations was removed at location 33-01681 to 6.0 ft bgs (Figure 6.11-1). No confirmation samples were required at location 33-01681 because the vertical extent of contamination was defined by deeper samples previously collected at this location.
- Soil with elevated copper, lead, and zinc concentrations was removed at location 33-01684 to 3.0 ft bgs (Figure 6.11-1). No confirmation samples were required at location 33-01684 because the vertical extent of contamination was defined by deeper samples previously collected at this location.
- Soil with elevated chromium, copper, lead, mercury, zinc, and PAH concentrations was removed at location 33-01680 to 6.0 ft bgs (Figure 6.11-1). Two samples were collected from existing location 33-01680 to define the vertical extent of chromium, copper, lead, mercury, zinc, and PAHs. Samples were collected from depth intervals 6.0–7.0 ft bgs and 9.0–10.0 ft bgs and analyzed at an off-site fixed laboratory for chromium, copper, lead, mercury, zinc, and PAHs.
- Soil with elevated copper, lead, and zinc concentrations was removed at location 33-01672 to 3.0 ft bgs. Twelve samples were collected from four new locations, 33-61968, 33-61969, 33-61970, and 33-61971, and placed 2 ft north, south, east, and west of existing location 33-01672 to define the vertical and lateral extent of copper, lead, and zinc. Samples were collected from depth intervals 0.0–1.0 ft, 5.0–6.0 ft, and 9.0–10.0 ft bgs, corresponding to the depth intervals sampled previously at location 33-01672. Samples were analyzed for copper, lead, and zinc.
- Soil with elevated copper, lead, and zinc concentrations was removed at location 33-01685 to the top of the tuff (Figure 6.11-1). No confirmation samples were required at location 33-01685 because the vertical extent of contamination was defined by deeper samples previously collected at this location. Twelve samples were collected from four new locations, 33-61972, 33-61973, 33-61975, and 33-61976, and placed 3 ft north, south, east, and west of existing location 33-01685 to define the vertical and lateral extent of copper, lead, and zinc. Samples were collected from the depth intervals of 0.0–1.0 ft, 2.0–3.0 ft, and 5.0–6.0 ft bgs and analyzed at an off-site analytical laboratory for copper, lead, and zinc.

- Approximately 67 yd^3 of contaminated soil and 4 yd^3 of buried landfill debris was removed at SWMU 33-008(c) to address potential unacceptable human health risk and ecological risk.

The sampling locations at SWMU 33-008(c) are shown in Figure 6.11-1. Table 6.11-1 presents the samples collected and analyses requested for SWMU 33-008(c). The geodetic coordinates of sample locations are presented in Table 3.2-1.

6.11.4.2 Soil, Rock, and Sediment Field Screening Results

During headspace screening for organic vapors at SWMU 33-008(c) a maximum concentration of 2.5 ppm was detected at location 33-012681 from 2.0 to 3.0 ft bgs. For the radiological-screening results, no samples exceeded twice the maximum site background levels for alpha-emitting radionuclides and seven samples exceeded twice the maximum site background levels for beta/gamma-emitting radionuclides. No changes were made to sampling or other activities based on field-screening results. Field-screening results are included in Appendix E (on DVD included with this document).

6.11.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data at SWMU 33-008(c) consist of results from 154 samples (92 tuff, 61 soil, and 1 sediment) collected from 51 locations.

Inorganic Chemicals

A total of 41 samples (24 tuff, 16 soil, and 1 sediment) were collected and analyzed for TAL metals; 39 samples (22 tuff, 16 soil, and 1 sediment) were analyzed for cyanide; 99 samples (56 tuff and 43 soil) were analyzed for antimony, chromium, copper, lead, mercury, and/or zinc only; and 5 samples (1 tuff and 4 soil) were analyzed for uranium only. Table 6.11-2 presents the inorganic chemicals above BVs and the detected inorganic chemicals with no BVs. Plate 17 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 0.906 mg/kg and was not detected but had DLs (0.533 mg/kg to 5.9 mg/kg) above the soil BV (0.83 mg/kg) and Qbt 2,3,4 BV in three soil samples and seven tuff samples. Antimony is retained as a COPC.

Barium was detected above the Qbt 2,3,4 BV (46 mg/kg) in one sample at a concentration of 62.6 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in tuff are not statistically different from background (Figure F-63 and Table F-10). Barium is not a COPC.

Beryllium was detected above the Qbt 2,3,4 BV (1.21 mg/kg) in one sample at a concentration of 1.33 mg/kg. The Gehan and quantile tests indicated site concentrations of beryllium in tuff are not statistically different from background (Figure F-64 and Table F-10). Beryllium is not a COPC.

Cadmium was detected above the soil BV (0.4 mg/kg) in 1 sample at a concentration of 0.401 mg/kg and was not detected but had DLs (0.71 mg/kg and 0.74 mg/kg) above the BV in 2 samples. The detected concentration was only 0.001 mg/kg above BV and was less than the 3 highest concentrations in the background data set (2.6 mg/kg, 1.4 mg/kg, and 0.6 mg/kg). The DLs were less than the 3 highest DLs in the background data set (2 mg/kg, 2 mg/kg, and 2 mg/kg). Cadmium was not detected or detected above background in 36 other samples (detected below BV in 11 samples). Cadmium is not a COPC.

Calcium was detected above the Qbt 2,3,4 BV (2200 mg/kg) in five tuff samples with a maximum concentration of 7310 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in tuff are not statistically different from background (Figure F-65 and Table F-10). Calcium is not a COPC.

Chromium was detected above the soil; sediment; and Qbt 2,3,4 BVs (19.3 mg/kg, 10.5 mg/kg, and 7.14 mg/kg, respectively) in 3 soil samples, 1 sediment sample, and 20 tuff samples with a maximum concentration of 180 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in tuff are statistically different from background (Figure F-66 and Table F-10). Chromium is retained as a COPC.

Cobalt was detected above the sediment BV (4.73 mg/kg) in one sediment sample at a concentration of 5.45 mg/kg. Cobalt is retained as a COPC.

Copper was detected above the soil and Qbt 2,3,4 BVs (14.7 mg/kg and 4.66 mg/kg, respectively) in 31 soil samples and 46 tuff samples with a maximum concentration of 6320 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in soil and tuff are statistically different from background (Figure F-67 and Table F-11, and Figure F-68 and Table F-10, respectively). Copper is retained as a COPC.

Lead was detected above the soil and Qbt 2,3,4 BVs (22.3 mg/kg and 11.2 mg/kg, respectively) in 18 soil samples and 20 tuff samples with a maximum concentration of 1310 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil are statistically different from background (Figure F-69 and Table F-11) and the quantile and slippage tests indicated site concentrations of lead in tuff are statistically different from background (Figure F-70 and Table F-10). Lead is retained as a COPC.

Magnesium was detected above the Qbt 2,3,4 BV (1690 mg/kg) in one sample at a concentration of 2060 mg/kg. The quantile and slippage tests indicated site concentrations of magnesium in tuff are not statistically different from background (Figure F-71 and Table F-10). Magnesium is not a COPC.

Mercury was detected above the soil and Qbt 2,3,4 BVs (0.1 mg/kg for each) in 21 soil samples and 9 tuff samples with a maximum concentration of 16.2 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 23.5 mg/kg. The quantile and slippage tests indicated site concentrations of nickel in tuff are not statistically different from background (Figure F-72 and Table F-10). Nickel is not a COPC.

Selenium was detected above the sediment and Qbt 2,3,4 BVs (0.3 mg/kg for each) in 1 sediment sample and 21 tuff samples with a maximum concentration of 1.19 mg/kg and was not detected but had a DL (0.39 mg/kg) above BV in 1 tuff sample. Selenium is retained as a COPC.

Silver was detected above the soil BV (1 mg/kg) in one sample at a concentration of 4.53 mg/kg and was not detected but had DLs (1.04 mg/kg to 1.17 mg/kg) above the soil BV and Qbt 2,3,4 BV (1 mg/kg) in four soil samples and two tuff samples. Silver is retained as a COPC.

Thallium was not detected above the soil BV (0.73 mg/kg) but had DLs (0.76 mg/kg and 0.81 mg/kg) above BV in two soil samples. The quantile and slippage tests indicated site concentrations of thallium in soil are not statistically different from background (Figure F-73 and Table F-11). Thallium is not a COPC.

Uranium was detected above the soil BV (1.82 mg/kg) in four soil samples with a maximum concentration of 3.22 mg/kg. Uranium is retained as a COPC.

Vanadium was detected above the sediment BV (19.7 mg/kg) in one sample at a concentration of 24.1 mg/kg. Vanadium is retained as a COPC.

Zinc was detected above the soil and Qbt 2,3,4 BVs (48.8 mg/kg and 63.5 mg/kg, respectively) in 30 soil samples and 13 tuff samples with a maximum concentration of 3220 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are statistically different from background (Figure F-74 and Table F-11). Zinc is retained as a COPC.

Organic Chemicals

A total of 39 samples (22 tuff, 16 soil, and 1 sediment) were collected and analyzed for SVOCs, 36 samples (22 tuff, 13 soil, and 1 sediment) were analyzed for VOCs, 18 samples (14 tuff and 4 soil) were analyzed for PCBs, and 72 samples (37 tuff and 35 soil) were analyzed for PAHs. Table 6.11-3 presents the detected organic chemicals. Plate 18 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 33-008(c) include acenaphthene; acenaphthylene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; 2-chloronaphthalene; chrysene; dibenz(a,h)anthracene; dibenzofuran; di-n-butylphthalate; di-n-octylphthalate; fluoranthene; fluorene; 2-hexanone; indeno(1,2,3-cd)pyrene; 1-methylnaphthalene; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; pyridine; styrene; tetrachloroethene; toluene; TCE; and xylene (total). The detected organic chemicals are retained as COPCs.

Radionuclides

A total of 34 samples (21 tuff, 12 soil, and 1 sediment) were collected and analyzed for isotopic uranium, isotopic plutonium, tritium, and gamma-emitting radionuclides. Table 6.11-4 presents the radionuclides detected or detected above BVs/FVs. Plate 19 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Uranium-235/236 was detected above the Qbt 2,3,4 BV (0.09 pCi/g) in three samples with a maximum activity of 0.21 pCi/g. Uranium-235/236 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 SWMU 33-008(c) are discussed below. The spatial distribution of COPCs was evaluated using the data presented in Tables 6.11-2, 6.11-3, and 6.11-4 and Plates 17, 18, and 19.

Inorganic Chemicals

Inorganic COPCs at SWMU 33-008(c) include antimony, chromium, cobalt, copper, lead, mercury, selenium, silver, uranium, vanadium, and zinc.

Antimony was detected above the Qbt 2,3,4 BV in one sample at a concentration of 0.906 mg/kg and was not detected but had DLs (0.533 mg/kg to 5.9 mg/kg) above the soil BV and Qbt 2,3,4 BV in three soil samples and seven tuff samples. Concentrations increased with depth at location 33-60677 and increased laterally. The residential SSL was approximately 35 times the maximum concentration. The residential SSL was approximately 5.3 times and the industrial SSL was approximately 88 times the maximum DL. Further sampling for extent of antimony is not warranted.

Chromium was detected above the soil; sediment; and Qbt 2,3,4 BVs in 3 soil samples, 1 sediment samples, and 20 tuff samples with a maximum concentration of 180 mg/kg. Concentrations increased with depth at locations 33-01670, 33-60676, 33-60677, 33-60678, and 33-60679; did not change substantially with depth (0.4 mg/kg) at location 33-60681; and decreased with depth at all other locations (concentrations at locations 33-01681 and 33-01682 decreased with respect to shallow samples that were excavated [Appendix E, Excavated Samples]). Concentrations decreased laterally from the maximum concentration at location 33-01680 that was excavated (2790 mg/kg). As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with the residential SSL for trivalent chromium (117,000 mg/kg). The residential trivalent chromium SSL was approximately 650 times the maximum concentration. The lateral extent of chromium is defined and further sampling for vertical extent is not warranted.

Cobalt was detected above the sediment BV in one sediment sample at a concentration of 5.45 mg/kg. Concentrations decreased with depth at location 33-60681 and decreased laterally. The lateral and vertical extent of cobalt are defined.

Copper was detected above the soil and Qbt 2,3,4 BVs in 31 soil samples and 46 tuff samples with a maximum concentration of 6320 mg/kg. Concentrations decreased with depth at all locations (concentrations at locations 33-01673, 33-01674, 33-01681, 33-01682, and 33-01684 decreased with respect to shallow samples that were excavated [Appendix E, Excavated Samples]). Concentrations decreased laterally from the maximum concentration at location 33-01680 that was excavated (25,200 mg/kg), but the concentrations in step-out samples at locations 33-61953 and 33-61954 are still greater than the residential SSL and the lateral extent of substantially elevated copper to the northeast of the excavation is not defined. The residential SSL is approximately 608 times the maximum concentration where vertical extent is not defined (5.15 mg/kg at location 33-61982). Further sampling for vertical extent of copper is not warranted, but further sampling for lateral extent north and east of locations 33-61953 and 33-61954 is warranted.

Lead was detected above the soil and Qbt 2,3,4 BVs in 18 soil samples and 20 tuff samples with a maximum concentration of 1310 mg/kg. Concentrations increased with depth at location 33-61962 and decreased with depth at all other locations (concentrations at locations 33-01673, 33-01674, 33-01681, and 33-01682 decreased with respect to shallow samples that were excavated [Appendix E, Excavated Samples]). Concentrations decreased laterally from the maximum concentration at location 33-01680 that was excavated (2040 mg/kg), but the concentrations in step-out samples at locations 33-61953 and 33-61962 are still greater than the residential and industrial SSLs and the lateral extent of substantially elevated lead to the northeast and south of the excavation is not defined. The maximum concentration was approximately 3.3 times the residential SSL and approximately 1.6 times the industrial SSL. Further sampling for vertical extent at location 33-61962 is warranted and further sampling for lateral extent of lead to the north and east of location 33-61953 and to the south of location 33-61962 is warranted.

Mercury was detected above the soil and Qbt 2,3,4 BVs in 21 soil samples and 9 tuff samples with a maximum concentration of 16.2 mg/kg. Concentrations decreased with depth at all locations. Concentrations decreased laterally from the maximum concentration at location 33-01681 that was excavated (5630 mg/kg), but the concentration in a step-out sample at location 33-61954 (16.2 mg/kg) is still similar to the residential SSL and the lateral extent of substantially elevated mercury to the northeast of the excavation is not defined. The vertical extent of mercury is defined, but further sampling for lateral extent north and east of location 33-61954 is warranted.

Selenium was detected above the sediment and Qbt 2,3,4 BVs in 1 sediment sample and 21 tuff samples with a maximum concentration of 1.19 mg/kg and was not detected but had a DL (0.39 mg/kg) above BV in 1 tuff sample. Concentrations increased with depth at locations 33-01670, 33-01679, 33-01685, and

33-60682; did not change substantially with depth (0.029 mg/kg to 0.29 mg/kg) at locations 33-60676, 33-60677, 33-60678, 33-60679, 33-60680, 33-60681, and 33-60683; and decreased with depth at all other locations (the concentrations in the shallow samples at locations 33-60676, 33-60677, 33-60678, and 33-60679 were 1.01 mg/kg, 0.897 mg/kg, 1.05 mg/kg, and 0.937 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables] and concentrations at locations 33-01680, 33-01681, and 33-01684 decreased with respect to shallow samples that were excavated [Appendix E, Excavated Samples]). Concentrations increased laterally. The residential SSL was approximately 329 times the maximum concentration and 1000 times the maximum DL. Further sampling for extent of selenium is not warranted.

Silver was detected above the soil BV in one sample at a concentration of 4.53 mg/kg and was not detected but had DLs (1.04 mg/kg to 1.17 mg/kg) above the soil BV and Qbt 2,3,4 BV in four soil samples and two tuff samples. Concentrations decreased with depth at location 33-01679 and increased laterally. The residential SSL was approximately 86 times the maximum concentration and 334 times the maximum DL. The vertical extent of silver is defined and further sampling for lateral extent is not warranted.

Uranium was detected above the soil BV in four soil samples with a maximum concentration of 3.22 mg/kg. Only one depth was sampled at locations 33-01670 and 33-01675, concentrations decreased with depth at location 33-01679, and concentrations increased laterally. The residential SSL was approximately 73 times the maximum concentration. Further sampling for vertical and lateral extent of uranium is not warranted.

Vanadium was detected above the sediment BV in one sample at a concentration of 24.1 mg/kg. Concentrations decreased with depth at location 33-60681 and increased laterally. The residential SSL was approximately 16 times the maximum concentration. The vertical extent of vanadium is defined and further sampling for lateral extent is not warranted.

Zinc was detected above the soil and Qbt 2,3,4 BVs in 30 soil samples and 13 tuff samples with a maximum concentration of 3220 mg/kg. Concentrations decreased with depth at all locations (concentrations at locations 33-01681 and 33-01682 decreased with respect to shallow samples that were excavated [Appendix E, Excavated Samples]). Concentrations decreased laterally from the maximum concentrations at locations 33-01680 and 33-01681 that were excavated (9440 mg/kg and 12,700 mg/kg, respectively). The lateral and vertical extent of zinc are defined.

Organic Chemicals

Organic COPCs at SWMU 33-008(c) include acenaphthene; acenaphthylene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; 2-chloronaphthalene; chrysene; dibenz(a,h)anthracene; dibenzofuran; di-n-butylphthalate; di-n-octylphthalate; fluoranthene; fluorene; 2-hexanone; indeno(1,2,3-cd)pyrene; 1-methylnaphthalene; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; pyridine; styrene; tetrachloroethene; toluene; TCE; and xylene (total).

Acenaphthene was detected in 36 samples with a maximum concentration of 3.51 mg/kg. Concentrations increased with depth at location 33-61979 and decreased with depth at all other locations (concentrations at location 33-01681 decreased with respect to the shallow sample that was excavated [Appendix E, Excavated Samples]). Concentrations decreased laterally from the maximum concentration at location 33-01681 that was excavated (4.4 mg/kg). The residential SSL was approximately 991 times the maximum concentration. The lateral extent of acenaphthene is defined and further sampling for vertical extent is not warranted.

Acenaphthylene was detected in 12 samples with a maximum concentration of 0.109 mg/kg. Concentrations decreased with depth at all locations and increased laterally. The residential SSL was approximately 16,000 times the maximum concentration. The vertical extent of acenaphthylene is defined and further sampling for lateral extent is not warranted.

Acetone was detected in four samples with a maximum concentration of 0.0066 mg/kg. Concentrations increased with depth at locations 33-01670, 33-01685, 33-60676, and 33-60679 and increased downgradient. The residential SSL was approximately 10,000,000 times the maximum concentration. Further sampling for extent of acetone is not warranted.

Anthracene was detected in 44 samples with a maximum concentration of 6.87 mg/kg. Concentrations increased with depth at location 33-61979 and decreased with depth at all other locations (concentrations at locations 33-01680 and 33-01681 decreased with respect to the shallow samples that were excavated [Appendix E, Excavated Samples]). Concentrations increased laterally. The residential SSL was approximately 2530 times the maximum concentration. Further sampling for extent of anthracene is defined.

Aroclor-1254 was detected in 11 samples with a maximum concentration of 0.0285 mg/kg. Only one depth was sampled at location 33-60677 and concentrations decreased with depth at all other locations (concentrations at locations 33-01672, 33-01680, and 33-01681 decreased with respect to the shallow samples that were excavated [Appendix E, Excavated Samples]). Concentrations decreased laterally. The residential SSL was approximately 40 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 nine samples with a maximum concentration of 0.0241 mg/kg. Concentrations decreased with depth at all locations and decreased laterally. The lateral and vertical extent of Aroclor-1260 are defined.

Benzo(a)anthracene was detected in 61 samples with a maximum concentration of 14.2 mg/kg. Concentrations decreased with depth at all locations (concentrations at locations 33-01671, 33-01672, 33-01680, 33-01681, and 33-01682 decreased with respect to the shallow samples that were excavated [Appendix E, Excavated Samples]). Concentrations increased laterally at locations 33-61956, 33-61957, and 33-61958 and were greater than residential SSLs. The maximum concentration was approximately 9.3 times the residential SSL and the industrial SSL was approximately 2.3 times the maximum concentration. The vertical extent of benzo(a)anthracene is defined but further sampling for lateral extent at locations 33-61956, 33-61957, and 33-61958 is warranted.

Benzo(a)pyrene was detected in 68 samples with a maximum concentration of 20.5 mg/kg. Concentrations decreased with depth at all locations (concentrations at locations 33-01671, 33-01672, 33-01680, 33-01681, and 33-01682 decreased with respect to the shallow samples that were excavated [Appendix E, Excavated Samples]). Concentrations increased laterally at locations 33-61956, 33-61957, and 33-61958 and were greater than residential SSLs. The maximum concentration was approximately 18 times the residential SSL and the industrial SSL was approximately 1.6 times the maximum concentration. The vertical extent of benzo(a)pyrene is defined but further sampling for lateral extent at locations 33-61956, 33-61957, and 33-61958 is warranted.

Benzo(b)fluoranthene was detected in 71 samples with a maximum concentration of 21.1 mg/kg. Only one depth was sampled at locations 33-60676 and 33-61962 and concentrations decreased with depth at all other locations (concentrations at locations 33-01671, 33-01672, 33-01681, and 33-01682 decreased with respect to the shallow samples that were excavated [Appendix E, Excavated Samples]). Concentrations increased laterally at locations 33-61956, 33-61957, and 33-61958 and were greater than residential SSLs. The maximum concentration was approximately 14 times the residential SSL and the industrial SSL was approximately 1.5 times the maximum concentration. Further sampling for extent of benzo(b)fluoranthene is warranted.

Benzo(g,h,i)perylene was detected in 57 samples with a maximum concentration of 13.5 mg/kg. Concentrations decreased with depth at all locations (concentrations at locations 33-01671, 33-01672, 33-01680, 33-01681, and 33-01682 decreased with respect to the shallow samples that were excavated [Appendix E, Excavated Samples]). Concentrations increased laterally at locations 33-61956 and 33-61958. The residential SSL was approximately 129 times the maximum concentration. The vertical extent of benzo(g,h,i)perylene is defined and further sampling for lateral extent is not warranted.

Benzo(k)fluoranthene was detected in 51 samples with a maximum concentration of 7.57 mg/kg. Concentrations decreased with depth at all locations (concentrations at location 33-01681 decreased with respect to the shallow sample that was excavated [Appendix E, Excavated Samples]) and increased laterally at locations 33-61956 and 33-61958. The residential SSL was approximately 2 times and the industrial SSL was approximately 43 times the maximum concentration. The vertical extent of benzo(k)fluoranthene is defined and further sampling for lateral extent is not warranted.

Bis(2-ethylhexyl)phthalate was detected in five samples with a maximum concentration of 1.38 mg/kg. Concentrations increased with depth at location 33-60678; concentrations decreased with depth at locations 33-01672, 33-01681, and 33-60679 (concentrations at location 33-01681 decreased with respect to the shallow sample that was excavated [Appendix E, Excavated Samples]); and concentrations decreased downgradient. The residential SSL was approximately 275 times the maximum concentration. The lateral extent of bis(2-ethylhexyl)phthalate is defined and further sampling for vertical extent is not warranted.

Chloronaphthalene[2-] was detected in one sample at a concentration of 0.0041 mg/kg. Concentrations decreased with depth at location 33-61981 and decreased laterally. The lateral and vertical extent of 2-chloronaphthalene are defined.

Chrysene was detected in 68 samples with a maximum concentration of 15.1 mg/kg. Concentrations increased with depth at location 33-61982, decreased with depth at all other locations (concentrations at locations 33-01672, 33-01681, and 33-01682 decreased with respect to the shallow samples that were excavated [Appendix E, Excavated Samples]), and increased laterally. The residential SSL was approximately 10 times and the industrial SSL was approximately 214 times the maximum concentration. Further sampling for extent of chrysene is not warranted.

Dibenz(a,h)anthracene was detected in 35 samples with a maximum concentration of 4.05 mg/kg. Concentrations decreased with depth at all locations (concentrations at location 33-01681 decreased with respect to the shallow sample that was excavated [Appendix E, Excavated Samples]) and increased laterally at locations 33-61956, 33-61957, and 33-61958, where they were greater than residential SSLs. The vertical extent of dibenz(a,h)anthracene is defined but further sampling for lateral extent is warranted.

Dibenzofuran was detected in one sample at a concentration of 1.37 mg/kg. Concentrations decreased with depth at location 33-01681 (concentrations decreased with respect to the shallow sample that was excavated [Appendix E, Excavated Samples]) and decreased downgradient. The lateral and vertical extent of dibenzofuran are defined.

Di-n-butylphthalate was detected in one sample at a concentration of 0.0113 mg/kg. Concentrations decreased with depth at location 33-01684 (concentrations decreased with respect to the shallow sample that was excavated [Appendix E, Excavated Samples]) and decreased downgradient. The lateral and vertical extent of di-n-butylphthalate are defined.

Di-n-octylphthalate was detected in one sample at a concentration of 0.0218 mg/kg. Concentrations decreased with depth at location 33-01681 (concentrations decreased with respect to the shallow sample that was excavated [Appendix E, Excavated Samples]) and decreased downgradient. The lateral and vertical extent of di-n-octylphthalate are defined.

Fluoranthene was detected in 80 samples with a maximum concentration of 22.8 mg/kg. Only one depth was sampled at location 33-01675. Concentrations decreased with depth at all other locations (concentrations at locations 33-01672, 33-01681, 33-01682, and 33-01684 decreased with respect to the shallow samples that were excavated [Appendix E, Excavated Samples]) and increased laterally at locations 33-61956 and 33-61958. The residential SSL was approximately 102 times the maximum concentration. Further sampling for extent of fluoranthene is not warranted.

Fluorene was detected in 33 samples with a maximum concentration of 3.82 mg/kg. Concentrations increased with depth at location 33-61979, decreased with depth at all other locations (concentrations at location 33-01681 decreased with respect to the shallow sample that was excavated [Appendix E, Excavated Samples]), and increased laterally at locations 33-61956 and 33-61958. The residential SSL was approximately 607 times the maximum concentration. Further sampling for extent of fluorene is not warranted.

Hexanone[2-] was detected in one sample at a concentration of 0.006 mg/kg. Concentrations decreased with depth at location 33-01679 and deceased downgradient. The lateral and vertical extent of 2-hexanone are defined.

Indeno(1,2,3-cd)pyrene was detected in 57 samples with a maximum concentration of 14.6 mg/kg. Concentrations decreased with depth at all locations (concentrations at locations 33-01672, 33-01681, and 33-01682 decreased with respect to the shallow samples that were excavated [Appendix E, Excavated Samples]) and increased laterally at locations 33-61956 and 33-61958, where they were greater than residential SSLs. The vertical extent of indeno(1,2,3-cd)pyrene is defined but further sampling for lateral extent is warranted.

Methylnaphthalene[1-] was detected in 23 samples with a maximum concentration of 1.15 mg/kg. Concentrations decreased with depth at all locations (concentrations at location 33-01681 decreased with respect to the shallow sample that was excavated [Appendix E, Excavated Samples]) and increased laterally. The residential SSL was approximately 150 times the maximum concentration. The vertical extent of 1-methylnaphthalene is defined and further sampling for lateral extent is not warranted.

Methylnaphthalene[2-] was detected in 22 samples with a maximum concentration of 1.62 mg/kg. Concentrations decreased with depth at all locations (concentrations at location 33-01681 decreased with respect to the shallow sample that was excavated [Appendix E, Excavated Samples]) and increased laterally. The residential SSL was approximately 143 times the maximum concentration. The vertical extent of 2-methylnaphthalene is defined and further sampling for lateral extent is not warranted.

Naphthalene was detected in 32 samples with a maximum concentration of 3.74 mg/kg. Concentrations decreased with depth at all locations (concentrations at locations 33-01681 and 33-01684 decreased with respect to the shallow samples that were excavated [Appendix E, Excavated Samples]) and increased laterally. The residential SSL was approximately 13 times the maximum concentration. The vertical extent of naphthalene is defined and further sampling for lateral extent is not warranted.

Phenanthrene was detected in 74 samples with a maximum concentration of 22.9 mg/kg. Concentrations decreased with depth at all locations (concentrations at locations 33-01672, 33-01681, 33-01682, and 33-01684 decreased with respect to the shallow samples that were excavated [Appendix E, Excavated Samples]) and increased laterally. The residential SSL was approximately 76 times the maximum concentration. The vertical extent of phenanthrene is defined and further sampling for lateral extent is not warranted.

Pyrene was detected in 79 samples with a maximum concentration of 20 mg/kg. Only one depth was sampled at location 33-01675, concentrations decreased with depth at all other locations (concentrations at locations 33-01672, 33-01681, and 33-01682 decreased with respect to the shallow samples that were excavated [Appendix E, Excavated Samples]), and concentrations increased laterally. The residential SSL was approximately 87 times the maximum concentration. Further sampling for extent of pyrene is not warranted.

Pyridine was detected in one sample at a concentration of 1.6 mg/kg. Concentrations decreased with depth at location 33-01670 and increased downgradient. The residential SSL was approximately 49 times the maximum concentration. Vertical extent of pyridine is defined and further sampling for lateral extent is not warranted.

Styrene was detected in one sample at a concentration of 0.000683 mg/kg. Concentrations decreased with depth at location 33-01681 (concentrations decreased with respect to the shallow samples that were excavated [Appendix E, Excavated Samples]) and decreased downgradient. The lateral and vertical extent of styrene are defined.

Tetrachloroethene, TCE, and total xylene were each detected in one sample at concentrations of 0.002 mg/kg, 0.002 mg/kg, and 0.002 mg/kg, respectively. Concentrations decreased with depth at location 33-01679 and decreased downgradient. The lateral and vertical extent of tetrachloroethene, TCE, and total xylene are defined.

Toluene was detected in two samples with a maximum concentration of 0.001 mg/kg. Concentrations decreased with depth at locations 33-01679 and 33-60680 and deceased downgradient. The lateral and vertical extent of toluene are defined.

Radionuclides

Radionuclide COPCs at SWMU 33-008(c) include uranium-235/236.

Uranium-235/236 was detected above the Qbt 2,3,4 BV in three samples with a maximum activity of 0.21 pCi/g. Activities increased with depth at location 33-01672, decreased with depth at locations 33-01679 and 33-01680 (activities at location 33-01680 decreased with respect to the shallow samples that were excavated [Appendix E, Excavated Samples]), and decreased downgradient. The residential SAL was approximately 200 times the maximum activity. The 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 are defined or no further sampling for extent is warranted at SWMU 33-008(c) except for vertical extent of lead at location 33-61962; lateral extent of copper north and east of locations 33-61953 and 33-61954; lateral extent of lead north and east of location 33-61953 and south of location 33-61962; lateral extent of mercury north and east of location 33-61954; vertical extent of benzo(b)fluoranthene at locations 33-60676 and 33-61962; lateral extent of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene at locations 33-61956, 33-61957, and 33-61958; and lateral extent of indeno(1,2,3-cd)pyrene at locations 33-61956 and 33-61958.

6.11.5 Summary of Human Health Risk Screening

A human health risk-screening assessment was not performed for SWMU 33-008(c) because the nature and extent of contamination have not been defined at this site.

6.11.6 Summary of Ecological Risk Screening

An ecological risk-screening assessment was not performed for SWMU 33-008(c) because the nature and extent of contamination have not been defined at this site.

6.12 SWMU 33-010(c), Surface Disposal Site

6.12.1 Site Description and Operational History

SWMU 33-010(c) is a former surface disposal area located at South Site on the northern rim of Chaquehui Canyon at the southern end of TA-33 (Figure 6.12-1). The disposal area measured approximately 50 ft long × 30 ft wide × 2-ft to 4-ft deep and was approximately 230 ft south of structure 33-26 [SWMU 33-006(a)] along the western edge of the main South Site drainage channel. From approximately 1950 to 1955, this site was used to dispose of debris from the implosion tests conducted at SWMU 33-006(a). Debris disposed of at the site included copper and aluminum shrapnel, pieces of electronic cable, sand and soil with residual HE, and wood. Between shots, the shot pad and surrounding area were scraped, and the debris was bulldozed over the canyon edge onto the hillside below (LANL 1992, 007671, p. 3-53). During the VCA performed in 1999, all debris and soil was excavated and removed from the site (LANL 2000, 066889). Residual debris was removed from SWMU 33-010(c) during the 2019–2020 investigation.

6.12.2 Relationship to Other SWMUs

SWMU 33-010(c) was located approximately 230 ft south of structure 33-26 [SWMU 33-006(a)] and directly adjacent to the western portion of SWMU 33-010(g) and the drainage downgradient of the SWMU 33-004(j) outfall (Plate 2).

6.12.3 Summary of Previous Investigations

During the 1994 Phase I RFI conducted at SWMU 33-010(c), six surface soil samples (0 to 0.5 ft) were collected from five locations on the face of the disposal pile. Additionally, six sediment samples (0 to 0.5 ft) were collected from five locations in the drainage below the disposal pile as part of the investigation of SWMU 33-006(a) and were used to characterize SWMU 33-010(c) (LANL 1995, 051903, p. 110). Samples were field-screened for radioactivity, organic chemicals, and HE and submitted for analysis of TAL metals, gamma-emitting radionuclides, and HE. Two sediment samples were also submitted for analysis of VOCs. Data from the 1994 Phase I RFI are screening-level data and showed numerous inorganic chemicals detected above BVs, no detected organic chemicals, and no radionuclides detected or detected above BVs/FVs. These data were not used to evaluate the nature and extent of contamination and are not discussed further in this report.

During the 1999 VCA performed at SWMU 33-010(c), all soil within the SWMU was excavated to undisturbed native soil and removed. The VCA used the SGS to separate radioactively contaminated soil and debris from nonradioactive soil and debris. The SGS unit was initially programmed to divert soil and debris with radioactivity above a cleanup criterion of 50 pCi/g at SWMU 33-010(c). Because of the fine, homogeneous nature of the contamination in the soil from this disposal area, the SGS was unable to separate the material efficiently. The SGS was reprogrammed to a target cleanup criterion of 65 pCi/g, and all soils from SWMU 33-010(c) were reprocessed through the SGS unit. A total 289.39 yd^3 of soil and debris was excavated and processed through the SGS. Once the disposal area had been excavated to native soil, the excavated area was surveyed for radioactivity. Areas of radioactivity that exceeded 2 times local background were further excavated and resurveyed to confirm removal. Four surface soil samples (0 to 0.5 ft bgs) and four subsurface samples (2 to 2.5 ft bgs) were collected from four locations within the excavated area. Three surface samples (0 to 0.5 ft bgs) were collected from the drainage located east of the disposal area that empties into Chaquehui Canyon (Figure 6.12-1). Samples were submitted for laboratory analysis of isotopic uranium and TAL metals. Soil removed during the VCA that had radioactivity levels above the cleanup criterion of 65 pCi/g was disposed of at Area G at TA-54. Soil with radioactivity levels below the cleanup criterion was returned to the SWMU boundary. A total 0.58 $yd^3$of soil exceeded the cleanup criterion of 65 pCi/g; the remaining 288.81 yd^3 of excavated soil was below the cleanup criterion and was returned to the SWMU boundary. The returned soil was regraded, compacted, and reseeded with native vegetation (LANL 2000, 066889). Data from the 1999 VCA confirmation samples meet data-validation standards and are decision-level data included in this report.

During the 2019–2020 investigation, a total of 18 samples were collected from 6 locations within and around the remediated portion of the site. At each location, samples were collected at the surface and from 2 subsurface intervals. All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, nitrate, perchlorate, VOCs, SVOCs, explosive compounds, isotopic uranium, isotopic plutonium, tritium, and gamma-emitting radionuclides. In addition, 4 samples were analyzed for PCBs. Residual debris was removed from SWMU 33-010(c) during the 2019–2020 investigation.

6.12.4 Site Contamination

6.12.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at SWMU 33-010(c). As a result, the following activities were completed as part of the 2021 investigation.

- Corrective actions at SWMU 33-0010(c) to address potential unacceptable ecological risk were performed by removing soil with elevated copper, lead, and zinc concentrations at location 33-60474. No confirmation samples were required at location 33-60474 because the vertical extent of contamination was defined by deeper samples previously collected at this location.
- Twelve samples were collected from four new locations, 33-61053, 33-61054, 33-61055, and 33-61056 placed 3 ft north, south, east, and west of existing location 33-60474, to define the vertical and lateral extent of copper, lead, and zinc. Fifteen samples were also collected from location 33-61057 downgradient of the excavation area and four locations upgradient of the excavation area (33-61058, 33-61059, 33-61060, and 33-61061) to define the vertical and lateral extent of copper, lead, and zinc. Samples were collected from the depth intervals of 0.0–1.0 ft, 3.0–4.0 ft, and 6.0–7.0 ft bgs, corresponding to the depth intervals sampled previously at location 33-60474. All samples were analyzed at an off-site analytical laboratory for copper, lead, and zinc.
- Approximately 1 yd^3 of soil with elevated copper, lead, and zinc concentrations was removed from location 33-60474 at SWMU 33-010(c) to address potential unacceptable ecological risk.

The sampling locations at SWMU 33-010(c) are shown in Figure 6.12-1. Table 6.12-1 presents the samples collected and analyses requested for SWMU 33-010(c). The geodetic coordinates of sample locations are presented in Table 3.2-1.

6.12.4.2 Soil, Rock, and Sediment Field Screening Results

During headspace screening for organic vapors at SWMU 33-010(c) a maximum concentration of 1.4.1 ppm was detected at location 33-61056 from 0.0 to 1.0 ft bgs and location 33-60161 from 0.0 to 1.0 ft bgs. For the radiological-screening results, 26 samples exceeded twice the maximum site background levels for alpha-emitting radionuclides and no samples exceeded twice the maximum site background levels for beta/gamma-emitting radionuclides. No changes were made to sampling or other activities based on field-screening results. Field-screening results are included in Appendix E (on DVD included with this document).

6.12.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data at SWMU 33-010(c) consist of results from 52 samples (19 soil, 30 tuff, and 3 sediment) collected from 22 locations.

Inorganic Chemicals

A total of 24 samples (13 soil, 8 tuff and 3 sediment) were collected and analyzed for TAL metals; 17 samples (9 soil and 8 tuff) were analyzed for cyanide, nitrate, and perchlorate; and 28 samples (6 soil and 22 tuff) were analyzed for copper, lead, and zinc only. Table 6.12-2 presents the inorganic chemicals detected above BVs and detected inorganic chemicals with no BVs. Plate 20 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was not detected but had DLs (0.86 mg/kg to 2.24 mg/kg) above the soil BV and Qbt 2,3,4 BV (0.83 mg/kg and 0.5 mg/kg, respectively) in 10 soil samples and 6 tuff samples. Antimony is retained as a COPC.

Barium was detected above the sediment and Qbt 2,3,4 BVs (127 mg/kg and 46 mg/kg, respectively) in one sediment sample and four tuff samples with a maximum concentration of 130 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in tuff are statistically different from background (Figure F-75 and Table F-12). Barium is retained as a COPC.

Beryllium was detected above the Qbt 2,3,4 BV (1.21 mg/kg) in two samples with a maximum concentration of 3.08 mg/kg. The Gehan and quantile tests indicated site concentrations of beryllium in tuff are not statistically different from background (Figure F-76 and Table F-12). Beryllium is not a COPC.

Calcium was detected above the Qbt 2,3,4 BV (2200 mg/kg) in three samples with a maximum concentration of 3610 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in tuff are statistically different from background (Figure F-77 and Table F-12). Calcium is retained as a COPC.

Chromium was detected above the Qbt 2,3,4 BV (7.14 mg/kg) in four samples with a maximum concentration of 45.2 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in tuff are statistically different from background (Figure F-78 and Table F-12). Chromium is retained as a COPC.

Copper was detected above the soil; sediment; and Qbt 2,3,4 BVs (14.7 mg/kg, 11.2 mg/kg, and 4.66 mg/kg, respectively) in 14 soil samples, 3 sediment samples, and 13 tuff samples with a maximum concentration of 2060 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in soil and tuff are statistically different from background (Figure F-79 and Table 13, and Figure F-80 and Table F-12, respectively). Copper is retained as a COPC.

Lead was detected above the soil and Qbt 2,3,4 BVs (22.3 mg/kg and 11.2 mg/kg, respectively) in two soil samples and one tuff sample with a maximum concentration of 32.5 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil are not statistically different from background (Figure F-81 and Table F-13) and the quantile and slippage tests indicated site concentrations of lead in tuff are not statistically different from background (Figure F-82 and Table F-12). 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 1830 mg/kg. The Gehan and quantile tests indicated site concentrations of magnesium in tuff are not statistically different from background (Figure F-83 and Table F-12). Magnesium is not a COPC.

Nickel was detected above the Qbt 2,3,4 BV (6.58 mg/kg) in one sample at a concentration of 8.66 mg/kg. The quantile and slippage tests indicated site concentrations of nickel in tuff are not statistically different from background (Figure F-84 and Table F-12). Nickel is not a COPC.

Nitrate was detected in 14 samples with a maximum concentration of 13.7 mg/kg. Nitrate is retained as a COPC.

Perchlorate was detected in four samples with a maximum concentration of 0.00114 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the soil; sediment; and Qbt 2,3,4 BVs (1.52 mg/kg, 0.3 mg/kg, and 0.3 mg/kg, respectively) in three soil samples, one sediment sample, and eight tuff samples with a maximum concentration of 3.21 mg/kg and was not detected but had DLs (0.44 mg/kg to 0.46 mg/kg) above BV in two sediment samples. The Gehan and quantile tests indicated site concentrations of selenium in soil are statistically different from background (Figure F-85 and Table F-13). Selenium is retained as a COPC.

Silver was detected above the sediment BV (1 mg/kg) in one sample at a concentration of 4.6 mg/kg and was not detected but had DLs (1.02 mg/kg to 1.08 mg/kg) above the soil and Qbt 2,3,4 BVs (1 mg/kg for each) in one soil sample and one tuff sample. Silver is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in four soil samples with a maximum concentration of 645 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are statistically different from background (Figure F-86 and Table F-13). Zinc is retained as a COPC.

Organic Chemicals

A total of 17 samples (9 soil and 8 tuff) were collected and analyzed for VOCs, SVOCs, and explosive compounds. In addition, 4 samples (2 tuff and 2 soil) were collected and analyzed for PCBs. Table 6.12-3 presents the detected organic chemicals. Plate 21 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 33-010(c) include acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; chrysene; dibenz(a,h)anthracene; di-n-butylphthalate; fluoranthene; indeno(1,2,3-cd)pyrene; phenanthrene; pyrene; and 1,2,3-trichlorobenzene. The detected organic chemicals are retained as COPCs.

Radionuclides

A total of 24 samples (13 soil, 8 tuff, and 3 sediment) were collected and analyzed for isotopic uranium, and 17 samples (9 soil and 8 tuff) were analyzed for isotopic plutonium, tritium, and gamma-emitting radionuclides. Table 6.12-4 presents the radionuclides detected or detected above BVs/FVs. Plate 22 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Tritium was detected in two soil samples with a maximum activity of 6.62 pCi/g. Tritium is retained as a COPC.

Uranium-234 was detected above the soil; sediment; and Qbt 2,3,4 BVs (2.59 pCi/g, 2.59 pCi/g, and 1.98 pCi/g, respectively) in nine soil samples, three sediment samples, and one tuff sample with a maximum activity of 17.7 pCi/g. Uranium-234 is retained as a COPC.

Uranium-235/236 was detected above the soil; sediment; and Qbt 2,3,4 BVs (0.2 pCi/g, 0.2 pCi/g, and 0.09 pCi/g, respectively) in nine soil samples, three sediment samples, and four tuff samples with a maximum activity of 0.933 pCi/g. Uranium-235/236 is retained as a COPC.

Uranium-238 was detected above the soil; sediment; and Qbt 2,3,4 BVs (2.29 pCi/g, 2.29 pCi/g, and 1.93 pCi/g, respectively) in nine soil samples, three sediment samples, and one tuff sample with a maximum activity of 19.1 pCi/g. Uranium-238 is retained as a COPC.

6.12.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 33-010(c) are discussed below. The spatial distribution of COPCs was evaluated using the data presented in Tables 6.12-2, 6.12-3, and 6.12-4 and Plates 20, 21, and 22.

Inorganic Chemicals

Inorganic COPCs at SWMU 33-010(c) include antimony, barium, calcium, chromium, copper, nitrate, perchlorate, selenium, silver, and zinc.

Antimony was not detected but had DLs (0.86 mg/kg to 2.24 mg/kg) above the soil and Qbt 2,3,4 BVs in 10 soil samples and 6 tuff samples. The residential SSL was approximately 14 times the maximum DL. Further sampling for extent of antimony is not warranted.

Barium was detected above the sediment and Qbt 2,3,4 BVs in one sediment sample and four tuff samples with a maximum concentration of 130 mg/kg. Only one depth was sampled at location 33-01720; concentrations decreased with depth at locations 33-60471, 33-60473, and 33-60475 (concentrations in the shallow samples at locations 33-60471 and 33-60473 were 96.8 mg/kg and 59.8 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]); and concentrations decreased downgradient. The residential SSL was approximately 120 times the maximum concentration. The lateral extent of barium is defined and further sampling for vertical extent is not warranted.

Calcium was detected above the Qbt 2,3,4 BV in three samples with a maximum concentration of 3610 mg/kg. Concentrations decreased with depth at locations 33-60473 and 33-60475 (concentrations in shallow samples at locations 33-60473 and 33-60475 were 4270 mg/kg and 4450 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]) and decreased downgradient. The lateral and vertical extent of calcium are defined.

Chromium was detected above the Qbt 2,3,4 BV in four samples with a maximum concentration of 45.2 mg/kg. Concentrations increased with depth at locations 33-60472 and 33-60474, decreased with depth at location 33-60473, and decreased downgradient. As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with the residential SSL for trivalent chromium (117,000 mg/kg). The residential trivalent chromium SSL was approximately 2590 times the maximum concentration. The lateral extent of chromium is defined and further sampling for vertical extent is not warranted.

Copper was detected above the soil; sediment; and Qbt 2,3,4 BVs in 14 soil samples, 3 sediment samples, and 13 tuff samples with a maximum concentration of 2060 mg/kg. Only one depth was sampled at locations 33-01704, 33-01705, 33-01720, 33-01721, and 33-01722; and concentrations decreased with depth at locations 33-60470, 33-60471, 33-60472, 33-60473, 33-60474, 33-60475, 33-61056, 33-61057, 33-61058, 33-61059, 33-61060, and 33-61061. Concentrations increased laterally at locations 33-61060 and 33-61061, which were sampled to bound the area around location 33-60474 where soil removal was required, but decreased laterally compared with the pre-excavation concentrations (Appendix E, Excavated Samples). Concentrations decreased downgradient in the drainage below the site. The residential SSL was approximately 1.5 times and the industrial SSL was approximately 25 times the maximum concentration. The residential SSL was approximately 5.4 times and the industrial SSL was approximately 89 times the maximum concentration where vertical extent is not defined (581 mg/kg at location 33-01720). Further sampling for extent of copper is not warranted.

Nitrate was detected in 14 samples with a maximum concentration of 13.7 mg/kg. Concentrations decreased with depth at all locations and decreased downgradient. The lateral and vertical extent of nitrate are defined.

Perchlorate was detected in four samples with a maximum concentration of 0.00114 mg/kg. Concentrations increased with depth at location 33-60470, decreased with depth at locations 33-60473 and 33-60475, and decreased laterally. The residential SSL was approximately 48,100 times the maximum concentration. The lateral extent of perchlorate is defined and further sampling for vertical extent is not warranted.

Selenium was detected above the soil; sediment; and Qbt 2,3,4 BVs in three soil samples, one sediment sample, and eight tuff samples with a maximum concentration of 3.21 mg/kg and was not detected but had DLs (0.44 mg/kg to 0.46 mg/kg) above BV in two sediment samples. Concentrations increased with depth at location 33-60475; only one depth was sampled at location 33-01721; concentrations did not change substantially with depth (0.07 mg/kg) at location 33-60474; concentrations decreased with depth at locations 33-60471, 33-60472, and 33-60473 (the concentration in the shallow sample at location 33-60471 was 1.37 mg/kg and below the soil BV [Appendix E, Pivot Tables]); and concentrations decreased downgradient. The residential SSL was approximately 122 times the maximum concentration and 850 times the maximum DL. The lateral extent of selenium is defined and further sampling for vertical extent is not warranted.

Silver was detected above the sediment BV in one sample at a concentration of 4.6 mg/kg and was not detected but had DLs (1.02 mg/kg to 1.08 mg/kg) above BVs in one soil sample and one Qbt 2 sample. Only one depth was sampled at location 33-01720 and concentrations decreased downgradient. Vertical extent at location 33-01720 is defined by concentrations below BV in deeper samples at adjacent location 33-60474. The lateral and vertical extent of silver are defined.

Zinc was detected above the soil BV in four soil samples with a maximum concentration of 645 mg/kg. Concentrations decreased with depth at locations 33-60471, 33-60472, 33-60475, and 33-61060 and decreased laterally. The lateral and vertical extent of zinc are defined.

Organic Chemicals

Organic COPCs at SWMU 33-010(c) include acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; chrysene; dibenz(a,h)anthracene; di-n-butylphthalate; fluoranthene; indeno(1,2,3-cd)pyrene; phenanthrene; pyrene; and 1,2,3-trichlorobenzene.

Acetone was detected in three samples with a maximum concentration of 0.00461 mg/kg. Acetone concentrations increased with depth at location 33-60473, decreased with depth at location 33-60474, and decreased laterally. The residential SSL was approximately 14,400,000 times the maximum concentration. The lateral extent of acetone is defined and further sampling for vertical extent is not warranted.

Anthracene was detected in two samples with a maximum concentration of 0.0158 mg/kg. Concentrations decreased with depth at location 33-60470 and decreased downgradient. The lateral and vertical extent of anthracene are defined.

Aroclor-1254 and Aroclor-1260 were each detected in one sample at concentrations of 0.00428 mg/kg and 0.0188 mg/kg, respectively. Only one depth was sampled at location 33-60470, and concentrations decreased downgradient. The residential SSLs were approximately 266 times and 129 times the detected concentrations, respectively. The lateral extent of Aroclor-1254 and Aroclor-1260 is defined and further sampling for vertical extent is not warranted.

Benzo(a)anthracene, benzo(a)pyrene, fluoranthene, and pyrene were each detected in five samples with maximum concentrations of 0.162 mg/kg, 0.0921 mg/kg, 0.183 mg/kg, and 0.137 mg/kg, respectively. Concentrations increased with depth at location 33-60470, decreased with depth at locations 33-60471 and 33-60473, and decreased downgradient. The residential SSLs were approximately 9; 12; 12,700; and 12,700 times the maximum concentrations, respectively. Lateral extent of benzo(a)anthracene, benzo(a)pyrene, fluoranthene, and pyrene is defined, and further sampling for vertical extent is not warranted.

Benzo(b)fluoranthene was detected in four samples with a maximum concentration of 0.229 mg/kg. Concentrations increased with depth at location 33-60470, decreased at locations 33-60471 and 33-60473, and decreased downgradient. The residential SSL was approximately 7 times and the industrial SSL was approximately 141 times the maximum concentration. Lateral extent of benzo(b)fluoranthene is defined and further sampling for vertical extent is not warranted.

Benzo(g,h,i)perylene; benzo(k)fluoranthene; and indeno(1,2,3-cd)pyrene were each detected in two samples with maximum concentrations of 0.0485 mg/kg, 0.0758 mg/kg, and 0.0533 mg/kg, respectively. Concentrations increased with depth at location 33-60470 and decreased downgradient. The residential SSLs were approximately 35,900; 202; and 29 times the maximum concentrations, respectively. Lateral extent of benzo(g,h,i)perylene; benzo(k)fluoranthene; and indeno(1,2,3-cd)pyrene are defined, and further sampling for vertical extent is not warranted.

Bis(2-ethylhexyl)phthalate was detected in seven samples with a maximum concentration of 0.368 mg/kg. Concentrations increased with depth at locations 33-60470 and 33-60474; decreased with depth at locations 33-60471, 33-60473, and 33-60475; and decreased laterally. The residential SSL was approximately 1030 times the maximum concentration. The lateral extent of bis(2-ethylhexyl)phthalate is defined and further sampling for vertical extent is not warranted.

Butylbenzylphthalate was detected in one sample at a concentration of 0.0128 mg/kg. Concentrations increased with depth at location 33-60470 and decreased downgradient. The residential SSL was approximately 226,000 times the detected concentration. The lateral extent of butylbenzylphthalate is defined and further sampling for vertical extent is not warranted.

Chrysene was detected in four samples with a maximum concentration of 0.252 mg/kg. Concentrations increased with depth at location 33-60470, decreased with depth at location 33-60471, and decreased downgradient. The residential SSL was approximately 607 times the maximum concentration. Lateral extent of chrysene is defined and further sampling for vertical extent is not warranted.

Dibenz(a,h)anthracene was detected in one sample at a concentration of 0.0156 mg/kg. Concentrations increased with depth at location 33-60470 and decreased downgradient. The residential SSL was approximately 10 times and the industrial SSL was approximately 207 times the maximum concentration, respectively. Lateral extent of dibenz(a,h)anthracene is defined and further sampling for vertical extent is not warranted.

Di-n-butylphthalate was detected in three samples with a maximum concentration of 1.08 mg/kg. Concentrations decreased with depth at locations 33-60470 and 33-60471 and decreased laterally. The lateral and vertical extent of di-n-butylphthalate are defined.

Phenanthrene was detected in four samples with a maximum concentration of 0.0617 mg/kg. Concentrations decreased with depth at locations 33-60470 and 33-60471 and decreased downgradient. The lateral and vertical extent of phenanthrene are defined.

Trichlorobenzene[1,2,3-] was detected in one sample at a concentration of 0.000368 mg/kg. Concentrations decreased with depth at location 33-60472 and decreased downgradient. The lateral and vertical extent of 1,2,3-trichlorobenzene are defined.

Radionuclides

Radionuclide COPCs at SWMU 33-010(c) include tritium, uranium-234, uranium-235/236, and uranium-238.

Tritium was detected in two soil samples with a maximum activity of 6.62 pCi/g. Activities decreased with depth at location 33-60471 and decreased downgradient. The lateral and vertical extent of tritium are defined.

Uranium-234 was detected above the soil; sediment; and Qbt 2,3,4 BVs in nine soil samples, three sediment samples, and one tuff sample with a maximum activity of 17.7 pCi/g. Only one depth was sampled at locations 33-01704, 33-01705, 33-01707, 33-01720, 33-01721, and 33-01722; activities decreased with depth at locations 33-60470, 33-60471, 33-60472, and 33-60473; and activities decreased downgradient. The residential SAL was approximately 16 times the maximum activity. The lateral extent of uranium-234 is defined and further sampling for vertical extent is not warranted.

Uranium-235/236 was detected above the soil; sediment; and Qbt 2,3,4 BVs in nine soil samples, three sediment samples, and four tuff samples with a maximum activity of 0.933 pCi/g. Only one depth was sampled at locations 33-01704, 33-01705, 33-01707, 33-01720, 33-01721, and 33-01722; activities decreased with depth at locations 33-60470, 33-60471, 33-60472, and 33-60473; and activities decreased downgradient. The residential SAL was approximately 45 times the maximum activity. The lateral extent of uranium-235/236 is defined and further sampling for vertical extent is not warranted.

Uranium-238 was detected above the soil; sediment; and Qbt 2,3,4 BVs in nine soil samples, three sediment samples, and one tuff sample with a maximum activity of 19.1 pCi/g. Only one depth was sampled at locations 33-01704, 33-01705, 33-01707, 33-01720, 33-01721, and 33-01722; activities decreased with depth at locations 33-60470, 33-60471, 33-60472, and 33-60473; and activities decreased downgradient. The residential SAL was approximately 8 times and the industrial SAL was approximately 37 times the maximum activity, respectively. The lateral extent of uranium-238 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 are defined or no further sampling for extent is warranted at SWMU 33-010(c).

6.12.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess chemical cancer risk for the industrial scenario is 7×10^{-8}, which is less than the NMED target risk level of 1×10^{-5}. The industrial HI is 0.02, which is less than the NMED target HI of 1. Radionuclide EPCs were less than SALs and the total estimated dose is 0.5 mrem/yr.

Construction Worker Scenario

The total excess chemical cancer risk for the construction worker scenario is 3×10^{-7}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 0.2, which is less than the NMED target HI of 1. Radionuclide EPCs were less than SALs and the total estimated dose is 0.8 mrem/yr.

Residential Scenario

The total excess chemical cancer risk for the residential scenario is 5×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The residential HI is 0.2, which is less than the NMED target HI of 1. Radionuclide EPCs were less than SALs and the total estimated dose is 3 mrem/yr.

Based on the risk-screening assessment results, there is no potential unacceptable chemical cancer risk, noncarcinogenic hazard, or dose for the industrial, construction worker, or residential scenarios at SWMU 33-010(c).

6.12.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and multiple lines of evidence, potential unacceptable ecological risk exists for SWMU 33-010(c) to the generic plant. However, debris disposed of at the site included copper and aluminum shrapnel, pieces of electronic cable, sand and soil with residual HE, wood, and shot material from the nearby shot pad. As a result, the ecological risk screening may overestimate risk to the generic plant as the metal COPCs are likely in a low bioavailable form, which is different from the more bioavailable forms used in studies to produce LOAEL-ESLs. Furthermore, the ecological risk assessment assesses population-level risk and given that the site is a small area (0.207 ha), the risk to plant populations is likely overestimated by the HI analysis. In addition, ecoscoping notes described no indication of adverse effects from chemicals of potential ecological concern (COPECs) on the plant community and also mentioned bird tracks found at the snow-covered site (Attachment G-3), thus indicating the HI analysis is likely overestimating risk. Based on these multiple lines of evidence, the analysis shows there is no potential unacceptable risk to the generic plant or other biota at SWMU 33-010(c).

6.13 SWMU 33-011(a), Soil Contamination from Former Storage Area

6.13.1 Site Description and Operational History

SWMU 33-011(a) is a former 0.25-acre drum storage area directly within the footprint of and south of former building 33-21 in the central portion of TA-33 (Figure 6.13-1). The 1990 SWMU report describes SWMU 33-011(a) as an approximately 0.25-acre area located within the drilling storage yard where steel drums containing waste oil were stored on pallets or directly on the soil following the removal of building 33-21 (LANL 1990, 007513). Following the removal of building 33-21 in 1974, this unpaved area was used to store 55-gal. drums of used oil on pallets or directly on the soil from 1974 to 1989; the drums are visible in a 1986 aerial photograph (Koogle and Pouls Engineering 1986, 017907). The used oil was stored before recycling. By 1989, the drums had been removed and SWMU 33-011(a) was being used to store drilling equipment, including drilling pipe associated with the Hot Dry Rock Program at Fenton Hill (TA-57). Drilling operations associated with the Hot Dry Rock Project ceased by 1992. The former location of building 33-21 remains vacant and unpaved, and several transportainers are located in the southern portion of SWMU 33-011(a).

Former Laboratory building 33-21 was constructed in 1950 and an accidental release of plutonium and beryllium powder in 1960 contaminated the entire building. Building 33-21 was decontaminated within a few weeks but was never used again. In 1974, Laboratory building 33-21 and the associated wastewater drainage systems [SWMUs 33-005(a–c)] were removed, and radioactively contaminated soil from much of the site was removed down to bedrock and disposed of at MDA G at TA-54. Soil was removed until radiation readings were below approximately 20 pCi/g gross alpha. The area was subsequently backfilled with clean fill and leveled.

6.13.2 Relationship to Other SWMUs

SWMU 33-011(a) is located within and east of SWMU 33-005(a), within and southeast of SWMU 33-005(b), and within and southeast of SWMU 33-005(c) (Plate 2).

6.13.3 Summary of Previous Investigations

During the 1993 Phase I RFI conducted at SWMU 33-011(a), three samples were collected from three locations based on the former drum storage area location reportedly depicted in the 1986 aerial photograph (Koogle and Pouls Engineering 1986, 017907). Samples were submitted for analysis of TAL metals, SVOCs, PCBs, pesticides, herbicides, gamma-emitting radionuclides, and isotopic plutonium. Data from the 1993 Phase I RFI are screening-level data and showed lead as the only inorganic chemical detected above the BV and numerous detected organic chemicals. No radionuclides were detected or detected above BVs/FVs. These data were not used to evaluate the nature and extent of contamination and are not discussed further in this report.

During the 2019–2020 investigation, a total of 12 samples were collected from 4 locations within the former storage area. At each location, samples were collected at three subsurface intervals. All samples were analyzed at off-site fixed laboratories for TAL metals, nitrate, perchlorate, cyanide, VOCs, SVOCs, isotopic uranium, isotopic plutonium, and gamma-emitting radionuclides. In addition, 4 samples were analyzed for PCBs.

6.13.4 Site Contamination

6.13.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at SWMU 33-011(a). As a result, the following activities were completed as part of the 2021 investigation.

- The nature and extent of contamination have been defined at the southern portion of SWMU 33-011(a). However, following a detailed review of engineering drawings for former building 33-21, the location of the former storage area was revised. As a result of this change, additional sampling was conducted to define the nature and extent of potential contamination across the entire site. A total of 65 samples were collected at 6 new locations within the footprint of the site and at 8 step-out locations approximately 10 ft outside the footprint of the site. Samples were collected from the depth intervals of 0.0–1.0, 2.0–3.0, and 5.0–6.0 ft bgs. All samples were analyzed at an off-site fixed laboratory for TAL metals, nitrate, perchlorate, cyanide, pH, VOCs, SVOCs, PCBs, isotopic uranium, isotopic plutonium, and gamma-emitting radionuclides.

The sampling locations at SWMU 33-011(a) are shown in Figure 6.13-1. Table 6.13-1 presents the samples collected and analyses requested for SWMU 33-011(a). The geodetic coordinates of sample locations are presented in Table 3.2-1.

6.13.4.2 Soil, Rock, and Sediment Field Screening Results

During headspace screening for organic vapors at SWMU 33-011(a) a maximum concentration of 2.2 ppm was detected at location 33-61064 from 0.0 to 1.0 ft bgs. For the radiological-screening results, 37 samples exceeded twice the maximum site background levels for alpha-emitting radionuclides and no samples exceeded twice the maximum site background levels for beta/gamma-emitting radionuclides. No changes were made to sampling or other activities based on field-screening results. Field-screening results are included in Appendix E (on DVD included with this document).

6.13.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data at SWMU 33-011(a) consist of results from 77 samples (30 soil and 47 tuff) collected from 18 locations.

Inorganic Chemicals

A total of 54 samples (19 soil and 35 tuff) were collected and analyzed for TAL metals, nitrate, perchlorate, and cyanide. Table 6.13-2 presents the inorganic chemicals detected above BVs and detected inorganic chemicals with no BVs. Plate 23 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 1.85 mg/kg and was not detected but had DLs (0.703 mg/kg to 1.53 mg/kg) above the soil BV (0.83 mg/kg) and Qbt 2,3,4 BV in two soil samples and four tuff samples. Antimony is retained as a COPC.

Arsenic was detected above the Qbt 2,3,4 BV (2.79 mg/kg) in three samples with a maximum concentration of 5.03 mg/kg. The Gehan and quantile tests indicated site concentrations of arsenic in tuff are statistically different from background (Figure F-87 and Table F-14). Arsenic is retained as a COPC.

Barium was detected above the Qbt 2,3,4 BV (46 mg/kg) in four samples with a maximum concentration of 219 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in tuff are not statistically different from background (Figure F-88 and Table F-14). Barium is not a COPC.

Calcium was detected above the soil and Qbt 2,3,4 BVs (6120 mg/kg and 2200 mg/kg, respectively) in 11 soil samples and 19 tuff samples with a maximum concentration of 117,000 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in soil and tuff are statistically different from background (Figure F-89 and Table F-15, and Figure F-90 and Table F-14). 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 17.5 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in tuff are not statistically different from background (Figure F-91 and Table F-14). 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 4 mg/kg. The quantile and slippage tests indicated site concentrations of cobalt in tuff are not statistically different from background (Figure F-92 and Table F-14). Cobalt is not a COPC.

Copper was detected above the soil BV (14.7 mg/kg) in one sample at a concentration of 16.8 mg/kg. The Gehan and slippage tests indicated site concentrations of copper in soil are not statistically different from background (Figure F-93 and Table F-15). Copper is not a COPC.

Lead was detected above the soil BV (22.3 mg/kg) in one sample at a concentration of 32.7 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil are not statistically different from background (Figure F-94 and Table F-15). Lead is not a COPC.

Magnesium was detected above the Qbt 2,3,4 BV (1690 mg/kg) in four samples with a maximum concentration of 3810 mg/kg. The quantile and slippage tests indicated site concentrations of magnesium in tuff are not statistically different from background (Figure F-95 and Table F-14). Magnesium is not a COPC.

Nitrate was detected in 32 samples with a maximum concentration of 3.23 mg/kg. Nitrate is retained as a COPC.

Perchlorate was detected in seven samples with a maximum concentration of 0.00228 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, respectively) in 5 soil samples and 35 tuff samples with a maximum concentration of 3.25 mg/kg. The Gehan and quantile tests indicated site concentrations of selenium in soil are statistically different from background (Figure F-96 and Table F-15). 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 1.04 mg/kg. This concentration was only 0.04 mg/kg above BV and silver was not detected or detected above BV in 53 other samples (detected below BV in 13 samples). Silver is not a COPC.

Zinc was detected above the soil and Qbt 2,3,4 BVs (48.8 mg/kg and 63.5 mg/kg, respectively) in one soil sample and one tuff sample with a maximum concentration of 66.3 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil and tuff are not statistically different from background (Figure F-97 and Table F-15, and Figure F-98 and Table F-14). Zinc is not a COPC.

Organic Chemicals

A total of 42 samples (19 soil and 23 tuff) were collected and analyzed for VOCs and SVOCs and 42 samples (19 soil and 23 tuff) were analyzed for PCBs. Table 6.13-3 presents the detected organic chemicals. Plate 24 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 33-011(a) include acenaphthene; acetone; anthracene; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; carbazole; chloroform; chrysene; dibenz(a,h)anthracene; dibenzofuran; diethylphthalate; di-n-butylphthalate; di-n-octylphthalate; fluoranthene; fluorene; 2-hexanone; indeno(1,2,3-cd)pyrene; isophorone; 4-isopropyltoluene; 1-methylnaphthalene; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; 1,2,4,5-tetrachlorobenzene; and toluene. The detected organic chemicals are retained as COPCs.

Radionuclides

A total of 54 samples (19 soil and 35 tuff) were collected and analyzed for isotopic plutonium, isotopic uranium, and gamma-emitting radionuclides. 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.

Cesium-137 was detected in soil below 1.0 ft bgs in two samples with a maximum activity of 0.0971 pCi/g. Cesium-137 is retained as a COPC.

Plutonium-239/240 was detected in soil below 1.0 ft bgs in one sample at an activity of 0.134 pCi/g. Plutonium-239/240 is retained as 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 0.126 mg/kg. Uranium-235/236 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 SWMU 33-011(a) are discussed below. The spatial distribution of COPCs was evaluated using the data presented in Tables 6.13-2, 6.13-3, and 6.13-4; Plates 23 and 24; and Figure 6.13-2.

Inorganic Chemicals

Inorganic COPCs at SWMU 33-011(a) include antimony, arsenic, calcium, nitrate, perchlorate, and selenium.

Antimony was detected above the Qbt 2,3,4 BV in one sample at a concentration of 1.85 mg/kg and was not detected but had DLs (0.703 mg/kg to 1.53 mg/kg) above the soil and Qbt 2,3,4 BVs in two soil samples and four tuff samples. Concentrations increased with depth at location 33-61005 and decreased laterally. The residential SSL was approximately 17 times the maximum concentration and 20 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 5.03 mg/kg. Concentrations decreased with depth at locations 33-61005 and 33-61007 and decreased laterally. The vertical and lateral extent of arsenic are defined.

Calcium was detected above the soil and Qbt 2,3,4 BVs in 11 soil samples and 19 tuff samples with a maximum concentration of 117,00 mg/kg. Concentrations increased with depth at location 33-01078; decreased with depth at locations 33-01073, 33-01076, 33-01077, 33-61001, 33-61003 through 33-61009, and 33-61063 through 33-61066; and decreased laterally. The residential essential nutrient SSL was approximately 111 times the maximum concentration. Further sampling for extent of calcium is not warranted.

Nitrate was detected in 32 samples with a maximum concentration of 3.23 mg/kg. Concentrations increased with depth at locations 33-61004 and 33-61007, decreased with depth at all other locations, and decreased laterally. The residential SSL was approximately 38,700 times the maximum concentration. The lateral extent of nitrate is defined and further sampling for vertical extent is not warranted.

Perchlorate was detected in seven samples with a maximum concentration of 0.00228 mg/kg. Concentrations increased with depth at locations 33-61064 and 33-61066; decreased with depth at locations 33-01077, 33-61007, and 33-61063; and decreased laterally. The residential SSL was approximately 24,000 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 5 soil samples and 35 tuff samples with a maximum concentration of 3.25 mg/kg. Concentrations increased with depth at location 33-61010; did not change substantially with depth (0.02 mg/kg to 0.2 mg/kg) at locations 33-01073, 33-01076, 33-61001, 33-61002, 33-61006, 33-61007, 33-61009, and 33-61063 through 33-61065; decreased with depth at all other locations; and decreased laterally. The residential SSL was approximately 120 times the maximum concentration. The lateral extent of selenium is defined and further sampling for vertical extent is not warranted.

Organic Chemicals

Organic COPCs at SWMU 33-011(a) include acenaphthene; acetone, anthracene; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; carbazole; chloroform; chrysene; dibenz(a,h)anthracene; dibenzofuran; diethylphthalate; di-n-butylphthalate; di-n-octylphthalate; fluoranthene; fluorene; 2-hexanone; indeno(1,2,3-cd)pyrene; isophorone; 4-isopropyltoluene; 1-methylnaphthalene; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; 1,2,4,5-tetrachlorobenzene; and toluene.

Acenaphthene was detected in 13 samples with a maximum concentration of 1.18 mg/kg. Concentrations decreased with depth at locations 33-61001, 33-61003, 33-61006, 33-61007, 33-61009, 33-61010, and 33-61063 through 33-61066 and increased laterally. The residential SSL was approximately 2950 times the maximum concentration. The vertical extent of acenaphthene is defined and further sampling for lateral extent is not warranted.

Acetone was detected in one sample at a concentration of 0.00463 mg/kg. Concentrations increased with depth at location 33-61066 and increased laterally. The residential SSL was approximately 14,300,000 times the maximum concentration. Further sampling for extent of acetone is not warranted.

Anthracene was detected in 15 samples with a maximum concentration of 1.81 mg/kg. Concentrations decreased with depth at locations 33-61001, 33-61003, 33-61006, 33-61009, 33-61010, and 33-61063 through 33-61066 and increased laterally. The residential SSL was approximately 9610 times the maximum concentration. The vertical extent of anthracene is defined and further sampling for lateral extent is not warranted.

Aroclor-1260 was detected in four samples with a maximum concentration of 0.0136 mg/kg. Concentrations decreased with depth at locations 33-61003, 33-61006, 33-61007, and 33-61063 and decreased laterally. The lateral and vertical extent of Aroclor-1260 are defined.

Benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene were each detected in 21 samples with maximum concentrations of 3.1 mg/kg, 3.7 mg/kg, and 3.61 mg/kg, respectively. Concentrations decreased with depth at locations 33-61001, 33-61003, 33-61006 through 33-61010, and 33-61063 through 33-61066 and increased laterally. The maximum concentrations were 2.0 times to 3.3 times the residential SSLs, and the industrial SSLs were 6.4 times to 10 times the maximum concentrations. The vertical extent of benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene is defined but further sampling for lateral extent north of locations 33-61009 and 33-61065 is warranted.

Benzo(g,h,i)perylene; chrysene; fluoranthene; phenanthrene; and pyrene were each detected in 19 samples to 21 samples with maximum concentrations of 1.93 mg/kg, 3.13 mg/kg, 6.28 mg/kg, 6.75 mg/kg, and 5.71 mg/kg, respectively. Concentrations decreased with depth at locations 33-61001, 33-61003, 33-61006 through 33-61010, and 33-61063 through 33-61066 and increased laterally. The residential SSLs were approximately 49 times to 902 times the maximum concentrations. The vertical extent of benzo(g,h,i)perylene, chrysene, fluoranthene, phenanthrene, and pyrene are defined and further sampling for lateral extent is not warranted.

Benzo(k)fluoranthene was detected in 16 samples with a maximum concentration of 1.5 mg/kg. Concentrations decreased with depth at locations 33-61001, 33-61003, 33-61006, 33-61009, 33-61010, and 33-61063 through 33-61066 and increased laterally. The residential SSL was approximately 10 times and the industrial SSL was approximately 215 times the maximum concentration. The vertical extent of benzo(k)fluoranthene is defined and further sampling for lateral extent is not warranted.

Benzoic acid was detected in two samples with a maximum concentration of 0.436 mg/kg. Concentrations increased with depth at location 33-61001, decreased with depth at location 33-61010, and increased laterally. The residential SSL was approximately 573,000 times the maximum concentration. Further sampling for extent of benzoic acid is not warranted.

Bis(2-ethylhexyl)phthalate was detected in six samples with a maximum concentration of 0.917 mg/kg. Concentrations increased with depth at locations 33-61001, 33-61006, and 33-61008; decreased with depth at locations 33-01076, 33-61002, and 33-61064; and decreased laterally. The residential SSL was approximately 414 times the maximum concentration. The lateral extent of bis(2-ethylhexyl)phthalate is defined and further sampling for vertical extent is not warranted.

Carbazole was detected in 12 samples with a maximum concentration of 0.926 mg/kg. Concentrations increased with depth at location 33-61001; decreased with depth at locations 33-61003, 33-61006, 33-61009, 33-61010, and 33-61064 through 33-61066; and increased laterally. The residential SSL was approximately 84 times the maximum concentration. Further sampling for extent of carbazole is not warranted.

Chloroform was detected in two samples with a maximum concentration of 0.000956 mg/kg. Concentrations decreased with depth at locations 33-61063 and 33-61065 and increased laterally. The residential SSL was approximately 6170 times the maximum concentration. Further sampling for extent of chloroform is not warranted.

Dibenz(a,h)anthracene was detected in eight samples with a maximum concentration of 0.535 mg/kg. Concentrations decreased with depth at locations 33-61003, 33-61006, 33-61009, 33-61064, and 33-61065 and increased laterally. The maximum concentration was 3.5 times the residential SSL and the industrial SSL was 6 times the maximum concentration. The vertical extent of dibenz(a,h)anthracene is defined but further sampling for lateral extent north of locations 33-61009 and 33-61065 is warranted.

Dibenzofuran was detected in one sample at a concentration of 0.628 mg/kg. Concentrations decreased with depth at 33-61009 and increased laterally. The residential SSL was approximately 124 times the maximum concentration. The vertical extent of dibenzofuran is defined and further sampling for lateral extent is not warranted.

Diethylphthalate and di-n-butylphthalate were each detected in five samples with maximum concentrations of 0.0307 mg/kg and 0.0824 mg/kg, respectively. Concentrations increased with depth at location 33-01076, decreased with depth at locations 33-01077 and 33-01078, and decreased laterally. The residential SSLs were approximately 1,600,000 and 74,800 times the maximum concentrations, respectively. The lateral extent of diethylphthalate and di-n-butylphthalate is defined and further sampling for vertical extent is not warranted.

Di-n-octylphthalate was detected in five samples with a maximum concentration of 0.0324 mg/kg. Concentrations increased with depth at locations 33-61004, 33-61063, and 33-61064; decreased with depth at location 33-61066; and increased laterally. The residential SSL was approximately 19,400 times the maximum concentration. Further sampling for extent of di-n-octylphthalate is not warranted.

Fluorene was detected in 13 samples with a maximum concentration of 1.05 mg/kg. Concentrations increased with depth at location 33-61001; decreased with depth at locations 33-61003, 33-61006, 33-61009, 33-61010, and 33-61063 through 33-61066; and increased laterally. The residential SSL was approximately 2210 times the maximum concentration. Further sampling for extent of fluorene is not warranted.

Hexanone[2-] was detected in one sample at a concentration of 0.00779 mg/kg. Concentrations increased with depth at location 33-61066 and increased laterally. The residential SSL was approximately 25,700 times the maximum concentration. Further sampling for extent of 2-hexanone is not warranted.

Indeno(1,2,3-cd)pyrene was detected in 17 samples with a maximum concentration of 2.2 mg/kg. Concentrations decreased with depth at locations 33-61001, 33-61003, 33-61006, 33-61009, 33-61010, and 33-61063 through 33-61066 and increased laterally. The maximum concentration was 1.4 times the residential SSL and the industrial SSL was 15 times the maximum concentration. The vertical extent of indeno(1,2,3-cd)pyrene is defined but further sampling for lateral extent north of locations 33-61009 and 33-61065 is warranted.

Isophorone was detected in five samples with a maximum concentration of 0.274 mg/kg. Concentrations increased with depth at location 33-01076, did not change substantially with depth (0.011 mg/kg) at location 33-01077, decreased with depth at location 33-01078, and decreased laterally. The residential SSL was approximately 20,500 times the maximum concentration. The lateral extent of isophorone is defined and further sampling for vertical extent is not warranted.

Isopropyltoluene[4-] was detected in one sample at a concentration of 0.000399 mg/kg. Concentrations decreased with depth at location 33-61064 and increased laterally. The residential SSL was approximately 5,900,000 times the maximum concentration. The vertical extent 4-isopropyltoluene is defined and further sampling for lateral extent is not warranted.

Methylnaphthalene[1-] was detected in three samples with a maximum concentration of 0.32 mg/kg. Concentrations decreased with depth at locations 33-61003, 33-61009, and 33-61065 and increased laterally. The residential SSL was approximately 538 times the maximum concentration. The vertical extent of 1-methylnaphthalene is defined and further sampling for lateral extent is not warranted.

Methylnaphthalene[2-] was detected in five samples with a maximum concentration of 0.427 mg/kg. Concentrations decreased with depth at locations 33-61003, 33-61009, 33-61065, and 33-61066 and increased laterally. The residential SSL was approximately 543 times the maximum concentration. The vertical extent of 2-methylnaphthalene is defined and further sampling for lateral extent is not warranted.

Naphthalene was detected in 12 samples with a maximum concentration of 1.23 mg/kg. Concentrations decreased with depth at locations 33-61001, 33-61003, 33-61006, 33-61009, 33-61064, 33-61065, and 33-61066 and increased laterally. The residential SSL was approximately 40 times the maximum concentration. The vertical extent of naphthalene is defined and further sampling for lateral extent is not warranted.

Tetrachlorobenzene[1,2,4,5-] was detected in one sample at a concentration of 0.118 mg/kg. Concentrations decreased with depth and decreased laterally. The lateral and vertical extent of 1,2,4,5-tetrachlorobenzene are defined.

Toluene was detected in two samples with a maximum concentration of 0.000494 mg/kg. Concentrations decreased with depth at locations 33-61003 and 33-61065 and increased laterally. The residential SSL was approximately 10,600,000 times the maximum concentration. The vertical extent of toluene is defined and further sampling for lateral extent is not warranted.

Radionuclides

Radionuclide COPCs at SWMU 33-011(a) include cesium-137, plutonium-239/240, and uranium-235/236.

Cesium-137 was detected in soil below 1.0 ft bgs in two samples with a maximum activity of 0.0971 pCi/g. Activities decreased with depth at locations 33-61001 and 33-61003 and decreased laterally. The lateral and vertical extent of cesium-137 are defined.

Plutonium-239/240 was detected in soil below 1.0 ft bgs in one sample at an activity of 0.134 pCi/g. Activities decreased with depth at location 33-61003 and decreased laterally. The lateral and vertical extent of plutonium-239/240 are defined.

Uranium 235/236 was detected above the Qbt 2,3,4 BV in five samples with a maximum activity of 0.126 mg/kg. Activities increased with depth at locations 33-01073, 33-61003, 33-61004, and 33-61010; decreased with depth at location 33-01076; and increased laterally. The residential SAL was approximately 333 times the maximum activity. Further sampling for extent of uranium-235/236 is not warranted.

Summary of Nature and Extent

The lateral and vertical extent of inorganic, organic, and radionuclide COPCs are defined or no further sampling for extent is warranted at SWMU 33-011(a) except for lateral extent of benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; dibenz(a,h)anthracene; and indeno(1,2,3-cd)pyrene north of locations 33-61009 and 33-61065.

6.13.5 Summary of Human Health Risk Screening

A human health risk-screening assessment was not performed for SWMU 33-011(a) because the nature and extent of contamination have not been defined at this site.

6.13.6 Summary of Ecological Risk Screening

An ecological risk-screening assessment was not performed for SWMU 33-011(a) because the nature and extent of contamination have not been defined at this site.

6.14 SWMU 33-011(d), Storage Area

6.14.1 Site Description and Operational History

SWMU 33-011(d) consists of a former storage area that was located on an asphalt pad around building 33-20 (a warehouse) in the southwest corner of the Main Site at TA-33 (Figure 6.14-1). Beryllium and uranium were stored in and outside of building 33-20 from 1950 until 1972. In addition, recovered scrap from shots containing uranium, beryllium, and tungsten was stored on the asphalt south of building 33-20. The amount of uranium stored at this site was reported to have been "tons" (Ahlquist 1983, 006854). Much of the material stored at the site was salvaged for use elsewhere. A 1987 site survey found no materials remaining in storage at this location (LANL 1992, 007671, p. 3-24).

6.14.2 Relationship to Other SWMUs

SWMU 33-011(d) is located approximately 100 ft east of SWMU 33-004(h), approximately 225 ft west of SWMU 33-015, and approximately 140 ft southwest of SWMU 33-004(i) (Plate 2).

6.14.3 Summary of Previous Investigations

During the Phase I RFI conducted at SWMU 33-011(d) in 1993, two asphalt samples and three soil samples from beneath the asphalt were collected at three locations (LANL 1995, 071300). Samples were submitted for analysis of TAL metals, uranium, and gamma-emitting radionuclides. Two samples were also analyzed for tritium and isotopic plutonium. Data from the 1993 Phase I RFI are screening-level data and showed inorganic chemicals detected above BVs and plutonium isotopes and tritium detected or detected above BVs/FVs. These data were not used to evaluate the nature and extent of contamination and are not discussed further in this report.

During the 1996 Phase II RFI conducted at SWMU 33-011(d), 14 samples were collected at 7 locations: 6 locations were beneath the asphalt and 1 location was in the drainage south of the asphalt. Samples were submitted for analysis of TAL metals, total uranium, and isotopic uranium. Data from the 1996 Phase II RFI meet data-validation standards and are decision-level data included in this report.

During the 2019–2020 investigation, a total of 15 samples were collected from 5 locations at previous RFI locations beneath an asphalt pad to determine vertical extent. At each location, samples were collected at the surface and from 2 subsurface depths below the structure. A total of 12 samples were collected from 4 step-out locations away from the asphalt pad to determine lateral extent. At each location, samples were collected from the surface and from 2 subsurface depths. All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, perchlorate, nitrate, VOCs, SVOCs, isotopic uranium, and isotopic plutonium. In addition, 6 samples were analyzed for PCBs.

6.14.4 Site Contamination

6.14.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at SWMU 33-011(d). As a result, the following activities were completed as part of the 2021 investigation.

- Six samples were collected at two step-out locations, 33-60998 and 33-60999, downgradient of location 33-60670.
- Three samples were also collected at location 33-61107 east of location 33-60670 to define the extent of PAHs to the south of the former storage area. Samples were collected from the depth intervals of 0.0–1.0 ft, 2.0–3.0 ft, and 4.0–5.0 ft bgs, corresponding to the depth intervals sampled during the 2019–2020 investigation.
- All samples were analyzed at an off-site analytical laboratory for SVOCs.

The sampling locations at SWMU 33-011(d) are shown in Figure 6.14-1. Table 6.14-1 presents the samples collected and analyses requested for SWMU 33-011(d). The geodetic coordinates of sample locations are presented in Table 3.2-1.

6.14.4.2 Soil, Rock, and Sediment Field Screening Results

During headspace screening for organic vapors at SWMU 33-011(d) a maximum concentration of 0.7 ppm was detected at location 33-60999 from 0.0 to 1.0 ft bgs and 4.0 to 5.0 ft bgs. For the radiological-screening results, two samples exceeded twice the maximum site background levels for alpha-emitting radionuclides and no samples exceeded twice the maximum site background levels for beta/gamma-emitting radionuclides. No changes were made to sampling or other activities based on field-screening results. Field-screening results are included in Appendix E (on DVD included with this document).

6.14.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data at SWMU 33-011(d) consist of results from 50 samples (20 tuff, 29 soil, and 1 sediment) collected from 15 locations.

Inorganic Chemicals

A total of 39 samples (16 tuff and 23 soil) were collected and analyzed for TAL metals, and 27 samples (16 tuff and 11 soil) were analyzed for cyanide, perchlorate, and nitrate. Table 6.14-2 presents the inorganic chemicals above BVs and the detected inorganic chemicals with no BVs. Plate 25 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was not detected above the soil and Qbt 2,3,4 BVs (0.83 mg/kg and 0.5 mg/kg, respectively) but had DLs (0.782 mg/kg to 11 mg/kg) in 14 soil samples and 4 tuff samples. Antimony is retained as a COPC.

Barium was detected above the Qbt 2,3,4 BV (46 mg/kg) in one sample at a concentration of 54.4 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in tuff are not statistically different from background (Figure F-99 and Table F-16). Barium is not a COPC.

Cadmium was detected above the soil BV (0.4 mg/kg) in 1 sample at a concentration of 1.38 mg/kg and had DLs (0.53 mg/kg to 0.75 mg/kg) above the BV in 12 samples. The concentration above BV was less than the 2 highest concentrations in the background data set (2.6 mg/kg and 1.4 mg/kg), and cadmium was not detected or detected above BV in 26 other samples (detected below BV in 4 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, respectively) in four soil samples and two tuff samples with a maximum concentration of 24,700 mg/kg. The Gehan and slippage tests for soil and the Gehan and quantile tests for tuff indicated site concentrations of calcium in soil and tuff are not statistically different from background (Figure F-100 and Table F-17, and Figure F-101 and Table F-16, respectively). However, the maximum concentration is substantially above the BVs. 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, respectively) in 4 soil samples and 16 tuff samples at a maximum concentration of 64.1 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in tuff are statistically different from background (Figure F-102 and Table F-16). Chromium is retained as a COPC.

Lead was detected above the soil BV (22.3 mg/kg) in five samples with a maximum concentration of 774 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil are not statistically different from background (Figure F-103 and Table F-17). However, the maximum concentration is substantially above the BV. Lead is retained as a COPC.

Magnesium was detected above the Qbt 2,3,4 BV (1690 mg/kg) in two samples with a maximum concentration of 2980 mg/kg. The Gehan and quantile tests indicated site concentrations of magnesium in tuff are not statistically different from background (Figure F-104 and Table F-16). Magnesium is not a COPC.

Mercury was detected above the soil BV (0.1 mg/kg) in two samples with a maximum concentration of 2 mg/kg and had a DL (0.11 mg/kg) above the BV in six samples. 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 7.01 mg/kg. The quantile and slippage tests indicated site concentrations of nickel in tuff are not statistically different from background (Figure F-105 and Table F-16). Nickel is not a COPC.

Nitrate was detected in nine samples with a maximum concentration of 1.34 mg/kg. Nitrate is retained as a COPC.

Selenium was detected above the Qbt 2,3,4 BV (0.3 mg/kg) in 16 samples with a maximum concentration of 1.71 mg/kg. Selenium is retained as a COPC.

Silver was not detected above the soil BV (1 mg/kg) but had DLs (1.4 mg/kg to 2.2 mg/kg) above BV in 12 samples. Silver is retained as a COPC.

Thallium was not detected above the soil BV (0.73 mg/kg) but had DLs (1.3 mg/kg to 1.4 mg/kg) above BV in six samples. Thallium is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in two samples with a maximum concentration of 94.2 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil are not statistically different from background (Figure F-106 and Table F-17). Zinc is not a COPC.

Organic Chemicals

A total of 27 samples (16 tuff and 11 soil) were collected and analyzed for VOCs and SVOCs, 6 samples (1 tuff and 5 soil) were analyzed for PCBs, and 9 samples (4 tuff and 5 soil) were analyzed for PAHs. Table 6.14-3 presents the detected organic chemicals. Plate 26 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 33-011(d) include acenaphthene; acetone; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; carbazole; chrysene; dibenz(a,h)anthracene; dibenzofuran; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 1-methylnaphthalene; 2-methylnaphthalene; naphthalene; phenanthrene; and pyrene. The listed detected organic chemicals are retained as COPCs.

Radionuclides

A total of 27 samples (16 tuff and 11 soil) were collected and analyzed for isotopic uranium and isotopic plutonium. Table 6.14-4 presents the radionuclides detected or detected above BVs/FVs. Plate 27 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Uranium-235/236 was detected above the Qbt 2,3,4 BV (0.09 pCi/g) in two samples with a maximum activity of 0.189 pCi/g. Uranium-235/236 is retained as a COPC.

6.14.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 33-011(d) are discussed below. The spatial distribution of COPCs was evaluated using the data presented in Tables 6.14-2, 6.14-3, and 6.14-4; and Plates 25, 26, and 27.

Inorganic Chemicals

Inorganic COPCs at SWMU 33-011(d) include antimony, calcium, chromium, lead, mercury, nitrate, selenium, silver, and thallium.

Antimony was not detected above the soil and Qbt 2,3,4 BVs but had DLs (0.782 mg/kg to 11 mg/kg) in 14 soil samples and 4 tuff samples. The residential SSL was approximately 2.8 times and the industrial SSL was approximately 47 times the maximum DL. The highest DLs were for 1996 RFI samples, and the residential SSL was approximately 15 times the maximum DL for 2020 samples. Further sampling for extent of antimony is not warranted.

Calcium was detected above the soil and Qbt 2,3,4 BVs in four soil samples and two tuff samples with a maximum concentration of 24,700 mg/kg. Concentrations increased with depth at location 33-01569; decreased with depth at locations 33-01081, 33-01572, and 33-60670; and decreased laterally. The residential essential nutrient SSL was approximately 526 times the maximum concentration. The lateral extent of calcium is defined and further sampling for vertical extent is not warranted.

Chromium was detected above the soil and Qbt 2,3,4 BVs in 4 soil samples and 16 tuff samples with a maximum concentration of 64.1 mg/kg. Concentrations increased with depth at locations 33-01081, 33-01571, 33-01572, 33-60667, 33-60668, and 33-60670; decreased with depth at locations 33-01566, 33-01567, and 33-60669; and increased laterally. As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with the residential SSL for trivalent chromium (117,000 mg/kg). The residential trivalent chromium SSL was approximately 1820 times the maximum concentration. Further sampling for extent of chromium is not warranted.

Lead was detected above the soil BV in five samples with a maximum concentration of 774 mg/kg. Concentrations decreased with depth at locations 33-01566 and 33-01567 and decreased laterally. The lateral and vertical extent of lead are defined.

Mercury was detected above the soil BV in two samples with a maximum concentration of 2 mg/kg and had a DL (0.11 mg/kg) above the BV in six soil samples. Concentrations decreased with depth at locations 33-01571 and 33-01572 and decreased laterally. The lateral and vertical extent of mercury are defined.

Nitrate was detected in nine samples with a maximum concentration of 1.34 mg/kg. Concentrations did not change substantially with depth (0.011 mg/kg) at location 33-01566; decreased with depth at locations 33-60667, 33-60668, 33-60669, and 33-60670; and decreased laterally. The residential SSL was approximately 93,300 times the maximum concentration. The lateral extent of nitrate is defined and further sampling for vertical extent is not warranted.

Selenium was detected above the Qbt 2,3,4 BV in 16 samples with a maximum concentration of 1.71 mg/kg. Concentrations increased with depth at location 33-60670; did not change substantially with depth (0.02 mg/kg to 0.078 mg/kg) at locations 33-01566, 33-01567, 33-01571, 33 01572, 33-60668, and 33-60669; decreased with depth at locations 33-01081 and 33-60667 (the concentrations in surface samples at locations 33-01572 and 33-60668 were 1.1 mg/kg and 1.13 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]); and decreased laterally. The residential SSL was approximately 229 times the maximum concentration. The lateral extent of selenium is defined and further sampling for vertical extent is not warranted.

Silver was not detected above the soil BV but had DLs (1.4 mg/kg to 2.2 mg/kg) above BV in 12 samples. The residential SSL was approximately 178 times the maximum DL. Further sampling for lateral and vertical extent of silver is not warranted.

Thallium was not detected above the soil BV but had DLs (1.3 mg/kg to 1.4 mg/kg) above BV in six samples. The maximum DL was approximately 1.8 times the residential SSL, and the industrial SSL was approximately 9.3 times the maximum DL. All DLs above BV were for 1996 RFI samples. Further sampling for lateral and vertical extent of thallium is not warranted.

Organic Chemicals

Organic COPCs at SWMU 33-011(d) include acenaphthene; acetone; anthracene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; carbazole; chrysene; dibenz(a,h)anthracene; dibenzofuran; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 1-methylnaphthalene; 2-methylnaphthalene; naphthalene; phenanthrene; and pyrene.

Acenaphthene and benzo(k)fluoranthene were detected in four samples and five samples, respectively, with maximum concentrations of 4.23 mg/kg and 2.4 mg/kg, respectively. Concentrations decreased with depth at locations 33-60670, 33-60998, and 33-60999 and decreased laterally. The lateral and vertical extent of acenaphthene and benzo(k)fluoranthene are defined.

Acetone was detected in 10 samples with a maximum concentration of 0.0144 mg/kg. Concentrations increased with depth at locations 33-01566, 33-60667, and 33-60669; decreased with depth at locations 33-01081, 33-01567, and 33-60668; and decreased laterally. The residential SSL was approximately 4,600,000 times the maximum concentration. The lateral extent of acetone is defined and further sampling for vertical extent is not warranted.

Anthracene and fluorene were each detected in four samples with maximum concentrations of 3.84 mg/kg and 3.91 mg/kg, respectively. Concentrations decreased with depth at locations 33-60670, 33-60998, and 33-60999 and decreased laterally. The lateral and vertical extent of anthracene and fluorene are defined.

Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene were each detected in six or seven samples with maximum concentrations of 5.31 mg/kg, 5.64 mg/kg, 6.07 mg/kg, and 2.75 mg/kg, respectively. Concentrations decreased with depth at locations 33-60670, 33-60998, 33-60999, and 33-61107 and decreased laterally. The lateral and vertical extent of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene are defined.

Benzo(g,h,i)perylene, chrysene, and fluoranthene were detected in six samples, six samples, and nine samples, respectively, with maximum concentrations of 2.97 mg/kg, 5.43 mg/kg, and 9.6 mg/kg, respectively. Concentrations decreased with depth at locations 33-60670, 33-60998, 33-60999, and 33-61107 and decreased laterally. The lateral and vertical extent of benzo(g,h,i)perylene, chrysene, and fluoranthene are defined.

Carbazole and dibenzofuran were each detected in one sample at concentrations of 1.81 mg/kg and 3.26 mg/kg, respectively. Concentrations decreased with depth at location 33-60670 and decreased laterally. The lateral and vertical extent of carbazole and dibenzofuran are defined.

Dibenz(a,h)anthracene was detected in four samples with a maximum concentration of 0.965 mg/kg. Concentrations decreased with depth at locations 33-60670, 33-60998, and 33-60999 and decreased laterally. The lateral and vertical extent of dibenz(a,h)anthracene are defined.

Methylnaphthalene[1-] and 2-methylnaphthalene were each detected in two samples with maximum concentrations of 2.35 mg/kg and 3.31 mg/kg, respectively. Concentrations decreased with depth at locations 33-60670 and 33-60998 and decreased laterally. The lateral and vertical extent of 1-methylnaphthalene and 2-methylnaphthalene are defined.

Naphthalene was detected in five samples with a maximum concentration of 11 mg/kg. Concentrations decreased with depth at locations 33-60668, 33-60670, and 33-60998 and decreased laterally. The lateral and vertical extent of naphthalene are defined.

Phenanthrene was detected in ten samples with a maximum concentration of 15 mg/kg. Concentrations decreased with depth at locations 33-60667, 33-60670, 33-60998, 33-60999, and 33-61107 and decreased laterally. The lateral and vertical extent of phenanthrene are defined.

Pyrene was detected in 11 samples with a maximum concentration of 12 mg/kg. Concentrations decreased with depth at locations 33-60667, 33-60668, 33-60670, 33-60998, 33-60999, and 33-61107 and decreased laterally. The lateral and vertical extent of pyrene are defined.

Radionuclides

Radionuclide COPCs at SWMU 33-011(d) include uranium-235/236.

Uranium-235/236 was detected above the Qbt 2,3,4 BV in two samples with a maximum activity of 0.189 pCi/g. Activities increased with depth at locations 33-01566 and 33-01571 and decreased laterally. The residential SAL was approximately 222 times the maximum activity. The 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 33-011(d).

6.14.5 Summary of Human Health Risk Screening

Industrial Scenario

The total excess chemical cancer risk for the industrial scenario is 5×10^{-7}, which is less than the NMED target risk level of 1×10^{-5}. The industrial HI is 0.04, which is less than the NMED target HI of 1. No radionuclide COPCs were identified in the 0.0–1.0 ft bgs depth interval.

Construction Worker Scenario

The total excess chemical cancer risk for the construction worker scenario is 1×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 0.4, which is less than the NMED target HI of 1. Radionuclide EPCs were less than SALs and the total estimated dose is 0.01 mrem/yr.

Residential Scenario

The total excess chemical cancer risk for the residential scenario is 9×10^{-5}, which is greater than the NMED target risk level of 1×10^{-5}. The residential HI is 0.7, which is less than the NMED target HI of 1. Radionuclide EPCs were less than SALs and the total estimated dose is 0.03 mrem/yr.

Lead

Lead was identified as a COPC for the industrial, construction worker, and residential scenarios. The back-calculated SSL from NMED for lead was used for the industrial, construction worker, and residential scenarios (NMED 2019, 700550). The industrial lead HQ was 0.3, the construction worker lead HQ was 0.2, and the residential lead HQ was 0.3.

Based on the risk-screening assessment results, there is no potential unacceptable chemical cancer risk, noncarcinogenic hazard, or dose for the industrial or construction worker scenarios at SWMU 33-011(d). However, there is a potential unacceptable cancer risk for the residential scenario but no unacceptable noncarcinogenic hazard or dose.

6.14.6 Summary of Ecological Risk Screening

Based on evaluations of the minimum ESLs, HI analyses, LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and multiple lines of evidence, potential unacceptable ecological risk exists for SWMU 33-011(d) to the generic plant. However, during ecoscoping, this site was noted to be a former storage area within the main security area of TA-33, which is primarily asphalt and does not provide much habitat for ecological receptors. In addition, the high PAH detections (acenapthene, anthracene, fluoranthene, fluorene, naphthalene, phenanthrene, and pyrene) are most likely related to paving at the site, and given the lack of habitat noted during ecoscoping (Attachment G-3), no unacceptable risk to ecological receptors is present at SWMU 33-011(d).

6.15 SWMU 33-012(a), Drum Storage Area

6.15.1 Site Description and Operational History

SWMU 33-012(a) is an SAA for a former machine shop in building 33-39 at the Main Site (Figure 6.15-1). This SAA was located on an asphalt pad (approximately 20 ft wide × 20 ft long) on the east side of building 33-39 between the building and a storage shed. The area was used to accumulate spent solvents and solvent-contaminated oil in one 55-gal. drum at a time in accordance with RCRA requirements (40 Code of Federal Regulations [CFR] 262, “Standards Applicable to Generators of Hazardous Waste”). Each drum was placed on a pallet or directly on the asphalt pad. Drums containing PCB-contaminated oil and used oil with heavy metals may have also been stored on the asphalt pad. The SAA was established in the mid-1980s and was deactivated by 1992 and moved to the interior of building 33-39.

The 1990 SWMU report notes the presence of multiple oil stains at this site (LANL 1990, 007513). The 1992 RFI work plan, however, states no evidence that oil staining was observed (LANL 1992, 007671).

6.15.2 Relationship to Other SWMUs

SWMU 33-012(a) is located directly west of SWMU 33-004(i), approximately 125 ft northwest of SWMU 33-015, and approximately 100 ft west of SWMU 33-008(a) (Plate 2).

6.15.3 Summary of Previous Investigations

During the 1993 Phase I RFI conducted at SWMU 33-012(a), a grid-based radiation survey was conducted, and no anomalies were identified. Soil samples were collected at two random locations on the asphalt pad and at two locations on the edge of the pad. All of the samples were collected beneath the asphalt. Samples were submitted for analysis of TAL metals, SVOCs, PCBs, herbicides, pesticides, and gamma-emitting radionuclides. Data from the 1993 Phase I RFI are screening-level data and showed inorganic chemicals detected above BVs and detected organic chemicals; radionuclides were not detected or detected above BVs/FVs. These data were not used to evaluate the nature and extent of contamination and are not discussed further in this report.

During the 2019–2020 investigation, a total of 21 samples were collected from 7 locations at previous RFI locations beneath the pad, 3 new locations next to the pad, and 1 new location downgradient of the pad. At each location, samples were collected at the surface and from 2 subsurface depths below the structure. A total of 15 samples were collected from 5 locations specified in the NMED approval with modifications letter for the Chaquehui Canyon Aggregate Area investigation work plan (LANL 2010, 111298.9; NMED 2011, 201242). At each location, samples were collected from 3 depths beneath the pad. All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, perchlorate, nitrate, VOCs, SVOCs, PCBs, isotopic uranium, tritium, and gamma-emitting radionuclides.

6.15.4 Site Contamination

6.15.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at SWMU 33-012(a). As a result, the following activities were completed as part of the 2021 investigation.

- Twenty-one samples were collected from seven locations (33-60992, 33-60993, 33-60996, 33-61085, 33-61089, 33-61090, and 33-61091) downgradient from locations 33-60659, 33-60660, and 33-60661 to define the lateral extent of PCBs and PAHs. Samples were collected from depth intervals 0.0–1.0 ft, 2.0–3.0 ft, and 4.0–5.0 ft bgs, corresponding to the depth intervals sampled during the 2019–2020 investigation. All samples were analyzed at an off-site fixed laboratory for PCBs and PAHs.
- Twenty-one samples were also collected from seven locations (33-60994, 33-60995, 33-61092, 33-61093, 33-61094, 33-61095, and 33-61096) between locations 33-01089 and 33-60660 to define the vertical and lateral extent of PCBs and PAHs to the east of the former drum storage area. Samples were collected from depth intervals 0.0–1.0 ft, 2.0–3.0 ft, and 4.0–5.0 ft bgs, corresponding to the depth intervals sampled during the 2019–2020 investigation. Samples were analyzed at an off-site fixed laboratory for PCBs and PAHs.
- Soil with elevated PAH concentrations was removed at location 33-60659 to 2.0 ft bgs. No confirmation samples were required at location 33-60659 because the vertical extent of contamination was defined by deeper samples previously collected at this location. Nine samples were collected from three new locations, 33-61086, 33-61087, and 33-61088, and placed 5 ft east, west, and south of existing location 33-60659 to define the vertical and lateral extent of PAHs. Samples were collected from the depth intervals of 0.0–1.0 ft, 2.0–3.0 ft, and 4.0–5.0 ft bgs and analyzed for PAHs.
- Soil with elevated PCB and PAH concentrations was removed at location 33-60661 to 2.0 ft bgs. No confirmation samples were required at location 33-60661 because the vertical extent of contamination was defined by deeper samples previously collected at this location. Twelve samples were collected from four new locations, 33-61097, 33-61098, 33-61099, and 33-61100, and placed 5 ft north, south, east, and west of existing location 33-60661 to define the vertical and lateral extent of PCBs and PAHs. Samples were collected from the depth intervals of 0.0–1.0 ft, 2.0–3.0 ft, and 4.0–5.0 ft bgs and analyzed for PCBs and PAHs.
- Approximately 2.2 yd^3 of soil with elevated PAH concentrations was removed from locations 33-60659 and 33-60661 at SWMU 33-012(a) to address potential unacceptable human health risk and ecological risk.

The sampling locations at SWMU 33-012(a) are shown in Figure 6.15-1. Table 6.15-1 presents the samples collected and analyses requested for SWMU 33-012(a). The geodetic coordinates of sample locations are presented in Table 3.2-1.

6.15.4.2 Soil, Rock, and Sediment Field Screening Results

During headspace screening for organic vapors at SWMU 33-012(a) a maximum concentration of 1.2 ppm was detected at location 33-60996 from 0.0 to 1.0 ft bgs. For the radiological-screening results, 51 samples exceeded twice the maximum site background levels for alpha-emitting radionuclides and 1 sample exceeded twice the maximum site background levels for beta/gamma-emitting radionuclides.

No changes were made to sampling or other activities based on field-screening results. Field-screening results are included in Appendix E (on DVD included with this document).

6.15.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data at SWMU 33-012(a) consist of results from 109 soil samples collected from 33 locations.

Inorganic Chemicals

A total of 34 soil samples were collected and analyzed for TAL metals, cyanide, perchlorate, and nitrate. Table 6.15-2 presents the inorganic chemicals above BVs and the detected inorganic chemicals with no BVs. Plate 28 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 (0.998 mg/kg to 7.09 mg/kg) above BV in 10 samples. Antimony is retained as a COPC.

Cadmium was detected above the soil BV (0.4 mg/kg) in four soil samples with a maximum concentration of 0.956 mg/kg. Cadmium is retained as a COPC.

Calcium was detected above the soil BV (6120 mg/kg) in 14 soil samples with a maximum concentration of 10,800 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in soil are statistically different from background (Figure F-107 and Table F-18). Calcium is retained as a COPC.

Chromium was detected above the soil BV (19.3 mg/kg) in one sample at a concentration of 482 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in soil are not statistically different from background (Figure F-108 and Table F-18). However, the maximum concentration was substantially greater than the BV. Chromium is retained as a COPC.

Copper was detected above the soil BV (14.7 mg/kg) in seven samples with a maximum concentration of 393 mg/kg. The quantile and slippage tests indicated site concentrations of copper in soil are statistically different from background (Figure F-109 and Table F-18). Copper is retained as a COPC.

Lead was detected above the soil BV (22.3 mg/kg) in six samples with a maximum concentration of 62.4 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil are not statistically different from background (Figure F-110 and Table F-18). Lead is not a COPC.

Nitrate was detected in 14 samples with a maximum concentration of 6.79 mg/kg. Nitrate is retained as a COPC.

Perchlorate was detected in two samples with a maximum concentration of 0.00986 mg/kg. Perchlorate is retained as a COPC.

Zinc was detected above the soil BV (48.8 mg/kg) in 10 samples with a maximum concentration of 638 mg/kg. The quantile and slippage tests indicated site concentrations of zinc in soil are statistically different from background (Figure F-111 and Table F-18). Zinc is retained as a COPC.

Organic Chemicals

A total of 34 soil samples were collected and analyzed for VOCs, SVOCs, and PCBs; 39 soil samples were analyzed for PCBs and PAHs only; 15 soil samples were analyzed for PCBs only; and 21 soil samples were analyzed for PAHs only. Table 6.15-3 presents the detected organic chemicals. Plate 29 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SMWU 33-012(a) include acenaphthene; acenaphthylene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; carbazole; chrysene; dibenz(a,h)anthracene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 1-methylnaphthalene; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; and TCE. The detected organic chemicals are retained as COPCs.

Radionuclides

A total of 34 soil samples were collected and analyzed for isotopic uranium, tritium, and gamma-emitting radionuclides.

Radionuclides were not detected above BVs/FVs at SWMU 33-012(a).

6.15.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 33-012(a) are discussed below. The spatial distribution of COPCs was evaluated using the data presented in Tables 6.15-2 and 6.15-3, and Plates 28 and 29.

Inorganic Chemicals

Inorganic COPCs at SWMU 33-012(a) include antimony, cadmium, calcium, chromium, copper, nitrate, perchlorate, and zinc.

Antimony was not detected above the soil BV but had DLs (0.998 mg/kg to 7.09 mg/kg) above BV in 10 samples. The residential SSL was approximately 4.4 times and the industrial SSL was approximately 73 times the maximum DL. Further sampling for extent of antimony is not warranted.

Cadmium was detected above the soil BV in four samples with a maximum concentration of 0.956 mg/kg. Concentrations decreased with depth at locations 33-01086, 33-01087, 33-60658, and 33-60662 and decreased downgradient. The lateral and vertical extent of cadmium are defined.

Calcium was detected above the soil BV in 14 samples with a maximum concentration of 10,800 mg/kg. Concentrations increased with depth at locations 33-01089, 33-60658, 33-60661, 33-60664, and 33-60665; did not change substantially with depth (10 mg/kg) at location 33-60663; decreased with depth at locations 33-01086, 33-01087, and 33-60660; and decreased downgradient. The residential essential nutrient SSL was approximately 1200 times the maximum concentration. The lateral extent of calcium is defined and further sampling for vertical extent is not warranted.

Chromium was detected above the soil BV in one sample at a concentration of 482 mg/kg. Concentrations decreased with depth at location 33-01086 and decreased downgradient. The lateral and vertical extent of chromium are defined.

Copper was detected above the soil BV in seven samples with a maximum concentration of 393 mg/kg. Concentrations decreased with depth at locations 33-01086, 33-01087, 33-01089, 33-60658, 33-60660, 33-60663, and 33-60665 and decreased downgradient. The lateral and vertical extent of copper are defined.

Nitrate was detected in 14 samples with a maximum concentration of 6.79 mg/kg. Concentrations increased with depth at locations 33-01086, 33-01089, and 33-60663; did not change substantially with depth (0.11 mg/kg) at location 33-60664; decreased with depth at locations 33-01087, 33-60659, 33-60661, and 33-60666; and increased downgradient at location 33-60661. The residential SSL was approximately 18,400 times the maximum concentration. Further sampling for extent of nitrate is not warranted.

Perchlorate was detected in two samples with a maximum concentration of 0.00986 mg/kg. Concentrations increased with depth at location 33-60661 and increased downgradient. The residential SSL was approximately 5560 times the maximum concentration. Further sampling for extent of perchlorate is not warranted.

Zinc was detected above the soil BV in 10 samples with a maximum concentration of 638 mg/kg. Concentrations decreased with depth at all locations and decreased downgradient at location 33-60661. The lateral and vertical extent of zinc are defined.

Organic Chemicals

Organic COPCs at SWMU 33-012(a) include acenaphthene; acenaphthylene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; carbazole; chrysene; dibenz(a,h)anthracene; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 1-methylnaphthalene; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; and TCE.

Acenaphthene was detected in 54 samples with a maximum concentration of 1.72 mg/kg. Concentrations increased with depth at locations 33-01086, 33-60658, 33-60662, and 33-60663; decreased with depth at all other locations; and decreased laterally downgradient (concentrations at location 33-61059 decreased with depth when compared with the surface sample, which was excavated [Appendix E, Excavated Samples]). The residential SSL was approximately 2020 times the maximum concentration. The lateral extent of acenaphthene is defined and further sampling for vertical extent is not warranted.

Acenaphthylene was detected in six samples with a maximum concentration of 0.13 mg/kg. Concentrations decreased with depth at all locations and increased laterally. The residential SSL was approximately 13,380 times the maximum concentration. The vertical extent of acenaphthylene is defined and further sampling for lateral extent is not warranted.

Acetone was detected in nine samples with a maximum concentration of 0.0863 mg/kg. Concentrations increased with depth at location 33-60662; decreased with depth at locations 33-01086, 33-60661, 33-60663, and 33-60664; and decreased downgradient. The residential SSL was approximately 768,000 times the maximum concentration. The lateral extent of acetone is defined and further sampling for vertical extent is not warranted.

Anthracene was detected in 62 samples with a maximum concentration of 3.15 mg/kg. Concentrations increased with depth at locations 33-01086, 33-60658, 33-60662, and 33-60663; decreased with depth at all other locations; and increased laterally (concentrations at location 33-60659 decreased with depth when compared with the surface sample, which was excavated [Appendix E, Excavated Samples]). The residential SSL was approximately 5520 times the maximum concentration. Further sampling for vertical and lateral extent is not warranted.

Aroclor-1254 was detected in 68 samples with a maximum concentration of 17.3 mg/kg. Concentrations did not change substantially with depth (0.49 mg/kg) at location 33-61094, decreased with depth at all other locations, and increased laterally (concentrations at location 33-60661 decreased with depth when compared with the surface sample, which was excavated [Appendix E, Excavated Samples]). The maximum concentration is approximately 15 times the residential SSL and approximately 1.6 times the industrial SSL. Further sampling for vertical extent of Aroclor-1254 at location 33-61094 and for lateral extent around location 33-60661 is warranted.

Aroclor-1260 was detected in 72 samples with a maximum concentration of 4.84 mg/kg. Concentrations did not change substantially with depth (0.0089 mg/kg) at location 33-60996, decreased with depth at all other locations, and increased laterally (concentrations at location 33-60661 decreased with depth when compared with the surface sample, which was excavated [Appendix E, Excavated Samples]). The maximum concentration was approximately 2 times the residential SSL, and the industrial SSL was approximately 2.3 times the maximum concentration. Further sampling for lateral extent of Aroclor-1260 around location 33-60661 is warranted.

Benzo(a)anthracene was detected in 82 samples with a maximum concentration of 11.5 mg/kg. Concentrations did not change substantially with depth (0.0001 mg/kg) at location 33-01087, decreased with depth at all other locations, and increased laterally (concentrations at locations 33-60659 and 33-60661 decreased with depth when compared with the surface samples, which were excavated [Appendix E, Excavated Samples]). Although the concentrations in step-out samples at location 33-60659 decreased compared with the excavated sample, the concentrations in step-out samples are still substantially elevated and above the residential SSL. The maximum concentration was approximately 7.5 times the residential SSL, and the industrial SSL was approximately 2.8 times the maximum concentration. Further sampling for lateral extent of benzo(a)anthracene around location 33-60659 is warranted.

Benzo(a)pyrene was detected in 78 samples with a maximum concentration of 10.4 mg/kg. Concentrations increased with depth at locations 33-01086, 33-01087, and 33-60662; decreased with depth at all other locations; and increased laterally at locations 33-61086 and 33-61087 (concentrations at locations 33-60659 and 33-60661 decreased with depth when compared with the surface samples, which were excavated [Appendix E, Excavated Samples]). Although the concentrations in step-out samples at location 33-60659 decreased compared with the excavated sample, the concentrations in step-out samples are still substantially elevated and above the residential SSL. The maximum concentration was approximately 9.3 times the residential SSL, and the industrial SSL was approximately 2.3 times the maximum concentration. Further sampling for lateral extent of benzo(a)pyrene around location 33-60659 is warranted.

Benzo(b)fluoranthene was detected in 77 samples with a maximum concentration of 14.8 mg/kg. Concentrations increased with depth at locations 33-01086, 33-01087, and 33-60662; decreased with depth at all other locations; and increased laterally at locations 33-61086 and 33-61087 (concentrations at locations 33-60659 and 33-60661 decreased with when depth compared with the surface samples, which were excavated [Appendix E, Excavated Samples]). Although the concentrations in step-out samples at location 33-60659 decreased compared with the excavated sample, the concentrations in step-out samples are still substantially elevated and above the residential SSL. The maximum concentration was approximately 9.7 times the residential SSL, and the industrial SSL was approximately 2.2 times the maximum concentration. Further sampling for lateral extent of benzo(b)fluoranthene around location 33-60659 is warranted.

Benzo(g,h,i)perylene was detected in 71 samples with a maximum concentration of 6.11 mg/kg. Concentrations increased with depth at locations 33-01086, 33-01087, 33-60662, and 33-60663; decreased with depth at all other locations; and increased laterally at locations 33-61086 and 33-61087 (concentrations at locations 33-60659 and 33-60661 decreased with depth when compared with the surface samples, which were excavated [Appendix E, Excavated Samples]). The residential SSL was approximately 285 times the maximum concentration. Further sampling for extent of benzo(g,h,i)perylene is not warranted.

Benzo(k)fluoranthene was detected in 68 samples with a maximum concentration of 5.06 mg/kg. Concentrations increased with depth at locations 33-01086, 33-01087, 33-60658, 33-60662, and 33--60663; decreased with depth at all other locations; and increased laterally at locations 33-61086 and 33-61087 (concentrations at location 33-60659 decreased with depth when compared with the surface sample, which was excavated [Appendix E, Excavated Samples]). The residential SSL was approximately 3 times and the industrial SSL was approximately 64 times the maximum concentration. Further sampling for extent of benzo(k)fluoranthene is not warranted.

Carbazole was detected in four samples with a maximum concentration of 0.422 mg/kg. Concentrations increased with depth at locations 33-60662 and 33-60663, decreased with depth at location 33-60659 and 33-60660, and increased downgradient at location 33-60660 (concentrations at location 33-60659 decreased with depth when compared with the surface sample, which was excavated [Appendix E, Excavated Samples]). The residential SSL was approximately 185 times the maximum concentration. Further sampling for extent of carbazole is not warranted.

Chrysene was detected in 76 samples with a maximum concentration of 11.7 mg/kg. Concentrations increased with depth at locations 33-01086, 33-01087, 33-60662, and 33-60663; decreased with depth at all other locations; and increased laterally at locations 33-61086 and 33-61087 (concentrations at locations 33-60659 and 33-60661 decreased with depth when compared with the surface samples, which were excavated [Appendix E, Excavated Samples]). The residential SSL was approximately 13 times the maximum concentration. Further sampling for extent of chrysene is not warranted.

Dibenz(a,h)anthracene was detected in 55 samples with a maximum concentration of 1.72 mg/kg. Concentrations increased with depth at location 33-60662; decreased with depth at all other locations; and increased laterally at location 33-61086 (concentrations at location 33-60659 decreased with depth when compared with the surface sample, which was excavated [Appendix E, Excavated Samples]). Although the concentrations in step-out samples at location 33-60659 decreased compared with the excavated sample, the concentrations in step-out samples are still substantially elevated and above the residential SSL. The maximum concentration was approximately 11 times the residential SSL, and the industrial SSL was approximately 1.9 times the maximum concentration. Further sampling for lateral extent of dibenz(a,h)anthracene around location 33-60659 is warranted.

Fluoranthene was detected in 82 samples with a maximum concentration of 30.4 mg/kg. Concentrations increased with depth at location 33-01087, decreased with depth at all other locations, and increased laterally at locations 33-61086 and 33-61087 (concentrations at locations 33-60659 and 33-60661 decreased with depth when compared with the surface samples, which were excavated [Appendix E, Excavated Samples]). The residential SSL was approximately 76 times the maximum concentration. Further sampling for extent of fluoranthene is not warranted.

Fluorene was detected in 49 samples with a maximum concentration of 1.87 mg/kg. Concentrations increased with depth at locations 33-01086, 33-60658, 33-60662, 33-60663, and 33-61088; decreased with depth at all other locations; and increased laterally at location 33-61087 (concentrations at location 33-60659 decreased with depth when compared with the surface sample, which was excavated

[Appendix E, Excavated Samples]). The residential SSL was approximately 1240 times the maximum concentration. Further sampling for extent of fluorene is not warranted.

Indeno(1,2,3-cd)pyrene was detected in 70 samples with a maximum concentration of 7.38 mg/kg. Concentrations increased with depth at locations 33-01086, 33-60658, 33-60662, and 33-60663; decreased with depth at all other locations; and increased laterally at locations 33-61086 and 33-61087 (concentrations at locations 33-60659 and 33-60661 decreased with depth when compared with the surface samples, which were excavated [Appendix E, Excavated Samples]). Although the concentrations in step-out samples at location 33-60659 decreased compared with the excavated sample, the concentrations in step-out samples are still substantially elevated and above the residential SSL. The maximum concentration was approximately 4.8 times the residential SSL, and the industrial SSL was approximately 4.4 times the maximum concentration. Further sampling for lateral extent of indeno(1,2,3-cd)pyrene around location 33-60659 is warranted.

Methylnaphthalene[1-] and 2-methylnaphthalene were detected in 27 samples and 29 samples, respectively, with maximum concentrations of 0.765 mg/kg and 1.17 mg/kg, respectively. Concentrations increased with depth at locations 33-60659, 33-60662, 33-61088, and 33-61099; decreased with depth at all other locations; and increased laterally at location 33-61087. The respective residential SSLs were approximately 225 times and 198 times the maximum concentrations. Further sampling for extent of 1-methylnaphthalene and 2-methylnaphthalene is not warranted.

Naphthalene was detected in 39 samples with a maximum concentration of 3.44 mg/kg. Concentrations increased with depth at locations 33-01086, 33-60658, 33-60662, 33-60663, 33-61088, and 33-61099; decreased with depth at all other locations; and increased laterally at location 33-61087 (concentrations at location 33-60659 decreased with depth when compared with the surface sample, which was excavated [Appendix E, Excavated Samples]). The residential SSL was approximately 26 times the maximum concentration. Further sampling for extent of naphthalene is not warranted.

Phenanthrene was detected in 79 samples with a maximum concentration of 15.1 mg/kg. Concentrations increased with depth at locations 33-01086, 33-01087, and 33-60658; decreased with depth at all other locations; and increased laterally at locations 33-61086 and 33-61087 (concentrations at locations 33-60659 and 33-60661 decreased with depth when compared with the surface samples, which were excavated [Appendix E, Excavated Samples]). The residential SSL was approximately 115 times the maximum concentration. Further sampling for extent of phenanthrene is not warranted.

Pyrene was detected in 86 samples with a maximum concentration of 29.5 mg/kg. Concentrations increased with depth at location 33-01087, decreased with depth at all other locations, and increased laterally at locations 33-61086 and 33-61087 (concentrations at locations 33-60659 and 33-60661 decreased with depth when compared with the surface samples, which were excavated [Appendix E, Excavated Samples]). The residential SSL was approximately 59 times the maximum concentration. Further sampling for extent of pyrene is not warranted.

TCE was detected in one sample at a concentration of 0.000909 mg/kg. Concentrations increased with depth at location 33-01089 and decreased downgradient. The residential SSL was approximately 7450 times the maximum concentration. The lateral extent of TCE is defined and further sampling for vertical extent is not warranted.

Radionuclides

Radionuclide COPCs were not identified for SWMU 33-012(a).

Summary of Nature and Extent

The lateral and vertical extent of inorganic and organic COPCs is defined or no further sampling for extent is warranted at SWMU 33-012(a) except for vertical extent of Aroclor-1254 at location 33-61094; lateral extent of Aroclor-1254 and Aroclor-1260 around location 33-60661; and lateral extent of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene around location 33-60659.

6.15.5 Summary of Human Health Risk Screening

A human health risk-screening assessment was not performed for SWMU 33-012(a) because the nature and extent of contamination have not been defined at this site.

6.15.6 Summary of Ecological Risk Screening

An ecological risk-screening assessment was not performed for SWMU 33-012(a) because the nature and extent of contamination have not been defined at this site.

6.16 SWMU 33-017, Operational Release

6.16.1 Site Description and Operational History

SWMU 33-017 consists of areas potentially impacted by operational releases from former operations within the Main Site at TA-33 (Figure 6.16-1). SWMU 33-017 is located at the northern and eastern edges of the Main Site and is approximately 600 ft long × 100 ft to 600 ft wide. The site generally slopes downward to the east and is at the head of a small drainage tributary of Chaquehui Canyon. SWMU 33-017 is potentially impacted by runoff from the paved areas of the Main Site complex, by deposition from airborne releases from TA-33 Main Site facilities, and by operational releases from an area east of building 33-39 used for vehicle maintenance.

Operations conducted within the Main Site included uranium processing and machining, cadmium and silver welding and soldering, lead melting and casting, cadmium and beryllium machining, and tritium processing and decontamination. Additional materials handled at the Main Site facilities included mercury and organic solvents. These operations began in 1949 and most continued until 1972. When these operations ceased, some of the facilities were used for offices and electronics laboratories.

6.16.2 Relationship to Other SWMUs

All or portions of SWMUs 33-004(a), 33-004(h), 33-004(i), 33-011(d), 33-012(a), and 33-015 and AOCs C-33-001 and C-33-003 are located within SWMU 33-017. SWMU 33-017 is located directly west of SWMU 33-008(c), approximately 120 ft northwest of SWMU 33-002(d), and approximately 125 ft northwest of SWMUs 33-002(a) and 33-002(c) (Plate 2).

6.16.3 Summary of Previous Investigations

During the 1993 RFI conducted at SWMU 33-017, 67 samples were collected from 66 locations including random offsets from a 100-ft grid overlying the Main Site, four radial extensions from the grid, within the vehicle maintenance area, and locations from drainage channels that receive runoff from the Main Site. Samples were submitted for analysis of TAL metals, total uranium, SVOCs, herbicides, pesticides, PCBs, isotopic plutonium, tritium, and gamma-emitting radionuclides. Data from the 1993 Phase I RFI are screening-level data and showed several inorganic chemicals detected above BVs; 23 detected organic chemicals; and cesium-137, plutonium-238, plutonium-239/240, and tritium detected or detected above FVs. These data were not used to evaluate the nature and extent of contamination and are not discussed further in this report.

During the 1996 Phase II RFI conducted at SWMU 33-017, the area of investigation focused on the area east of building 33-39 at the location of the former vehicle maintenance area. A total of 25 samples were collected from 24 locations. Samples were submitted for analysis of SVOCs and PCBs. Data from the 1996 Phase II RFI meet data-validation standards and are decision-level data included in this report.

During the 2019–2020 investigation, a total of 75 samples were collected from 25 previous RFI locations to determine nature and extent and define vertical extent. At each location, samples were collected at the surface and from 2 subsurface depths. A total of 15 samples were collected from 5 locations in the drainage downgradient of the Main Site to the storm water gauge station E340 to determine lateral extent. At each location, samples were collected from three depths beneath the pad. All samples were analyzed at off-site fixed laboratories for TAL metals, cyanide, perchlorate, nitrate, VOCs, SVOCs, PCBs, isotopic uranium, tritium, isotopic plutonium, and gamma-emitting radionuclides.

6.16.4 Site Contamination

6.16.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at SWMU 33-017. As a result, the following activities were completed as part of the 2021 investigation.

- Soil with elevated copper, lead, mercury, zinc, and selenium concentrations was removed at location 33-01114 to 2.0 ft bgs. No confirmation samples were required at location 33-01114 because the vertical extent of contamination was defined by deeper samples previously collected at this location. This location was excavated as part of the activities for SWMU 33-008(c).
- Soil with elevated copper, lead, mercury, zinc, and selenium concentrations was removed at locations 33-01106, 33-01107, and 33-01612 to 2.0 ft bgs. No confirmation samples were required at these locations because the vertical extent of contamination was defined by deeper samples previously collected at these locations. Twelve samples were collected from four new locations, 33-60982, 33-60983, 33-60984, and 33-60985 placed 5 ft north, south, and west of existing locations 33-01106, 33-01107, and 33-01612, to define the vertical and lateral extent of copper, lead, mercury, zinc, and selenium. Samples were collected from the depth intervals of 0.0–1.0 ft, 2.0–3.0 ft, and 4.0–5.0 ft bgs, corresponding to the depth intervals sampled during the 2019–2020 investigation. All samples were analyzed for TAL metals.
- Approximately 17.25 yd^3 of soil with elevated copper, lead, mercury, zinc, and selenium concentrations was removed from locations 33-01106, 33-01107, 33-01114, and 33-01612 at SWMU 33-017 to address potential unacceptable ecological risk.

The sampling locations at SWMU 33-017 are shown in Figure 6.16-1. Table 6.16-1 presents the samples collected and analyses requested for SWMU 33-017. The geodetic coordinates of sample locations are presented in Table 3.2-1.

6.16.4.2 Soil, Rock, and Sediment Field Screening Results

During headspace screening for organic vapors at SWMU 33-017 a maximum concentration of 17.1 ppm was detected at location 33-60984 from 4.0 to 5.0 ft bgs. For the radiological-screening results, 11 samples exceeded twice the maximum site background levels for alpha-emitting radionuclides and 1 sample exceeded twice the maximum site background levels for beta/gamma-emitting radionuclides. No changes were made to sampling or other activities based on field-screening results. Field-screening results are included in Appendix E (on DVD included with this document).

6.16.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data at SWMU 33-017 consist of results from 121 samples (48 tuff, 70 soil, and 3 sediment) collected from 51 locations.

Inorganic Chemicals

A total of 97 samples (48 tuff, 48 soil, and 1 sediment) were collected and analyzed for TAL metals, cyanide, perchlorate, and nitrate. Table 6.16-2 presents the inorganic chemicals above BVs and the detected inorganic chemicals with no BVs. Plate 30 shows the spatial distribution of inorganic chemicals detected or detected above BVs.

Antimony was detected above the soil and Qbt 2,3,4 BVs (0.83 mg/kg and 0.5 mg/kg, respectively) in 2 soil samples and 3 tuff samples with a maximum a concentration of 1.7 mg/kg and was not detected but had DLs (0.51 mg/kg to 1.82 mg/kg) above BVs in 9 soil samples and 10 tuff samples. Antimony is retained as a COPC.

Barium was detected above the Qbt 2,3,4 BV (46 mg/kg) in two samples with a maximum concentration of 65.1 mg/kg. The Gehan and quantile tests indicated site concentrations of barium in tuff are not statistically different from background (Figure F-112 and Table F-19). Barium is not a COPC.

Cadmium was detected above the soil; sediment; and Qbt 2,3,4 BVs (0.4 mg/kg, 0.4 mg/kg, and 1.63 mg/kg, respectively) in eight soil samples, one sediment sample, and two tuff samples with a maximum concentration of 6.91 mg/kg. Cadmium is retained as a COPC.

Calcium was detected above the soil and Qbt 2,3,4 BVs (6120 mg/kg and 2200 mg/kg, respectively) in 12 soil samples and 4 tuff samples with a maximum concentration of 15,500 mg/kg. The Gehan and quantile tests indicated site concentrations of calcium in soil are statistically different from background (Figure F-113 and Table F-20). 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, respectively) in 1 soil sample and 20 tuff samples with a maximum concentration of 31.2 mg/kg. The Gehan and quantile tests indicated site concentrations of chromium in tuff are statistically different from background (Figure F 114 and Table F-19). 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 5.25 mg/kg. The Gehan and quantile tests indicated site concentrations of cobalt in tuff are not statistically different from background (Figure F-115 and Table F-19). Cobalt is not a COPC.

Copper was detected above the soil; sediment; and Qbt 2,3,4 BVs (14.7 mg/kg, 11.2 mg/kg, and 4.66 mg/kg, respectively) in 12 soil samples, 1 sediment sample, and 8 tuff samples with a maximum concentration of 186 mg/kg. The Gehan and quantile tests indicated site concentrations of copper in soil are statistically different from background (Figure F-116 and Table F-20). Copper is retained as a COPC.

Iron was detected above the Qbt 2,3,4 BV (14,500 mg/kg) in one sample at a concentration of 56,600 mg/kg. The quantile and slippage tests indicated site concentrations of iron in tuff are not statistically different from background (Figure F-117 and Table F-19). Iron is not a COPC.

Lead was detected above the soil; sediment; and Qbt 2,3,4 BVs (22.3 mg/kg, 19.7 mg/kg, and 11.2 mg/kg, respectively) in 10 soil samples, 1 sediment sample, and 6 tuff samples with a maximum concentration of 304 mg/kg. The Gehan and quantile tests indicated site concentrations of lead in soil and tuff are statistically different from background (Figure F-118 and Table F-20, and Figure F-119 and Table F-19, respectively), and there are too few sediment samples to perform statistical tests. Lead is retained as a COPC.

Magnesium was detected above the Qbt 2,3,4 BV (1690 mg/kg) in one sample at a concentration of 2050 mg/kg. The quantile and slippage tests indicated site concentrations of magnesium in tuff are not statistically different from background (Figure F-120 and Table F-19). 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 1350 mg/kg. The Gehan and quantile tests indicated site concentrations of manganese in tuff are not statistically different from background (Figure F-121 and Table F-19). Manganese is not a COPC.

Mercury was detected above the soil and Qbt 2,3,4 BVs (0.1 mg/kg for both) in five soil samples and two tuff samples with a maximum concentration of 0.162 mg/kg. Mercury is retained as a COPC.

Nickel was detected above the soil and Qbt 2,3,4 BVs (15.4 mg/kg and 6.58 mg/kg, respectively) in one soil sample and in one tuff sample with a maximum concentration of 39.9 mg/kg. The Gehan and quantile tests indicated site concentrations of nickel in soil are not statistically different from background (Figure F-122 and Table F-20). The quantile and slippage tests indicated site concentrations of nickel in tuff are not statistically different from background (Figure F-123 and Table F-19). Nickel is not a COPC.

Nitrate was detected in 48 samples with a maximum concentration of 57.2 mg/kg. Nitrate is retained as a COPC.

Perchlorate was detected in 29 samples with a maximum concentration of 0.0265 mg/kg. Perchlorate is retained as a COPC.

Selenium was detected above the soil; sediment; and Qbt 2,3,4 BVs (1.52 mg/kg, 0.3 mg/kg, and 0.3 mg/kg, respectively) in 4 soil samples, 1 sediment sample, and 48 tuff samples with a maximum concentration of 1.81 mg/kg. The Gehan and quantile tests indicated site concentrations of selenium in soil are statistically different from background (Figure F-124 and Table F-20). Selenium is retained as a COPC.

Silver was detected above the soil and Qbt 2,3,4 BVs (1 mg/kg for both) in five soil samples and five tuff samples with a maximum concentration of 72.9 mg/kg. Silver is retained as a COPC.

Sodium was detected above the soil BV (915 mg/kg) in two soil samples with a maximum concentration of 1190 mg/kg. The Gehan and quantile tests indicated site concentrations of sodium in soil are not statistically different from background (Figure F-125 and Table F-20). Sodium is not a COPC.

Zinc was detected above the soil; sediment; and Qbt 2,3,4 BVs (48.8 mg/kg, 60.2 mg/kg, and 63.5 mg/kg, respectively) in 10 soil samples, 1 sediment sample, and in 3 tuff samples with a maximum concentration of 436 mg/kg. The Gehan and quantile tests indicated site concentrations of zinc in soil and tuff are not statistically different from background (Figure F-126 and Table F-20, and Figure F-127 and Table F-19) and there were too few sediment samples to perform statistical tests. Zinc is retained as a COPC.

Organic Chemicals

A total of 103 samples (40 tuff, 60 soil, and 3 sediment) were collected and analyzed for SVOCs, 85 samples (40 tuff, 44 soil, and 1 sediment) were analyzed for VOCs, and 91 samples (40 tuff, 50 soil, and 1 sediment) were analyzed for PCBs. Table 6.16-3 presents the detected organic chemicals. Plate 31 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at SWMU 33-017 include acenaphthene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; carbazole; chrysene; dibenz(a,h)anthracene; dibenzofuran; di-n-butylphthalate; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; 1-methylnaphthalene; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; toluene; and TCE. The detected organic chemicals are retained as COPCs.

Radionuclides

A total of 85 samples (40 tuff, 44 soil, and 1 sediment) were collected and analyzed for isotopic uranium, tritium, and isotopic plutonium. Table 6.16-4 presents the radionuclides detected or detected above BVs/FVs. Plate 32 shows the spatial distribution of radionuclides detected or detected above BVs/FVs.

Plutonium-239/240 was detected above the soil FV (0.054 pCi/g) in one sample from 0.0 to 1.0 ft bgs and detected in five tuff samples with a maximum activity of 0.056 pCi/g. Plutonium-239/240 is retained as a COPC.

Tritium was detected in three soil samples with a maximum activity of 14.2 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 0.164 pCi/g. Uranium-235/236 is retained as a COPC.

Uranium-238 was detected above the soil BV (2.29 pCi/g) in two samples with a maximum activity of 2.59 pCi/g. Uranium-238 is retained as a COPC.

6.16.4.4 Nature and Extent of Contamination

The nature and extent of inorganic, organic, and radionuclide COPCs at SWMU 33-017 are discussed below. The spatial distribution of COPCs was evaluated using the data presented in Tables 6.16-2, 6.16-3, and 6.16-4 and Plates 30, 31, and 32.

Inorganic Chemicals

Inorganic COPCs at SWMU 33-017 include antimony, cadmium, calcium, chromium, copper, lead, mercury, nitrate, perchlorate, selenium, silver, 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 1.7 mg/kg and was not detected but had DLs (0.51 mg/kg to 1.82 mg/kg) above BVs in 9 soil samples and 10 tuff samples. Concentrations decreased with depth at locations 33-60982, 33-60984, and 33-60985 and decreased downgradient. The residential SSL was approximately 17 times the maximum DL. Further sampling for extent of antimony is not warranted.

Cadmium was detected above the soil; sediment; and Qbt 2,3,4 BVs in eight soil samples, one sediment sample, and two tuff samples with a maximum concentration of 6.91 mg/kg. Concentrations decreased with depth at locations 33-01104, 33-01113, 33-01114, 33-01606, 33-01614, 33-01616, 33-60982, 33-60983, 33-60984, and 33-60985 and decreased downgradient (concentrations at location 33-01114 decreased with depth when compared with the surface sample, which was excavated [Appendix E, Excavated Samples]). The lateral and vertical extent of cadmium are defined.

Calcium was detected above the soil and Qbt 2,3,4 BVs in 12 soil samples and 4 tuff samples with a maximum concentration of 15,500 mg/kg. Concentrations increased with depth at locations 33-01109 and 33-01607; did not change substantially with depth (60 mg/kg and 90 mg/kg) at locations 33-01166 and 33-01615; decreased with depth at locations 33-01102, 33-01104, 33-01116, 33-01120, 33-01152, 33-01156, 33-01606, and 33-01614; and decreased downgradient. The residential essential nutrient SSL was approximately 839 times the maximum concentration. The lateral extent of calcium is defined and further sampling for vertical extent is not warranted.

Chromium was detected above the soil and Qbt 2,3,4 BVs in 1 soil sample and 20 tuff samples with a maximum concentration of 31.2 mg/kg. Concentrations increased with depth at locations 33-01120, 33-01128, 33-01135, 33-01145, 33-01152, 33-01156, 33-01166, 33-60619, and 33-60620; decreased with depth at locations 33-01106, 33-01107, 33-01109, 33-01113, 33-01114, 33-01612, 33-01616, and 33-60984; and increased downgradient at location 33-60620. As discussed in section 4.2, because there was no known use of hexavalent chromium at this site, the results were compared with the residential SSL for trivalent chromium (117,000 mg/kg). The residential trivalent chromium SSL was approximately 3750 times the maximum concentration. Further sampling for extent of chromium is not warranted.

Copper was detected above the soil; sediment; and Qbt 2,3,4 BVs in 12 soil samples, 1 sediment sample, and 8 tuff samples with a maximum concentration of 186 mg/kg. Concentrations decreased with depth at locations 33-01106, 33-01109, 33-01113, 33-01114, 33-01120, 33-01128, 33-01606, 33-01607, 33-01614, 33-01615, 33-01616, 33-60982, 33-60983, 33-60984, and 33-60985 and decreased downgradient (concentrations at location 33-01114 decreased with depth when compared with the surface sample, which was excavated [Appendix E, Excavated Samples]). The lateral extent of the area requiring excavation around locations 33-01106, 33-01107, and 33-01612 was bounded. The lateral and vertical extent of copper are defined.

Lead was detected above the soil; sediment; and Qbt 2,3,4 BVs in 10 soil samples, 1 sediment sample, and 6 tuff samples with a maximum concentration of 304 mg/kg. Concentrations decreased with depth at locations 33-01106, 33-01109, 33-01113, 33-01114, 33-01120, 33-01135, 33-01614, 33-01615, 33-01616, 33-60982, 33-60983, 33-60984, and 33-60985 (concentrations at location 33-01106 decreased with depth when compared with the surface sample, which was excavated [Appendix E, Excavated Samples]). Concentrations decreased downgradient, but the concentration in the step-out sample at location 33-60984 was similar to the concentration excavated at location 33-01114 and the lateral extent of elevated lead has not been defined. The vertical extent of lead is defined but further sampling for lateral extent at location 33-60984 is warranted.

Mercury was detected above the soil and Qbt 2,3,4 BVs in five soil samples and two tuff samples with a maximum concentration of 0.162 mg/kg. Concentrations increased with depth at location 33-01612; decreased with depth at locations 33-01114, 33-01145, 33-01616, 33-60982, 33-60984, and 33-60985; and decreased downgradient. The residential SSL was approximately 145 times the maximum concentration. The lateral extent of mercury is defined and further sampling for vertical extent is not warranted.

Nitrate was detected in 48 samples with a maximum concentration of 57.2 mg/kg. Concentrations increased with depth at locations 33-01604, 33-01606, 33-01614, and 33-01615; decreased with depth at all other locations; and decreased downgradient. The residential SSL was approximately 2180 times the maximum concentration. The lateral extent of nitrate is defined and further sampling for vertical extent is not warranted.

Perchlorate was detected in 29 samples with a maximum concentration of 0.0265 mg/kg. Concentrations increased with depth at locations 33-01146, 33-01156, 33-60618, and 33-60619; did not change substantially with depth (0.000055 mg/kg) at location 33-01135; decreased with depth at locations 33-01105, 33-01116, 33-01120, 33-01145, 33-01614, 33-01615, 33-01616, 33-60617, and 33-60620; and decreased downgradient. The residential SSL was approximately 2070 times the maximum concentration. The lateral extent of perchlorate is defined and further sampling for vertical extent is not warranted.

Selenium was detected above the soil; sediment; and Qbt 2,3,4 BVs in 4 soil samples, 1 sediment sample, and 48 tuff samples with a maximum concentration of 1.81 mg/kg. Concentrations increased with depth at locations 33-01102, 33-01106, 33-01109, 33-01166, and 33-60619; did not change substantially with depth (0.03 mg/kg to 0.14 mg/kg) at locations 33-01107, 33-01113, 33-01114, 33-01120, 33-01135, 33-01152, 33-60616, 33-60617, 33-60618, 33-60620, 33-60982, 33-60983, 33-60984, and 33-60985; and decreased with depth at all other locations (concentrations in shallow samples at locations 33-01120, 33-01128, 33-01135, 33-01152, and 33-01616 were 1.35 mg/kg, 1.11 mg/kg, 0.984 mg/kg, 0.668 mg/kg, and 1.12 mg/kg, respectively, and below the soil BV [Appendix E, Pivot Tables]). Concentrations decreased downgradient. The residential SSL was approximately 216 times the maximum concentration. Further sampling for extent of selenium is not warranted.

Silver was detected above the soil and Qbt 2,3,4 BVs in five soil samples and five tuff samples with a maximum concentration of 72.9 mg/kg. Concentrations decreased with depth at locations 33-01106, 33-01114, 33-01616, 33-60982, 33-60983, 33-60984, and 33-60985 and increased laterally (concentrations at location 33-01106 decreased with depth when compared with the surface sample, which was excavated [Appendix E, Excavated Samples]). The residential SSL was approximately 5.4 times and the industrial SSL was approximately 89 times the maximum concentration. The vertical extent of silver is defined and further sampling for lateral extent is not warranted.

Zinc was detected above the soil; sediment; and Qbt 2,3,4 BVs in 10 soil samples, 1 sediment sample, and 3 tuff samples with a maximum concentration of 436 mg/kg. Concentrations decreased with depth at locations 33-01104, 33-01109, 33-01113, 33-01114, 33-01606, 33-01614, 33-01615, 33-01616, 33-60982, 33-60983, 33-60984, and 33-60985 and decreased downgradient (concentrations at location 33-01114 decreased with depth when compared with the surface sample, which was excavated [Appendix E, Excavated Samples]). The lateral and vertical extent of zinc are defined.

Organic Chemicals

Organic COPCs at SWMU 33-017 include acenaphthene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; benzoic acid; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; carbazole; chrysene; dibenz(a,h)anthracene; dibenzofuran; di-n-butylphthalate; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; 4-isopropyltoluene; 1-methylnaphthalene; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; toluene; and TCE.

Acenaphthene was detected in 19 samples with a maximum concentration of 1.3 mg/kg. Only one depth was sampled at locations 33-01585, 33-01588, 33-01593, 33-01595, 33-01596, and 33-01598; concentrations decreased with depth at locations 33-01102, 33-01105, 33-01106, 33-01109, 33-01114, 33-01128, 33-01604, 33-01612, 33-01614, 33-01615, and 33-01616; and concentrations decreased downgradient (concentrations at location 33-01114 decreased with depth when compared with the surface sample, which was excavated [Appendix E, Excavated Samples]). The residential SSL was approximately 2680 times the maximum concentration. The lateral extent of acenaphthene is defined and further sampling for vertical extent is not warranted.

Acetone was detected in 17 samples with a maximum concentration of 0.0583 mg/kg. Concentrations increased with depth at locations 33-01106, 33-01107, 33-01114, 33-01152, 33-01156, and 33-01612; did not change substantially with depth (0.0004 mg/kg and 0.00045 mg/kg) at locations 33-01128 and 33-01616; decreased with depth at locations 33-01116, 33-01607, and 33-60617; and decreased downgradient. The residential SSL was approximately 1,140,000 times the maximum concentration. The lateral extent of acetone is defined and further sampling for vertical extent is not warranted.

Anthracene was detected in 25 samples with a maximum concentration of 2 mg/kg. Concentrations increased with depth at location 33-01130; only one depth was sampled at locations 33-01585, 33-01588, 33-01593, 33-01595, 33-01596, and 33-01598; concentrations decreased with depth at locations 33-01102, 33-01105, 33-01106, 33-01109, 33-01113, 33-01114, 33-01120, 33-01128, 33-01604, 33-01614, 33-01615, and 33-01616; and concentrations decreased downgradient (concentrations at location 33-01114 decreased with depth when compared with the surface sample, which was excavated [Appendix E, Excavated Samples]). The residential SSL was approximately 8700 times the maximum concentration. The lateral extent of anthracene is defined and further sampling for vertical extent is not warranted.

Aroclor-1254 was detected in 41 samples with a maximum concentration of 1.56 mg/kg. Concentrations decreased with depth at locations 33-01104, 33-01105, 33-01106, 33-01107, 33-01109, 33-01113, 33-01114, 33-01128, 33-01130, 33-01604, 33-01606, 33-01607, 33-01612, 33-01614, 33-01615, 33-01616, and 33-60616 and decreased downgradient (concentrations at location 33-01612 decreased with depth when compared with the surface sample, which was excavated [Appendix E, Excavated Samples]). The lateral and vertical extent of Aroclor-1254 is defined.

Aroclor-1260 was detected in 42 samples with a maximum concentration of 3.7 mg/kg. Concentrations decreased with depth at locations 33-01102, 33-01104, 33-01105, 33-01106, 33-01107, 33-01109, 33-01113, 33-01114, 33-01128, 33-01130, 33-01604, 33-01606, 33-01607, 33-01612, 33-01614, 33-01615, 33-01616, and 33-60616 and decreased downgradient (concentrations at locations 33-01102 and 33-01612 decreased with depth when compared with the surface samples, which were excavated [Appendix E, Excavated Samples]). The lateral and vertical extent of Aroclor-1260 are defined.

Benzo(a)anthracene was detected in 50 samples with a maximum concentration of 3.5 mg/kg. Concentrations increased with depth at locations 33-01130 and 33-01606; only one depth was sampled at locations 33-01585, 33-01586, 33-01587, 33-01588, 33-01589, 33-01590, 33-01591, 33-01592, 33-01593, 33-01594, 33-01595, 33-01596, 33-01598, and 33-01602; concentrations decreased with depth at locations 33-01102, 33-01104, 33-01105, 33-01106, 33-01107, 33-01109, 33-01113, 33-01114, 33-01120, 33-01128, 33-01601, 33-01604, 33-01607, 33-01612, 33-01614, 33-01615, 33-01616, and 33-60616; and concentrations decreased downgradient (concentrations at location 33-01114 decreased with depth when compared with the surface sample, which was excavated [Appendix E, Excavated Samples]). Vertical extent at locations 33-01588, 33-01593, and 33-01595 is defined by decreasing concentrations in deeper samples from adjacent locations 33-60613 and 33-01059 [SWMU 33-004(i)] (Plate 9). The residential SSL was approximately 1.8 times and the industrial SSL was approximately

38 times the maximum concentration where extent is not defined (0.84 mg/kg at location 33-01585). The lateral extent of benzo(a)anthracene is defined and further sampling for vertical extent is not warranted.

Benzo(a)pyrene was detected in 46 samples with a maximum concentration of 2.4 mg/kg. Concentrations increased with depth at locations 33-01130 and 33-01606; concentrations did not change substantially with depth (0.012 mg/kg) at location 33-01105; only one depth was sampled at locations 33-01585, 33-01586, 33-01588, 33-01589, 33-01591, 33-01593, 33-01594, 33-01595, 33-01596, 33-01598, 33-01600, and 33-01602; concentrations decreased with depth at locations 33-01102, 33-01104, 33-01106, 33-01107, 33-01109, 33-01113, 33-01114, 33-01120, 33-01128, 33-01601, 33-01604, 33-01607, 33-01612, 33-01614, 33-01615, 33-01616, and 33-60616; and concentrations decreased downgradient (concentrations at location 33-01114 decreased with depth when compared with the surface sample, which was excavated [Appendix E, Excavated Samples]). Vertical extent at locations 33-01588, 33-01593, and 33-01595 is defined by decreasing concentrations in deeper samples from adjacent locations 33-60613 and 33-01059 [SWMU 33-004(i)] (Plate 9). The residential SSL was approximately 1.4 times and the industrial SSL was approximately 30 times the maximum concentration where extent is not defined (0.78 mg/kg at location 33-01585). The lateral extent of benzo(a)pyrene is defined and further sampling for vertical extent is not warranted.

Benzo(b)fluoranthene was detected in 44 samples with a maximum concentration of 2.7 mg/kg. Concentrations increased with depth at locations 33-01130 and 33-01606; concentrations did not change substantially with depth (0.014 mg/kg) at location 33-01105; only one depth was sampled at locations 33-01585, 33-01586, 33-01588, 33-01589, 33-01591, 33-01592, 33-01593, 33-01594, 33-01595, 33-01596, 33-01598, and 33-01600; concentrations decreased with depth at locations 33-01102, 33-01104, 33-01106, 33-01107, 33-01109, 33-01113, 33-01114, 33-01120, 33-01128, 33-01604, 33-01607, 33-01612, 33-01614, 33-01615, 33-01616, and 33-60616; and concentrations decreased downgradient (concentrations at location 33-01114 decreased with depth when compared with the surface sample, which was excavated [Appendix E, Excavated Samples]). Vertical extent at locations 33-01588, 33-01593, and 33-01595 is defined by decreasing concentrations in deeper samples from adjacent locations 33-01614, 33-60613, and 33-01059 [SWMU 33-004(i)] (Plate 9). The residential SSL was approximately 1.5 times and the industrial SSL was approximately 33 times the maximum concentration where extent is not defined (0.99 mg/kg at location 33-01585). The lateral extent of benzo(b)fluoranthene is defined and further sampling for vertical extent is not warranted.

Benzo(g,h,i)perylene was detected in 34 samples with a maximum concentration of 1.41 mg/kg. Concentrations increased with depth at locations 33-01130 and 33-01606; only one depth was sampled at locations 33-01585, 33-01588, 33-01593, 33-01594, 33-01595, 33-01596, 33-01597, 33-01598, 33-01600, and 33-01602; concentrations decreased with depth at locations 33-01102, 33-01105, 33-01106, 33-01109, 33-01113, 33-01114, 33-01120, 33-01128, 33-01604, 33-01612, 33-01614, 33-01615, and 33-01616; and concentrations decreased downgradient (concentrations at location 33-01114 decreased with depth when compared with the surface sample, which was excavated [Appendix E, Excavated Samples]). The residential SSL was approximately 1230 times the maximum concentration. The lateral extent of benzo(g,h,i)perylene is defined and further sampling for vertical extent is not warranted.

Benzo(k)fluoranthene was detected in 30 samples with a maximum concentration of 1.1 mg/kg. Concentrations increased with depth at locations 33-01130 and 33-01606; only one depth was sampled at locations 33-01585, 33-01588, 33-01595, and 33-01596; concentrations decreased with depth at locations 33-01102, 33-01105, 33-01106, 33-01109, 33-01113, 33-01114, 33-01120, 33-01128, 33-01604, 33-01607, 33-01612, 33-01614, 33-01615, and 33-01616; and concentrations decreased downgradient (concentrations at location 33-01114 decreased with depth when compared with the surface sample, which was excavated [Appendix E, Excavated Samples]). The residential SSL was approximately 14 times and the industrial SSL was approximately 294 times the maximum concentration. The lateral extent of benzo(k)fluoranthene is defined and further sampling for vertical extent is not warranted.

Benzoic acid was detected in three samples with a maximum concentration of 0.22 mg/kg. Only one depth was sampled at locations 33-01588, 33-01589, and 33-01591, and concentrations decreased downgradient. The residential SSL was approximately 1,140,000 times the maximum concentration. The lateral extent of benzoic acid is defined and further sampling for vertical extent is not warranted.

Bis(2-ethylhexyl)phthalate was detected in seven samples with a maximum concentration of 0.404 mg/kg. Concentrations decreased with depth at locations 33-01105, 33-01106, 33-01114, 33-01612, 33-01614, 33-01616, and 33-60616 and decreased downgradient (concentrations at locations 33-01106 and 33-01114 decreased with depth when compared with the surface samples, which were excavated [Appendix E, Excavated Samples]). The lateral and vertical extent of bis(2-ethylhexyl)phthalate are defined.

Butylbenzylphthalate was detected in one sample at a concentration of 0.43 mg/kg. Only one depth was sampled at location 33-01591 and concentrations decreased downgradient. The residential SSL was approximately 6740 times the maximum concentration. The lateral extent of butylbenzylphthalate is defined and further sampling for vertical extent is not warranted.

Carbazole was detected in 16 samples at a maximum concentration of 0.447 mg/kg. Concentrations increased with depth at location 33-01130; decreased with depth at locations 33-01102, 33-01105, 33-01106, 33-01109, 33-01114, 33-01120, 33-01604, 33-01614, 33-01615, and 33-01616; and decreased downgradient (concentrations at location 33-01114 decreased with depth when compared with the surface sample, which was excavated [Appendix E, Excavated Samples]). The residential SSL was approximately 174 times the maximum concentration. The lateral extent of carbazole is defined and further sampling for vertical extent is not warranted.

Chrysene was detected in 49 samples with a maximum concentration of 2.5 mg/kg. Concentrations increased with depth at locations 33-01130 and 33-01606; only one depth was sampled at locations 33-01585, 33-01586, 33-01587, 33-01588, 33-01589, 33-01590, 33-01591, 33-01592, 33-01593, 33-01594, 33-01595, 33-01596, 33-01598, 33-01600, and 33-01602; concentrations decreased with depth at locations 33-01102, 33-01104, 33-01105, 33-01106, 33-01107, 33-01109, 33-01113, 33-01114, 33-01120, 33-01128, 33-01601, 33-01604, 33-01607, 33-01612, 33-01614, 33-01615, 33-01616, and 33-60616; and concentrations decreased downgradient (concentrations at location 33-01114 decreased with depth when compared with the surface sample, which was excavated [Appendix E, Excavated Samples]). The residential SSL was approximately 61 times the maximum concentration where extent is not defined (2.5 mg/kg at location 33-01595). The lateral extent of chrysene is defined and further sampling for vertical extent is not warranted.

Dibenz(a,h)anthracene was detected in 14 samples with a maximum concentration of 0.33 mg/kg. Concentrations increased with depth at location 33-01130; only one depth was sampled at locations 33-01593 and 33-01595; concentrations decreased with depth at locations 33-01102, 33-01109, 33-01114, 33-01604, 33-01614, and 33-01615; and concentrations decreased downgradient (concentrations at location 33-01114 decreased with depth when compared with the surface sample, which was excavated [Appendix E, Excavated Samples]). Vertical extent at locations 33-01593 and 33-01595 is defined by decreasing concentrations in deeper samples from adjacent locations 33-60613 and 33-01059 [SWMU 33-004(i)] (Plate 9). The residential SSL was approximately 12 times the maximum concentration where extent is not defined (0.0133 mg/kg at location 33-01130). The lateral extent of dibenz(a,h)anthracene is defined and further sampling for vertical extent is not warranted.

Dibenzofuran was detected in three samples with a maximum concentration of 0.43 mg/kg. Only one depth was sampled at locations 33-01588, 33-01593, and 33-01595 and concentrations decreased downgradient. The residential SSL was approximately 180 times the maximum concentration. The lateral extent of dibenzofuran is defined and further sampling for vertical extent is not warranted.

Di-n-butylphthalate was detected in eight samples with a maximum concentration of 0.26 mg/kg. Only one depth was sampled at locations 33-01588, 33-01589, 33-01600, and 33-01602; concentrations decreased with depth at locations 33-01106, 33-01614, 33-01615, and 33-01616; and concentrations decreased downgradient. The residential SSL was approximately 23,700 times the maximum concentration. The lateral extent of di-n-butylphthalate is defined and further sampling for vertical extent is not warranted.

Fluoranthene was detected in 54 samples with a maximum concentration of 6.4 mg/kg. Concentrations increased with depth at location 33-01130; only one depth was sampled at locations 33-01585, 33-01586, 33-01587, 33-01588, 33-01589, 33-01590, 33-01591, 33-01593, 33-01594, 33-01595, 33-01596, 33-01598, 33-01600, and 33-01602; concentrations decreased with depth at locations 33-01102, 33-01104, 33-01105, 33-01106, 33-01107, 33-01109, 33-01113, 33-01114, 33-01120, 33-01128, 33-01152, 33-01601, 33-01604, 33-01606, 33-01607, 33-01612, 33-01614, 33-01615, 33-01616, and 33-60616; and concentrations decreased downgradient (concentrations at location 33-01114 decreased with depth when compared with the surface sample, which was excavated [Appendix E, Excavated Samples]). The residential SSL was approximately 362 times the maximum concentration. The lateral extent of fluoranthene is defined and further sampling for vertical extent is not warranted.

Fluorene was detected in 18 samples with a maximum concentration of 0.94 mg/kg. Only one depth was sampled at locations 33-01585, 33-01588, 33-01593, and 33-01595; concentrations decreased with depth at locations 33-01102, 33-01105, 33-01106, 33-01109, 33-01114, 33-01128, 33-01604, 33-01614, 33-01615, and 33-01616; and concentrations decreased downgradient (concentrations at location 33-01114 decreased with depth when compared with the surface sample, which was excavated [Appendix E, Excavated Samples]). The residential SSL was approximately 2470 times the maximum concentration. The lateral extent of fluorene is defined and further sampling for vertical extent is not warranted.

Indeno(1,2,3-cd)pyrene was detected in 38 samples with a maximum concentration of 1 mg/kg. Concentrations increased with depth at locations 33-01130 and 33-01606; only one depth was sampled at locations 33-01585, 33-01586, 33-01588, 33-01589, 33-01591, 33-01593, 33-01594, 33-01595, 33-01596, 33-01598, 33-01600, and 33-01602; concentrations decreased with depth at locations 33-01102, 33-01104, 33-01105, 33-01106, 33-01109, 33-01113, 33-01114, 33-01120, 33-01128, 33-01601, 33-01604, 33-01612, 33-01614, 33-01615, and 33-01616; and concentrations decreased downgradient (concentrations at location 33-01114 decreased with depth when compared with the surface sample, which was excavated [Appendix E, Excavated Samples]). Vertical extent at locations 33-01588, 33-01593, and 33-01595 is defined by decreasing concentrations in deeper samples from adjacent locations 33-01614, 33-60613, and 33-01059 [SWMU 33-004(i)] (Plate 9) . The residential SSL was approximately 1.5 times and the industrial SSL was approximately 32 times the maximum concentration. The lateral extent of indeno(1,2,3-cd)pyrene is defined and further sampling for vertical extent is not warranted.

Isopropyltoluene[4-] was detected in three samples with a maximum concentration of 0.006 mg/kg. Concentrations decreased with depth at locations 33-01116 and 33-01145 and decreased downgradient. The lateral and vertical extent of 4-isopropyltoluene are defined.

Methylnaphthalene[1-] was detected in three samples with a maximum concentration of 0.114 mg/kg. Concentrations decreased with depth at locations 33-01102, 33-01604, and 33-01616 and decreased downgradient. The lateral and vertical extent of 1-methylnaphthalene are defined.

Methylnaphthalene[2-] was detected in seven samples with a maximum concentration of 0.15 mg/kg. Only one depth was sampled at locations 33-01585, 33-01588, and 33-01595; concentrations decreased with depth at locations 33-01102, 33-01604, 33-01615, and 33-01616; and concentrations decreased downgradient. The residential SSL was approximately 1550 times the maximum concentration. The lateral extent of 2-methylnaphthalene is defined and further sampling for vertical extent is not warranted.

Naphthalene was detected in 17 samples with a maximum concentration of 0.51 mg/kg. Only one depth was sampled at locations 33-01585, 33-01588, 33-01593, and 33-01595; concentrations decreased with depth at locations 33-01102, 33-01105, 33-01109, 33-01114, 33-01128, 33-01604, 33-01614, 33-01615, and 33-01616; and concentrations decreased downgradient (concentrations at location 33-01114 decreased with depth when compared with the surface sample, which was excavated [Appendix E, Excavated Samples]). The residential SSL was approximately 97 times the maximum concentration. The lateral extent of naphthalene is defined and further sampling for vertical extent is not warranted.

Phenanthrene was detected in 44 samples with a maximum concentration of 7.1 mg/kg. Concentrations increased with depth at locations 33-01105, 33-01130, and 33-01606; only one depth was sampled at locations 33-01585, 33-01586, 33-01588, 33-01589, 33-01591, 33-01593, 33-01595, 33-01596, 33-01598, 33-01600, and 33-01602; concentrations decreased with depth at locations 33-01102, 33-01104, 33-01106, 33-01107, 33-01109, 33-01113, 33-01114, 33-01120, 33-01128, 33-01604, 33-01607, 33-01612, 33-01614, 33-01615, 33-01616, and 33-60616; and concentrations decreased downgradient (concentrations at location 33-01114 decreased with depth when compared with the surface sample, which was excavated [Appendix E, Excavated Samples]). The residential SSL was approximately 245 times the maximum concentration. The lateral extent of phenanthrene is defined and further sampling for vertical extent is not warranted.

Pyrene was detected in 56 samples with a maximum concentration of 5.1 mg/kg. Concentrations increased with depth at locations 33-01130 and 33-01606; only one depth was sampled at locations 33-01585, 33-01586, 33-01587, 33-01588, 33-01589, 33-01590, 33-01591, 33-01592, 33-01593, 33-01594, 33-01595, 33-01596, 33-01598, 33-01600, and 33-01602; concentrations decreased with depth at locations 33-01102, 33-01104, 33-01105, 33-01106, 33-01107, 33-01109, 33-01113, 33-01114, 33-01120, 33-01128, 33-01146, 33-01152, 33-01601, 33-01604, 33-01607, 33-01612, 33-01614, 33-01615, 33-01616, and 33-60616; and concentrations decreased downgradient (concentrations at location 33-01114 decreased with depth when compared with the surface sample, which was excavated [Appendix E, Excavated Samples]). The residential SSL was approximately 341 times the maximum concentration. The lateral extent of pyrene is defined and further sampling for vertical extent is not warranted.

Toluene was detected in three samples with a maximum concentration of 0.000549 mg/kg. Concentrations decreased with depth at locations 33-01113, 33-01116, and 33-01145 and decreased downgradient. The lateral and vertical extent of toluene are defined.

TCE was detected in one sample at a concentration of 0.0065 mg/kg. Concentrations increased with depth at location 33-01606 and decreased downgradient. The residential SSL was approximately 1040 times the maximum concentration. The lateral extent of TCE is defined and further sampling for vertical extent is not warranted.

Radionuclides

Radionuclide COPCs at SWMU 33-017 include plutonium-239/240, tritium, uranium-235/236, and uranium-238.

Plutonium-239/240 was detected above the soil FV in one sample from 0.0 to 1.0 ft bgs and detected in five tuff samples with a maximum activity of 0.056 pCi/g. Activities increased with depth at locations 33-01166 and 33-60619, decreased with depth at locations 33-01135 and 33-60620, and increased downgradient. The residential SAL was approximately 1410 times the maximum activity. Further sampling for extent of plutonium-239/240 is not warranted.

Tritium was detected in three soil samples with a maximum activity of 14.2 pCi/g. Activities decreased with depth at locations 33-01116, 33-01145, and 33-01614 and decreased downgradient. The lateral and vertical extent of tritium are defined.

Uranium-235/236 was detected above the Qbt 2,3,4 BV in six samples with a maximum activity of 0.164 pCi/g. Activities increased with depth at locations 33-01152, 33-01156, and 33-60619; decreased with depth at locations 33-01135, 33-01145, and 33-60620; and increased downgradient. The residential SAL was approximately 256 times the maximum activity. Further sampling for extent of uranium-235/236 is not warranted.

Uranium-238 was detected above the soil BV in two samples with a maximum activity of 2.59 pCi/g. Activities decreased with depth at locations 33-01614 and 33-01616 and decreased downgradient. The 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 SWMU 33-017 except for lateral extent of lead at location 33-60984.

6.16.5 Summary of Human Health Risk Screening

A human health risk-screening assessment was not performed for SWMU 33-017 because the nature and extent of contamination have not been defined at this site.

6.16.6 Summary of Ecological Risk Screening

An ecological risk-screening assessment was not performed for SWMU 33-017 because the nature and extent of contamination have not been defined at this site.

6.17 AOC C-33-001, Former Transformer

6.17.1 Site Description and Operational History

AOC C-33-001 consists of a former PCB transformer (former structure 33-124) in the northern portion of the Main Site at TA-33 (Figure 6-17-1). The transformer was mounted on a 15-ft-long × 50-ft-wide concrete pad next to the northeast wall of building 33-114 and was bounded by asphalt to the north, east, and south. The pad was enclosed by a fence and accessible only through a locked gate. The transformer (former structure 33-124) was placed into service in the 1950s, and the mineral oil in the transformer contained PCBs. Oil stains were observed on the concrete pad and leaks from the transformer were observed during routine inspections conducted between September 1985 and March 1992. In 1992, the transformer was removed and replaced with a non-PCB transformer as part of DOE's program to remove all PCB-containing electrical equipment. The stained areas on the concrete pad were double-washed and double-rinsed; however, post-cleanup sampling was not conducted to verify the completion of cleanup as required by the Toxic Substances Control Act (TSCA) PCB spill cleanup requirements (40 CFR 761.130).

Sampling conducted during the transformer replacement was limited to the area where the old transformer had been placed temporarily during removal.

6.17.2 Relationship to Other SWMUs

AOC C-33-001 is located within SWMU 33-017, directly south of the eastern portion of AOC C-33-003, and approximately 170 ft northeast of SWMU 33-012(a) (Plate 2).

6.17.3 Summary of Previous Investigations

During the 1993 Phase I RFI conducted at TA-33, the ER Project determined the sampling conducted during the removal and replacement of the PCB transformer did not meet RFI objectives and did not meet the confirmation sampling requirements of the TSCA PCB spill cleanup regulations (40 CFR 761.130). The RFI report, therefore, recommended additional sampling to determine whether historical releases of PCBs had occurred. The proposed sampling included field-screening the stained areas on the concrete pad and the soil around the perimeter of the pad. If field screening detected PCBs in soil at the perimeter of the pad, additional screening samples were to be collected at greater distances from the pad until the extent of PCB contamination had been bounded (LANL 1995, 050113, pp. 90–93).

During the 1996 Phase II RFI conducted at TA-33, four samples were collected from four locations around the AOC C-33-001 transformer pad. The samples were submitted for analysis of PCBs/pesticides. Data from the 1996 RFI meet data-validation standards and are decision-level data included in this report.

In 1999, a BMP was performed at AOC C-33-001 consisting of the removal of PCB-contaminated soil and sediment using an industrial vacuum system on the asphalt area between buildings 33-113 and 33-114. The field team began by vacuuming the area closest to the transformer pads next to building 33-114 and continued to pick up sediment present in low-lying depressions on the asphalt. Special emphasis was placed on cracks and potholes that had developed over the years. In addition, the field team followed a low-grade slope from building 33-114 to the east between buildings 33-113 and 33-39 where surface sediment could migrate off-site during storm events. One 55-gal. drum of material was collected. No samples were collected during the 1999 BMP implementation.

During the 2019–2020 investigation, a total of 21 samples were collected from 4 previous RFI locations around the concrete pad and 3 additional locations downgradient to determine extent. At each location, samples were collected at the surface and from 2 subsurface depths. All samples were analyzed at off-site fixed laboratories for PCBs. Numerous utilities were encountered during the field event, which limited the locations that could be sampled.

6.17.4 Site Contamination

6.17.4.1 Soil, Rock, and Sediment Sampling

Based on previous investigation results, further characterization was required to assess potential contamination at AOC C-33-001. As a result, the following activities were completed as part of the 2021 investigation.

- Corrective actions at AOC C-33-001 to address potential unacceptable human health risk was performed by removing soil with elevated Aroclor-1260 concentrations at location 33-01749. No confirmation samples were required at location 33-01749 because the vertical extent of PCBs was defined by deeper samples previously collected at this location. Twelve samples were collected from four new locations, 33-61102, 33-61103, 33-61104, and 33-61105 placed north, south, east, and west of location 33-01749, to define the vertical and lateral extent of PCBs. Samples were collected from the depth intervals of 0.0–1.0 ft, 2.0–3.0 ft, and 4.0–5.0 ft bgs, corresponding to the depth intervals sampled during the 2019–2020 investigation. All samples were analyzed for PCBs.

Approximately 0.01 yd^3 of soil with elevated Aroclor-1260 concentrations was removed from location 33-01749 at AOC C-33-001 to address potential unacceptable human health risk. The sampling locations at AOC C-33-001 are shown in Figure 6.17-1. Table 6.17-1 presents the samples collected and analyses requested for SWMU 33-017. The geodetic coordinates of sample locations are presented in Table 3.2-1.

6.17.4.2 Soil, Rock, and Sediment Field Screening Results

During headspace screening for organic vapors at AOC C-33-001 a maximum concentration of 0.7 ppm was detected at location 33-01749 from 0.4 to 1.4 ft bgs. For the radiological-screening results, five samples exceeded twice the maximum site background levels for alpha-emitting radionuclides and no samples exceeded twice the maximum site background levels for beta/gamma-emitting radionuclides. No changes were made to sampling or other activities based on field-screening results. Field-screening results are included in Appendix E (on DVD included with this document).

6.17.4.3 Soil, Rock, and Sediment Sampling Analytical Results

Decision-level data at AOC C-33-001 consist of results from 36 samples (22 tuff and 14 soil) collected from 11 locations.

Inorganic Chemicals

Samples from AOC C-33-001 were not analyzed for inorganic chemicals.

Organic Chemicals

A total of 36 samples (22 tuff and 14 soil) were collected and analyzed for PCBs. Table 6.17-2 presents the detected organic chemicals. Figure 6.17-2 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected at AOC C-33-001 include Aroclor-1254 and Aroclor-1260, which are retained as COPCs.

Radionuclides

Samples from AOC C-33-001 were not analyzed for radionuclides.

6.17.4.4 Nature and Extent of Contamination

The nature and extent of organic COPCs at AOC C-33-001 are discussed below. The spatial distribution of COPCs was evaluated using the data presented in Table 6.17-2 and Figure 6.17-2.

Inorganic Chemicals

Samples from AOC C-33-001 were not analyzed for inorganic chemicals.

Organic Chemicals

Aroclor-1254 was detected in one sample at a concentration of 1.98 mg/kg. Concentrations decreased with depth at location 33-61105 and increased laterally at location 33-61105. The maximum concentration was approximately 1.7 times the residential SSL and the industrial SSL was approximately 5.6 times the maximum concentration. The vertical extent of Aroclor-1254 is defined and further sampling for lateral extent is warranted.

Aroclor-1260 was detected in 28 samples with a maximum concentration of 233 mg/kg. Concentrations decreased with depth at locations 33-01748, 33-01749, 33-01751, 33-01752, 33-60700, 33-61102, 33-61103, 33-61104, and 33-61105 and increased laterally at locations 33-01751, 33-01752, 33-61103, and 33-61104. Although concentrations decreased laterally around location 33-01749 compared with the pre-excavation maximum concentration, the maximum concentrations in samples from locations 33-61103, 33-61104, and 33-61105 are greater than the industrial SSL. The vertical extent of Aroclor-1260 is defined and further sampling for lateral extent is warranted.

Radionuclides

Samples from AOC C-33-001 were not analyzed for radionuclides.

Summary of Nature and Extent

The lateral and vertical extent of organic COPCs is defined or no further sampling for extent is warranted at AOC C-33-001 except for lateral extent of Aroclor-1254 at location 33-61105 and Aroclor-1260 at location 33-01749.

6.17.5 Summary of Human Health Risk Screening

A human health risk-screening assessment was not performed for AOC C-33-001 because the nature and extent of contamination have not been defined at this site.

6.17.6 Summary of Ecological Risk Screening

An ecological risk-screening assessment was not performed for AOC C-33-001 because the nature and extent of contamination have not been defined at this site.

7.0 CONCLUSIONS

7.1 Nature and Extent of Contamination

Based on the evaluation of the data, the nature and extent of contamination have been defined, and/or no further sampling for extent is warranted for three sites investigated previously or during the 2021 Chaquehui Canyon Aggregate Area investigation. The nature and extent of contamination have not been defined, and further sampling is warranted for 13 sites. Summaries of the nature and extent of contamination and remaining characterization and/or remediation requirements for the sites at TA-33 located in the Chaquehui Canyon Aggregate Area are presented below.

The nature and extent of contamination have been defined, and/or no further sampling for extent is warranted, for the following three sites:

- SWMU 33-007(c), Firing Sites
- SWMU 33-010(c), Surface Disposal Site
- SWMU 33-011(d), Storage Area

The nature and extent of contamination have not been defined, and further sampling is warranted for the following eight sites. Additional sampling is needed to define the extent of contamination for one or more inorganic and/or organic chemicals at the following sites:

- SWMU 33-004(a), Septic System—lateral extent of lead east of the drain field and lateral extent of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene south of the drain field
- SWMU 33-004(i), Drainline and Outfall Associated with Building 33-39—lateral extent of Aroclor-1254 and Aroclor-1260 to the north of location 33-60990
- SWMU 33-006(a), Firing Site—lateral extent of copper around locations 33-60415 and 33-60423
- SWMU 33-008(c), Landfill—vertical extent of lead at location 33-61962; lateral extent of copper north and east of locations 33-61953 and 33-61954; lateral extent of lead north and east of location 33-61953 and south of location 33-61962; lateral extent of mercury north and east of location 33-61954; vertical extent of benzo(b)fluoranthene at locations 33-60676 and 33-61962; and lateral extent of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene at locations 33-61956, 33-61957, and 33-61958
- SWMU 33-011(a), Soil Contamination from Former Storage Area—lateral extent of benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; dibenz(a,h)anthracene; and indeno(1,2,3-cd)pyrene north of locations 33-61009 and 33-61065
- SWMU 33-012(a), Drum Storage Area—vertical extent of Aroclor-1254 at location 33-61094; lateral extent of Aroclor-1254 and Aroclor-1260 at location 33-60661; and lateral extent of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene around location 33-60659
- SWMU 33-017, Operational Release—lateral extent of lead at location 33-60984
- AOC C-33-001, Former Transformer—lateral extent of Aroclor-1254 at location 33-61105 and Aroclor-1260 at location 33-01749

The nature and extent of contamination outside the MDA E fence have been defined, but the nature and extent of contamination within the MDA E fence have not been defined. Additional sampling is needed to define the extent of contamination for the following five sites:

- SWMU 33-001(a), Disposal Pit (MDA E)
- SWMU 33-001(b), Disposal Pit (MDA E)
- SWMU 33-001(c), Disposal Pit (MDA E)
- SWMU 33-001(d), Disposal Pit (MDA E)
- SWMU 33-001(e), Soil Contamination from Underground Chamber and Shaft (MDA E)

7.2 Summary of Risk-Screening Assessments

Three sites with nature and extent defined—SWMUs 33-007(c), 33-010(c), and 33-011(d)—were evaluated for potential risk by human health risk-screening assessments and ecological risk-screening assessments.

7.2.1 Human Health Risk-Screening Assessment

For the industrial scenario, all sites had total excess cancer risks less than the NMED target risk of 1×10^{-5}, HIs less than the target of 1, and estimated doses below the target of 25 mrem/yr. No radionuclide COPCs were identified in the 0.0–1.0 ft bgs depth interval for SWMU 33-011(d).

For the construction worker scenario, all sites had total excess cancer risk less than the NMED target risk of 1×10^{-5} and estimated doses below the target of 25 mrem/yr. All sites had noncarcinogenic hazard less than the target of 1, except SWMU 33-007(c), which had an HI equivalent to 1 because of cobalt (HQ = 1).

For the residential scenario, all sites had estimated doses below the target of 25 mrem/yr. All sites had total excess cancer risk less than the NMED target risk of 1×10^{-5}, except SWMU 33-011(d), which had cancer risk of 9×10^{-5}, because of PAHs (HQ = 9×10^{-5}). PAHs at the site were likely from the asphalt covering the majority of SWMU 33-011(d). All sites had HIs less than the target hazard of 1, except SWMU 33-007(c), which had an HI of 2. Cobalt was the primary contributor (HQ = 1.8) at SWMU 33-007(c). Although residential cancer risk at SWMU 33-011(d) and residential hazard at SWMU 33-007(c) exceed current risk thresholds, the sites are currently under institutional control and land use will remain industrial for the foreseeable future. Therefore, no further action is recommended based on residential risk at this time.

Lead was identified as a COPC at one site, SWMU 33-011(d); protective soil concentrations for the industrial, construction worker, and residential scenarios were not exceeded at this site.

The radionuclide EPCs were less than SALs and the total estimated dose is less than 25 mrem/yr for the industrial, construction worker, and residential scenarios at all SWMUs/AOCs.

The total doses were equivalent to total excess radiological risks of 6×10^{-6} to 9×10^{-6} for the industrial scenario, 8×10^{-9} to 6×10^{-7} for the construction worker scenario, and 6×10^{-7} to 3×10^{-5} for the residential scenario, based on conversion from dose using RESRAD (Residual Radioactivity) computer code Version 7.0 (https://resrad.evs.anl.gov/documents/).

No sites within the Chaquehui Canyon Aggregate Area are accessible to the public and are not planned for release by DOE in the foreseeable future. Therefore, an as low as reasonably achievable (ALARA) evaluation for radiological exposure to the public is not currently required. Should DOE's plans for releasing these areas change, an ALARA evaluation will be conducted at that time.

7.2.2 Ecological Risk-Screening Assessment

Based on evaluations of the minimum ESLs, HI analyses, LOAEL analyses, and COPECs without ESLs, no potential ecological risks to the Mexican spotted owl, gray fox, American kestrel, American robin, mountain cottontail, montane shrew, deer mouse, earthworm, or generic plant exist at SWMUs 33-007(c), 33-010(c), and 33-011(d) at Chaquehui Canyon Aggregate Area.

8.0 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 for corrective actions complete either with or without controls or for additional corrective action. The residential scenario is the only scenario under which corrective action complete without controls is applicable; that is, no additional corrective actions or conditions are necessary. The other decision scenarios (industrial, construction worker, and recreational) result in corrective action complete with controls; that is, some type of institutional controls must be in place to ensure land use remains consistent with site cleanup levels. The current and reasonably foreseeable future land use for the Chaquehui Canyon Aggregate Area is industrial.

8.1 Additional Field Characterization Activities

The nature and extent of contamination have not been defined for eight sites investigated in the Phase II investigation of Chaquehui Canyon Aggregate Area (Table 8.1-1). Additional sampling is needed to define the extent of contamination for one or more inorganic and/or organic chemicals at the following sites:

- SWMU 33-004(a), Septic System
- SWMU 33-004(i), Drainline and Outfall Associated with Building 33-39
- SWMU 33-006(a), Firing Site
- SWMU 33-008(c), Landfill
- SWMU 33-011(a), Soil Contamination from Former Storage Area
- SWMU 33-012(a), Drum Storage Area
- SWMU 33-017, Operational Release
- AOC C-33-001, Former Transformer

The nature and extent of contamination within the MDA E fence have not been defined. Additional field characterization to determine whether corrective actions are complete is needed for the following sites:

- SWMU 33-001(a), Disposal Pit (MDA E)
- SWMU 33-001(b), Disposal Pit (MDA E)
- SWMU 33-001(c), Disposal Pit (MDA E)
- SWMU 33-001(d), Disposal Pit (MDA E)
- SWMU 33-001(e), Soil Contamination from Underground Chamber and Shaft (MDA E)

A work plan will be developed specifying sampling locations, numbers of samples, and analytical suites required to define the extent of contamination for the sites listed above. Upon completion of the proposed Phase III sampling, the data will be used to confirm the extent of contamination has been defined and human health and ecological risk-screening assessments will be performed for these sites. The results will be presented in a Phase III investigation report for the Chaquehui Canyon Aggregate Area.

8.2 Remediation Activities

Sites requiring remediation (Table 8.1-1) in the Chaquehui Canyon Aggregate Area include the following:

- SWMU 33-004(i), Drainline and Outfall associated with Building 33-39
- SWMU 33-008(c), Landfill
- SWMU 33-012(a), Drum Storage Area
- AOC C-33-001, Former Transformer

A work plan will be prepared specifying the area(s) to be excavated, estimated volumes of waste, sampling locations, numbers of samples, and analytical suites required to remediate and define the extent of contamination for the sites listed above. After the proposed remediation and sampling are complete, the data will be used to prepare human health and ecological risk-screening assessments for these sites. The results will be presented in a Phase III investigation report for the Chaquehui Canyon Aggregate Area.

8.3 Recommendations for Corrective Actions Complete

8.3.1 Corrective Actions Complete without Controls

One SWMU does not pose a potential unacceptable risk or dose to human health under the industrial, construction worker, and residential scenarios and has no potential ecological risks. The nature and extent of contamination is defined for this site, and/or no further sampling for extent is warranted (Table 8.1-1). This site is appropriate for corrective actions complete without controls:

- SWMU 33-010(c), Surface Disposal Site

8.3.2 Corrective Actions Complete with Controls

Two sites have been found to pose no potential unacceptable risks or doses to human health under the industrial and construction worker scenarios and to ecological receptors. The nature and extent of contamination is defined for these sites, and/or no further sampling for extent is warranted for these sites (Table 8.1-1). These sites are appropriate for corrective actions complete with controls:

- SWMU 33-007(c), Firing Sites
- SWMU 33-011(d), Storage Area

8.4 Schedule for Recommended Activities

A work plan will be developed for the sites requiring additional characterization and/or remediation activities and submitted to NMED after the Phase II investigation report is approved. The work plan will provide details of and a schedule for implementing sampling and remediation activities and submitting a Phase III investigation report. The anticipated schedule for submitting the plan to NMED will be on or before September 30, 2022, pending NMED approval of the Phase II investigation report.

9.0 REFERENCES AND MAP DATA SOURCES

9.1 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.

Abeele, W.V., M.L. Wheeler, and B.W. Burton, October 1981. "Geohydrology of Bandelier Tuff," Los Alamos National Laboratory report LA-8962-MS, Los Alamos, New Mexico. (Abeele et al. 1981, 006273)

Ahlquist, A.J., November 1, 1983. "Conversations with Harlow Russ RE TA-33, 10/27/83," Los Alamos Scientific Laboratory memorandum to file from A.J. Ahlquist (HSE-8), Los Alamos, New Mexico. (Ahlquist 1983, 006854)

Aubele, J.C., 1978. "Geology of the Cerros del Rio Volcanic Field," in *Guidebook to Rio Grande Rift in New Mexico and Colorado*, Circular 163, New Mexico Bureau of Mines and Mineral Resources, Socorro, New Mexico, pp. 198-201. (Aubele 1978, 054426)

Bailey, R.A., R.L. Smith, and C.S. Ross, 1969. "Stratigraphic Nomenclature of Volcanic Rocks in the Jemez Mountains, New Mexico," in *Contributions to Stratigraphy*, U.S. Geological Survey Bulletin 1274-P, Washington, D.C. (Bailey at el. 1969, 021498)

Baltz, E.H., J.H. Abrahams, Jr., and W.D. Purtymun, March 1963. "Preliminary Report on the Geology and Hydrology of Mortandad Canyon near Los Alamos, New Mexico, with Reference to Disposal of Liquid Low-Level Radioactive Waste," U.S. Geological Survey Open File Report, Albuquerque, New Mexico. (Baltz et al. 1963, 008402)

Buckland, C.W., October 20, 1951. "12 October 1951 Spill at TA-33," Los Alamos Scientific Laboratory memorandum to D.P. MacMillan (W-3) from C. Buckland (H-1), Los Alamos, New Mexico. (Buckland 1951, 007845)

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)

Dethier, D.P., 1997. "Geology of White Rock Quadrangle, Los Alamos and Santa Fe Counties, New Mexico," Map 73, New Mexico Bureau of Mines and Mineral Resources. (Dethier 1997, 049843)

Galusha, T., and J.C. Blick, April 1971. "Stratigraphy of the Santa Fe Group, New Mexico," *Bulletin of the American Museum of Natural History,* Vol. 144, No. 1, pp. 1–128. (Galusha and Blick 1971, 021526)

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)

Griggs, R.L., and J.D. Hem, 1964. “Geology and Ground-Water Resources of the Los Alamos Area, New Mexico,” U.S. Geological Survey Water Supply Paper 1753, Washington, D.C. (Griggs and Hem 1964, 092516)

Heiken, G., F.E. Goff, J. Stix, S. Tamanyu, M. Shafiqullah, S.R. Garcia, and R.C. Hagan, February 10, 1986. “Intracaldera Volcanic Activity, Toledo Caldera and Embayment, Jemez Mountains, New Mexico,” *Journal of Geophysical Research,* Vol. 91, No. B2, pp. 1799-1816. (Heiken et al. 1986, 048638)

Heiken, G., K. Wohletz, R.V. Fisher, and D.P. Dethier, 1989. “Maar Volcanoes of White Rock Canyon–Interaction of Ground and Surface Water with Basaltic Volcanoes of the Rio Grande Rift, New Mexico,” Los Alamos National Laboratory document LA-UR-89-1917, Los Alamos, New Mexico. (Heiken et al. 1989, 054425)

Hoard, D., September 17, 1991. “Conversation with John Dougherty RE TA-33,” Los Alamos National Laboratory memorandum (CLS-1/91-303-DH) to file from D. Hoard (CLS-1), Los Alamos, New Mexico. (Hoard 1991, 009733)

Hoard, D., September 17, 1991. “Conversation with Harlow Russ,” Los Alamos National Laboratory memorandum (CLS-1/91-304-DH) to file from D. Hoard (CLS-1), Los Alamos, New Mexico. (Hoard 1991, 009734)

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)

Hyatt, E.C., June 5, 1956. “Proposed Hot Machine Shop, TA-33, Building HP-113,” Los Alamos Scientific Laboratory memorandum to J. Bolton (ENG-DO) from E.C. Hyatt (H-5), Los Alamos, New Mexico. (Hyatt 1956, 007929)

Izett, G.A., and J.D. Obradovich, February 10, 1994. “$^{40}Ar/^{39}Ar$ Age Constraints for the Jaramillo Normal Subchron and the Matuyama-Brunhes Geomagnetic Boundary,” *Journal of Geophysical Research,* Vol. 99, No. B2, pp. 2925–2934. (Izett and Obradovich 1994, 048817)

Jordan, H.S., August 2, 1954. "Industrial Hygiene Survey, TA-33," Los Alamos Scientific Laboratory memorandum to D. MacMillan (W-3) from H.S. Jordan (H-5), Los Alamos, New Mexico. (Jordan 1954, 007918)

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)

Koogle and Pouls Engineering, November 29, 1986. "TA-33 and TA-39 aerial photograph," Los Alamos National Laboratory, Los Alamos, New Mexico. (Koogle and Pouls Engineering 1986, 017907)

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 1992. "RFI Work Plan for Operable Unit 1122," Los Alamos National Laboratory document LA-UR-92-925, Los Alamos, New Mexico. (LANL 1992, 007671)

LANL (Los Alamos National Laboratory), June 1993. "RFI Work Plan for Operable Unit 1130," Los Alamos National Laboratory document LA-UR-93-1152, Los Alamos, New Mexico. (LANL 1993, 015313)

LANL (Los Alamos National Laboratory), July 1993. "RFI Work Plan for Operable Unit 1086," Los Alamos National Laboratory document LA-UR-92-3968, Los Alamos, New Mexico. (LANL 1993, 020946)

LANL (Los Alamos National Laboratory), December 1995. "RFI Report for Potential Release Sites 33-004(b), 33-004(c), 33-004(j), 33-004(m), 33-006(a), 33-006(b), 33-007(a), 33-007(b), 33-010(a), 33-010(b), 33-010(c), 33-010(d), 33-010(g), 33-010(h), 33-011(b), 33-011(c), 33-014," Los Alamos National Laboratory document LA-UR-95-4439, Los Alamos, New Mexico. (LANL 1995, 051903)

LANL (Los Alamos National Laboratory), September 29, 1995. "RFI Report for MDA K, PRSs 33-002(a,b,c,d,e)," Los Alamos National Laboratory document LA-UR-95-3624, Los Alamos, New Mexico. (LANL 1995, 050113)

LANL (Los Alamos National Laboratory), September 29, 1995. "RFI Report for Field Unit 3, Operable Unit 1122, Technical Area 33, RFI Report for PRSs 33-003(a), 33-004(a), 33-007(c), 33-009, 33-011(d), 33-013, 33-016, 33-017, Revised Sampling Plans for PRSs 33-003(b), 33-004(k), 33-008(a), 33-008(b), C-33-001, C-33-002," Los Alamos National Laboratory document LA-UR-95-3625, Los Alamos, New Mexico. (LANL 1995, 071300)

LANL (Los Alamos National Laboratory), February 1996. "Interim Action Report for Potential Release Site 33-007(c)," Los Alamos National Laboratory document LA-UR-96-710, Los Alamos, New Mexico. (LANL 1996, 052919)

LANL (Los Alamos National Laboratory), July 1996. "Sampling and Analysis Plan, PRS 33-008(c)," Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 1996, 054963)

LANL (Los Alamos National Laboratory), August 1996. "Voluntary Corrective Action Plan for a Solid Waste Management Unit at TA-33, 33-007(c)," Los Alamos National Laboratory document LA-UR-96-2942, Los Alamos, New Mexico. (LANL 1996, 054906)

LANL (Los Alamos National Laboratory), September 1996. "Voluntary Corrective Action Report for a Solid Waste Management Unit at TA-33, 33-007(c)," Los Alamos National Laboratory document LA-UR-96-3198, Los Alamos, New Mexico. (LANL 1996, 062541)

LANL (Los Alamos National Laboratory), September 1997. "NFA Report for Potential Release Sites 33-002(b–c), 33-003(b), 33-004(k), 33-006(a), 33-008(a–b), 33-011(d), 33-013, 33-017 (located in former Operable Unit 1122)," Los Alamos National Laboratory document LA-UR-97-2944, Los Alamos, New Mexico. (LANL 1997, 071478)

LANL (Los Alamos National Laboratory), May 22, 1998. "Hydrogeologic Workplan," Los Alamos National Laboratory document LA-UR-01-6511, Los Alamos, New Mexico. (LANL 1998, 059599)

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), September 1999. "Work Plan for Sandia Canyon and Cañada del Buey," Los Alamos National Laboratory document LA-UR-99-3610, Los Alamos, New Mexico. (LANL 1999, 064617)

LANL (Los Alamos National Laboratory), August 18, 2000. "Submittal of Response to Request for Supplemental Information (RSI) for the Voluntary Corrective Action (VCA) Plan for Potential Release Sites (PRSs) 33-007(b), 33-010(c), and C-33-003 [and attached 'Segmented Gate System, Voluntary Corrective Action Status Report for Potential Release Sites 33-007(b), 33-010(c), C-33-033]," Los Alamos National Laboratory letter (ER2000-0171) to J. Kieling (NMED-HWB) from J.A. Canepa (LANL) and T.J. Taylor (DOE-LAAO), Los Alamos, New Mexico. (LANL 2000, 066889)

LANL (Los Alamos National Laboratory), September 29, 2000. "Annual Transmittal of Best Management Practices (BMPs) Installed, Inspected, and Maintained at PRSs at Los Alamos National Laboratory (LANL)," Los Alamos National Laboratory letter (ER2000-0535) to J. Young (NMED-HWB) from J. Canepa (LANL) and T.J. Taylor (DOE-LAAO), Los Alamos, New Mexico. (LANL 2000, 068748)

LANL (Los Alamos National Laboratory), July 27, 2006. "As-Built Structure Location Maps, HP Site, TA-33, Revision 4," Engineering Drawing AB26, sheet number 4 of 5, Los Alamos, New Mexico. (LANL 2006, 110681)

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), November 2010. "Investigation Work Plan for Chaquehui Canyon Aggregate Area, Revision 1," Los Alamos National Laboratory document LA-UR-10-7226, Los Alamos, New Mexico. (LANL 2010, 111298.9)

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), February 2017. "Development of Ecological Preliminary Remediation Goals for Los Alamos National Laboratory," Los Alamos National Laboratory document LA-UR-16-26470, Los Alamos, New Mexico. (LANL 2017, 602228)

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)

LASL (Los Alamos Scientific Laboratory), November 1954. Excerpted pages from "H-Division Progress Report, October 20 - November 20, 1954," Los Alamos Scientific Laboratory, Los Alamos, New Mexico. (LASL 1954, 107465)

LASL (Los Alamos Scientific Laboratory), October 25, 1958. "Site Grading and Paving Pl., Laboratory, Office Building, HP-114 and HP-128, TA-33, Los Alamos, New Mexico," Engineering Drawing ENG-C-25512, Los Alamos, New Mexico. (LASL 1958, 107488)

Laughlin, A.W., G. WoldeGabriel, and D.P. Dethier, October 29, 1993. "Volcanic Stratigraphy of the Pajarito Plateau," Preliminary Report FY93, Los Alamos Scientific Laboratory, Los Alamos, New Mexico. (Laughlin et al. 1993, 054424)

Michelotti, R., and L. Kidman, October 30, 1997. "Transfer of Responsibility for Future Contamination at TA-33-31," Los Alamos National Laboratory memorandum (ER-RM-97-65) to P. Bussolini (NIS-33) from R. Michelotti (CST-18) and L. Kidman (ICF KE), Los Alamos, New Mexico. (Michelotti and Kidman 1997, 074002)

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)

N3B (Newport News Nuclear BWXT-Los Alamos, LLC), November 2020. "ECORISK Database (Release 4.2)," on CD, Newport News Nuclear BWXT-Los Alamos, LLC, document EM2020-0575, Los Alamos, New Mexico. (N3B 2020, 701067)

N3B (Newport News Nuclear BWXT-Los Alamos, LLC), March 2021. "Phase II Investigation Work Plan for Chaquehui Canyon Aggregate Area," Newport News Nuclear BWXT-Los Alamos, LLC, document EM2021-0038, Los Alamos, New Mexico. (N3B 2021, 701355)

NMED (New Mexico Environment Department), August 30, 2006. "Approval and Certificate of Completion, Remedy Completion Report for the Investigation and Remediation of Solid Waste Management Unit 33-013, Technical Area 33," 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, 093526)

NMED (New Mexico Environment Department), March 3, 2011. "Approval with Modifications for the Investigation Work Plan for Chaquehui Canyon Aggregate Area, Revision 1," New Mexico Environment Department letter to G.J. Rael (DOE-LASO) and M.J. Graham (LANL) from J.E. Kieling (NMED-HWB), Santa Fe, New Mexico. (NMED 2011, 201242)

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)

NMED (New Mexico Environment Department), June 19, 2019. "Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Soil Screening Guidance for Human Health Risk Assessments," February 2019 (Revision 2, 6/19/19), Hazardous Waste Bureau and Ground Water Quality Bureau, Santa Fe, New Mexico. (NMED 2019, 700550)

NMED (New Mexico Environment Department), July 26, 2021. "Approval, Phase II Investigation Work Plan for Chaquehui Canyon Aggregate Area," New Mexico Environment Department letter to A. Duran (EM-LA) from R. Maestas (NMED-HWB), Santa Fe, New Mexico. (NMED 2021, 701546)

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., December 1975. "Geohydrology of the Pajarito Plateau with Reference to Quality of Water, 1949-1972," Informal Report, Los Alamos Scientific Laboratory document LA-UR-02-4726, Los Alamos, New Mexico. (Purtymun 1975, 011787)

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)

Reneau, S.L., D.P. Dethier, and J.S. Carney, 1995. "Landslides and Other Mass Movements near Technical Area 33, Los Alamos National Laboratory," Los Alamos National Laboratory report LA-12955-MS, Los Alamos, New Mexico. (Reneau et al. 1995, 054405)

Rogers, M.A., June 1977. "History and Environmental Setting of LASL Near-Surface Land Disposal Facilities for Radioactive Wastes (Areas A, B, C, D, E, F, G, and T)," Vol. II, Los Alamos Scientific Laboratory report LA-6848-MS, Los Alamos, New Mexico. (Rogers 1977, 005708)

Santa Fe Engineering Ltd., January 1992. "Wastewater Stream Characterization for TA-33, 39, 49 and 69, Los Alamos National Laboratory, Environmental Study, Characterization Report #26," draft report prepared for Los Alamos National Laboratory, Santa Fe, New Mexico. (Santa Fe Engineering, Ltd. 1992, 062036)

Spiegal, Z., and B. Baldwin, 1963. "Geology and Water Resources of the Santa Fe Area, New Mexico," Geological Survey Water Supply Paper 1525, U.S. Government Printing Office, Washington, D.C. (Spiegel and Baldwin 1963, 054259)

Stoker, A.K., March 31, 1993. "Direct Testimony of Alan K. Stoker on Behalf of Petitioners before the New Mexico Water Quality Control Commission," Los Alamos, New Mexico. (Stoker 1993, 056021)

Turbeville, B.N., D.B. Waresback, and S. Self, February 1989. "Lava-Dome Growth and Explosive Volcanism in the Jemez Mountains, New Mexico: Evidence from the Pilo-Pliestocene Puye Alluvial Fan," *Journal of Volcanology and Geothermal Research,* Vol. 36, pp. 267-291. (Turbeville et al. 1989, 021587)

USAF (U.S. Air Force), November 22, 1958. "TA-33 and TA-39 aerial photograph," Los Alamos Scientific Laboratory, Los Alamos, New Mexico. (USAF 1958, 015987)

Vaniman, D., and K. Wohletz, November 14, 1990. "Results of Geological Mapping/Fracture Studies: TA-55 Area," Los Alamos National Laboratory memorandum (EES1-SH90-17) to J.L. Gardner (EES-1) from D. Vaniman, and K. Wohletz, Los Alamos, New Mexico. (Vaniman and Wohletz 1990, 009995.2)

WoldeGabriel, G., R.G. Warren, D. Broxton, D. Vaniman, M.T. Heizler, E.C. Kluk, and L. Peters, 2001. "Episodic Volcanism, Petrology, and Lithostratigraphy of the Pajarito Plateau and Adjacent Areas of the Española Basin and the Jemez Mountains," *Volcanology in the New Mexico, NM Natural History and Science Bulletin,* Vol. 18, pp. 97-129. (WoldeGabriel et al. 2001, 092523)

9.2 Map Data Sources

Data sources for all figures are provided below, unless otherwise indicated on the figures themselves.

Sample location: As published, N3B/T2S, GIS projects folder; \\n3b-fs01\n3b-shares) (Q: GIS DATA) Project: 20-0006; project_data.gdb; point feature dataset; xy_locations_33_011_a; July 2021.

SWMU or AOC boundary: As published; Triad SDE Spatial Geodatabase: GISEMPRD1\PUB.regulatory\PUB.prs_all_reg_admin; July 2021.

Structures: As published; Triad SDE Spatial Geodatabase: gispubprd1.sde\PUB.Infrastructure\PUB.structures_poly; July 2021.

Former structures: As published; Triad SDE Spatial Geodatabase: gispubprd1.sde\PUB.Infrastructure\PUB.FRMR_structures_ply; July 2021.

Fences: As published; Triad SDE Spatial Geodatabase: GISPUBPRD1\PUB.Infrastructure\PUB.fences_arc; July 2021.

Paved road centerline: As published, Triad SDE Spatial Geodatabase: gispubprd1.sde\PUB.Infrastructure\PUB.RoadCL; July 2021.

Paved road: As published; Triad SDE Spatial Geodatabase: GISPUBPRD1\PUB.Infrastructure\PUB.paved_rds_arc; July 2021.

Unpaved road: As published, Triad SDE Spatial Geodatabase: gispubprd1.sde\PUB.Infrastructure\PUB.dirt_rds_arc; July 2021.

Index and terrain contours (10- and 2-ft Interval): As published, N3B/T2S, GIS projects folder; \\n3b-fs01\n3b-shares) (Q: GIS DATA) Project 21-0003; project_data.gdb; contour_2ft; July 2021.

Communication line: As published, Triad SDE Spatial Geodatabase: gispubprd1.sde\PUB.Utilities\PUB.Comm_Arc; July 2021.

Electric line: As published, Triad SDE Spatial Geodatabase: gispubprd1.sde\PUB.Utilities\PUB.SW_GravityMain; July 2021.

Secondary utility: As published, Triad SDE Spatial Geodatabase: gispubprd1.sde\PUB.Utilities\PUB.SecondaryUtilLines; July 2021.

Gas line: As published, N3B/T2S, GIS projects folder; \\n3b-fs01\n3b-shares) (Q: GIS DATA) Project: 20-0006; project_data.gdb; merge_gas; July 2021.

Sewer line: As published, Triad SDE Spatial Geodatabase: gispubprd1.sde\PUB.Utilities\PUB.SW_GravityMain; July 2021.

Steam line: As published, Triad SDE Spatial Geodatabase: gispubprd1.sde\PUB.Utilities\PUB.steam_arc; July 2021.

Water line: As published, N3B/T2S, GIS projects folder; \\n3b-fs01\n3b-shares) (Q: GIS DATA) Project: 20-0006; project_data.gdb; merge_water; July 2021.

Landscape feature: As published, Triad SDE Spatial Geodatabase: gispubprd1.sde\PUB.Infrastructure\PUB.landscape_arc; July 2021.

Tech areas: As published; Triad SDE Spatial Geodatabase: GISPUBPRD1\PUB.Boundaries\PUB.tecareas; July 2021.

LANL boundary: As published; Triad SDE Spatial Geodatabase: gispubprd1.sde\PUB.Boundaries\PUB.lanlarea; July 2021.

Drainage: As published; Triad SDE Spatial Geodatabase: gispubprd1.sde\PUB.Hydrology\PUB.EM_sw_watercourse; July 2021.

Aggregate area: As published; Triad SDE Spatial Geodatabase: gispubprd1.sde\PUB.regulatory\PUB.aggregate_area; July 2021.

Excavation boundary: As published, N3B/T2S, GIS projects folder; \\n3b-fs01\n3b-shares) (Q: GIS DATA) Project: 21-0006; project_data.gdb; poly; excavtion_boundaries; July 2021.

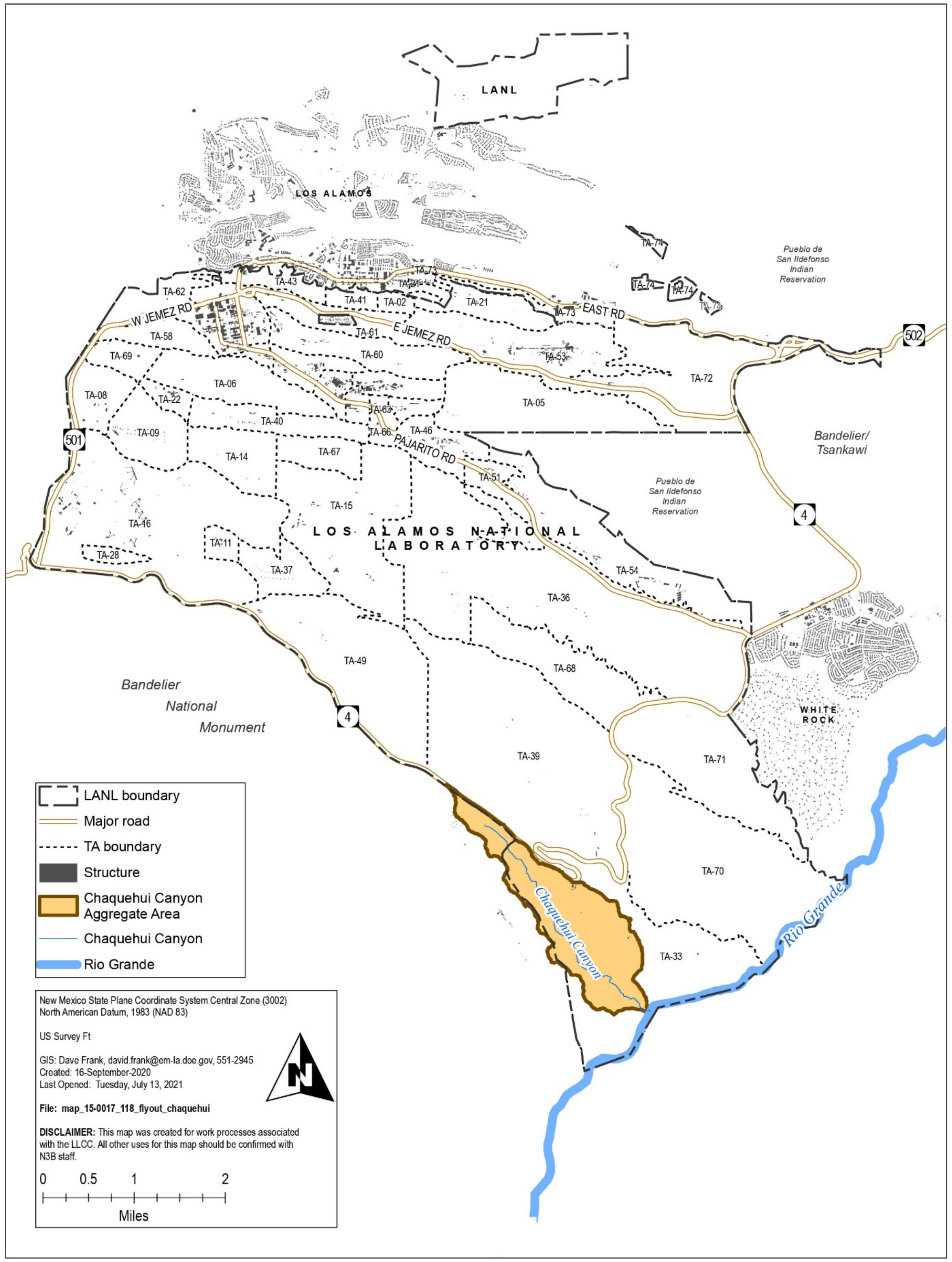


Figure 1.0-1 Location of Chaquehui Canyon Aggregate Area with respect to Laboratory technical areas

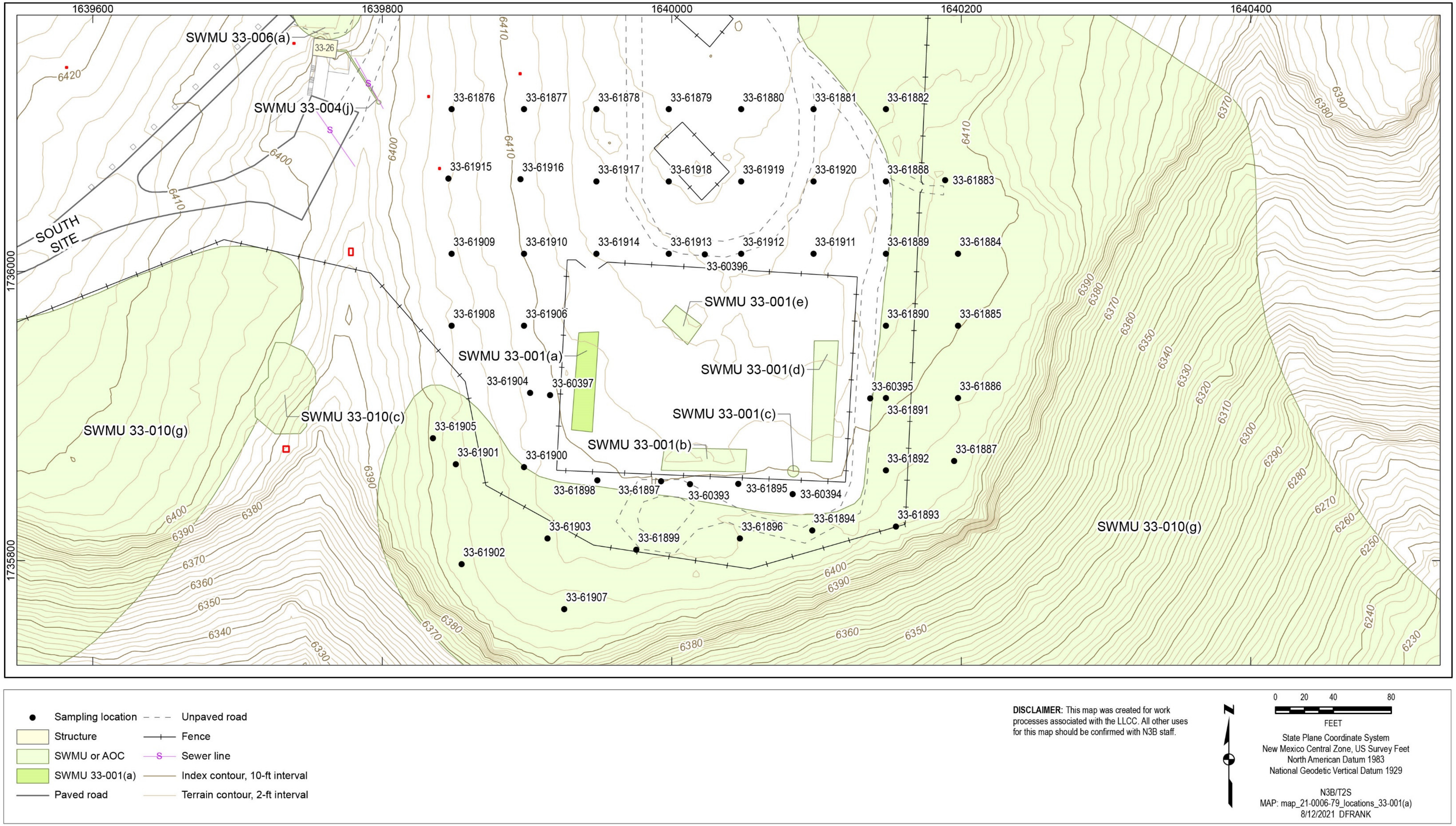


Figure 6.2-1 Site map and sampling locations at SWMUs 33-001(a–e)

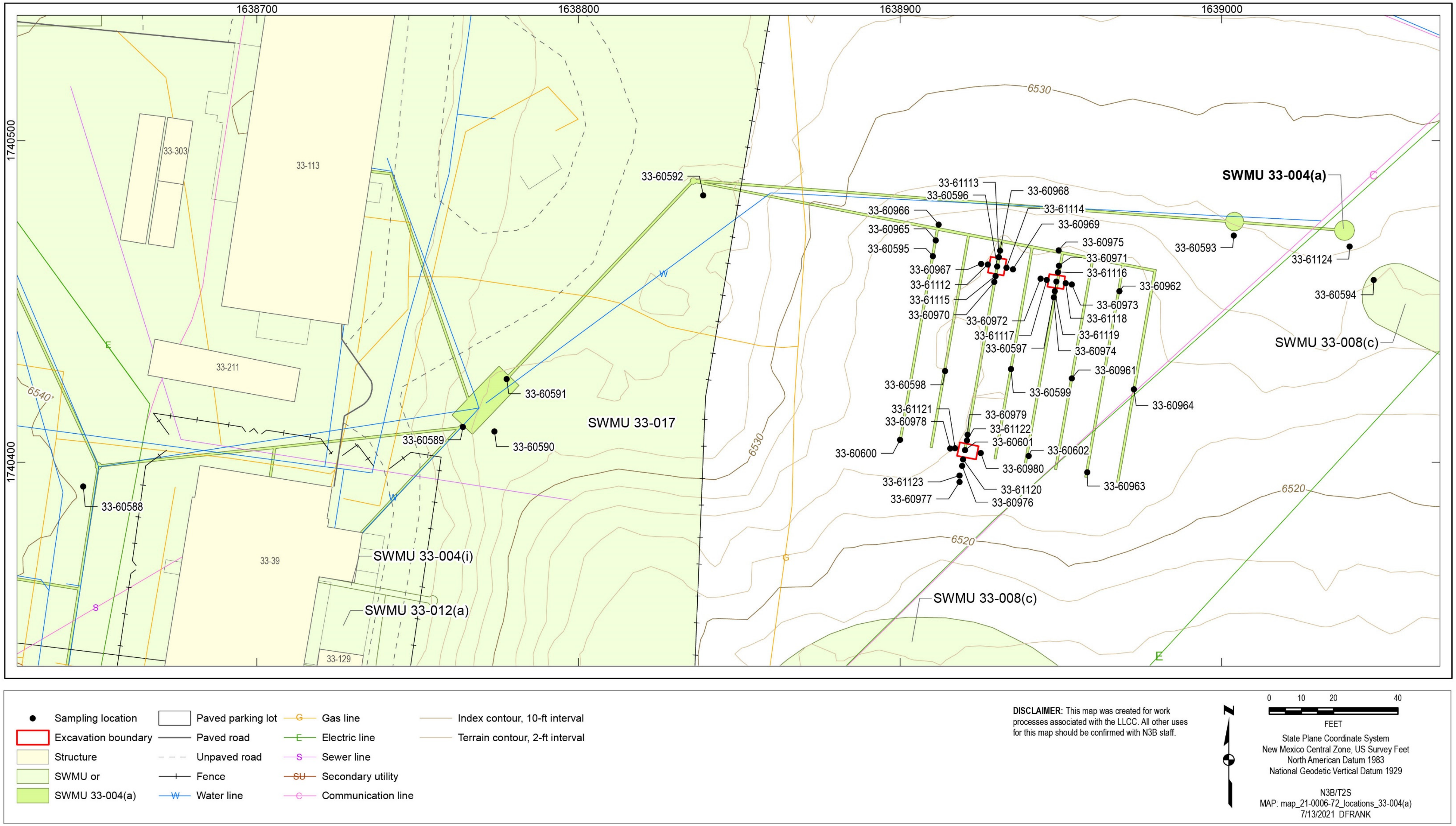


Figure 6.7-1 Site map and sampling locations at SWMU 33-004(a)

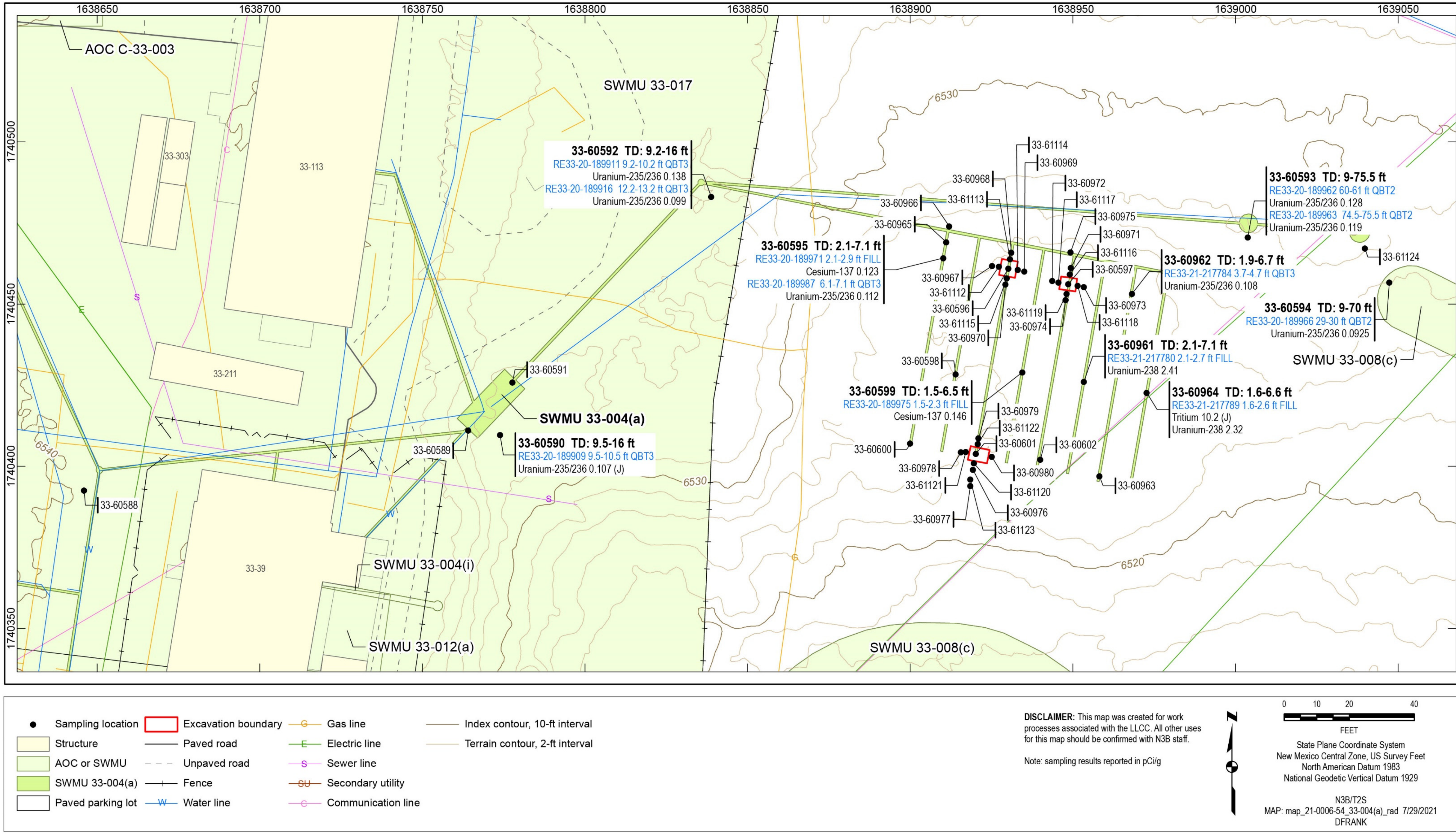


Figure 6.7-2 Radionuclides detected or detected above BVs/FVs at SWMU 33-004(a)

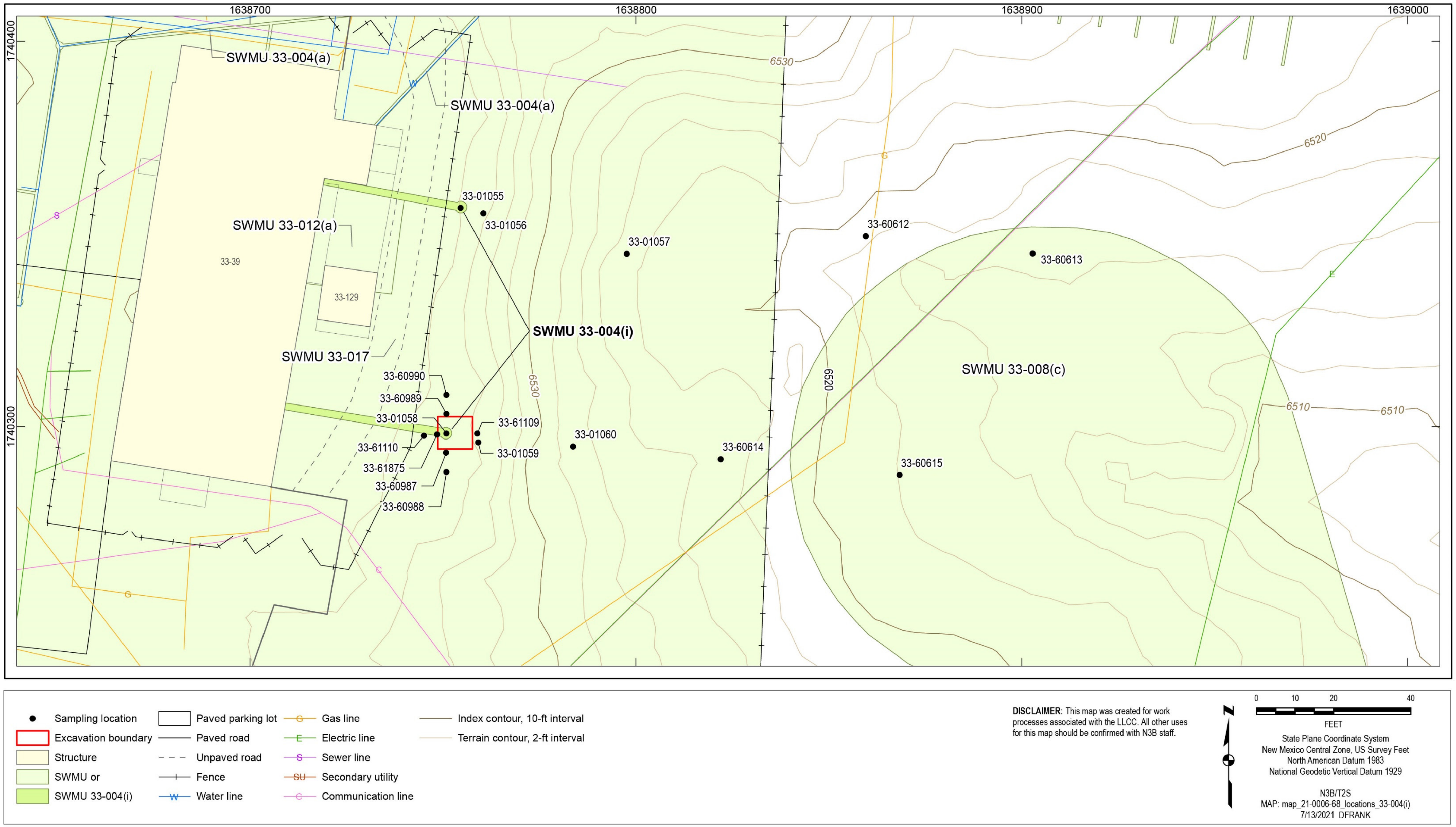


Figure 6.8-1 Site map and sampling locations at SWMU 33-004(i)

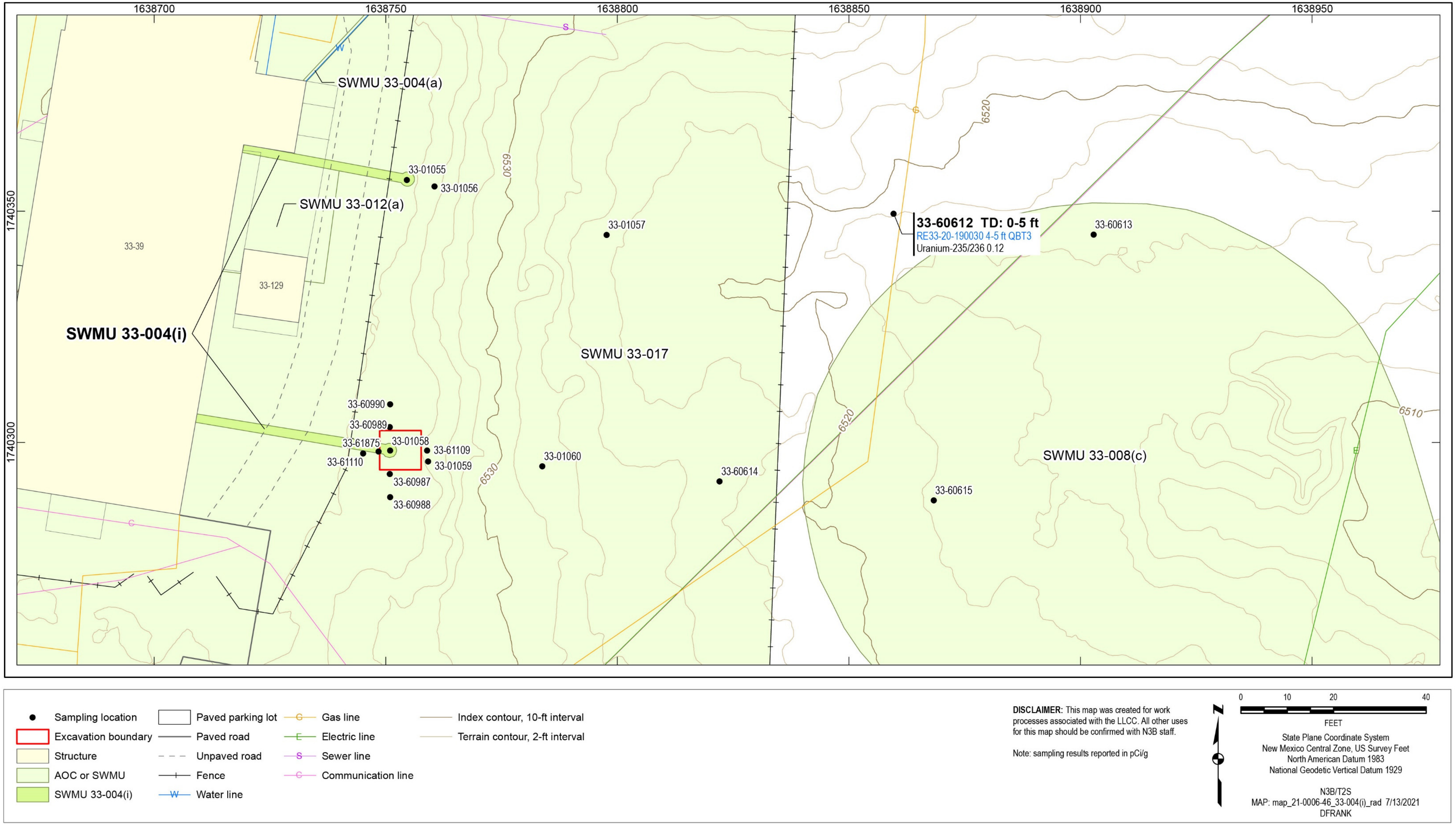


Figure 6.8-2 Radionuclides detected or detected above BVs/FVs at SWMU 33-004(i)

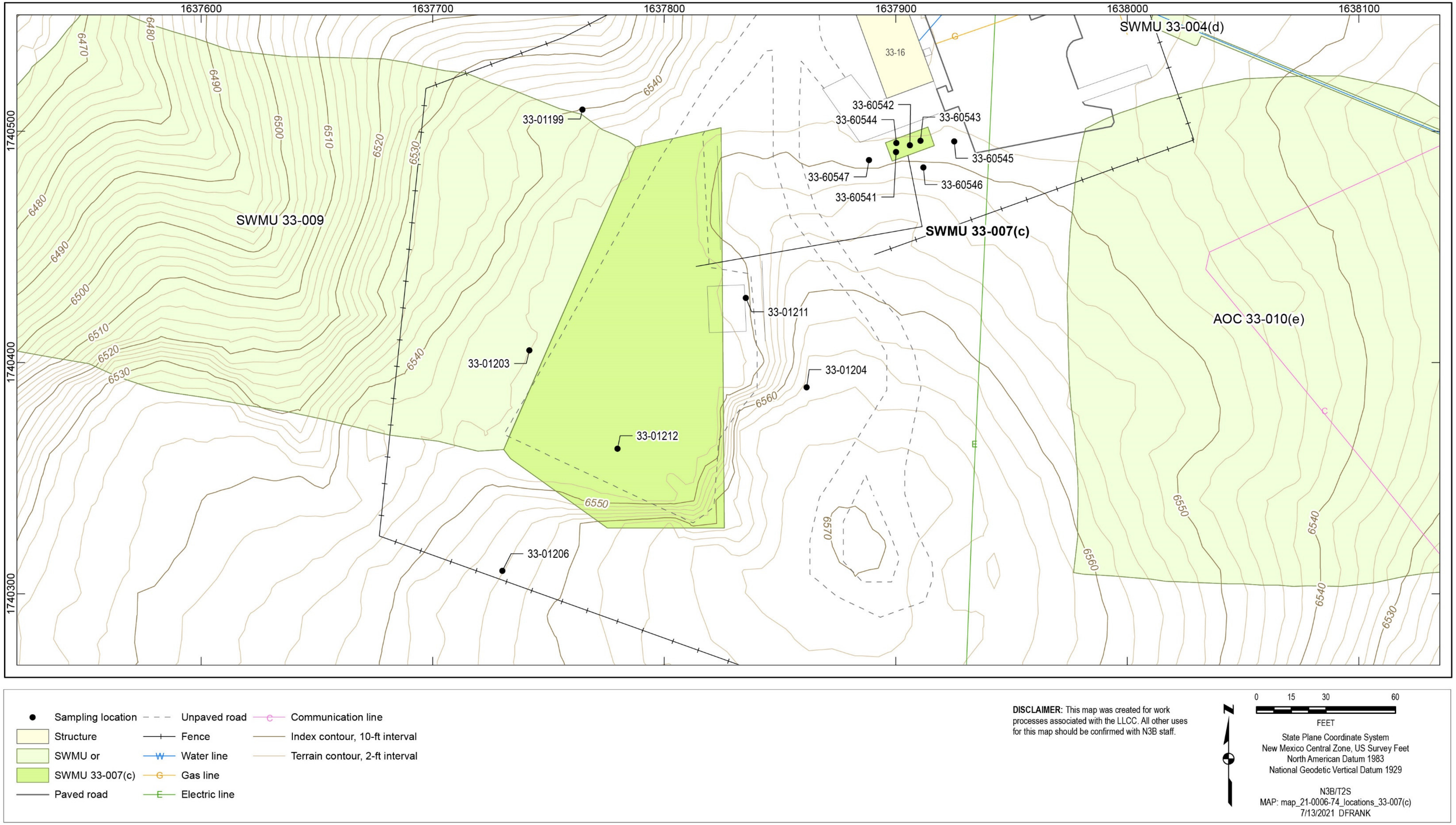


Figure 6.10-1 Site map and sampling locations at SWMU 33-007(c)

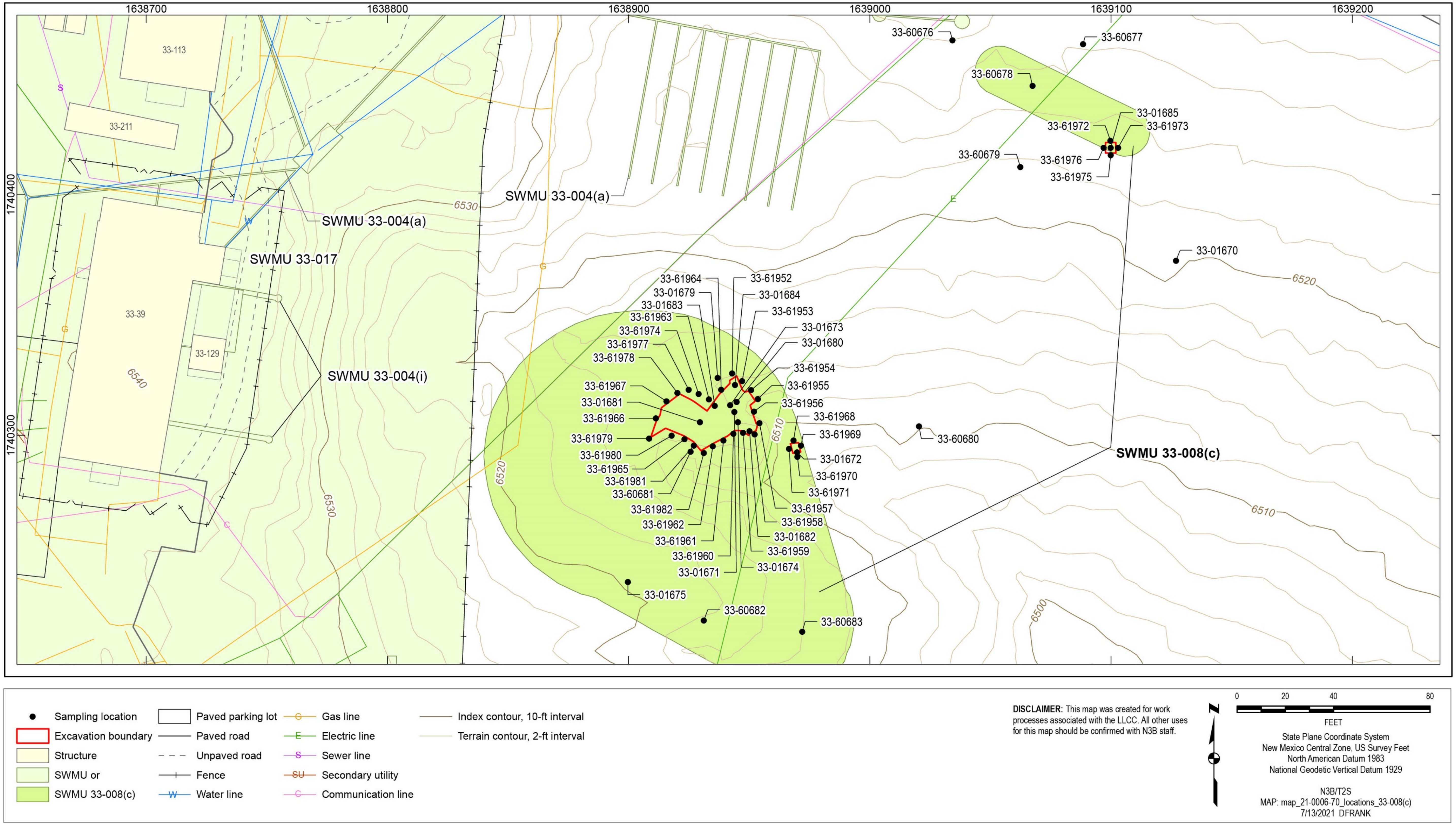


Figure 6.11-1 Site map and sampling locations at SWMU 33-008(c)

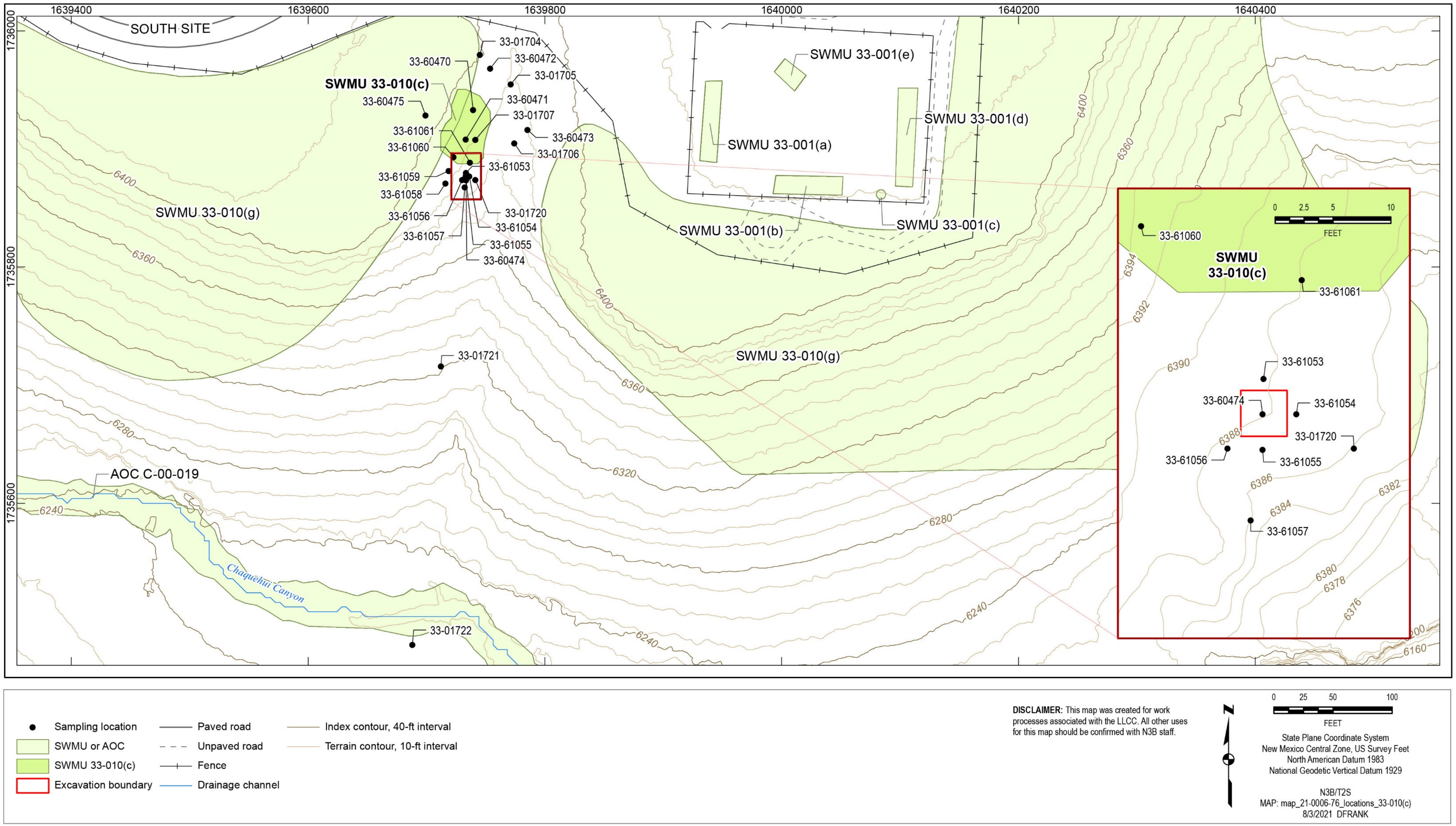


Figure 6.12-1 Site map and sampling locations at SWMU 33-010(c)

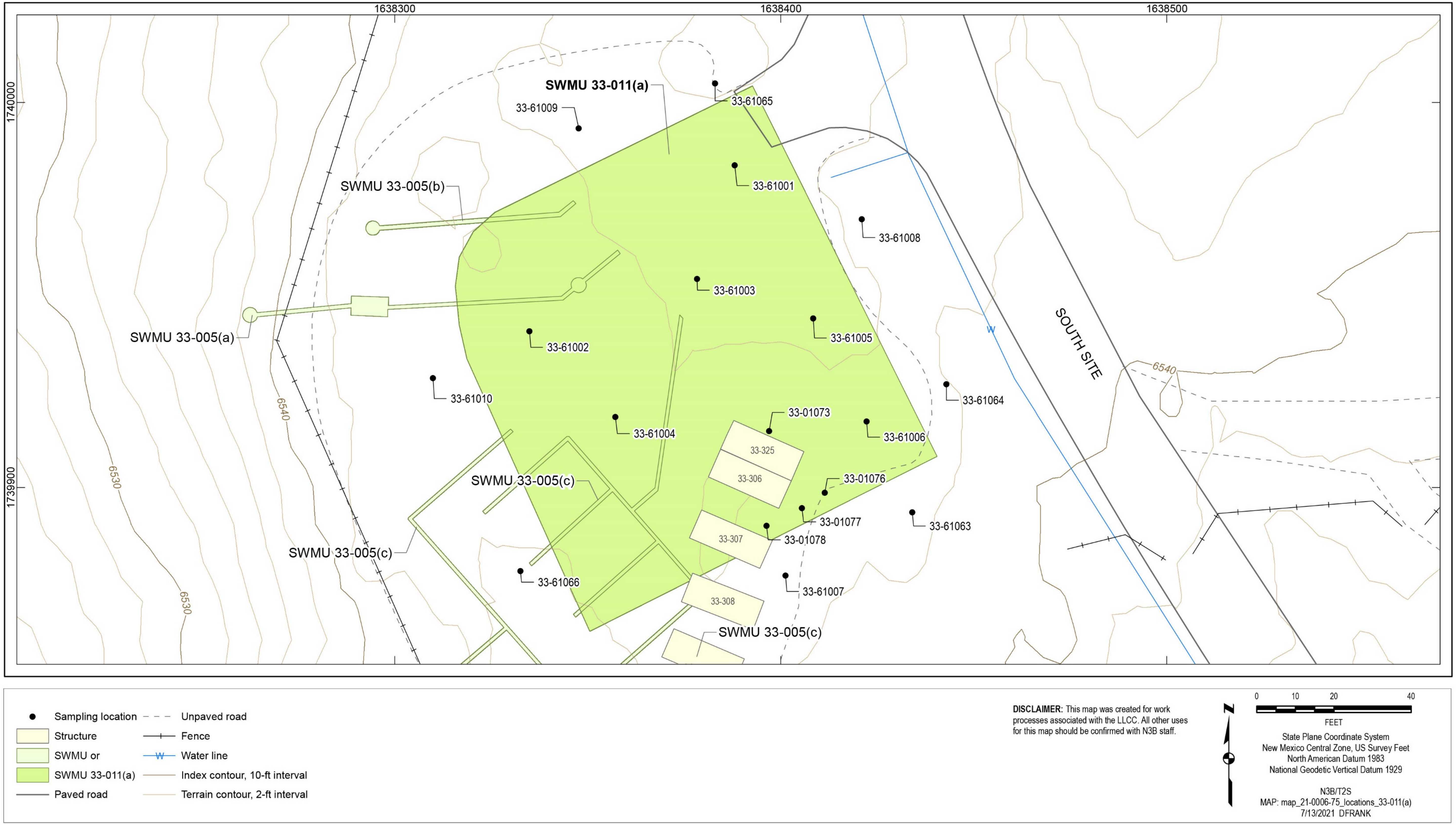


Figure 6.13-1 Site map and sampling locations at SWMU 33-011(a)

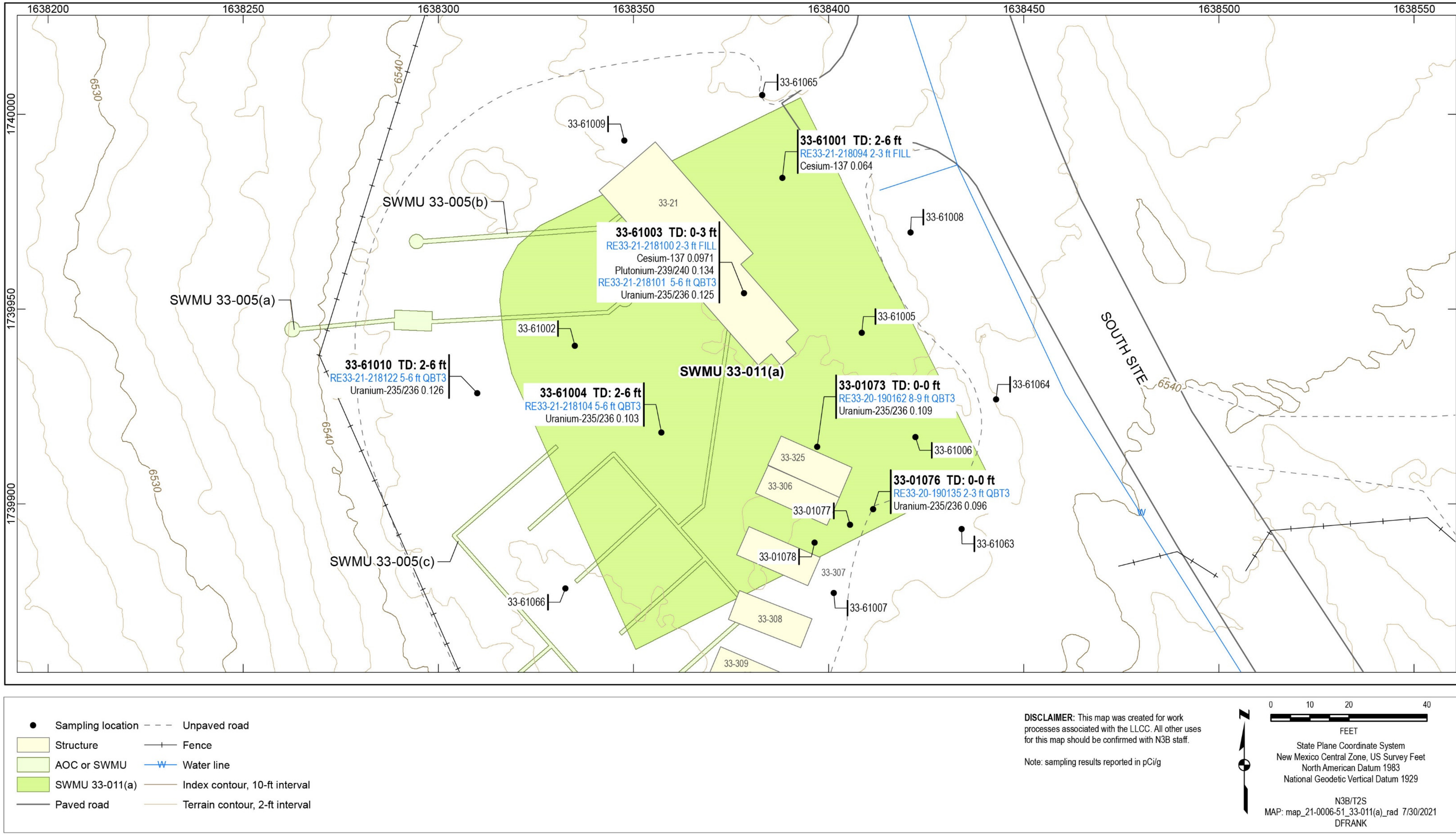


Figure 6.13-2 Radionuclides detected or detected above BVs/FVs at SWMU 33-011(a)

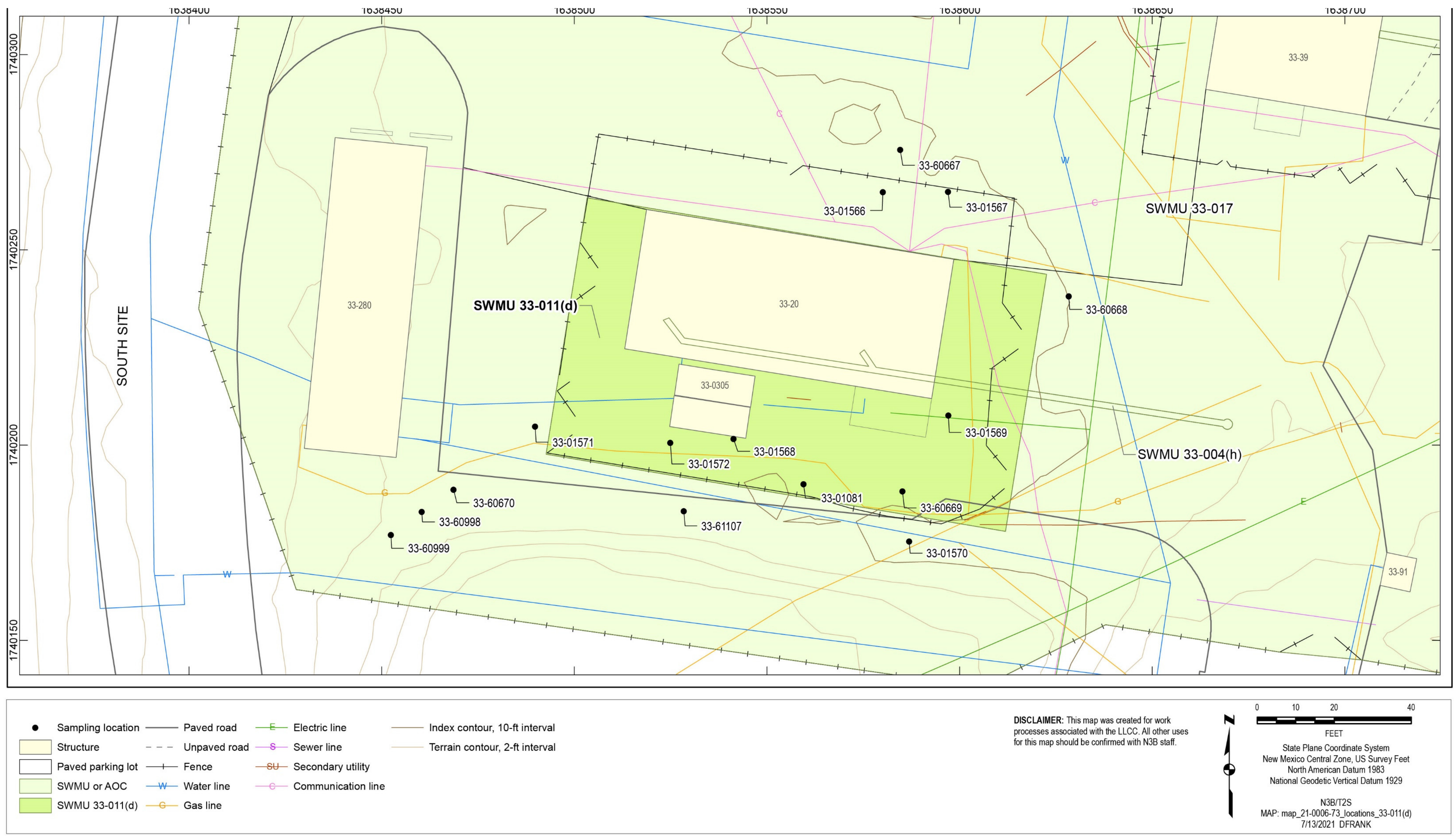


Figure 6.14-1 Site map and sampling locations at SWMU 33-011(d)

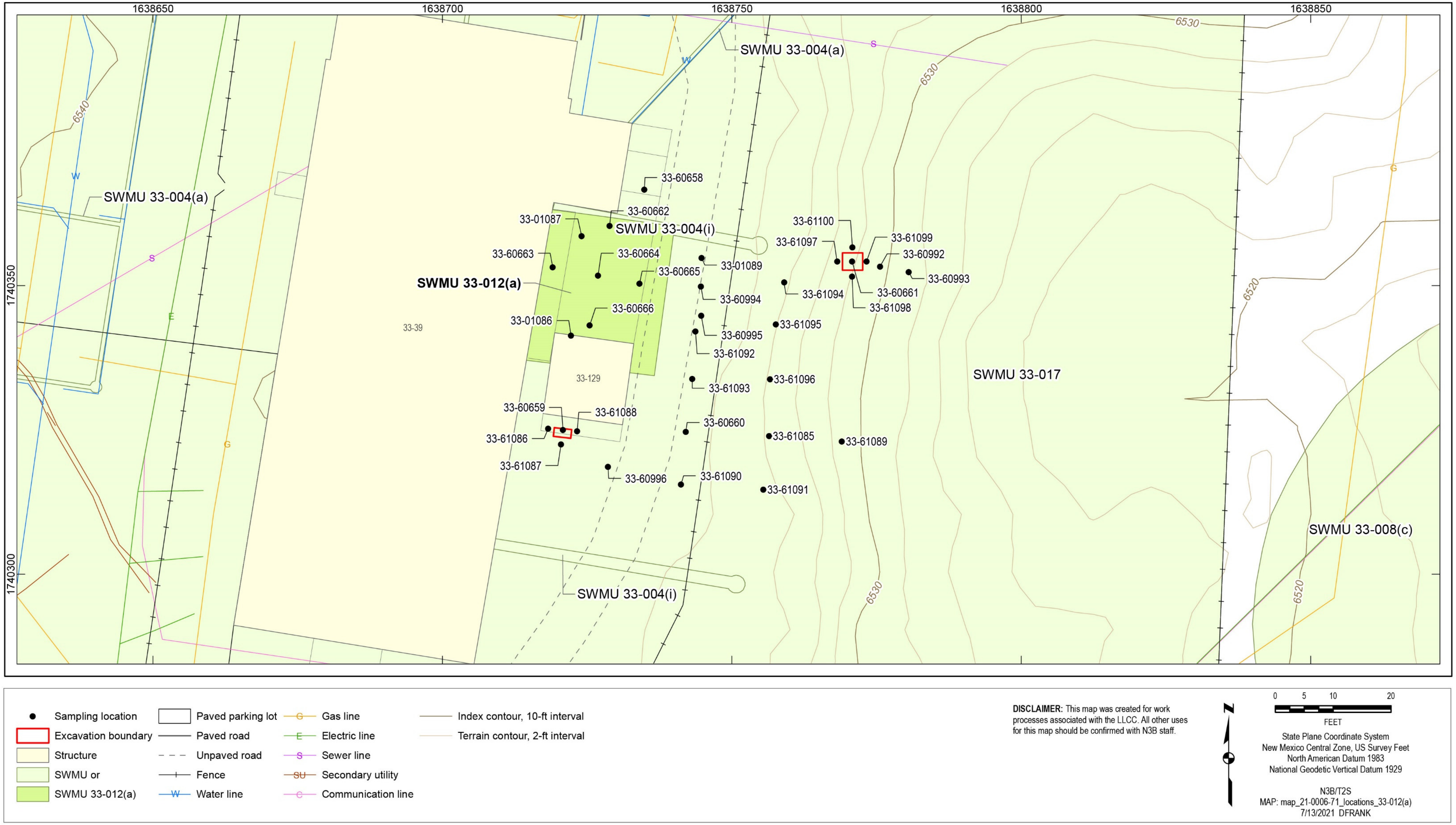


Figure 6.15-1 Site map and sampling locations at SWMU 33-012(a)

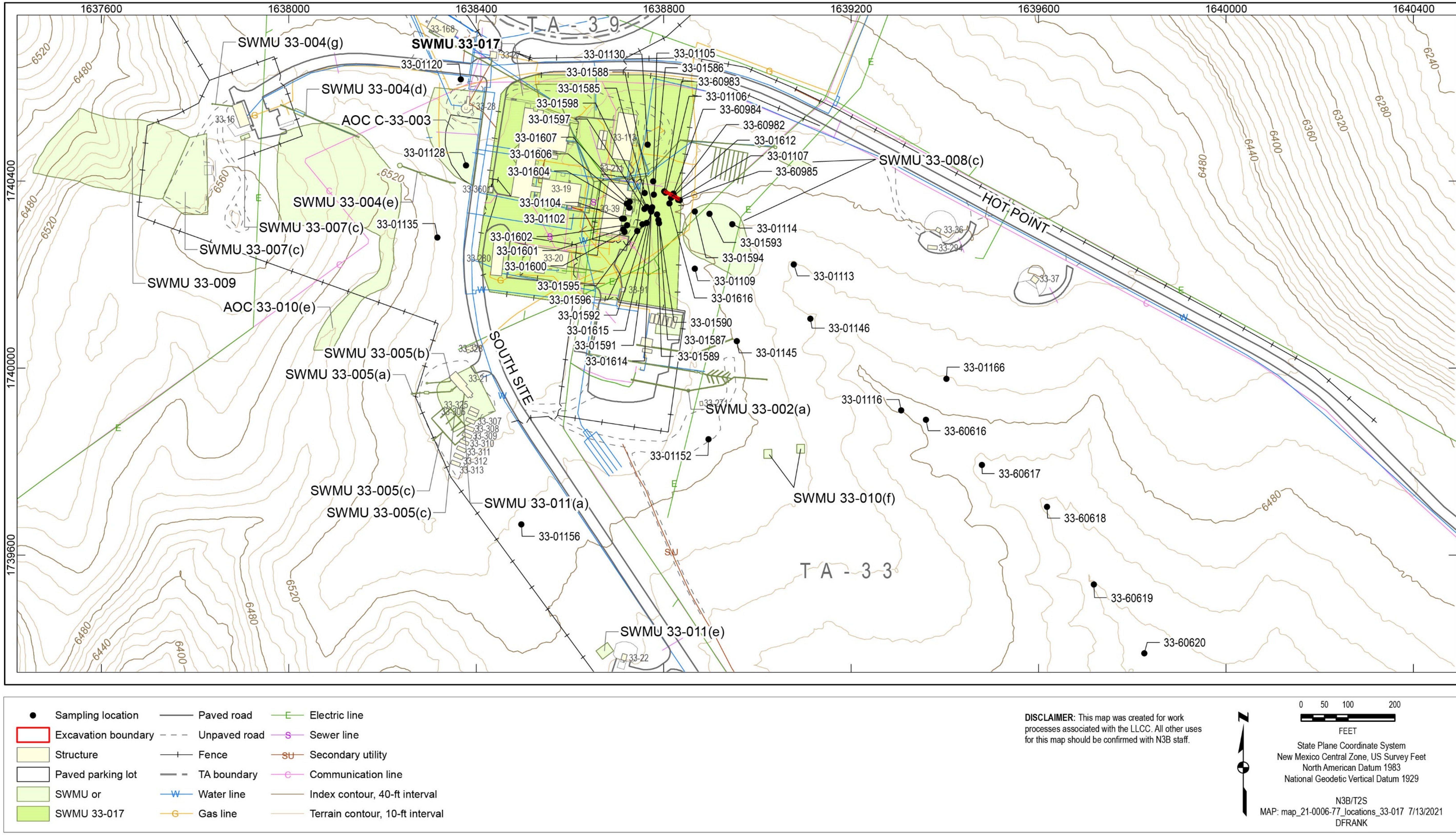


Figure 6.16-1 Site map and sampling locations at SWMU 33-017

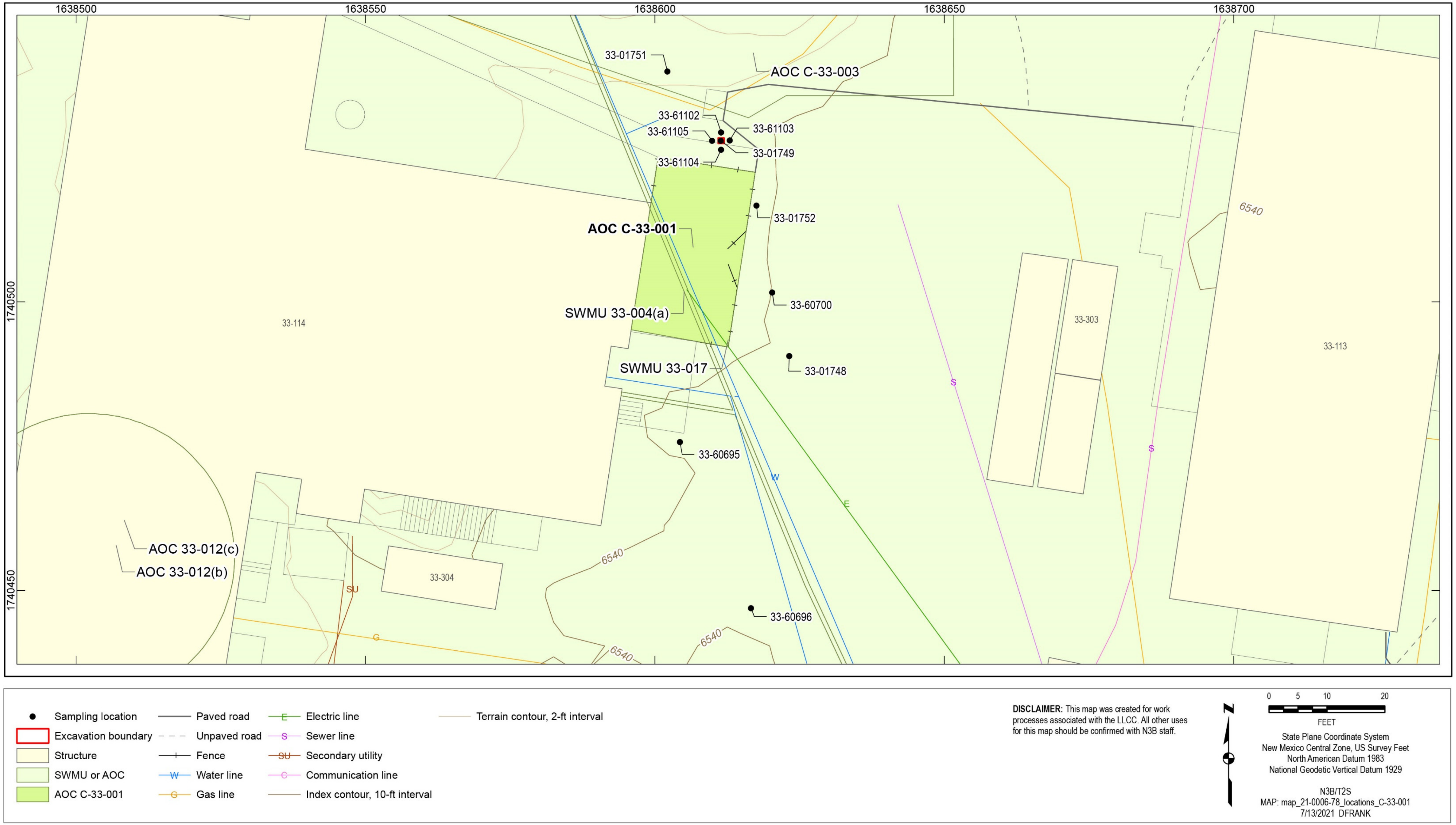


Figure 6.17-1 Site map and sampling locations at AOC C-33-001

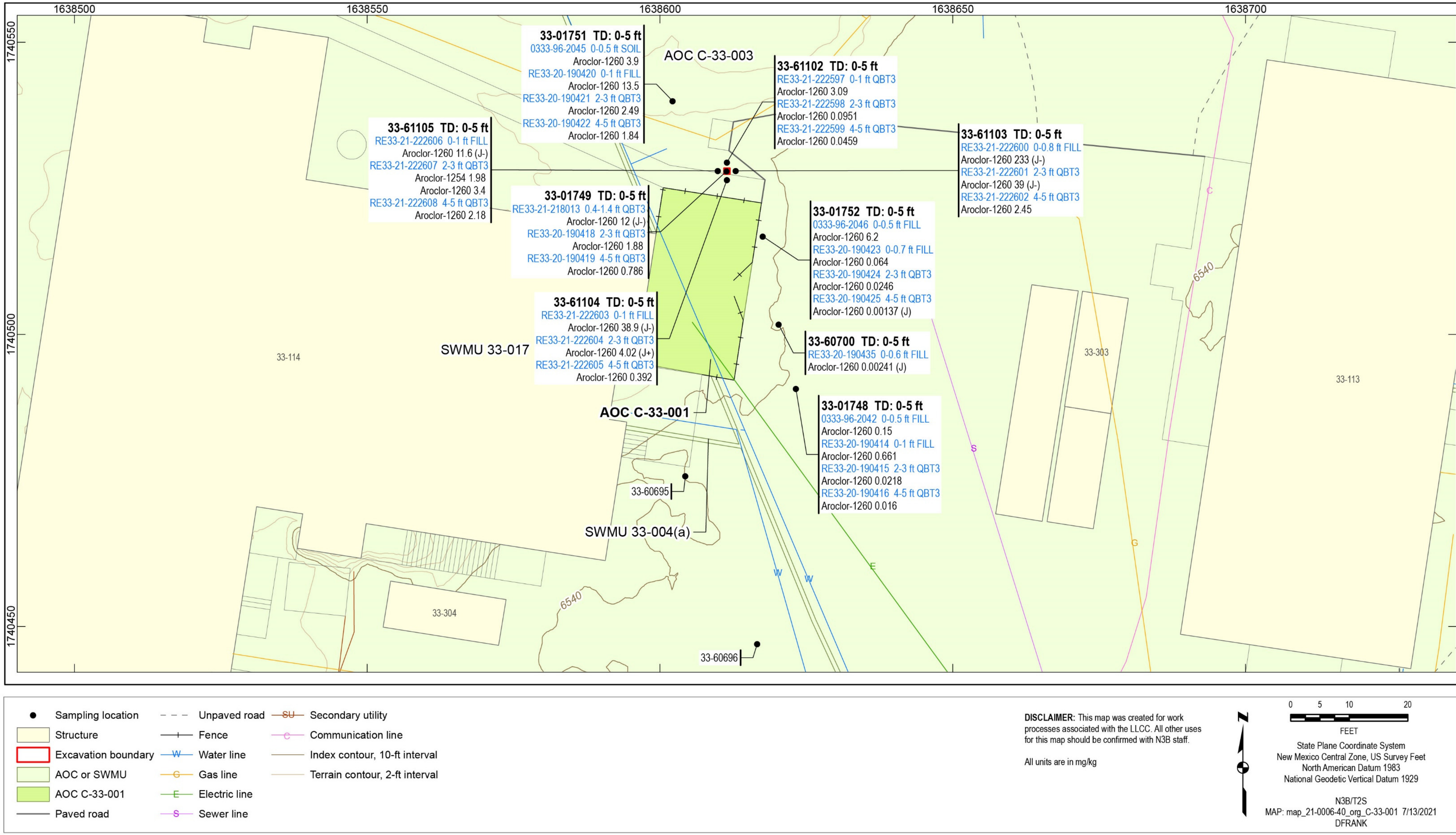


Figure 6.17-2 Organic chemicals detected at AOC C-33-001

Table 1.1-1
Sites under Investigation in the Chaquehui Canyon Aggregate Area

SWMU/AOC	Brief Description	2021 Phase II Investigation	Current Status
SWMU 33-001(a)	Disposal Pit (MDA E)	Sampled	Phase II investigation report (section 6.2)
SWMU 33-001(b)	Disposal Pit (MDA E)	Sampled	Phase II investigation report (section 6.3)
SWMU 33-001(c)	Disposal Pit (MDA E)	Sampled	Phase II investigation report (section 6.4)
SWMU 33-001(d)	Disposal Pit (MDA E)	Sampled	Phase II investigation report (section 6.5)
SWMU 33-001(e)	Soil Contamination from Underground Chamber and Shaft (MDA E)	Sampled	Phase II investigation report (section 6.6)
SWMU 33-004(a)	Septic System	Soil removal, sampled	Phase II investigation report (section 6.7)
SWMU 33-004(i)	Drainline and Outfall associated with Building 33-39	Soil removal, sampled	Phase II investigation report (section 6.8)
SWMU 33-006(a)	Firing Site	Soil removal, sampled	Phase II investigation report (section 6.9)
SWMU 33-007(c)	Firing Sites	Sampled	Phase II investigation report (section 6.10)
SWMU 33-008(c)	Landfill	Soil removal, sampled	Phase II investigation report (section 6.11)
SWMU 33-010(c)	Surface Disposal Site	Soil removal, sampled	Phase II investigation report (section 6.12)
SWMU 33-011(a)	Soil Contamination from Former Storage Area	Sampled	Phase II investigation report (section 6.13)
SWMU 33-011(d)	Storage Area	Sampled	Phase II investigation report (section 6.14)
SWMU 33-012(a)	Drum Storage Area	Soil removal, sampled	Phase II investigation report (section 6.15)
SWMU 33-017	Operational Release	Soil removal, sampled	Phase II investigation report (section 6.16)
AOC C-33-001	Former Transformer	Soil removal, sampled	Phase II investigation report (section 6.17)

Table 3.2-1
Surveyed Coordinates for Locations Sampled in 2021

SWMU/AOC	Location ID	Easting (ft)	Northing (ft)
33-001(a–e)	33-61876	1639847.84	1736112.38
	33-61877	1639897.84	1736112.38
	33-61878	1639947.84	1736112.38
	33-61879	1639997.84	1736112.38
	33-61880	1640047.84	1736112.38
	33-61881	1640097.84	1736112.38
	33-61882	1640147.84	1736112.38
	33-61883	1640188.86	1736063.27
	33-61884	1640197.84	1736012.38
	33-61885	1640197.84	1735962.38
	33-61886	1640197.84	1735912.38
	33-61887	1640195.00	1735868.72
	33-61888	1640147.84	1736062.38
	33-61889	1640147.84	1736012.38
	33-61890	1640147.84	1735962.38
	33-61891	1640147.84	1735912.38
	33-61892	1640147.84	1735862.38
	33-61893	1640154.91	1735823.49
	33-61894	1640096.96	1735820.85
	33-61895	1640045.92	1735852.97
	33-61896	1640047.03	1735815.22
	33-61897	1640042.98	1735859.43
	33-61898	1639992.31	1735863.65
	33-61899	1639975.45	1735807.44
	33-61900	1639897.85	1735864.54
	33-61901	1639850.71	1735866.60
	33-61902	1639854.73	1735797.42
	33-61903	1639914.06	1735815.25
	33-61904	1639901.95	1735915.89
	33-61905	1639834.87	1735884.59
	33-61906	1639897.84	1735962.38
	33-61907	1639925.62	1735766.40
	33-61908	1639847.84	1735962.38
	33-61909	1639847.84	1736012.38
	33-61910	1639897.84	1736012.38
	33-61911	1640097.84	1736012.38
	33-61912	1640047.84	1736012.38

Table 3.2-1 (continued)

SWMU/AOC	Location ID	Easting (ft)	Northing (ft)
33-001(a–e) (cont.)	33-61913	1639997.84	1736012.38
	33-61914	1639947.84	1736012.38
	33-61915	1639845.56	1736064.41
	33-61916	1639895.44	1736064.07
	33-61917	1639947.84	1736062.38
	33-61918	1639997.84	1736062.38
	33-61919	1640047.84	1736062.38
	33-61920	1640097.84	1736062.38
33-004(a)	33-60590	1638773.84	1740409.64
	33-60592	1638838.80	1740483.10
	33-60595	1638910.19	1740464.24
	33-60597	1638948.60	1740456.23
	33-60599	1638934.52	1740429.05
	33-60961	1638953.40	1740426.07
	33-60962	1638968.24	1740453.18
	33-60963	1638958.18	1740396.94
	33-60964	1638972.77	1740422.73
	33-60965	1638911.09	1740469.10
	33-60966	1638912.02	1740474.08
	33-60967	1638925.19	1740461.86
	33-60968	1638931.11	1740465.97
	33-60969	1638935.10	1740460.14
	33-60970	1638929.28	1740456.18
	33-60971	1638949.41	1740461.20
	33-60972	1638943.70	1740457.18
	33-60973	1638953.44	1740455.29
	33-60974	1638947.78	1740451.28
	33-60975	1638949.33	1740466.05
	33-60976	1638919.31	1740398.95
	33-60977	1638918.48	1740393.94
	33-60978	1638915.63	1740404.26
	33-60979	1638921.02	1740408.64
	33-60980	1638925.14	1740402.91
	33-61112	1638927.31	1740461.59
	33-61113	1638930.72	1740463.98
	33-61114	1638933.11	1740460.62
	33-61115	1638929.70	1740458.07
	33-61116	1638949.09	1740459.21
	33-61117	1638945.57	1740456.75

Table 3.2-1 (continued)

SWMU/AOC	Location ID	Easting (ft)	Northing (ft)
33-004(a) (cont.)	33-61118	1638951.53	1740455.77
	33-61119	1638948.14	1740453.25
	33-61120	1638919.60	1740400.91
	33-61121	1638917.14	1740404.39
	33-61122	1638920.82	1740406.80
	33-61123	1638918.53	1740395.93
	33-61124	1639039.89	1740467.26
33-004(i)	33-01055	1638754.54	1740356.82
	33-01057	1638797.67	1740344.92
	33-01058	1638750.90	1740298.20
	33-01059	1638759.13	1740295.84
	33-01060	1638783.76	1740294.81
	33-60987	1638750.84	1740293.17
	33-60988	1638750.92	1740288.16
	33-60989	1638750.86	1740303.27
	33-60990	1638750.89	1740308.24
	33-61109	1638758.87	1740298.22
	33-61110	1638745.09	1740297.58
	33-61875	1638748.44	1740297.99
33-006(a)	33-60415	1639751.81	1736178.88
	33-60423	1639778.21	1736013.55
	33-60941	1639768.25	1736013.56
	33-60942	1639758.16	1736011.93
	33-60943	1639788.17	1736013.57
	33-60944	1639798.27	1736013.43
	33-60945	1639648.95	1736314.88
	33-60946	1639660.16	1736288.72
	33-60947	1639663.13	1736264.21
	33-60948	1639730.69	1736232.24
	33-60949	1639581.56	1736141.13
	33-60950	1639738.79	1736157.81
	33-60951	1639757.83	1736225.45
	33-60952	1639793.55	1736356.96
	33-60953	1639895.00	1736136.81
	33-60954	1639831.74	1736120.98
	33-60955	1639839.35	1736071.20
	33-60957	1639780.02	1736023.51
	33-60958	1639782.01	1736033.21
	33-60959	1639776.79	1736003.88

Table 3.2-1 (continued)

SWMU/AOC	Location ID	Easting (ft)	Northing (ft)
33-006(a) (cont.)	33-60960	1639775.27	1735993.77
	33-61068	1639751.88	1736181.14
	33-61069	1639754.12	1736179.39
	33-61070	1639751.87	1736177.20
	33-61071	1639749.78	1736179.00
	33-61072	1639754.11	1736266.96
	33-61073	1639756.44	1736264.01
	33-61074	1639753.54	1736261.74
	33-61075	1639751.87	1736264.91
	33-61076	1639834.95	1736189.24
	33-61077	1639837.66	1736186.03
	33-61078	1639834.79	1736181.66
	33-61079	1639831.21	1736187.06
	33-61080	1639774.74	1736013.62
	33-61081	1639778.62	1736017.14
	33-61082	1639781.88	1736013.35
	33-61083	1639777.86	1736010.90
33-007(c)	33-60541	1637900.00	1740491.10
	33-60543	1637910.60	1740496.04
	33-60544	1637900.18	1740495.03
	33-60545	1637925.17	1740495.74
	33-60547	1637888.44	1740487.68
33-008(c)	33-01671	1638943.87	1740309.78
	33-01672	1638969.90	1740292.90
	33-01673	1638942.08	1740312.56
	33-01674	1638945.26	1740305.45
	33-01679	1638936.94	1740323.80
	33-01680	1638944.72	1740303.90
	33-01681	1638929.56	1740305.52
	33-01682	1638950.05	1740301.74
	33-01684	1638944.11	1740320.89
	33-60676	1639034.32	1740464.39
	33-61952	1638942.88	1740325.76
	33-61953	1638947.05	1740322.50
	33-61954	1638950.73	1740318.81
	33-61955	1638953.63	1740315.05
	33-61956	1638951.93	1740309.85
	33-61957	1638954.19	1740305.04
	33-61958	1638952.24	1740300.34

Table 3.2-1 (continued)

SWMU/AOC	Location ID	Easting (ft)	Northing (ft)
33-008(c) (cont.)	33-61959	1638947.47	1740301.02
	33-61960	1638943.47	1740300.65
	33-61961	1638939.29	1740297.82
	33-61962	1638934.95	1740295.50
	33-61963	1638933.29	1740314.89
	33-61964	1638938.35	1740318.89
	33-61965	1638923.18	1740298.45
	33-61966	1638911.34	1740307.09
	33-61967	1638915.72	1740314.17
	33-61968	1638968.34	1740297.87
	33-61969	1638971.42	1740295.75
	33-61970	1638970.04	1740291.07
	33-61971	1638966.48	1740294.41
	33-61972	1639099.79	1740422.57
	33-61973	1639102.91	1740419.61
	33-61974	1638929.09	1740317.15
	33-61975	1639099.87	1740416.54
	33-61976	1639096.91	1740419.65
	33-61977	1638924.83	1740318.90
	33-61978	1638920.16	1740317.63
	33-61979	1638908.54	1740298.64
	33-61980	1638917.87	1740299.91
	33-61981	1638926.99	1740295.68
	33-61982	1638931.18	1740292.65
33-010(c)	33-60474	1639733.11	1735876.95
	33-61053	1639733.19	1735880.01
	33-61054	1639736.03	1735876.96
	33-61055	1639733.11	1735873.89
	33-61056	1639730.08	1735873.99
	33-61057	1639732.09	1735867.77
	33-61058	1639715.81	1735871.07
	33-61059	1639718.58	1735881.71
	33-61060	1639722.63	1735893.26
	33-61061	1639736.50	1735888.61

Table 3.2-1 (continued)

SWMU/AOC	Location ID	Easting (ft)	Northing (ft)
33-011(a)	33-61001	1638388.07	1739983.75
	33-61002	1638334.88	1739940.56
	33-61003	1638378.31	1739954.13
	33-61004	1638357.12	1739918.34
	33-61005	1638408.42	1739943.93
	33-61006	1638422.24	1739917.17
	33-61007	1638401.24	1739877.11
	33-61008	1638420.99	1739969.76
	33-61009	1638347.62	1739993.39
	33-61010	1638309.89	1739928.38
	33-61063	1638434.08	1739893.60
	33-61064	1638442.90	1739926.80
	33-61065	1638382.95	1740005.07
	33-61066	1638332.51	1739878.27
33-011(d)	33-60998	1638460.32	1740182.84
	33-60999	1638452.30	1740176.96
	33-61107	1638528.38	1740183.04
33-012(a)	33-60992	1638775.63	1740353.31
	33-60993	1638780.55	1740352.38
	33-60994	1638744.67	1740349.80
	33-60995	1638744.72	1740344.75
	33-60996	1638728.59	1740318.59
	33-61085	1638756.41	1740323.94
	33-61086	1638718.25	1740325.22
	33-61087	1638720.47	1740322.46
	33-61088	1638723.25	1740324.77
	33-61089	1638769.00	1740322.96
	33-61090	1638741.21	1740315.52
	33-61091	1638755.45	1740314.66
	33-61092	1638743.73	1740342.02
	33-61093	1638743.15	1740333.83
	33-61094	1638759.03	1740350.57
	33-61095	1638757.61	1740343.27
	33-61096	1638756.60	1740333.78
	33-61097	1638768.20	1740354.23
	33-61098	1638770.80	1740351.61
	33-61099	1638773.29	1740354.23
	33-61100	1638770.80	1740356.64

Table 3.2-1 (continued)

SWMU/AOC	Location ID	Easting (ft)	Northing (ft)
33-017	33-60982	1638815.57	1740364.33
	33-60983	1638801.05	1740378.45
	33-60984	1638820.45	1740373.54
	33-60985	1638834.42	1740359.82
C-33-001	33-01749	1638611.37	1740527.97
	33-61102	1638611.41	1740529.43
	33-61103	1638612.93	1740528.02
	33-61104	1638611.44	1740526.45
	33-61105	1638609.88	1740527.98

Table 6.2-1
Samples Collected and Analyses Requested at SWMUs 33-001 (a–e)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOCs	SVOCs	Explosive Compounds	Cyanide	Nitrate
RE33-20-186547	33-60393	9.0–10.0	QBT3	N3B-2020-790	N3B-2020-790	N3B-2020-790	N3B-2020-790	N3B-2020-790	N3B-2020-790	N3B-2020-790	N3B-2020-790	—*	NeB-2020-791	N3B-2020-790	N3B-2020-790
RE33-20-186548	33-60393	21.0–22.0	QBT3	N3B-2020-798	N3B-2020-798	N3B-2020-798	N3B-2020-798	N3B-2020-798	N3B-2020-798	N3B-2020-798	N3B-2020-798	N3B-2020-798	N3B-2020-799	N3B-2020-798	N3B-2020-798
RE33-20-186549	33-60393	29.0–30.0	QBT2	N3B-2020-798	N3B-2020-798	N3B-2020-798	N3B-2020-798	N3B-2020-798	N3B-2020-798	—	N3B-2020-798	N3B-2020-798	N3B-2020-799	N3B-2020-798	N3B-2020-798
RE33-20-186550	33-60393	39.0–40.0	QBT1V	N3B-2020-798	N3B-2020-798	N3B-2020-798	N3B-2020-798	N3B-2020-798	N3B-2020-798	—	N3B-2020-798	N3B-2020-798	N3B-2020-799	N3B-2020-798	N3B-2020-798
RE33-20-186551	33-60393	49.0–50.0	QBT1V	N3B-2020-798	N3B-2020-798	N3B-2020-798	N3B-2020-798	N3B-2020-798	N3B-2020-798	—	N3B-2020-798	N3B-2020-798	N3B-2020-799	N3B-2020-798	N3B-2020-798
RE33-20-186552	33-60393	59.0–60.0	QBT1V	N3B-2020-798	N3B-2020-798	N3B-2020-798	N3B-2020-798	N3B-2020-798	N3B-2020-798	—	N3B-2020-798	N3B-2020-798	N3B-2020-799	N3B-2020-798	N3B-2020-798
RE33-20-186553	33-60393	69.0–70.0	QBT1V	N3B-2020-798	N3B-2020-798	N3B-2020-798	N3B-2020-798	N3B-2020-798	N3B-2020-798	—	N3B-2020-798	N3B-2020-798	N3B-2020-799	N3B-2020-798	N3B-2020-798
RE33-20-186554	33-60394	9.0–10.0	QBT2	N3B-2020-809	N3B-2020-809	N3B-2020-809	N3B-2020-809	N3B-2020-809	N3B-2020-809	N3B-2020-809	N3B-2020-809	N3B-2020-809	N3B-2020-810	N3B-2020-809	N3B-2020-809
RE33-20-186555	33-60394	19.0–20.0	QBT2	N3B-2020-809	N3B-2020-809	N3B-2020-809	N3B-2020-809	N3B-2020-809	N3B-2020-809	N3B-2020-809	N3B-2020-809	N3B-2020-809	N3B-2020-810	N3B-2020-809	N3B-2020-809
RE33-20-186556	33-60394	29.0–29.8	QBT2	N3B-2020-809	N3B-2020-809	N3B-2020-809	N3B-2020-809	N3B-2020-809	N3B-2020-809	—	N3B-2020-809	N3B-2020-809	N3B-2020-810	N3B-2020-809	N3B-2020-809
RE33-20-186557	33-60394	42.0–43.0	QBT1V	N3B-2020-809	N3B-2020-809	N3B-2020-809	N3B-2020-809	N3B-2020-809	N3B-2020-809	—	N3B-2020-809	N3B-2020-809	N3B-2020-810	N3B-2020-809	N3B-2020-809
RE33-20-186558	33-60394	49.0–50.0	QBT1V	N3B-2020-809	N3B-2020-809	N3B-2020-809	N3B-2020-809	N3B-2020-809	N3B-2020-809	—	N3B-2020-809	N3B-2020-809	N3B-2020-810	N3B-2020-809	N3B-2020-809
RE33-20-186559	33-60394	59.0–60.0	QBT1V	N3B-2020-809	N3B-2020-809	N3B-2020-809	N3B-2020-809	N3B-2020-809	N3B-2020-809	—	N3B-2020-809	N3B-2020-809	N3B-2020-810	N3B-2020-809	N3B-2020-809
RE33-20-186560	33-60394	70.0–71.0	QBT1V	N3B-2020-809	N3B-2020-809	N3B-2020-809	N3B-2020-809	N3B-2020-809	N3B-2020-809	—	N3B-2020-809	N3B-2020-809	N3B-2020-810	N3B-2020-809	N3B-2020-809
RE33-20-186561	33-60395	9.0–10.0	QBT2	N3B-2020-815	N3B-2020-815	N3B-2020-815	N3B-2020-815	N3B-2020-815	N3B-2020-815	N3B-2020-815	N3B-2020-815	N3B-2020-815	N3B-2020-816	N3B-2020-815	N3B-2020-815
RE33-20-186562	33-60395	19.0–22.0	QBT2	N3B-2020-815	N3B-2020-815	N3B-2020-815	N3B-2020-815	N3B-2020-815	N3B-2020-815	N3B-2020-815	N3B-2020-815	N3B-2020-815	N3B-2020-816	N3B-2020-815	N3B-2020-815
RE33-20-186563	33-60395	29.0–30.0	QBT2	N3B-2020-815	N3B-2020-815	N3B-2020-815	N3B-2020-815	N3B-2020-815	N3B-2020-815	—	N3B-2020-815	N3B-2020-815	N3B-2020-816	N3B-2020-815	N3B-2020-815
RE33-20-186564	33-60395	42.0–43.0	QBT1V	N3B-2020-815	N3B-2020-815	N3B-2020-815	N3B-2020-815	N3B-2020-815	N3B-2020-815	—	N3B-2020-815	N3B-2020-815	N3B-2020-816	N3B-2020-815	N3B-2020-815
RE33-20-186565	33-60395	49.0–50.0	QBT1V	N3B-2020-815	N3B-2020-815	N3B-2020-815	N3B-2020-815	N3B-2020-815	N3B-2020-815	—	N3B-2020-815	N3B-2020-815	N3B-2020-816	N3B-2020-815	N3B-2020-815
RE33-20-186566	33-60395	59.0–60.0	QBT1V	N3B-2020-815	N3B-2020-815	N3B-2020-815	N3B-2020-815	N3B-2020-815	N3B-2020-815	—	N3B-2020-815	N3B-2020-815	N3B-2020-816	N3B-2020-815	N3B-2020-815
RE33-20-186567	33-60395	69.0–70.0	QBT1V	N3B-2020-815	N3B-2020-815	N3B-2020-815	N3B-2020-815	N3B-2020-815	N3B-2020-815	—	N3B-2020-815	N3B-2020-815	N3B-2020-816	N3B-2020-815	N3B-2020-815
RE33-20-186568	33-60396	9.0–10.0	QBT2	N3B-2020-824	N3B-2020-824	N3B-2020-824	N3B-2020-824	N3B-2020-824	N3B-2020-824	N3B-2020-824	N3B-2020-824	N3B-2020-824	NeB-2020-825	N3B-2020-824	N3B-2020-824
RE33-20-186569	33-60396	19.0–22.0	QBT2	N3B-2020-824	N3B-2020-824	N3B-2020-824	N3B-2020-824	N3B-2020-824	N3B-2020-824	—	N3B-2020-824	N3B-2020-824	N3B-2020-825	N3B-2020-824	N3B-2020-824
RE33-20-186570	33-60396	28.5–29.5	QBT2	N3B-2020-824	N3B-2020-824	N3B-2020-824	N3B-2020-824	N3B-2020-824	N3B-2020-824	—	N3B-2020-824	N3B-2020-824	N3B-2020-825	N3B-2020-824	N3B-2020-824
RE33-20-186571	33-60396	39.0–40.0	QBT1V	N3B-2020-824	N3B-2020-824	N3B-2020-824	N3B-2020-824	N3B-2020-824	N3B-2020-824	—	N3B-2020-824	N3B-2020-824	N3B-2020-825	N3B-2020-824	N3B-2020-824
RE33-20-186572	33-60396	51.0–52.0	QBT1V	N3B-2020-824	N3B-2020-824	N3B-2020-824	N3B-2020-824	N3B-2020-824	N3B-2020-824	—	N3B-2020-824	N3B-2020-824	N3B-2020-825	N3B-2020-824	N3B-2020-824
RE33-20-186573	33-60396	59.0–60.0	QBT1V	N3B-2020-824	N3B-2020-824	N3B-2020-824	N3B-2020-824	N3B-2020-824	N3B-2020-824	—	N3B-2020-824	N3B-2020-824	N3B-2020-825	N3B-2020-824	N3B-2020-824
RE33-20-186574	33-60396	69.0–70.0	QBT1V	N3B-2020-824	N3B-2020-824	N3B-2020-824	N3B-2020-824	N3B-2020-824	N3B-2020-824	—	N3B-2020-824	N3B-2020-824	N3B-2020-825	N3B-2020-824	N3B-2020-824
RE33-20-186575	33-60397	9.0–10.0	QBT3	N3B-2020-833	N3B-2020-833	N3B-2020-833	N3B-2020-833	N3B-2020-833	N3B-2020-833	N3B-2020-833	N3B-2020-833	N3B-2020-833	N3B-2020-834	N3B-2020-833	N3B-2020-833
RE33-20-186576	33-60397	19.0–20.0	QBT2	N3B-2020-833	N3B-2020-833	N3B-2020-833	N3B-2020-833	N3B-2020-833	N3B-2020-833	—	N3B-2020-833	N3B-2020-833	N3B-2020-834	N3B-2020-833	N3B-2020-833
RE33-20-186577	33-60397	29.0–30.0	QBT2	N3B-2020-833	N3B-2020-833	N3B-2020-833	N3B-2020-833	N3B-2020-833	N3B-2020-833	—	N3B-2020-833	N3B-2020-833	N3B-2020-834	N3B-2020-833	N3B-2020-833

Table 6.2-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOCs	SVOCs	Explosive Compounds	Cyanide	Nitrate
RE33-20-186578	33-60397	39.5–40.0	QBT1V	N3B-2020-833	N3B-2020-833	N3B-2020-833	N3B-2020-833	N3B-2020-833	N3B-2020-833	—	N3B-2020-833	N3B-2020-833	N3B-2020-834	N3B-2020-833	N3B-2020-833
RE33-20-186579	33-60397	51.0–52.0	QBT1V	N3B-2020-833	N3B-2020-833	N3B-2020-833	N3B-2020-833	N3B-2020-833	N3B-2020-833	—	N3B-2020-833	N3B-2020-833	N3B-2020-834	N3B-2020-833	N3B-2020-833
RE33-20-186580	33-60397	59.0–60.0	QBT1V	N3B-2020-833	N3B-2020-833	N3B-2020-833	N3B-2020-833	N3B-2020-833	N3B-2020-833	—	N3B-2020-833	N3B-2020-833	N3B-2020-834	N3B-2020-833	N3B-2020-833
RE33-20-186581	33-60397	69.0–70.0	QBT1V	N3B-2020-833	N3B-2020-833	N3B-2020-833	N3B-2020-833	N3B-2020-833	N3B-2020-833	—	N3B-2020-833	N3B-2020-833	N3B-2020-834	N3B-2020-833	N3B-2020-833
RE33-21-223856	33-61876	0.0-0.5	ALLH	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	—	—	—	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426
RE33-21-223857	33-61876	1.0-1.5	QBT3	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	—	—	—	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426
RE33-21-223858	33-61877	0.0-0.3	ALLH	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	—	—	—	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426
RE33-21-223859	33-61877	1.5-1.8	QBT3	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	—	—	—	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426
RE33-21-223860	33-61878	0.0-0.5	ALLH	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	—	—	—	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426
RE33-21-223861	33-61878	1.0-1.4	ALLH	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	—	—	—	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426
RE33-21-223862	33-61879	0.0-0.5	ALLH	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	—	—	—	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426
RE33-21-223863	33-61879	1.0-1.4	QBT3	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	—	—	—	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426
RE33-21-223864	33-61880	0.0-0.5	ALLH	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	—	—	—	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426
RE33-21-223865	33-61880	1.0-1.4	QBT3	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	—	—	—	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426
RE33-21-223866	33-61881	0.0-0.5	ALLH	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	—	—	—	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426
RE33-21-223867	33-61881	1.0-1.5	QBT3	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	—	—	—	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426
RE33-21-223868	33-61882	0.0-0.5	ALLH	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	—	—	—	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426
RE33-21-223869	33-61882	1.0-1.5	QBT3	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	—	—	—	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426
RE33-21-223870	33-61883	0.0-0.5	ALLH	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	—	—	—	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426
RE33-21-223871	33-61883	1.0-1.5	QBT3	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	—	—	—	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426
RE33-21-223872	33-61884	0.0-0.5	ALLH	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426	—	—	—	N3B-2021-1426	N3B-2021-1426	N3B-2021-1426
RE33-21-223873	33-61884	1.0-1.5	ALLH	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	—	—	—	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427
RE33-21-223874	33-61885	0.0-0.5	ALLH	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	—	—	—	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427
RE33-21-223875	33-61885	1.0-1.5	ALLH	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	—	—	—	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427
RE33-21-223876	33-61886	0.0-0.5	ALLH	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	—	—	—	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427
RE33-21-223877	33-61886	1.0-1.5	QBT3	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	—	—	—	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427
RE33-21-223878	33-61887	0.0-0.5	ALLH	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	—	—	—	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427
RE33-21-223879	33-61887	1.0-1.5	QBT3	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	—	—	—	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427
RE33-21-223880	33-61888	0.0-0.5	ALLH	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	—	—	—	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427
RE33-21-223881	33-61888	1.0-1.5	QBT3	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	—	—	—	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427
RE33-21-223882	33-61889	0.0-0.5	ALLH	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	—	—	—	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427
RE33-21-223883	33-61889	1.0-1.5	QBT3	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	—	—	—	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427

Table 6.2-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOCs	SVOCs	Explosive Compounds	Cyanide	Nitrate
RE33-21-223884	33-61890	0.0-0.5	ALLH	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	—	—	—	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427
RE33-21-223885	33-61890	1.0-1.5	QBT3	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	—	—	—	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427
RE33-21-223886	33-61891	0.0-0.5	ALLH	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	—	—	—	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427
RE33-21-223887	33-61891	1.0-1.4	QBT3	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	—	—	—	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427
RE33-21-223888	33-61892	0.0-0.5	ALLH	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	—	—	—	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427
RE33-21-223889	33-61892	1.0-1.5	ALLH	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427	—	—	—	N3B-2021-1427	N3B-2021-1427	N3B-2021-1427
RE33-21-223890	33-61893	0.0-0.5	ALLH	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	—	—	—	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437
RE33-21-223891	33-61893	1.0-1.5	ALLH	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	—	—	—	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437
RE33-21-223892	33-61894	0.0-0.5	ALLH	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	—	—	—	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437
RE33-21-223893	33-61894	1.0-1.5	ALLH	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	—	—	—	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437
RE33-21-223894	33-61895	0.0-0.5	ALLH	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	—	—	—	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437
RE33-21-223895	33-61895	1.0-1.4	ALLH	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	—	—	—	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437
RE33-21-223896	33-61896	0.0-0.5	ALLH	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	—	—	—	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437
RE33-21-223897	33-61896	1.0-1.3	QBT3	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	—	—	—	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437
RE33-21-223898	33-61897	0.0-0.5	QBT3	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	—	—	—	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437
RE33-21-223899	33-61897	1.0-1.3	QBT3	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	—	—	—	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437
RE33-21-223900	33-61898	0.0-0.5	QBT3	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	—	—	—	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437
RE33-21-223901	33-61898	1.0-1.3	QBT3	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	—	—	—	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437
RE33-21-223902	33-61899	0.0-0.5	ALLH	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	—	—	—	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437
RE33-21-223903	33-61899	1.0-1.5	QBT3	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	—	—	—	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437
RE33-21-223904	33-61900	0.0-0.5	ALLH	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	—	—	—	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437
RE33-21-223905	33-61900	1.0-1.5	QBT3	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437	—	—	—	N3B-2021-1437	N3B-2021-1437	N3B-2021-1437
RE33-21-223906	33-61901	0.0-0.5	ALLH	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	—	—	—	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438
RE33-21-223907	33-61901	1.0-1.5	QBT3	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	—	—	—	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438
RE33-21-223908	33-61902	0.0-0.5	ALLH	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	—	—	—	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438
RE33-21-223909	33-61902	1.0-1.4	QBT3	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	—	—	—	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438
RE33-21-223910	33-61903	0.0-0.5	ALLH	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	—	—	—	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438
RE33-21-223911	33-61903	1.0-1.5	QBT3	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	—	—	—	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438
RE33-21-223912	33-61904	0.0-0.5	ALLH	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	—	—	—	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438
RE33-21-223913	33-61904	1.0-1.5	QBT3	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	—	—	—	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438
RE33-21-223914	33-61905	0.0-0.5	ALLH	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	—	—	—	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438
RE33-21-223915	33-61905	1.0-1.5	QBT3	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	—	—	—	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438

Table 6.2-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOCs	SVOCs	Explosive Compounds	Cyanide	Nitrate
RE33-21-223916	33-61906	0.0-0.5	ALLH	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	—	—	—	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438
RE33-21-223917	33-61906	1.0-1.5	QBT3	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	—	—	—	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438
RE33-21-223918	33-61907	0.0-0.5	ALLH	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438	—	—	—	N3B-2021-1438	N3B-2021-1438	N3B-2021-1438
RE33-21-223919	33-61907	1.0-1.5	QBT3	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439	—	—	—	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439
RE33-21-223920	33-61908	0.0-0.5	ALLH	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439	—	—	—	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439
RE33-21-223921	33-61908	1.0-1.5	QBT3	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439	—	—	—	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439
RE33-21-223922	33-61909	0.0-0.5	ALLH	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439	—	—	—	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439
RE33-21-223923	33-61909	1.0-1.5	QBT3	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439	—	—	—	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439
RE33-21-223924	33-61910	0.0-0.5	ALLH	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439	—	—	—	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439
RE33-21-223925	33-61910	1.0-1.5	QBT3	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439	—	—	—	N3B-2021-1439	N3B-2021-1439	N3B-2021-1439
RE33-21-223926	33-61911	0.0-0.5	ALLH	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	—	—	—	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451
RE33-21-223927	33-61911	1.0-1.5	QBT3	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	—	—	—	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451
RE33-21-223928	33-61912	0.0-0.5	ALLH	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	—	—	—	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451
RE33-21-223929	33-61912	1.0-1.3	QBT3	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	—	—	—	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451
RE33-21-223930	33-61913	0.0-0.5	ALLH	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	—	—	—	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451
RE33-21-223931	33-61913	1.0-1.3	QBT3	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	—	—	—	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451
RE33-21-223932	33-61914	0.0-0.5	ALLH	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	—	—	—	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451
RE33-21-223933	33-61914	1.0-1.3	QBT3	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	—	—	—	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451
RE33-21-223934	33-61915	0.0-0.5	ALLH	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	—	—	—	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451
RE33-21-223935	33-61915	1.0-1.5	QBT3	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	—	—	—	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451
RE33-21-223936	33-61916	0.0-0.5	ALLH	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	—	—	—	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451
RE33-21-223937	33-61916	1.0-1.5	QBT3	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451	—	—	—	N3B-2021-1451	N3B-2021-1451	N3B-2021-1451
RE33-21-223938	33-61917	0.0-0.5	ALLH	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	—	—	—	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452
RE33-21-223939	33-61917	1.0-1.5	ALLH	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	—	—	—	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452
RE33-21-223940	33-61918	0.0-0.5	ALLH	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	—	—	—	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452
RE33-21-223941	33-61918	1.0-1.5	ALLH	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	—	—	—	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452
RE33-21-223942	33-61919	0.0-0.5	ALLH	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	—	—	—	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452
RE33-21-223943	33-61919	1.0-1.5	ALLH	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	—	—	—	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452
RE33-21-223944	33-61920	0.0-0.5	ALLH	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	—	—	—	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452
RE33-21-223945	33-61920	1.0-1.5	QBT3	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452	—	—	—	N3B-2021-1452	N3B-2021-1452	N3B-2021-1452

Note: Numbers in analyte columns are request numbers.
* — = Analysis not requested.

Table 6.2-2
Inorganic Chemicals above BVs at SWMUs 33-001(a–e)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium
Soil Background Value[a]				**29,200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**21,500**	**22.3**	**4610**
Qbt 1v Background Value[a]				**8170**	**0.5**	**1.81**	**26.5**	**1.70**	**0.4**	**3700**	**2.24**	**1.78**	**3.26**	**9900**	**18.4**	**780**
Qbt 2,3,4 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**14,500**	**11.2**	**1690**
Construction Worker SSL[b]				**41,400**	**142**	**41.2**	**4390**	**148**	**72.1**	**na[c]**	**134[d]**	**36.7**	**14,200**	**248,000**	**800**	**na**
Industrial SSL[b]				**1,290,000**	**519**	**35.9**	**255,000**	**2580**	**1110**	**na**	**505[d]**	**388**	**51,900**	**908,000**	**800**	**na**
Residential SSL[b]				**78,000**	**31.3**	**7.07**	**15,600**	**156**	**70.5**	**na**	**96.6[d]**	**23.4**	**3130**	**54,800**	**400**	**na**
RE33-20-186547	33-60393	9.0–10.0	QBT3	—[e]	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186548	33-60393	21.0–22.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186549	33-60393	29.0–30.0	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186550	33-60393	39.0–40.0	QBT1V	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186551	33-60393	49.0–50.0	QBT1V	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186552	33-60393	59.0–60.0	QBT1V	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186553	33-60393	69.0–70.0	QBT1V	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186554	33-60394	9.0–10.0	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186555	33-60394	19.0–20.0	QBT2	—	—	—	—	—	—	—	11.3	—	—	—	—	—
RE33-20-186556	33-60394	29.0–29.8	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186557	33-60394	42.0–43.0	QBT1V	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186558	33-60394	49.0–50.0	QBT1V	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186559	33-60394	59.0–60.0	QBT1V	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186560	33-60394	70.0–71.0	QBT1V	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186561	33-60395	9.0–10.0	QBT2	—	—	—	—	—	—	5640	—	—	—	—	—	—
RE33-20-186562	33-60395	19.0–22.0	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186563	33-60395	29.0–30.0	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186564	33-60395	42.0–43.0	QBT1V	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186565	33-60395	49.0–50.0	QBT1V	—	—	—	—	—	—	—	2.95	—	—	—	—	—
RE33-20-186566	33-60395	59.0–60.0	QBT1V	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186567	33-60395	69.0–70.0	QBT1V	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186568	33-60396	9.0–10.0	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186569	33-60396	19.0–22.0	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186570	33-60396	28.5–29.5	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186571	33-60396	39.0–40.0	QBT1V	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 6.2-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium
Soil Background Value[a]				**29,200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**21,500**	**22.3**	**4610**
Qbt 1v Background Value[a]				**8170**	**0.5**	**1.81**	**26.5**	**1.70**	**0.4**	**3700**	**2.24**	**1.78**	**3.26**	**9900**	**18.4**	**780**
Qbt 2,3,4 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**14,500**	**11.2**	**1690**
Construction Worker SSL[b]				**41,400**	**142**	**41.2**	**4390**	**148**	**72.1**	**na[c]**	**134[d]**	**36.7**	**14,200**	**248,000**	**800**	**na**
Industrial SSL[b]				**1,290,000**	**519**	**35.9**	**255,000**	**2580**	**1110**	**na**	**505[d]**	**388**	**51,900**	**908,000**	**800**	**na**
Residential SSL[b]				**78,000**	**31.3**	**7.07**	**15,600**	**156**	**70.5**	**na**	**96.6[d]**	**23.4**	**3130**	**54,800**	**400**	**na**
RE33-20-186572	33-60396	51.0-52.0	QBT1V	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186573	33-60396	59.0-60.0	QBT1V	—	—	—	—	—	—	—	3.49	—	—	—	27.5	920
RE33-20-186574	33-60396	69.0-70.0	QBT1V	—	—	—	—	—	—	—	—	—	—	—	24.5	—
RE33-20-186575	33-60397	9.0-10.0	QBT3	—	—	—	—	—	—	3020	—	—	—	—	—	—
RE33-20-186576	33-60397	19.0-20.0	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186577	33-60397	29.0-30.0	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186578	33-60397	39.5-40.0	QBT1V	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186579	33-60397	51.0-52.0	QBT1V	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186580	33-60397	59.0-60.0	QBT1V	—	—	—	—	—	—	—	11	—	—	—	22.9	—
RE33-20-186581	33-60397	69.0-70.0	QBT1V	—	—	2.17	—	—	—	—	—	—	—	—	19.1	—
RE33-21-223856	33-61876	0.0-0.5	SOIL	—	—	—	—	4.99 (J-)	—	—	—	—	421 (J)	—	—	—
RE33-21-223857	33-61876	1.0-1.5	QBT3	—	—	—	—	—	—	—	—	—	9.91 (J)	—	—	—
RE33-21-223858	33-61877	0.0-0.3	SOIL	—	—	—	—	—	—	—	—	—	351 (J)	—	—	—
RE33-21-223859	33-61877	1.5-1.8	QBT3	—	0.902 (U)	—	61.2 (J)	—	—	8840	—	—	8.25 (J)	—	—	—
RE33-21-223860	33-61878	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-223861	33-61878	1.0-1.4	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-223862	33-61879	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	18.2 (J)	—	—	—
RE33-21-223863	33-61879	1.0-1.4	QBT3	—	1.64 (UJ)	—	51.5 (J)	—	—	—	—	—	6.17 (J)	—	—	1740 (J+)
RE33-21-223864	33-61880	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	40.9 (J)	—	—	—
RE33-21-223865	33-61880	1.0-1.4	QBT3	—	0.861 (U)	—	—	—	—	—	—	—	—	—	—	—
RE33-21-223866	33-61881	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	36.5 (J)	—	—	—
RE33-21-223867	33-61881	1.0-1.5	QBT3	—	1.18 (U)	—	—	—	—	4710	—	—	—	—	—	—
RE33-21-223868	33-61882	0.0-0.5	SOIL	—	1.08 (U)	—	—	—	—	10,600	—	—	—	—	—	—
RE33-21-223869	33-61882	1.0-1.5	QBT3	—	0.893 (U)	—	48.8 (J)	—	—	8090	—	—	7.1 (J)	—	—	2630 (J+)
RE33-21-223870	33-61883	0.0-0.5	SOIL	—	1.67 (UJ)	—	—	—	0.506 (U)	8660	—	—	—	—	—	—
RE33-21-223871	33-61883	1.0-1.5	QBT3	—	0.546 (U)	2.98	140 (J)	—	—	9610	—	—	6.94 (J)	—	—	1790 (J+)

Table 6.2-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium
Soil Background Value[a]				**29,200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**21,500**	**22.3**	**4610**
Qbt 1v Background Value[a]				**8170**	**0.5**	**1.81**	**26.5**	**1.70**	**0.4**	**3700**	**2.24**	**1.78**	**3.26**	**9900**	**18.4**	**780**
Qbt 2,3,4 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**14,500**	**11.2**	**1690**
Construction Worker SSL[b]				**41,400**	**142**	**41.2**	**4390**	**148**	**72.1**	**na[c]**	**134[d]**	**36.7**	**14,200**	**248,000**	**800**	**na**
Industrial SSL[b]				**1,290,000**	**519**	**35.9**	**255,000**	**2580**	**1110**	**na**	**505[d]**	**388**	**51,900**	**908,000**	**800**	**na**
Residential SSL[b]				**78,000**	**31.3**	**7.07**	**15,600**	**156**	**70.5**	**na**	**96.6[d]**	**23.4**	**3130**	**54,800**	**400**	**na**
RE33-21-223872	33-61884	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-223873	33-61884	1.0-1.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-223874	33-61885	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-223875	33-61885	1.0-1.5	SOIL	—	1.02 (U)	—	—	—	—	—	—	—	—	—	—	—
RE33-21-223876	33-61886	0.0-0.5	SOIL	—	1.23 (U)	—	—	—	—	6740	—	—	—	—	—	—
RE33-21-223877	33-61886	1.0-1.5	QBT3	—	5.69 (U)	4	142	—	—	31,700	—	—	—	—	—	2760 (J+)
RE33-21-223878	33-61887	0.0-0.5	SOIL	—	—	—	—	—	—	11,000	—	—	—	—	—	—
RE33-21-223879	33-61887	1.0-1.5	QBT3	—	1.14 (U)	—	61.7	—	—	8650	—	—	—	—	—	—
RE33-21-223880	33-61888	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-223881	33-61888	1.0-1.5	QBT3	—	0.535 (U)	—	—	—	—	—	—	—	—	—	—	—
RE33-21-223882	33-61889	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-223883	33-61889	1.0-1.5	QBT3	—	0.75 (U)	—	62.7	—	—	5550	—	—	—	—	—	—
RE33-21-223884	33-61890	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-223885	33-61890	1.0-1.5	QBT3	—	1.18 (U)	—	119	—	—	46,700	—	—	5.42	—	—	—
RE33-21-223886	33-61891	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-223887	33-61891	1.0-1.4	QBT3	—	0.612 (U)	—	73.1	—	—	11,300	—	—	—	—	—	—
RE33-21-223888	33-61892	0.0-0.5	SOIL	—	1.52 (U)	—	—	—	—	22,100	—	—	—	—	—	—
RE33-21-223889	33-61892	1.0-1.5	SOIL	—	—	—	—	—	—	6860	—	—	—	—	—	—
RE33-21-223890	33-61893	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-223891	33-61893	1.0-1.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-223892	33-61894	0.0-0.5	SOIL	—	1.06 (J)	—	—	—	—	7770	—	—	—	—	—	—
RE33-21-223893	33-61894	1.0-1.5	SOIL	—	0.953 (J)	—	—	—	—	—	—	—	—	—	—	—
RE33-21-223894	33-61895	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-223895	33-61895	1.0-1.4	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-223896	33-61896	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-223897	33-61896	1.0-1.3	QBT3	—	—	—	59.7	—	—	7540	—	—	4.67	—	—	—

Table 6.2-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium
Soil Background Value[a]				**29,200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**21,500**	**22.3**	**4610**
Qbt 1v Background Value[a]				**8170**	**0.5**	**1.81**	**26.5**	**1.70**	**0.4**	**3700**	**2.24**	**1.78**	**3.26**	**9900**	**18.4**	**780**
Qbt 2,3,4 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**14,500**	**11.2**	**1690**
Construction Worker SSL[b]				**41,400**	**142**	**41.2**	**4390**	**148**	**72.1**	**na[c]**	**134[d]**	**36.7**	**14,200**	**248,000**	**800**	**na**
Industrial SSL[b]				**1,290,000**	**519**	**35.9**	**255,000**	**2580**	**1110**	**na**	**505[d]**	**388**	**51,900**	**908,000**	**800**	**na**
Residential SSL[b]				**78,000**	**31.3**	**7.07**	**15,600**	**156**	**70.5**	**na**	**96.6[d]**	**23.4**	**3130**	**54,800**	**400**	**na**
RE33-21-223898	33-61897	0.0-0.5	QBT3	—	—	—	46.3	—	—	—	—	—	—	—	—	—
RE33-21-223899	33-61897	1.0-1.3	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-223900	33-61898	0.0-0.5	QBT3	8060	—	3.23	77.6	1.5	—	2960	—	3.3	7.75	—	—	1870 (J+)
RE33-21-223901	33-61898	1.0-1.3	QBT3	—	0.956 (J)	—	51.3	—	—	21,900	—	—	—	—	—	—
RE33-21-223902	33-61899	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-223903	33-61899	1.0-1.5	QBT3	—	—	—	50.3	—	—	—	—	—	5.34	—	—	—
RE33-21-223904	33-61900	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	36.6	—	—	—
RE33-21-223905	33-61900	1.0-1.5	QBT3	—	1.77 (J)	5.23	282	—	—	73,000	—	—	15.2	—	—	3810 (J+)
RE33-21-223906	33-61901	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	33.4 (J+)	—	—	—
RE33-21-223907	33-61901	1.0-1.5	QBT3	12,700	—	4.3	129	1.67	—	2890	11.6	4.6	8.97 (J+)	16,100	12.8	2340 (J+)
RE33-21-223908	33-61902	0.0-0.5	SOIL	—	—	—	—	2.23	—	19,400	—	—	26.5 (J+)	—	—	—
RE33-21-223909	33-61902	1.0-1.4	QBT3	8850	1.73 (U)	4.82	186	2.07	—	82,600	—	3.98	13.9 (J+)	—	—	2310 (J+)
RE33-21-223910	33-61903	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-223911	33-61903	1.0-1.5	QBT3	—	—	2.94	197	—	—	45,200	—	—	6.76 (J+)	—	—	2020 (J+)
RE33-21-223912	33-61904	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-223913	33-61904	1.0-1.5	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-223914	33-61905	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	17.5 (J+)	—	—	—
RE33-21-223915	33-61905	1.0-1.5	QBT3	14,300	—	5.22	185	3.65	—	4640	10.3	3.76	11 (J+)	—	11.7	3470 (J+)
RE33-21-223916	33-61906	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	66.7 (J+)	—	—	—
RE33-21-223917	33-61906	1.0-1.5	QBT3	—	—	—	—	—	—	—	—	—	13.5 (J+)	—	—	—
RE33-21-223918	33-61907	0.0-0.5	SOIL	—	—	—	—	—	—	24,500	—	—	19 (J+)	—	—	—
RE33-21-223919	33-61907	1.0-1.5	QBT3	7720	1.6 (U)	3.48	165 (J-)	1.3	—	55,200	—	3.26	11.7	—	—	2340 (J)
RE33-21-223920	33-61908	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	29.2	—	—	—
RE33-21-223921	33-61908	1.0-1.5	QBT3	—	—	—	71 (J-)	—	—	—	—	—	10.9	—	—	—
RE33-21-223922	33-61909	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	129	—	—	—
RE33-21-223923	33-61909	1.0-1.5	QBT3	—	—	3.4	82 (J-)	1.74	—	2540	—	3.52	63.7	—	—	1710 (J)

Table 6.2-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium
Soil Background Value[a]				**29,200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**21,500**	**22.3**	**4610**
Qbt 1v Background Value[a]				**8170**	**0.5**	**1.81**	**26.5**	**1.70**	**0.4**	**3700**	**2.24**	**1.78**	**3.26**	**9900**	**18.4**	**780**
Qbt 2,3,4 Background Value[a]				**7340**	**0.5**	**2.79**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**14,500**	**11.2**	**1690**
Construction Worker SSL[b]				**41,400**	**142**	**41.2**	**4390**	**148**	**72.1**	**na[c]**	**134[d]**	**36.7**	**14,200**	**248,000**	**800**	**na**
Industrial SSL[b]				**1,290,000**	**519**	**35.9**	**255,000**	**2580**	**1110**	**na**	**505[d]**	**388**	**51,900**	**908,000**	**800**	**na**
Residential SSL[b]				**78,000**	**31.3**	**7.07**	**15,600**	**156**	**70.5**	**na**	**96.6[d]**	**23.4**	**3130**	**54,800**	**400**	**na**
RE33-21-223924	33-61910	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	31.6	—	—	—
RE33-21-223925	33-61910	1.0-1.5	QBT3	—	—	—	78.9 (J-)	—	—	—	—	—	15.9	—	—	—
RE33-21-223926	33-61911	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	23.2 (J+)	—	—	—
RE33-21-223927	33-61911	1.0-1.5	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-223928	33-61912	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	16.8 (J+)	—	—	—
RE33-21-223929	33-61912	1.0-1.3	QBT3	—	—	—	—	—	—	—	—	—	9.28 (J+)	—	—	—
RE33-21-223930	33-61913	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	34.8	—	—	—
RE33-21-223931	33-61913	1.0-1.3	QBT3	—	—	—	53.4	—	—	9100	—	—	12 (J+)	—	—	—
RE33-21-223932	33-61914	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	15.7 (J+)	—	—	—
RE33-21-223933	33-61914	1.0-1.3	QBT3	—	—	—	56	—	—	—	—	—	10 (J+)	—	—	—
RE33-21-223934	33-61915	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	211	—	—	—
RE33-21-223935	33-61915	1.0-1.5	QBT3	—	—	—	61.6	—	—	—	—	—	202	—	—	—
RE33-21-223936	33-61916	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	52.3	—	—	—
RE33-21-223937	33-61916	1.0-1.5	QBT3	—	—	—	—	—	—	—	—	—	7.42 (J+)	—	—	—
RE33-21-223938	33-61917	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	21.1 (J)	—	—	—
RE33-21-223939	33-61917	1.0-1.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-223940	33-61918	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-223941	33-61918	1.0-1.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-223942	33-61919	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	18.1 (J)	—	—	—
RE33-21-223943	33-61919	1.0-1.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-223944	33-61920	0.0-0.5	SOIL	—	1.27 (U)	—	—	—	—	48,400	—	—	—	—	—	5800 (J+)
RE33-21-223945	33-61920	1.0-1.5	QBT3	—	1.27 (U)	—	50.3 (J)	—	—	23,900	—	—	—	—	—	4250 (J+)

Table 6.2-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Sodium	Vanadium	Zinc
Soil Background Value[a]				**671**	**0.1**	**15.4**	**na[c]**	**na**	**1.52**	**1**	**915**	**39.6**	**48.8**
Qbt 1v Background Value[a]				**408**	**0.1**	**2**	**na**	**na**	**0.3**	**1**	**6330**	**4.48**	**84.6**
Qbt 2,3,4 Background Value[a]				**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**2770**	**17**	**63.5**
Construction Worker SSL[b]				**464**	**77.1**	**753**	**566,000**	**248**	**1750**	**1770**	**na**	**614**	**106,000**
Industrial SSL[b]				**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**na**	**6530**	**389,000**
Residential SSL[b]				**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**na**	**394**	**23,500**
RE33-20-186547	33-60393	9.0–10.0	QBT3	—	—	—	—	—	2.17	—	—	—	—
RE33-20-186548	33-60393	21.0–22.0	QBT3	—	—	—	—	0.000765 (J)	1.59	—	—	—	—
RE33-20-186549	33-60393	29.0–30.0	QBT2	—	—	—	—	0.000805 (J)	1.42	—	—	—	—
RE33-20-186550	33-60393	39.0–40.0	QBT1V	—	—	—	—	0.000959 (J)	1.53	—	—	—	—
RE33-20-186551	33-60393	49.0–50.0	QBT1V	—	—	—	—	0.000535 (J)	1.93	—	—	—	—
RE33-20-186552	33-60393	59.0–60.0	QBT1V	—	—	—	—	—	2.03	—	—	—	—
RE33-20-186553	33-60393	69.0–70.0	QBT1V	—	—	—	—	—	2.14	—	—	—	—
RE33-20-186554	33-60394	9.0–10.0	QBT2	—	—	—	—	—	1.82	1.08 (U)	—	—	—
RE33-20-186555	33-60394	19.0–20.0	QBT2	—	—	—	0.886 (J)	0.00152 (J)	1.85	1.28 (U)	—	—	—
RE33-20-186556	33-60394	29.0–29.8	QBT2	—	—	—	0.481 (J)	—	2.19	1.05 (U)	—	—	—
RE33-20-186557	33-60394	42.0–43.0	QBT1V	—	—	—	1.21	0.000513 (J)	3.01	—	—	—	—
RE33-20-186558	33-60394	49.0–50.0	QBT1V	—	—	—	0.414 (J)	—	2.84	—	—	—	—
RE33-20-186559	33-60394	59.0–60.0	QBT1V	—	—	—	—	—	2.58	—	—	—	—
RE33-20-186560	33-60394	70.0–71.0	QBT1V	—	—	—	—	—	3.1	—	—	—	—
RE33-20-186561	33-60395	9.0–10.0	QBT2	—	—	—	—	—	1.86	1.67 (U)	—	—	—
RE33-20-186562	33-60395	19.0–22.0	QBT2	—	—	—	—	—	2.09	1.03 (U)	—	—	—
RE33-20-186563	33-60395	29.0–30.0	QBT2	—	—	—	0.772 (J)	0.00207	2.16	1.27 (U)	—	—	—
RE33-20-186564	33-60395	42.0–43.0	QBT1V	—	—	—	—	0.000713 (J)	3.04	—	—	—	—
RE33-20-186565	33-60395	49.0–50.0	QBT1V	—	—	—	—	—	2.52	1.08 (U)	—	—	—
RE33-20-186566	33-60395	59.0–60.0	QBT1V	—	—	—	—	—	3.35	1.08 (U)	—	—	—
RE33-20-186567	33-60395	69.0–70.0	QBT1V	—	—	—	—	—	2.93	—	—	—	—
RE33-20-186568	33-60396	9.0–10.0	QBT2	—	—	—	—	—	1.84	1.02 (U)	—	—	—
RE33-20-186569	33-60396	19.0–22.0	QBT2	—	—	—	—	—	2.03	—	—	—	—
RE33-20-186570	33-60396	28.5–29.5	QBT2	—	—	—	—	—	1.73	1.01 (U)	—	—	—
RE33-20-186571	33-60396	39.0–40.0	QBT1V	—	—	—	—	—	2.34	1.04 (U)	—	—	—

Table 6.2-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Sodium	Vanadium	Zinc
Soil Background Value[a]				**671**	**0.1**	**15.4**	**na[c]**	**na**	**1.52**	**1**	**915**	**39.6**	**48.8**
Qbt 1v Background Value[a]				**408**	**0.1**	**2**	**na**	**na**	**0.3**	**1**	**6330**	**4.48**	**84.6**
Qbt 2,3,4 Background Value[a]				**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**2770**	**17**	**63.5**
Construction Worker SSL[b]				**464**	**77.1**	**753**	**566,000**	**248**	**1750**	**1770**	**na**	**614**	**106,000**
Industrial SSL[b]				**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**na**	**6530**	**389,000**
Residential SSL[b]				**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**na**	**394**	**23,500**
RE33-20-186572	33-60396	51.0-52.0	QBT1V	—	—	—	—	—	2.94	—	—	—	—
RE33-20-186573	33-60396	59.0-60.0	QBT1V	—	—	—	—	—	2.87	—	—	6.3	—
RE33-20-186574	33-60396	69.0-70.0	QBT1V	599	—	—	—	—	2.88	1.04 (U)	—	—	—
RE33-20-186575	33-60397	9.0-10.0	QBT3	—	—	—	—	—	1.69	—	—	—	—
RE33-20-186576	33-60397	19.0-20.0	QBT2	—	—	—	—	—	2.05	—	—	—	—
RE33-20-186577	33-60397	29.0-30.0	QBT2	—	—	—	—	0.00103 (J)	2.05	—	—	—	—
RE33-20-186578	33-60397	39.5-40.0	QBT1V	—	—	—	—	0.00124 (J)	2.83	—	—	—	—
RE33-20-186579	33-60397	51.0-52.0	QBT1V	—	—	—	—	0.000851 (J)	3.16	—	—	—	—
RE33-20-186580	33-60397	59.0-60.0	QBT1V	—	—	—	—	—	2.99	—	—	—	—
RE33-20-186581	33-60397	69.0-70.0	QBT1V	—	—	—	—	—	2.88	1.01 (U)	—	—	—
RE33-21-223856	33-61876	0.0-0.5	SOIL	—	—	—	2.56	—	—	—	—	—	53.4
RE33-21-223857	33-61876	1.0-1.5	QBT3	—	—	—	0.503 (J)	—	0.966 (J)	—	—	—	—
RE33-21-223858	33-61877	0.0-0.3	SOIL	—	—	—	1.01 (J)	—	—	—	—	—	—
RE33-21-223859	33-61877	1.5-1.8	QBT3	—	—	—	0.567 (J)	—	1.06	—	—	—	—
RE33-21-223860	33-61878	0.0-0.5	SOIL	—	—	—	—	0.0017 (J)	—	—	—	—	—
RE33-21-223861	33-61878	1.0-1.4	SOIL	—	—	—	—	0.00198	—	—	—	—	—
RE33-21-223862	33-61879	0.0-0.5	SOIL	—	—	—	0.908 (J)	0.000523 (J)	—	—	—	—	—
RE33-21-223863	33-61879	1.0-1.4	QBT3	—	—	—	—	—	1.72	—	—	—	—
RE33-21-223864	33-61880	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	—
RE33-21-223865	33-61880	1.0-1.4	QBT3	—	—	—	—	—	0.785 (J)	—	—	—	—
RE33-21-223866	33-61881	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	—
RE33-21-223867	33-61881	1.0-1.5	QBT3	—	—	—	—	—	1.12	—	—	—	—
RE33-21-223868	33-61882	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	—
RE33-21-223869	33-61882	1.0-1.5	QBT3	—	—	7.49 (J)	—	0.000717 (J)	1.17	—	—	—	—
RE33-21-223870	33-61883	0.0-0.5	SOIL	—	—	—	9.11	—	—	—	—	—	—
RE33-21-223871	33-61883	1.0-1.5	QBT3	—	—	8.81 (J)	3.74	—	1.18	—	—	—	—

Table 6.2-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Sodium	Vanadium	Zinc
Soil Background Value[a]				**671**	**0.1**	**15.4**	**na[c]**	**na**	**1.52**	**1**	**915**	**39.6**	**48.8**
Qbt 1v Background Value[a]				**408**	**0.1**	**2**	**na**	**na**	**0.3**	**1**	**6330**	**4.48**	**84.6**
Qbt 2,3,4 Background Value[a]				**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**2770**	**17**	**63.5**
Construction Worker SSL[b]				**464**	**77.1**	**753**	**566,000**	**248**	**1750**	**1770**	**na**	**614**	**106,000**
Industrial SSL[b]				**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**na**	**6530**	**389,000**
Residential SSL[b]				**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**na**	**394**	**23,500**
RE33-21-223872	33-61884	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	—
RE33-21-223873	33-61884	1.0-1.5	SOIL	—	—	—	2.29	—	1.53	—	—	—	—
RE33-21-223874	33-61885	0.0-0.5	SOIL	—	—	—	2.04	—	1.63	1.03 (U)	—	—	—
RE33-21-223875	33-61885	1.0-1.5	SOIL	—	—	—	4.67	—	1.53	1.04 (U)	—	—	—
RE33-21-223876	33-61886	0.0-0.5	SOIL	—	—	—	1.05 (J)	—	1.55	1.02 (U)	—	—	—
RE33-21-223877	33-61886	1.0-1.5	QBT3	—	0.926	7.3	1.47	—	2.66	—	—	—	—
RE33-21-223878	33-61887	0.0-0.5	SOIL	—	—	—	0.46 (J)	—	1.88	—	—	—	—
RE33-21-223879	33-61887	1.0-1.5	QBT3	—	—	—	—	—	1.97	—	—	—	—
RE33-21-223880	33-61888	0.0-0.5	SOIL	—	—	—	0.679 (J)	—	—	—	—	—	—
RE33-21-223881	33-61888	1.0-1.5	QBT3	—	—	—	—	—	1.56	—	—	—	—
RE33-21-223882	33-61889	0.0-0.5	SOIL	—	—	—	—	—	1.61	1.01 (U)	—	—	—
RE33-21-223883	33-61889	1.0-1.5	QBT3	—	—	—	0.51 (J)	—	1.59	-	—	—	—
RE33-21-223884	33-61890	0.0-0.5	SOIL	—	—	—	1.45	—	—	—	—	—	81
RE33-21-223885	33-61890	1.0-1.5	QBT3	—	—	—	1.15	—	1.68	—	—	—	—
RE33-21-223886	33-61891	0.0-0.5	SOIL	—	—	—	0.847 (J)	—	2.34	1.07 (U)	—	—	—
RE33-21-223887	33-61891	1.0-1.4	QBT3	—	—	—	—	—	1.83	—	—	—	—
RE33-21-223888	33-61892	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	—
RE33-21-223889	33-61892	1.0-1.5	SOIL	—	—	—	0.605 (J)	0.00131 (J)	1.81	1.02 (U)	957	—	—
RE33-21-223890	33-61893	0.0-0.5	SOIL	—	—	—	0.568 (J)	—	—	—	—	—	53.7
RE33-21-223891	33-61893	1.0-1.5	SOIL	—	—	—	0.74 (J)	—	—	—	—	—	—
RE33-21-223892	33-61894	0.0-0.5	SOIL	—	—	—	0.558 (J)	—	—	—	—	—	—
RE33-21-223893	33-61894	1.0-1.5	SOIL	—	—	—	—	—	—	—	—	—	—
RE33-21-223894	33-61895	0.0-0.5	SOIL	—	—	—	1.08	—	1.59	—	—	—	50.3
RE33-21-223895	33-61895	1.0-1.4	SOIL	—	—	—	0.61 (J)	—	—	—	—	—	—
RE33-21-223896	33-61896	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	—
RE33-21-223897	33-61896	1.0-1.3	QBT3	—	—	—	—	—	1.32	—	—	—	—

Table 6.2-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Sodium	Vanadium	Zinc
Soil Background Value[a]				**671**	**0.1**	**15.4**	**na[c]**	**na**	**1.52**	**1**	**915**	**39.6**	**48.8**
Qbt 1v Background Value[a]				**408**	**0.1**	**2**	**na**	**na**	**0.3**	**1**	**6330**	**4.48**	**84.6**
Qbt 2,3,4 Background Value[a]				**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**2770**	**17**	**63.5**
Construction Worker SSL[b]				**464**	**77.1**	**753**	**566,000**	**248**	**1750**	**1770**	**na**	**614**	**106,000**
Industrial SSL[b]				**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**na**	**6530**	**389,000**
Residential SSL[b]				**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**na**	**394**	**23,500**
RE33-21-223898	33-61897	0.0-0.5	QBT3	—	—	—	1.28	—	1.26	—	—	—	—
RE33-21-223899	33-61897	1.0-1.3	QBT3	—	—	—	1.12	—	1.53	—	—	—	—
RE33-21-223900	33-61898	0.0-0.5	QBT3	—	—	9.61	1.64	—	1.81	—	—	—	—
RE33-21-223901	33-61898	1.0-1.3	QBT3	—	—	—	—	—	1.08	—	—	—	—
RE33-21-223902	33-61899	0.0-0.5	SOIL	—	—	—	0.548 (J)	—	—	—	—	—	—
RE33-21-223903	33-61899	1.0-1.5	QBT3	—	—	—	—	—	1.4	—	—	—	—
RE33-21-223904	33-61900	0.0-0.5	SOIL	—	—	—	1.43	—	1.56	—	—	—	51.5
RE33-21-223905	33-61900	1.0-1.5	QBT3	—	—	7.01	0.846 (J)	0.00088 (J)	1.54	1.08 (U)	—	—	—
RE33-21-223906	33-61901	0.0-0.5	SOIL	—	—	—	1.76	—	—	—	—	—	—
RE33-21-223907	33-61901	1.0-1.5	QBT3	—	—	10.2	0.953 (J)	0.000719 (J)	1.11 (J)	—	—	31.3	—
RE33-21-223908	33-61902	0.0-0.5	SOIL	—	—	—	4.64	—	2.77	—	—	—	—
RE33-21-223909	33-61902	1.0-1.4	QBT3	—	—	13.1	1.9	—	3.23	—	—	—	—
RE33-21-223910	33-61903	0.0-0.5	SOIL	—	—	—	4.41	—	1.7	—	—	—	—
RE33-21-223911	33-61903	1.0-1.5	QBT3	—	—	7.3	4.18	—	2.02	—	—	—	—
RE33-21-223912	33-61904	0.0-0.5	SOIL	—	—	—	1.02 (J)	—	—	—	—	—	—
RE33-21-223913	33-61904	1.0-1.5	QBT3	—	—	—	0.547 (J)	—	2.11	—	—	—	—
RE33-21-223914	33-61905	0.0-0.5	SOIL	—	—	—	0.605 (J)	—	—	—	—	—	—
RE33-21-223915	33-61905	1.0-1.5	QBT3	—	—	16.6	0.601 (J)	0.000779 (J)	3.02	—	—	24.6	—
RE33-21-223916	33-61906	0.0-0.5	SOIL	—	—	—	3.67	0.000612 (J)	—	—	—	—	—
RE33-21-223917	33-61906	1.0-1.5	QBT3	—	—	—	0.763 (J)	—	1.52	—	—	—	—
RE33-21-223918	33-61907	0.0-0.5	SOIL	—	—	—	3.86	—	1.62	—	—	—	—
RE33-21-223919	33-61907	1.0-1.5	QBT3	—	—	10.4	8.7	—	2.17	1.07 (U)	—	—	—
RE33-21-223920	33-61908	0.0-0.5	SOIL	—	—	—	1.44	—	—	—	—	—	—
RE33-21-223921	33-61908	1.0-1.5	QBT3	—	—	—	2.07	—	1.44	—	—	—	—
RE33-21-223922	33-61909	0.0-0.5	SOIL	—	—	—	1.33	—	1.75	—	—	—	—
RE33-21-223923	33-61909	1.0-1.5	QBT3	—	—	11.1	1.33	—	2.56	—	—	17.4	—

Table 6.2-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Sodium	Vanadium	Zinc
Soil Background Value[a]				**671**	**0.1**	**15.4**	**na[c]**	**na**	**1.52**	**1**	**915**	**39.6**	**48.8**
Qbt 1v Background Value[a]				**408**	**0.1**	**2**	**na**	**na**	**0.3**	**1**	**6330**	**4.48**	**84.6**
Qbt 2,3,4 Background Value[a]				**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**2770**	**17**	**63.5**
Construction Worker SSL[b]				**464**	**77.1**	**753**	**566,000**	**248**	**1750**	**1770**	**na**	**614**	**106,000**
Industrial SSL[b]				**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**na**	**6530**	**389,000**
Residential SSL[b]				**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**na**	**394**	**23,500**
RE33-21-223924	33-61910	0.0-0.5	SOIL	—	—	—	1.75	—	1.74	—	—	—	—
RE33-21-223925	33-61910	1.0-1.5	QBT3	—	—	7.98	0.932 (J)	—	2.13	—	—	—	—
RE33-21-223926	33-61911	0.0-0.5	SOIL	—	—	—	0.577 (J)	—	—	—	—	—	—
RE33-21-223927	33-61911	1.0-1.5	QBT3	—	—	—	—	—	1.21	—	—	—	—
RE33-21-223928	33-61912	0.0-0.5	SOIL	—	—	—	0.504 (J)	—	—	—	—	—	—
RE33-21-223929	33-61912	1.0-1.3	QBT3	—	—	—	0.481 (J)	—	1.19	—	—	—	—
RE33-21-223930	33-61913	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	—
RE33-21-223931	33-61913	1.0-1.3	QBT3	—	—	—	—	—	0.93 (J)	—	—	—	—
RE33-21-223932	33-61914	0.0-0.5	SOIL	—	—	—	0.705 (J)	—	—	—	—	—	—
RE33-21-223933	33-61914	1.0-1.3	QBT3	—	—	—	0.607 (J)	—	1.08	—	—	—	—
RE33-21-223934	33-61915	0.0-0.5	SOIL	—	—	—	0.753 (J)	—	—	—	—	—	—
RE33-21-223935	33-61915	1.0-1.5	QBT3	—	—	—	0.841 (J)	—	1.16	—	—	—	—
RE33-21-223936	33-61916	0.0-0.5	SOIL	—	—	—	2.44	0.00092 (J)	—	—	—	—	—
RE33-21-223937	33-61916	1.0-1.5	QBT3	—	—	—	1.47	—	1.2	—	—	—	—
RE33-21-223938	33-61917	0.0-0.5	SOIL	—	—	—	—	—	1.86	—	—	—	—
RE33-21-223939	33-61917	1.0-1.5	SOIL	—	—	—	0.472 (J)	—	1.85	—	—	—	—
RE33-21-223940	33-61918	0.0-0.5	SOIL	—	—	—	—	—	1.68	—	—	—	—
RE33-21-223941	33-61918	1.0-1.5	SOIL	—	—	—	—	—	1.7	—	—	—	—
RE33-21-223942	33-61919	0.0-0.5	SOIL	—	—	—	—	—	—	—	—	—	—
RE33-21-223943	33-61919	1.0-1.5	SOIL	—	—	—	—	—	1.7	—	—	—	—
RE33-21-223944	33-61920	0.0-0.5	SOIL	—	—	—	0.622 (J)	—	1.8	—	—	—	—
RE33-21-223945	33-61920	1.0-1.5	QBT3	—	—	—	—	0.00237	2.54	—	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] SSLs from NMED (2019, 700550) unless otherwise noted.

[c] na = Not available.

[d] SSL for total chromium.

[e] — = Not detected or not detected above BV.

Table 6.2-3
Organic Chemicals Detected at SWMUs 33-001(a–e)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Bis(2-ethylhexyl)phthalate	Di-n-butylphthalate	Diethylphthalate	Isopropyltoluene[4-]
Construction worker SSL[a]				**242,000**	**5380**	**26,900**	**215,000**	**2740**
Industrial SSL[a]				**960,000**	**1830**	**91,600**	**733,000**	**14,200**
Residential SSL[a]				**66,300**	**380**	**6160**	**49,300**	**2360**
RE33-20-186547	33-60393	9.0-10.0	QBT3	0.00203 (J)	NA[b]	NA	NA	—
RE33-20-186548	33-60393	21-22	QBT3	—[c]	0.0403	—	—	—
RE33-20-186549	33-60393	29-30	QBT2	—	0.0207 (J)	0.0177 (J)	0.0147 (J)	—
RE33-20-186550	33-60393	39-40	QBT1V	—	0.012 (J)	—	—	—
RE33-20-186551	33-60393	49-50	QBT1V	—	0.0257 (J)	—	—	—
RE33-20-186553	33-60393	69-70	QBT1V	—	0.0222 (J)	—	—	—
RE33-20-186554	33-60394	9.0-10.0	QBT2	—	—	—	—	0.00514
RE33-20-186556	33-60394	29.0-29.8	QBT2	—	0.0106 (J)	—	—	—
RE33-20-186560	33-60394	70.0-71.0	QBT1V	—	0.0194 (J)	—	—	—
RE33-20-186561	33-60395	9.0-10.0	QBT2	—	0.0145 (J)	—	—	—
RE33-20-186562	33-60395	19.0-20.0	QBT2	—	0.0138 (J)	—	—	—
RE33-20-186564	33-60395	42.0-43.0	QBT1V	—	0.015 (J)	—	—	—
RE33-20-186565	33-60395	49.0-50.0	QBT1V	—	0.0524	—	—	—
RE33-20-186566	33-60395	59.0-60.0	QBT1V	—	0.0537	—	—	—
RE33-20-186567	33-60395	69.0-70.0	QBT1V	—	0.042	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] SSLs from NMED (2019, 700550) unless otherwise noted.

[b] NA = Not analyzed.

[c] — = Not detected.

Table 6.2-4
Radionuclides Detected or Detected above BVs/FVs at SWMUs 33-001(a–e)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Uranium-234	Uranium-235/236	Uranium-238
Soil Background Value[a]				**1.65**	**0.054**	**2.59**	**0.2**	**2.29**
Qbt 1v Background Value[a]				**na[b]**	**na**	**3.12**	**0.14**	**3.05**
Qbt 2,3,4 Background Value[a]				**na**	**na**	**1.98**	**0.09**	**1.93**
Construction Worker SAL[c]				**37**	**200**	**1000**	**130**	**470**
Industrial SAL[c]				**41**	**1200**	**3100**	**160**	**710**
Residential SAL[c]				**12**	**79**	**290**	**42**	**150**
RE33-20-186550	33-60393	39-40	QBT1V	—[d]	0.0606	—	—	—
RE33-20-186562	33-60395	19.0-20.0	QBT2	—	—	—	0.102	—
RE33-20-186569	33-60396	19.0-20.0	QBT2	—	—	—	0.0968	—
RE33-20-186575	33-60397	9.0-10.0	QBT3	—	—	—	0.118	—
RE33-20-186580	33-60397	59.0-60.0	QBT1V	—	—	—	0.162	—
RE33-20-186581	33-60397	69.0-70.0	QBT1V	—	—	—	0.206	—
RE33-21-223856	33-61876	0.0-0.5	SOIL	—	—	13.4	0.849	14.1
RE33-21-223858	33-61877	0.0-0.3	SOIL	—	—	6.4	0.442	7.02
RE33-21-223859	33-61877	1.5-1.8	QBT3	—	—	—	0.0916	—
RE33-21-223866	33-61881	0.0-0.5	SOIL	—	—	—	—	2.85
RE33-21-223877	33-61886	1.0-1.5	QBT3	—	—	—	0.103	—
RE33-21-223889	33-61892	1.0-1.5	SOIL	0.338	—	6.17	0.312	6.24
RE33-21-223898	33-61897	0.0-0.5	QBT3	—	—	—	0.0982	—
RE33-21-223900	33-61898	0.0-0.5	QBT3	0.146	—	—	—	—
RE33-21-223901	33-61898	1.0-1.3	QBT3	0.0591	—	—	—	—
RE33-21-223903	33-61899	1.0-1.5	QBT3	0.122	—	—	—	—
RE33-21-223905	33-61900	1.0-1.5	QBT3	0.0734	—	—	—	—
RE33-21-223906	33-61901	0.0-0.5	SOIL	—	—	6.13	0.291	6.04
RE33-21-223909	33-61902	1.0-1.4	QBT3	0.201	—	—	—	—

Table 6.2-4 (continued)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Uranium-234	Uranium-235/236	Uranium-238
Soil Background Value[a]				**1.65**	**0.054**	**2.59**	**0.2**	**2.29**
Qbt 1v Background Value[a]				**na**	**na**	**3.12**	**0.14**	**3.05**
Qbt 2,3,4 Background Value[a]				**na**	**na**	**1.98**	**0.09**	**1.93**
Construction Worker SAL[c]				**41**	**200**	**3100**	**160**	**710**
Industrial SAL[c]				**12**	**1200**	**290**	**42**	**150**
Residential SAL[c]				**na**	**79**	**4**	**0.18**	**3.9**
RE33-21-223911	33-61903	1.0-1.5	QBT3	0.058	—	—	—	—
RE33-21-223916	33-61906	0.0-0.5	SOIL	—	—	3.13	—	3.13
RE33-21-223917	33-61906	1.0-1.5	QBT3	0.108	—	—	—	—
RE33-21-223919	33-61907	1.0-1.5	QBT3	0.354	—	—	—	—
RE33-21-223922	33-61909	0.0-0.5	SOIL	—	—	3.67	—	3.64
RE33-21-223923	33-61909	1.0-1.5	QBT3	0.209	—	2.84	0.169	2.89
RE33-21-223925	33-61910	1.0-1.5	QBT3	0.0759	—	—	0.103	—
RE33-21-223928	33-61912	0.0-0.5	SOIL	—	—	4.17	0.227	4.32
RE33-21-223931	33-61913	1.0-1.3	QBT3	0.112	—	—	—	—
RE33-21-223933	33-61914	1.0-1.3	QBT3	0.122	—	—	—	—
RE33-21-223934	33-61915	0.0-0.5	SOIL	—	—	4.49	0.225	4.55
RE33-21-223935	33-61915	1.0-1.5	QBT3	0.178	—	2.91	0.151	3.18

Note: Results are in pCi/g.

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

[b] na = Not available.

[c] SALs from LANL (2015, 6009290.

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

Table 6.7-1
Samples Collected and Analyses Requested at SWMU 33-004(a)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Tritium	Americium-241	Isotopic Plutonium	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOCs	SVOCs	Cyanide	Nitrate
RE33-20-189907	33-60588	7.1–8.1	QBT3	N3B-2020-966	N3B-2020-966	N3B-2020-966	N3B-2020-966	N3B-2020-966	N3B-2020-966	N3B-2020-966	N3B-2020-966	N3B-2020-966	N3B-2020-966	N3B-2020-966	N3B-2020-966
RE33-20-189912	33-60588	10.0–11.0	QBT3	N3B-2020-976	N3B-2020-976	N3B-2020-976	N3B-2020-976	N3B-2020-976	N3B-2020-976	N3B-2020-976	—[a]	N3B-2020-976	N3B-2020-976	N3B-2020-976	N3B-2020-976
RE33-20-189908	33-60589	7.4–8.4	FILL	N3B-2020-976	N3B-2020-976	N3B-2020-976	N3B-2020-976	N3B-2020-976	N3B-2020-976	N3B-2020-976	—	N3B-2020-976	N3B-2020-976	N3B-2020-976	N3B-2020-976
RE33-20-189913	33-60589	10.4–11.3	FILL	N3B-2020-976	N3B-2020-976	N3B-2020-976	N3B-2020-976	N3B-2020-976	N3B-2020-976	N3B-2020-976	N3B-2020-976	N3B-2020-976	N3B-2020-976	N3B-2020-976	N3B-2020-976
RE33-20-189909	33-60590	9.5–10.5	QBT3	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	—	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933
RE33-20-189914	33-60590	12.5–13.5	QBT3	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	—	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933
RE33-21-222765	33-60590	15.0–16.0	QBT3	—	—	—	—	—	—	—	—	—	N3B-2021-1328[b]	—	—
RE33-20-189910	33-60591	7.4–7.9	FILL	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	—	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933
RE33-20-189915	33-60591	10.4–11.4	QBT3	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	—	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933
RE33-20-189911	33-60592	9.2–10.2	QBT3	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	—	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925
RE33-20-189916	33-60592	12.2–13.2	QBT3	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	—	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925
RE33-21-222765	33-60592	15.0–16.0	QBT3	—	—	—	—	—	—	—	—	—	N3B-2021-1357[b]	—	—
RE33-20-189957	33-60593	9.0–10.0	QBT3	N3B-2020-654	N3B-2020-654	—	N3B-2020-654	N3B-2020-654	N3B-2020-654	N3B-2020-654	N3B-2020-654	N3B-2020-654	N3B-2020-654	N3B-2020-654	N3B-2020-654
RE33-20-189958	33-60593	19.0–20.0	QBT2	N3B-2020-654	N3B-2020-654	—	N3B-2020-654	N3B-2020-654	N3B-2020-654	N3B-2020-654	N3B-2020-654	N3B-2020-654	N3B-2020-654	N3B-2020-654	N3B-2020-654
RE33-20-189959	33-60593	29.0–30.0	QBT2	N3B-2020-654	N3B-2020-654	—	N3B-2020-654	N3B-2020-654	N3B-2020-654	N3B-2020-654	—	N3B-2020-654	N3B-2020-654	N3B-2020-654	N3B-2020-654
RE33-20-189960	33-60593	39.0–40.0	QBT2	N3B-2020-654	N3B-2020-654	—	N3B-2020-654	N3B-2020-654	N3B-2020-654	N3B-2020-654	—	N3B-2020-654	N3B-2020-654	N3B-2020-654	N3B-2020-654
RE33-20-189961	33-60593	52.0–53.0	QBT2	N3B-2020-654	N3B-2020-654	—	N3B-2020-654	N3B-2020-654	N3B-2020-654	N3B-2020-654	—	N3B-2020-654	N3B-2020-654	N3B-2020-654	N3B-2020-654
RE33-20-189962	33-60593	60.0–61.0	QBT2	N3B-2020-664	N3B-2020-664	—	N3B-2020-664	N3B-2020-664	N3B-2020-664	N3B-2020-664	—	N3B-2020-664	N3B-2020-664	N3B-2020-664	N3B-2020-664
RE33-20-189963	33-60593	74.5–75.5	QBT2	N3B-2020-679	N3B-2020-679	—	N3B-2020-679	N3B-2020-679	N3B-2020-679	N3B-2020-679	—	N3B-2020-679	N3B-2020-679	N3B-2020-679	N3B-2020-679
RE33-20-189964	33-60594	9.0–10.0	QBT3	N3B-2020-690	N3B-2020-690	—	N3B-2020-690	N3B-2020-690	N3B-2020-690	N3B-2020-690	N3B-2020-690	N3B-2020-690	N3B-2020-690	N3B-2020-690	N3B-2020-690
RE33-20-189965	33-60594	19.0–20.0	QBT2	N3B-2020-690	N3B-2020-690	—	N3B-2020-690	N3B-2020-690	N3B-2020-690	N3B-2020-690	N3B-2020-690	N3B-2020-690	N3B-2020-690	N3B-2020-690	N3B-2020-690
RE33-20-189966	33-60594	29.0–30.0	QBT2	N3B-2020-690	N3B-2020-690	—	N3B-2020-690	N3B-2020-690	N3B-2020-690	N3B-2020-690	—	N3B-2020-690	N3B-2020-690	N3B-2020-690	N3B-2020-690
RE33-20-189967	33-60594	39.0–40.0	QBT2	N3B-2020-690	N3B-2020-690	—	N3B-2020-690	N3B-2020-690	N3B-2020-690	N3B-2020-690	—	N3B-2020-690	N3B-2020-690	N3B-2020-690	N3B-2020-690
RE33-20-189968	33-60594	52.5–53.5	QBT2	N3B-2020-690	N3B-2020-690	—	N3B-2020-690	N3B-2020-690	N3B-2020-690	N3B-2020-690	—	N3B-2020-690	N3B-2020-690	N3B-2020-690	N3B-2020-690
RE33-20-189969	33-60594	59.0–60.0	QBT2	N3B-2020-690	N3B-2020-690	—	N3B-2020-690	N3B-2020-690	N3B-2020-690	N3B-2020-690	—	N3B-2020-690	N3B-2020-690	N3B-2020-690	N3B-2020-690
RE33-20-189970	33-60594	69.0–70.0	QBT2	N3B-2020-690	N3B-2020-690	—	N3B-2020-690	N3B-2020-690	N3B-2020-690	N3B-2020-690	—	N3B-2020-690	N3B-2020-690	N3B-2020-690	N3B-2020-690
RE33-20-189971	33-60595	2.1–2.9	FILL	N3B-2020-912	N3B-2020-912	—	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912
RE33-20-189979	33-60595	4.1–5.1	QBT3	N3B-2020-913	N3B-2020-913	—	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	—	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913

Table 6.7-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Tritium	Americium-241	Isotopic Plutonium	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOCs	SVOCs	Cyanide	Nitrate
RE33-21-222767	33-60595	4.1–5.1	QBT3	—	—	—	—	—	—	—	N3B-2021-1357	—	—	—	—
RE33-20-189987	33-60595	6.1–7.1	QBT3	N3B-2020-912	N3B-2020-912	—	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	—	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912
RE33-21-222768	33-60595	6.1–7.1	QBT3	—	—	—	—	—	—	—	N3B-2021-1357	—	—	—	—
RE33-20-189980	33-60596	3.6–4.6	QBT3	N3B-2020-919	N3B-2020-919	—	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919	—	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919
RE33-20-189988	33-60596	5.6–6.6	QBT3	N3B-2020-919	N3B-2020-919	—	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919
RE33-20-189981	33-60597	3.7–4.7	QBT3	N3B-2020-925	N3B-2020-925	—	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	—	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925
RE33-21-217778	33-60597	3.7–4.7	QBT3	—	—	—	—	—	—	—	N3B-2021-756	—	—	—	—
RE33-20-189989	33-60597	5.7–6.7	QBT3	N3B-2020-925	N3B-2020-925	—	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	—	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925
RE33-21-217779	33-60597	5.7–6.7	QBT3	—	—	—	—	—	—	—	N3B-2021-756	—	—	—	—
RE33-21-222769	33-60597	9.0–10.0	QBT3	—	—	—	—	—	—	—	—	—	N3B-2021-1357[b]	—	—
RE33-20-189974	33-60598	1.9–2.9	FILL	N3B-2020-919	N3B-2020-919	—	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919	—	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919
RE33-20-189982	33-60598	3.9–4.9	QBT3	N3B-2020-919	N3B-2020-919	—	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919	—	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919
RE33-20-189990	33-60598	5.9–6.9	QBT3	N3B-2020-919	N3B-2020-919	—	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919
RE33-20-189975	33-60599	1.5–2.3	FILL	N3B-2020-919	N3B-2020-919	—	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919
RE33-20-189983	33-60599	3.5–4.5	QBT3	N3B-2020-919	N3B-2020-919	—	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919	—	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919
RE33-21-222770	33-60599	3.5–4.5	QBT3	—	—	—	—	—	—	—	N3B-2021-1363	—	—	—	—
RE33-20-189991	33-60599	5.5–6.5	QBT3	N3B-2020-919	N3B-2020-919	—	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919	—	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919
RE33-21-222771	33-60599	5.5–6.5	QBT3	—	—	—	—	—	—	—	N3B-2021-1363	—	—	—	—
RE33-20-189976	33-60600	2.2–3.2	FILL	N3B-2020-913	N3B-2020-913	—	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	—	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913
RE33-20-189984	33-60600	4.2–5.2	QBT3	N3B-2020-912	N3B-2020-912	—	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	—	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912
RE33-20-189992	33-60600	6.2–7.2	QBT3	N3B-2020-912	N3B-2020-912	—	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912
RE33-20-189985	33-60601	3.8–4.8	QBT3	N3B-2020-919	N3B-2020-919	—	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919	—	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919
RE33-20-189993	33-60601	5.8–6.8	QBT3	N3B-2020-919	N3B-2020-919	—	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919	—	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919
RE33-20-189978	33-60602	1.9–2.8	FILL	N3B-2020-919	N3B-2020-919	—	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919	—	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919
RE33-20-189986	33-60602	3.9–4.9	QBT3	N3B-2020-919	N3B-2020-919	—	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919	—	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919
RE33-20-189994	33-60602	5.9–6.9	QBT3	N3B-2020-919	N3B-2020-919	—	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919	—	N3B-2020-919	N3B-2020-919	N3B-2020-919	N3B-2020-919
RE33-21-217780	33-60961	2.1–2.7	FILL	N3B-2021-785	N3B-2021-785	—	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785
RE33-21-217781	33-60961	4.1–5.1	QBT3	N3B-2021-785	N3B-2021-785	—	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785
RE33-21-217782	33-60961	6.1–7.1	QBT3	N3B-2021-785	N3B-2021-785	—	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785
RE33-21-217783	33-60962	1.9–2.7	QBT3	N3B-2021-768	N3B-2021-768	—	N3B-2021-768	N3B-2021-768	N3B-2021-768	N3B-2021-768	N3B-2021-768	N3B-2021-768	N3B-2021-768	N3B-2021-768	N3B-2021-768
RE33-21-217784	33-60962	3.7–4.7	QBT3	N3B-2021-768	N3B-2021-768	—	N3B-2021-768	N3B-2021-768	N3B-2021-768	N3B-2021-768	N3B-2021-768	N3B-2021-768	N3B-2021-768	N3B-2021-768	N3B-2021-768
RE33-21-217785	33-60962	5.7–6.7	QBT3	N3B-2021-768	N3B-2021-768	—	N3B-2021-768	N3B-2021-768	N3B-2021-768	N3B-2021-768	N3B-2021-768	N3B-2021-768	N3B-2021-768	N3B-2021-768	N3B-2021-768

Table 6.7-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Tritium	Americium-241	Isotopic Plutonium	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOCs	SVOCs	Cyanide	Nitrate
RE33-21-217786	33-60963	1.6–2.6	ALLH	N3B-2021-785	N3B-2021-785	—	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785
RE33-21-217787	33-60963	3.6–4.6	QBT3	N3B-2021-785	N3B-2021-785	—	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785
RE33-21-217788	33-60963	5.6–6.6	QBT3	N3B-2021-785	N3B-2021-785	—	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785
RE33-21-217789	33-60964	1.6–2.6	FILL	N3B-2021-785	N3B-2021-785	—	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785
RE33-21-217790	33-60964	3.6–4.6	QBT3	N3B-2021-785	N3B-2021-785	—	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785
RE33-21-217791	33-60964	5.6–6.6	QBT3	N3B-2021-785	N3B-2021-785	—	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785	N3B-2021-785
RE33-21-217792	33-60965	2.1–2.9	FILL	—	—	—	—	—	—	—	N3B-2021-756	—	—	—	—
RE33-21-217793	33-60965	4.1–5.1	QBT3	—	—	—	—	—	—	—	N3B-2021-756	—	—	—	—
RE33-21-217794	33-60965	6.1–7.1	QBT3	—	—	—	—	—	—	—	N3B-2021-756	—	—	—	—
RE33-21-217795	33-60966	2.1–2.9	FILL	—	—	—	—	—	—	—	N3B-2021-756	—	—	—	—
RE33-21-217796	33-60966	4.2–5.1	QBT3	—	—	—	—	—	—	—	N3B-2021-756	—	—	—	—
RE33-21-217797	33-60966	6.1–7.1	QBT3	—	—	—	—	—	—	—	N3B-2021-756	—	—	—	—
RE33-21-217798	33-60967	1.6–2.25	QBT3	—	—	—	—	—	N3B-2021-746[c]	—	—	—	—	—	—
RE33-21-217799	33-60967	3.6–4.6	QBT3	—	—	—	—	—	N3B-2021-746[c]	—	—	—	—	—	—
RE33-21-217800	33-60967	5.6–6.6	QBT3	—	—	—	—	—	N3B-2021-746[c]	—	—	—	—	—	—
RE33-21-217801	33-60968	1.6–2.3	FILL	—	—	—	—	—	N3B-2021-733[c]	—	—	—	—	—	—
RE33-21-217802	33-60968	3.6–4.6	QBT3	—	—	—	—	—	N3B-2021-746[c]	—	—	—	—	—	—
RE33-21-217803	33-60968	5.6–6.6	QBT3	—	—	—	—	—	N3B-2021-746[c]	—	—	—	—	—	—
RE33-21-217804	33-60969	1.6–2.25	QBT3	—	—	—	—	—	N3B-2021-746[c]	—	—	—	—	—	—
RE33-21-217805	33-60969	3.6–4.6	QBT3	—	—	—	—	—	N3B-2021-746[c]	—	—	—	—	—	—
RE33-21-217806	33-60969	5.6–6.6	QBT3	—	—	—	—	—	N3B-2021-746[c]	—	—	—	—	—	—
RE33-21-217807	33-60970	1.6–2.25	FILL	—	—	—	—	—	N3B-2021-746[c]	—	—	—	—	—	—
RE33-21-217808	33-60970	3.6–4.6	QBT3	—	—	—	—	—	N3B-2021-746[c]	—	—	—	—	—	—
RE33-21-217809	33-60970	5.6–6.6	QBT3	—	—	—	—	—	N3B-2021-746[c]	—	—	—	—	—	—
RE33-21-217810	33-60971	1.7–2.4	FILL	—	—	—	—	—	N3B-2021-753[c]	—	N3B-2021-753	—	—	—	—
RE33-21-217811	33-60971	3.7–4.7	QBT3	—	—	—	—	—	N3B-2021-753[c]	—	N3B-2021-753	—	—	—	—
RE33-21-217812	33-60971	5.7–6.7	QBT3	—	—	—	—	—	N3B-2021-753[c]	—	N3B-2021-753	—	—	—	—
RE33-21-217813	33-60972	1.7–2.4	QBT3	—	—	—	—	—	N3B-2021-753[c]	—	N3B-2021-753	—	—	—	—
RE33-21-217814	33-60972	3.7–4.7	QBT3	—	—	—	—	—	N3B-2021-753[c]	—	N3B-2021-753	—	—	—	—
RE33-21-217815	33-60972	5.7–6.7	QBT3	—	—	—	—	—	N3B-2021-753[c]	—	N3B-2021-753	—	—	—	—
RE33-21-217816	33-60973	1.7–2.4	QBT3	—	—	—	—	—	N3B-2021-753[c]	—	N3B-2021-753	—	—	—	—
RE33-21-217817	33-60973	3.7–4.7	QBT3	—	—	—	—	—	N3B-2021-753[c]	—	N3B-2021-753	—	—	—	—

Table 6.7-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Tritium	Americium-241	Isotopic Plutonium	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOCs	SVOCs	Cyanide	Nitrate
RE33-21-217818	33-60973	5.7–6.7	QBT3	—	—	—	—	—	N3B-2021-753[c]	—	N3B-2021-753	—	—	—	—
RE33-21-217819	33-60974	1.7–2.4	FILL	—	—	—	—	—	N3B-2021-753[c]	—	N3B-2021-753	—	—	—	—
RE33-21-217820	33-60974	3.7–4.7	QBT3	—	—	—	—	—	N3B-2021-753[c]	—	N3B-2021-753	—	—	—	—
RE33-21-217821	33-60974	5.7–6.7	QBT3	—	—	—	—	—	N3B-2021-753[c]	—	N3B-2021-753	—	—	—	—
RE33-21-217822	33-60975	1.7–2.4	QBT3	—	—	—	—	—	—	—	N3B-2021-756	—	—	—	—
RE33-21-217823	33-60975	3.7–4.7	QBT3	—	—	—	—	—	—	—	N3B-2021-756	—	—	—	—
RE33-21-217824	33-60975	5.7–6.7	QBT3	—	—	—	—	—	—	—	N3B-2021-756	—	—	—	—
RE33-21-217825	33-60976	1.8–2.8	FILL	—	—	—	—	—	—	—	—	—	N3B-2021-729[b]	—	—
RE33-21-217826	33-60976	3.8–4.8	QBT3	—	—	—	—	—	—	—	—	—	N3B-2021-729[b]	—	—
RE33-21-217827	33-60976	5.8–6.8	QBT3	—	—	—	—	—	—	—	—	—	N3B-2021-729[b]	—	—
RE33-21-217828	33-60977	1.8–2.8	FILL	—	—	—	—	—	—	—	—	—	N3B-2021-733[b]	—	—
RE33-21-217829	33-60977	3.9–4.9	QBT3	—	—	—	—	—	—	—	—	—	N3B-2021-733[b]	—	—
RE33-21-217830	33-60977	5.8–6.8	QBT3	—	—	—	—	—	—	—	—	—	N3B-2021-733[b]	—	—
RE33-21-217831	33-60978	1.8–2.8	FILL	—	—	—	—	—	—	—	—	—	N3B-2021-729[b]	—	—
RE33-21-217832	33-60978	3.8–4.8	QBT3	—	—	—	—	—	—	—	—	—	N3B-2021-729[b]	—	—
RE33-21-217833	33-60978	5.8–6.8	QBT3	—	—	—	—	—	—	—	—	—	N3B-2021-729[b]	—	—
RE33-21-217834	33-60979	1.8–2.8	FILL	—	—	—	—	—	—	—	—	—	N3B-2021-733[b]	—	—
RE33-21-217835	33-60979	3.8–4.8	QBT3	—	—	—	—	—	—	—	—	—	N3B-2021-733[b]	—	—
RE33-21-217836	33-60979	5.8–6.8	QBT3	—	—	—	—	—	—	—	—	—	N3B-2021-733[b]	—	—
RE33-21-217837	33-60980	2–2.8	QBT3	—	—	—	—	—	—	—	—	—	N3B-2021-729[b]	—	—
RE33-21-217838	33-60980	3.8–4.8	QBT3	—	—	—	—	—	—	—	—	—	N3B-2021-729[b]	—	—
RE33-21-217839	33-60980	5.8–6.8	QBT3	—	—	—	—	—	—	—	—	—	N3B-2021-729[b]	—	—
RE33-21-222772	33-61112	1.6–2.25	QBT3	—	—	—	—	—	N3B-2021-1363[c]	—	—	—	—	—	—
RE33-21-222773	33-61112	3.6–4.6	QBT3	—	—	—	—	—	N3B-2021-1363[c]	—	—	—	—	—	—
RE33-21-222774	33-61112	5.6–6.6	QBT3	—	—	—	—	—	N3B-2021-1363[c]	—	—	—	—	—	—
RE33-21-222775	33-61113	1.6–2.25	FILL	—	—	—	—	—	N3B-2021-1363[c]	—	—	—	—	—	—
RE33-21-222776	33-61113	3.6–4.6	QBT3	—	—	—	—	—	N3B-2021-1363[c]	—	—	—	—	—	—
RE33-21-222777	33-61113	5.6–6.6	QBT3	—	—	—	—	—	N3B-2021-1363[c]	—	—	—	—	—	—
RE33-21-222778	33-61114	1.6–2.25	QBT3	—	—	—	—	—	N3B-2021-1363[c]	—	—	—	—	—	—
RE33-21-222779	33-61114	3.6–4.6	QBT3	—	—	—	—	—	N3B-2021-1363[c]	—	—	—	—	—	—
RE33-21-222780	33-61114	5.6–6.6	QBT3	—	—	—	—	—	N3B-2021-1363[c]	—	—	—	—	—	—
RE33-21-222781	33-61115	1.6–2.25	FILL	—	—	—	—	—	N3B-2021-1363[c]	—	—	—	—	—	—

Table 6.7-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Tritium	Americium-241	Isotopic Plutonium	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOCs	SVOCs	Cyanide	Nitrate
RE33-21-222782	33-61115	3.6–4.6	QBT3	—	—	—	—	—	N3B-2021-1363[c]	—	—	—	—	—	—
RE33-21-222783	33-61115	5.6–6.6	QBT3	—	—	—	—	—	N3B-2021-1363[c]	—	—	—	—	—	—
RE33-21-222784	33-61116	1.7–2.4	FILL	—	—	—	—	—	N3B-2021-1396[c]	—	—	—	—	—	—
RE33-21-222785	33-61116	3.7–4.7	QBT3	—	—	—	—	—	N3B-2021-1396[c]	—	—	—	—	—	—
RE33-21-222786	33-61116	5.7–6.7	QBT3	—	—	—	—	—	N3B-2021-1396[c]	—	—	—	—	—	—
RE33-21-222787	33-61117	1.7–2.4	QBT3	—	—	—	—	—	N3B-2021-1396[c]	—	—	—	—	—	—
RE33-21-222788	33-61117	3.7–4.7	QBT3	—	—	—	—	—	N3B-2021-1396[c]	—	—	—	—	—	—
RE33-21-222789	33-61117	5.7–6.7	QBT3	—	—	—	—	—	N3B-2021-1396[c]	—	—	—	—	—	—
RE33-21-222790	33-61118	1.7–2.4	QBT3	—	—	—	—	—	N3B-2021-1396[c]	—	—	—	—	—	—
RE33-21-222791	33-61118	3.7–4.7	QBT3	—	—	—	—	—	N3B-2021-1396[c]	—	—	—	—	—	—
RE33-21-222792	33-61118	5.7–6.7	QBT3	—	—	—	—	—	N3B-2021-1396[c]	—	—	—	—	—	—
RE33-21-222793	33-61119	1.7–2.4	FILL	—	—	—	—	—	N3B-2021-1396[c]	—	—	—	—	—	—
RE33-21-222794	33-61119	3.7–4.7	QBT3	—	—	—	—	—	N3B-2021-1396[c]	—	—	—	—	—	—
RE33-21-222795	33-61119	5.7–6.7	QBT3	—	—	—	—	—	N3B-2021-1396[c]	—	—	—	—	—	—
RE33-21-222796	33-61120	1.8–2.8	FILL	—	—	—	—	—	—	—	—	—	N3B-2021-1343[b]	—	—
RE33-21-222797	33-61120	3.8–4.8	QBT3	—	—	—	—	—	—	—	—	—	N3B-2021-1343[b]	—	—
RE33-21-222798	33-61120	5.8–6.8	QBT3	—	—	—	—	—	—	—	—	—	N3B-2021-1343[b]	—	—
RE33-21-222799	33-61121	1.8–2.8	QBT3	—	—	—	—	—	—	—	—	—	N3B-2021-1357[b]	—	—
RE33-21-222800	33-61121	3.8–4.8	QBT3	—	—	—	—	—	—	—	—	—	N3B-2021-1357[b]	—	—
RE33-21-222801	33-61121	5.8–6.8	QBT3	—	—	—	—	—	—	—	—	—	N3B-2021-1357[b]	—	—
RE33-21-222802	33-61122	1.8–2.8	FILL	—	—	—	—	—	—	—	—	—	N3B-2021-1357[b]	—	—
RE33-21-222803	33-61122	3.8–4.8	QBT3	—	—	—	—	—	—	—	—	—	N3B-2021-1357[b]	—	—
RE33-21-222804	33-61122	5.8–6.8	QBT3	—	—	—	—	—	—	—	—	—	N3B-2021-1357[b]	—	—
RE33-21-222805	33-61123	1.8–2.8	FILL	—	—	—	—	—	—	—	—	—	N3B-2021-1357[b]	—	—
RE33-21-222806	33-61123	3.8–4.8	QBT3	—	—	—	—	—	—	—	—	—	N3B-2021-1357[b]	—	—
RE33-21-222807	33-61123	5.8–6.8	QBT3	—	—	—	—	—	—	—	—	—	N3B-2021-1357[b]	—	—
RE33-21-222808	33-61124	5.0–6.0	QBT3	N3B-2021-1401	N3B-2021-1401	—	N3B-2021-1401	N3B-2021-1401	N3B-2021-1401	N3B-2021-1401	N3B-2021-1401	N3B-2021-1401	N3B-2021-1401	N3B-2021-1401	N3B-2021-1401
RE33-21-222809	33-61124	9.0–10.0	QBT3	N3B-2021-1401	N3B-2021-1401	—	N3B-2021-1401	N3B-2021-1401	N3B-2021-1401	N3B-2021-1401	N3B-2021-1401	N3B-2021-1401	N3B-2021-1401	N3B-2021-1401	N3B-2021-1401
RE33-21-222810	33-61124	19.0–19.8	QBT3	N3B-2021-1401	N3B-2021-1401	—	N3B-2021-1401	N3B-2021-1401	N3B-2021-1401	N3B-2021-1401	N3B-2021-1401	N3B-2021-1401	N3B-2021-1401	N3B-2021-1401	N3B-2021-1401

Note: Numbers in analyte columns are request numbers.

[a] — = Analysis not requested.

[b] Sample analyzed for PAHs only.

[c] Sample analyzed for mercury only.

Table 6.7-2
Inorganic Chemicals above BVs at SWMU 33-004(a)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Calcium	Chromium	Copper	Cyanide (Total)	Lead	Mercury	Nitrate	Perchlorate	Selenium	Silver	Zinc
Soil Background Value[a]				**0.83**	**295**	**0.4**	**6120**	**19.3**	**14.7**	**0.5**	**22.3**	**0.1**	**na[b]**	**na**	**1.52**	**1**	**48.8**
Qbt 2,3,4 Background Value[a]				**0.5**	**46**	**1.63**	**2220**	**7.14**	**4.66**	**0.5**	**11.2**	**0.1**	**na**	**na**	**0.3**	**1**	**63.5**
Construction Worker SSL[c]				**142**	**4390**	**72.1**	**na**	**134[d]**	**14,200**	**12.1**	**800**	**77.1**	**566,000**	**248**	**1750**	**1770**	**106,000**
Industrial SSL[c]				**519**	**255,000**	**1110**	**na**	**505[d]**	**51,900**	**63.3**	**800**	**389**	**2,080,000**	**908**	**6490**	**6490**	**389,000**
Residential SSL[c]				**31.3**	**15,600**	**70.5**	**na**	**96.6[d]**	**3130**	**11.2**	**400**	**23.5**	**125,000**	**54.8**	**391**	**391**	**23,500**
RE33-20-189907	33-60588	7.1–8.1	QBT3	0.903 (U)	—[e]	—	—	21.8	—	—	—	—	5.34	—	0.675 (J)	—	—
RE33-20-189912	33-60588	10.0–11.0	QBT3	—	—	—	—	29.6	—	—	—	—	3.24	—	2.51	—	—
RE33-20-189908	33-60589	7.4–8.4	FILL	—	—	—	—	—	—	—	—	0.172 (J+)	16.5	—	2.33	—	—
RE33-20-189913	33-60589	10.4–11.3	FILL	—	—	—	—	—	—	—	—	—	14.6	—	2.45	—	—
RE33-20-189909	33-60590	9.5–10.5	QBT3	—	—	—	—	16.1	5.73	—	—	—	103	—	0.749 (J)	—	—
RE33-20-189914	33-60590	12.5–13.5	QBT3	—	—	—	—	24.6	—	—	—	—	23.3	—	0.848 (J)	—	—
RE33-20-189910	33-60591	7.4–7.9	FILL	—	—	—	—	—	—	—	—	—	4.26	—	—	—	55.8
RE33-20-189915	33-60591	10.4–11.4	QBT3	—	—	—	—	25	—	—	—	—	1.92	—	0.79 (J)	—	—
RE33-20-189911	33-60592	9.2–10.2	QBT3	—	—	—	—	23.7	—	—	—	—	9.38	—	0.998 (J)	—	—
RE33-20-189916	33-60592	12.2–13.2	QBT3	0.501 (U)	—	—	—	48.4	—	—	—	—	5.72	—	0.942 (J)	—	—
RE33-20-189957	33-60593	9.0–10	QBT3	—	—	—	—	—	—	—	—	—	1.86	0.000577 (J)	1.35	—	—
RE33-20-189958	33-60593	19.0–20.0	QBT2	—	—	—	—	—	—	—	—	—	1.52	0.00075 (J)	0.567 (J)	—	—
RE33-20-189959	33-60593	29.0–30.0	QBT2	—	—	—	—	—	—	—	—	—	1.41	—	1.14	—	—
RE33-20-189960	33-60593	39.0–40.0	QBT2	—	—	—	—	—	—	—	—	—	1.66	0.000759 (J)	0.969	—	—
RE33-20-189961	33-60593	52.0–53.0	QBT2	—	—	7.99	—	—	—	—	—	—	2	—	1.1	—	—
RE33-20-189962	33-60593	60.0–61.0	QBT2	—	—	—	—	—	—	—	—	—	2.51	—	1.14	—	—
RE33-20-189963	33-60593	74.5–75.5	QBT2	—	—	—	—	—	—	—	—	—	1.93	—	1.09	—	—
RE33-20-189964	33-60594	9.0–10.0	QBT3	—	—	—	—	—	—	—	—	—	—	0.00106 (J)	0.915 (J)	—	—
RE33-20-189965	33-60594	19.0–20.0	QBT2	—	—	—	—	—	—	—	—	—	0.587 (J)	0.000931 (J)	0.72 (J)	—	—
RE33-20-189966	33-60594	29.0–30.0	QBT2	—	—	—	—	—	—	—	—	—	—	0.000694 (J)	0.898 (J)	—	—
RE33-20-189967	33-60594	39.0–40.0	QBT2	—	—	—	—	—	—	—	—	—	—	—	0.915 (J)	—	—
RE33-20-189968	33-60594	52.5–53.5	QBT2	—	—	—	—	—	—	—	—	—	—	—	0.971	—	—
RE33-20-189969	33-60594	59.0–60.0	QBT2	—	—	—	—	—	—	—	—	—	—	—	0.98 (J)	—	—
RE33-20-189970	33-60594	69.0–70.0	QBT2	—	—	—	—	—	—	—	—	—	0.67 (J)	—	0.967 (J)	—	—
RE33-20-189971	33-60595	2.1–2.9	FILL	—	—	—	—	—	25.9	—	73.1	0.261	22.2	—	—	1.5	74.5
RE33-20-189979	33-60595	4.1–5.1	QBT3	—	55.6	—	—	24.7	4.87	—	—	—	7.85	—	0.898 (J)	—	—

Table 6.7-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Calcium	Chromium	Copper	Cyanide (Total)	Lead	Mercury	Nitrate	Perchlorate	Selenium	Silver	Zinc
Soil Background Value[a]				**0.83**	**295**	**0.4**	**6120**	**19.3**	**14.7**	**0.5**	**22.3**	**0.1**	**na[b]**	**na**	**1.52**	**1**	**48.8**
Qbt 2,3,4 Background Value[a]				**0.5**	**46**	**1.63**	**2220**	**7.14**	**4.66**	**0.5**	**11.2**	**0.1**	**na**	**na**	**0.3**	**1**	**63.5**
Construction Worker SSL[c]				**142**	**4390**	**72.1**	**na**	**134[d]**	**14,200**	**12.1**	**800**	**77.1**	**566,000**	**248**	**1750**	**1770**	**106,000**
Industrial SSL[c]				**519**	**255,000**	**1110**	**na**	**505[d]**	**51,900**	**63.3**	**800**	**389**	**2,080,000**	**908**	**6490**	**6490**	**389,000**
Residential SSL[c]				**31.3**	**15,600**	**70.5**	**na**	**96.6[d]**	**3130**	**11.2**	**400**	**23.5**	**125,000**	**54.8**	**391**	**391**	**23,500**
RE33-20-189987	33-60595	6.1–7.1	QBT3	—	—	—	—	18.7	—	—	—	—	5.82	—	0.898 (J)	—	—
RE33-20-189980	33-60596	3.6–4.6	QBT3	—	—	—	—	29.4	—	—	—	—	3.11	—	1.13	—	—
RE33-20-189988	33-60596	5.6–6.6	QBT3	—	—	—	—	11.8	—	—	—	—	3.81	—	1.44	—	—
RE33-20-189981	33-60597	3.7–4.7	QBT3	—	—	—	—	64.1	—	—	—	—	3.69	—	1.06	—	—
RE33-20-189989	33-60597	5.7–6.7	QBT3	—	—	—	—	24.5	6.19	—	11.4 (J+)	—	3.37	—	1.02	—	—
RE33-20-189974	33-60598	1.9–2.9	FILL	—	—	—	—	—	—	—	—	0.132 (J-)	9.56	—	—	—	54.9
RE33-20-189982	33-60598	3.9–4.9	QBT3	—	—	—	—	35	—	—	—	—	4.37	—	1.01 (J)	—	—
RE33-20-189990	33-60598	5.9–6.9	QBT3	—	—	—	—	53.9	—	—	—	—	3.86	—	1.08	—	—
RE33-20-189975	33-60599	1.5–2.3	FILL	—	—	—	—	—	15	—	28.2 (J+)	0.183 (J-)	12.6	—	—	—	52.9
RE33-20-189983	33-60599	3.5–4.5	QBT3	—	—	—	—	14.6	—	—	—	—	4.02	—	1.04	—	—
RE33-20-189991	33-60599	5.5–6.5	QBT3	—	—	—	—	11.1	—	—	—	—	2.86	—	1.35	—	—
RE33-20-189976	33-60600	2.2–3.2	FILL	—	—	—	—	—	—	—	—	—	32.5	—	—	—	—
RE33-20-189984	33-60600	4.2–5.2	QBT3	—	—	—	—	21	—	—	—	—	1.5	—	0.777 (J)	—	—
RE33-20-189992	33-60600	6.2–7.2	QBT3	—	—	—	—	32.6	—	—	—	—	1.46	—	0.716 (J)	—	—
RE33-20-189985	33-60601	3.8–4.8	QBT3	—	—	—	—	25.4	—	—	—	—	33.2	—	1.06	—	—
RE33-20-189993	33-60601	5.8–6.8	QBT3	—	—	—	—	25	—	0.532	—	—	8.87	—	1.34	—	—
RE33-20-189978	33-60602	1.9–2.8	FILL	—	—	0.487 (J)	—	—	32.8	—	44.7 (J+)	0.31 (J-)	35	—	—	—	50.2
RE33-20-189986	33-60602	3.9–4.9	QBT3	—	—	—	—	17	—	—	—	—	17.8	—	0.933 (J)	—	—
RE33-20-189994	33-60602	5.9–6.9	QBT3	—	—	—	—	22.6	—	—	—	—	3.71	—	1.2	—	—
RE33-21-217780	33-60961	2.1–2.7	FILL	—	—	0.431 (J)	—	—	34.8	—	95.9	1.32	30.3	0.000538 (J)	—	2.99	—
RE33-21-217781	33-60961	4.1–5.1	QBT3	—	—	—	—	—	—	—	—	—	1.6	—	1.01	—	—
RE33-21-217782	33-60961	6.1–7.1	QBT3	0.655 (J)	—	—	—	—	—	—	—	—	5.11	—	1.1	—	—
RE33-21-217783	33-60962	1.9–2.7	QBT3	—	—	—	—	—	8.07	—	13 (J+)	0.153 (J)	5.55	—	1.23	—	—
RE33-21-217784	33-60962	3.7–4.7	QBT3	—	—	—	—	—	—	—	—	—	16.8	—	1.31	—	—
RE33-21-217785	33-60962	5.7–6.7	QBT3	—	—	—	—	—	—	—	—	—	13.1	—	1.29	—	—
RE33-21-217786	33-60963	1.6–2.6	ALLH	—	—	1.19	—	—	47.1	—	56.8	0.197	47.6	—	—	—	85.3
RE33-21-217787	33-60963	3.6–4.6	QBT3	—	—	—	—	—	—	—	—	—	19.8	—	1.21	—	—
RE33-21-217788	33-60963	5.6–6.6	QBT3	—	—	—	—	—	—	—	—	—	10.5	—	1.14	—	—

Table 6.7-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Calcium	Chromium	Copper	Cyanide (Total)	Lead	Mercury	Nitrate	Perchlorate	Selenium	Silver	Zinc
Soil Background Value[a]				**0.83**	**295**	**0.4**	**6120**	**19.3**	**14.7**	**0.5**	**22.3**	**0.1**	**na[b]**	**na**	**1.52**	**1**	**48.8**
Qbt 2,3,4 Background Value[a]				**0.5**	**46**	**1.63**	**2220**	**7.14**	**4.66**	**0.5**	**11.2**	**0.1**	**na**	**na**	**0.3**	**1**	**63.5**
Construction Worker SSL[c]				**142**	**4390**	**72.1**	**na**	**134[d]**	**14,200**	**12.1**	**800**	**77.1**	**566,000**	**248**	**1750**	**1770**	**106,000**
Industrial SSL[c]				**519**	**255,000**	**1110**	**na**	**505[d]**	**51,900**	**63.3**	**800**	**389**	**2,080,000**	**908**	**6490**	**6490**	**389,000**
Residential SSL[c]				**31.3**	**15,600**	**70.5**	**na**	**96.6[d]**	**3130**	**11.2**	**400**	**23.5**	**125,000**	**54.8**	**391**	**391**	**23,500**
RE33-21-217789	33-60964	1.6–2.6	FILL	—	—	1.74	—	36.4	101	—	155	1.34	15.2	—	—	3.35	85.4
RE33-21-217790	33-60964	3.6–4.6	QBT3	—	—	—	—	—	—	—	—	—	3.95	—	1.09	—	—
RE33-21-217791	33-60964	5.6–6.6	QBT3	—	—	—	—	—	—	—	—	—	4.34	—	1.28	—	—
RE33-21-217798	33-60967	1.6–2.25	QBT3	NA[f]	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-217799	33-60967	3.6–4.6	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-217800	33-60967	5.6–6.6	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-217801	33-60968	1.6–2.3	FILL	NA	NA	NA	NA	NA	NA	NA	NA	0.412	NA	NA	NA	NA	NA
RE33-21-217802	33-60968	3.6–4.6	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-217803	33-60968	5.6–6.6	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-217804	33-60969	1.6–2.25	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-217805	33-60969	3.6–4.6	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-217806	33-60969	5.6–6.6	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-217807	33-60970	1.6–2.25	FILL	NA	NA	NA	NA	NA	NA	NA	NA	0.303	NA	NA	NA	NA	NA
RE33-21-217808	33-60970	3.6–4.6	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-217809	33-60970	5.6–6.6	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-217810	33-60971	1.7–2.4	FILL	NA	NA	NA	NA	NA	NA	NA	NA	0.54 (J+)	NA	NA	NA	NA	NA
RE33-21-217811	33-60971	3.7–4.7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-217812	33-60971	5.7–6.7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-217813	33-60972	1.7–2.4	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-217814	33-60972	3.7–4.7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-217815	33-60972	5.7–6.7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-217816	33-60973	1.7–2.4	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-217817	33-60973	3.7–4.7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-217818	33-60973	5.7–6.7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-217819	33-60974	1.7–2.4	FILL	NA	NA	NA	NA	NA	NA	NA	NA	0.232 (J+)	NA	NA	NA	NA	NA
RE33-21-217820	33-60974	3.7–4.7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-217821	33-60974	5.7–6.7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-222772	33-61112	1.6–2.25	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA

Table 6.7-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Calcium	Chromium	Copper	Cyanide (Total)	Lead	Mercury	Nitrate	Perchlorate	Selenium	Silver	Zinc
Soil Background Value[a]				**0.83**	**295**	**0.4**	**6120**	**19.3**	**14.7**	**0.5**	**22.3**	**0.1**	**na[b]**	**na**	**1.52**	**1**	**48.8**
Qbt 2,3,4 Background Value[a]				**0.5**	**46**	**1.63**	**2220**	**7.14**	**4.66**	**0.5**	**11.2**	**0.1**	**na**	**na**	**0.3**	**1**	**63.5**
Construction Worker SSL[c]				**142**	**4390**	**72.1**	**na**	**134[d]**	**14,200**	**12.1**	**800**	**77.1**	**566,000**	**248**	**1750**	**1770**	**106,000**
Industrial SSL[c]				**519**	**255,000**	**1110**	**na**	**505[d]**	**51,900**	**63.3**	**800**	**389**	**2,080,000**	**908**	**6490**	**6490**	**389,000**
Residential SSL[c]				**31.3**	**15,600**	**70.5**	**na**	**96.6[d]**	**3130**	**11.2**	**400**	**23.5**	**125,000**	**54.8**	**391**	**391**	**23,500**
RE33-21-222773	33-61112	3.6–4.6	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-222774	33-61112	5.6–6.6	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-222775	33-61113	1.6–2.25	FILL	NA	NA	NA	NA	NA	NA	NA	NA	0.573	NA	NA	NA	NA	NA
RE33-21-222776	33-61113	3.6–4.6	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-222777	33-61113	5.6–6.6	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-222778	33-61114	1.6–2.25	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-222779	33-61114	3.6–4.6	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-222780	33-61114	5.6–6.6	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-222781	33-61115	1.6–2.25	FILL	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-222782	33-61115	3.6–4.6	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-222783	33-61115	5.6–6.6	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-222784	33-61116	1.7–2.4	FILL	NA	NA	NA	NA	NA	NA	NA	NA	1.11 (J+)	NA	NA	NA	NA	NA
RE33-21-222785	33-61116	3.7–4.7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	0.13 (J+)	NA	NA	NA	NA	NA
RE33-21-222786	33-61116	5.7–6.7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-222787	33-61117	1.7–2.4	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-222788	33-61117	3.7–4.7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-222789	33-61117	5.7–6.7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-222790	33-61118	1.7–2.4	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-222791	33-61118	3.7–4.7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-222792	33-61118	5.7–6.7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-222793	33-61119	1.7–2.4	FILL	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-222794	33-61119	3.7–4.7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA
RE33-21-222795	33-61119	5.7–6.7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA

Table 6.7-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Calcium	Chromium	Copper	Cyanide (Total)	Lead	Mercury	Nitrate	Perchlorate	Selenium	Silver	Zinc
Soil Background Value[a]				**0.83**	**295**	**0.4**	**6120**	**19.3**	**14.7**	**0.5**	**22.3**	**0.1**	**na[b]**	**na**	**1.52**	**1**	**48.8**
Qbt 2,3,4 Background Value[a]				**0.5**	**46**	**1.63**	**2220**	**7.14**	**4.66**	**0.5**	**11.2**	**0.1**	**na**	**na**	**0.3**	**1**	**63.5**
Construction Worker SSL[c]				**142**	**4390**	**72.1**	**na**	**134[d]**	**14,200**	**12.1**	**800**	**77.1**	**566,000**	**248**	**1750**	**1770**	**106,000**
Industrial SSL[c]				**519**	**255,000**	**1110**	**na**	**505[d]**	**51,900**	**63.3**	**800**	**389**	**2,080,000**	**908**	**6490**	**6490**	**389,000**
Residential SSL[c]				**31.3**	**15,600**	**70.5**	**na**	**96.6[d]**	**3130**	**11.2**	**400**	**23.5**	**125,000**	**54.8**	**391**	**391**	**23,500**
RE33-21-222808	33-61124	5.0–6.0	QBT3	—	—	—	2300 (J)	—	—	—	—	—	1.7	—	1.77	—	—
RE33-21-222809	33-61124	9.0–10.0	QBT3	—	—	—	2360 (J)	—	—	—	—	—	1.43	0.00111 (J)	1.6	—	—
RE33-21-222810	33-61124	19.0–19.8	QBT3	—	—	—	—	—	—	—	—	—	1.3	0.000922 (J)	1.53	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2019, 700550) unless otherwise noted.

[d] SSL for total chromium.

[e] — = Not detected or not detected above BV.

[f] NA = Not analyzed.

Table 6.7-3
Organic Chemicals Detected at SWMU 33-004(a)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acenaphthylene	Acetone	Acrylonitrile	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
Construction Worker SSL[a]				**15,100**	**7530[b]**	**242,000**	**35.2**	**75,300**	**4.91**	**85.3**	**240**	**15.0**	**240**	**7530**	**2310**	**5380**
Industrial SSL[a]				**50,500**	**25,300[b]**	**960,000**	**24.6**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300**	**323**	**1830**
Residential SSL[a]				**3480**	**1740[b]**	**66,300**	**4.93**	**17,400**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740**	**15.3**	**380**
RE33-20-189907	33-60588	7.1–8.1	QBT3	—[c]	—	—	—	—	—	—	0.0125 (J)	—	—	—	—	—
RE33-20-189908	33-60589	7.4–8.4	FILL	—	—	—	—	—	NA[d]	NA	0.0374 (J)	0.0404 (J)	0.0523	0.0242 (J)	—	0.136
RE33-20-189913	33-60589	10.4–11.3	FILL	—	—	—	—	—	0.0595	0.0326	—	0.0156 (J)	0.0219 (J)	0.0153 (J)	—	0.0606
RE33-20-189909	33-60590	9.5–10.5	QBT3	—	—	0.0207	—	—	NA	NA	0.023 (J)	0.0183 (J)	0.0233 (J)	0.0129 (J)	—	—
RE33-20-189914	33-60590	12.5–13.5	QBT3	—	—	—	—	—	NA	NA	0.0249 (J)	0.0231 (J)	0.0264 (J)	—	—	—
RE33-21-222765	33-60590	15.0–16.0	QBT3	—	—	NA	NA	—	NA	NA	0.032 (J)	0.032 (J)	0.0392	0.0285 (J+)	—	NA
RE33-20-189910	33-60591	7.4–7.9	FILL	—	—	—	—	—	NA	NA	0.0749 (J)	—	0.0749 (J)	—	—	—
RE33-20-189915	33-60591	10.4–11.4	QBT3	—	—	0.0274	—	—	NA	NA	—	—	—	—	—	—
RE33-20-189911	33-60592	9.2–10.2	QBT3	—	—	0.00213 (J)	—	—	NA	NA	0.0247 (J)	0.023 (J)	0.023 (J)	0.0178 (J)	—	—
RE33-20-189916	33-60592	12.2–13.2	QBT3	—	—	—	—	—	NA	NA	0.0203 (J)	0.0199 (J)	0.0256 (J)	—	—	—
RE33-21-222766	33-60592	15.0–16.0	QBT3	0.0119 (J)	—	NA	NA	0.0204	NA	NA	0.0543	0.0628	0.0662	0.0509	0.0271	NA
RE33-20-189957	33-60593	9.0–10	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.0259 (J)
RE33-20-189958	33-60593	19.0–20.0	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	0.0883
RE33-20-189960	33-60593	39.0–40.0	QBT2	—	—	—	—	—	NA	NA	—	—	—	—	—	0.165
RE33-20-189961	33-60593	52.0–53.0	QBT2	—	—	—	—	—	NA	NA	—	—	—	—	—	0.0537
RE33-20-189962	33-60593	60.0–61.0	QBT2	—	—	—	—	—	NA	NA	—	—	—	—	—	0.0418
RE33-20-189963	33-60593	74.5–75.5	QBT2	—	—	—	—	—	NA	NA	—	—	—	—	—	0.11
RE33-20-189964	33-60594	9.0–10.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.0246 (J)
RE33-20-189965	33-60594	19.0–20.0	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	0.0213 (J)
RE33-20-189966	33-60594	29.0–30.0	QBT2	—	—	—	—	—	NA	NA	—	—	—	—	—	0.0586
RE33-20-189967	33-60594	39.0–40.0	QBT2	—	—	—	—	—	NA	NA	—	—	—	—	—	0.0116 (J)
RE33-20-189968	33-60594	52.5–53.5	QBT2	—	—	—	—	—	NA	NA	—	—	—	—	—	0.0396
RE33-20-189969	33-60594	59.0–60.0	QBT2	—	—	—	—	—	NA	NA	—	—	—	—	—	0.0205 (J)
RE33-20-189970	33-60594	69.0–70.0	QBT2	—	—	—	—	—	NA	NA	—	—	—	—	—	0.0389

Table 6.7-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acenaphthylene	Acetone	Acrylonitrile	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
Construction Worker SSL[a]				**15,100**	**7530[b]**	**242,000**	**35.2**	**75,300**	**4.91**	**85.3**	**240**	**15.0**	**240**	**7530**	**2310**	**5380**
Industrial SSL[a]				**50,500**	**25,300[b]**	**960,000**	**24.6**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300**	**323**	**1830**
Residential SSL[a]				**3480**	**1740[b]**	**66,300**	**4.93**	**17,400**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740**	**15.3**	**380**
RE33-20-189971	33-60595	2.1–2.9	FILL	—	—	—	—	0.071 (J)	4.96	1.8	0.666	0.597	0.856	0.345	0.318	0.561
RE33-20-189979	33-60595	4.1–5.1	QBT3	—	—	—	—	—	NA	NA	—	—	—	—	—	0.0113 (J)
RE33-21-222767	33-60595	4.1–5.1	QBT3	NA	NA	NA	NA	NA	0.375	0.158 (J-)	NA	NA	NA	NA	NA	NA
RE33-20-189987	33-60595	6.1–7.1	QBT3	—	—	—	—	—	NA	NA	0.0418	0.0404	0.0537	0.0211 (J)	0.0176 (J)	0.072
RE33-21-222768	33-60595	6.1–7.1	QBT3	NA	NA	NA	NA	NA	3.08	1.19 (J-)	NA	NA	NA	NA	NA	NA
RE33-20-189988	33-60596	5.6–6.6	QBT3	—	—	—	—	—	0.00533	0.00234 (J)	—	—	—	—	—	—
RE33-20-189981	33-60597	3.7–4.7	QBT3	—	—	0.00888	—	—	NA	NA	—	—	—	—	—	—
RE33-21-217778	33-60597	3.7–4.7	QBT3	NA	NA	NA	NA	NA	0.00362	0.00177 (J)	NA	NA	NA	NA	NA	NA
RE33-20-189989	33-60597	5.7–6.7	QBT3	—	—	0.00215 (J)	—	—	NA	NA	0.0293 (J)	0.0363	0.0435	0.0166 (J)	0.0162 (J)	0.0207 (J)
RE33-21-217779	33-60597	5.7–6.7	QBT3	—	NA	NA	NA	NA	—	—	NA	NA	NA	NA	NA	NA
RE33-21-222769	33-60597	9.0–10.0	QBT3	—	—	NA	NA	—	NA	NA	—	—	—	—	—	—
RE33-20-189974	33-60598	1.9–2.9	FILL	—	—	—	—	—	NA	NA	0.461	0.426	0.562	0.211	0.204	—
RE33-20-189982	33-60598	3.9–4.9	QBT3	—	—	—	—	—	NA	NA	0.028 (J+)	0.0211 (J+)	0.0259 (J+)	—	0.0167 (J+)	—
RE33-20-189990	33-60598	5.9–6.9	QBT3	—	—	—	—	—	0.00918	0.00398	0.0145 (J)	—	—	—	—	—
RE33-20-189975	33-60599	1.5–2.3	FILL	—	—	—	—	0.359	1.04	0.394	3.1	2.95	3.96	1.56	1.34	0.162 (J)
RE33-20-189983	33-60599	3.5–4.5	QBT3	—	—	—	—	—	NA	NA	0.0398	0.0312 (J)	0.0367	0.0237 (J)	—	—
RE33-21-222770	33-60599	3.5–4.5	QBT3	NA	NA	NA	NA	NA	0.0204	0.00761	NA	NA	NA	NA	NA	NA
RE33-21-222771	33-60599	5.5–6.5	QBT3	NA	NA	NA	NA	NA	0.00328 (J)	—	NA	NA	NA	NA	NA	NA
RE33-20-189976	33-60600	2.2–3.2	FILL	—	—	—	—	0.371	NA	NA	3.6	3.07	4.17	1.55	1.37	0.12 (J)
RE33-20-189992	33-60600	6.2–7.2	QBT3	—	—	—	—	—	0.00178 (J)	—	—	—	—	—	—	—
RE33-20-189985	33-60601	3.8–4.8	QBT3	—	—	—	—	0.0272 (J)	NA	NA	0.258	0.234	0.334	0.141	0.0898	—
RE33-20-189993	33-60601	5.8–6.8	QBT3	—	—	—	—	—	NA	NA	0.0663	0.0546	0.0755	0.0311 (J)	0.0205 (J)	—
RE33-20-189978	33-60602	1.9–2.8	FILL	—	—	—	—	0.305	NA	NA	3.12	3.05	3.92	1.69	1.44	—
RE33-20-189986	33-60602	3.9–4.9	QBT3	—	—	—	—	—	NA	NA	—	—	—	—	—	—
RE33-21-217780	33-60961	2.1–2.7	FILL	—	—	—	0.00187 (J)	0.414	2.74 (J+)	1.37 (J+)	3.07	3.22	3.96	1.81	1.7	—

Table 6.7-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acenaphthylene	Acetone	Acrylonitrile	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
Construction Worker SSL[a]				**15,100**	**7530[b]**	**242,000**	**35.2**	**75,300**	**4.91**	**85.3**	**240**	**15.0**	**240**	**7530**	**2310**	**5380**
Industrial SSL[a]				**50,500**	**25,300[b]**	**960,000**	**24.6**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300**	**323**	**1830**
Residential SSL[a]				**3480**	**1740[b]**	**66,300**	**4.93**	**17,400**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740**	**15.3**	**380**
RE33-21-217781	33-60961	4.1–5.1	QBT3	—	—	—	—	—	0.0426	0.0183	—	—	—	—	—	—
RE33-21-217782	33-60961	6.1–7.1	QBT3	—	—	—	—	—	0.0103	0.00455	—	—	—	—	—	—
RE33-21-217783	33-60962	1.9–2.7	QBT3	—	—	—	—	0.0113 (J)	0.297 (J)	0.132 (J)	0.11	0.124	0.157	0.0707	0.055	0.0236 (J)
RE33-21-217784	33-60962	3.7–4.7	QBT3	—	—	—	—	—	0.0194 (J)	0.00869 (J)	—	—	—	—	—	—
RE33-21-217785	33-60962	5.7–6.7	QBT3	—	—	—	—	—	0.00729 (J)	0.00375 (J)	0.0166 (J)	—	—	—	—	—
RE33-21-217786	33-60963	1.6–2.6	ALLH	—	—	—	—	0.0821 (J)	1	0.485	0.693	0.693	0.931	0.421	0.322	—
RE33-21-217787	33-60963	3.6–4.6	QBT3	—	—	—	—	—	0.0105	0.00488	—	—	—	—	—	—
RE33-21-217788	33-60963	5.6–6.6	QBT3	—	—	—	—	—	0.00502	0.0027 (J)	—	—	—	—	—	—
RE33-21-217789	33-60964	1.6–2.6	FILL	—	—	—	—	0.136 (J)	3.34	1.61	1.03	1.06	1.38	0.642	0.564	—
RE33-21-217790	33-60964	3.6–4.6	QBT3	—	—	—	—	—	0.0135	0.0065	—	—	—	—	—	—
RE33-21-217791	33-60964	5.6–6.6	QBT3	—	—	—	—	—	0.151	0.0722	0.0298 (J)	0.0295 (J)	0.0291 (J)	—	0.0116 (J)	—
RE33-21-217792	33-60965	2.1–2.9	FILL	NA	NA	NA	NA	NA	1.13 (J+)	0.606 (J+)	NA	NA	NA	NA	NA	NA
RE33-21-217793	33-60965	4.1–5.1	QBT3	NA	NA	NA	NA	NA	0.0515	0.0246	NA	NA	NA	NA	NA	NA
RE33-21-217794	33-60965	6.1–7.1	QBT3	NA	NA	NA	NA	NA	0.0159	0.00747	NA	NA	NA	NA	NA	NA
RE33-21-217795	33-60966	2.1–2.9	FILL	NA	NA	NA	NA	NA	0.0357	0.0343	NA	NA	NA	NA	NA	NA
RE33-21-217796	33-60966	4.2–5.1	QBT3	NA	NA	NA	NA	NA	0.0158	0.0111	NA	NA	NA	NA	NA	NA
RE33-21-217797	33-60966	6.1–7.1	QBT3	NA	NA	NA	NA	NA	0.00494	0.00338 (J)	NA	NA	NA	NA	NA	NA
RE33-21-217810	33-60971	1.7–2.4	FILL	NA	NA	NA	NA	NA	3.12 (J+)	1.61 (J+)	NA	NA	NA	NA	NA	NA
RE33-21-217811	33-60971	3.7–4.7	QBT3	NA	NA	NA	NA	NA	0.0105	0.00558	NA	NA	NA	NA	NA	NA
RE33-21-217812	33-60971	5.7–6.7	QBT3	NA	NA	NA	NA	NA	0.00783	0.00444	NA	NA	NA	NA	NA	NA
RE33-21-217815	33-60972	5.7–6.7	QBT3	NA	NA	NA	NA	NA	0.00348	0.00313 (J)	NA	NA	NA	NA	NA	NA
RE33-21-217816	33-60973	1.7–2.4	QBT3	NA	NA	NA	NA	NA	0.00248 (J)	0.00156 (J)	NA	NA	NA	NA	NA	NA
RE33-21-217817	33-60973	3.7–4.7	QBT3	NA	NA	NA	NA	NA	0.00153 (J)	—	NA	NA	NA	NA	NA	NA
RE33-21-217818	33-60973	5.7–6.7	QBT3	NA	NA	NA	NA	NA	0.00182 (J)	0.00134 (J)	NA	NA	NA	NA	NA	NA
RE33-21-217819	33-60974	1.7–2.4	FILL	NA	NA	NA	NA	NA	2.79 (J+)	1.32 (J+)	NA	NA	NA	NA	NA	NA

Table 6.7-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acenaphthylene	Acetone	Acrylonitrile	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
Construction Worker SSL[a]				**15,100**	**7530[b]**	**242,000**	**35.2**	**75,300**	**4.91**	**85.3**	**240**	**15.0**	**240**	**7530**	**2310**	**5380**
Industrial SSL[a]				**50,500**	**25,300[b]**	**960,000**	**24.6**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300**	**323**	**1830**
Residential SSL[a]				**3480**	**1740[b]**	**66,300**	**4.93**	**17,400**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740**	**15.3**	**380**
RE33-21-217820	33-60974	3.7–4.7	QBT3	NA	NA	NA	NA	NA	0.0425	0.023	NA	NA	NA	NA	NA	NA
RE33-21-217821	33-60974	5.7–6.7	QBT3	NA	NA	NA	NA	NA	0.0048	0.00325 (J)	NA	NA	NA	NA	NA	NA
RE33-21-217822	33-60975	1.7–2.4	QBT3	NA	NA	NA	NA	NA	1.34	0.643	NA	NA	NA	NA	NA	NA
RE33-21-217823	33-60975	3.7–4.7	QBT3	NA	NA	NA	NA	NA	0.0304	0.016	NA	NA	NA	NA	NA	NA
RE33-21-217824	33-60975	5.7–6.7	QBT3	NA	NA	NA	NA	NA	0.00265 (J)	—	NA	NA	NA	NA	NA	NA
RE33-21-217825	33-60976	1.8–2.8	FILL	—	—	NA	NA	—	NA	NA	0.0622 (J)	0.083	0.0968	0.0553 (J)	—	NA
RE33-21-217826	33-60976	3.8–4.8	QBT3	—	—	NA	NA	—	NA	NA	—	—	—	0.00237 (J)	—	NA
RE33-21-217827	33-60976	5.8–6.8	QBT3	—	—	NA	NA	—	NA	NA	—	—	—	0.00176 (J)	—	NA
RE33-21-217828	33-60977	1.8–2.8	FILL	—	—	NA	NA	0.138	NA	NA	1.05	1.03	1.2	0.572	0.448	NA
RE33-21-217831	33-60978	1.8–2.8	FILL	—	—	NA	NA	—	NA	NA	—	—	—	—	—	NA
RE33-21-217833	33-60978	5.8–6.8	QBT3	—	—	NA	NA	—	NA	NA	—	—	—	—	—	NA
RE33-21-217834	33-60979	1.8–2.8	FILL	—	—	NA	NA	0.0557	NA	NA	0.414	0.4	0.473	0.216	0.174	NA
RE33-21-217837	33-60980	2–2.8	QBT3	—	—	NA	NA	—	NA	NA	—	—	—	—	—	NA
RE33-21-217838	33-60980	3.8–4.8	QBT3	—	—	NA	NA	—	NA	NA	—	—	—	—	—	NA
RE33-21-222796	33-61120	1.8–2.8	FILL	—	0.135 (J)	NA	NA	0.488 (J+)	NA	NA	2.38 (J+)	2.07 (J+)	2.7 (J+)	1.27 (J+)	0.893 (J+)	NA
RE33-21-222797	33-61120	3.8–4.8	QBT3	—	0.00205 (J)	NA	NA	0.0065	NA	NA	0.0349	0.0311	0.0407	0.0209 (J+)	0.0157 (J+)	NA
RE33-21-222798	33-61120	5.8–6.8	QBT3	0.0037 (J)	0.00773 (J)	NA	NA	0.0323	NA	NA	0.161	0.148	0.191	0.0972 (J+)	0.0646 (J+)	NA
RE33-21-222799	33-61121	1.8–2.8	QBT3	—	—	NA	NA	—	NA	NA	0.00444	0.00444	0.00547	0.00342	0.00239 (J)	NA
RE33-21-222802	33-61122	1.8–2.8	FILL	—	0.146	NA	NA	0.686 (J)	NA	NA	3.77 (J)	3.37 (J)	4.61 (J)	1.82 (J)	1.47 (J)	NA
RE33-21-222805	33-61123	1.8–2.8	FILL	—	—	NA	NA	0.0278 (J)	NA	NA	0.0905	0.111	0.139	0.101	0.0522	NA
RE33-21-222806	33-61123	3.8–4.8	QBT3	—	—	NA	NA	—	NA	NA	0.00303 (J)	0.00337	0.00405	0.0027 (J)	—	NA

Table 6.7-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Carbazole	Chloronapthalene[2-]	Chrysene	Di-n-butylphthalate	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Hexanone[2-]	Indeno(1,2,3-cd)pyrene	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Styrene	Toluene
Construction Worker SSL[a]				**85[e,f]**	**28,300**	**23,100**	**26,900**	**24**	**10,000**	**10,000**	**340[f]**	**240**	**1000**	**159**	**7530**	**7530**	**10,200**	**14,000**
Industrial SSL[a]				**1200[e,g]**	**104,000**	**3230**	**91,600**	**3.23**	**33,700**	**33,700**	**1300[g]**	**32.3**	**3370**	**241**	**25,300**	**25,300**	**51,300**	**61,300**
Residential SSL[a]				**78[e,g]**	**6260**	**153**	**6160**	**0.153**	**2320**	**2320**	**200[g]**	**1.53**	**232**	**49.7**	**1740**	**1740**	**7260**	**5230**
RE33-20-189907	33-60588	7.1–8.1	QBT3	—	—	—	—	—	0.0189 (J)	—	—	—	—	—	0.0113 (J)	0.0125 (J)	—	—
RE33-20-189908	33-60589	7.4–8.4	FILL	—	—	0.0319 (J)	—	—	0.054	—	—	0.0221 (J)	—	—	0.0204 (J)	0.0438	—	—
RE33-20-189913	33-60589	10.4–11.3	FILL	—	—	—	—	—	0.0176 (J)	—	—	—	—	—	—	0.0203 (J)	—	—
RE33-20-189909	33-60590	9.5–10.5	QBT3	—	—	0.0201 (J)	—	—	0.0251 (J)	—	—	0.0118 (J)	—	—	0.0158 (J)	0.0323 (J)	—	—
RE33-20-189914	33-60590	12.5–13.5	QBT3	—	—	0.0199 (J)	—	—	0.0365	—	—	—	—	—	0.0311 (J)	0.0419	—	—
RE33-21-222765	33-60590	15.0–16.0	QBT3	NA	—	0.032 (J+)	NA	—	0.0569	—	NA	0.0249 (J)	—	—	0.0356	0.0605 (J)	NA	NA
RE33-20-189910	33-60591	7.4–7.9	FILL	—	—	—	—	—	0.0954 (J)	—	—	—	—	—	0.0861 (J)	0.112 (J)	—	—
RE33-20-189915	33-60591	10.4–11.4	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-189911	33-60592	9.2–10.2	QBT3	—	—	0.0185 (J)	—	—	0.0289 (J)	—	—	—	—	—	0.0251 (J)	0.0345 (J)	—	—
RE33-20-189916	33-60592	12.2–13.2	QBT3	—	—	0.0167 (J)	—	—	0.0335 (J)	—	—	—	—	—	0.0242 (J)	0.0313 (J)	—	—
RE33-21-222766	33-60592	15.0–16.0	QBT3	NA	—	0.0526	NA	0.0136 (J)	0.0899	0.0102 (J)	NA	0.056	—	0.00848 (J)	0.0763	0.105	NA	NA
RE33-20-189957	33-60593	9.0–10	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-189958	33-60593	19.0–20.0	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-189960	33-60593	39.0–40.0	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-189961	33-60593	52.0–53.0	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-189962	33-60593	60.0–61.0	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-189963	33-60593	74.5–75.5	QBT2	NA	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-189964	33-60594	9.0–10.0	QBT3	NA	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-189965	33-60594	19.0–20.0	QBT2	NA	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-189966	33-60594	29.0–30.0	QBT2	NA	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-189967	33-60594	39.0–40.0	QBT2	NA	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-189968	33-60594	52.5–53.5	QBT2	NA	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-189969	33-60594	59.0–60.0	QBT2	NA	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-189970	33-60594	69.0–70.0	QBT2	NA	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 6.7-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Carbazole	Chloronapthalene[2-]	Chrysene	Di-n-butylphthalate	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Hexanone[2-]	Indeno(1,2,3-cd)pyrene	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Styrene	Toluene
Construction Worker SSL[a]				**85[e,f]**	**28,300**	**23,100**	**26,900**	**24**	**10,000**	**10,000**	**340[f]**	**240**	**1000**	**159**	**7530**	**7530**	**10,200**	**14,000**
Industrial SSL[a]				**1200[e,g]**	**104,000**	**3230**	**91,600**	**3.23**	**33,700**	**33,700**	**1300[g]**	**32.3**	**3370**	**241**	**25,300**	**25,300**	**51,300**	**61,300**
Residential SSL[a]				**78[e,g]**	**6260**	**153**	**6160**	**0.153**	**2320**	**2320**	**200[g]**	**1.53**	**232**	**49.7**	**1740**	**1740**	**7260**	**5230**
RE33-20-189971	33-60595	2.1–2.9	FILL	—	—	0.68	0.352	0.0924 (J)	1.43	—	—	0.377	—	—	0.291	1.33	—	0.000546 (J)
RE33-20-189979	33-60595	4.1–5.1	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-222767	33-60595	4.1–5.1	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-189987	33-60595	6.1–7.1	QBT3	—	—	0.0442	0.0326 (J)	—	0.0744	—	—	0.0256 (J)	—	—	0.0218 (J)	0.0727	—	—
RE33-21-222768	33-60595	6.1–7.1	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-189988	33-60596	5.6–6.6	QBT3	—	—	—	—	—	—	0.0918 (J)	—	—	—	—	—	—	—	—
RE33-20-189981	33-60597	3.7–4.7	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-217778	33-60597	3.7–4.7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-189989	33-60597	5.7–6.7	QBT3	—	—	0.0331 (J)	0.0162 (J)	—	0.0539	—	—	0.0204 (J)	—	—	0.0276 (J)	0.0532	—	—
RE33-21-222768	33-60597	5.7–6.7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217779	33-60597	5.7–6.7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222769	33-60597	9.0–10.0	QBT3	NA	NA	—	NA	NA	—	NA	NA	—	NA	NA	—	—	NA	NA
RE33-20-189974	33-60598	1.9–2.9	FILL	—	—	0.485	—	—	0.681	—	—	0.264	—	—	0.164 (J)	0.911	—	0.000903 (J)
RE33-20-189982	33-60598	3.9–4.9	QBT3	—	—	0.0211 (J+)	—	—	0.0378 (J+)	—	—	—	—	—	0.0102 (J+)	0.0498 (J+)	—	—
RE33-20-189990	33-60598	5.9–6.9	QBT3	—	—	—	—	—	0.0169 (J)	—	—	—	—	—	—	0.0169 (J)	—	—
RE33-20-189975	33-60599	1.5–2.3	FILL	0.215 (J)	—	2.54	—	0.482	5.35	—	—	1.78	—	—	1.4	7.08	—	0.00094 (J)
RE33-20-189983	33-60599	3.5–4.5	QBT3	—	—	0.0336 (J)	—	—	0.0624	—	—	0.0158 (J)	—	—	0.0161 (J)	0.0789	—	—
RE33-21-222770	33-60599	3.5–4.5	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222771	33-60599	5.5–6.5	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-189976	33-60600	2.2–3.2	FILL	0.202	—	3.35	—	0.484	5.16	0.0709 (J)	—	1.84	—	—	1.28	7.15	—	—
RE33-20-189992	33-60600	6.2–7.2	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-189985	33-60601	3.8–4.8	QBT3	0.0122 (J)	—	0.263	—	0.0444	0.446	—	—	0.146	—	—	0.101	0.5	—	0.000432 (J)
RE33-20-189993	33-60601	5.8–6.8	QBT3	—	—	0.0557	—	—	0.113	—	—	0.0338 (J)	—	—	0.0321 (J)	0.118	—	—
RE33-20-189978	33-60602	1.9–2.8	FILL	0.0937 (J)	—	3.2	0.154 (J)	0.508	4.66	0.085 (J)	—	1.75	—	—	1.12	6.63	—	0.00041 (J)
RE33-20-189986	33-60602	3.9–4.9	QBT3	—	—	—	—	—	0.0126 (J)	—	—	—	—	—	—	0.0153 (J)	—	—
RE33-21-217780	33-60961	2.1–2.7	FILL	—	—	3.25	—	0.601	4.8	0.132 (J)	—	1.94	—	0.000356 (J)	1.19	5.21	0.00194	—

Table 6.7-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Carbazole	Chloronapthalene[2-]	Chrysene	Di-n-butylphthalate	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Hexanone[2-]	Indeno(1,2,3-cd)pyrene	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Styrene	Toluene
Construction Worker SSL[a]				**85[e,f]**	**28,300**	**23,100**	**26,900**	**24**	**10,000**	**10,000**	**340[f]**	**240**	**1000**	**159**	**7530**	**7530**	**10,200**	**14,000**
Industrial SSL[a]				**1200[e,g]**	**104,000**	**3230**	**91,600**	**3.23**	**33,700**	**33,700**	**1300[g]**	**32.3**	**3370**	**241**	**25,300**	**25,300**	**51,300**	**61,300**
Residential SSL[a]				**78[e,g]**	**6260**	**153**	**6160**	**0.153**	**2320**	**2320**	**200[g]**	**1.53**	**232**	**49.7**	**1740**	**1740**	**7260**	**5230**
RE33-21-217781	33-60961	4.1–5.1	QBT3	—	—	—	—	—	0.0117 (J)	—	—	—	—	—	—	—	—	—
RE33-21-217782	33-60961	6.1–7.1	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-217783	33-60962	1.9–2.7	QBT3	—	—	0.11	0.0195 (J)	—	0.216 (J)	—	—	0.0768	—	—	0.0502	0.192	—	—
RE33-21-217784	33-60962	3.7–4.7	QBT3	—	—	—	—	—	0.0122 (J)	—	—	—	—	—	—	0.0115 (J)	—	—
RE33-21-217785	33-60962	5.7–6.7	QBT3	—	—	0.0145 (J)	—	—	0.0274 (J)	—	—	—	—	—	—	0.027 (J)	—	—
RE33-21-217786	33-60963	1.6–2.6	ALLH	—	—	0.748	—	0.132 (J)	1.12	—	—	0.419	—	—	0.299	1.14	—	—
RE33-21-217787	33-60963	3.6–4.6	QBT3	—	—	—	—	—	—	—	0.0545	—	—	—	—	—	—	—
RE33-21-217788	33-60963	5.6–6.6	QBT3	—	—	—	—	—	—	—	0.0092	—	—	—	—	—	—	—
RE33-21-217789	33-60964	1.6–2.6	FILL	0.0475 (J)	—	1.18	—	0.173	1.37	0.0461 (J)	—	0.649	—	—	0.433	1.33	—	—
RE33-21-217790	33-60964	3.6–4.6	QBT3	—	—	—	—	—	—	—	0.0261	—	—	—	—	—	—	—
RE33-21-217791	33-60964	5.6–6.6	QBT3	—	—	0.0325 (J)	—	—	0.0411	—	—	—	—	—	0.0116 (J)	0.0421	—	—
RE33-21-217792	33-60965	2.1–2.9	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217793	33-60965	4.1–5.1	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217794	33-60965	6.1–7.1	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217795	33-60966	2.1–2.9	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217796	33-60966	4.2–5.1	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217797	33-60966	6.1–7.1	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217810	33-60971	1.7–2.4	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217811	33-60971	3.7–4.7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217812	33-60971	5.7–6.7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217815	33-60972	5.7–6.7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217816	33-60973	1.7–2.4	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217817	33-60973	3.7–4.7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217818	33-60973	5.7–6.7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217819	33-60974	1.7–2.4	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 6.7-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Carbazole	Chloronapthalene[2-]	Chrysene	Di-n-butylphthalate	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Hexanone[2-]	Indeno(1,2,3-cd)pyrene	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Styrene	Toluene
Construction Worker SSL[a]				**85[e,f]**	**28,300**	**23,100**	**26,900**	**24**	**10,000**	**10,000**	**340[f]**	**240**	**1000**	**159**	**7530**	**7530**	**10,200**	**14,000**
Industrial SSL[a]				**1200[e,g]**	**104,000**	**3230**	**91,600**	**3.23**	**33,700**	**33,700**	**1300[g]**	**32.3**	**3370**	**241**	**25,300**	**25,300**	**51,300**	**61,300**
Residential SSL[a]				**78[e,g]**	**6260**	**153**	**6160**	**0.153**	**2320**	**2320**	**200[g]**	**1.53**	**232**	**49.7**	**1740**	**1740**	**7260**	**5230**
RE33-21-217820	33-60974	3.7–4.7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217821	33-60974	5.7–6.7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217822	33-60975	1.7–2.4	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217823	33-60975	3.7–4.7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217824	33-60975	5.7–6.7	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217825	33-60976	1.8–2.8	FILL	NA	—	0.0761	NA	—	0.138	—	NA	0.0692	—	—	0.0899	0.118	NA	NA
RE33-21-217826	33-60976	3.8–4.8	QBT3	NA	0.00339	—	NA	0.00169 (J)	—	—	NA	0.00237 (J)	—	—	0.00237 (J)	—	NA	NA
RE33-21-217827	33-60976	5.8–6.8	QBT3	NA	—	—	NA	—	—	—	NA	0.00212 (J)	—	—	0.00282 (J)	—	NA	NA
RE33-21-217828	33-60977	1.8–2.8	FILL	NA	—	1.05	NA	0.207	2.21	—	NA	0.744	—	—	0.496	1.72	NA	NA
RE33-21-217831	33-60978	1.8–2.8	FILL	NA	—	—	NA	—	—	—	NA	—	—	—	0.00211 (J)	—	NA	NA
RE33-21-217833	33-60978	5.8–6.8	QBT3	NA	—	—	NA	—	—	—	NA	—	—	—	0.00272 (J)	—	NA	NA
RE33-21-217834	33-60979	1.8–2.8	FILL	NA	—	0.393	NA	0.0766	0.933	—	NA	0.271	—	—	0.198	0.71	NA	NA
RE33-21-217837	33-60980	2–2.8	QBT3	NA	—	—	NA	—	—	—	NA	—	—	—	0.00171 (J)	—	NA	NA
RE33-21-217838	33-60980	3.8–4.8	QBT3	NA	—	—	NA	—	—	—	NA	—	—	—	0.00243 (J)	—	NA	NA
RE33-21-222796	33-61120	1.8–2.8	FILL	NA	—	2.22 (J+)	NA	0.375 (J+)	5.08 (J+)	0.0826 (J+)	NA	1.56 (J+)	—	0.0375 (J+)	1.3 (J+)	3.96 (J)	NA	NA
RE33-21-222797	33-61120	3.8–4.8	QBT3	NA	—	0.0342 (J+)	NA	0.00718	0.0646	0.00239 (J)	NA	0.0253	—	—	0.0209	0.0629 (J)	NA	NA
RE33-21-222798	33-61120	5.8–6.8	QBT3	NA	—	0.154 (J+)	NA	0.0286	0.33	0.00706	NA	0.118	0.00437 (J)	0.0249 (J)	0.0945	0.281 (J)	NA	NA
RE33-21-222799	33-61121	1.8–2.8	QBT3	NA	—	0.00479	NA	—	0.00923	—	NA	0.00376	—	—	0.00718	0.0103	NA	NA
RE33-21-222802	33-61122	1.8–2.8	FILL	NA	—	3.58 (J)	NA	0.555 (J)	7.89 (J)	0.131	NA	2.26 (J)	—	—	2.09 (J)	7.4 (J)	NA	NA
RE33-21-222805	33-61123	1.8–2.8	FILL	NA	—	0.104	NA	0.0209 (J)	0.181	—	NA	0.108	—	—	0.146	0.223	NA	NA
RE33-21-222806	33-61123	3.8–4.8	QBT3	NA	—	0.00337	NA	—	0.00573	—	NA	0.00303 (J)	—	—	0.00472	0.00641	NA	NA

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] SSLs from NMED (2019, 700550) unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] — = Not detected.

[d] NA= Not analyzed.

[e] Dibenzofuran used as a surrogate based on structural similarity.

[f] Construction worker SSLs calculated using the equations outlined in NMED (2019, 700550), incorporating toxicity and chemical-specific parameters from EPA regional screening level (RSL) tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

[g] SSL from EPA RSL tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

Table 6.7-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 33-004(a)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Tritium	Uranium-235/236	Uranium-238
Soil Background Value[a]				**1.65**	**na[b]**	**0.2**	**2.29**
Construction Worker SAL[c]				**37**	**1,600,000**	**130**	**470**
Industrial SAL[c]				**41**	**2,400,000**	**160**	**710**
Residential SAL[c]				**12**	**1700**	**42**	**150**
RE33-20-189909	33-60590	9.5–10.5	QBT3	—[d]	—	0.107 (J)	—
RE33-20-189911	33-60592	9.2–10.2	QBT3	—	—	0.138	—
RE33-20-189916	33-60592	12.2–13.2	QBT3	—	—	0.099	—
RE33-20-189962	33-60593	60.0–61.0	QBT2	—	—	0.128	—
RE33-20-189963	33-60593	74.5–75.5	QBT2	—	—	0.119	—
RE33-20-189966	33-60594	29.0–30.0	QBT2	—	—	0.0925	—
RE33-20-189971	33-60595	2.1-2.9	FILL	0.123	—	—	—
RE33-20-189987	33-60595	6.1–7.1	QBT3	—	—	0.112	—
RE33-20-189975	33-60599	1.5-2.3	FILL	0.146	—	—	—
RE33-21-217780	33-60961	2.1-2.7	FILL	—	—	—	2.41
RE33-21-217784	33-60962	3.7-4.7	QBT3	—	—	0.108	—
RE33-21-217789	33-60964	1.6-2.6	FILL	—	10.2 (J)	—	2.32

Note: Results are in pCi/g.
[a] BVs from LANL (1998, 059730).
[b] na = Not available.
[c] SALs from LANL (2015, 600929).
[d] — = Not detected or not detected above BV/FV.

Table 6.8-1
Samples Collected and Analyses Requested at SWMU 33-004(i)

Sample ID	Location ID	Depth (ft)	Media	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOCs	SVOCs	Cyanide	Inorganic Anions
RE33-20-190004	33-01055	0.0–1.0	FILL	N3B-2020-965	N3B-2020-965	N3B-2020-965	N3B-2020-965	N3B-2020-965	N3B-2020-965	N3B-2020-965	N3B-2020-965
RE33-20-190014	33-01055	2.0–3.0	FILL	N3B-2020-965	N3B-2020-965	N3B-2020-965	—*	N3B-2020-965	N3B-2020-965	N3B-2020-965	N3B-2020-965
RE33-21-217964	33-01055	2.0–3.0	FILL	—	—	—	N3B-2021-839	—	—	—	—
RE33-20-190024	33-01055	4.0–5.0	FILL	N3B-2020-965	N3B-2020-965	N3B-2020-965	—	N3B-2020-965	N3B-2020-965	N3B-2020-965	N3B-2020-965
RE33-21-217965	33-01055	4.0–5.0	FILL	—	—	—	N3B-2021-839	—	—	—	—
RE33-20-190005	33-01056	0.0–1.0	FILL	N3B-2020-965	N3B-2020-965	N3B-2020-965	—	N3B-2020-965	N3B-2020-965	N3B-2020-965	N3B-2020-965
RE33-20-190015	33-01056	2.0–3.0	FILL	N3B-2020-965	N3B-2020-965	N3B-2020-965	—	N3B-2020-965	N3B-2020-965	N3B-2020-965	N3B-2020-965
RE33-20-190006	33-01057	0.0–1.0	ALLH	N3B-2020-965	N3B-2020-965	N3B-2020-965	N3B-2020-965	N3B-2020-965	N3B-2020-965	N3B-2020-965	N3B-2020-965
RE33-21-217966	33-01057	2.0–2.5	ALLH	—	—	—	N3B-2021-839	—	—	—	—
RE33-20-190016	33-01057	2.3–3.0	QBT3	N3B-2020-965	N3B-2020-965	N3B-2020-965	—	N3B-2020-965	N3B-2020-965	N3B-2020-965	N3B-2020-965
RE33-20-190026	33-01057	4.0–5.0	QBT3	N3B-2020-965	N3B-2020-965	N3B-2020-965	—	N3B-2020-965	N3B-2020-965	N3B-2020-965	N3B-2020-965
RE33-21-217967	33-01057	4.0–5.0	QBT3	—	—	—	N3B-2021-839	—	—	—	—
RE33-21-217970	33-01058	6.0–7.0	FILL	—	—	—	N3B-2021-848	—	—	—	—
RE33-21-217971	33-01058	8.0–9.0	FILL	—	—	—	N3B-2021-848	—	—	—	—
RE33-20-190008	33-01059	0.0–1.0	FILL	N3B-2020-966	N3B-2020-966	N3B-2020-966	N3B-2020-966	N3B-2020-966	N3B-2020-966	N3B-2020-966	N3B-2020-966
RE33-20-190018	33-01059	2.0–3.0	FILL	N3B-2020-969	N3B-2020-969	N3B-2020-969	—	N3B-2020-969	N3B-2020-969	N3B-2020-969	N3B-2020-969
RE33-21-217972	33-01059	2.0–3.0	FILL	—	—	—	N3B-2021-839	—	—	—	—
RE33-20-190028	33-01059	4.0–5.0	FILL	N3B-2020-966	N3B-2020-966	N3B-2020-966	—	N3B-2020-966	N3B-2020-966	N3B-2020-966	N3B-2020-966
RE33-21-217973	33-01059	4.0–5.0	FILL	—	—	—	N3B-2021-839	—	—	—	—
RE33-20-190009	33-01060	0.0–1.0	FILL	N3B-2020-969	N3B-2020-969	N3B-2020-969	—	N3B-2020-969	N3B-2020-969	N3B-2020-969	N3B-2020-969
RE33-21-222626	33-01060	0.0–1.0	ALLH	—	—	—	N3B-2021-1227	—	—	—	—
RE33-20-190019	33-01060	2.0–3.0	FILL	N3B-2020-969	N3B-2020-969	N3B-2020-969	—	N3B-2020-969	N3B-2020-969	N3B-2020-969	N3B-2020-969
RE33-21-222627	33-01060	2.0–3.0	ALLH	—	—	—	N3B-2021-1227	—	—	—	—
RE33-20-190029	33-01060	4.0–5.0	FILL	N3B-2020-966	N3B-2020-966	N3B-2020-966	N3B-2020-966	N3B-2020-966	N3B-2020-966	N3B-2020-966	N3B-2020-966
RE33-21-222628	33-01060	6.0–7.0	QBT3	—	—	—	N3B-2021-1227	—	—	—	—
RE33-20-190010	33-60612	0.0–1.0	ALLH	N3B-2020-956	N3B-2020-956	N3B-2020-956	—	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956
RE33-20-190020	33-60612	2.0–3.0	ALLH	N3B-2020-956	N3B-2020-956	N3B-2020-956	—	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956
RE33-20-190030	33-60612	4.0–5.0	QBT3	N3B-2020-956	N3B-2020-956	N3B-2020-956	—	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956
RE33-20-190011	33-60613	0.0–1.0	ALLH	N3B-2020-956	N3B-2020-956	N3B-2020-956	—	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956
RE33-20-190021	33-60613	2.0–3.0	QBT3	N3B-2020-956	N3B-2020-956	N3B-2020-956	—	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956

Table 6.8-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOCs	SVOCs	Cyanide	Inorganic Anions
RE33-20-190031	33-60613	4.0–5.0	QBT3	N3B-2020-956	N3B-2020-956	N3B-2020-956	—	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956
RE33-20-190012	33-60614	0.0–1.0	ALLH	N3B-2020-956	N3B-2020-956	N3B-2020-956	—	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956
RE33-20-190022	33-60614	2.0–3.0	ALLH	N3B-2020-956	N3B-2020-956	N3B-2020-956	—	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956
RE33-20-190032	33-60614	4.0–5.0	ALLH	N3B-2020-956	N3B-2020-956	N3B-2020-956	—	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956
RE33-20-190013	33-60615	0.0–1.0	ALLH	N3B-2020-956	N3B-2020-956	N3B-2020-956	—	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956
RE33-20-190023	33-60615	2.0–3.0	ALLH	N3B-2020-956	N3B-2020-956	N3B-2020-956	—	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956
RE33-20-190033	33-60615	4.0–5.0	QBT3	N3B-2020-956	N3B-2020-956	N3B-2020-956	—	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956
RE33-21-217974	33-60987	0.0–1.0	FILL	—	—	—	N3B-2021-839	—	—	—	—
RE33-21-217975	33-60987	2.0–3.0	FILL	—	—	—	N3B-2021-839	—	—	—	—
RE33-21-217976	33-60987	4.0–5.0	FILL	—	—	—	N3B-2021-839	—	—	—	—
RE33-21-222629	33-60987	6.0–7.0	FILL	—	—	—	N3B-2021-1227	—	—	—	—
RE33-21-222630	33-60987	8.0–9.0	FILL	—	—	—	N3B-2021-1227	—	—	—	—
RE33-21-217977	33-60988	0.0–1.0	FILL	—	—	—	N3B-2021-839	—	—	—	—
RE33-21-217978	33-60988	2–3	FILL	—	—	—	N3B-2021-839	—	—	—	—
RE33-21-217979	33-60988	4.0–5.0	FILL	—	—	—	N3B-2021-839	—	—	—	—
RE33-21-222631	33-60988	6.0–7.0	FILL	—	—	—	N3B-2021-1227	—	—	—	—
RE33-21-222632	33-60988	8.0–9.0	FILL	—	—	—	N3B-2021-1227	—	—	—	—
RE33-21-217980	33-60989	0.0–1.0	ALLH	—	—	—	N3B-2021-839	—	—	—	—
RE33-21-217981	33-60989	2.0–3.0	FILL	—	—	—	N3B-2021-839	—	—	—	—
RE33-21-217982	33-60989	4.0–5.0	FILL	—	—	—	N3B-2021-839	—	—	—	—
RE33-21-222635	33-60989	6.0–7.0	FILL	—	—	—	N3B-2021-1227	—	—	—	—
RE33-21-222636	33-60989	8.0–9.0	FILL	—	—	—	N3B-2021-1227	—	—	—	—
RE33-21-217983	33-60990	0.0–1.0	FILL	—	—	—	N3B-2021-848	—	—	—	—
RE33-21-217984	33-60990	2.0–3.0	FILL	—	—	—	N3B-2021-848	—	—	—	—
RE33-21-217985	33-60990	4.0–5.0	FILL	—	—	—	N3B-2021-848	—	—	—	—
RE33-21-222633	33-60990	6.0–7.0	FILL	—	—	—	N3B-2021-1227	—	—	—	—
RE33-21-222634	33-60990	8.0–9.0	FILL	—	—	—	N3B-2021-1227	—	—	—	—
RE33-21-222637	33-61109	0.0–1.0	FILL	—	—	—	N3B-2021-1260	—	—	—	—
RE33-21-222638	33-61109	2.0–3.0	FILL	—	—	—	N3B-2021-1260	—	—	—	—
RE33-21-222639	33-61109	4.0–5.0	FILL	—	—	—	N3B-2021-1252	—	—	—	—
RE33-21-222640	33-61109	6.0–7.0	FILL	—	—	—	N3B-2021-1252	—	—	—	—
RE33-21-222641	33-61109	8.0–9.0	FILL	—	—	—	N3B-2021-1252	—	—	—	—

Table 6.8-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOCs	SVOCs	Cyanide	Inorganic Anions
RE33-21-222642	33-61110	0.0–1.0	ALLH	—	—	—	N3B-2021-1260	—	—	—	—
RE33-21-222643	33-61110	2.0–3.0	FILL	—	—	—	N3B-2021-1260	—	—	—	—
RE33-21-222644	33-61110	4.0–5.0	FILL	—	—	—	N3B-2021-1260	—	—	—	—
RE33-21-222645	33-61110	6.0–7.0	FILL	—	—	—	N3B-2021-1260	—	—	—	—
RE33-21-222646	33-61110	8.0–9.0	FILL	—	—	—	N3B-2021-1260	—	—	—	—
RE33-21-223506	33-61875	0.0–1.0	FILL	—	—	—	N3B-2021-1280	—	—	—	—
RE33-21-223507	33-61875	2.0–3.0	FILL	—	—	—	N3B-2021-1280	—	—	—	—
RE33-21-223508	33-61875	4.0–5.0	FILL	—	—	—	N3B-2021-1280	—	—	—	—
RE33-21-223509	33-61875	6.0–7.0	FILL	—	—	—	N3B-2021-1280	—	—	—	—
RE33-21-223510	33-61875	8.0–9.0	FILL	—	—	—	N3B-2021-1280	—	—	—	—

Note: Numbers in analyte columns are request numbers.
* — = Analysis not requested.

Table 6.8-2
Inorganic Chemicals above BVs at SWMU 33-004(i)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Calcium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Zinc
Soil Background Value[a]				**0.83**	**295**	**0.4**	**6120**	**19.3**	**14.7**	**21,500**	**22.3**	**0.1**	**15.4**	**na[b]**	**na**	**1.52**	**1**	**48.8**
Qbt 2,3,4 Background Value[a]				**0.5**	**46**	**1.63**	**2200**	**7.14**	**4.66**	**14,500**	**11.2**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**63.5**
Construction Worker SSL[c]				**142**	**4390**	**72.1**	**na**	**134[d]**	**14,200**	**248,000**	**800**	**77.1**	**753**	**566,000**	**248**	**1750**	**1770**	**106,000**
Industrial SSL[c]				**519**	**255,000**	**1110**	**na**	**505[d]**	**51,900**	**908,000**	**800**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**389,000**
Residential SSL[c]				**31.3**	**15,600**	**70.5**	**na**	**96.6[d]**	**3130**	**54,800**	**400**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**23,500**
RE33-20-190004	33-01055	0.0–1.0	FILL	1.57 (U)	—[e]	0.642	—	—	36.7	—	75.9 (J-)	—	—	0.674 (J)	0.00081 (J)	—	1.28	108
RE33-20-190014	33-01055	2.0–3.0	FILL	—	—	—	—	—	19.2	—	24.7 (J-)	—	—	0.604 (J)	0.00103 (J)	—	—	58.8
RE33-20-190024	33-01055	4.0–5.0	FILL	—	—	—	—	—	—	—	—	—	—	—	0.00137 (J)	—	—	—
RE33-20-190005	33-01056	0.0–1.0	FILL	1.31 (U)	—	—	—	—	115	22,600	42.3 (J-)	—	35.9	7.65	0.00143 (J)	—	1.61	195
RE33-20-190015	33-01056	2.0–3.0	FILL	1.02 (U)	—	—	—	—	44.9	—	—	—	—	3.92	0.00293	—	—	—
RE33-20-190006	33-01057	0.0–1.0	SOIL	—	—	—	—	—	28.5	—	—	—	—	8.05	0.00108 (J)	—	—	74.1
RE33-20-190016	33-01057	2.3–3.0	QBT3	0.613 (U)	—	—	—	—	—	—	—	—	—	0.985 (J)	—	0.733 (J)	—	—
RE33-20-190026	33-01057	4.0–5.0	QBT3	0.692 (U)	—	—	—	14.4	—	—	—	—	—	0.744 (J)	0.00195 (J)	0.691 (J)	—	—

Table 6.8-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Calcium	Chromium	Copper	Iron	Lead	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Zinc
Soil Background Value[a]				**0.83**	**295**	**0.4**	**6120**	**19.3**	**14.7**	**21,500**	**22.3**	**0.1**	**15.4**	**na[b]**	**na**	**1.52**	**1**	**48.8**
Qbt 2,3,4 Background Value[a]				**0.5**	**46**	**1.63**	**2200**	**7.14**	**4.66**	**14,500**	**11.2**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**63.5**
Construction Worker SSL[c]				**142**	**4390**	**72.1**	**na**	**134[d]**	**14,200**	**248,000**	**800**	**77.1**	**753**	**566,000**	**248**	**1750**	**1770**	**106,000**
Industrial SSL[c]				**519**	**255,000**	**1110**	**na**	**505[d]**	**51,900**	**908,000**	**800**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**389,000**
Residential SSL[c]				**31.3**	**15,600**	**70.5**	**na**	**96.6[d]**	**3130**	**54,800**	**400**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**23,500**
RE33-20-190008	33-01059	0.0–1.0	FILL	0.916 (U)	—	—	—	—	—	—	40.7	—	—	1.29	0.018	—	—	—
RE33-20-190018	33-01059	2.0–3.0	FILL	—	—	—	—	—	—	—	—	—	—	1.52	0.00379	—	—	—
RE33-20-190028	33-01059	4.0–5.0	FILL	—	—	0.503	6380	—	18.1	—	—	—	—	1.13	0.00215	—	—	70.5
RE33-20-190009	33-01060	0.0–1.0	FILL	1.33 (U)	—	0.678	—	—	153 (J)	—	31.7	—	—	1.14 (J)	0.000643 (J)	—	—	120
RE33-20-190019	33-01060	2.0–3.0	FILL	0.942 (U)	—	—	—	—	—	—	—	—	—	0.81 (J)	0.00132 (J)	—	—	—
RE33-20-190029	33-01060	4.0–5.0	FILL	0.892 (U)	—	—	9320	—	—	—	—	—	—	—	0.00466	—	—	—
RE33-20-190010	33-60612	0.0–1.0	SOIL	1.4 (U)	—	—	—	—	17.4	—	30 (J+)	0.132	—	1.95	0.000697 (J)	—	2.89	—
RE33-20-190020	33-60612	2.0–3.0	SOIL	0.879 (U)	—	—	—	—	—	—	—	—	—	—	—	—	2.01	—
RE33-20-190030	33-60612	4.0–5.0	QBT3	0.788 (U)	—	—	—	11.8	—	—	—	—	—	—	—	0.487 (J)	—	—
RE33-20-190011	33-60613	0.0–1.0	SOIL	6.14 (J+)	—	—	—	289	—	—	30.8 (J+)	—	—	2.45	0.0008 (J)	—	—	54.5
RE33-20-190021	33-60613	2.0–3.0	QBT3	—	—	—	—	—	—	—	—	—	—	0.67 (J)	0.000609 (J)	0.584 (J)	—	—
RE33-20-190031	33-60613	4.0–5.0	QBT3	0.677 (U)	—	—	—	10.1	—	—	—	—	—	0.803 (J)	—	0.555 (J)	—	—
RE33-20-190012	33-60614	0.0–1.0	SOIL	—	—	—	—	—	—	—	—	—	—	2.65	0.00168 (J)	—	—	—
RE33-20-190022	33-60614	2.0–3.0	SOIL	1.03 (U)	—	—	—	—	—	—	—	—	—	—	0.00101 (J)	—	—	—
RE33-20-190032	33-60614	4.0–5.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	0.00112 (J)	—	—	—
RE33-20-190013	33-60615	0.0–1.0	SOIL	1.48 (U)	—	—	—	—	—	—	—	—	—	0.985 (J)	—	—	—	—
RE33-20-190023	33-60615	2.0–3.0	SOIL	1.12 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190033	33-60615	4.0–5.0	QBT3	0.821 (U)	57.5	—	—	11.3	—	—	—	—	8.12	—	—	0.627 (J)	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2019, 700550) unless otherwise noted.

[d] SSL for total chromium.

[e] — = Not detected or not detected above BV.

Table 6.8-3
Organic Chemicals Detected at SWMU 33-004(i)

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	Carbazole	Chrysene	Di-n-butylphthalate
Construction Worker SSL[a]				**15,100**	**75,300**	**4.91**	**85.3**	**240**	**15.0**	**240**	**7530[b]**	**2310**	**85[c,d]**	**23,100**	**26,900**
Industrial SSL[a]				**50,500**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**1200[c,e]**	**3230**	**91,600**
Residential SSL[a]				**3480**	**17,400**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**78[c,e]**	**153**	**6160**
RE33-20-190004	33-01055	0.0–1.0	FILL	0.114 (J)	0.17 (J)	0.249	0.116	0.407	0.39	0.46	0.206	0.187	0.0766 (J)	0.379	0.0729 (J)
RE33-20-190014	33-01055	2.0–3.0	FILL	0.27	0.728	NA[f]	NA	1.52	1.34	1.62	0.665	0.642	0.363	1.42	—[g]
RE33-21-217964	33-01055	2.0–3.0	FILL	NA	NA	0.168	0.106 (J+)	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190024	33-01055	4.0–5.0	FILL	0.0232 (J)	0.0532	NA	NA	0.158	0.178	0.198	0.0946	0.0774	0.0203 (J)	0.148	—
RE33-21-217965	33-01055	4.0–5.0	FILL	NA	NA	0.0469	0.0373 (J+)	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190005	33-01056	0.0–1.0	FILL	0.159 (J)	0.314 (J)	NA	NA	0.966	1	1.24	0.553	0.494	0.203 (J)	0.955	—
RE33-20-190015	33-01056	2.0–3.0	FILL	—	0.0889 (J)	NA	NA	1.01	1.16	1.46	0.664	0.569	—	1.01	—
RE33-20-190006	33-01057	0.0–1.0	SOIL	—	—	0.629	0.268	0.0385 (J)	0.0452	0.0586	0.0256 (J)	0.0224 (J)	—	0.0373 (J)	—
RE33-21-217966	33-01057	2.0–2.5	SOIL	NA	NA	0.0243	0.0139 (J+)	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217967	33-01057	4.0–5.0	QBT3	NA	NA	0.00978	0.00486 (J+)	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217970	33-01058	6.0–7.0	FILL	NA	NA	0.0571	0.0104	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217971	33-01058	8.0–9.0	FILL	NA	NA	0.0112	0.00289 (J)	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190008	33-01059	0.0–1.0	FILL	—	0.2 (J)	0.0496	0.0287	0.555	0.571	0.669	0.28 (J)	0.223 (J)	—	0.521	—
RE33-20-190018	33-01059	2.0–3.0	FILL	1.48	2.32	NA	NA	3.39	2.8	3.44	1.2	1.37	1.02	3.22	—
RE33-21-217972	33-01059	2.0–3.0	FILL	NA	NA	0.181	0.074 (J+)	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190028	33-01059	4.0–5.0	FILL	—	—	NA	NA	—	—	—	—	—	—	—	—
RE33-21-217973	33-01059	4.0–5.0	FILL	NA	NA	0.401	0.141 (J+)	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190009	33-01060	0.0–1.0	FILL	—	—	NA	NA	0.256	0.252	0.294	0.0981 (J)	0.115 (J)	—	0.241	—
RE33-21-222626	33-01060	0.0–1.0	SOIL	NA	NA	0.512	0.207	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190019	33-01060	2.0–3.0	FILL	—	—	NA	NA	0.0163 (J)	—	0.0141 (J)	—	—	—	—	—
RE33-21-222627	33-01060	2.0–3.0	SOIL	NA	NA	0.0209	0.0102	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190029	33-01060	4.0–5.0	FILL	—	—	0.00885	0.00464	—	—	—	—	—	—	—	—
RE33-21-222628	33-01060	6.0–7.0	QBT3	NA	NA	0.00783	0.00324 (J)	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190010	33-60612	0.0–1.0	SOIL	0.0149 (J)	0.0206 (J)	NA	NA	0.0988	0.123	0.148	0.0896	0.0562	0.0206 (J)	0.118	0.0224 (J)
RE33-20-190020	33-60612	2.0–3.0	SOIL	0.0305 (J)	0.0674	NA	NA	0.162	0.18	0.195	0.145	0.0692	0.0319 (J)	0.172	—

Table 6.8-3 (continued)

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	Carbazole	Chrysene	Di-n-butylphthalate
Construction Worker SSL[a]				**15,100**	**75,300**	**4.91**	**85.3**	**240**	**15.0**	**240**	**7530[b]**	**2310**	**85[c,d]**	**23,100**	**26,900**
Industrial SSL[a]				**50,500**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**1200[c,e]**	**3230**	**91,600**
Residential SSL[a]				**3480**	**17,400**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**78[c,e]**	**153**	**6160**
RE33-20-190011	33-60613	0.0–1.0	SOIL	0.106 (J)	0.185 (J)	NA	NA	0.492	0.5	0.551	0.283	0.226	0.112 (J)	0.46	—
RE33-20-190021	33-60613	2.0–3.0	QBT3	—	—	NA	NA	0.0151 (J)	0.013 (J)	0.0151 (J)	—	—	—	0.012 (J)	—
RE33-20-190031	33-60613	4.0–5.0	QBT3	—	0.0214 (J)	NA	NA	0.0669	0.0634	0.0767	0.0371	0.0294 (J)	0.0154 (J)	0.0683	—
RE33-20-190012	33-60614	0.0–1.0	SOIL	—	—	NA	NA	0.0332 (J)	0.0368 (J)	0.0428 (J)	0.0216 (J)	0.0189 (J)	—	0.0327 (J)	—
RE33-20-190013	33-60615	0.0–1.0	SOIL	—	—	NA	NA	0.0384 (J)	0.0389 (J)	0.046	0.0223 (J)	0.0188 (J)	—	0.038 (J)	—
RE33-21-217974	33-60987	0.0–1.0	FILL	NA	NA	1.18	0.608 (J+)	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217975	33-60987	2.0–3.0	FILL	NA	NA	0.178	0.0997 (J+)	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217976	33-60987	4.0–5.0	FILL	NA	NA	47 (J-)	16 (J-)	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222629	33-60987	6.0–7.0	FILL	NA	NA	1.09	0.21	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222630	33-60987	8.0–9.0	FILL	NA	NA	0.722	0.144	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217977	33-60988	0.0–1.0	FILL	NA	NA	0.0683	0.0402 (J+)	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217978	33-60988	2–3	FILL	NA	NA	0.0152 (J)	0.0113 (J+)	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217979	33-60988	4.0–5.0	FILL	NA	NA	0.0336	0.0187 (J+)	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222631	33-60988	6.0–7.0	FILL	NA	NA	0.00304 (J)	0.00131 (J)	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222632	33-60988	8.0–9.0	FILL	NA	NA	0.0188	0.00681	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217980	33-60989	0.0–1.0	SOIL	NA	NA	0.0454	0.0398 (J+)	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217982	33-60989	4.0–5.0	FILL	NA	NA	0.0248 (J)	0.0269 (J+)	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217983	33-60990	0.0–1.0	FILL	NA	NA	0.0668	0.041	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217985	33-60990	4.0–5.0	FILL	NA	NA	9.88	4.19	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222633	33-60990	6.0–7.0	FILL	NA	NA	0.00786	0.00465	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222634	33-60990	8.0–9.0	FILL	NA	NA	0.00285 (J)	0.00231 (J)	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222637	33-61109	0.0–1.0	FILL	NA	NA	0.119	0.0728 (J-)	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222638	33-61109	2.0–3.0	FILL	NA	NA	0.205	0.0819 (J-)	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222639	33-61109	4.0–5.0	FILL	NA	NA	1.03	0.24	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222640	33-61109	6.0–7.0	FILL	NA	NA	0.0189	0.00576	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222641	33-61109	8.0–9.0	FILL	NA	NA	0.00171 (J)	0.00213 (J)	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222642	33-61110	0.0–1.0	SOIL	NA	NA	0.214	0.134 (J-)	NA	NA	NA	NA	NA	NA	NA	NA

Table 6.8-3 (continued)

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	Carbazole	Chrysene	Di-n-butylphthalate
Construction Worker SSL[a]				**15,100**	**75,300**	**4.91**	**85.3**	**240**	**15.0**	**240**	**7530[b]**	**2310**	**85[c,d]**	**23,100**	**26,900**
Industrial SSL[a]				**50,500**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**1200[c,e]**	**3230**	**91,600**
Residential SSL[a]				**3480**	**17,400**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**78[c,e]**	**153**	**6160**
RE33-21-222644	33-61110	4.0–5.0	FILL	NA	NA	0.0144 (J)	—	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222645	33-61110	6.0–7.0	FILL	NA	NA	0.024	0.0146 (J-)	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-223506	33-61875	0.0–1.0	FILL	NA	NA	0.22	0.101	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-223507	33-61875	2.0–3.0	FILL	NA	NA	1	0.237	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-223508	33-61875	4.0–5.0	FILL	NA	NA	19.5 (J-)	6.03 (J-)	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-223509	33-61875	6.0–7.0	FILL	NA	NA	4.69	1.48	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-223510	33-61875	8.0–9.0	FILL	NA	NA	0.48	0.146	NA	NA	NA	NA	NA	NA	NA	NA

Table 6.8-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Methylnaphthalene[1-]	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene
Construction Worker SSL[a]				**24**	**10,000**	**10,000**	**240**	**6060**	**1000**	**159**	**7530**	**7530**
Industrial SSL[a]				**3.23**	**33,700**	**33,700**	**32.3**	**813**	**3370**	**241**	**25,300**	**25,300**
Residential SSL[a]				**0.153**	**2320**	**2320**	**1.53**	**172**	**232**	**49.7**	**1740**	**1740**
RE33-20-190004	33-01055	0.0–1.0	FILL	—	0.882	0.0878 (J)	0.247	—	—	0.101 (J)	0.631	0.622
RE33-20-190014	33-01055	2.0–3.0	FILL	0.231	4.14	0.219	0.79	—	—	—	2.41	2.81
RE33-21-217964	33-01055	2.0–3.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190024	33-01055	4.0–5.0	FILL	0.0257 (J)	0.326	0.0193 (J)	0.0981	—	—	0.0107 (J)	0.177	0.256
RE33-21-217965	33-01055	4.0–5.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190005	33-01056	0.0–1.0	FILL	0.159 (J)	2.24	0.125 (J)	0.583	—	—	—	1.28	1.55
RE33-20-190015	33-01056	2.0–3.0	FILL	0.224	1.44	—	0.626	—	—	—	0.235	1.26
RE33-20-190006	33-01057	0.0–1.0	SOIL	—	0.0865	—	0.0248 (J)	—	—	—	0.0366 (J)	0.0605
RE33-21-217966	33-01057	2.0–2.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217967	33-01057	4.0–5.0	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217970	33-01058	6.0–7.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217971	33-01058	8.0–9.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190008	33-01059	0.0–1.0	FILL	—	1.18	—	0.276 (J)	—	—	—	0.782	0.892
RE33-20-190018	33-01059	2.0–3.0	FILL	0.366	6.6 (J-)	1.36	1.43	0.284 (J)	0.414	1.09	7.72	6.99 (J-)
RE33-21-217972	33-01059	2.0–3.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190028	33-01059	4.0–5.0	FILL	—	—	—	—	—	—	0.00141	—	—
RE33-21-217973	33-01059	4.0–5.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190009	33-01060	0.0–1.0	FILL	—	0.435 (J-)	—	0.13 (J)	—	—	—	0.38	0.478 (J-)
RE33-21-222626	33-01060	0.0–1.0	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190019	33-01060	2.0–3.0	FILL	—	0.0282 (J)	—	—	—	—	—	0.0155 (J)	0.021 (J)
RE33-21-222627	33-01060	2.0–3.0	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190029	33-01060	4.0–5.0	FILL	—	—	—	—	—	—	—	—	—
RE33-21-222628	33-01060	6.0–7.0	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190010	33-60612	0.0–1.0	SOIL	—	0.162	—	0.0953	—	—	—	0.119	0.269
RE33-20-190020	33-60612	2.0–3.0	SOIL	0.0561	0.295	0.0391 (J)	0.152	—	—	0.0525	0.293	0.328

Table 6.8-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Methylnaphthalene[1-]	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene
Construction Worker SSL[a]				**24**	**10,000**	**10,000**	**240**	**6060**	**1000**	**159**	**7530**	**7530**
Industrial SSL[a]				**3.23**	**33,700**	**33,700**	**32.3**	**813**	**3370**	**241**	**25,300**	**25,300**
Residential SSL[a]				**0.153**	**2320**	**2320**	**1.53**	**172**	**232**	**49.7**	**1740**	**1740**
RE33-20-190011	33-60613	0.0–1.0	SOIL	0.0767 (J)	1.06	0.124 (J)	0.299	—	—	0.0905 (J)	0.903	0.893
RE33-20-190021	33-60613	2.0–3.0	QBT3	—	0.0201 (J)	—	—	—	—	—	0.019 (J)	0.0261 (J)
RE33-20-190031	33-60613	4.0–5.0	QBT3	—	0.112	—	0.035	—	—	—	0.0963	0.149
RE33-20-190012	33-60614	0.0–1.0	SOIL	—	0.0636	—	0.0198 (J)	—	—	—	0.0378 (J)	0.0649
RE33-20-190013	33-60615	0.0–1.0	SOIL	—	0.0603	—	0.0331 (J)	—	—	—	0.0282 (J)	0.0675
RE33-21-217974	33-60987	0.0–1.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217975	33-60987	2.0–3.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217976	33-60987	4.0–5.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222629	33-60987	6.0–7.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222630	33-60987	8.0–9.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217977	33-60988	0.0–1.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217978	33-60988	2–3	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217979	33-60988	4.0–5.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222631	33-60988	6.0–7.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222632	33-60988	8.0–9.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217980	33-60989	0.0–1.0	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217982	33-60989	4.0–5.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217983	33-60990	0.0–1.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217985	33-60990	4.0–5.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222633	33-60990	6.0–7.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222634	33-60990	8.0–9.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222637	33-61109	0.0–1.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222638	33-61109	2.0–3.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222639	33-61109	4.0–5.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222640	33-61109	6.0–7.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222641	33-61109	8.0–9.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222642	33-61110	0.0–1.0	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 6.8-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Methylnaphthalene[1-]	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene
Construction Worker SSL[a]				**24**	**10,000**	**10,000**	**240**	**6060**	**1000**	**159**	**7530**	**7530**
Industrial SSL[a]				**3.23**	**33,700**	**33,700**	**32.3**	**813**	**3370**	**241**	**25,300**	**25,300**
Residential SSL[a]				**0.153**	**2320**	**2320**	**1.53**	**172**	**232**	**49.7**	**1740**	**1740**
RE33-21-222644	33-61110	4.0–5.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222645	33-61110	6.0–7.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-223506	33-61875	0.0–1.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-223507	33-61875	2.0–3.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-223508	33-61875	4.0–5.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-223509	33-61875	6.0–7.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-223510	33-61875	8.0–9.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] SSLs from NMED (2019, 700550) unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] Dibenzofuran used as a surrogate based on structural similarity.

[d] Construction worker SSLs calculated using the equations outlined in NMED (2019, 700550), incorporating toxicity and chemical-specific parameters from EPA RSL tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

[e] SSL from EPA RSL tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

[f] NA = Not analyzed.

[g] — = Not detected.

Table 6.8-4
Radionuclides Detected or
Detected above BVs/FVs at SWMU 33-004(i)

Sample ID	Location ID	Depth (ft)	Media	Uranium-235/236
Qbt 2,3,4 Background Value[a]				**0.09**
Construction Worker SAL[b]				**130**
Industrial SAL[b]				**160**
Residential SAL[b]				**42**
RE33-20-190030	33-60612	4.0–5.0	QBT3	0.12

Note: Results are in pCi/g.

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

[b] SALs from LANL (2015, 600929).

Table 6.9-1
Samples Collected and Analyses Requested at SWMU 33-006(a)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOC	SVOC	Explosive Compounds	Cyanide	Nitrate
RE33-20-186626	33-60414	0.0–1.0	FILL	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635
RE33-20-186632	33-60414	2.0–3.0	FILL	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	—[a]	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635
RE33-21-222046	33-60415	4.0–5.0	QBT3	—	—	—	—	—	—	—	—	N3B-2021-1172[b]	—	—	—
RE33-21-222047	33-60415	7.0–8.0	QBT3	—	—	—	—	—	—	—	—	N3B-2021-1172[b]	—	—	—
RE33-20-186634	33-60416	2.0–3.0	QBT3	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	—	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635
RE33-20-186635	33-60417	2.0–3.0	QBT3	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	—	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635
RE33-20-186630	33-60418	0.0–1.0	ALLH	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	—	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635
RE33-20-186636	33-60418	2.0–3.0	QBT3	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	—	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635
RE33-20-186631	33-60419	0.0–1.0	ALLH	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	—	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635
RE33-20-186637	33-60419	2.0–3.0	ALLH	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	—	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635
RE33-20-186638	33-60420	0.0–1.0	ALLH	N3B-2020-643	N3B-2020-643	N3B-2020-643	N3B-2020-643	N3B-2020-643	N3B-2020-643	N3B-2020-643	N3B-2020-643	N3B-2020-643	N3B-2020-643	N3B-2020-643	N3B-2020-643
RE33-20-186640	33-60420	2.2–3.0	QBT3	N3B-2020-643	N3B-2020-643	N3B-2020-643	N3B-2020-643	N3B-2020-643	N3B-2020-643	—	N3B-2020-643	N3B-2020-643	N3B-2020-643	N3B-2020-643	N3B-2020-643
RE33-20-186639	33-60421	0.0–1.0	ALLH	N3B-2020-643	N3B-2020-643	N3B-2020-643	N3B-2020-643	N3B-2020-643	N3B-2020-643	—	N3B-2020-643	N3B-2020-643	N3B-2020-643	N3B-2020-643	N3B-2020-643
RE33-20-186641	33-60421	2.0–3.0	QBT3	N3B-2020-643	N3B-2020-643	N3B-2020-643	N3B-2020-643	N3B-2020-643	N3B-2020-643	N3B-2020-643	N3B-2020-643	N3B-2020-643	N3B-2020-643	N3B-2020-643	N3B-2020-643
RE33-20-186642	33-60422	0.0–1.0	FILL	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635
RE33-20-186650	33-60422	2.0–2.9	FILL	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	—	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635	N3B-2020-635
RE33-21-217579	33-60423	3–4	QBT3	—	—	—	—	N3B-2021-713[c]	—	—	—	—	—	—	—
RE33-21-217580	33-60423	5.0–6.0	QBT3	—	—	—	—	N3B-2021-713[c]	—	—	—	—	—	—	—
RE33-21-222048	33-60423	6.0–7.0	QBT2	—	—	—	—	N3B-2021-1170[c]	—	—	—	—	—	—	—
RE33-21-217581	33-60941	0–1	ALLH	—	—	—	—	N3B-2021-719[c]	—	—	—	—	—	—	—
RE33-21-217582	33-60941	2–3	FILL	—	—	—	—	N3B-2021-719[c]	—	—	—	—	—	—	—
RE33-21-217583	33-60941	4.0–5.0	QBT3	—	—	—	—	N3B-2021-719[c]	—	—	—	—	—	—	—
RE33-21-217584	33-60941	6.0–7.0	QBT3	—	—	—	—	N3B-2021-719[c]	—	—	—	—	—	—	—
RE33-21-217585	33-60942	0–1	ALLH	—	—	—	—	N3B-2021-719[c]	—	—	—	—	—	—	—
RE33-21-217586	33-60942	2–3	FILL	—	—	—	—	N3B-2021-719[c]	—	—	—	—	—	—	—
RE33-21-217587	33-60942	5.5–6.5	QBT3	—	—	—	—	N3B-2021-719[c]	—	—	—	—	—	—	—
RE33-21-217588	33-60942	7.5–8.5	QBT3	—	—	—	—	N3B-2021-719[c]	—	—	—	—	—	—	—
RE33-21-217589	33-60943	0–1	ALLH	—	—	—	—	N3B-2021-719[c]	—	—	—	—	—	—	—
RE33-21-217591	33-60943	1.0–2.0	QBT3	—	—	—	—	N3B-2021-719[c]	—	—	—	—	—	—	—
RE33-21-217592	33-60943	3.0–4.0	QBT3	—	—	—	—	N3B-2021-719[c]	—	—	—	—	—	—	—

Table 6.9-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOC	SVOC	Explosive Compounds	Cyanide	Nitrate
RE33-21-217593	33-60944	0–0.1	ALLH	—	—	—	—	N3B-2021-719[c]	—	—	—	—	—	—	—
RE33-21-217663	33-60944	0.1–1.1	QBT3	—	—	—	—	N3B-2021-718[c]	—	—	—	—	—	—	—
RE33-21-217596	33-60944	2.1–3.1	QBT3	—	—	—	—	N3B-2021-718[c]	—	—	—	—	—	—	—
RE33-21-217597	33-60945	1–2	FILL	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723	—	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723
RE33-21-217598	33-60945	3–4	QBT3	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723
RE33-21-217599	33-60946	1.0–1.5	FILL	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724	—	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724
RE33-21-217600	33-60946	3.0–4.0	QBT3	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724	—	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724
RE33-21-217601	33-60947	1–2	FILL	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723	—	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723
RE33-21-217602	33-60947	3.0–3.8	FILL	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724	—	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724
RE33-21-217603	33-60948	0.2–1.2	QBT3	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723
RE33-21-217605	33-60948	2.2–3.2	QBT3	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723	—	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723	N3B-2021-723
RE33-21-217607	33-60949	1–2	ALLH	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724	—	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724
RE33-21-217608	33-60949	3.0–4.0	ALLH	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724	—	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724
RE33-21-217609	33-60950	1.0–1.5	ALLH	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724	—	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724
RE33-21-217610	33-60950	3–4	QBT3	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724	—	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724	N3B-2021-724
RE33-21-217611	33-60951	1–2	QBT3	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	—	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728
RE33-21-217612	33-60951	3–4	QBT3	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728
RE33-21-217613	33-60952	0.8–1.8	QBT3	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	—	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728
RE33-21-217614	33-60952	2.8–3.8	QBT3	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	—	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728
RE33-21-217615	33-60953	0.2–1.2	QBT3	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	—	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728
RE33-21-217617	33-60953	2.2–3.2	QBT3	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	—	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728
RE33-21-217619	33-60954	0.4–1.4	QBT3	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728
RE33-21-217620	33-60954	2.4–3.4	QBT3	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	—	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728
RE33-21-217621	33-60955	0.3–1.3	QBT3	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	—	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728
RE33-21-217622	33-60955	2.3–3.3	QBT3	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	—	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728	N3B-2021-728
RE33-21-217650	33-60957	0–1	SED	—	—	—	—	N3B-2021-713[c]	—	—	—	—	—	—	—
RE33-21-217658	33-60957	2–3	QBT3	—	—	—	—	N3B-2021-713[c]	—	—	—	—	—	—	—
RE33-21-217662	33-60957	4–5	QBT3	—	—	—	—	N3B-2021-713[c]	—	—	—	—	—	—	—
RE33-21-217651	33-60958	0.0–1.0	SED	—	—	—	—	N3B-2021-713[c]	—	—	—	—	—	—	—
RE33-21-217655	33-60958	2.0–2.2	SED	—	—	—	—	N3B-2021-713[c]	—	—	—	—	—	—	—
RE33-21-217595	33-60958	2.2–3.2	QBT3	—	—	—	—	N3B-2021-718[c]	—	—	—	—	—	—	—
RE33-21-217659	33-60958	4.2–5.2	QBT3	—	—	—	—	N3B-2021-718[c]	—	—	—	—	—	—	—

Table 6.9-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOC	SVOC	Explosive Compounds	Cyanide	Nitrate
RE33-21-217652	33-60959	0.0–0.5	FILL	—	—	—	—	N3B-2021-723[c]	—	—	—	—	—	—	—
RE33-21-217660	33-60959	0.5–1.5	QBT3	—	—	—	—	N3B-2021-723[c]	—	—	—	—	—	—	—
RE33-21-217664	33-60959	2.5–3.5	QBT3	—	—	—	—	N3B-2021-723[c]	—	—	—	—	—	—	—
RE33-21-217653	33-60960	0.0–1.0	ALLH	—	—	—	—	N3B-2021-718[c]	—	—	—	—	—	—	—
RE33-21-217657	33-60960	2–2.3	ALLH	—	—	—	—	N3B-2021-718[c]	—	—	—	—	—	—	—
RE33-21-217661	33-60960	2.3–3.3	QBT3	—	—	—	—	N3B-2021-718[c]	—	—	—	—	—	—	—
RE33-21-217665	33-60960	4.3–5.3	QBT2	—	—	—	—	N3B-2021-718[c]	—	—	—	—	—	—	—
RE33-21-222049	33-61068	0.0–1.0	FILL	—	—	—	—	N3B-2021-1191[c]	—	—	—	N3B-2021-1191[b]	—	—	—
RE33-21-222050	33-61068	2.0–3.0	FILL	—	—	—	—	N3B-2021-1191[c]	—	—	—	N3B-2021-1191[b]	—	—	—
RE33-21-222051	33-61068	4.8–5.8	QBT3	—	—	—	—	N3B-2021-1191[c]	—	—	—	N3B-2021-1191[b]	—	—	—
RE33-21-222052	33-61068	6.8–7.8	QBT3	—	—	—	—	N3B-2021-1191[c]	—	—	—	N3B-2021-1191[b]	—	—	—
RE33-21-222053	33-61069	0.0–1.0	FILL	—	—	—	—	N3B-2021-1191[c]	—	—	—	N3B-2021-1191[b]	—	—	—
RE33-21-222054	33-61069	2.0–3.0	FILL	—	—	—	—	N3B-2021-1191[c]	—	—	—	N3B-2021-1191[b]	—	—	—
RE33-21-222055	33-61069	4.8–5.8	QBT3	—	—	—	—	N3B-2021-1191[c]	—	—	—	N3B-2021-1191[b]	—	—	—
RE33-21-222056	33-61069	6.8–7.8	QBT3	—	—	—	—	N3B-2021-1191[c]	—	—	—	N3B-2021-1191[b]	—	—	—
RE33-21-222057	33-61070	0.0–1.0	FILL	—	—	—	—	N3B-2021-1191[c]	—	—	—	N3B-2021-1191[b]	—	—	—
RE33-21-222058	33-61070	2.0–3.0	FILL	—	—	—	—	N3B-2021-1191[c]	—	—	—	N3B-2021-1191[b]	—	—	—
RE33-21-222059	33-61070	3.8–4.8	QBT3	—	—	—	—	N3B-2021-1191[c]	—	—	—	N3B-2021-1191[b]	—	—	—
RE33-21-222060	33-61070	5.8–6.8	QBT3	—	—	—	—	N3B-2021-1191[c]	—	—	—	N3B-2021-1191[b]	—	—	—
RE33-21-222061	33-61071	0.0–1.0	FILL	—	—	—	—	N3B-2021-1191[c]	—	—	—	N3B-2021-1191[b]	—	—	—
RE33-21-222062	33-61071	2.0–3.0	FILL	—	—	—	—	N3B-2021-1191[c]	—	—	—	N3B-2021-1191[b]	—	—	—
RE33-21-222063	33-61071	4.0–5.0	QBT3	—	—	—	—	N3B-2021-1191[c]	—	—	—	N3B-2021-1191[b]	—	—	—
RE33-21-222064	33-61071	6.0–7.0	QBT3	—	—	—	—	N3B-2021-1192[c]	—	—	—	N3B-2021-1192[b]	—	—	—
RE33-21-222065	33-61072	0.0–1.0	ALLH	—	—	—	—	N3B-2021-1192[c]	—	—	—	—	—	—	—
RE33-21-222067	33-61072	1.0–2.0	QBT3	—	—	—	—	N3B-2021-1192[c]	—	—	—	—	—	—	—
RE33-21-222068	33-61072	3.0–4.0	QBT3	—	—	—	—	N3B-2021-1192[c]	—	—	—	—	—	—	—
RE33-21-222069	33-61073	0.0–1.0	ALLH	—	—	—	—	N3B-2021-1192[c]	—	—	—	—	—	—	—
RE33-21-222071	33-61073	1.0–2.0	QBT3	—	—	—	—	N3B-2021-1192[c]	—	—	—	—	—	—	—
RE33-21-222072	33-61073	3.0–4.0	QBT3	—	—	—	—	N3B-2021-1192[c]	—	—	—	—	—	—	—
RE33-21-222073	33-61074	0.0–0.5	ALLH	—	—	—	—	N3B-2021-1192[c]	—	—	—	—	—	—	—
RE33-21-222075	33-61074	0.5–1.5	QBT3	—	—	—	—	N3B-2021-1192[c]	—	—	—	—	—	—	—
RE33-21-222076	33-61074	2.5–3.5	QBT3	—	—	—	—	N3B-2021-1192[c]	—	—	—	—	—	—	—

Table 6.9-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOC	SVOC	Explosive Compounds	Cyanide	Nitrate
RE33-21-222077	33-61075	0.0–0.5	FILL	—	—	—	—	N3B-2021-1192[c]	—	—	—	—	—	—	—
RE33-21-222079	33-61075	0.5–1.5	QBT3	—	—	—	—	N3B-2021-1192[c]	—	—	—	—	—	—	—
RE33-21-222080	33-61075	2.5–3.5	QBT3	—	—	—	—	N3B-2021-1192[c]	—	—	—	—	—	—	—
RE33-21-222081	33-61076	0.0–0.4	ALLH	—	—	—	—	N3B-2021-1196[c]	—	—	—	—	—	—	—
RE33-21-222083	33-61076	0.4–1.4	QBT3	—	—	—	—	N3B-2021-1196[c]	—	—	—	—	—	—	—
RE33-21-222084	33-61076	1.4–2.4	QBT3	—	—	—	—	N3B-2021-1196[c]	—	—	—	—	—	—	—
RE33-21-222087	33-61077	0.0–1.0	QBT3	—	—	—	—	N3B-2021-1196[c]	—	—	—	—	—	—	—
RE33-21-222088	33-61077	2.0–3.0	QBT3	—	—	—	—	N3B-2021-1196[c]	—	—	—	—	—	—	—
RE33-21-222089	33-61078	0.0–0.2	ALLH	—	—	—	—	N3B-2021-1196[c]	—	—	—	—	—	—	—
RE33-21-222091	33-61078	0.2–1.2	QBT3	—	—	—	—	N3B-2021-1196[c]	—	—	—	—	—	—	—
RE33-21-222092	33-61078	2.2–3.2	QBT3	—	—	—	—	N3B-2021-1196[c]	—	—	—	—	—	—	—
RE33-21-222095	33-61079	0.0–1.0	QBT3	—	—	—	—	N3B-2021-1196[c]	—	—	—	—	—	—	—
RE33-21-222096	33-61079	2.0–3.0	QBT3	—	—	—	—	N3B-2021-1196[c]	—	—	—	—	—	—	—
RE33-21-222097	33-61080	0.0–1.0	ALLH	—	—	—	—	N3B-2021-1170[c]	—	—	—	—	—	—	—
RE33-21-222098	33-61080	2.0–3.0	FILL	—	—	—	—	N3B-2021-1170[c]	—	—	—	—	—	—	—
RE33-21-222099	33-61080	3.8–4.8	QBT2	—	—	—	—	N3B-2021-1170[c]	—	—	—	—	—	—	—
RE33-21-222100	33-61080	5.8–6.8	QBT2	—	—	—	—	N3B-2021-1170[c]	—	—	—	—	—	—	—
RE33-21-222101	33-61081	0.0–1.0	ALLH	—	—	—	—	N3B-2021-1170[c]	—	—	—	—	—	—	—
RE33-21-222103	33-61081	2.0–3.0	QBT2	—	—	—	—	N3B-2021-1170[c]	—	—	—	—	—	—	—
RE33-21-222104	33-61081	4.0–5.0	QBT2	—	—	—	—	N3B-2021-1170[c]	—	—	—	—	—	—	—
RE33-21-222105	33-61082	0.0–1.0	ALLH	—	—	—	—	N3B-2021-1170[c]	—	—	—	—	—	—	—
RE33-21-222106	33-61082	2.0–2.5	ALLH	—	—	—	—	N3B-2021-1170[c]	—	—	—	—	—	—	—
RE33-21-222107	33-61082	2.5–3.5	QBT2	—	—	—	—	N3B-2021-1170[c]	—	—	—	—	—	—	—
RE33-21-222108	33-61082	4.5–5.5	QBT2	—	—	—	—	N3B-2021-1170[c]	—	—	—	—	—	—	—
RE33-21-222109	33-61083	0.0–1.0	ALLH	—	—	—	—	N3B-2021-1172[c]	—	—	—	—	—	—	—
RE33-21-222110	33-61083	2.0–2.5	ALLH	—	—	—	—	N3B-2021-1172[c]	—	—	—	—	—	—	—
RE33-21-222111	33-61083	2.5–3.5	QBT2	—	—	—	—	N3B-2021-1172[c]	—	—	—	—	—	—	—
RE33-21-222112	33-61083	4.5–5.5	QBT2	—	—	—	—	N3B-2021-1172[c]	—	—	—	—	—	—	—

Note: Numbers in analyte columns are request numbers.

[a] — = Analysis not requested.

[b] Sample analyzed for di-n-butylphthalate only.

[c] Sample analyzed for copper only.

Table 6.9-2
Inorganic Chemicals above BVs at SWMU 33-006(a)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Calcium	Chromium	Cobalt	Copper	Lead	Magnesium	Nickel	Nitrate	Perchlorate	Selenium	Zinc
Soil Background Value[a]				**0.83**	**295**	**6120**	**19.3**	**8.64**	**14.7**	**22.3**	**4610**	**15.4**	**na[b]**	**na**	**1.52**	**48.8**
Qbt 2,3,4 Background Value[a]				**0.5**	**46**	**2200**	**7.14**	**3.14**	**4.66**	**11.2**	**1690**	**6.58**	**na**	**na**	**0.3**	**63.5**
Sediment Background Value[a]				**0.83**	**127**	**4420**	**10.5**	**4.73**	**11.2**	**19.7**	**2370**	**9.38**	**na**	**na**	**0.3**	**60.2**
Construction Worker SSL[c]				**142**	**4390**	**na**	**134[d]**	**36.7**	**14,200**	**800**	**na**	**753**	**566,000**	**248**	**1750**	**106,000**
Industrial SSL[c]				**519**	**255,000**	**na**	**505[d]**	**388**	**51,900**	**800**	**na**	**25,700**	**2,080,000**	**908**	**6490**	**389,000**
Residential SSL[c]				**31.3**	**15,600**	**na**	**96.6[d]**	**23.4**	**3130**	**400**	**na**	**1560**	**125,000**	**54.8**	**391**	**23,500**
RE33-20-186626	33-60414	0.0–1.0	FILL	—[e]	—	8180 (J)	—	—	102 (J+)	—	—	—	—	—	—	—
RE33-20-186632	33-60414	2.0–3.0	FILL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-222046	33-60415	4.0–5.0	QBT3	NA[f]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222047	33-60415	7.0–8.0	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-186634	33-60416	2.0–3.0	QBT3	—	—	—	10	—	—	—	—	—	—	—	1.21	—
RE33-20-186635	33-60417	2.0–3.0	QBT3	—	—	—	17.3	—	—	—	—	—	—	—	1.39	—
RE33-20-186630	33-60418	0.0–1.0	SOIL	—	—	—	—	—	385 (J+)	36.8	—	—	0.736 (J)	—	—	54.3
RE33-20-186636	33-60418	2.0–3.0	QBT3	—	—	—	21.7	—	37.5 (J+)	—	—	—	—	—	1.09	—
RE33-20-186631	33-60419	0.0–1.0	SOIL	—	—	—	—	—	392 (J+)	—	—	—	1.55	—	—	58.4
RE33-20-186637	33-60419	2.0–3.0	SOIL	—	—	—	—	—	48.9 (J+)	—	—	—	—	—	—	—
RE33-20-186638	33-60420	0.0–1.0	SOIL	—	—	—	—	—	—	—	—	—	0.902 (J)	0.000568 (J)	—	—
RE33-20-186640	33-60420	2.2–3.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	1.04	—
RE33-20-186639	33-60421	0.0–1.0	SOIL	—	—	—	—	—	82.7	—	—	—	1.17	—	—	—
RE33-20-186641	33-60421	2.0–3.0	QBT3	—	123	2270	9.68	3.36	6.34	—	—	7.52	—	—	1.18	—
RE33-20-186642	33-60422	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	1.17	—	—	—
RE33-20-186650	33-60422	2.0–2.9	FILL	—	—	—	—	—	—	—	—	—	—	0.00247	—	—
RE33-21-217579	33-60423	3–4	QBT3	NA	NA	NA	NA	NA	141 (J)	NA	NA	NA	NA	NA	NA	NA
RE33-21-217580	33-60423	5.0–6.0	QBT3	NA	NA	NA	NA	NA	28.6 (J)	NA	NA	NA	NA	NA	NA	NA
RE33-21-222048	33-60423	6.0–7.0	QBT2	NA	NA	NA	NA	NA	15.9 (J-)	NA	NA	NA	NA	NA	NA	NA
RE33-21-217581	33-60941	0–1	SOIL	NA	NA	NA	NA	NA	39.3	NA	NA	NA	NA	NA	NA	NA
RE33-21-217582	33-60941	2–3	FILL	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA	NA	NA
RE33-21-217583	33-60941	4.0–5.0	QBT3	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA	NA	NA
RE33-21-217584	33-60941	6.0–7.0	QBT3	NA	NA	NA	NA	NA	4.94	NA	NA	NA	NA	NA	NA	NA
RE33-21-217585	33-60942	0–1	SOIL	NA	NA	NA	NA	NA	100	NA	NA	NA	NA	NA	NA	NA
RE33-21-217586	33-60942	2–3	FILL	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA	NA	NA

Table 6.9-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Calcium	Chromium	Cobalt	Copper	Lead	Magnesium	Nickel	Nitrate	Perchlorate	Selenium	Zinc
Soil Background Value[a]				**0.83**	**295**	**6120**	**19.3**	**8.64**	**14.7**	**22.3**	**4610**	**15.4**	**na[b]**	**na**	**1.52**	**48.8**
Qbt 2,3,4 Background Value[a]				**0.5**	**46**	**2200**	**7.14**	**3.14**	**4.66**	**11.2**	**1690**	**6.58**	**na**	**na**	**0.3**	**63.5**
Sediment Background Value[a]				**0.83**	**127**	**4420**	**10.5**	**4.73**	**11.2**	**19.7**	**2370**	**9.38**	**na**	**na**	**0.3**	**60.2**
Construction Worker SSL[c]				**142**	**4390**	**na**	**134[d]**	**36.7**	**14,200**	**800**	**na**	**753**	**566,000**	**248**	**1750**	**106,000**
Industrial SSL[c]				**519**	**255,000**	**na**	**505[d]**	**388**	**51,900**	**800**	**na**	**25,700**	**2,080,000**	**908**	**6490**	**389,000**
Residential SSL[c]				**31.3**	**15,600**	**na**	**96.6[d]**	**23.4**	**3130**	**400**	**na**	**1560**	**125,000**	**54.8**	**391**	**23,500**
RE33-21-217587	33-60942	5.5–6.5	QBT3	NA	NA	NA	NA	NA	12.4	NA	NA	NA	NA	NA	NA	NA
RE33-21-217588	33-60942	7.5–8.5	QBT3	NA	NA	NA	NA	NA	5.55	NA	NA	NA	NA	NA	NA	NA
RE33-21-217589	33-60943	0–1	SOIL	NA	NA	NA	NA	NA	1790	NA	NA	NA	NA	NA	NA	NA
RE33-21-217591	33-60943	1.0–2.0	QBT3	NA	NA	NA	NA	NA	19.9	NA	NA	NA	NA	NA	NA	NA
RE33-21-217592	33-60943	3.0–4.0	QBT3	NA	NA	NA	NA	NA	6.29	NA	NA	NA	NA	NA	NA	NA
RE33-21-217593	33-60944	0–0.1	SOIL	NA	NA	NA	NA	NA	295	NA	NA	NA	NA	NA	NA	NA
RE33-21-217663	33-60944	0.1–1.1	QBT3	NA	NA	NA	NA	NA	24.1	NA	NA	NA	NA	NA	NA	NA
RE33-21-217596	33-60944	2.1–3.1	QBT3	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA	NA	NA
RE33-21-217597	33-60945	1–2	FILL	—	—	—	—	—	—	—	—	—	0.689 (J)	—	—	—
RE33-21-217598	33-60945	3–4	QBT3	—	—	4950	—	—	—	—	2630 (J+)	—	0.603 (J)	—	1.21	—
RE33-21-217599	33-60946	1.0–1.5	FILL	—	—	—	—	—	123 (J-)	—	—	—	0.937 (J)	—	—	—
RE33-21-217600	33-60946	3.0–4.0	QBT3	—	60.4	33,800	—	—	6.42 (J-)	—	3820 (J+)	—	0.775 (J)	0.00186	1.07	—
RE33-21-217601	33-60947	1–2	FILL	—	—	—	—	—	—	30.7	—	—	0.654 (J)	—	—	—
RE33-21-217602	33-60947	3.0–3.8	FILL	—	—	—	—	—	—	—	—	—	1.55	0.00103 (J)	—	—
RE33-21-217603	33-60948	0.2–1.2	QBT3	—	—	—	—	—	5.22 (J-)	—	—	—	—	—	1.43	—
RE33-21-217605	33-60948	2.2–3.2	QBT3	—	—	—	—	—	—	—	—	—	—	0.00048 (J)	1.33	—
RE33-21-217607	33-60949	1–2	SOIL	—	—	—	—	—	—	—	—	—	0.651 (J)	—	—	—
RE33-21-217608	33-60949	3.0–4.0	SOIL	—	—	—	—	—	—	—	—	—	—	0.00231	—	—
RE33-21-217609	33-60950	1.0–1.5	SOIL	—	—	—	—	—	113 (J-)	—	—	—	—	—	—	—
RE33-21-217610	33-60950	3–4	QBT3	—	—	—	—	—	14.5 (J-)	—	—	—	—	—	0.948 (J)	—
RE33-21-217611	33-60951	1–2	QBT3	—	—	—	—	—	—	—	—	—	—	—	1.21	—
RE33-21-217612	33-60951	3–4	QBT3	—	—	—	—	—	—	—	—	—	—	—	1.44	—
RE33-21-217613	33-60952	0.8–1.8	QBT3	—	—	—	—	—	—	—	—	—	—	—	1.37	—
RE33-21-217614	33-60952	2.8–3.8	QBT3	0.638 (U)	—	—	—	—	—	—	—	—	—	—	1.19	—
RE33-21-217615	33-60953	0.2–1.2	QBT3	—	—	—	—	—	—	—	—	—	—	—	1.29	—
RE33-21-217617	33-60953	2.2–3.2	QBT3	—	—	—	—	—	—	—	—	—	—	—	1.31	—

Table 6.9-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Calcium	Chromium	Cobalt	Copper	Lead	Magnesium	Nickel	Nitrate	Perchlorate	Selenium	Zinc
Soil Background Value[a]				**0.83**	**295**	**6120**	**19.3**	**8.64**	**14.7**	**22.3**	**4610**	**15.4**	**na[b]**	**na**	**1.52**	**48.8**
Qbt 2,3,4 Background Value[a]				**0.5**	**46**	**2200**	**7.14**	**3.14**	**4.66**	**11.2**	**1690**	**6.58**	**na**	**na**	**0.3**	**63.5**
Sediment Background Value[a]				**0.83**	**127**	**4420**	**10.5**	**4.73**	**11.2**	**19.7**	**2370**	**9.38**	**na**	**na**	**0.3**	**60.2**
Construction Worker SSL[c]				**142**	**4390**	**na**	**134[d]**	**36.7**	**14,200**	**800**	**na**	**753**	**566,000**	**248**	**1750**	**106,000**
Industrial SSL[c]				**519**	**255,000**	**na**	**505[d]**	**388**	**51,900**	**800**	**na**	**25,700**	**2,080,000**	**908**	**6490**	**389,000**
Residential SSL[c]				**31.3**	**15,600**	**na**	**96.6[d]**	**23.4**	**3130**	**400**	**na**	**1560**	**125,000**	**54.8**	**391**	**23,500**
RE33-21-217619	33-60954	0.4–1.4	QBT3	0.601 (U)	—	—	—	—	—	—	—	—	—	—	1.21	—
RE33-21-217620	33-60954	2.4–3.4	QBT3	—	—	—	—	—	—	—	—	—	—	—	1.46	—
RE33-21-217621	33-60955	0.3–1.3	QBT3	—	—	—	—	—	—	—	—	—	—	—	0.993 (J)	—
RE33-21-217622	33-60955	2.3–3.3	QBT3	—	—	—	—	—	—	—	—	—	—	—	0.988 (J)	—
RE33-21-217650	33-60957	0–1	SED	NA	NA	NA	NA	NA	1510 (J)	NA	NA	NA	NA	NA	NA	NA
RE33-21-217658	33-60957	2–3	QBT3	NA	NA	NA	NA	NA	910 (J)	NA	NA	NA	NA	NA	NA	NA
RE33-21-217662	33-60957	4–5	QBT3	NA	NA	NA	NA	NA	17.7 (J)	NA	NA	NA	NA	NA	NA	NA
RE33-21-217651	33-60958	0.0–1.0	SED	NA	NA	NA	NA	NA	2660 (J)	NA	NA	NA	NA	NA	NA	NA
RE33-21-217655	33-60958	2.0–2.2	SED	NA	NA	NA	NA	NA	378 (J)	NA	NA	NA	NA	NA	NA	NA
RE33-21-217595	33-60958	2.2–3.2	QBT3	NA	NA	NA	NA	NA	34.9	NA	NA	NA	NA	NA	NA	NA
RE33-21-217659	33-60958	4.2–5.2	QBT3	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA	NA	NA
RE33-21-217652	33-60959	0.0–0.5	FILL	NA	NA	NA	NA	NA	110 (J-)	NA	NA	NA	NA	NA	NA	NA
RE33-21-217660	33-60959	0.5–1.5	QBT3	NA	NA	NA	NA	NA	24.2 (J-)	NA	NA	NA	NA	NA	NA	NA
RE33-21-217664	33-60959	2.5–3.5	QBT3	NA	NA	NA	NA	NA	13.2 (J-)	NA	NA	NA	NA	NA	NA	NA
RE33-21-217653	33-60960	0.0–1.0	SOIL	NA	NA	NA	NA	NA	83.9	NA	NA	NA	NA	NA	NA	NA
RE33-21-217657	33-60960	2–2.3	SOIL	NA	NA	NA	NA	NA	39.1	NA	NA	NA	NA	NA	NA	NA
RE33-21-217661	33-60960	2.3–3.3	QBT3	NA	NA	NA	NA	NA	53.5	NA	NA	NA	NA	NA	NA	NA
RE33-21-217665	33-60960	4.3–5.3	QBT2	NA	NA	NA	NA	NA	14.3	NA	NA	NA	NA	NA	NA	NA
RE33-21-222049	33-61068	0.0–1.0	FILL	NA	NA	NA	NA	NA	432 (J)	NA	NA	NA	NA	NA	NA	NA
RE33-21-222050	33-61068	2.0–3.0	FILL	NA	NA	NA	NA	NA	139 (J)	NA	NA	NA	NA	NA	NA	NA
RE33-21-222051	33-61068	4.8–5.8	QBT3	NA	NA	NA	NA	NA	5.94 (J)	NA	NA	NA	NA	NA	NA	NA
RE33-21-222052	33-61068	6.8–7.8	QBT3	NA	NA	NA	NA	NA	4.94 (J)	NA	NA	NA	NA	NA	NA	NA
RE33-21-222053	33-61069	0.0–1.0	FILL	NA	NA	NA	NA	NA	1500 (J)	NA	NA	NA	NA	NA	NA	NA
RE33-21-222054	33-61069	2.0–3.0	FILL	NA	NA	NA	NA	NA	112 (J)	NA	NA	NA	NA	NA	NA	NA
RE33-21-222055	33-61069	4.8–5.8	QBT3	NA	NA	NA	NA	NA	10 (J)	NA	NA	NA	NA	NA	NA	NA
RE33-21-222056	33-61069	6.8–7.8	QBT3	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA	NA	NA

Table 6.9-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Calcium	Chromium	Cobalt	Copper	Lead	Magnesium	Nickel	Nitrate	Perchlorate	Selenium	Zinc
Soil Background Value[a]				**0.83**	**295**	**6120**	**19.3**	**8.64**	**14.7**	**22.3**	**4610**	**15.4**	**na[b]**	**na**	**1.52**	**48.8**
Qbt 2,3,4 Background Value[a]				**0.5**	**46**	**2200**	**7.14**	**3.14**	**4.66**	**11.2**	**1690**	**6.58**	**na**	**na**	**0.3**	**63.5**
Sediment Background Value[a]				**0.83**	**127**	**4420**	**10.5**	**4.73**	**11.2**	**19.7**	**2370**	**9.38**	**na**	**na**	**0.3**	**60.2**
Construction Worker SSL[c]				**142**	**4390**	**na**	**134[d]**	**36.7**	**14,200**	**800**	**na**	**753**	**566,000**	**248**	**1750**	**106,000**
Industrial SSL[c]				**519**	**255,000**	**na**	**505[d]**	**388**	**51,900**	**800**	**na**	**25,700**	**2,080,000**	**908**	**6490**	**389,000**
Residential SSL[c]				**31.3**	**15,600**	**na**	**96.6[d]**	**23.4**	**3130**	**400**	**na**	**1560**	**125,000**	**54.8**	**391**	**23,500**
RE33-21-222057	33-61070	0.0–1.0	FILL	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA	NA	NA
RE33-21-222058	33-61070	2.0–3.0	FILL	NA	NA	NA	NA	NA	97.1 (J)	NA	NA	NA	NA	NA	NA	NA
RE33-21-222059	33-61070	3.8–4.8	QBT3	NA	NA	NA	NA	NA	8.89 (J)	NA	NA	NA	NA	NA	NA	NA
RE33-21-222060	33-61070	5.8–6.8	QBT3	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA	NA	NA
RE33-21-222061	33-61071	0.0–1.0	FILL	NA	NA	NA	NA	NA	367 (J)	NA	NA	NA	NA	NA	NA	NA
RE33-21-222062	33-61071	2.0–3.0	FILL	NA	NA	NA	NA	NA	67.5 (J)	NA	NA	NA	NA	NA	NA	NA
RE33-21-222063	33-61071	4.0–5.0	QBT3	NA	NA	NA	NA	NA	12.7 (J)	NA	NA	NA	NA	NA	NA	NA
RE33-21-222064	33-61071	6.0–7.0	QBT3	NA	NA	NA	NA	NA	13.3 (J-)	NA	NA	NA	NA	NA	NA	NA
RE33-21-222065	33-61072	0.0–1.0	SOIL	NA	NA	NA	NA	NA	62.8 (J-)	NA	NA	NA	NA	NA	NA	NA
RE33-21-222067	33-61072	1.0–2.0	QBT3	NA	NA	NA	NA	NA	10.7 (J-)	NA	NA	NA	NA	NA	NA	NA
RE33-21-222068	33-61072	3.0–4.0	QBT3	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA	NA	NA
RE33-21-222069	33-61073	0.0–1.0	SOIL	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA	NA	NA
RE33-21-222071	33-61073	1.0–2.0	QBT3	NA	NA	NA	NA	NA	7.06 (J-)	NA	NA	NA	NA	NA	NA	NA
RE33-21-222072	33-61073	3.0–4.0	QBT3	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA	NA	NA
RE33-21-222073	33-61074	0.0–0.5	SOIL	NA	NA	NA	NA	NA	24.5 (J-)	NA	NA	NA	NA	NA	NA	NA
RE33-21-222075	33-61074	0.5–1.5	QBT3	NA	NA	NA	NA	NA	12.5 (J-)	NA	NA	NA	NA	NA	NA	NA
RE33-21-222076	33-61074	2.5–3.5	QBT3	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA	NA	NA
RE33-21-222077	33-61075	0.0–0.5	FILL	NA	NA	NA	NA	NA	28 (J-)	NA	NA	NA	NA	NA	NA	NA
RE33-21-222079	33-61075	0.5–1.5	QBT3	NA	NA	NA	NA	NA	6.9 (J-)	NA	NA	NA	NA	NA	NA	NA
RE33-21-222080	33-61075	2.5–3.5	QBT3	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA	NA	NA
RE33-21-222081	33-61076	0.0–0.4	SOIL	NA	NA	NA	NA	NA	48.6	NA	NA	NA	NA	NA	NA	NA
RE33-21-222083	33-61076	0.4–1.4	QBT3	NA	NA	NA	NA	NA	5.94	NA	NA	NA	NA	NA	NA	NA
RE33-21-222084	33-61076	1.4–2.4	QBT3	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA	NA	NA
RE33-21-222087	33-61077	0.0–1.0	QBT3	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA	NA	NA
RE33-21-222088	33-61077	2.0–3.0	QBT3	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA	NA	NA
RE33-21-222089	33-61078	0.0–0.2	SOIL	NA	NA	NA	NA	NA	602	NA	NA	NA	NA	NA	NA	NA

Table 6.9-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Calcium	Chromium	Cobalt	Copper	Lead	Magnesium	Nickel	Nitrate	Perchlorate	Selenium	Zinc
Soil Background Value[a]				**0.83**	**295**	**6120**	**19.3**	**8.64**	**14.7**	**22.3**	**4610**	**15.4**	**na[b]**	**na**	**1.52**	**48.8**
Qbt 2,3,4 Background Value[a]				**0.5**	**46**	**2200**	**7.14**	**3.14**	**4.66**	**11.2**	**1690**	**6.58**	**na**	**na**	**0.3**	**63.5**
Sediment Background Value[a]				**0.83**	**127**	**4420**	**10.5**	**4.73**	**11.2**	**19.7**	**2370**	**9.38**	**na**	**na**	**0.3**	**60.2**
Construction Worker SSL[c]				**142**	**4390**	**na**	**134[d]**	**36.7**	**14,200**	**800**	**na**	**753**	**566,000**	**248**	**1750**	**106,000**
Industrial SSL[c]				**519**	**255,000**	**na**	**505[d]**	**388**	**51,900**	**800**	**na**	**25,700**	**2,080,000**	**908**	**6490**	**389,000**
Residential SSL[c]				**31.3**	**15,600**	**na**	**96.6[d]**	**23.4**	**3130**	**400**	**na**	**1560**	**125,000**	**54.8**	**391**	**23,500**
RE33-21-222091	33-61078	0.2–1.2	QBT3	NA	NA	NA	NA	NA	13.5	NA	NA	NA	NA	NA	NA	NA
RE33-21-222092	33-61078	2.2–3.2	QBT3	NA	NA	NA	NA	NA	5.37	NA	NA	NA	NA	NA	NA	NA
RE33-21-222095	33-61079	0.0–1.0	QBT3	NA	NA	NA	NA	NA	19.7	NA	NA	NA	NA	NA	NA	NA
RE33-21-222096	33-61079	2.0–3.0	QBT3	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA	NA	NA
RE33-21-222097	33-61080	0.0–1.0	SOIL	NA	NA	NA	NA	NA	534 (J-)	NA	NA	NA	NA	NA	NA	NA
RE33-21-222098	33-61080	2.0–3.0	FILL	NA	NA	NA	NA	NA	—	NA	NA	NA	NA	NA	NA	NA
RE33-21-222099	33-61080	3.8–4.8	QBT2	NA	NA	NA	NA	NA	6.29 (J-)	NA	NA	NA	NA	NA	NA	NA
RE33-21-222100	33-61080	5.8–6.8	QBT2	NA	NA	NA	NA	NA	8.1 (J-)	NA	NA	NA	NA	NA	NA	NA
RE33-21-222101	33-61081	0.0–1.0	SOIL	NA	NA	NA	NA	NA	290 (J-)	NA	NA	NA	NA	NA	NA	NA
RE33-21-222103	33-61081	2.0–3.0	QBT2	NA	NA	NA	NA	NA	46.4 (J-)	NA	NA	NA	NA	NA	NA	NA
RE33-21-222104	33-61081	4.0–5.0	QBT2	NA	NA	NA	NA	NA	7.91 (J-)	NA	NA	NA	NA	NA	NA	NA
RE33-21-222105	33-61082	0.0–1.0	SOIL	NA	NA	NA	NA	NA	390 (J-)	NA	NA	NA	NA	NA	NA	NA
RE33-21-222106	33-61082	2.0–2.5	SOIL	NA	NA	NA	NA	NA	87.3 (J-)	NA	NA	NA	NA	NA	NA	NA
RE33-21-222107	33-61082	2.5–3.5	QBT2	NA	NA	NA	NA	NA	90.3 (J-)	NA	NA	NA	NA	NA	NA	NA
RE33-21-222108	33-61082	4.5–5.5	QBT2	NA	NA	NA	NA	NA	9.65 (J-)	NA	NA	NA	NA	NA	NA	NA
RE33-21-222109	33-61083	0.0–1.0	SOIL	NA	NA	NA	NA	NA	176	NA	NA	NA	NA	NA	NA	NA
RE33-21-222110	33-61083	2.0–2.5	SOIL	NA	NA	NA	NA	NA	140	NA	NA	NA	NA	NA	NA	NA
RE33-21-222111	33-61083	2.5–3.5	QBT2	NA	NA	NA	NA	NA	80.6	NA	NA	NA	NA	NA	NA	NA
RE33-21-222112	33-61083	4.5–5.5	QBT2	NA	NA	NA	NA	NA	17.9	NA	NA	NA	NA	NA	NA	NA

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2019, 700550) unless otherwise noted.

[d] SSL for total chromium.

[e] — = Not detected or not detected above BV.

[f] NA = Not analyzed.

Table 6.9-3
Organic Chemicals Detected at SWMU 33-006(a)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Butylbenzylphthalate	Carbazole	Chrysene	Di-n-butylphthalate
Construction Worker SSL[a]				**15,100**	**75,300**	**240**	**15**	**240**	**7530[b]**	**2310**	**1,100,000[c]**	**5380**	**99,000[e]**	**85[d,e]**	**23,100**	**26,900**
Industrial SSL[a]				**50,500**	**253,000**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**3,300,000[c]**	**1830**	**12,000**	**1200[c,d]**	**3230**	**91,600**
Residential SSL[a]				**3480**	**17,400**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**250,000[c]**	**380**	**2900**	**78[c,d]**	**153**	**6160**
RE33-20-186626	33-60414	0.0–1.0	FILL	—[f]	—	—	—	—	—	—	—	—	—	—	—	0.0171 (J)
RE33-20-186630	33-60418	0.0–1.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	0.0823 (J)
RE33-20-186631	33-60419	0.0–1.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	0.524
RE33-20-186637	33-60419	2.0–3.0	SOIL	0.0262 (J)	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186638	33-60420	0.0–1.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	0.0464
RE33-20-186639	33-60421	0.0–1.0	SOIL	—	—	—	—	0.0131 (J)	—	—	—	—	0.0271 (J)	—	—	—
RE33-21-217599	33-60946	1.0–1.5	FILL	—	—	0.0155 (J)	0.0172 (J)	0.0179 (J)	0.0124 (J)	—	—	—	—	—	0.0141 (J)	—
RE33-21-217601	33-60947	1–2	FILL	0.495	0.707	1.13	1.3	1.26	0.618	0.546	—	—	—	0.388	1.06	—
RE33-21-217602	33-60947	3.0–3.8	FILL	0.106	0.163	0.287	0.348	0.347	0.164	0.157	—	—	—	0.0868	0.284	—
RE33-21-217603	33-60948	0.2–1.2	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-217609	33-60950	1.0–1.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-217610	33-60950	3–4	QBT3	—	—	—	—	—	—	—	—	0.107 (J+)	—	—	—	—
RE33-21-217612	33-60951	3–4	QBT3	—	—	—	—	—	—	—	—	0.0105 (J)	—	—	—	—
RE33-21-217621	33-60955	0.3–1.3	QBT3	—	—	—	—	—	—	—	0.385 (J)	—	—	—	—	—
RE33-21-222062	33-61071	2.0–3.0	FILL	NA[g]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.175
RE33-21-222063	33-61071	4.0–5.0	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0114 (J)

Table 6.9-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Di-n-octylphthalate	Dibenz(a,h)anthracene	Dibenzofuran	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylnaphthalene[1-]	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene
Construction Worker SSL[a]				**2700[e]**	**24**	**85[e]**	**10,000**	**10,000**	**240**	**2740[h]**	**6060**	**1000**	**159**	**7530**	**7530**
Industrial SSL[a]				**8200[c]**	**3.23**	**1200[c]**	**33,700**	**33,700**	**32.3**	**14,200[h]**	**813**	**3370**	**241**	**25,300**	**25,300**
Residential SSL[a]				**630[c]**	**0.153**	**78[c]**	**2320**	**2320**	**1.53**	**2360[h]**	**172**	**232**	**49.7**	**1740**	**1740**
RE33-20-186626	33-60414	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186630	33-60418	0.0–1.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186631	33-60419	0.0–1.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186637	33-60419	2.0–3.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186638	33-60420	0.0–1.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186639	33-60421	0.0–1.0	SOIL	—	—	—	0.0156 (J)	—	—	—	—	—	—	—	0.0148 (J)
RE33-21-217599	33-60946	1.0–1.5	FILL	—	—	—	0.0213 (J)	—	—	—	—	—	—	0.0258 (J)	0.0289 (J)
RE33-21-217601	33-60947	1–2	FILL	—	—	0.509 (J)	1.64	0.794	0.536	—	0.268	0.455	1.67	2.87	2.18
RE33-21-217602	33-60947	3.0–3.8	FILL	—	0.0523	0.105 (J)	0.493	0.176	0.158	—	0.0586	0.0875	0.26	0.694	0.565
RE33-21-217603	33-60948	0.2–1.2	QBT3	—	—	—	—	—	—	—	—	—	0.000427 (J)	—	—
RE33-21-217609	33-60950	1.0–1.5	SOIL	—	—	—	—	—	—	0.00108 (J)	—	—	—	—	—
RE33-21-217610	33-60950	3–4	QBT3	0.0406	—	—	—	—	—	—	—	—	—	—	0.0116 (J)
RE33-21-217612	33-60951	3–4	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-217621	33-60955	0.3–1.3	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-222062	33-61071	2.0–3.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222063	33-61071	4.0–5.0	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] SSLs from NMED (2019, 700550) unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSLs from EPA regional screening level (RSL) tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

[d] Dibenzofuran used as a surrogate based on structural similarity.

[e] Construction worker SSLs calculated using the equations outlined in NMED (2019, 700550), incorporating toxicity and chemical-specific parameters from EPA RSL tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

[f] — = Not detected.

[g] NA = Not analyzed.

[h] Isopropylbenzene used as a surrogate based on structural similarity.

Table 6.9-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 33-006(a)

Sample ID	Location ID	Depth (ft)	Media	Uranium-234	Uranium-235/236	Uranium-238
Soil Background Value[a]				**2.59**	**0.2**	**2.29**
Qbt 2,3,4 Background Value[a]				**1.98**	**0.09**	**1.93**
Construction Worker SAL[b]				**1000**	**130**	**470**
Industrial SAL[b]				**3100**	**160**	**710**
Residential SAL[b]				**290**	**42**	**150**
RE33-20-186626	33-60414	0.0–1.0	FILL	10.7	1.16	11.7
RE33-20-186632	33-60414	2.0–3.0	FILL	—[c]	0.21	—
RE33-20-186635	33-60417	2.0–3.0	QBT3	—	0.162	—
RE33-20-186630	33-60418	0.0–1.0	SOIL	36.3 (J)	3.83 (J-)	39.4 (J)
RE33-20-186636	33-60418	2.0–3.0	QBT3	5.49 (J)	0.423 (J-)	5.88 (J)
RE33-20-186631	33-60419	0.0–1.0	SOIL	49.3 (J)	3.95	52.3 (J)
RE33-20-186637	33-60419	2.0–3.0	SOIL	10.4 (J)	0.624	10.3 (J)
RE33-20-186640	33-60420	2.2–3.0	QBT3	—	0.195	—
RE33-20-186639	33-60421	0.0–1.0	SOIL	—	0.287	2.85
RE33-20-186641	33-60421	2.0–3.0	QBT3	—	0.111	—
RE33-20-186642	33-60422	0.0–1.0	FILL	3.19 (J)	—	3.74 (J)
RE33-21-217603	33-60948	0.2–1.2	QBT3	—	0.127	—
RE33-21-217605	33-60948	2.2–3.2	QBT3	2.33	0.145	2.44
RE33-21-217609	33-60950	1.0–1.5	SOIL	6.45	0.444	6.94
RE33-21-217611	33-60951	1–2	QBT3	2.22	—	2.53

Note: Results are in pCi/g.

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

[b] SALs from LANL (2015, 600929).

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

Table 6.10-1
Samples Collected and Analyses Requested at SWMU 33-007(c)

Sample ID	Location ID	Depth (ft)	Media	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOCs	SVOCs	Explosive Compounds	Cyanide	Inorganic Anions
RE33-20-189624	33-01199	0.0–1.0	ALLH	N3B-2020-877	N3B-2020-877	N3B-2020-877	N3B-2020-877	N3B-2020-877	N3B-2020-877	N3B-2020-878	N3B-2020-877	N3B-2020-877
RE33-20-189625	33-01199	2.0–3.0	ALLH	N3B-2020-877	N3B-2020-877	N3B-2020-877	N3B-2020-877	N3B-2020-877	N3B-2020-877	N3B-2020-878	N3B-2020-877	N3B-2020-877
RE33-20-189626	33-01199	4.0–5.0	ALLH	N3B-2020-877	N3B-2020-877	N3B-2020-877	N3B-2020-877	N3B-2020-877	N3B-2020-877	N3B-2020-878	N3B-2020-877	N3B-2020-877
RE33-20-189627	33-01203	0.0–1.0	FILL	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-871	N3B-2020-870	N3B-2020-870
RE33-20-189628	33-01203	2.0–3.0	TCB	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-871	N3B-2020-870	N3B-2020-870
RE33-20-189629	33-01203	4.0–5.0	TCB	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-871	N3B-2020-870	N3B-2020-870
RE33-20-189630	33-01204	0.0–1.0	ALLH	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-871	N3B-2020-870	N3B-2020-870
RE33-20-189631	33-01204	2.0–3.0	TCB	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-871	N3B-2020-870	N3B-2020-870
RE33-20-189632	33-01204	4.0–5.0	TCB	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-871	N3B-2020-870	N3B-2020-870
RE33-20-189633	33-01206	0.0–1.0	ALLH	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-871	N3B-2020-870	N3B-2020-870
RE33-20-189634	33-01206	2.0–3.0	TCB	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-871	N3B-2020-870	N3B-2020-870
RE33-20-189635	33-01206	4.0–5.0	TCB	N3B-2020-877	N3B-2020-877	N3B-2020-877	N3B-2020-877	N3B-2020-877	N3B-2020-877	N3B-2020-878	N3B-2020-877	N3B-2020-877
RE33-20-189636	33-01211	0.0–1.0	FILL	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-871	N3B-2020-870	N3B-2020-870
RE33-20-189637	33-01211	2.0–3.0	FILL	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-871	N3B-2020-870	N3B-2020-870
RE33-20-189638	33-01211	4.0–5.0	TCB	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-870	N3B-2020-871	N3B-2020-870	N3B-2020-870
RE33-20-189639	33-01212	0.0–1.0	FILL	N3B-2020-865	N3B-2020-865	N3B-2020-865	N3B-2020-865	N3B-2020-865	N3B-2020-865	N3B-2020-866	N3B-2020-865	N3B-2020-865
RE33-20-189640	33-01212	2.0–3.0	TCB	N3B-2020-865	N3B-2020-865	N3B-2020-865	N3B-2020-865	N3B-2020-865	N3B-2020-865	N3B-2020-866	N3B-2020-865	N3B-2020-865
RE33-20-189641	33-01212	4.0–5.0	TCB	N3B-2020-865	N3B-2020-865	N3B-2020-865	N3B-2020-865	N3B-2020-865	N3B-2020-865	N3B-2020-866	N3B-2020-865	N3B-2020-865
RE33-20-189603	33-60541	0.0–1.0	FILL	N3B-2020-1053	N3B-2020-1053	N3B-2020-1053	N3B-2020-1053	N3B-2020-1053	N3B-2020-1053	N3B-2020-1054	N3B-2020-1053	N3B-2020-1053
RE33-20-189606	33-60541	2.0–3.0	FILL	N3B-2020-1053	N3B-2020-1053	N3B-2020-1053	—[a]	N3B-2020-1053	N3B-2020-1053	N3B-2020-1054	N3B-2020-1053	N3B-2020-1053
RE33-21-221827	33-60541	2.0–3.0	FILL	—	—	—	N3B-2021-1132	—	—	—	—	—
RE33-20-189609	33-60541	4.5–5.5	TCB	N3B-2020-1053	N3B-2020-1053	N3B-2020-1053	—	N3B-2020-1053	N3B-2020-1053	N3B-2020-1054	N3B-2020-1053	N3B-2020-1053
RE33-21-221828	33-60541	4.0–5.0	TCB	—	—	—	N3B-2021-1132	—	—	—	—	—
RE33-21-217569	33-60541	6.0–7.0	TCB	—	N3B-2021-708[b]	—	—	—	—	—	—	—
RE33-21-217570	33-60541	8.0–9.0	TCB	—	N3B-2021-708[b]	—	—	—	—	—	—	—
RE33-20-189604	33-60542	0.0–1.0	FILL	N3B-2020-1053	N3B-2020-1053	N3B-2020-1053	N3B-2020-1053	N3B-2020-1053	N3B-2020-1053	N3B-2020-1054	N3B-2020-1053	N3B-2020-1053
RE33-20-189605	33-60543	0.0–1.0	FILL	N3B-2020-1069	N3B-2020-1069	N3B-2020-1069	—	N3B-2020-1069	N3B-2020-1069	N3B-2020-1070	N3B-2020-1069	N3B-2020-1069
RE33-20-189608	33-60543	2.0–3.0	FILL	N3B-2020-1069	N3B-2020-1069	N3B-2020-1069	—	N3B-2020-1069	N3B-2020-1069	N3B-2020-1070	N3B-2020-1069	N3B-2020-1069
RE33-20-189611	33-60543	7.0–8.0	TCB	N3B-2020-1069	N3B-2020-1069	N3B-2020-1069	—	N3B-2020-1069	N3B-2020-1069	N3B-2020-1070	N3B-2020-1069	N3B-2020-1069

Table 6.10-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOCs	SVOCs	Explosive Compounds	Cyanide	Inorganic Anions
RE33-21-217571	33-60543	9.0–10.0	TCB	—	N3B-2021-712[b]	—	—	—	—	—	—	—
RE33-21-217572	33-60543	11.0–12.0	TCB	—	N3B-2021-712[b]	—	—	—	—	—	—	—
RE33-20-189612	33-60544	0.0–1.0	FILL	N3B-2020-877	N3B-2020-877	N3B-2020-877	N3B-2020-877	N3B-2020-877	N3B-2020-877	N3B-2020-878	N3B-2020-877	N3B-2020-877
RE33-20-189616	33-60544	2.0–3.0	FILL	N3B-2020-877	N3B-2020-877	N3B-2020-877	—	N3B-2020-877	N3B-2020-877	N3B-2020-878	N3B-2020-877	N3B-2020-877
RE33-21-217573	33-60544	2.0–3.0	FILL	—	—	—	N3B-2021-712	—	—	—	—	—
RE33-20-189620	33-60544	4.0–4.75	TCB	N3B-2020-877	N3B-2020-877	N3B-2020-877	—	N3B-2020-877	N3B-2020-877	N3B-2020-878	N3B-2020-877	N3B-2020-877
RE33-21-217574	33-60544	4–4.75	TCB	—	—	—	N3B-2021-712	—	—	—	—	—
RE33-20-189613	33-60545	0.0–1.0	FILL	N3B-2020-1069	N3B-2020-1069	N3B-2020-1069	N3B-2020-1069	N3B-2020-1069	N3B-2020-1069	N3B-2020-1070	N3B-2020-1069	N3B-2020-1069
RE33-20-189617	33-60545	2.0–3.0	FILL	N3B-2020-1069	N3B-2020-1069	N3B-2020-1069	—	N3B-2020-1069	N3B-2020-1069	N3B-2020-1070	N3B-2020-1069	N3B-2020-1069
RE33-21-221831	33-60545	2.0–3.0	FILL	—	—	—	N3B-2021-1132	—	—	—	—	—
RE33-20-189621	33-60545	4.0–5.0	FILL	N3B-2020-1069	N3B-2020-1069	N3B-2020-1069	—	N3B-2020-1069	N3B-2020-1069	N3B-2020-1070	N3B-2020-1069	N3B-2020-1069
RE33-21-221832	33-60545	4.0–5.0	FILL	—	—	—	N3B-2021-1132	—	—	—	—	—
RE33-20-189614	33-60546	0.0–1.0	FILL	N3B-2020-877	N3B-2020-877	N3B-2020-877	—	N3B-2020-877	N3B-2020-877	N3B-2020-878	N3B-2020-877	N3B-2020-877
RE33-20-189618	33-60546	2.0–3.0	ALLH	N3B-2020-877	N3B-2020-877	N3B-2020-877	—	N3B-2020-877	N3B-2020-877	N3B-2020-878	N3B-2020-877	N3B-2020-877
RE33-20-189622	33-60546	4.0–5.0	ALLH	N3B-2020-877	N3B-2020-877	N3B-2020-877	—	N3B-2020-877	N3B-2020-877	N3B-2020-878	N3B-2020-877	N3B-2020-877
RE33-20-189615	33-60547	0.0–1.0	FILL	N3B-2020-1069	N3B-2020-1069	N3B-2020-1069	—	N3B-2020-1069	N3B-2020-1069	N3B-2020-1070	N3B-2020-1069	N3B-2020-1069
RE33-20-189619	33-60547	2.0–3.0	FILL	N3B-2020-1069	N3B-2020-1069	N3B-2020-1069	—	N3B-2020-1069	N3B-2020-1069	N3B-2020-1070	N3B-2020-1069	N3B-2020-1069
RE33-20-189623	33-60547	4.0–5.0	TCB	N3B-2020-1069	N3B-2020-1069	N3B-2020-1069	—	N3B-2020-1069	N3B-2020-1069	N3B-2020-1070	N3B-2020-1069	N3B-2020-1069
RE33-21-217575	33-60547	6.0–7.0	TCB	—	N3B-2021-708[b]	—	—	—	—	—	—	—
RE33-21-217576	33-60547	8.0–9.0	TCB	—	N3B-2021-708[b]	—	—	—	—	—	—	—

Note: Numbers in analyte columns are request numbers.

[a] — = Analysis not requested.

[b] Sample analyzed for cobalt only.

Table 6.10-2
Inorganic Chemicals above BVs at SWMU 33-007(c)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium
Soil Background Value[a]				**29,200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**21,500**	**22.3**	**4610**
Construction Worker SSL[b]				**41,400**	**142**	**41.2**	**4390**	**148**	**72.1**	**na[c]**	**134[d]**	**36.7**	**14,200**	**248,000**	**800**	**na**
Industrial SSL[b]				**1,290,000**	**519**	**35.9**	**255,000**	**2580**	**1110**	**na**	**505[d]**	**388**	**51,900**	**908,000**	**800**	**na**
Residential SSL[b]				**78,000**	**31.3**	**7.07**	**15,600**	**156**	**70.5**	**na**	**96.6[d]**	**23.4**	**3130**	**54,800**	**400**	**na**
RE33-20-189624	33-01199	0.0–1.0	SOIL	—[e]	1.54 (U)	—	—	—	0.409 (J)	—	—	11.4	15.1	—	—	7820
RE33-20-189625	33-01199	2.0–3.0	SOIL	—	—	—	—	—	—	—	—	—	15.3	—	—	8530
RE33-20-189626	33-01199	4.0–5.0	SOIL	—	0.949 (U)	—	—	—	—	—	—	—	15.1	—	—	7350
RE33-20-189627	33-01203	0.0–1.0	FILL	—	1.48 (U)	—	—	—	—	6400	39.5 (J+)	—	—	—	23.8 (J+)	—
RE33-20-189628	33-01203	2.0–3.0	TCB	8590	—	1.38	166	0.928	—	5750	13.3 (J+)	10.1	14.9	14,500	3.91 (J+)	9230
RE33-20-189629	33-01203	4.0–5.0	TCB	7490	—	0.592 (J)	178	0.369	—	9290	18.3 (J+)	13.2	18.4	16,200	—	12,100
RE33-20-189630	33-01204	0.0–1.0	SOIL	—	—	—	344	—	—	—	21.4 (J+)	15.1	17.9	23,900	—	6840
RE33-20-189631	33-01204	2.0–3.0	TCB	17,200	—	3.17	192	1.37	—	15,800	14.6 (J+)	13.4	18.9	21,800	8.06 (J+)	12,000
RE33-20-189632	33-01204	4.0–5.0	TCB	12,500	—	3.63	219	0.552	—	81,800	9.28 (J+)	11.2	21.7	15,400	—	22,700
RE33-20-189633	33-01206	0.0–1.0	SOIL	—	—	—	356	—	—	—	—	14.3	15.4	22,200	—	6710
RE33-20-189634	33-01206	2.0–3.0	TCB	21,000	—	1.98	454	1.46	—	14,000	15.8 (J+)	18	17.9	25,600	7.41 (J+)	14,600
RE33-20-189635	33-01206	4.0–5.0	TCB	11,700	—	1.67	133	0.701	0.18 (J)	16,400	12.8	7.79	16	15,100	3.78 (J+)	13,900
RE33-20-189636	33-01211	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	18.1	—	—	—
RE33-20-189637	33-01211	2.0–3.0	FILL	—	1.41 (U)	—	—	—	—	—	—	10.8	32.7	—	—	8540
RE33-20-189638	33-01211	4.0–5.0	TCB	6320	—	0.427 (J)	142	0.332	—	5830	12.7 (J+)	12.5	20.9	15,100	—	10,100
RE33-20-189639	33-01212	0.0–1.0	FILL	—	—	—	—	—	—	7290 (J)	—	—	—	—	—	—
RE33-20-189640	33-01212	2.0–3.0	TCB	3440 (J+)	—	0.908 (J)	101	0.438	—	3320 (J)	9.21 (J)	5.63	13	8050	26.5	4410
RE33-20-189641	33-01212	4.0–5.0	TCB	4090 (J+)	—	0.451 (J)	85.4	0.235	—	4100 (J)	11.2 (J)	7.08	17.7	11,200	2.05 (J)	6690
RE33-20-189603	33-60541	0.0–1.0	FILL	—	3.43 (J+)	—	—	—	—	—	—	14.7 (J)	20.9	—	—	—
RE33-20-189606	33-60541	2.0–3.0	FILL	—	—	—	—	—	—	7020	—	—	—	—	—	—
RE33-20-189609	33-60541	4.5–5.5	TCB	4350	—	0.892 (J)	135	0.372	—	3600	16.1	225 (J)	50.1	13,700	2.39	8200
RE33-21-217569	33-60541	6–7	TCB	NA[f]	NA	NA	NA	NA	NA	NA	NA	8.31	NA	NA	NA	NA
RE33-21-217570	33-60541	8–9	TCB	NA	NA	NA	NA	NA	NA	NA	NA	20	NA	NA	NA	NA
RE33-20-189604	33-60542	0.0–1.0	FILL	—	2.29 (U)	—	—	—	—	—	—	—	—	—	—	—
RE33-20-189605	33-60543	0.0–1.0	FILL	—	2.4	—	—	—	—	—	—	—	20.6	—	—	—
RE33-20-189608	33-60543	2.0–3.0	FILL	—	—	—	—	—	—	18,500	—	—	—	—	—	—

Table 6.10-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium
Soil Background Value[a]				**29,200**	**0.83**	**8.17**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**21,500**	**22.3**	**4610**
Construction Worker SSL[b]				**41,400**	**142**	**41.2**	**4390**	**148**	**72.1**	**na[c]**	**134[d]**	**36.7**	**14,200**	**248,000**	**800**	**na**
Industrial SSL[b]				**1,290,000**	**519**	**35.9**	**255,000**	**2580**	**1110**	**na**	**505[d]**	**388**	**51,900**	**908,000**	**800**	**na**
Residential SSL[b]				**78,000**	**31.3**	**7.07**	**15,600**	**156**	**70.5**	**na**	**96.6[d]**	**23.4**	**3130**	**54,800**	**400**	**na**
RE33-20-189611	33-60543	7.0–8.0	TCB	4300	—	0.85 (J)	126	0.308	0.816	8480	12.9	76.5	17.9	10100	1.44 (J)	6870
RE33-21-217571	33-60543	9–10	TCB	NA	NA	NA	NA	NA	NA	NA	NA	8.77	NA	NA	NA	NA
RE33-21-217572	33-60543	11–12	TCB	NA	NA	NA	NA	NA	NA	NA	NA	7.16	NA	NA	NA	NA
RE33-20-189612	33-60544	0.0–1.0	FILL	—	2.53 (U)	—	—	—	—	12,600	—	—	19.2	—	—	—
RE33-20-189616	33-60544	2.0–3.0	FILL	—	1.03 (U)	—	—	—	—	—	—	—	—	—	—	—
RE33-20-189620	33-60544	4.0–4.75	TCB	1160	—	—	22.2	0.131	—	1080	1.76	0.62	1.72 (J)	2080	—	1660
RE33-20-189613	33-60545	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	17.1	—	—	—
RE33-20-189617	33-60545	2.0–3.0	FILL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-189621	33-60545	4.0–5.0	FILL	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-189614	33-60546	0.0–1.0	FILL	—	2.01 (U)	—	—	—	—	—	25.5	—	24.3	—	—	—
RE33-20-189618	33-60546	2.0–3.0	SOIL	—	0.919 (U)	—	—	—	—	20,500	—	—	—	—	—	—
RE33-20-189622	33-60546	4.0–5.0	SOIL	—	7.58 (J+)	—	—	—	—	11,300	—	—	—	—	—	5130
RE33-20-189615	33-60547	0.0–1.0	FILL	—	2.58	—	—	—	—	—	—	—	22	—	—	—
RE33-20-189619	33-60547	2.0–3.0	FILL	—	1.78 (U)	—	—	—	0.538 (U)	25,900	—	—	—	—	—	5470
RE33-20-189623	33-60547	4.0–5.0	TCB	6490	—	1.48	136	0.518	0.18 (J)	8540	6.79	94.3	16.1	12,800	5	7540
RE33-21-217575	33-60547	6–7	TCB	NA	NA	NA	NA	NA	NA	NA	NA	11.8	NA	NA	NA	NA
RE33-21-217576	33-60547	8–9	TCB	NA	NA	NA	NA	NA	NA	NA	NA	10.1	NA	NA	NA	NA

Table 6.10-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
Soil Background Value[a]				**671**	**0.1**	**15.4**	**na[c]**	**na**	**3460**	**1.52**	**1**	**915**	**0.73**	**39.6**	**48.8**
Construction Worker SSL[b]				**464**	**77.1**	**753**	**566,000**	**248**	**na**	**1750**	**1770**	**na**	**3.54**	**614**	**106,000**
Industrial SSL[b]				**160,000**	**389**	**25,700**	**2,080,000**	**908**	**na**	**6490**	**6490**	**na**	**13**	**6530**	**389,000**
Residential SSL[b]				**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**na**	**391**	**391**	**na**	**0.782**	**394**	**23,500**
RE33-20-189624	33-01199	0.0–1.0	SOIL	—	—	53.3	1.51	—	—	—	—	—	—	—	—
RE33-20-189625	33-01199	2.0–3.0	SOIL	—	—	44.9	—	—	—	—	—	—	—	—	—
RE33-20-189626	33-01199	4.0–5.0	SOIL	—	—	31.2	—	—	—	—	—	—	—	—	—
RE33-20-189627	33-01203	0.0–1.0	FILL	—	—	25.9	1 (J)	—	—	—	—	—	—	—	—
RE33-20-189628	33-01203	2.0–3.0	TCB	276	0.0148 (J)	49.8	—	—	1370 (J+)	1.35	—	317	—	15.9	23.3 (J+)
RE33-20-189629	33-01203	4.0–5.0	TCB	309	0.0103 (J)	43.6	1.36	—	1370 (J+)	0.688 (J)	—	657	—	19.9	21.3 (J+)
RE33-20-189630	33-01204	0.0–1.0	SOIL	—	—	25.7	—	—	—	1.64	—	—	—	44.2	—
RE33-20-189631	33-01204	2.0–3.0	TCB	387	0.0272	47.8	—	0.00593	2750 (J+)	1.61	—	2880	0.192 (J)	39.1	36.7 (J+)
RE33-20-189632	33-01204	4.0–5.0	TCB	275	0.0206 (J)	35.6	—	0.0117	2550 (J+)	1.36	—	4750	—	35.5	28.2 (J+)
RE33-20-189633	33-01206	0.0–1.0	SOIL	—	—	39.4	2.99	0.000582 (J)	—	1.71	—	—	—	—	—
RE33-20-189634	33-01206	2.0–3.0	TCB	408	0.0261	56.6	0.756 (J)	—	2830 (J+)	1.41	—	418	0.173 (J)	28.4	34.4 (J+)
RE33-20-189635	33-01206	4.0–5.0	TCB	231	0.026 (J)	45.4	—	0.00174 (J)	2230 (J+)	1.01 (J)	—	829	—	20.3	20.2
RE33-20-189636	33-01211	0.0–1.0	FILL	—	—	21.1	—	0.0009 (J)	—	—	—	—	—	—	—
RE33-20-189637	33-01211	2.0–3.0	FILL	—	—	83.3	—	—	—	—	—	—	—	—	—
RE33-20-189638	33-01211	4.0–5.0	TCB	271	—	60.4	—	—	1880 (J+)	0.715 (J)	0.111 (J)	1160	—	22.4	21.7 (J+)
RE33-20-189639	33-01212	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-189640	33-01212	2.0–3.0	TCB	170	—	41.9	—	—	783	0.906 (J)	—	390	—	10.5	10.2
RE33-20-189641	33-01212	4.0–5.0	TCB	175	—	35.9	—	—	917	0.824 (J)	—	480	—	16.3	12.8
RE33-20-189603	33-60541	0.0–1.0	FILL	—	0.124	31.4	2.75	—	—	—	—	—	—	—	—
RE33-20-189606	33-60541	2.0–3.0	FILL	—	—	19.2	11.9	—	—	—	—	—	—	—	—
RE33-20-189609	33-60541	4.5–5.5	TCB	220	—	72.2	7.47	—	1340	0.749 (J)	18.5	773 (J+)	—	14.1	26.6
RE33-21-217569	33-60541	6–7	TCB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217570	33-60541	8–9	TCB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-189604	33-60542	0.0–1.0	FILL	—	—	20.8	0.762 (J)	—	—	—	—	—	—	—	—
RE33-20-189605	33-60543	0.0–1.0	FILL	—	—	41.4	1.37	—	—	1.58	—	—	—	—	—
RE33-20-189608	33-60543	2.0–3.0	FILL	—	—	—	1.55	—	—	—	—	—	—	—	—

Table 6.10-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
Soil Background Value[a]				**671**	**0.1**	**15.4**	**na[c]**	**na**	**3460**	**1.52**	**1**	**915**	**0.73**	**39.6**	**48.8**
Construction Worker SSL[b]				**464**	**77.1**	**753**	**566,000**	**248**	**na**	**1750**	**1770**	**na**	**3.54**	**614**	**106,000**
Industrial SSL[b]				**160,000**	**389**	**25,700**	**2,080,000**	**908**	**na**	**6490**	**6490**	**na**	**13**	**6530**	**389,000**
Residential SSL[b]				**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**na**	**391**	**391**	**na**	**0.782**	**394**	**23,500**
RE33-20-189611	33-60543	7.0–8.0	TCB	144	—	42.5	5.87	—	1180	0.799 (J)	10.3	616	—	12.2	13.5 (J+)
RE33-21-217571	33-60543	9–10	TCB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217572	33-60543	11–12	TCB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-189612	33-60544	0.0–1.0	FILL	—	0.11	27.7	0.982 (J)	—	—	—	—	—	—	—	—
RE33-20-189616	33-60544	2.0–3.0	FILL	—	—	—	4.64	—	—	—	—	—	—	—	—
RE33-20-189620	33-60544	4.0–4.75	TCB	53.5	—	4.6	17.9	—	413 (J+)	—	—	223	—	1.6	6.19
RE33-20-189613	33-60545	0.0–1.0	FILL	—	—	24.6	0.883 (J)	—	—	1.67	—	—	—	—	—
RE33-20-189617	33-60545	2.0–3.0	FILL	—	—	20.9	—	—	—	—	—	—	—	—	—
RE33-20-189621	33-60545	4.0–5.0	FILL	—	—	—	0.893 (J)	—	—	—	—	—	—	—	—
RE33-20-189614	33-60546	0.0–1.0	FILL	—	0.174	27.1	3.65	—	—	—	—	—	—	—	—
RE33-20-189618	33-60546	2.0–3.0	SOIL	—	—	—	17.7	—	—	—	—	—	—	—	—
RE33-20-189622	33-60546	4.0–5.0	SOIL	—	—	—	112	0.000699 (J)	—	—	—	—	—	—	—
RE33-20-189615	33-60547	0.0–1.0	FILL	—	0.111	34.7	0.86 (J)	—	—	1.65	—	—	—	—	—
RE33-20-189619	33-60547	2.0–3.0	FILL	—	—	84	4.13	—	—	—	—	—	—	—	—
RE33-20-189623	33-60547	4.0–5.0	TCB	254	0.022 (J)	69.8	3.13	—	1830	1.18	11	541	—	15.2	26.3 (J+)
RE33-21-217575	33-60547	6–7	TCB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217576	33-60547	8–9	TCB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] SSLs from NMED (2019, 700550) unless otherwise noted.

[c] na = Not available.

[d] SSL for total chromium.

[e] — = Not detected or not detected above BV.

[f] NA= Not analyzed.

Table 6.10-3
Organic Chemicals Detected at SWMU 33-007(c)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Aroclor-1254	Aroclor-1260	Benzene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Chrysene	Di-n-butylphthalate
Construction Worker SSL[a]				**242,000**	**4.91**	**85.3**	**142**	**15.0**	**240**	**7530[b]**	**2310**	**5380**	**23,100**	**26,900**
Industrial SSL[a]				**960,000**	**11**	**11.1**	**87.2**	**23.6**	**32.3**	**25,300[b]**	**323**	**1830**	**3230**	**91,600**
Residential SSL[a]				**66,300**	**1.14**	**2.43**	**17.8**	**1.12**	**1.53**	**1740[b]**	**15.3**	**380**	**153**	**6160**
RE33–20–189624	33–01199	0.0–1.0	SOIL	—[c]	0.00281 (J)	0.00178 (J)	—	—	—	—	—	—	—	—
RE33–20–189627	33–01203	0.0–1.0	FILL	—	0.119	0.0341	—	—	—	—	—	—	—	—
RE33–20–189628	33–01203	2.0–3.0	TCB	—	0.0103	0.00372	—	—	—	—	—	—	—	—
RE33–20–189631	33–01204	2.0–3.0	TCB	—	—	—	—	—	—	—	—	—	—	—
RE33–20–189632	33–01204	4.0–5.0	TCB	—	—	—	—	—	—	—	—	0.0147 (J)	—	—
RE33–20–189633	33–01206	0.0–1.0	SOIL	—	0.00163 (J)	—	—	—	—	—	—	—	—	—
RE33–20–189636	33–01211	0.0–1.0	FILL	—	0.0166	0.0138	—	—	—	—	—	—	—	—
RE33–20–189638	33–01211	4.0–5.0	TCB	—	—	—	—	—	—	—	—	—	—	—
RE33–20–189639	33–01212	0.0–1.0	FILL	—	0.00531	0.00569	—	—	—	—	—	—	—	—
RE33–20–189641	33–01212	4.0–5.0	TCB	0.00656	—	—	—	—	—	—	0.0292 (J)	—	0.0358 (J)	—
RE33–20–189603	33–60541	0.0–1.0	FILL	—	0.239	0.0813	—	—	—	—	—	0.0783 (J)	—	—
RE33–20–189606	33–60541	2.0–3.0	FILL	—	NA	NA	—	0.014 (J)	0.0246 (J)	0.0182 (J)	—	—	—	—
RE33–21–221827	33–60541	2.0–3.0	FILL	NA[d]	0.0944	0.0454	NA	NA	NA	NA	NA	NA	NA	NA
RE33–20–189609	33–60541	4.5–5.5	TCB	—	NA	NA	—	—	—	—	—	0.0152 (J)	—	—
RE33–20–189604	33–60542	0.0–1.0	FILL	—	0.164	0.0572	—	—	—	—	—	—	—	—
RE33–20–189605	33–60543	0.0–1.0	FILL	—	NA	NA	—	—	0.0535 (J)	0.108 (J)	—	—	—	—
RE33–20–189611	33–60543	7.0–8.0	TCB	—	NA	NA	—	—	—	—	—	0.0112 (J)	—	0.045
RE33–20–189612	33–60544	0.0–1.0	FILL	—	1.18	0.292	—	—	—	—	—	—	—	0.0266 (J)
RE33–21–217573	33–60544	2–3	FILL	NA	0.0027 (J)	—	NA	NA	NA	NA	NA	NA	NA	NA
RE33–21–217574	33–60544	4–4.75	TCB	NA	0.00292 (J)	—	NA	NA	NA	NA	NA	NA	NA	NA
RE33–20–189613	33–60545	0.0–1.0	FILL	—	0.161	0.0574	—	—	—	—	—	—	—	—
RE33–20–189621	33–60545	4.0–5.0	FILL	—	NA	NA	—	—	—	—	—	—	—	0.0236 (J-)
RE33–20–189614	33–60546	0.0–1.0	FILL	—	NA	NA	0.000727 (J)	—	—	—	—	—	—	0.0434
RE33–20–189622	33–60546	4.0–5.0	SOIL	—	NA	NA	—	—	—	—	—	—	—	0.0124 (J)

Table 6.10-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Aroclor-1254	Aroclor-1260	Benzene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Chrysene	Di-n-butylphthalate
Construction Worker SSL[a]				**242,000**	**4.91**	**85.3**	**142**	**15.0**	**240**	**7530[b]**	**2310**	**5380**	**23,100**	**26,900**
Industrial SSL[a]				**960,000**	**11**	**11.1**	**87.2**	**23.6**	**32.3**	**25,300[b]**	**323**	**1830**	**3230**	**91,600**
Residential SSL[a]				**66,300**	**1.14**	**2.43**	**17.8**	**1.12**	**1.53**	**1740[b]**	**15.3**	**380**	**153**	**6160**
RE33–20–189615	33–60547	0.0–1.0	FILL	—	NA	NA	—	—	—	—	—	—	—	1
RE33–20–189619	33–60547	2.0–3.0	FILL	—	NA	NA	—	—	—	—	—	0.0162 (J)	—	0.0374 (J)
RE33–20–189623	33–60547	4.0–5.0	TCB	—	NA	NA	—	—	—	—	—	0.085	—	0.0658

Table 6.10-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Diethylphthalate	Dinitrotoluene[2,4-]	Hexanone[2-]	Isophorone	Methylene Chloride	Methylnaphthalene[1-]	Methylnaphthalene[2-]	Naphthalene	RDX	Toluene	Trichloroethene	Xylene[1,3-]+Xylene[1,4-]
Construction Worker SSL[a]				**215,000**	**536**	**340[e]**	**53,700[e]**	**1210**	**6060**	**1000**	**159**	**1350**	**14,000**	**6.90**	**798**
Industrial SSL[a]				**733,000**	**82.3**	**1300[f]**	**27,000[f]**	**5130**	**813**	**3370**	**241**	**428**	**61,300**	**36.5**	**4280**
Residential SSL[a]				**49,300**	**17.1**	**200[f]**	**5610[f]**	**409**	**172**	**232**	**49.7**	**83.1**	**5230**	**6.77**	**871**
RE33–20–189624	33–01199	0.0–1.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	—
RE33–20–189627	33–01203	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	0.00103 (J)	—	—
RE33–20–189628	33–01203	2.0–3.0	TCB	—	—	—	—	—	—	—	—	—	0.000512 (J)	—	—
RE33–20–189631	33–01204	2.0–3.0	TCB	—	—	—	—	—	—	—	—	—	0.000713 (J)	—	—
RE33–20–189632	33–01204	4.0–5.0	TCB	—	—	—	—	—	—	—	—	—	0.000408 (J)	—	—
RE33–20–189633	33–01206	0.0–1.0	SOIL	—	—	—	—	—	—	—	—	—	0.000501 (J)	—	—
RE33–20–189636	33–01211	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	0.000816 (J+)	—	—
RE33–20–189638	33–01211	4.0–5.0	TCB	—	—	0.157	—	—	—	—	—	—	—	—	—
RE33–20–189639	33–01212	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	—	—	—
RE33–20–189641	33–01212	4.0–5.0	TCB	—	—	0.05	—	—	—	—	—	—	—	—	—
RE33–20–189603	33–60541	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	—	—	0.000806 (J)
RE33–20–189606	33–60541	2.0–3.0	FILL	—	—	—	—	—	—	—	—	—	—	—	—
RE33–21–221827	33–60541	2.0–3.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33–20–189609	33–60541	4.5–5.5	TCB	—	—	—	—	—	—	—	—	—	—	—	—
RE33–20–189604	33–60542	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	—	—	—
RE33–20–189605	33–60543	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	—	—	—
RE33–20–189611	33–60543	7.0–8.0	TCB	—	—	—	—	—	—	—	—	0.182 (J)	—	—	—
RE33–20–189612	33–60544	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	0.00458	—	—
RE33–21–217573	33–60544	2–3	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33–21–217574	33–60544	4–4.75	TCB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33–20–189613	33–60545	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	—	—	—
RE33–20–189621	33–60545	4.0–5.0	FILL	—	—	—	0.112 (J-)	—	—	—	—	—	—	—	—
RE33–20–189614	33–60546	0.0–1.0	FILL	—	—	—	—	—	0.0149 (J)	0.0213 (J)	0.0181 (J)	—	0.000933 (J)	0.000484 (J)	—
RE33–20–189622	33–60546	4.0–5.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	—

Table 6.10-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Diethylphthalate	Dinitrotoluene[2,4-]	Hexanone[2-]	Isophorone	Methylene Chloride	Methylnaphthalene[1-]	Methylnaphthalene[2-]	Naphthalene	RDX	Toluene	Trichloroethene	Xylene[1,3-]+Xylene[1,4-]
Construction Worker SSL[a]				**215,000**	**536**	**340[e]**	**53,700[e]**	**1210**	**6060**	**1000**	**159**	**1350**	**14,000**	**6.90**	**798**
Industrial SSL[a]				**733,000**	**82.3**	**1300[f]**	**27,000[f]**	**5130**	**813**	**3370**	**241**	**428**	**61,300**	**36.5**	**4280**
Residential SSL[a]				**49,300**	**17.1**	**200[f]**	**5610[f]**	**409**	**172**	**232**	**49.7**	**83.1**	**5230**	**6.77**	**871**
RE33–20–189615	33–60547	0.0–1.0	FILL	—	1.88	—	—	—	—	—	—	—	—	—	—
RE33–20–189619	33–60547	2.0–3.0	FILL	0.0262 (J)	—	—	0.287 (J)	0.00256 (J)	—	—	—	—	—	—	—
RE33–20–189623	33–60547	4.0–5.0	TCB	0.0229 (J)	—	—	0.205 (J)	—	—	—	—	—	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] SSLs from NMED (2019, 700550) unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] — = Not detected.

[d] NA = Not analyzed.

[e] Construction worker SSLs calculated using the equations outlined in NMED (2019, 700550), incorporating toxicity and chemical-specific parameters from EPA regional screening level (RSL) tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

[f] SSLs from EPA RSL tables (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

Table 6.10-4
Radionuclides Detected or
Detected above BVs/FVs at SWMU 33-007(c)

Sample ID	Location ID	Depth (ft)	Media	Uranium-234	Uranium-235/236	Uranium-238
Soil Background Value[a]				**2.59**	**0.2**	**2.29**
Construction Worker SAL[b]				**1000**	**130**	**470**
Industrial SAL[b]				**3100**	**160**	**710**
Residential SAL[b]				**290**	**42**	**150**
RE33-20-189628	33-01203	2.0–3.0	TCB	0.98	—[c]	1.24
RE33-20-189629	33-01203	4.0–5.0	TCB	1.14	—	1.19
RE33-20-189631	33-01204	2.0–3.0	TCB	1.42	—	1.48
RE33-20-189632	33-01204	4.0–5.0	TCB	2.19	—	2.01
RE33-20-189634	33-01206	2.0–3.0	TCB	0.641	—	0.836
RE33-20-189635	33-01206	4.0–5.0	TCB	1.26	—	1.42
RE33-20-189636	33-01211	0.0–1.0	FILL	3.35	—	3.02
RE33-20-189638	33-01211	4.0–5.0	TCB	1.21	—	1.22
RE33-20-189640	33-01212	2.0–3.0	TCB	1.27	—	1.65
RE33-20-189641	33-01212	4.0–5.0	TCB	1.71	0.452	1.57
RE33-20-189603	33-60541	0.0–1.0	FILL	6.81	0.437	6.93
RE33-20-189609	33-60541	4.5–5.5	TCB	1.38	—	1.44
RE33-20-189604	33-60542	0.0–1.0	FILL	6.31	0.341	6.26
RE33-20-189605	33-60543	0.0–1.0	FILL	4.38	0.211	4.39
RE33-20-189608	33-60543	2.0–3.0	FILL	—	—	2.31
RE33-20-189611	33-60543	7.0–8.0	TCB	1.84	0.0744	1.98
RE33-20-189612	33-60544	0.0–1.0	FILL	6.31	0.308	6.59
RE33-20-189620	33-60544	4.0–4.75	TCB	1.91	0.107	2.14
RE33-20-189613	33-60545	0.0–1.0	FILL	5.83	0.32	5.99
RE33-20-189617	33-60545	2.0–3.0	FILL	3.07	—	3.36
RE33-20-189614	33-60546	0.0–1.0	FILL	6.82	0.315	6.32
RE33-20-189615	33-60547	0.0–1.0	FILL	6.45	0.318	6.34
RE33-20-189623	33-60547	4.0–5.0	TCB	2.21	0.086	2.2

Note: Results are in pCi/g.

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

[b] SALs from LANL (2015, 600929).

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

Table 6.11-1
Samples Collected and Analyses Requested at SWMU 33-008(c)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Tritium	Uranium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	VOCs	SVOCs	Cyanide
0333-96-0652	33-01670	0–0.5	ALLH	—[a]	—	2657	—	—	2656	—	—	2655	2656
RE33-20-190358	33-01670	0.0–0.1	ALLH	N3B-2020-667	N3B-2020-667	—	N3B-2020-667	N3B-2020-667	N3B-2020-667	—	N3B-2020-667	N3B-2020-667	N3B-2020-667
RE33-20-190359	33-01670	5.0–6.0	QBT3	N3B-2020-667	N3B-2020-667	—	N3B-2020-667	N3B-2020-667	N3B-2020-667	—	N3B-2020-667	N3B-2020-667	N3B-2020-667
RE33-21-217928	33-01671	1.8–2.8	QBT3	—	—	—	—	—	N3B-2021-818[b]	—	—	—	—
RE33-21-224203	33-01671	3.0–4.0	QBT3	—	—	—	—	—	—	—	—	N3B-2021-1475[c]	—
RE33-21-217929	33-01671	3.8–4.8	QBT3	—	—	—	—	—	N3B-2021-818[b]	—	—	—	—
RE33-21-224204	33-01671	5.0–6.0	QBT3	—	—	—	—	—	N3B-2021-1475[b]	—	—	N3B-2021-1475[c]	—
RE33-21-217935	33-01672	2–3	QBT3	—	—	—	—	—	—	N3B-2021-827	—	—	—
RE33-21-217937	33-01672	4–5	QBT3	—	—	—	—	—	—	N3B-2021-827	—	—	—
RE33-20-190363	33-01672	5.0–6.0	QBT3	N3B-2020-679	N3B-2020-679	—	N3B-2020-679	N3B-2020-679	N3B-2020-679	—	N3B-2020-679	N3B-2020-679	N3B-2020-679
RE33-21-224205	33-01672	6.0–7.0	QBT3	—	—	—	—	—	—	N3B-2021-1409	—	—	—
RE33-20-190364	33-01672	9.0–10.0	QBT3	N3B-2020-679	N3B-2020-679	—	N3B-2020-679	N3B-2020-679	N3B-2020-679	—	N3B-2020-679	N3B-2020-679	N3B-2020-679
RE33-21-217938	33-01673	2.0–3.0	QBT3	—	—	—	—	—	N3B-2021-832[b]	—	—	—	—
RE33-21-217939	33-01674	2–3	QBT3	—	—	—	—	—	N3B-2021-832[b]	—	—	—	—
0333-96-0659	33-01675	0–0.5	ALLH	—	—	2657	—	—	2656	—	—	2655	2656
0333-96-0673	33-01679	0–2	ALLH	—	—	2676	—	—	2675	—	—	2674	2675
RE33-20-190365	33-01679	0.0–1.0	ALLH	N3B-2020-679	N3B-2020-679	—	N3B-2020-679	N3B-2020-679	N3B-2020-679	N3B-2020-679	N3B-2020-679	N3B-2020-679	N3B-2020-679
0333-96-0674	33-01679	3–5	ALLH	—	—	2676	—	—	2675	—	2674	2674	2675
RE33-21-224206	33-01679	4.0–5.0	ALLH	—	—	—	—	—	—	N3B-2021-1475	—	—	—
0333-96-0675	33-01679	5–7	Qbt3	—	—	2676	—	—	2675	—	2674	2674	2675
RE33-20-190366	33-01679	5.0–6.0	QBT3	N3B-2020-679	N3B-2020-679	—	N3B-2020-679	N3B-2020-679	N3B-2020-679	—	N3B-2020-679	N3B-2020-679	N3B-2020-679
RE33-21-224207	33-01679	6.0–7.0	QBT3	—	—	—	—	—	—	N3B-2021-1475	—	—	—
RE33-20-190367	33-01679	9.0–10.0	QBT3	N3B-2020-690	N3B-2020-690	—	N3B-2020-690	N3B-2020-690	N3B-2020-690	—	N3B-2020-690	N3B-2020-690	N3B-2020-690
RE33-21-217940	33-01680	6–7	FILL	—	—	—	—	—	N3B-2021-832[b]	—	—	N3B-2021-832[c]	—
RE33-21-224208	33-01680	6.0–7.0	QBT3	—	—	—	—	—	—	N3B-2021-1460	—	—	—
RE33-21-224209	33-01680	9.0–10.0	QBT3	—	—	—	—	—	—	N3B-2021-1460	—	—	—
RE33-20-190370	33-01680	9.0–10.0	QBT3	N3B-2020-679	N3B-2020-679	—	N3B-2020-679	N3B-2020-679	N3B-2020-679	—	N3B-2020-679	N3B-2020-679	N3B-2020-679
RE33-21-224210	33-01681	6.59–7.0	QBT3	—	—	—	—	—	—	N3B-2021-1460	—	—	—
RE33-20-190373	33-01681	9.0–10.0	QBT3	N3B-2020-690	N3B-2020-690	—	N3B-2020-690	N3B-2020-690	N3B-2020-690	—	N3B-2020-690	N3B-2020-690	N3B-2020-690
RE33-21-224211	33-01681	9.0–10.0	QBT3	—	—	—	—	—	—	N3B-2021-1460	—	—	—
RE33-20-190375	33-01682	5.0–6.0	QBT3	N3B-2020-679	N3B-2020-679	—	N3B-2020-679	N3B-2020-679	N3B-2020-679	—	N3B-2020-679	N3B-2020-679	N3B-2020-679

Table 6.11-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Tritium	Uranium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	VOCs	SVOCs	Cyanide
RE33-21-224212	33-01682	6.0–7.0	QBT3	—	—	—	—	—	—	N3B-2021-1460	—	—	—
RE33-20-190376	33-01682	9.0–10.0	QBT3	N3B-2020-679	N3B-2020-679	—	N3B-2020-679	N3B-2020-679	N3B-2020-679	—	N3B-2020-679	N3B-2020-679	N3B-2020-679
RE33-21-224213	33-01682	9.0–10.0	QBT3	—	—	—	—	—	—	N3B-2021-1460	—	—	—
RE33-21-217958	33-01684	4–5	FILL	—	—	—	—	—	—	N3B-2021-827	—	—	—
RE33-20-190378	33-01684	5.0–6.0	QBT3	N3B-2020-679	N3B-2020-679	—	N3B-2020-679	N3B-2020-679	N3B-2020-679	—	N3B-2020-679	N3B-2020-679	N3B-2020-679
RE33-21-224214	33-01684	6.0–7.0	QBT3	—	—	—	—	—	—	N3B-2021-1460	—	—	—
RE33-20-190379	33-01684	9.0–10.0	QBT3	N3B-2020-690	N3B-2020-690	—	N3B-2020-690	N3B-2020-690	N3B-2020-690	—	N3B-2020-690	N3B-2020-690	N3B-2020-690
RE33-20-190361	33-01685	5.0–6.0	QBT3	N3B-2020-667	N3B-2020-667	—	N3B-2020-667	N3B-2020-667	N3B-2020-667	—	N3B-2020-667	N3B-2020-667	N3B-2020-667
RE33-20-190350	33-60676	0.0–1.0	ALLH	N3B-2020-667	N3B-2020-667	—	N3B-2020-667	N3B-2020-667	N3B-2020-667	N3B-2020-667	N3B-2020-667	N3B-2020-667	N3B-2020-667
RE33-21-224215	33-60676	4.0–5.0	QBT3	—	—	—	—	—	—	N3B-2021-1475	—	—	—
RE33-20-190354	33-60676	5.0–6.0	QBT3	N3B-2020-667	N3B-2020-667	—	N3B-2020-667	N3B-2020-667	N3B-2020-667	—	N3B-2020-667	N3B-2020-667	N3B-2020-667
RE33-21-224216	33-60676	6.0–7.0	QBT3	—	—	—	—	—	—	N3B-2021-1475	—	—	—
RE33-20-190351	33-60677	0.0–0.1	ALLH	N3B-2020-664	N3B-2020-664	—	N3B-2020-664	N3B-2020-664	N3B-2020-664	—	N3B-2020-664	N3B-2020-664	N3B-2020-664
RE33-20-190355	33-60677	5.0–6.0	QBT3	N3B-2020-664	N3B-2020-664	—	N3B-2020-664	N3B-2020-664	N3B-2020-664	N3B-2020-664	N3B-2020-664	N3B-2020-664	N3B-2020-664
RE33-20-190352	33-60678	0.0–0.5	ALLH	N3B-2020-667	N3B-2020-667	—	N3B-2020-667	N3B-2020-667	N3B-2020-667	—	N3B-2020-667	N3B-2020-667	N3B-2020-667
RE33-20-190356	33-60678	5.0–6.0	QBT3	N3B-2020-667	N3B-2020-667	—	N3B-2020-667	N3B-2020-667	N3B-2020-667	—	N3B-2020-667	N3B-2020-667	N3B-2020-667
RE33-20-190353	33-60679	0.0–0.3	ALLH	N3B-2020-667	N3B-2020-667	—	N3B-2020-667	N3B-2020-667	N3B-2020-667	—	N3B-2020-667	N3B-2020-667	N3B-2020-667
RE33-20-190357	33-60679	5.0–6.0	QBT3	N3B-2020-667	N3B-2020-667	—	N3B-2020-667	N3B-2020-667	N3B-2020-667	—	N3B-2020-667	N3B-2020-667	N3B-2020-667
RE33-20-190380	33-60680	0.0–0.95	ALLH	N3B-2020-668	N3B-2020-668	—	N3B-2020-668	N3B-2020-668	N3B-2020-668	—	N3B-2020-668	N3B-2020-668	N3B-2020-668
RE33-20-190384	33-60680	5.0–6.0	QBT3	N3B-2020-668	N3B-2020-668	—	N3B-2020-668	N3B-2020-668	N3B-2020-668	—	N3B-2020-668	N3B-2020-668	N3B-2020-668
RE33-20-190388	33-60680	9.0–10.0	QBT2	N3B-2020-668	N3B-2020-668	—	N3B-2020-668	N3B-2020-668	N3B-2020-668	—	N3B-2020-668	N3B-2020-668	N3B-2020-668
RE33-20-190381	33-60681	0.0–1.0	SED	N3B-2020-668	N3B-2020-668	—	N3B-2020-668	N3B-2020-668	N3B-2020-668	—	N3B-2020-668	N3B-2020-668	N3B-2020-668
RE33-20-190385	33-60681	5.0–6.0	ALLH	N3B-2020-668	N3B-2020-668	—	N3B-2020-668	N3B-2020-668	N3B-2020-668	—	N3B-2020-668	N3B-2020-668	N3B-2020-668
RE33-20-190389	33-60681	9.0–10.0	QBT2	N3B-2020-668	N3B-2020-668	—	N3B-2020-668	N3B-2020-668	N3B-2020-668	—	N3B-2020-668	N3B-2020-668	N3B-2020-668
RE33-20-190382	33-60682	0.0–1.0	ALLH	N3B-2020-680	N3B-2020-680	—	N3B-2020-680	N3B-2020-680	N3B-2020-680	—	N3B-2020-680	N3B-2020-680	N3B-2020-680
RE33-20-190386	33-60682	5.0–6.0	ALLH	N3B-2020-680	N3B-2020-680	—	N3B-2020-680	N3B-2020-680	N3B-2020-680	—	N3B-2020-680	N3B-2020-680	N3B-2020-680
RE33-20-190390	33-60682	9.0–10.0	QBT3	N3B-2020-680	N3B-2020-680	—	N3B-2020-680	N3B-2020-680	N3B-2020-680	—	N3B-2020-680	N3B-2020-680	N3B-2020-680
RE33-20-190383	33-60683	0.0–1.0	ALLH	N3B-2020-680	N3B-2020-680	—	N3B-2020-680	N3B-2020-680	N3B-2020-680	—	N3B-2020-680	N3B-2020-680	N3B-2020-680
RE33-20-190387	33-60683	5.0–6.0	ALLH	N3B-2020-680	N3B-2020-680	—	N3B-2020-680	N3B-2020-680	N3B-2020-680	—	N3B-2020-680	N3B-2020-680	N3B-2020-680
RE33-20-190391	33-60683	9.0–10.0	QBT3	N3B-2020-680	N3B-2020-680	—	N3B-2020-680	N3B-2020-680	N3B-2020-680	—	N3B-2020-680	N3B-2020-680	N3B-2020-680
RE33-21-224217	33-61952	0.0–1.0	ALLH	—	—	—	—	—	N3B-2021-1458[b]	—	—	N3B-2021-1458[c]	—
RE33-21-224218	33-61952	5.0–6.0	QBT3	—	—	—	—	—	N3B-2021-1458[b]	—	—	N3B-2021-1458[c]	—
RE33-21-224219	33-61952	9.0–10.0	QBT3	—	—	—	—	—	N3B-2021-1458[b]	—	—	N3B-2021-1458[c]	—
RE33-21-224220	33-61953	0.0–1.0	FILL	—	—	—	—	—	N3B-2021-1530[b]	—	—	N3B-2021-1530[c]	—
RE33-21-224221	33-61953	5.0–6.0	QBT3	—	—	—	—	—	N3B-2021-1530[b]	—	—	N3B-2021-1530[c]	—
RE33-21-224222	33-61953	9.0–10.0	QBT3	—	—	—	—	—	N3B-2021-1530[b]	—	—	N3B-2021-1530[c]	—

Table 6.11-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Tritium	Uranium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	VOCs	SVOCs	Cyanide
RE33-21-224223	33-61954	0.0–1.0	ALLH	—	—	—	—	—	N3B-2021-1530[b]	—	—	N3B-2021-1530[c]	—
RE33-21-224224	33-61954	5.0–6.0	QBT3	—	—	—	—	—	N3B-2021-1530[b]	—	—	N3B-2021-1530[c]	—
RE33-21-224225	33-61954	9.0–10.0	QBT3	—	—	—	—	—	N3B-2021-1530[b]	—	—	N3B-2021-1530[c]	—
RE33-21-224226	33-61955	0.0–1.0	ALLH	—	—	—	—	—	N3B-2021-1530[b]	—	—	N3B-2021-1530[c]	—
RE33-21-224227	33-61955	5.0–6.0	QBT3	—	—	—	—	—	N3B-2021-1530[b]	—	—	N3B-2021-1530[c]	—
RE33-21-224228	33-61955	9.0–10.0	QBT3	—	—	—	—	—	N3B-2021-1530[b]	—	—	N3B-2021-1530[c]	—
RE33-21-224229	33-61956	0.0–1.0	ALLH	—	—	—	—	—	N3B-2021-1530[b]	—	—	N3B-2021-1530[c]	—
RE33-21-224230	33-61956	5.0–6.0	QBT3	—	—	—	—	—	N3B-2021-1530[b]	—	—	N3B-2021-1530[c]	—
RE33-21-224231	33-61956	9.0–10.0	QBT3	—	—	—	—	—	N3B-2021-1530[b]	—	—	N3B-2021-1530[c]	—
RE33-21-224232	33-61957	0.0–1.0	ALLH	—	—	—	—	—	N3B-2021-1530[b]	—	—	N3B-2021-1530[c]	—
RE33-21-224233	33-61957	5.0–6.0	QBT3	—	—	—	—	—	N3B-2021-1530[b]	—	—	N3B-2021-1530[c]	—
RE33-21-224234	33-61957	9.0–10.0	QBT3	—	—	—	—	—	N3B-2021-1530[b]	—	—	N3B-2021-1530[c]	—
RE33-21-224235	33-61958	0.0–1.0	ALLH	—	—	—	—	—	N3B-2021-1531[b]	—	—	N3B-2021-1531[c]	—
RE33-21-224236	33-61958	5.0–6.0	QBT3	—	—	—	—	—	N3B-2021-1531[b]	—	—	N3B-2021-1531[c]	—
RE33-21-224237	33-61958	9.0–10.0	QBT3	—	—	—	—	—	N3B-2021-1531[b]	—	—	N3B-2021-1531[c]	—
RE33-21-224238	33-61959	0.0–1.0	ALLH	—	—	—	—	—	N3B-2021-1531[b]	—	—	N3B-2021-1531[c]	—
RE33-21-224239	33-61959	5.0–6.0	QBT3	—	—	—	—	—	N3B-2021-1531[b]	—	—	N3B-2021-1531[c]	—
RE33-21-224240	33-61959	9.0–10.0	QBT3	—	—	—	—	—	N3B-2021-1531[b]	—	—	N3B-2021-1531[c]	—
RE33-21-224241	33-61960	0.0–1.0	ALLH	—	—	—	—	—	N3B-2021-1531[b]	—	—	N3B-2021-1531[c]	—
RE33-21-224242	33-61960	5.0–6.0	QBT3	—	—	—	—	—	N3B-2021-1531[b]	—	—	N3B-2021-1531[c]	—
RE33-21-224243	33-61960	9.0–10.0	QBT3	—	—	—	—	—	N3B-2021-1531[b]	—	—	N3B-2021-1531[c]	—
RE33-21-224244	33-61961	0.0–1.0	ALLH	—	—	—	—	—	N3B-2021-1531[b]	—	—	N3B-2021-1531[c]	—
RE33-21-224245	33-61961	5.0–6.0	QBT3	—	—	—	—	—	N3B-2021-1531[b]	—	—	N3B-2021-1531[c]	—
RE33-21-224246	33-61961	9.0–10.0	QBT3	—	—	—	—	—	N3B-2021-1531[b]	—	—	N3B-2021-1531[c]	—
RE33-21-224247	33-61962	0.0–1.0	ALLH	—	—	—	—	—	N3B-2021-1475[b]	—	—	N3B-2021-1475[c]	—
RE33-21-224248	33-61962	5.0–6.0	ALLH	—	—	—	—	—	N3B-2021-1475[b]	—	—	N3B-2021-1475	—
RE33-21-224249	33-61962	9.0–10.0	QBT3	—	—	—	—	—	N3B-2021-1475[b]	—	—	N3B-2021-1475	—
RE33-21-224250	33-61963	0.0–1.0	ALLH	—	—	—	—	—	N3B-2021-1458[b]	—	—	N3B-2021-1458[c]	—
RE33-21-224251	33-61963	5.0–6.0	QBT3	—	—	—	—	—	N3B-2021-1458[b]	—	—	N3B-2021-1458[c]	—
RE33-21-224252	33-61963	9.0–10.0	QBT3	—	—	—	—	—	N3B-2021-1458[b]	—	—	N3B-2021-1458[c]	—
RE33-21-224253	33-61964	0.0–1.0	ALLH	—	—	—	—	—	N3B-2021-1458[b]	—	—	N3B-2021-1458[c]	—
RE33-21-224254	33-61964	5.0–6.0	QBT3	—	—	—	—	—	N3B-2021-1458[b]	—	—	N3B-2021-1458[c]	—
RE33-21-224255	33-61964	9.0–10.0	QBT3	—	—	—	—	—	N3B-2021-1458[b]	—	—	N3B-2021-1458[c]	—
RE33-21-224256	33-61965	0.0–1.0	FILL	—	—	—	—	—	N3B-2021-1460[b]	—	—	N3B-2021-1460[c]	—
RE33-21-224257	33-61965	5.0–6.0	FILL	—	—	—	—	—	N3B-2021-1460[b]	—	—	N3B-2021-1460[c]	—
RE33-21-224258	33-61965	9.0–10.0	QBT3	—	—	—	—	—	N3B-2021-1460[b]	—	—	N3B-2021-1460[c]	—

Table 6.11-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Tritium	Uranium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	VOCs	SVOCs	Cyanide
RE33-21-224259	33-61966	0.0–1.0	FILL	—	—	—	—	—	N3B-2021-1460[b]	—	—	N3B-2021-1460[c]	—
RE33-21-224260	33-61966	5.0–6.0	FILL	—	—	—	—	—	N3B-2021-1460[b]	—	—	N3B-2021-1460[c]	—
RE33-21-224261	33-61966	9.0–10.0	QBT3	—	—	—	—	—	N3B-2021-1460[b]	—	—	N3B-2021-1460[c]	—
RE33-21-224262	33-61967	0.0–1.0	FILL	—	—	—	—	—	N3B-2021-1460[b]	—	—	N3B-2021-1460[c]	—
RE33-21-224263	33-61967	5.0–6.0	FILL	—	—	—	—	—	N3B-2021-1460[b]	—	—	N3B-2021-1460[c]	—
RE33-21-224264	33-61967	9.0–10.0	QBT3	—	—	—	—	—	N3B-2021-1460[b]	—	—	N3B-2021-1460[c]	—
RE33-21-224265	33-61968	0.0–1.0	ALLH	—	—	—	—	—	N3B-2021-1409[b]	—	—	—	—
RE33-21-224266	33-61968	5.0–6.0	QBT3	—	—	—	—	—	N3B-2021-1409[b]	—	—	—	—
RE33-21-224267	33-61968	9.0–10.0	QBT3	—	—	—	—	—	N3B-2021-1409[b]	—	—	—	—
RE33-21-224268	33-61969	0.0–1.0	ALLH	—	—	—	—	—	N3B-2021-1409[b]	—	—	—	—
RE33-21-224269	33-61969	5.0–6.0	QBT3	—	—	—	—	—	N3B-2021-1409[b]	—	—	—	—
RE33-21-224270	33-61969	9.0–10.0	QBT3	—	—	—	—	—	N3B-2021-1409[b]	—	—	—	—
RE33-21-224271	33-61970	0.0–1.0	ALLH	—	—	—	—	—	N3B-2021-1409[b]	—	—	—	—
RE33-21-224272	33-61970	5.0–6.0	QBT3	—	—	—	—	—	N3B-2021-1409[b]	—	—	—	—
RE33-21-224273	33-61970	9.0–10.0	QBT3	—	—	—	—	—	N3B-2021-1409[b]	—	—	—	—
RE33-21-224274	33-61971	0.0–1.0	ALLH	—	—	—	—	—	N3B-2021-1409[b]	—	—	—	—
RE33-21-224275	33-61971	5.0–6.0	QBT3	—	—	—	—	—	N3B-2021-1409[b]	—	—	—	—
RE33-21-224276	33-61971	9.0–10.0	QBT3	—	—	—	—	—	N3B-2021-1409[b]	—	—	—	—
RE33-21-224277	33-61972	0.0–0.3	FILL	—	—	—	—	—	N3B-2021-1417[b]	—	—	—	—
RE33-21-224278	33-61972	5.0–6.0	QBT3	—	—	—	—	—	N3B-2021-1417[b]	—	—	—	—
RE33-21-224279	33-61972	9.0–10.0	QBT3	—	—	—	—	—	N3B-2021-1417[b]	—	—	—	—
RE33-21-224280	33-61973	0.0–0.7	FILL	—	—	—	—	—	N3B-2021-1417[b]	—	—	—	—
RE33-21-224281	33-61973	5.0–6.0	QBT3	—	—	—	—	—	N3B-2021-1417[b]	—	—	—	—
RE33-21-224282	33-61973	9.0–10.0	QBT3	—	—	—	—	—	N3B-2021-1417[b]	—	—	—	—
RE33-21-224283	33-61974	0.0–1.0	ALLH	—	—	—	—	—	N3B-2021-1458[b]	—	—	N3B-2021-1458[c]	—
RE33-21-224284	33-61974	5.0–6.0	ALLH	—	—	—	—	—	N3B-2021-1458[b]	—	—	N3B-2021-1458[c]	—
RE33-21-224285	33-61974	9.0–10.0	QBT3	—	—	—	—	—	N3B-2021-1458[b]	—	—	N3B-2021-1458[c]	—
RE33-21-224286	33-61975	0.0–1.0	FILL	—	—	—	—	—	N3B-2021-1417[b]	—	—	—	—
RE33-21-224287	33-61975	5.0–6.0	QBT3	—	—	—	—	—	N3B-2021-1417[b]	—	—	—	—
RE33-21-224288	33-61975	9.0–10.0	QBT3	—	—	—	—	—	N3B-2021-1417[b]	—	—	—	—
RE33-21-224289	33-61976	0.0–1.0	FILL	—	—	—	—	—	N3B-2021-1417[b]	—	—	—	—
RE33-21-224290	33-61976	5.0–6.0	QBT3	—	—	—	—	—	N3B-2021-1417[b]	—	—	—	—
RE33-21-224291	33-61976	9.0–10.0	QBT3	—	—	—	—	—	N3B-2021-1417[b]	—	—	—	—
RE33-21-224292	33-61977	0.0–1.0	ALLH	—	—	—	—	—	N3B-2021-1458[b]	—	—	N3B-2021-1458[c]	—
RE33-21-224293	33-61977	5.0–6.0	ALLH	—	—	—	—	—	N3B-2021-1458[b]	—	—	N3B-2021-1458[c]	—
RE33-21-224294	33-61977	9.0–10.0	QBT2	—	—	—	—	—	N3B-2021-1458[b]	—	—	N3B-2021-1458[c]	—

Table 6.11-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Tritium	Uranium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	PCBs	VOCs	SVOCs	Cyanide
RE33-21-224295	33-61978	0.0–1.0	ALLH	—	—	—	—	—	N3B-2021-1458[b]	—	—	N3B-2021-1458[c]	—
RE33-21-224296	33-61978	5.0–6.0	ALLH	—	—	—	—	—	N3B-2021-1457[b]	—	—	N3B-2021-1457[c]	—
RE33-21-224297	33-61978	9.0–10.0	QBT3	—	—	—	—	—	N3B-2021-1457[b]	—	—	N3B-2021-1457[c]	—
RE33-21-224298	33-61979	0.0–1.0	ALLH	—	—	—	—	—	N3B-2021-1457[b]	—	—	N3B-2021-1457[c]	—
RE33-21-224299	33-61979	5.0–6.0	ALLH	—	—	—	—	—	N3B-2021-1457[b]	—	—	N3B-2021-1457[c]	—
RE33-21-224300	33-61979	9.0–10.0	QBT3	—	—	—	—	—	N3B-2021-1457[b]	—	—	N3B-2021-1457[c]	—
RE33-21-224301	33-61980	0.0–1.0	ALLH	—	—	—	—	—	N3B-2021-1457[b]	—	—	N3B-2021-1457[c]	—
RE33-21-224302	33-61980	5.0–6.0	ALLH	—	—	—	—	—	N3B-2021-1457[b]	—	—	N3B-2021-1457[c]	—
RE33-21-224303	33-61980	9.0–10.0	QBT3	—	—	—	—	—	N3B-2021-1457[b]	—	—	N3B-2021-1457[c]	—
RE33-21-224304	33-61981	0.0–1.0	ALLH	—	—	—	—	—	N3B-2021-1457[b]	—	—	N3B-2021-1457[c]	—
RE33-21-224305	33-61981	5.0–6.0	ALLH	—	—	—	—	—	N3B-2021-1457[b]	—	—	N3B-2021-1457[c]	—
RE33-21-224306	33-61981	9.0–10.0	QBT3	—	—	—	—	—	N3B-2021-1457[b]	—	—	N3B-2021-1457[c]	—
RE33-21-224307	33-61982	0.0–1.0	ALLH	—	—	—	—	—	N3B-2021-1457[b]	—	—	N3B-2021-1457[c]	—
RE33-21-224308	33-61982	5.0–6.0	ALLH	—	—	—	—	—	N3B-2021-1457[b]	—	—	N3B-2021-1457[c]	—
RE33-21-224309	33-61982	9.0–10.0	QBT3	—	—	—	—	—	N3B-2021-1457[b]	—	—	N3B-2021-1457[c]	—

Note: Numbers in analyte columns are request numbers.

[a] — = Analysis not requested.

[b] Samples analyzed for antimony, chromium, copper, lead, mercury, and/or zinc only.

[c] Samples analyzed for PAHs only.

Table 6.11-2
Inorganic Chemicals above BVs at SWMU 33-008(c)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Magnesium	Mercury	Nickel	Selenium	Silver	Thallium	Uranium	Vanadium	Zinc
Soil Background Value[a]				**0.83**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**22.3**	**4610**	**0.1**	**15.4**	**1.52**	**1**	**0.73**	**1.82**	**39.6**	**48.8**
Qbt 2,3,4 Background Value[a]				**0.5**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**11.2**	**1690**	**0.1**	**6.58**	**0.3**	**1**	**1.1**	**2.4**	**17**	**63.5**
Sediment Background Value[a]				**0.83**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**4.73**	**11.2**	**19.7**	**2370**	**0.1**	**9.38**	**0.3**	**1**	**0.73**	**2.22**	**19.7**	**60.2**
Construction Worker SSL[b]				**142**	**4390**	**148**	**72.1**	**na[c]**	**134[d]**	**36.7**	**14,200**	**800**	**na**	**77.1**	**753**	**1750**	**1770**	**3.54**	**277**	**614**	**106,000**
Industrial SSL[b]				**519**	**255,000**	**2580**	**1110**	**na**	**505[d]**	**388**	**51,900**	**800**	**na**	**389**	**25,700**	**6490**	**6490**	**13**	**3880**	**6530**	**389,000**
Residential SSL[b]				**31.3**	**15,600**	**156**	**70.5**	**na**	**96.6[d]**	**23.4**	**3130**	**400**	**na**	**23.5**	**1560**	**391**	**391**	**0.782**	**234**	**394**	**23,500**
RE33-20-190358	33-01670	0.0–0.1	SOIL	—[e]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	NA[f]	—	—
0333-96-0652	33-01670	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.81 (U)	2.6	—	—
RE33-20-190359	33-01670	5.0–6.0	QBT3	0.808 (U)	—	—	—	—	12.2	—	—	—	—	—	—	0.93 (J)	—	—	NA	—	—
RE33-21-217928	33-01671	1.8–2.8	QBT3	1.44 (U)	NA	NA	NA	NA	NA	NA	56.9 (J)	39.8 (J)	NA	NA	NA	NA	NA	NA	NA	NA	64.1 (J)
RE33-21-217929	33-01671	3.8–4.8	QBT3	0.757 (U)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-224204	33-01671	5.0–6.0	QBT3	NA	NA	NA	NA	NA	NA	NA	—	—	NA	NA	NA	NA	NA	NA	NA	NA	—
RE33-20-190363	33-01672	5.0–6.0	QBT3	—	—	—	—	—	13.3	—	—	—	—	—	—	0.989 (J)	—	—	NA	—	—
RE33-20-190364	33-01672	9.0–10.0	QBT3	—	—	—	—	—	8.01	—	—	—	—	—	—	0.821 (J)	—	—	NA	—	—
RE33-21-217938	33-01673	2.0–3.0	QBT3	NA	NA	NA	NA	NA	NA	NA	27.8	16.4 (J)	NA	NA	NA	NA	NA	NA	NA	NA	—
RE33-21-217939	33-01674	2–3	QBT3	NA	NA	NA	NA	NA	NA	NA	56.2	41.6 (J)	NA	NA	NA	NA	NA	NA	NA	NA	—
0333-96-0659	33-01675	0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.76 (U)	2.79	—	—
RE33-20-190365	33-01679	0.0–1.0	SOIL	—	—	—	0.401 (J)	—	—	—	26.7 (J)	—	—	—	—	—	4.53	—	NA	—	119
0333-96-0673	33-01679	0–2	SOIL	5.6 (U)	—	—	0.71 (U)	—	—	—	24.6	—	—	—	—	—	—	—	3.22	—	114
0333-96-0674	33-01679	3–5	SOIL	5.9 (U)	—	—	0.74 (U)	—	—	—	—	—	—	—	—	—	—	—	2.3	—	—
RE33-20-190366	33-01679	5.0–6.0	QBT3	—	—	—	—	—	23	—	—	—	—	—	—	0.847 (J)	—	—	NA	—	—
0333-96-0675	33-01679	5–7	Qbt3	5.9 (U)	—	—	—	—	7.8	—	5 (J)	—	—	—	—	0.39 (U)	—	—	—	—	—
RE33-20-190367	33-01679	9.0–10.0	QBT3	—	—	—	—	—	8.05 (J+)	—	—	—	—	—	—	0.868 (J)	—	—	NA	—	—
RE33-21-217940	33-01680	6–7	FILL	NA	NA	NA	NA	NA	13.9	NA	226	87.4 (J)	NA	0.952	NA	NA	NA	NA	NA	NA	238
RE33-20-190370	33-01680	9.0–10.0	QBT3	—	—	—	—	—	—	—	164 (J)	48.8 (J+)	—	0.172	—	0.962 (J)	—	—	NA	—	—
RE33-20-190373	33-01681	9.0–10.0	QBT3	—	—	—	—	—	8.44 (J+)	—	32.7	17.9	—	0.246	—	0.792 (J)	—	—	NA	—	84.8
RE33-20-190375	33-01682	5.0–6.0	QBT3	—	—	—	—	—	12.3	—	5.18 (J)	—	—	—	—	0.971 (J)	—	—	NA	—	—
RE33-20-190376	33-01682	9.0–10.0	QBT3	0.533 (U)	—	—	—	—	14	—	38.8 (J)	17 (J+)	—	—	23.5 (J)	0.805 (J)	—	—	NA	—	64.1
RE33-20-190378	33-01684	5.0–6.0	QBT3	—	62.6	—	—	5800	17.8	—	12 (J)	—	—	—	—	0.767 (J)	—	—	NA	—	—
RE33-20-190379	33-01684	9.0–10.0	QBT3	—	—	—	—	—	11.1 (J+)	—	5.49	—	—	—	—	0.79 (J)	—	—	NA	—	—

Table 6.11-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Magnesium	Mercury	Nickel	Selenium	Silver	Thallium	Uranium	Vanadium	Zinc
Soil Background Value[a]				**0.83**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**22.3**	**4610**	**0.1**	**15.4**	**1.52**	**1**	**0.73**	**1.82**	**39.6**	**48.8**
Qbt 2,3,4 Background Value[a]				**0.5**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**11.2**	**1690**	**0.1**	**6.58**	**0.3**	**1**	**1.1**	**2.4**	**17**	**63.5**
Sediment Background Value[a]				**0.83**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**4.73**	**11.2**	**19.7**	**2370**	**0.1**	**9.38**	**0.3**	**1**	**0.73**	**2.22**	**19.7**	**60.2**
Construction Worker SSL[b]				**142**	**4390**	**148**	**72.1**	**na[c]**	**134[d]**	**36.7**	**14,200**	**800**	**na**	**77.1**	**753**	**1750**	**1770**	**3.54**	**277**	**614**	**106,000**
Industrial SSL[b]				**519**	**255,000**	**2580**	**1110**	**na**	**505[d]**	**388**	**51,900**	**800**	**na**	**389**	**25,700**	**6490**	**6490**	**13**	**3880**	**6530**	**389,000**
Residential SSL[b]				**31.3**	**15,600**	**156**	**70.5**	**na**	**96.6[d]**	**23.4**	**3130**	**400**	**na**	**23.5**	**1560**	**391**	**391**	**0.782**	**234**	**394**	**23,500**
RE33-20-190361	33-01685	5.0–6.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	1.16	—	—	NA	—	—
RE33-20-190350	33-60676	0.0–1.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	NA	—	—
RE33-20-190354	33-60676	5.0–6.0	QBT3	—	—	—	—	—	10.4	—	—	—	—	—	—	1.12	—	—	NA	—	—
RE33-20-190351	33-60677	0.0–0.1	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	NA	—	—
RE33-20-190355	33-60677	5.0–6.0	QBT3	0.906 (J)	—	—	—	2260	25.2	—	—	—	—	—	—	0.926 (J)	—	—	NA	—	—
RE33-20-190352	33-60678	0.0–0.5	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	NA	—	—
RE33-20-190356	33-60678	5.0–6.0	QBT3	—	—	—	—	—	9.03	—	—	—	—	—	—	1.13	—	—	NA	—	—
RE33-20-190353	33-60679	0.0–0.3	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	NA	—	—
RE33-20-190357	33-60679	5.0–6.0	QBT3	0.678 (U)	—	—	—	—	13.6	—	—	—	—	—	—	0.987	—	—	NA	—	—
RE33-20-190380	33-60680	0.0–0.95	SOIL	1.16 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	NA	—	—
RE33-20-190384	33-60680	5.0–6.0	QBT3	0.63 (U)	—	1.33	—	4140	21.6	—	—	—	—	—	—	1.19	—	—	NA	—	—
RE33-20-190388	33-60680	9.0–10.0	QBT2	—	—	—	—	5070	10.1	—	—	—	2060 (J+)	—	—	1.11	—	—	NA	—	—
RE33-20-190381	33-60681	0.0–1.0	SED	—	—	—	—	—	12	5.45	—	—	—	—	—	0.583 (J)	—	—	NA	24.1	—
RE33-20-190385	33-60681	5.0–6.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	NA	—	—
RE33-20-190389	33-60681	9.0–10.0	QBT2	—	—	—	—	—	12.4	—	—	—	—	—	—	1.09 (J)	—	—	NA	—	—
RE33-20-190382	33-60682	0.0–1.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	1.17 (U)	—	NA	—	—
RE33-20-190386	33-60682	5.0–6.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	1.06 (U)	—	NA	—	—
RE33-20-190390	33-60682	9.0–10.0	QBT3	—	—	—	—	7310	—	—	—	—	—	—	—	1.06	1.05 (U)	—	NA	—	—
RE33-20-190383	33-60683	0.0–1.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	1.17 (U)	—	NA	—	—
RE33-20-190387	33-60683	5.0–6.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	1.11 (U)	—	NA	—	—
RE33-20-190391	33-60683	9.0–10.0	QBT3	—	—	—	—	—	7.61	—	—	—	—	—	—	0.748 (J)	1.04 (U)	—	NA	—	—
RE33-21-224217	33-61952	0.0–1.0	SOIL	NA	NA	NA	NA	NA	—	NA	33.2 (J)	—	NA	0.159	NA	NA	NA	NA	NA	NA	91.9
RE33-21-224218	33-61952	5.0–6.0	QBT3	NA	NA	NA	NA	NA	—	NA	13.5 (J)	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224219	33-61952	9.0–10.0	QBT3	NA	NA	NA	NA	NA	—	NA	8.86 (J)	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224220	33-61953	0.0–1.0	FILL	NA	NA	NA	NA	NA	—	NA	2650 (J)	245 (J)	NA	1.95 (J)	NA	NA	NA	NA	NA	NA	1270 (J)
RE33-21-224221	33-61953	5.0–6.0	QBT3	NA	NA	NA	NA	NA	—	NA	6320 (J)	1110 (J)	NA	0.456 (J)	NA	NA	NA	NA	NA	NA	1840 (J)

Table 6.11-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Magnesium	Mercury	Nickel	Selenium	Silver	Thallium	Uranium	Vanadium	Zinc
Soil Background Value[a]				**0.83**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**22.3**	**4610**	**0.1**	**15.4**	**1.52**	**1**	**0.73**	**1.82**	**39.6**	**48.8**
Qbt 2,3,4 Background Value[a]				**0.5**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**11.2**	**1690**	**0.1**	**6.58**	**0.3**	**1**	**1.1**	**2.4**	**17**	**63.5**
Sediment Background Value[a]				**0.83**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**4.73**	**11.2**	**19.7**	**2370**	**0.1**	**9.38**	**0.3**	**1**	**0.73**	**2.22**	**19.7**	**60.2**
Construction Worker SSL[b]				**142**	**4390**	**148**	**72.1**	**na[c]**	**134[d]**	**36.7**	**14,200**	**800**	**na**	**77.1**	**753**	**1750**	**1770**	**3.54**	**277**	**614**	**106,000**
Industrial SSL[b]				**519**	**255,000**	**2580**	**1110**	**na**	**505[d]**	**388**	**51,900**	**800**	**na**	**389**	**25,700**	**6490**	**6490**	**13**	**3880**	**6530**	**389,000**
Residential SSL[b]				**31.3**	**15,600**	**156**	**70.5**	**na**	**96.6[d]**	**23.4**	**3130**	**400**	**na**	**23.5**	**1560**	**391**	**391**	**0.782**	**234**	**394**	**23,500**
RE33-21-224222	33-61953	9.0–10.0	QBT3	NA	NA	NA	NA	NA	—	NA	22.1 (J)	92.9 (J)	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224223	33-61954	0.0–1.0	SOIL	NA	NA	NA	NA	NA	180 (J)	NA	5710 (J)	741 (J)	NA	16.2 (J)	NA	NA	NA	NA	NA	NA	1740 (J)
RE33-21-224224	33-61954	5.0–6.0	QBT3	NA	NA	NA	NA	NA	—	NA	226 (J)	19.5 (J)	NA	0.297 (J)	NA	NA	NA	NA	NA	NA	—
RE33-21-224225	33-61954	9.0–10.0	QBT3	NA	NA	NA	NA	NA	—	NA	31.7 (J)	17.7 (J)	NA	0.688 (J)	NA	NA	NA	NA	NA	NA	66.1 (J)
RE33-21-224226	33-61955	0.0–1.0	SOIL	NA	NA	NA	NA	NA	31.1 (J)	NA	291 (J)	228 (J)	NA	3.36 (J)	NA	NA	NA	NA	NA	NA	3220 (J)
RE33-21-224227	33-61955	5.0–6.0	QBT3	NA	NA	NA	NA	NA	—	NA	41.6 (J)	11.4 (J)	NA	—	NA	NA	NA	NA	NA	NA	240 (J)
RE33-21-224228	33-61955	9.0–10.0	QBT3	NA	NA	NA	NA	NA	—	NA	—	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224229	33-61956	0.0–1.0	SOIL	NA	NA	NA	NA	NA	—	NA	496 (J)	150 (J)	NA	1.92 (J)	NA	NA	NA	NA	NA	NA	712 (J)
RE33-21-224230	33-61956	5.0–6.0	QBT3	NA	NA	NA	NA	NA	—	NA	12.1 (J)	—	NA	0.123 (J)	NA	NA	NA	NA	NA	NA	—
RE33-21-224231	33-61956	9.0–10.0	QBT3	NA	NA	NA	NA	NA	—	NA	6.93 (J)	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224232	33-61957	0.0–1.0	SOIL	NA	NA	NA	NA	NA	—	NA	743 (J)	320 (J)	NA	1.93 (J)	NA	NA	NA	NA	NA	NA	767 (J)
RE33-21-224233	33-61957	5.0–6.0	QBT3	NA	NA	NA	NA	NA	—	NA	33.4 (J)	29.1 (J)	NA	0.136 (J)	NA	NA	NA	NA	NA	NA	74.5 (J)
RE33-21-224234	33-61957	9.0–10.0	QBT3	NA	NA	NA	NA	NA	—	NA	8.24 (J)	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224235	33-61958	0.0–1.0	SOIL	NA	NA	NA	NA	NA	49.1	NA	862 (J)	215 (J)	NA	2.91 (J)	NA	NA	NA	NA	NA	NA	1310
RE33-21-224236	33-61958	5.0–6.0	QBT3	NA	NA	NA	NA	NA	—	NA	103 (J)	58.2 (J)	NA	0.202 (J)	NA	NA	NA	NA	NA	NA	94.7
RE33-21-224237	33-61958	9.0–10.0	QBT3	NA	NA	NA	NA	NA	—	NA	20.5 (J)	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224238	33-61959	0.0–1.0	SOIL	NA	NA	NA	NA	NA	—	NA	146 (J)	81.9 (J)	NA	0.495 (J)	NA	NA	NA	NA	NA	NA	180
RE33-21-224239	33-61959	5.0–6.0	QBT3	NA	NA	NA	NA	NA	—	NA	8.78 (J)	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224240	33-61959	9.0–10.0	QBT3	NA	NA	NA	NA	NA	—	NA	—	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224241	33-61960	0.0–1.0	SOIL	NA	NA	NA	NA	NA	—	NA	613 (J)	70.1 (J)	NA	0.677 (J)	NA	NA	NA	NA	NA	NA	382
RE33-21-224242	33-61960	5.0–6.0	QBT3	NA	NA	NA	NA	NA	—	NA	9.33 (J)	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224243	33-61960	9.0–10.0	QBT3	NA	NA	NA	NA	NA	—	NA	10.3 (J)	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224244	33-61961	0.0–1.0	SOIL	NA	NA	NA	NA	NA	—	NA	63.8 (J)	—	NA	0.184 (J)	NA	NA	NA	NA	NA	NA	70.1 (J)
RE33-21-224245	33-61961	5.0–6.0	QBT3	NA	NA	NA	NA	NA	—	NA	—	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224246	33-61961	9.0–10.0	QBT3	NA	NA	NA	NA	NA	—	NA	—	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224247	33-61962	0.0–1.0	SOIL	NA	NA	NA	NA	NA	—	NA	19.2	—	NA	0.114	NA	NA	NA	NA	NA	NA	—

Table 6.11-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Magnesium	Mercury	Nickel	Selenium	Silver	Thallium	Uranium	Vanadium	Zinc
Soil Background Value[a]				**0.83**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**22.3**	**4610**	**0.1**	**15.4**	**1.52**	**1**	**0.73**	**1.82**	**39.6**	**48.8**
Qbt 2,3,4 Background Value[a]				**0.5**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**11.2**	**1690**	**0.1**	**6.58**	**0.3**	**1**	**1.1**	**2.4**	**17**	**63.5**
Sediment Background Value[a]				**0.83**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**4.73**	**11.2**	**19.7**	**2370**	**0.1**	**9.38**	**0.3**	**1**	**0.73**	**2.22**	**19.7**	**60.2**
Construction Worker SSL[b]				**142**	**4390**	**148**	**72.1**	**na[c]**	**134[d]**	**36.7**	**14,200**	**800**	**na**	**77.1**	**753**	**1750**	**1770**	**3.54**	**277**	**614**	**106,000**
Industrial SSL[b]				**519**	**255,000**	**2580**	**1110**	**na**	**505[d]**	**388**	**51,900**	**800**	**na**	**389**	**25,700**	**6490**	**6490**	**13**	**3880**	**6530**	**389,000**
Residential SSL[b]				**31.3**	**15,600**	**156**	**70.5**	**na**	**96.6[d]**	**23.4**	**3130**	**400**	**na**	**23.5**	**1560**	**391**	**391**	**0.782**	**234**	**394**	**23,500**
RE33-21-224248	33-61962	5.0–6.0	SOIL	NA	NA	NA	NA	NA	—	NA	60.7	29.4	NA	0.347	NA	NA	NA	NA	NA	NA	68.3 (J+)
RE33-21-224249	33-61962	9.0–10.0	QBT3	NA	NA	NA	NA	NA	—	NA	27.9	1310	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224250	33-61963	0.0–1.0	SOIL	NA	NA	NA	NA	NA	—	NA	151 (J)	67.4 (J)	NA	1.76	NA	NA	NA	NA	NA	NA	304
RE33-21-224251	33-61963	5.0–6.0	QBT3	NA	NA	NA	NA	NA	—	NA	13.7 (J)	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224252	33-61963	9.0–10.0	QBT3	NA	NA	NA	NA	NA	—	NA	5.43 (J)	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224253	33-61964	0.0–1.0	SOIL	NA	NA	NA	NA	NA	—	NA	1260 (J)	143 (J)	NA	0.338	NA	NA	NA	NA	NA	NA	557
RE33-21-224254	33-61964	5.0–6.0	QBT3	NA	NA	NA	NA	NA	—	NA	27.7 (J)	17.8 (J)	NA	—	NA	NA	NA	NA	NA	NA	66.8
RE33-21-224255	33-61964	9.0–10.0	QBT3	NA	NA	NA	NA	NA	—	NA	31.7 (J)	20.7 (J)	NA	—	NA	NA	NA	NA	NA	NA	83.5
RE33-21-224256	33-61965	0.0–1.0	FILL	NA	NA	NA	NA	NA	—	NA	48.8 (J)	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224257	33-61965	5.0–6.0	FILL	NA	NA	NA	NA	NA	—	NA	—	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224258	33-61965	9.0–10.0	QBT3	NA	NA	NA	NA	NA	—	NA	11.1 (J)	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224259	33-61966	0.0–1.0	FILL	NA	NA	NA	NA	NA	—	NA	25.1 (J)	—	NA	—	NA	NA	NA	NA	NA	NA	65
RE33-21-224260	33-61966	5.0–6.0	FILL	NA	NA	NA	NA	NA	—	NA	—	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224261	33-61966	9.0–10.0	QBT3	NA	NA	NA	NA	NA	—	NA	—	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224262	33-61967	0.0–1.0	FILL	NA	NA	NA	NA	NA	—	NA	28.8 (J)	25.6	NA	—	NA	NA	NA	NA	NA	NA	75.8
RE33-21-224263	33-61967	5.0–6.0	FILL	NA	NA	NA	NA	NA	—	NA	—	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224264	33-61967	9.0–10.0	QBT3	NA	NA	NA	NA	NA	—	NA	—	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224265	33-61968	0.0–1.0	SOIL	NA	NA	NA	NA	NA	NA	NA	25.6	—	NA	NA	NA	NA	NA	NA	NA	NA	54.1
RE33-21-224266	33-61968	5.0–6.0	QBT3	NA	NA	NA	NA	NA	NA	NA	—	—	NA	NA	NA	NA	NA	NA	NA	NA	—
RE33-21-224267	33-61968	9.0–10.0	QBT3	NA	NA	NA	NA	NA	NA	NA	—	—	NA	NA	NA	NA	NA	NA	NA	NA	—
RE33-21-224268	33-61969	0.0–1.0	SOIL	NA	NA	NA	NA	NA	NA	NA	153	77.5 (J+)	NA	NA	NA	NA	NA	NA	NA	NA	322
RE33-21-224269	33-61969	5.0–6.0	QBT3	NA	NA	NA	NA	NA	NA	NA	5.97	—	NA	NA	NA	NA	NA	NA	NA	NA	—
RE33-21-224270	33-61969	9.0–10.0	QBT3	NA	NA	NA	NA	NA	NA	NA	7.2	—	NA	NA	NA	NA	NA	NA	NA	NA	—
RE33-21-224271	33-61970	0.0–1.0	SOIL	NA	NA	NA	NA	NA	NA	NA	607	157 (J+)	NA	NA	NA	NA	NA	NA	NA	NA	611
RE33-21-224272	33-61970	5.0–6.0	QBT3	NA	NA	NA	NA	NA	NA	NA	61.4	24.5 (J+)	NA	NA	NA	NA	NA	NA	NA	NA	98.1
RE33-21-224273	33-61970	9.0–10.0	QBT3	NA	NA	NA	NA	NA	NA	NA	25.8	—	NA	NA	NA	NA	NA	NA	NA	NA	—

Table 6.11-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Magnesium	Mercury	Nickel	Selenium	Silver	Thallium	Uranium	Vanadium	Zinc
Soil Background Value[a]				**0.83**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**22.3**	**4610**	**0.1**	**15.4**	**1.52**	**1**	**0.73**	**1.82**	**39.6**	**48.8**
Qbt 2,3,4 Background Value[a]				**0.5**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**11.2**	**1690**	**0.1**	**6.58**	**0.3**	**1**	**1.1**	**2.4**	**17**	**63.5**
Sediment Background Value[a]				**0.83**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**4.73**	**11.2**	**19.7**	**2370**	**0.1**	**9.38**	**0.3**	**1**	**0.73**	**2.22**	**19.7**	**60.2**
Construction Worker SSL[b]				**142**	**4390**	**148**	**72.1**	**na[c]**	**134[d]**	**36.7**	**14,200**	**800**	**na**	**77.1**	**753**	**1750**	**1770**	**3.54**	**277**	**614**	**106,000**
Industrial SSL[b]				**519**	**255,000**	**2580**	**1110**	**na**	**505[d]**	**388**	**51,900**	**800**	**na**	**389**	**25,700**	**6490**	**6490**	**13**	**3880**	**6530**	**389,000**
Residential SSL[b]				**31.3**	**15,600**	**156**	**70.5**	**na**	**96.6[d]**	**23.4**	**3130**	**400**	**na**	**23.5**	**1560**	**391**	**391**	**0.782**	**234**	**394**	**23,500**
RE33-21-224274	33-61971	0.0–1.0	SOIL	NA	NA	NA	NA	NA	NA	NA	964	159 (J+)	NA	NA	NA	NA	NA	NA	NA	NA	1130
RE33-21-224275	33-61971	5.0–6.0	QBT3	NA	NA	NA	NA	NA	NA	NA	57.1	16.9 (J+)	NA	NA	NA	NA	NA	NA	NA	NA	71.4
RE33-21-224276	33-61971	9.0–10.0	QBT3	NA	NA	NA	NA	NA	NA	NA	6.14	—	NA	NA	NA	NA	NA	NA	NA	NA	—
RE33-21-224277	33-61972	0.0–0.3	FILL	NA	NA	NA	NA	NA	NA	NA	—	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224278	33-61972	5.0–6.0	QBT3	NA	NA	NA	NA	NA	NA	NA	—	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224279	33-61972	9.0–10.0	QBT3	NA	NA	NA	NA	NA	NA	NA	—	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224280	33-61973	0.0–0.7	FILL	NA	NA	NA	NA	NA	NA	NA	33.8 (J)	—	NA	0.286 (J)	NA	NA	NA	NA	NA	NA	56.4
RE33-21-224281	33-61973	5.0–6.0	QBT3	NA	NA	NA	NA	NA	NA	NA	—	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224282	33-61973	9.0–10.0	QBT3	NA	NA	NA	NA	NA	NA	NA	4.79 (J)	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224283	33-61974	0.0–1.0	SOIL	NA	NA	NA	NA	NA	—	NA	165 (J)	43.1 (J)	NA	1.19	NA	NA	NA	NA	NA	NA	240
RE33-21-224284	33-61974	5.0–6.0	SOIL	NA	NA	NA	NA	NA	—	NA	—	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224285	33-61974	9.0–10.0	QBT3	NA	NA	NA	NA	NA	—	NA	4.92 (J)	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224286	33-61975	0.0–1.0	FILL	NA	NA	NA	NA	NA	NA	NA	1350 (J)	—	NA	0.585 (J)	NA	NA	NA	NA	NA	NA	—
RE33-21-224287	33-61975	5.0–6.0	QBT3	NA	NA	NA	NA	NA	NA	NA	6.35 (J)	13.5	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224288	33-61975	9.0–10.0	QBT3	NA	NA	NA	NA	NA	NA	NA	—	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224289	33-61976	0.0–1.0	FILL	NA	NA	NA	NA	NA	NA	NA	25.7 (J)	—	NA	0.178 (J)	NA	NA	NA	NA	NA	NA	—
RE33-21-224290	33-61976	5.0–6.0	QBT3	NA	NA	NA	NA	NA	NA	NA	—	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224291	33-61976	9.0–10.0	QBT3	NA	NA	NA	NA	NA	NA	NA	—	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224292	33-61977	0.0–1.0	SOIL	NA	NA	NA	NA	NA	—	NA	53.3 (J)	28.2 (J)	NA	1.26	NA	NA	NA	NA	NA	NA	130
RE33-21-224293	33-61977	5.0–6.0	SOIL	NA	NA	NA	NA	NA	—	NA	—	—	NA	—	NA	NA	NA	NA	NA	NA	414
RE33-21-224294	33-61977	9.0–10.0	QBT2	NA	NA	NA	NA	NA	—	NA	—	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224295	33-61978	0.0–1.0	SOIL	NA	NA	NA	NA	NA	—	NA	28.3 (J)	23 (J)	NA	0.293	NA	NA	NA	NA	NA	NA	84.4
RE33-21-224296	33-61978	5.0–6.0	SOIL	NA	NA	NA	NA	NA	—	NA	—	—	NA	—	NA	NA	NA	NA	NA	NA	89.8
RE33-21-224297	33-61978	9.0–10.0	QBT3	NA	NA	NA	NA	NA	—	NA	—	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224298	33-61979	0.0–1.0	SOIL	NA	NA	NA	NA	NA	—	NA	—	—	NA	—	NA	NA	NA	NA	NA	NA	70.9
RE33-21-224299	33-61979	5.0–6.0	SOIL	NA	NA	NA	NA	NA	—	NA	—	—	NA	—	NA	NA	NA	NA	NA	NA	—

Table 6.11-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Lead	Magnesium	Mercury	Nickel	Selenium	Silver	Thallium	Uranium	Vanadium	Zinc
Soil Background Value[a]				**0.83**	**295**	**1.83**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**22.3**	**4610**	**0.1**	**15.4**	**1.52**	**1**	**0.73**	**1.82**	**39.6**	**48.8**
Qbt 2,3,4 Background Value[a]				**0.5**	**46**	**1.21**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**11.2**	**1690**	**0.1**	**6.58**	**0.3**	**1**	**1.1**	**2.4**	**17**	**63.5**
Sediment Background Value[a]				**0.83**	**127**	**1.31**	**0.4**	**4420**	**10.5**	**4.73**	**11.2**	**19.7**	**2370**	**0.1**	**9.38**	**0.3**	**1**	**0.73**	**2.22**	**19.7**	**60.2**
Construction Worker SSL[b]				**142**	**4390**	**148**	**72.1**	**na[c]**	**134[d]**	**36.7**	**14,200**	**800**	**na**	**77.1**	**753**	**1750**	**1770**	**3.54**	**277**	**614**	**106,000**
Industrial SSL[b]				**519**	**255,000**	**2580**	**1110**	**na**	**505[d]**	**388**	**51,900**	**800**	**na**	**389**	**25,700**	**6490**	**6490**	**13**	**3880**	**6530**	**389,000**
Residential SSL[b]				**31.3**	**15,600**	**156**	**70.5**	**na**	**96.6[d]**	**23.4**	**3130**	**400**	**na**	**23.5**	**1560**	**391**	**391**	**0.782**	**234**	**394**	**23,500**
RE33-21-224300	33-61979	9.0–10.0	QBT3	NA	NA	NA	NA	NA	—	NA	5.13	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224301	33-61980	0.0–1.0	SOIL	NA	NA	NA	NA	NA	—	NA	43.9	—	NA	0.164	NA	NA	NA	NA	NA	NA	118
RE33-21-224302	33-61980	5.0–6.0	SOIL	NA	NA	NA	NA	NA	—	NA	—	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224303	33-61980	9.0–10.0	QBT3	NA	NA	NA	NA	NA	—	NA	5.74	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224304	33-61981	0.0–1.0	SOIL	NA	NA	NA	NA	NA	—	NA	—	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224305	33-61981	5.0–6.0	SOIL	NA	NA	NA	NA	NA	—	NA	21.5	—	NA	—	NA	NA	NA	NA	NA	NA	76
RE33-21-224306	33-61981	9.0–10.0	QBT3	NA	NA	NA	NA	NA	—	NA	5.77	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224307	33-61982	0.0–1.0	SOIL	NA	NA	NA	NA	NA	—	NA	—	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224308	33-61982	5.0–6.0	SOIL	NA	NA	NA	NA	NA	—	NA	—	—	NA	—	NA	NA	NA	NA	NA	NA	—
RE33-21-224309	33-61982	9.0–10.0	QBT3	NA	NA	NA	NA	NA	—	NA	5.15	—	NA	—	NA	NA	NA	NA	NA	NA	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] SSLs from NMED (2019, 700550) unless otherwise noted.

[c] na = Not available.

[d] SSL for total chromium.

[e] — = Not detected or not detected above BV.

[f] NA = Not analyzed.

Table 6.11-3
Organic Chemicals Detected at SWMU 33-008(c)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acenaphthylene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate
Construction Worker SSL[a]				**15,100**	**7530**	**242,000**	**75,300**	**4.91**	**85.3**	**240**	**15.0**	**240**	**7530[b]**	**2310**	**5380**
Industrial SSL[a]				**50,500**	**25,300**	**960,000**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**1830**
Residential SSL[a]				**3480**	**1740**	**66,300**	**17,400**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**380**
0333-96-0652	33-01670	0–0.5	SOIL	—[c]	—	NA[d]	—	NA	NA	—	—	—	—	1.6	—
RE33-20-190359	33-01670	5.0–6.0	QBT3	—	—	0.0066	—	NA	NA	—	—	—	—	—	—
RE33-21-224203	33-01671	3.0–4.0	QBT3	—	—	NA	—	NA	NA	0.00331 (J)	0.00331 (J)	0.00331 (J)	0.00221 (J)	—	NA
RE33-21-217935	33-01672	2–3	QBT3	NA	NA	NA	NA	0.0267	0.0241 (J-)	NA	NA	NA	NA	NA	NA
RE33-21-217937	33-01672	4–5	QBT3	NA	NA	NA	NA	0.0109	0.0105 (J-)	NA	NA	NA	NA	NA	NA
RE33-20-190363	33-01672	5.0–6.0	QBT3	—	—	—	—	NA	NA	—	—	0.0117 (J)	0.0127 (J)	—	1.38
RE33-21-224205	33-01672	6.0–7.0	QBT3	NA	NA	NA	NA	0.0285	0.0189	NA	NA	NA	NA	NA	NA
RE33-20-190364	33-01672	9.0–10.0	QBT3	—	—	—	—	NA	NA	0.0199 (J)	0.0263 (J)	0.0259 (J)	0.0259 (J)	—	0.0135 (J)
0333-96-0659	33-01675	0–0.5	SOIL	—	—	NA	—	NA	NA	—	—	—	—	—	—
RE33-20-190365	33-01679	0.0–1.0	SOIL	0.0475	—	—	—	0.0054	0.00671	0.0234 (J)	0.0253 (J)	0.0279 (J)	0.0177 (J)	—	—
0333-96-0673	33-01679	0–2	SOIL	—	—	NA	—	NA	NA	0.058 (J)	0.077 (J)	0.056 (J)	0.053 (J)	0.06 (J)	—
0333-96-0674	33-01679	3–5	SOIL	—	—	—	—	NA	NA	—	—	—	—	—	—
RE33-21-217940	33-01680	6–7	FILL	0.11 (J+)	—	NA	0.162	NA	NA	0.356 (J+)	0.448 (J+)	0.445 (J+)	0.313 (J+)	0.19 (J+)	NA
RE33-21-224208	33-01680	6.0–7.0	QBT3	NA	NA	NA	NA	0.00371	—	NA	NA	NA	NA	NA	NA
RE33-20-190370	33-01680	9.0–10.0	QBT3	—	—	—	—	NA	NA	0.0114 (J)	—	—	—	—	—
RE33-21-224209	33-01680	9.0–10.0	QBT3	NA	NA	NA	NA	0.00148 (J)	—	NA	NA	NA	NA	NA	NA
RE33-21-224210	33-01681	6.59–7.0	QBT3	NA	NA	NA	NA	0.0167	0.00904	NA	NA	NA	NA	NA	NA
RE33-20-190373	33-01681	9.0–10.0	QBT3	0.193	—	—	0.365	NA	NA	0.677	0.882	0.892	0.467	0.335	0.81
RE33-21-224211	33-01681	9.0–10.0	QBT3	NA	NA	NA	NA	0.0192	0.00702	NA	NA	NA	NA	NA	NA
RE33-20-190376	33-01682	9.0–10.0	QBT3	—	—	—	—	NA	NA	0.0205 (J)	0.0205 (J)	0.0205 (J)	0.0165 (J)	—	—
RE33-21-217958	33-01684	4–5	FILL	NA	NA	NA	NA	0.0082	0.00443 (J-)	NA	NA	NA	NA	NA	NA
RE33-21-224214	33-01684	6.0–7.0	QBT3	NA	NA	NA	NA	—	0.00155 (J)	NA	NA	NA	NA	NA	NA
RE33-20-190379	33-01684	9.0–10.0	QBT3	—	—	—	—	NA	NA	—	—	—	—	—	—
RE33-20-190361	33-01685	5.0–6.0	QBT3	—	—	0.0051	—	NA	NA	—	—	—	—	—	—

Table 6.11-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acenaphthylene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate
Construction Worker SSL[a]				**15,100**	**7530**	**242,000**	**75300**	**4.91**	**85.3**	**240**	**15.0**	**240**	**7530[b]**	**2310**	**5380**
Industrial SSL[a]				**50,500**	**25,300**	**960,000**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**1830**
Residential SSL[a]				**3480**	**1740**	**66,300**	**17,400**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**380**
RE33-20-190350	33-60676	0.0–1.0	SOIL	—	—	—	—	0.00737	0.00473	0.0116 (J)	—	0.014 (J)	—	—	—
RE33-20-190354	33-60676	5.0–6.0	QBT3	—	—	0.00332 (J)	—	NA	NA	—	—	—	—	—	—
RE33-20-190351	33-60677	0.0–0.1	SOIL	—	—	—	—	NA	NA	0.0125 (J)	—	—	—	—	—
RE33-20-190355	33-60677	5.0–6.0	QBT3	—	—	—	—	0.00124 (J)	—	—	—	—	—	—	—
RE33-20-190356	33-60678	5.0–6.0	QBT3	—	—	—	—	NA	NA	—	—	—	—	—	0.015 (J)
RE33-20-190353	33-60679	0.0–0.3	SOIL	—	—	—	—	NA	NA	—	—	—	—	—	0.0188 (J)
RE33-20-190357	33-60679	5.0–6.0	QBT3	—	—	0.00553	—	NA	NA	—	—	—	—	—	—
RE33-20-190380	33-60680	0.0–0.95	SOIL	—	—	—	—	NA	NA	—	—	—	—	—	—
RE33-20-190383	33-60683	0.0–1.0	SOIL	—	—	—	—	NA	NA	0.0242 (J)	—	—	—	—	—
RE33-21-224217	33-61952	0.0–1.0	SOIL	0.0089	0.00651	NA	0.0257	NA	NA	0.107	0.143	0.153	0.0681	0.0579	NA
RE33-21-224218	33-61952	5.0–6.0	QBT3	—	—	NA	—	NA	NA	0.00245 (J)	0.0028 (J)	0.00349	—	—	NA
RE33-21-224219	33-61952	9.0–10.0	QBT3	—	—	NA	—	NA	NA	0.00419	0.00454	0.00559	0.00209 (J)	0.00209 (J)	NA
RE33-21-224220	33-61953	0.0–1.0	FILL	0.0142 (J)	—	NA	0.0135 (J)	NA	NA	0.0382	0.0507	0.0588	0.0318	0.022	NA
RE33-21-224221	33-61953	5.0–6.0	QBT3	0.036 (J)	—	NA	0.00686 (J)	NA	NA	—	0.0302	0.0388	0.0196	0.0144	NA
RE33-21-224222	33-61953	9.0–10.0	QBT3	—	—	NA	—	NA	NA	—	—	0.00237 (J)	—	—	NA
RE33-21-224223	33-61954	0.0–1.0	SOIL	0.0454 (J)	0.0101	NA	0.0964 (J)	NA	NA	0.251	0.33	0.386	0.129	0.144	NA
RE33-21-224224	33-61954	5.0–6.0	QBT3	—	—	NA	—	NA	NA	0.00308 (J)	0.00342	0.0041	—	—	NA
RE33-21-224225	33-61954	9.0–10.0	QBT3	—	—	NA	—	NA	NA	—	0.0034	0.00442	0.00204 (J)	—	NA
RE33-21-224226	33-61955	0.0–1.0	SOIL	0.0232 (J)	—	NA	0.0447 (J)	NA	NA	0.248	0.472	0.42	0.273	0.136	NA
RE33-21-224227	33-61955	5.0–6.0	QBT3	—	—	NA	0.0021 (J)	NA	NA	0.00838	0.0133	0.0154	0.00734	0.00559	NA
RE33-21-224229	33-61956	0.0–1.0	SOIL	1.52 (J)	—	NA	5.13 (J)	NA	NA	14.2	20.5	21.1	13.5	7.57	NA
RE33-21-224230	33-61956	5.0–6.0	QBT3	—	—	NA	0.0039 (J)	NA	NA	0.0128	0.0191	0.0206	0.0145	0.0078	NA
RE33-21-224231	33-61956	9.0–10.0	QBT3	—	—	NA	0.00244 (J)	NA	NA	0.00977	0.0129	0.0157	0.00559	0.00593	NA
RE33-21-224232	33-61957	0.0–1.0	SOIL	0.279 (J)	0.0279	NA	0.567 (J)	NA	NA	1.62	2.23	2.69	0.799	1.01	NA
RE33-21-224233	33-61957	5.0–6.0	QBT3	0.0265 (J)	0.00177 (J)	NA	0.0495 (J)	NA	NA	0.103	0.13	0.154	0.0477	0.0569	NA
RE33-21-224234	33-61957	9.0–10.0	QBT3	0.0585 (J)	0.00528	NA	0.126 (J)	NA	NA	0.18	0.219	0.241	0.0733	0.094	NA

Table 6.11-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acenaphthylene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate
Construction Worker SSL[a]				**15,100**	**7530**	**242,000**	**75300**	**4.91**	**85.3**	**240**	**15.0**	**240**	**7530[b]**	**2310**	**5380**
Industrial SSL[a]				**50,500**	**25,300**	**960,000**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**1830**
Residential SSL[a]				**3480**	**1740**	**66,300**	**17,400**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**380**
RE33-21-224235	33-61958	0.0–1.0	SOIL	3.51	0.109 (J)	NA	6.87	NA	NA	10.4	11.9	12	6.9	4.63	NA
RE33-21-224236	33-61958	5.0–6.0	QBT3	0.0659	0.0043	NA	0.107	NA	NA	0.204	0.252	0.275	0.129	0.102	NA
RE33-21-224237	33-61958	9.0–10.0	QBT3	0.00786	—	NA	0.0161	NA	NA	0.0282	0.0304	0.0307	0.0161	0.0121	NA
RE33-21-224238	33-61959	0.0–1.0	SOIL	0.0372	—	NA	0.0638	NA	NA	0.276	0.383	0.431	0.206	0.167	NA
RE33-21-224239	33-61959	5.0–6.0	QBT3	0.016	—	NA	0.0407	NA	NA	0.104	0.145	0.147	0.0635	0.0613	NA
RE33-21-224240	33-61959	9.0–10.0	QBT3	0.00524	—	NA	0.00593	NA	NA	0.0213	0.023	0.0269	0.00908	0.0108	NA
RE33-21-224241	33-61960	0.0–1.0	SOIL	0.114	0.0185	NA	0.197	NA	NA	0.336	0.415	0.439	0.205	0.161	NA
RE33-21-224242	33-61960	5.0–6.0	QBT3	—	—	NA	0.00208 (J)	NA	NA	0.0052	0.00589	0.00658	0.00312 (J)	0.00242 (J)	NA
RE33-21-224243	33-61960	9.0–10.0	QBT3	—	—	NA	—	NA	NA	—	0.00602	0.00637	0.00318 (J)	0.00283 (J)	NA
RE33-21-224244	33-61961	0.0–1.0	SOIL	0.0159 (J)	—	NA	0.0301	NA	NA	0.104 (J)	0.122 (J)	0.122 (J)	0.062 (J)	0.0443 (J)	NA
RE33-21-224245	33-61961	5.0–6.0	QBT3	—	—	NA	0.00239 (J)	NA	NA	0.0218	0.0236	0.0222	0.0181	0.0215	NA
RE33-21-224246	33-61961	9.0–10.0	QBT3	—	—	NA	—	NA	NA	0.0105 (J)	0.0105 (J)	0.0112 (J)	0.00838 (J)	0.0105 (J)	NA
RE33-21-224247	33-61962	0.0–1.0	SOIL	—	—	NA	—	NA	NA	0.0302	0.0374	0.0391	0.0213	0.016 (J)	NA
RE33-21-224248	33-61962	5.0–6.0	SOIL	—	—	NA	—	NA	NA	—	—	—	—	—	NA
RE33-21-224249	33-61962	9.0–10.0	QBT3	—	—	NA	—	NA	NA	—	—	—	—	—	NA
RE33-21-224250	33-61963	0.0–1.0	SOIL	0.235	0.0142 (J)	NA	0.366	NA	NA	0.616	0.756	0.804	0.333	0.306	NA
RE33-21-224251	33-61963	5.0–6.0	QBT3	—	—	NA	0.00214 (J)	NA	NA	0.00642	0.00678	0.00857	0.00286 (J)	0.00321 (J)	NA
RE33-21-224252	33-61963	9.0–10.0	QBT3	0.0107	—	NA	0.0143	NA	NA	0.0233	0.0279	0.0297	0.0122	0.0111	NA
RE33-21-224253	33-61964	0.0–1.0	SOIL	0.0568	—	NA	0.0827	NA	NA	0.152	0.188	0.198	0.0827	0.0758	NA
RE33-21-224254	33-61964	5.0–6.0	QBT3	0.00821	—	NA	0.00205 (J)	NA	NA	0.0065	0.00787	0.00924	0.00342	0.00342	NA
RE33-21-224255	33-61964	9.0–10.0	QBT3	0.00209 (J)	—	NA	0.00174 (J)	NA	NA	0.00733	0.00942	0.0112	0.00454	0.00419	NA
RE33-21-224256	33-61965	0.0–1.0	FILL	0.00206 (J)	—	NA	0.00343	NA	NA	0.013	0.0158	0.0185	0.00996	0.00687	NA
RE33-21-224257	33-61965	5.0–6.0	FILL	—	—	NA	—	NA	NA	—	—	—	—	—	NA
RE33-21-224258	33-61965	9.0–10.0	QBT3	—	—	NA	—	NA	NA	—	0.00211 (J)	0.00246 (J)	—	—	NA
RE33-21-224259	33-61966	0.0–1.0	FILL	—	—	NA	0.00881 (J)	NA	NA	0.0405	0.0546	0.0669	0.0317	0.0247	NA
RE33-21-224260	33-61966	5.0–6.0	FILL	—	—	NA	—	NA	NA	—	0.00283 (J)	0.00354	—	—	NA

Table 6.11-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acenaphthylene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate
Construction Worker SSL[a]				**15,100**	**7530**	**242,000**	**75300**	**4.91**	**85.3**	**240**	**15.0**	**240**	**7530[b]**	**2310**	**5380**
Industrial SSL[a]				**50,500**	**25,300**	**960,000**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**1830**
Residential SSL[a]				**3480**	**1740**	**66,300**	**17,400**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**380**
RE33-21-224261	33-61966	9.0–10.0	QBT3	—	—	NA	—	NA	NA	—	—	—	—	—	NA
RE33-21-224262	33-61967	0.0–1.0	FILL	0.0637	0.0109 (J)	NA	0.091	NA	NA	0.233	0.282	0.337	0.118	0.126	NA
RE33-21-224263	33-61967	5.0–6.0	FILL	—	—	NA	—	NA	NA	—	0.00248 (J)	0.00319 (J)	—	—	NA
RE33-21-224264	33-61967	9.0–10.0	QBT3	—	—	NA	0.00281 (J)	NA	NA	0.00704	0.00774	0.0095	0.00352	0.00352	NA
RE33-21-224283	33-61974	0.0–1.0	SOIL	0.0108 (J)	—	NA	0.0161 (J)	NA	NA	0.0609	0.0806	0.095	0.0358	0.0358	NA
RE33-21-224284	33-61974	5.0–6.0	SOIL	0.034	0.00596	NA	0.0599	NA	NA	0.112	0.134	0.142	0.0494	0.0561	NA
RE33-21-224285	33-61974	9.0–10.0	QBT3	—	—	NA	0.00213 (J)	NA	NA	0.00674	0.00816	0.00994	0.00319 (J)	0.0039	NA
RE33-21-224292	33-61977	0.0–1.0	SOIL	0.0358 (J+)	—	NA	0.0537 (J+)	NA	NA	0.175 (J+)	0.211 (J+)	0.261 (J+)	0.0788 (J+)	0.1 (J+)	NA
RE33-21-224293	33-61977	5.0–6.0	SOIL	0.266	0.0422	NA	0.418	NA	NA	0.681	0.798	0.76	0.503	0.301	NA
RE33-21-224294	33-61977	9.0–10.0	QBT2	—	—	NA	—	NA	NA	—	0.00329 (J)	0.00439	0.00293 (J)	—	NA
RE33-21-224295	33-61978	0.0–1.0	SOIL	0.044 (J+)	—	NA	0.0586 (J+)	NA	NA	0.212 (J+)	0.271 (J+)	0.337 (J+)	0.106 (J+)	0.132 (J+)	NA
RE33-21-224296	33-61978	5.0–6.0	SOIL	0.00249 (J)	—	NA	0.00284 (J)	NA	NA	0.00817 (J)	0.0103 (J)	0.0114 (J)	0.00533 (J)	0.00426 (J)	NA
RE33-21-224297	33-61978	9.0–10.0	QBT3	—	—	NA	—	NA	NA	0.00244 (J)	0.0021 (J)	0.00244 (J)	—	—	NA
RE33-21-224298	33-61979	0.0–1.0	SOIL	—	—	NA	—	NA	NA	0.0463 (J)	0.0606 (J)	0.0749 (J)	0.0321 (J)	0.0285 (J)	NA
RE33-21-224299	33-61979	5.0–6.0	SOIL	—	—	NA	—	NA	NA	0.00277 (J)	0.00312 (J)	0.00346 (J)	—	—	NA
RE33-21-224300	33-61979	9.0–10.0	QBT3	0.00309 (J)	—	NA	0.00481 (J)	NA	NA	0.0113 (J)	0.0127 (J)	0.0138 (J)	0.0055 (J)	0.0055 (J)	NA
RE33-21-224301	33-61980	0.0–1.0	SOIL	0.243 (J)	—	NA	0.36 (J)	NA	NA	0.559 (J)	0.658 (J)	0.693 (J)	0.268 (J)	0.271 (J)	NA
RE33-21-224303	33-61980	9.0–10.0	QBT3	—	—	NA	—	NA	NA	—	0.00293 (J)	0.00367 (J)	—	—	NA
RE33-21-224304	33-61981	0.0–1.0	SOIL	0.00273 (J)	—	NA	0.00376 (J)	NA	NA	0.0113 (J)	0.0126 (J)	0.0157 (J)	0.00512 (J)	0.00615 (J)	NA
RE33-21-224305	33-61981	5.0–6.0	SOIL	—	—	NA	—	NA	NA	—	0.0032 (J)	0.00356 (J)	—	—	NA
RE33-21-224306	33-61981	9.0–10.0	QBT3	—	—	NA	—	NA	NA	—	0.00213 (J)	0.00284 (J)	—	—	NA
RE33-21-224307	33-61982	0.0–1.0	SOIL	—	—	NA	—	NA	NA	0.0316 (J)	0.0351 (J)	0.0386 (J)	—	—	NA
RE33-21-224309	33-61982	9.0–10.0	QBT3	—	—	NA	—	NA	NA	—	0.00245 (J)	0.00315 (J)	—	—	NA

Table 6.11-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Chloronaphthalene[2-]	Chrysene	Di-n-butylphthalate	Di-n-octylphthalate	Dibenz(a,h)anthracene	Dibenzofuran	Fluoranthene	Fluorene	Hexanone[2-]	Indeno(1,2,3-cd)pyrene	Methylnaphthalene[1-]	Methylnaphthalene[2-]
Construction Worker SSL[a]				**28,300**	**23,100**	**26,900**	**2700[e]**	**24**	**85[e]**	**10,000**	**10,000**	**340[e]**	**240**	**6060**	**1000**
Industrial SSL[a]				**104,000**	**3230**	**91,600**	**8200[f]**	**3.23**	**1200[f]**	**33,700**	**33,700**	**1300[f]**	**32.3**	**813**	**3370**
Residential SSL[a]				**6260**	**153**	**6160**	**630[f]**	**0.153**	**78[f]**	**2320**	**2320**	**200[f]**	**1.53**	**172**	**232**
0333-96-0652	33-01670	0–0.5	SOIL	—	—	—	—	—	—	—	—	NA	—	NA	—
RE33-20-190359	33-01670	5.0–6.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-224203	33-01671	3.0–4.0	QBT3	—	0.00257 (J)	NA	NA	—	NA	0.00515	—	NA	0.00221 (J)	0.00184 (J)	0.00331 (J)
RE33-21-217935	33-01672	2–3	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217937	33-01672	4–5	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190363	33-01672	5.0–6.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-224205	33-01672	6.0–7.0	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190364	33-01672	9.0–10.0	QBT3	—	0.0178 (J)	—	—	—	—	0.0245 (J)	—	—	0.0227 (J)	—	—
0333-96-0659	33-01675	0–0.5	SOIL	—	—	—	—	—	—	0.21 (J)	—	NA	—	NA	—
RE33-20-190365	33-01679	0.0–1.0	SOIL	—	0.0207 (J)	—	—	—	—	0.0396	—	—	0.023 (J)	—	—
0333-96-0673	33-01679	0–2	SOIL	—	0.072 (J)	—	—	—	—	0.11 (J)	—	NA	0.049 (J)	NA	—
0333-96-0674	33-01679	3–5	SOIL	—	—	—	—	—	—	—	—	0.006 (J)	—	NA	—
RE33-21-217940	33-01680	6–7	FILL	—	0.37 (J+)	NA	NA	0.105 (J+)	NA	0.663 (J+)	0.096 (J+)	NA	0.354 (J+)	—	—
RE33-21-224208	33-01680	6.0–7.0	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190370	33-01680	9.0–10.0	QBT3	—	—	—	—	—	—	0.018 (J)	—	—	—	—	—
RE33-21-224209	33-01680	9.0–10.0	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-224210	33-01681	6.59–7.0	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190373	33-01681	9.0–10.0	QBT3	—	0.69	—	0.0218 (J)	0.119	0.137 (J)	1.41	0.218	—	0.549	0.0625	0.0802
RE33-21-224211	33-01681	9.0–10.0	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190376	33-01682	9.0–10.0	QBT3	—	0.0161 (J)	—	—	—	—	0.0296 (J)	—	—	0.0179 (J)	—	—
RE33-21-217958	33-01684	4–5	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-224214	33-01684	6.0–7.0	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190379	33-01684	9.0–10.0	QBT3	—	—	0.0113 (J)	—	—	—	0.0124 (J)	—	—	—	—	—
RE33-20-190361	33-01685	5.0–6.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—

Table 6.11-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Chloronaphthalene[2-]	Chrysene	Di-n-butylphthalate	Di-n-octylphthalate	Dibenz(a,h)anthracene	Dibenzofuran	Fluoranthene	Fluorene	Hexanone[2-]	Indeno(1,2,3-cd)pyrene	Methylnaphthalene[1-]	Methylnaphthalene[2-]
Construction Worker SSL[a]				**28,300**	**23,100**	**26,900**	**2700[e]**	**24**	**85[e]**	**10,000**	**10,000**	**340[e]**	**240**	**6060**	**1000**
Industrial SSL[a]				**104,000**	**3230**	**91,600**	**8200[f]**	**3.23**	**1200[f]**	**33,700**	**33,700**	**1300[f]**	**32.3**	**813**	**3370**
Residential SSL[a]				**6260**	**153**	**6160**	**630[f]**	**0.153**	**78[f]**	**2320**	**2320**	**200[f]**	**1.53**	**172**	**232**
RE33-20-190350	33-60676	0.0–1.0	SOIL	—	—	—	—	—	—	0.0178 (J)	—	—	—	—	—
RE33-20-190354	33-60676	5.0–6.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190351	33-60677	0.0–0.1	SOIL	—	0.0125 (J)	—	—	—	—	0.0231 (J)	—	—	—	—	—
RE33-20-190355	33-60677	5.0–6.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190356	33-60678	5.0–6.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190353	33-60679	0.0–0.3	SOIL	—	—	—	—	—	—	0.0192 (J)	—	—	—	—	—
RE33-20-190357	33-60679	5.0–6.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190380	33-60680	0.0–0.95	SOIL	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190383	33-60683	0.0–1.0	SOIL	—	0.0339 (J)	—	—	—	—	0.0504	—	—	—	—	—
RE33-21-224217	33-61952	0.0–1.0	SOIL	—	0.118	NA	NA	0.0205	NA	0.193	0.00822	NA	0.0808	0.00616	0.00651
RE33-21-224218	33-61952	5.0–6.0	QBT3	—	0.0028 (J)	NA	NA	—	NA	0.00419	—	NA	0.00175 (J)	—	—
RE33-21-224219	33-61952	9.0–10.0	QBT3	—	0.00454	NA	NA	—	NA	0.00908	—	NA	0.00279 (J)	—	—
RE33-21-224220	33-61953	0.0–1.0	FILL	—	0.045	NA	NA	0.00913 (J)	NA	0.0784 (J)	0.00778 (J)	NA	0.0348	0.00304 (J)	0.00304 (J)
RE33-21-224221	33-61953	5.0–6.0	QBT3	—	0.0261	NA	NA	0.00652 (J)	NA	0.0374 (J)	0.00275 (J)	NA	0.0216	—	—
RE33-21-224222	33-61953	9.0–10.0	QBT3	—	—	NA	NA	—	NA	0.00237 (J)	—	NA	—	—	—
RE33-21-224223	33-61954	0.0–1.0	SOIL	—	0.282	NA	NA	0.0423 (J)	NA	0.473 (J)	0.0478 (J)	NA	0.157	0.0121	0.0128 (J)
RE33-21-224224	33-61954	5.0–6.0	QBT3	—	0.00308 (J)	NA	NA	—	NA	0.00547 (J)	—	NA	0.00205 (J)	—	—
RE33-21-224225	33-61954	9.0–10.0	QBT3	—	0.00306 (J)	NA	NA	—	NA	0.00442 (J)	—	NA	0.00204 (J)	—	—
RE33-21-224226	33-61955	0.0–1.0	SOIL	—	0.377	NA	NA	0.0625 (J)	NA	0.322 (J)	0.0196 (J)	NA	0.184	0.0125 (J)	0.0161 (J)
RE33-21-224227	33-61955	5.0–6.0	QBT3	—	0.0136	NA	NA	0.0021 (J)	NA	0.0203 (J)	—	NA	0.00699	—	—
RE33-21-224229	33-61956	0.0–1.0	SOIL	—	15.1	NA	NA	4.05 (J)	NA	22.8 (J)	1.14 (J)	NA	14.6	0.342	0.428 (J)
RE33-21-224230	33-61956	5.0–6.0	QBT3	—	0.0145	NA	NA	0.00425 (J)	NA	0.0227 (J)	—	NA	0.0156	—	—
RE33-21-224231	33-61956	9.0–10.0	QBT3	—	0.0115	NA	NA	0.00209 (J)	NA	0.0188 (J)	—	NA	0.00663	—	—
RE33-21-224232	33-61957	0.0–1.0	SOIL	—	1.81	NA	NA	0.281 (J)	NA	2.91 (J)	0.27 (J)	NA	0.998	0.0688	0.0762 (J)
RE33-21-224233	33-61957	5.0–6.0	QBT3	—	0.11	NA	NA	0.0166 (J)	NA	0.208 (J)	0.0283 (J)	NA	0.0604	0.00813	0.0106 (J)
RE33-21-224234	33-61957	9.0–10.0	QBT3	—	0.18	NA	NA	0.0282 (J)	NA	0.378 (J)	0.0866 (J)	NA	0.0947	0.0229	0.0394 (J)

Table 6.11-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Chloronaphthalene[2-]	Chrysene	Di-n-butylphthalate	Di-n-octylphthalate	Dibenz(a,h)anthracene	Dibenzofuran	Fluoranthene	Fluorene	Hexanone[2-]	Indeno(1,2,3-cd)pyrene	Methylnaphthalene[1-]	Methylnaphthalene[2-]
Construction Worker SSL[a]				**28,300**	**23,100**	**26,900**	**2700[e]**	**24**	**85[e]**	**10,000**	**10,000**	**340[e]**	**240**	**6060**	**1000**
Industrial SSL[a]				**104,000**	**3230**	**91,600**	**8200[f]**	**3.23**	**1200[f]**	**33,700**	**33,700**	**1300[f]**	**32.3**	**813**	**3370**
Residential SSL[a]				**6260**	**153**	**6160**	**630[f]**	**0.153**	**78[f]**	**2320**	**2320**	**200[f]**	**1.53**	**172**	**232**
RE33-21-224235	33-61958	0.0–1.0	SOIL	—	10.4	NA	NA	2.13	NA	22.1	3.82	NA	7.93	1.15	1.62
RE33-21-224236	33-61958	5.0–6.0	QBT3	—	0.222	NA	NA	0.039	NA	0.467	0.0673	NA	0.151	0.0186	0.0233
RE33-21-224237	33-61958	9.0–10.0	QBT3	—	0.0282	NA	NA	0.005	NA	0.0536	0.00965	NA	0.0182	0.00214 (J)	0.00286 (J)
RE33-21-224238	33-61959	0.0–1.0	SOIL	—	0.337	NA	NA	0.0585	NA	0.498	0.0372	NA	0.225	0.00886 (J)	—
RE33-21-224239	33-61959	5.0–6.0	QBT3	—	0.114	NA	NA	0.02	NA	0.166	0.0189	NA	0.0781	0.00357	0.00321 (J)
RE33-21-224240	33-61959	9.0–10.0	QBT3	—	0.022	NA	NA	0.00279 (J)	NA	0.0422	0.00454	NA	0.0112	—	—
RE33-21-224241	33-61960	0.0–1.0	SOIL	—	0.358	NA	NA	0.0656	NA	0.746	0.126	NA	0.245	0.0487	0.0723
RE33-21-224242	33-61960	5.0–6.0	QBT3	—	0.00554	NA	NA	—	NA	0.0114	—	NA	0.00381	—	—
RE33-21-224243	33-61960	9.0–10.0	QBT3	—	0.00495	NA	NA	—	NA	0.00779	—	NA	—	—	—
RE33-21-224244	33-61961	0.0–1.0	SOIL	—	0.136 (J)	NA	NA	0.0159 (J)	NA	0.182 (J)	0.0177	NA	0.0549 (J)	—	—
RE33-21-224245	33-61961	5.0–6.0	QBT3	—	0.0201	NA	NA	0.0215	NA	0.0178	—	NA	0.0201	—	—
RE33-21-224246	33-61961	9.0–10.0	QBT3	—	0.0112 (J)	NA	NA	0.00908 (J)	NA	0.00663 (J)	—	NA	0.00908 (J)	—	—
RE33-21-224247	33-61962	0.0–1.0	SOIL	—	0.0338	NA	NA	—	NA	0.0676	—	NA	0.0213	—	—
RE33-21-224248	33-61962	5.0–6.0	SOIL	—	—	NA	NA	—	NA	0.00217 (J)	—	NA	—	—	—
RE33-21-224249	33-61962	9.0–10.0	QBT3	—	—	NA	NA	—	NA	0.00212 (J)	—	NA	—	—	—
RE33-21-224250	33-61963	0.0–1.0	SOIL	—	0.636	NA	NA	0.11	NA	1.27	0.232	NA	0.404	0.0797	0.101
RE33-21-224251	33-61963	5.0–6.0	QBT3	—	0.00642	NA	NA	—	NA	0.00999	—	NA	0.00357	—	—
RE33-21-224252	33-61963	9.0–10.0	QBT3	—	0.024	NA	NA	0.00394	NA	0.0487	0.01	NA	0.015	0.00358	0.0043
RE33-21-224253	33-61964	0.0–1.0	SOIL	—	0.157	NA	NA	0.0258	NA	0.312	0.0534	NA	0.0999	0.0207	0.0258
RE33-21-224254	33-61964	5.0–6.0	QBT3	—	0.00719	NA	NA	—	NA	0.0123	—	NA	—	—	—
RE33-21-224255	33-61964	9.0–10.0	QBT3	—	0.00837	NA	NA	—	NA	0.0136	—	NA	0.00523	—	—
RE33-21-224256	33-61965	0.0–1.0	FILL	—	0.0148	NA	NA	0.00275 (J)	NA	0.0292	0.00172 (J)	NA	0.011	—	—
RE33-21-224257	33-61965	5.0–6.0	FILL	—	—	NA	NA	—	NA	0.0032 (J)	—	NA	—	—	—
RE33-21-224258	33-61965	9.0–10.0	QBT3	—	0.00211 (J)	NA	NA	—	NA	0.00422	—	NA	—	—	—
RE33-21-224259	33-61966	0.0–1.0	FILL	—	0.0511	NA	NA	—	NA	0.0934	—	NA	0.0352	—	—
RE33-21-224260	33-61966	5.0–6.0	FILL	—	0.00283 (J)	NA	NA	—	NA	0.00496	—	NA	0.00177 (J)	—	—

Table 6.11-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Chloronaphthalene[2-]	Chrysene	Di-n-butylphthalate	Di-n-octylphthalate	Dibenz(a,h)anthracene	Dibenzofuran	Fluoranthene	Fluorene	Hexanone[2-]	Indeno(1,2,3-cd)pyrene	Methylnaphthalene[1-]	Methylnaphthalene[2-]
Construction Worker SSL[a]				**28,300**	**23,100**	**26,900**	**2700[e]**	**24**	**85[e]**	**10,000**	**10,000**	**340[e]**	**240**	**6060**	**1000**
Industrial SSL[a]				**104,000**	**3230**	**91,600**	**8200[f]**	**3.23**	**1200[f]**	**33,700**	**33,700**	**1300[f]**	**32.3**	**813**	**3370**
Residential SSL[a]				**6260**	**153**	**6160**	**630[f]**	**0.153**	**78[f]**	**2320**	**2320**	**200[f]**	**1.53**	**172**	**232**
RE33-21-224261	33-61966	9.0–10.0	QBT3	—	—	NA	NA	—	NA	0.00206 (J)	—	NA	—	—	—
RE33-21-224262	33-61967	0.0–1.0	FILL	—	0.273	NA	NA	0.0364	NA	0.568	0.0528	NA	0.146	0.0182	0.02
RE33-21-224263	33-61967	5.0–6.0	FILL	—	0.00248 (J)	NA	NA	—	NA	0.00496	—	NA	—	—	—
RE33-21-224264	33-61967	9.0–10.0	QBT3	—	0.00774	NA	NA	—	NA	0.0158	—	NA	0.00422	—	—
RE33-21-224283	33-61974	0.0–1.0	SOIL	—	0.0717	NA	NA	0.0108 (J)	NA	0.133	0.0108 (J)	NA	0.043	—	—
RE33-21-224284	33-61974	5.0–6.0	SOIL	—	0.115	NA	NA	0.0165	NA	0.235	0.0445	NA	0.062	0.014	0.0154
RE33-21-224285	33-61974	9.0–10.0	QBT3	—	0.00745	NA	NA	—	NA	0.0142	—	NA	0.00426	—	—
RE33-21-224292	33-61977	0.0–1.0	SOIL	—	0.2 (J+)	NA	NA	0.0251 (J+)	NA	0.415 (J+)	0.0322 (J+)	NA	0.1 (J+)	—	—
RE33-21-224293	33-61977	5.0–6.0	SOIL	—	0.672	NA	NA	0.138	NA	1.45	0.36	NA	0.547	0.141	0.216
RE33-21-224294	33-61977	9.0–10.0	QBT2	—	0.00329 (J)	NA	NA	—	NA	0.00622	—	NA	0.00293 (J)	—	—
RE33-21-224295	33-61978	0.0–1.0	SOIL	—	0.249 (J+)	NA	NA	0.033 (J+)	NA	0.502 (J+)	0.033 (J+)	NA	0.132 (J+)	—	—
RE33-21-224296	33-61978	5.0–6.0	SOIL	—	0.00959 (J)	NA	NA	—	NA	0.0185 (J)	0.00249 (J)	NA	0.00604 (J)	—	—
RE33-21-224297	33-61978	9.0–10.0	QBT3	—	0.00244 (J)	NA	NA	—	NA	0.00419 (J)	—	NA	—	—	—
RE33-21-224298	33-61979	0.0–1.0	SOIL	—	0.0606 (J)	NA	NA	—	NA	0.107 (J)	—	NA	0.0357 (J)	—	—
RE33-21-224299	33-61979	5.0–6.0	SOIL	—	0.00277 (J)	NA	NA	—	NA	0.00589 (J)	—	NA	—	—	—
RE33-21-224300	33-61979	9.0–10.0	QBT3	—	0.0113 (J)	NA	NA	—	NA	0.0244 (J)	0.00206 (J)	NA	0.00653 (J)	—	—
RE33-21-224301	33-61980	0.0–1.0	SOIL	—	0.573 (J)	NA	NA	0.0823 (J+)	NA	1.22 (J)	0.264 (J)	NA	0.326 (J)	0.106 (J+)	0.158 (J+)
RE33-21-224303	33-61980	9.0–10.0	QBT3	—	0.00293 (J)	NA	NA	—	NA	0.0055 (J)	—	NA	—	—	—
RE33-21-224304	33-61981	0.0–1.0	SOIL	0.0041	0.0126 (J)	NA	NA	—	NA	0.0277 (J)	0.00307 (J)	NA	0.00615 (J)	—	—
RE33-21-224305	33-61981	5.0–6.0	SOIL	—	0.00285 (J)	NA	NA	—	NA	0.00569 (J)	—	NA	—	—	—
RE33-21-224306	33-61981	9.0–10.0	QBT3	—	—	NA	NA	—	NA	0.00498 (J)	—	NA	—	—	—
RE33-21-224307	33-61982	0.0–1.0	SOIL	—	—	NA	NA	—	NA	0.0703 (J)	—	NA	—	—	—
RE33-21-224309	33-61982	9.0–10.0	QBT3	—	0.00245 (J)	NA	NA	—	NA	0.00595 (J)	—	NA	—	—	—

Table 6.11-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Naphthalene	Phenanthrene	Pyrene	Pyridine	Styrene	Tetrachloroethene	Toluene	Trichloroethene	Xylene (Total)
Construction Worker SSL[a]				**159**	**7530**	**7530**	**85**	**10,200**	**120**	**14,000**	**6.90**	**798**
Industrial SSL[a]				**241**	**25,300**	**25,300**	**1200**	**51,300**	**629**	**61,300**	**36.5**	**4280**
Residential SSL[a]				**49.7**	**1740**	**1740**	**78**	**7260**	**111**	**5230**	**6.77**	**871**
0333-96-0652	33-01670	0–0.5	SOIL	—	—	—	1.6	NA	NA	NA	NA	NA
RE33-20-190359	33-01670	5.0–6.0	QBT3	—	—	—	—	—	—	—	—	NA
RE33-21-224203	33-01671	3.0–4.0	QBT3	0.00257 (J)	0.00515	0.00588	NA	NA	NA	NA	NA	NA
RE33-21-217935	33-01672	2–3	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217937	33-01672	4–5	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190363	33-01672	5.0–6.0	QBT3	—	—	—	—	—	—	—	—	NA
RE33-21-224205	33-01672	6.0–7.0	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190364	33-01672	9.0–10.0	QBT3	—	0.0163 (J)	0.0195 (J)	—	—	—	—	—	NA
0333-96-0659	33-01675	0–0.5	SOIL	—	—	0.24 (J)	—	NA	NA	NA	NA	NA
RE33-20-190365	33-01679	0.0–1.0	SOIL	—	0.026 (J)	0.0362 (J)	—	—	—	—	—	NA
0333-96-0673	33-01679	0–2	SOIL	—	0.1 (J)	0.1 (J)	NA	NA	NA	NA	NA	NA
0333-96-0674	33-01679	3–5	SOIL	—	—	—	NA	—	0.002 (J)	0.001 (J)	0.002 (J)	0.002 (J)
RE33-21-217940	33-01680	6–7	FILL	0.0925 (J+)	0.601 (J-)	0.688 (J+)	NA	NA	NA	NA	NA	NA
RE33-21-224208	33-01680	6.0–7.0	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190370	33-01680	9.0–10.0	QBT3	0.000487 (J-)	0.0213 (J)	0.0147 (J)	—	—	—	—	—	NA
RE33-21-224209	33-01680	9.0–10.0	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-224210	33-01681	6.59–7.0	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190373	33-01681	9.0–10.0	QBT3	0.235	1.36	1.43	—	0.000683 (J)	—	—	—	NA
RE33-21-224211	33-01681	9.0–10.0	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190376	33-01682	9.0–10.0	QBT3	—	0.0252 (J)	0.0274 (J)	—	—	—	—	—	NA
RE33-21-217958	33-01684	4–5	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-224214	33-01684	6.0–7.0	QBT3	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190379	33-01684	9.0–10.0	QBT3	0.00368	0.0156 (J)	—	—	—	—	—	—	NA
RE33-20-190361	33-01685	5.0–6.0	QBT3	—	—	—	—	—	—	—	—	NA

Table 6.11-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Naphthalene	Phenanthrene	Pyrene	Pyridine	Styrene	Tetrachloroethene	Toluene	Trichloroethene	Xylene (Total)
Construction Worker SSL[a]				**159**	**7530**	**7530**	**85**	**10,200**	**120**	**14,000**	**6.90**	**798**
Industrial SSL[a]				**241**	**25,300**	**25,300**	**1200**	**51,300**	**629**	**61,300**	**36.5**	**4280**
Residential SSL[a]				**49.7**	**1740**	**1740**	**78**	**7260**	**111**	**5230**	**6.77**	**871**
RE33-20-190350	33-60676	0.0–1.0	SOIL	—	—	0.0128 (J)	—	—	—	—	—	NA
RE33-20-190354	33-60676	5.0–6.0	QBT3	—	—	—	—	—	—	—	—	NA
RE33-20-190351	33-60677	0.0–0.1	SOIL	—	—	0.0197 (J)	—	—	—	—	—	NA
RE33-20-190355	33-60677	5.0–6.0	QBT3	—	—	—	—	—	—	—	—	NA
RE33-20-190356	33-60678	5.0–6.0	QBT3	—	—	—	—	—	—	—	—	NA
RE33-20-190353	33-60679	0.0–0.3	SOIL	—	—	0.0153 (J)	—	—	—	—	—	NA
RE33-20-190357	33-60679	5.0–6.0	QBT3	—	—	—	—	—	—	—	—	NA
RE33-20-190380	33-60680	0.0–0.95	SOIL	—	—	—	—	—	—	0.000901 (J)	—	NA
RE33-20-190383	33-60683	0.0–1.0	SOIL	—	0.031 (J)	0.0431	—	—	—	—	—	NA
RE33-21-224217	33-61952	0.0–1.0	SOIL	0.00514	0.088	0.175	NA	NA	NA	NA	NA	NA
RE33-21-224218	33-61952	5.0–6.0	QBT3	—	0.00245 (J)	0.00349	NA	NA	NA	NA	NA	NA
RE33-21-224219	33-61952	9.0–10.0	QBT3	—	0.00594	0.00803	NA	NA	NA	NA	NA	NA
RE33-21-224220	33-61953	0.0–1.0	FILL	0.00609 (J)	0.0571 (J)	0.0666 (J)	NA	NA	NA	NA	NA	NA
RE33-21-224221	33-61953	5.0–6.0	QBT3	0.00309 (J)	0.0254 (J)	0.0316 (J)	NA	NA	NA	NA	NA	NA
RE33-21-224222	33-61953	9.0–10.0	QBT3	—	0.00169 (J)	0.00203 (J)	NA	NA	NA	NA	NA	NA
RE33-21-224223	33-61954	0.0–1.0	SOIL	0.0315 (J)	0.339 (J)	0.435 (J)	NA	NA	NA	NA	NA	NA
RE33-21-224224	33-61954	5.0–6.0	QBT3	—	0.0041 (J)	0.00513 (J)	NA	NA	NA	NA	NA	NA
RE33-21-224225	33-61954	9.0–10.0	QBT3	—	0.00272 (J)	0.00408 (J)	NA	NA	NA	NA	NA	NA
RE33-21-224226	33-61955	0.0–1.0	SOIL	0.0143 (J)	0.189 (J)	0.354 (J)	NA	NA	NA	NA	NA	NA
RE33-21-224227	33-61955	5.0–6.0	QBT3	—	0.0143 (J)	0.0182 (J)	NA	NA	NA	NA	NA	NA
RE33-21-224229	33-61956	0.0–1.0	SOIL	0.941 (J)	16.9 (J)	20 (J)	NA	NA	NA	NA	NA	NA
RE33-21-224230	33-61956	5.0–6.0	QBT3	—	0.0149 (J)	0.0198 (J)	NA	NA	NA	NA	NA	NA
RE33-21-224231	33-61956	9.0–10.0	QBT3	—	0.0108 (J)	0.0168 (J)	NA	NA	NA	NA	NA	NA
RE33-21-224232	33-61957	0.0–1.0	SOIL	0.171 (J)	2.02 (J)	2.73 (J)	NA	NA	NA	NA	NA	NA
RE33-21-224233	33-61957	5.0–6.0	QBT3	0.0269 (J)	0.177 (J)	0.185 (J)	NA	NA	NA	NA	NA	NA
RE33-21-224234	33-61957	9.0–10.0	QBT3	0.149 (J)	0.406 (J)	0.335 (J)	NA	NA	NA	NA	NA	NA

Table 6.11-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Naphthalene	Phenanthrene	Pyrene	Pyridine	Styrene	Tetrachloroethene	Toluene	Trichloroethene	Xylene (Total)
Construction Worker SSL[a]				**159**	**7530**	**7530**	**85**	**10,200**	**120**	**14,000**	**6.90**	**798**
Industrial SSL[a]				**241**	**25,300**	**25,300**	**1200**	**51,300**	**629**	**61,300**	**36.5**	**4280**
Residential SSL[a]				**49.7**	**1740**	**1740**	**78**	**7260**	**111**	**5230**	**6.77**	**871**
RE33-21-224235	33-61958	0.0–1.0	SOIL	3.74	22.9	19.1	NA	NA	NA	NA	NA	NA
RE33-21-224236	33-61958	5.0–6.0	QBT3	0.0509	0.418	0.388	NA	NA	NA	NA	NA	NA
RE33-21-224237	33-61958	9.0–10.0	QBT3	0.00929	0.055	0.0504	NA	NA	NA	NA	NA	NA
RE33-21-224238	33-61959	0.0–1.0	SOIL	0.0177	0.317	0.509	NA	NA	NA	NA	NA	NA
RE33-21-224239	33-61959	5.0–6.0	QBT3	0.00428	0.154	0.173	NA	NA	NA	NA	NA	NA
RE33-21-224240	33-61959	9.0–10.0	QBT3	—	0.0381	0.0436	NA	NA	NA	NA	NA	NA
RE33-21-224241	33-61960	0.0–1.0	SOIL	0.254	0.662	0.629	NA	NA	NA	NA	NA	NA
RE33-21-224242	33-61960	5.0–6.0	QBT3	—	0.00762	0.0097	NA	NA	NA	NA	NA	NA
RE33-21-224243	33-61960	9.0–10.0	QBT3	—	0.00495	0.00814	NA	NA	NA	NA	NA	NA
RE33-21-224244	33-61961	0.0–1.0	SOIL	0.0142 (J)	0.119 (J)	0.188 (J)	NA	NA	NA	NA	NA	NA
RE33-21-224245	33-61961	5.0–6.0	QBT3	—	0.00444	0.0164	NA	NA	NA	NA	NA	NA
RE33-21-224246	33-61961	9.0–10.0	QBT3	—	0.00244 (J)	0.00838 (J)	NA	NA	NA	NA	NA	NA
RE33-21-224247	33-61962	0.0–1.0	SOIL	—	0.0445	0.0587	NA	NA	NA	NA	NA	NA
RE33-21-224248	33-61962	5.0–6.0	SOIL	—	—	0.00217 (J)	NA	NA	NA	NA	NA	NA
RE33-21-224249	33-61962	9.0–10.0	QBT3	—	0.00177 (J)	0.00177 (J)	NA	NA	NA	NA	NA	NA
RE33-21-224250	33-61963	0.0–1.0	SOIL	0.255	1.27	1.12	NA	NA	NA	NA	NA	NA
RE33-21-224251	33-61963	5.0–6.0	QBT3	—	0.00642	0.00892	NA	NA	NA	NA	NA	NA
RE33-21-224252	33-61963	9.0–10.0	QBT3	0.0104	0.0509	0.043	NA	NA	NA	NA	NA	NA
RE33-21-224253	33-61964	0.0–1.0	SOIL	0.0724	0.301	0.277	NA	NA	NA	NA	NA	NA
RE33-21-224254	33-61964	5.0–6.0	QBT3	—	0.0089	0.0109	NA	NA	NA	NA	NA	NA
RE33-21-224255	33-61964	9.0–10.0	QBT3	—	0.00803	0.0126	NA	NA	NA	NA	NA	NA
RE33-21-224256	33-61965	0.0–1.0	FILL	—	0.0161	0.0254	NA	NA	NA	NA	NA	NA
RE33-21-224257	33-61965	5.0–6.0	FILL	—	0.00249 (J)	0.00284 (J)	NA	NA	NA	NA	NA	NA
RE33-21-224258	33-61965	9.0–10.0	QBT3	—	0.00281 (J)	0.00387	NA	NA	NA	NA	NA	NA
RE33-21-224259	33-61966	0.0–1.0	FILL	—	0.0528	0.0881	NA	NA	NA	NA	NA	NA
RE33-21-224260	33-61966	5.0–6.0	FILL	—	0.00354	0.00425	NA	NA	NA	NA	NA	NA

Table 6.11-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Naphthalene	Phenanthrene	Pyrene	Pyridine	Styrene	Tetrachloroethene	Toluene	Trichloroethene	Xylene (Total)
Construction Worker SSL[a]				**159**	**7530**	**7530**	**85**	**10,200**	**120**	**14,000**	**6.90**	**798**
Industrial SSL[a]				**241**	**25,300**	**25,300**	**1200**	**51,300**	**629**	**61,300**	**36.5**	**4280**
Residential SSL[a]				**49.7**	**1740**	**1740**	**78**	**7260**	**111**	**5230**	**6.77**	**871**
RE33-21-224261	33-61966	9.0–10.0	QBT3	—	—	0.00171 (J)	NA	NA	NA	NA	NA	NA
RE33-21-224262	33-61967	0.0–1.0	FILL	0.051	0.422	0.499	NA	NA	NA	NA	NA	NA
RE33-21-224263	33-61967	5.0–6.0	FILL	—	0.00354	0.00425	NA	NA	NA	NA	NA	NA
RE33-21-224264	33-61967	9.0–10.0	QBT3	—	0.0106	0.0141	NA	NA	NA	NA	NA	NA
RE33-21-224283	33-61974	0.0–1.0	SOIL	—	0.0735	0.124	NA	NA	NA	NA	NA	NA
RE33-21-224284	33-61974	5.0–6.0	SOIL	0.0357	0.228	0.21	NA	NA	NA	NA	NA	NA
RE33-21-224285	33-61974	9.0–10.0	QBT3	—	0.00852	0.0124	NA	NA	NA	NA	NA	NA
RE33-21-224292	33-61977	0.0–1.0	SOIL	—	0.258 (J+)	0.365 (J+)	NA	NA	NA	NA	NA	NA
RE33-21-224293	33-61977	5.0–6.0	SOIL	0.721	1.66	1.27	NA	NA	NA	NA	NA	NA
RE33-21-224294	33-61977	9.0–10.0	QBT2	—	0.00476	0.00549	NA	NA	NA	NA	NA	NA
RE33-21-224295	33-61978	0.0–1.0	SOIL	—	0.304 (J+)	0.458 (J+)	NA	NA	NA	NA	NA	NA
RE33-21-224296	33-61978	5.0–6.0	SOIL	0.00284 (J)	0.0149 (J)	0.0163 (J)	NA	NA	NA	NA	NA	NA
RE33-21-224297	33-61978	9.0–10.0	QBT3	—	0.00244 (J)	0.00384 (J)	NA	NA	NA	NA	NA	NA
RE33-21-224298	33-61979	0.0–1.0	SOIL	0.0392 (J)	0.0642 (J)	0.0963 (J)	NA	NA	NA	NA	NA	NA
RE33-21-224299	33-61979	5.0–6.0	SOIL	—	0.00485 (J)	0.00519 (J)	NA	NA	NA	NA	NA	NA
RE33-21-224300	33-61979	9.0–10.0	QBT3	—	0.0168 (J)	0.022 (J)	NA	NA	NA	NA	NA	NA
RE33-21-224301	33-61980	0.0–1.0	SOIL	0.497 (J)	1.26 (J)	1.06 (J)	NA	NA	NA	NA	NA	NA
RE33-21-224303	33-61980	9.0–10.0	QBT3	—	0.0033 (J)	0.00477 (J)	NA	NA	NA	NA	NA	NA
RE33-21-224304	33-61981	0.0–1.0	SOIL	0.00205 (J)	0.0188 (J)	0.0239 (J)	NA	NA	NA	NA	NA	NA
RE33-21-224305	33-61981	5.0–6.0	SOIL	—	0.00427 (J)	0.00534 (J)	NA	NA	NA	NA	NA	NA
RE33-21-224306	33-61981	9.0–10.0	QBT3	—	0.0032 (J)	0.00426 (J)	NA	NA	NA	NA	NA	NA
RE33-21-224307	33-61982	0.0–1.0	SOIL	0.0386 (J)	0.0492 (J)	0.0597 (J)	NA	NA	NA	NA	NA	NA
RE33-21-224309	33-61982	9.0–10.0	QBT3	—	0.00455 (J)	0.00525 (J)	NA	NA	NA	NA	NA	NA

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] SSLs from NMED (2019, 700550) unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] — = Not detected.

[d] NA = Not analyzed.

[e] Construction worker SSLs calculated using the equations outlined in NMED (2019. 700550), incorporating toxicity and chemical-specific parameters from EPA regional screening level (RSL) tables (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[f] SSLs from EPA RSL tables (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

Table 6.11-4
Radionuclides Detected or
Detected above BVs/FVs at SWMU 33-008(c)

Sample ID	Location ID	Depth (ft)	Media	Uranium-235/236
Qbt 2,3,4 Background Value[a]				**0.09**
Construction Worker SAL[b]				**130**
Industrial SAL[b]				**160**
Residential SAL[b]				**42**
RE33-20-190364	33-01672	9.0–10.0	QBT3	0.21
RE33-20-190366	33-01679	5.0–6.0	QBT3	0.132
RE33-20-190370	33-01680	9.0–10.0	QBT3	0.13

Note: Results are in pCi/g.
[a] BVs from LANL (1998, 059730).
[b] SALs from LANL (2015, 600929).

Table 6.12-1
Samples Collected and Analyses Requested at SWMU 33-010(c)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOCs	SVOCs	Explosive Compounds	Cyanide	Nitrate
RE33-99-0005	33-01704	0.0–0.5	SOIL	—[a]	—	—	5608R	5607R	—	—	—	—	—	—	—
RE33-99-0006	33-01705	0.0–0.5	SOIL	—	—	—	5608R	5607R	—	—	—	—	—	—	—
RE33-99-0007	33-01706	0.0–0.5	SOIL	—	—	—	5608R	5607R	—	—	—	—	—	—	—
RE33-99-0008	33-01707	0.0–0.5	SOIL	—	—	—	5608R	5607R	—	—	—	—	—	—	—
RE33-99-0065	33-01720	0.0–0.5	SED	—	—	—	5683R	5682R	—	—	—	—	—	—	—
RE33-99-0066	33-01721	0.0–0.5	SED	—	—	—	5683R	5682R	—	—	—	—	—	—	—
RE33-99-0067	33-01722	0.0–0.5	SED	—	—	—	5683R	5682R	—	—	—	—	—	—	—
RE33-20-186819	33-60470	0.0–1.0	FILL	N3B-2020-378	N3B-2020-378	N3B-2020-378	N3B-2020-378	N3B-2020-378	N3B-2020-378	N3B-2020-378	N3B-2020-378	N3B-2020-378	N3B-2020-378	N3B-2020-378	N3B-2020-378
RE33-20-186825	33-60470	3.0–4.0	FILL	N3B-2020-378	N3B-2020-378	N3B-2020-378	N3B-2020-378	N3B-2020-378	N3B-2020-378	—	N3B-2020-378	N3B-2020-378	N3B-2020-378	N3B-2020-378	N3B-2020-378
RE33-20-186831	33-60470	6.0–7.0	FILL	N3B-2020-378	N3B-2020-378	N3B-2020-378	N3B-2020-378	N3B-2020-378	N3B-2020-378	—	N3B-2020-378	N3B-2020-378	N3B-2020-378	N3B-2020-378	N3B-2020-378
RE33-20-186820	33-60471	0.0–1.0	FILL	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	—	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385
RE33-20-186826	33-60471	3.0–4.0	FILL	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	—	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385
RE33-20-186832	33-60471	6.0–6.75	QBT2	N3B-2020-440	N3B-2020-440	N3B-2020-440	N3B-2020-440	N3B-2020-440	N3B-2020-440	N3B-2020-440	N3B-2020-440	N3B-2020-440	N3B-2020-440	N3B-2020-440	N3B-2020-440

Table 6.12-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOCs	SVOCs	Explosive Compounds	Cyanide	Nitrate
RE33-20-186821	33-60472	0.0–1.0	FILL	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385
RE33-20-186827	33-60472	3.0–4.0	FILL	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	—	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385
RE33-20-186833	33-60472	6.0–7.0	QBT2	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	—	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385
RE33-20-186822	33-60473	0.0–1.0	FILL	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	—	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385
RE33-20-186834	33-60473	3.0–4.0	QBT2	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385
RE33-20-186828	33-60473	6.0–7.0	QBT2	N3B-2020-440	N3B-2020-440	N3B-2020-440	N3B-2020-440	N3B-2020-440	N3B-2020-440	—	N3B-2020-440	N3B-2020-440	N3B-2020-440	N3B-2020-440	N3B-2020-440
RE33-20-186829	33-60474	3.0–4.0	QBT2	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	—	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385	N3B-2020-385
RE33-21-217891	33-60474	4.6–5.6	QBT2	—	—	—	—	N3B-2021-817[b]	—	—	—	—	—	—	—
RE33-20-186835	33-60474	6.0–7.0	QBT2	N3B-2020-402	N3B-2020-402	N3B-2020-402	N3B-2020-402	N3B-2020-402	N3B-2020-402	—	N3B-2020-402	N3B-2020-402	N3B-2020-402	N3B-2020-402	N3B-2020-402
RE33-20-186824	33-60475	0.0–1.0	FILL	N3B-2020-490	N3B-2020-490	N3B-2020-490	N3B-2020-490	N3B-2020-490	N3B-2020-490	—	N3B-2020-490	N3B-2020-490	N3B-2020-490	N3B-2020-490	N3B-2020-490
RE33-20-186830	33-60475	3.0–4.0	QBT2	N3B-2020-490	N3B-2020-490	N3B-2020-490	N3B-2020-490	N3B-2020-490	N3B-2020-490	—	N3B-2020-490	N3B-2020-490	N3B-2020-490	N3B-2020-490	N3B-2020-490
RE33-20-186836	33-60475	6.0–7.0	QBT2	N3B-2020-490	N3B-2020-490	N3B-2020-490	N3B-2020-490	N3B-2020-490	N3B-2020-490	—	N3B-2020-490	N3B-2020-490	N3B-2020-490	N3B-2020-490	N3B-2020-490
RE33-21-221795	33-61053	0.0–1.0	QBT2	—	—	—	—	N3B-2021-1139[b]	—	—	—	—	—	—	—
RE33-21-221796	33-61053	3.0–4.0	QBT2	—	—	—	—	N3B-2021-1139[b]	—	—	—	—	—	—	—
RE33-21-221797	33-61053	6.0–7.0	QBT2	—	—	—	—	N3B-2021-1139[b]	—	—	—	—	—	—	—
RE33-21-221798	33-61054	0.0–1.0	QBT2	—	—	—	—	N3B-2021-1139[b]	—	—	—	—	—	—	—
RE33-21-221799	33-61054	3.0–4.0	QBT2	—	—	—	—	N3B-2021-1139[b]	—	—	—	—	—	—	—
RE33-21-221800	33-61054	6.0–7.0	QBT2	—	—	—	—	N3B-2021-1139[b]	—	—	—	—	—	—	—
RE33-21-221801	33-61055	0.0–1.0	QBT2	—	—	—	—	N3B-2021-1139[b]	—	—	—	—	—	—	—
RE33-21-221802	33-61055	3.0–4.0	QBT2	—	—	—	—	N3B-2021-1139[b]	—	—	—	—	—	—	—
RE33-21-221803	33-61055	6.0–7.0	QBT2	—	—	—	—	N3B-2021-1139[b]	—	—	—	—	—	—	—
RE33-21-221804	33-61056	0.0–0.5	ALLH	—	—	—	—	N3B-2021-1157[b]	—	—	—	—	—	—	—
RE33-21-221805	33-61056	3.0–4.0	QBT2	—	—	—	—	N3B-2021-1157[b]	—	—	—	—	—	—	—
RE33-21-221806	33-61056	6.0–7.0	QBT2	—	—	—	—	N3B-2021-1157[b]	—	—	—	—	—	—	—
RE33-21-221807	33-61057	0.0–0.5	ALLH	—	—	—	—	N3B-2021-1157[b]	—	—	—	—	—	—	—
RE33-21-221808	33-61057	3.0–4.0	QBT2	—	—	—	—	N3B-2021-1157[b]	—	—	—	—	—	—	—
RE33-21-221809	33-61057	6.0–7.0	QBT2	—	—	—	—	N3B-2021-1157[b]	—	—	—	—	—	—	—
RE33-21-221810	33-61058	0.0–0.3	ALLH	—	—	—	—	N3B-2021-1157[b]	—	—	—	—	—	—	—
RE33-21-221811	33-61058	3.0–4.0	QBT2	—	—	—	—	N3B-2021-1157[b]	—	—	—	—	—	—	—
RE33-21-221812	33-61058	6.0–7.0	QBT2	—	—	—	—	N3B-2021-1157[b]	—	—	—	—	—	—	—
RE33-21-221813	33-61059	0.0–0.2	ALLH	—	—	—	—	N3B-2021-1157[b]	—	—	—	—	—	—	—

Table 6.12-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOCs	SVOCs	Explosive Compounds	Cyanide	Nitrate
RE33-21-221814	33-61059	3.0–4.0	QBT2	—	—	—	—	N3B-2021-1157[b]	—	—	—	—	—	—	—
RE33-21-221815	33-61059	6.0–7.0	QBT2	—	—	—	—	N3B-2021-1157[b]	—	—	—	—	—	—	—
RE33-21-221816	33-61060	0.0–1.0	ALLH	—	—	—	—	N3B-2021-1157[b]	—	—	—	—	—	—	—
RE33-21-221817	33-61060	3.0–4.0	QBT2	—	—	—	—	N3B-2021-1157[b]	—	—	—	—	—	—	—
RE33-21-221818	33-61060	6.0–7.0	QBT2	—	—	—	—	N3B-2021-1157[b]	—	—	—	—	—	—	—
RE33-21-221819	33-61061	0.0–0.4	ALLH	—	—	—	—	N3B-2021-1171[b]	—	—	—	—	—	—	—
RE33-21-221820	33-61061	3.0–4.0	QBT2	—	—	—	—	N3B-2021-1171[b]	—	—	—	—	—	—	—
RE33-21-221821	33-61061	6.0–7.0	QBT2	—	—	—	—	N3B-2021-1171[b]	—	—	—	—	—	—	—

Note: Numbers in analyte columns are request numbers.

[a] — = Analysis not requested.

[b] Sample analyzed for copper, lead, and zinc only.

Table 6.12-2
Inorganic Chemicals above BVs at SWMU 33-010(c)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Beryllium	Calcium	Chromium	Copper	Lead	Magnesium	Nickel	Nitrate	Perchlorate	Selenium	Silver	Zinc
Soil Background Value[a]				**0.83**	**295**	**1.83**	**6120**	**19.3**	**14.7**	**22.3**	**4610**	**15.4**	**na[b]**	**na**	**1.52**	**1**	**48.8**
Qbt 2,3,4 Background Value[a]				**0.5**	**46**	**1.21**	**2200**	**7.14**	**4.66**	**11.2**	**1690**	**6.58**	**na**	**na**	**0.3**	**1**	**63.5**
Sediment Background Value[a]				**0.83**	**127**	**1.31**	**4420**	**10.5**	**11.2**	**19.7**	**2370**	**9.38**	**na**	**na**	**0.3**	**1**	**60.2**
Construction Worker SSL[c]				**142**	**4390**	**148**	**na**	**134[d]**	**14,200**	**800**	**na**	**753**	**566,000**	**248**	**1750**	**1770**	**106,000**
Industrial SSL[c]				**519**	**255,000**	**2580**	**na**	**505[d]**	**51,900**	**800**	**na**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**389,000**
Residential SSL[c]				**31.3**	**15,600**	**156**	**na**	**96.6[d]**	**3130**	**400**	**na**	**1560**	**125,000**	**54.8**	**391**	**391**	**23,500**
RE33-99-0005	33-01704	0.0–0.5	SOIL	—[e]	—	—	—	—	116	—	—	—	NA[f]	NA	—	—	—
RE33-99-0006	33-01705	0.0–0.5	SOIL	0.91 (U)	—	—	—	—	44.7	—	—	—	NA	NA	—	—	—
RE33-99-0007	33-01706	0.0–0.5	SOIL	0.86 (U)	—	—	—	—	—	—	—	—	NA	NA	—	—	—
RE33-99-0065	33-01720	0.0–0.5	SED	—	130	—	—	—	581	—	—	—	NA	NA	0.46 (U)	4.6	—
RE33-99-0066	33-01721	0.0–0.5	SED	—	—	—	—	—	570	—	—	—	NA	NA	0.89 (J)	—	—
RE33-99-0067	33-01722	0.0–0.5	SED	—	—	—	—	—	270	—	—	—	NA	NA	0.44 (U)	—	—
RE33-20-186819	33-60470	0.0–1.0	FILL	1.38 (U)	—	—	—	—	45.5 (J+)	—	—	—	13.7	0.000797 (J)	—	—	—
RE33-20-186825	33-60470	3.0–4.0	FILL	1.15 (U)	—	—	—	—	—	—	—	—	2.5	—	—	—	—

Table 6.12-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Beryllium	Calcium	Chromium	Copper	Lead	Magnesium	Nickel	Nitrate	Perchlorate	Selenium	Silver	Zinc
Soil Background Value[a]				**0.83**	**295**	**1.83**	**6120**	**19.3**	**14.7**	**22.3**	**4610**	**15.4**	**na[b]**	**na**	**1.52**	**1**	**48.8**
Qbt 2,3,4 Background Value[a]				**0.5**	**46**	**1.21**	**2200**	**7.14**	**4.66**	**11.2**	**1690**	**6.58**	**na**	**na**	**0.3**	**1**	**63.5**
Sediment Background Value[a]				**0.83**	**127**	**1.31**	**4420**	**10.5**	**11.2**	**19.7**	**2370**	**9.38**	**na**	**na**	**0.3**	**1**	**60.2**
Construction Worker SSL[c]				**142**	**4390**	**148**	**na**	**134[d]**	**14,200**	**800**	**na**	**753**	**566,000**	**248**	**1750**	**1770**	**106,000**
Industrial SSL[c]				**519**	**255,000**	**2580**	**na**	**505[d]**	**51,900**	**800**	**na**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**389,000**
Residential SSL[c]				**31.3**	**15,600**	**156**	**na**	**96.6[d]**	**3130**	**400**	**na**	**1560**	**125,000**	**54.8**	**391**	**391**	**23,500**
RE33-20-186831	33-60470	6.0–7.0	FILL	1.67 (U)	—	—	—	—	—	—	—	—	1.68	0.00114 (J)	—	—	—
RE33-20-186820	33-60471	0.0–1.0	FILL	1.85 (U)	—	—	—	—	91.3	—	—	—	1.14	—	—	—	51.7
RE33-20-186826	33-60471	3.0–4.0	FILL	1.47 (U)	—	—	—	—	38.7	—	—	—	1.38	—	—	—	—
RE33-20-186832	33-60471	6.0–6.75	QBT2	1.19 (U)	49.1	—	—	—	85.9	—	—	—	1.07	—	1.07	—	—
RE33-20-186821	33-60472	0.0–1.0	FILL	1.3 (U)	—	—	—	—	26.1	—	—	—	1.46	—	1.9	—	53.6
RE33-20-186827	33-60472	3.0–4.0	FILL	2.24 (U)	—	—	—	—	—	—	—	—	0.829 (J)	—	2.08	—	—
RE33-20-186833	33-60472	6.0–7.0	QBT2	1.99 (U)	—	—	—	28.5	—	—	—	—	—	—	1.9	—	—
RE33-20-186822	33-60473	0.0–1.0	FILL	1.96 (U)	—	—	—	—	31.8	—	—	—	1.33	—	—	—	—
RE33-20-186834	33-60473	3.0–4.0	QBT2	1.68 (U)	59	2.9	3100	21.3	8.51	—	1830	8.66	8.02	0.00097 (J)	2.8	—	—
RE33-20-186828	33-60473	6.0–7.0	QBT2	1.18 (U)	53.7	3.08	2920	—	8.36	—	—	—	1.28	—	1.48	—	—
RE33-20-186829	33-60474	3.0–4.0	QBT2	1.45 (U)	—	—	—	14.1	—	—	—	—	0.67 (J)	—	2.22	—	—
RE33-21-217891	33-60474	4.6–5.6	QBT2	NA	NA	NA	NA	NA	22.9 (J)	—	NA	NA	NA	NA	NA	NA	—
RE33-20-186835	33-60474	6.0–7.0	QBT2	1.58 (U)	—	—	—	45.2	—	—	—	—	—	—	2.29	—	—
RE33-20-186824	33-60475	0.0–1.0	FILL	—	—	—	—	—	21.5 (J)	32.5 (J)	—	—	1.55	0.000826 (J)	1.7	1.08 (U)	645 (J)
RE33-20-186830	33-60475	3. 0–4.0	QBT2	—	95.1	—	—	—	210 (J)	—	—	—	1.03	—	2.77	—	—
RE33-20-186836	33-60475	6.0–7.0	QBT2	—	—	—	3610	—	—	—	—	—	—	—	3.21	1.02 (U)	—
RE33-21-221804	33-61056	0.0–0.5	SOIL	NA	NA	NA	NA	NA	40.1	—	NA	NA	NA	NA	NA	NA	—
RE33-21-221805	33-61056	3.0–4.0	QBT2	NA	NA	NA	NA	NA	5.96	—	NA	NA	NA	NA	NA	NA	—
RE33-21-221807	33-61057	0.0–0.5	SOIL	NA	NA	NA	NA	NA	145	—	NA	NA	NA	NA	NA	NA	—
RE33-21-221809	33-61057	6.0–7.0	QBT2	NA	NA	NA	NA	NA	5.17	—	NA	NA	NA	NA	NA	NA	—
RE33-21-221810	33-61058	0.0–0.3	SOIL	NA	NA	NA	NA	NA	83.3	—	NA	NA	NA	NA	NA	NA	—
RE33-21-221811	33-61058	3.0–4.0	QBT2	NA	NA	NA	NA	NA	5.22	—	NA	NA	NA	NA	NA	NA	—
RE33-21-221813	33-61059	0.0–0.2	SOIL	NA	NA	NA	NA	NA	33.4	31.9	NA	NA	NA	NA	NA	NA	—
RE33-21-221814	33-61059	3.0–4.0	QBT2	NA	NA	NA	NA	NA	7.71	—	NA	NA	NA	NA	NA	NA	—
RE33-21-221816	33-61060	0.0–1.0	SOIL	NA	NA	NA	NA	NA	2060	—	NA	NA	NA	NA	NA	NA	58.1
RE33-21-221817	33-61060	3.0–4.0	QBT2	NA	NA	NA	NA	NA	503	15.5	NA	NA	NA	NA	NA	NA	—
RE33-21-221818	33-61060	6.0–7.0	QBT2	NA	NA	NA	NA	NA	41.1	—	NA	NA	NA	NA	NA	NA	—
RE33-21-221819	33-61061	0.0–0.4	SOIL	NA	NA	NA	NA	NA	1420	—	NA	NA	NA	NA	NA	NA	—
RE33-21-221820	33-61061	3.0–4.0	QBT2	NA	NA	NA	NA	NA	31.6	—	NA	NA	NA	NA	NA	NA	—

Table 6.12-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Beryllium	Calcium	Chromium	Copper	Lead	Magnesium	Nickel	Nitrate	Perchlorate	Selenium	Silver	Zinc
Soil Background Value[a]				**0.83**	**295**	**1.83**	**6120**	**19.3**	**14.7**	**22.3**	**4610**	**15.4**	**na[b]**	**na**	**1.52**	**1**	**48.8**
Qbt 2,3,4 Background Value[a]				**0.5**	**46**	**1.21**	**2200**	**7.14**	**4.66**	**11.2**	**1690**	**6.58**	**na**	**na**	**0.3**	**1**	**63.5**
Sediment Background Value[a]				**0.83**	**127**	**1.31**	**4420**	**10.5**	**11.2**	**19.7**	**2370**	**9.38**	**na**	**na**	**0.3**	**1**	**60.2**
Construction Worker SSL[c]				**142**	**4390**	**148**	**na**	**134[d]**	**14,200**	**800**	**na**	**753**	**566,000**	**248**	**1750**	**1770**	**106,000**
Industrial SSL[c]				**519**	**255,000**	**2580**	**na**	**505[d]**	**51,900**	**800**	**na**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**389,000**
Residential SSL[c]				**31.3**	**15,600**	**156**	**na**	**96.6[d]**	**3130**	**400**	**na**	**1560**	**125,000**	**54.8**	**391**	**391**	**23,500**
RE33-21-221821	33-61061	6.0–7.0	QBT2	NA	NA	NA	NA	NA	6.25	—	NA	NA	NA	NA	NA	NA	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2019, 700550) unless otherwise noted.

[d] SSL for total chromium.

[e] — = Not detected or not detected above BV.

[f] NA = Not analyzed.

Table 6.12-3
Organic Chemicals Detected at SWMU 33-010(c)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Butylbenzylphthalate	Chrysene	Di-n-butylphthalate	Dibenz(a,h)anthracene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene	Trichlorobenzene[1,2,3-]
Construction Worker SSL[a]				**242,000**	**75,300**	**4.91**	**85.3**	**240**	**15.0**	**240**	**7530[b]**	**2310**	**5380**	**99,000[c]**	**23,100**	**26,900**	**24**	**10,000**	**240**	**7530**	**7530**	**68[c]**
Industrial SSL[a]				**960,000**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**1830**	**12,000**	**3230**	**91,600**	**3.23**	**33,700**	**32.3**	**25,300**	**25,300**	**930[d]**
Residential SSL[a]				**66,300**	**17,400**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**380**	**2900**	**153**	**6160**	**0.153**	**2320**	**1.53**	**1740**	**1740**	**63[d]**
RE33-20-186819	33-60470	0.0–1.0	FILL	—[e]	0.0158 (J)	0.00428	0.0188	0.0391	0.0351	0.0462	0.0222 (J)	0.0179 (J)	0.0189 (J)	—	0.0351	1.08	—	0.094	0.0216 (J)	0.0617	0.0792	—
RE33-20-186831	33-60470	6.0–7.0	FILL	—	0.0111 (J)	NA[f]	NA	0.162	0.0921	0.229	0.0485	0.0758	0.0201 (J)	0.0128 (J)	0.252	—	0.0156 (J)	0.183	0.0533	0.0249 (J)	0.137	—
RE33-20-186820	33-60471	0.0–1.0	FILL	—	—	NA	NA	0.0198 (J)	0.0191 (J)	0.0222 (J)	—	—	—	—	0.0191 (J)	0.162	—	0.0322 (J)	—	0.0161 (J)	0.0292 (J)	—
RE33-20-186826	33-60471	3.0–4.0	FILL	—	—	NA	NA	0.017 (J)	0.0139 (J)	—	—	—	0.368	—	0.0156 (J)	0.0407	—	0.0299 (J)	—	0.0159 (J)	0.0258 (J)	—
RE33-20-186827	33-60472	3.0–4.0	FILL	—	—	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.000368 (J)
RE33-20-186822	33-60473	0.0–1.0	FILL	—	—	NA	NA	0.0126 (J)	0.0109 (J)	0.0136 (J)	—	—	0.0351	—	—	—	—	0.0187 (J)	—	—	0.0201 (J)	—
RE33-20-186834	33-60473	3.0–4.0	QBT2	0.00331 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186828	33-60473	6.0–7.0	QBT2	0.00415 (J)	—	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 6.12-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Butylbenzylphthalate	Chrysene	Di-n-butylphthalate	Dibenz(a,h)anthracene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene	Trichlorobenzene[1,2,3-]
Construction Worker SSL[a]				**242,000**	**75,300**	**4.91**	**85.3**	**240**	**15.0**	**240**	**7530[b]**	**2310**	**5380**	**99,000[c]**	**23,100**	**26,900**	**24**	**10,000**	**240**	**7530**	**7530**	**68[c]**
Industrial SSL[a]				**960,000**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**1830**	**12,000**	**3230**	**91,600**	**3.23**	**33,700**	**32.3**	**25,300**	**25,300**	**930[d]**
Residential SSL[a]				**66,300**	**17,400**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**380**	**2900**	**153**	**6160**	**0.153**	**2320**	**1.53**	**1740**	**1740**	**63[d]**
RE33-20-186829	33-60474	3.0–4.0	QBT2	0.00461 (J)	—	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-186835	33-60474	6.0–7.0	QBT2	—	—	NA	NA	—	—	—	—	—	0.0231 (J)	—	—	—	—	—	—	—	—	—
RE33-20-186824	33-60475	0.0–1.0	FILL	—	—	NA	NA	—	—	—	—	—	0.135	—	—	—	—	—	—	—	—	—
RE33-20-186830	33-60475	3.0–4.0	QBT2	—	—	NA	NA	—	—	—	—	—	0.0331 (J)	—	—	—	—	—	—	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] SSLs from NMED (2019, 700550), unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] Construction worker SSLs calculated using the equations outlined in NMED (2019, 700500), incorporating toxicity and chemical-specific parameters from EPA regional screening level (RSL) tables (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[d] SSLs from EPA RSL tables (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[e] — = Not detected.

[f] NA = Not analyzed.

Table 6.12-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 33-010(c)

Sample ID	Location ID	Depth (ft)	Media	Tritium	Uranium-234	Uranium-235/236	Uranium-238
Soil Background Value[a]				**na[b]**	**2.59**	**0.2**	**2.29**
Qbt 2,3,4 Background Value[a]				**na**	**1.98**	**0.09**	**1.93**
Sediment Background Value[a]				**0.093**	**2.59**	**0.2**	**2.29**
Construction Worker SAL[c]				**1,600,000**	**1000**	**130**	**470**
Industrial SAL[c]				**2,400,000**	**3100**	**160**	**710**
Residential SAL[c]				**1700**	**290**	**42**	**150**
RE33-99-0005	33-01704	0.0–0.5	SOIL	NA[d]	4.62	0.269	4.54
RE33-99-0006	33-01705	0.0–0.5	SOIL	NA	9.78	0.5	9.41
RE33-99-0008	33-01707	0.0–0.5	SOIL	NA	4.05	0.221	3.94
RE33-99-0065	33-01720	0.0–0.5	SED	NA	16.3	0.76	17.2
RE33-99-0066	33-01721	0.0–0.5	SED	NA	13.7	0.785	14.35
RE33-99-0067	33-01722	0.0–0.5	SED	NA	4.86	0.3	5.57
RE33-20-186819	33-60470	0.0–1.0	FILL	—[e]	6.04 (J)	0.441	6.72 (J)
RE33-20-186825	33-60470	3.0–4.0	FILL	—	5.02 (J)	0.32	5.36 (J)
RE33-20-186820	33-60471	0.0–1.0	FILL	4.68	7.71 (J)	0.386	8.17 (J)
RE33-20-186826	33-60471	3.0–4.0	FILL	6.62	17.7 (J)	0.933	19.1 (J)
RE33-20-186832	33-60471	6.0–6.75	QBT2	—	4.55	0.227	4.94
RE33-20-186821	33-60472	0.0–1.0	FILL	—	5.87 (J)	0.409	7.08 (J)
RE33-20-186833	33-60472	6.0–7.0	QBT2	—	—	0.126	—
RE33-20-186822	33-60473	0.0–1.0	FILL	—	3.76 (J)	0.225	3.99 (J)
RE33-20-186834	33-60473	3.0–4.0	QBT2	—	—	0.103	—
RE33-20-186828	33-60473	6.0–7.0	QBT2	—	—	0.104	—

Note: Results are in pCi/g.
[a] BVs from LANL (1998, 059730).
[b] na = Not available.
[c] SALs from LANL (2015, 600929).
[d] NA = Not analyzed.
[e] — = Not detected or not detected above BV/FV.

Table 6.13-1
Samples Collected and Analyses Requested at SWMU 33-011(a)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Isotopic Plutonium	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOCs	SVOCs	Cyanide	Nitrate
RE33-20-190134	33-01073	2.0–3.0	QBT3	N3B-2020-1031	N3B-2020-1031	N3B-2020-1031	N3B-2020-1031	N3B-2020-1031	—*	N3B-2020-1031	N3B-2020-1031	N3B-2020-1031	N3B-2020-1031
RE33-20-190148	33-01073	5.0–6.0	QBT3	N3B-2020-1031	N3B-2020-1031	N3B-2020-1031	N3B-2020-1031	N3B-2020-1031	—	N3B-2020-1031	N3B-2020-1031	N3B-2020-1031	N3B-2020-1031
RE33-20-190162	33-01073	8.0–9.0	QBT3	N3B-2020-1031	N3B-2020-1031	N3B-2020-1031	N3B-2020-1031	N3B-2020-1031	—	N3B-2020-1031	N3B-2020-1031	N3B-2020-1031	N3B-2020-1031
RE33-20-190135	33-01076	2.0–3.0	QBT3	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	—	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036
RE33-20-190149	33-01076	5.0–6.0	QBT3	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	—	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036
RE33-20-190163	33-01076	8.0–9.0	QBT3	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	—	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036
RE33-20-190136	33-01077	2.0–3.0	QBT3	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	—	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036
RE33-20-190150	33-01077	5.0–6.0	QBT3	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	—	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036
RE33-20-190164	33-01077	8.0–9.0	QBT3	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	—	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036
RE33-20-190137	33-01078	2.0–3.0	QBT3	N3B-2020-1031	N3B-2020-1031	N3B-2020-1031	N3B-2020-1031	N3B-2020-1031	—	N3B-2020-1031	N3B-2020-1031	N3B-2020-1031	N3B-2020-1031
RE33-20-190151	33-01078	5.0–6.0	QBT3	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	—	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036
RE33-20-190165	33-01078	8.0–9.0	QBT3	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	—	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036	N3B-2020-1036
RE33-21-218093	33-61001	0.0–1.0	FILL	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895
RE33-21-218094	33-61001	2.0–3.0	FILL	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895		N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895
RE33-21-221910	33-61001	2.0–3.0	FILL	—	—	—	—	—	N3B-2021-1201	—	—	—	—
RE33-21-218095	33-61001	5.0–6.0	QBT3	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	—	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895
RE33-21-221911	33-61001	5.0–6.0	QBT3	—	—	—	—	—	N3B-2021-1201	—	—	—	—
RE33-21-218096	33-61002	0.0–1.0	FILL	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	—	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895
RE33-21-221912	33-61002	0.0–1.0	FILL	—	—	—	—	—	N3B-2021-1201	—	—	—	—
RE33-21-218097	33-61002	2.0–3.0	QBT3	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895
RE33-21-218098	33-61002	5.0–6.0	QBT3	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	—	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895
RE33-21-221913	33-61002	5.0–6.0	QBT3	—	—	—	—	—	N3B-2021-1201	—	—	—	—
RE33-21-218099	33-61003	0.0–1.0	FILL	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	—	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895
RE33-21-221914	33-61003	0.0–1.0	FILL	—	—	—	—	—	N3B-2021-1201	—	—	—	—
RE33-21-221915	33-61003	2.0–3.0	FILL	—	—	—	—	—	N3B-2021-1201	—	—	—	—
RE33-21-218100	33-61003	2.0–3.0	FILL	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	—	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895
RE33-21-218101	33-61003	5.0–6.0	QBT3	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895
RE33-21-218102	33-61004	0.0–1.0	FILL	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895
RE33-21-221916	33-61004	2.0–3.0	QBT3	—	—	—	—	—	N3B-2021-1195	—	—	—	—

Table 6.13-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Isotopic Plutonium	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOCs	SVOCs	Cyanide	Nitrate
RE33-21-218103	33-61004	2.0–3.0	QBT3	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	—	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895
RE33-21-221917	33-61004	5.0–6.0	QBT3	—	—	—	—	—	N3B-2021-1195	—	—	—	—
RE33-21-218104	33-61004	5.0–6.0	QBT3	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895	—	N3B-2021-895	N3B-2021-895	N3B-2021-895	N3B-2021-895
RE33-21-221918	33-61005	0.0–1.0	FILL	—	—	—	—	—	N3B-2021-1201	—	—	—	—
RE33-21-218105	33-61005	0.0–1.0	FILL	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868	—	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868
RE33-21-218106	33-61005	2.0–3.0	QBT3	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868
RE33-21-218107	33-61005	5.0–6.0	QBT3	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868	—	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868
RE33-21-221919	33-61005	5.0–6.0	QBT3	—	—	—	—	—	N3B-2021-1201	—	—	—	—
RE33-21-218108	33-61006	0.0–1.0	FILL	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868	—	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868
RE33-21-221920	33-61006	0.0–1.0	FILL	—	—	—	—	—	N3B-2021-1201	—	—	—	—
RE33-21-218109	33-61006	2.0–3.0	QBT3	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868	—	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868
RE33-21-221921	33-61006	2.0–3.0	QBT3	—	—	—	—	—	N3B-2021-1201	—	—	—	—
RE33-21-221922	33-61006	5.0–6.0	QBT3	—	—	—	—	—	N3B-2021-1201	—	—	—	—
RE33-21-218110	33-61006	5.0–6.0	QBT3	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868	—	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868
RE33-21-218111	33-61007	0.0–1.0	FILL	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868	—	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868
RE33-21-221923	33-61007	0.0–1.0	FILL	—	—	—	—	—	N3B-2021-1201	—	—	—	—
RE33-21-218112	33-61007	2.0–3.0	QBT3	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868	—	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868
RE33-21-221924	33-61007	2.0–3.0	QBT3	—	—	—	—	—	N3B-2021-1201	—	—	—	—
RE33-21-218113	33-61007	5.0–6.0	QBT3	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868
RE33-21-218114	33-61008	0.0–0.6	FILL	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868		N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868
RE33-21-221925	33-61008	0.0–1.0	ALLH	—	—	—	—	—	N3B-2021-1201	—	—	—	—
RE33-21-218115	33-61008	2.0–3.0	QBT3	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868		N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868
RE33-21-221926	33-61008	2.0–3.0	QBT3	—	—	—	—	—	N3B-2021-1201	—	—	—	—
RE33-21-218116	33-61008	5.0–6.0	QBT3	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868	—	N3B-2021-868	N3B-2021-868	N3B-2021-868	N3B-2021-868
RE33-21-221927	33-61008	5.0–6.0	QBT3	—	—	—	—	—	N3B-2021-1201	—	—	—	—
RE33-21-218117	33-61009	0.0–1.0	FILL	N3B-2021-871	N3B-2021-871	N3B-2021-871	N3B-2021-871	N3B-2021-871	—	N3B-2021-871	N3B-2021-871	N3B-2021-871	N3B-2021-871
RE33-21-221928	33-61009	0.0–1.0	FILL	—	—	—	—	—	N3B-2021-1201	—	—	—	—
RE33-21-218118	33-61009	2.0–3.0	QBT3	N3B-2021-871	N3B-2021-871	N3B-2021-871	N3B-2021-871	N3B-2021-871	N3B-2021-871	N3B-2021-871	N3B-2021-871	N3B-2021-871	N3B-2021-871
RE33-21-218119	33-61009	5.0–6.0	QBT3	N3B-2021-871	N3B-2021-871	N3B-2021-871	N3B-2021-871	N3B-2021-871	—	N3B-2021-871	N3B-2021-871	N3B-2021-871	N3B-2021-871
RE33-21-221929	33-61009	5.0–6.0	QBT3	—	—	—	—	—	N3B-2021-1201	—	—	—	—
RE33-21-218120	33-61010	0.0–1.0	FILL	N3B-2021-889	N3B-2021-889	N3B-2021-889	N3B-2021-889	N3B-2021-889	—	N3B-2021-889	N3B-2021-889	N3B-2021-889	N3B-2021-889
RE33-21-221930	33-61010	0.0–1.0	FILL	—	—	—	—	—	N3B-2021-1195	—	—	—	—

Table 6.13-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Isotopic Plutonium	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOCs	SVOCs	Cyanide	Nitrate
RE33-21-218121	33-61010	2.0–3.0	FILL	N3B-2021-889	N3B-2021-889	N3B-2021-889	N3B-2021-889	N3B-2021-889		N3B-2021-889	N3B-2021-889	N3B-2021-889	N3B-2021-889
RE33-21-221931	33-61010	2.0–3.0	FILL	—	—	—	—	—	N3B-2021-1195	—	—	—	—
RE33-21-218122	33-61010	5.0–6.0	QBT3	N3B-2021-889	N3B-2021-889	N3B-2021-889	N3B-2021-889	N3B-2021-889	—	N3B-2021-889	N3B-2021-889	N3B-2021-889	N3B-2021-889
RE33-21-221932	33-61010	5.0–6.0	QBT3	—	—	—	—	—	N3B-2021-1195	—	—	—	—
RE33-21-221933	33-61063	0.0–0.5	ALLH	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218
RE33-21-221934	33-61063	2.0–3.0	QBT3	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218
RE33-21-221935	33-61063	5.0–6.0	QBT3	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218
RE33-21-221936	33-61064	0.0–0.8	ALLH	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218
RE33-21-221937	33-61064	2.0–3.0	QBT3	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218
RE33-21-221938	33-61064	5.0–6.0	QBT3	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218
RE33-21-221939	33-61065	0.0–0.8	FILL	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218
RE33-21-221940	33-61065	2.0–3.0	QBT3	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218
RE33-21-221941	33-61065	5.0–6.0	QBT3	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218
RE33-21-221942	33-61066	0.0–1.0	FILL	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218
RE33-21-221943	33-61066	2.0–3.0	FILL	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218
RE33-21-221944	33-61066	5.0–6.0	FILL	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218	N3B-2021-1218

Note: Numbers in analyte columns are request numbers.

* — = Analysis not requested.

Table 6.13-2
Inorganic Chemicals above BVs at SWMU 33-011(a)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Barium	Calcium	Chromium	Cobalt	Copper	Lead	Magnesium	Nitrate	Perchlorate	Selenium	Silver	Zinc
Soil Background Value[a]				**0.83**	**8.17**	**295**	**6120**	**19.3**	**8.64**	**14.7**	**22.3**	**4610**	**na[b]**	**na**	**1.52**	**1**	**48.8**
Qbt 2,3,4 Background Value[a]				**0.5**	**2.79**	**46**	**2200**	**7.14**	**3.14**	**4.66**	**11.2**	**1690**	**na**	**na**	**0.3**	**1**	**63.5**
Construction Worker SSL[c]				**142**	**41.2**	**4390**	**na**	**134[d]**	**36.7**	**14,200**	**800**	**na**	**566,000**	**248**	**1750**	**1770**	**106,000**
Industrial SSL[c]				**519**	**35.9**	**255,000**	**na**	**505[d]**	**388**	**51,900**	**800**	**na**	**2,080,000**	**908**	**6490**	**6490**	**389,000**
Residential SSL[c]				**31.3**	**7.07**	**15,600**	**na**	**96.6[d]**	**23.4**	**3130**	**400**	**na**	**125,000**	**54.8**	**391**	**391**	**23,500**
RE33-20-190134	33-01073	2.0–3.0	QBT3	—[e]	—	—	10,200	—	—	—	—	—	—	—	1.75	—	—
RE33-20-190148	33-01073	5.0–6.0	QBT3	—	—	—	2950	—	—	—	—	—	—	—	2.02	—	—
RE33-20-190162	33-01073	8.0–9.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	2.04	—	—
RE33-20-190135	33-01076	2.0–3.0	QBT3	—	—	—	7370 (J+)	—	—	—	—	—	—	—	1.81	—	—
RE33-20-190149	33-01076	5.0–6.0	QBT3	—	—	—	2210 (J+)	17.5	—	—	—	—	—	—	1.85	—	—
RE33-20-190163	33-01076	8.0–9.0	QBT3	—	—	—	2260 (J+)	—	—	—	—	—	—	—	1.79	—	—
RE33-20-190136	33-01077	2.0–3.0	QBT3	—	—	—	14,100 (J+)	13.7	—	—	—	—	—	0.00228	1.87	—	—
RE33-20-190150	33-01077	5.0–6.0	QBT3	—	—	—	10,300 (J+)	—	—	—	—	—	—	0.000807 (J)	1.73	—	—
RE33-20-190164	33-01077	8.0–9.0	QBT3	—	—	—	3010 (J+)	—	—	—	—	—	—	—	1.65	—	—
RE33-20-190137	33-01078	2.0–3.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	2.1	—	—
RE33-20-190151	33-01078	5.0–6.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	1.95	—	—
RE33-20-190165	33-01078	8.0–9.0	QBT3	—	—	—	3900 (J+)	—	—	—	—	—	—	—	1.89	—	—
RE33-21-218093	33-61001	0.0–1.0	FILL	—	—	—	7860	—	—	—	—	—	1.68	—	—	—	—
RE33-21-218094	33-61001	2.0–3.0	FILL	—	—	—	6160	—	—	—	—	—	0.912 (J)	—	2	—	—
RE33-21-218095	33-61001	5.0–6.0	QBT3	—	—	—	—	—	—	—	—	—	0.89 (J)	—	2.07	—	—
RE33-21-218096	33-61002	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	0.833 (J)	—	—	—	—
RE33-21-218097	33-61002	2.0–3.0	QBT3	—	—	—	—	—	4	—	—	—	1.71	—	2.06	—	—
RE33-21-218098	33-61002	5.0–6.0	QBT3	—	—	—	—	—	—	—	—	—	1.01 (J)	—	2.26	—	—
RE33-21-218099	33-61003	0.0–1.0	FILL	—	—	—	6680	—	—	—	—	—	0.844 (J)	—	—	—	—
RE33-21-218100	33-61003	2.0–3.0	FILL	—	—	—	—	—	—	—	32.7 (J+)	—	3.23	—	2.32	—	—
RE33-21-218101	33-61003	5.0–6.0	QBT3	—	—	—	—	—	—	—	—	—	1.23	—	1.99	—	—
RE33-21-218102	33-61004	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	1.33	—	—	—	—
RE33-21-218103	33-61004	2.0–3.0	QBT3	—	—	—	8520	—	—	—	—	—	2.08	—	3.25	—	—
RE33-21-218104	33-61004	5.0–6.0	QBT3	—	—	—	—	—	3.6	—	—	—	2.66	—	2.4	—	—
RE33-21-218105	33-61005	0.0–1.0	FILL	1.28 (U)	—	—	63,100 (J)	—	—	—	—	—	0.81 (J)	—	2.84	—	—
RE33-21-218106	33-61005	2.0–3.0	QBT3	1.53 (U)	5.03	219	117,000 (J)	—	—	—	—	3810 (J)	—	—	2.01	1.04 (J)	—
RE33-21-218107	33-61005	5.0–6.0	QBT3	1.85 (J+)	3.72	110	51,300 (J)	—	—	—	—	2500 (J)	—	—	2.1	—	—
RE33-21-218108	33-61006	0.0–1.0	FILL	0.973 (U)	—	—	7280 (J)	—	—	—	—	—	—	—	—	—	60
RE33-21-218109	33-61006	2.0–3.0	QBT3	—	—	—	12,500 (J)	—	—	—	—	—	—	—	2.09	—	—

Table 6.13-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Arsenic	Barium	Calcium	Chromium	Cobalt	Copper	Lead	Magnesium	Nitrate	Perchlorate	Selenium	Silver	Zinc
Soil Background Value[a]				**0.83**	**8.17**	**295**	**6120**	**19.3**	**8.64**	**14.7**	**22.3**	**4610**	**na[b]**	**na**	**1.52**	**1**	**48.8**
Qbt 2,3,4 Background Value[a]				**0.5**	**2.79**	**46**	**2200**	**7.14**	**3.14**	**4.66**	**11.2**	**1690**	**na**	**na**	**0.3**	**1**	**63.5**
Construction Worker SSL[c]				**142**	**41.2**	**4390**	**na**	**134[d]**	**36.7**	**14200**	**800**	**na**	**566,000**	**248**	**1750**	**1770**	**106,000**
Industrial SSL[c]				**519**	**35.9**	**255,000**	**na**	**505[d]**	**388**	**51900**	**800**	**na**	**2,080,000**	**908**	**6490**	**6490**	**389,000**
Residential SSL[c]				**31.3**	**7.07**	**15,600**	**na**	**96.6[d]**	**23.4**	**3130**	**400**	**na**	**125,000**	**54.8**	**391**	**391**	**23,500**
RE33-21-218110	33-61006	5.0–6.0	QBT3	0.703 (U)	—	—	—	—	—	—	—	—	—	—	2.06	—	—
RE33-21-218111	33-61007	0.0–1.0	FILL	—	—	—	6140 (J)	—	—	—	—	—	0.686 (J)	—	—	—	—
RE33-21-218112	33-61007	2.0–3.0	QBT3	1.39 (U)	3.48	99.3	50,100 (J)	—	—	—	—	3640 (J)	—	0.000808 (J)	2.22	—	—
RE33-21-218113	33-61007	5.0–6.0	QBT3	1.05 (U)	—	62.3	25,900 (J)	—	—	—	—	1720 (J)	1.54	—	2.14	—	—
RE33-21-218114	33-61008	0.0–0.6	FILL	—	—	—	10,200 (J)	—	—	—	—	—	1.1 (J)	—	1.57	—	—
RE33-21-218115	33-61008	2.0–3.0	QBT3	—	—	—	—	—	—	—	—	—	0.669 (J)	—	1.93	—	—
RE33-21-218116	33-61008	5.0–6.0	QBT3	—	—	—	2900 (J)	—	—	—	—	—	0.586 (J)	—	1.77	—	—
RE33-21-218117	33-61009	0.0–1.0	FILL	—	—	—	6440 (J)	—	—	—	—	—	1.05 (J)	—	1.98	—	—
RE33-21-218118	33-61009	2.0–3.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	2.04	—	—
RE33-21-218119	33-61009	5.0–6.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	2.23	—	—
RE33-21-218120	33-61010	0.0–1.0	FILL	—	—	—	—	—	—	16.8 (J)	—	—	1.03	—	—	—	—
RE33-21-218121	33-61010	2.0–3.0	FILL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-218122	33-61010	5.0–6.0	QBT3	—	—	—	—	—	3.17	—	—	—	—	—	2.28	—	66.3
RE33-21-221933	33-61063	0.0–0.5	SOIL	—	—	—	9720 (J)	—	—	—	—	—	0.744 (J)	0.000556 (J)	—	—	—
RE33-21-221934	33-61063	2.0–3.0	QBT3	—	—	—	6020 (J)	—	—	—	—	—	0.607 (J)	0.000546 (J)	0.956 (J)	—	—
RE33-21-221935	33-61063	5.0–6.0	QBT3	—	—	—	—	—	—	—	—	—	0.579 (J)	—	0.961 (J)	—	—
RE33-21-221936	33-61064	0.0–0.8	SOIL	—	—	—	16,600 (J)	—	—	—	—	—	1.04 (J)	—	—	—	—
RE33-21-221937	33-61064	2.0–3.0	QBT3	—	—	—	3690 (J)	—	—	—	—	—	0.647 (J)	—	1.4	—	—
RE33-21-221938	33-61064	5.0–6.0	QBT3	—	—	—	—	—	—	—	—	—	0.579 (J)	0.000857 (J)	1.27	—	—
RE33-21-221939	33-61065	0.0–0.8	FILL	—	—	—	—	—	—	—	—	—	0.793 (J)	—	—	—	—
RE33-21-221940	33-61065	2.0–3.0	QBT3	—	—	—	4410 (J)	—	—	—	—	—	0.623 (J)	—	1.06	—	—
RE33-21-221941	33-61065	5.0–6.0	QBT3	—	—	—	—	—	—	—	—	—	0.581 (J)	—	1.18	—	—
RE33-21-221942	33-61066	0.0–1.0	FILL	—	—	—	25,300 (J)	—	—	—	—	—	1.48	—	—	—	—
RE33-21-221943	33-61066	2.0–3.0	FILL	—	—	—	—	—	—	—	—	—	0.823 (J)	—	—	—	—
RE33-21-221944	33-61066	5.0–6.0	FILL	—	—	—	—	—	—	—	—	—	0.613 (J)	0.00121 (J)	—	—	—

Notes: Units are mg/kg. Data qualifiers are defined in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2019, 700550).

[d] SSL for total chromium.

[e] — = Not detected or not detected above BV.

Table 6.13-3
Organic Chemicals Detected at SWMU 33-011(a)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Carbazole
Construction Worker SSL[a]				**15,100**	**242,000**	**75,300**	**85.3**	**240**	**15.0**	**240**	**7530**[b]	**2310**	**1,080,000**[c]	**5380**	**85**[c,d]
Industrial SSL[a]				**50,500**	**960,000**	**253,000**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300**[b]	**323**	**3,300,000**[e]	**1830**	**1200**[d,e]
Residential SSL[a]				**3480**	**66,300**	**17,400**	**2.43**	**1.53**	**1.12**	**1.53**	**1740**[b]	**15.3**	**250,000**[e]	**380**	**78**[d,e]
RE33-20-190135	33-01076	2.0–3.0	QBT3	—[f]	—	—	NA[g]	—	—	—	—	—	—	0.0135 (J)	—
RE33-20-190149	33-01076	5.0–6.0	QBT3	—	—	—	NA	—	—	—	—	—	—	—	—
RE33-20-190136	33-01077	2.0–3.0	QBT3	—	—	—	NA	—	—	—	—	—	—	—	—
RE33-20-190150	33-01077	5.0–6.0	QBT3	—	—	—	NA	—	—	—	—	—	—	—	—
RE33-20-190137	33-01078	2.0–3.0	QBT3	—	—	—	NA	—	—	—	—	—	—	—	—
RE33-21-218093	33-61001	0.0–1.0	FILL	—	—	—	—	0.0632 (J)	0.0529 (J)	0.0581 (J)	—	—	—	—	—
RE33-21-218094	33-61001	2.0–3.0	FILL	0.113 (J)	—	0.116 (J)	NA	0.352 (J)	0.436	0.479	0.269 (J)	0.207 (J)	—	—	—
RE33-21-218095	33-61001	5.0–6.0	QBT3	—	—	0.0194 (J)	NA	0.0485	0.0506	0.0517	0.0337 (J)	0.0233 (J)	0.436 (J)	0.917 (J)	0.0133 (J)
RE33-21-218096	33-61002	0.0–1.0	FILL	—	—	—	NA	—	—	—	—	—	—	0.0962	—
RE33-21-218099	33-61003	0.0–1.0	FILL	0.0732 (J)	—	0.0971 (J)	NA	0.252	0.312	0.325	0.194	0.124 (J)	—	—	0.0613 (J)
RE33-21-218100	33-61003	2.0–3.0	FILL	0.808	—	1.11	NA	1.77	2.15	2.21	1.25	0.842	—	—	0.563
RE33-21-221915	33-61003	2.0–3.0	FILL	NA	NA	NA	0.0136 (J)	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-218101	33-61003	5.0–6.0	QBT3	—	—	—	—	0.02 (J)	0.0219 (J)	0.0222 (J)	0.0141 (J)	—	—	—	—
RE33-21-218104	33-61004	5.0–6.0	QBT3	—	—	—	NA	—	—	—	—	—	—	—	—
RE33-21-218106	33-61005	2.0–3.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-218108	33-61006	0.0–1.0	FILL	0.107 (J)	—	0.121 (J-)	NA	0.336 (J-)	0.343 (J-)	0.364 (J-)	0.215 (J-)	0.152 (J)	—	—	0.0787 (J)
RE33-21-221920	33-61006	0.0–1.0	FILL	NA	NA	NA	0.00157 (J)	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-218110	33-61006	5.0–6.0	QBT3	—	—	—	NA	—	—	—	—	—	—	0.0136 (J)	—
RE33-21-218111	33-61007	0.0–1.0	FILL	—	—	—	NA	0.0781 (J-)	0.0712 (J-)	0.0816 (J-)	0.0573 (J-)	—	—	—	—
RE33-21-221923	33-61007	0.0–1.0	FILL	NA	NA	NA	0.00213 (J)	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-218114	33-61008	0.0–0.6	FILL	—	—	—	NA	0.0902 (J-)	0.0902 (J-)	0.107 (J-)	0.0589 (J-)	—	—	—	—
RE33-21-218116	33-61008	5.0–6.0	QBT3	—	—	—	NA	—	—	—	—	—	—	0.039	—
RE33-21-218117	33-61009	0.0–1.0	FILL	1.18 (J)	—	1.81 (J)	NA	3.1 (J)	3.7 (J)	3.61 (J)	1.93 (J)	1.5 (J)	—	—	0.926 (J)
RE33-21-218118	33-61009	2.0–3.0	QBT3	—	—	0.0127 (J-)	—	0.0305 (J)	0.0332 (J)	0.0332 (J)	0.0236 (J)	0.0154 (J)	—	—	—

Table 6.13-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Carbazole
Construction Worker SSL[a]				**15,100**	**242,000**	**75,300**	**85.3**	**240**	**15.0**	**240**	**7530**[b]	**2310**	**1,080,000**[c]	**5380**	**85**[c,d]
Industrial SSL[a]				**50,500**	**960,000**	**253,000**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300**[b]	**323**	**3,300,000**[e]	**1830**	**1200**[d,e]
Residential SSL[a]				**3480**	**66,300**	**17,400**	**2.43**	**1.53**	**1.12**	**1.53**	**1740**[b]	**15.3**	**250,000**[e]	**380**	**78**[d,e]
RE33-21-218119	33-61009	5.0–6.0	QBT3	0.018 (J)	—	0.0259 (J-)	NA	0.0546 (J)	0.0556 (J)	0.0563 (J)	0.0373 (J)	0.0235 (J)	—	—	0.0142 (J)
RE33-21-218120	33-61010	0.0–1.0	FILL	0.0135 (J)	—	0.0196 (J)	NA	0.0577 (J)	0.068 (J)	0.0801 (J)	0.0402 (J)	0.0313 (J)	0.435 (J)	—	0.0128 (J)
RE33-21-221933	33-61063	0.0–0.5	SOIL	0.0196 (J)	—	0.021 (J)	0.00625	0.074	0.106	0.116	0.058	0.0453	—	—	—
RE33-21-221935	33-61063	5.0–6.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-221936	33-61064	0.0–0.8	SOIL	—	—	—	—	0.293	0.406	0.465	0.221	0.187 (J)	—	—	—
RE33-21-221937	33-61064	2.0–3.0	QBT3	0.0213 (J)	—	0.0385	—	0.0826	0.103	0.108	0.0475	0.0441	—	0.011 (J)	0.0193 (J)
RE33-21-221938	33-61064	5.0–6.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-221939	33-61065	0.0–0.8	FILL	0.885	—	1.23	—	2.08	2.57	2.76	1.19	1.13	—	—	0.526
RE33-21-221940	33-61065	2.0–3.0	QBT3	0.0184 (J)	—	0.0406	—	0.0868	0.11	0.111	0.0465	0.0441	—	—	0.0205 (J)
RE33-21-221942	33-61066	0.0–1.0	FILL	0.159 (J)	—	0.252	—	0.602	0.763	0.812	0.362	0.326	—	—	0.143 (J)
RE33-21-221943	33-61066	2.0–3.0	FILL	0.0241 (J)	—	0.0194 (J)	—	0.0522	0.064	0.0723	0.0306 (J)	0.0277 (J)	—	—	0.0126 (J)
RE33-21-221944	33-61066	5.0–6.0	FILL	—	0.00463 (J)	—	—	0.0845 (J)	0.0812 (J)	0.0862 (J)	—	—	—	—	—

Table 6.13-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Chloroform	Chrysene	Di-n-butylphthalate	Di-n-octylphthalate	Dibenz(a,h)anthracene	Dibenzofuran	Diethylphthalate	Fluoranthene	Fluorene	Hexanone[2-]	Indeno(1,2,3-cd)pyrene	Isophorone
Construction Worker SSL[a]				**134**	**23,100**	**26,900**	**2700**[c]	**24**	**85**[c]	**215,000**	**10,000**	**10,000**	**340**[c]	**240**	**53,700**
Industrial SSL[a]				**28.7**	**3230**	**91,600**	**8200**[e]	**3.23**	**1200**[e]	**733,000**	**33,700**	**33,700**	**1300**[e]	**32.3**	**27,000**
Residential SSL[a]				**5.9**	**153**	**6160**	**630**[e]	**0.153**	**78**[e]	**49,300**	**2320**	**2320**	**200**[e]	**1.53**	**5610**
RE33-20-190135	33-01076	2.0–3.0	QBT3	—	—	0.0323 (J)	—	—	—	0.017 (J)	—	—	—	—	0.236 (J)
RE33-20-190149	33-01076	5.0–6.0	QBT3	—	—	0.0393	—	—	—	0.0223 (J)	—	—	—	—	0.274 (J)
RE33-20-190136	33-01077	2.0–3.0	QBT3	—	—	0.0824	—	—	—	0.0254 (J)	—	—	—	—	0.238 (J)
RE33-20-190150	33-01077	5.0–6.0	QBT3	—	—	0.0543	—	—	—	0.0223 (J)	—	—	—	—	0.249 (J)
RE33-20-190137	33-01078	2.0–3.0	QBT3	—	—	0.0553	—	—	—	0.0307 (J)	—	—	—	—	0.244 (J)
RE33-21-218093	33-61001	0.0–1.0	FILL	—	—	—	—	—	—	—	0.0922 (J)	—	—	—	—
RE33-21-218094	33-61001	2.0–3.0	FILL	—	0.374	—	—	—	—	—	0.788 (J)	—	—	0.247 (J)	—
RE33-21-218095	33-61001	5.0–6.0	QBT3	—	0.0474	—	—	—	—	—	0.105 (J)	0.0133 (J)	—	0.0348 (J)	—
RE33-21-218096	33-61002	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-218099	33-61003	0.0–1.0	FILL	—	0.276	—	—	—	—	—	0.535 (J)	0.0681 (J)	—	0.198	—
RE33-21-218100	33-61003	2.0–3.0	FILL	—	1.9	—	—	0.305 (J)	—	—	4.27 (J)	0.771	—	1.34	—
RE33-21-221915	33-61003	2.0–3.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-218101	33-61003	5.0–6.0	QBT3	—	0.0182 (J)	—	—	—	—	—	0.037 (J)	—	—	0.0152 (J)	—
RE33-21-218104	33-61004	5.0–6.0	QBT3	—	—	—	0.0183 (J)	—	—	—	—	—	—	—	—
RE33-21-218106	33-61005	2.0–3.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-218108	33-61006	0.0–1.0	FILL	—	0.29 (J-)	—	—	0.0577 (J)	—	—	0.652 (J-)	0.077 (J)	—	0.227 (J-)	—
RE33-21-221920	33-61006	0.0–1.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-218110	33-61006	5.0–6.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-218111	33-61007	0.0–1.0	FILL	—	0.059 (J-)	—	—	—	—	—	0.116 (J-)	—	—	—	—
RE33-21-221923	33-61007	0.0–1.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-218114	33-61008	0.0–0.6	FILL	—	0.0755 (J-)	—	—	—	—	—	0.149 (J-)	—	—	—	—
RE33-21-218116	33-61008	5.0–6.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—
RE33-21-218117	33-61009	0.0–1.0	FILL	—	3.13 (J)	—	—	0.535	0.628 (J)	—	6.28 (J)	1.05 (J)	—	2.2 (J)	—
RE33-21-218118	33-61009	2.0–3.0	QBT3	—	0.0284 (J)	—	—	—	—	—	0.0568 (J)	—	—	0.0202 (J)	—

Table 6.13-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Chloroform	Chrysene	Di-n-butylphthalate	Di-n-octylphthalate	Dibenz(a,h)anthracene	Dibenzofuran	Diethylphthalate	Fluoranthene	Fluorene	Hexanone[2-]	Indeno(1,2,3-cd)pyrene	Isophorone
Construction Worker SSL[a]				**134**	**23,100**	**26,900**	**2700[c]**	**24**	**85[c]**	**215,000**	**10,000**	**10,000**	**340[c]**	**240**	**53,700**
Industrial SSL[a]				**28.7**	**3230**	**91,600**	**8200[e]**	**3.23**	**1200[e]**	**733,000**	**33,700**	**33,700**	**1300[e]**	**32.3**	**27,000**
Residential SSL[a]				**5.9**	**153**	**6160**	**630[e]**	**0.153**	**78[e]**	**49,300**	**2320**	**2320**	**200[e]**	**1.53**	**5610**
RE33-21-218119	33-61009	5.0–6.0	QBT3	—	0.048 (J)	—	—	0.0114 (J)	—	—	0.116 (J)	0.0155 (J)	—	0.0366 (J)	—
RE33-21-218120	33-61010	0.0–1.0	FILL	—	0.0548 (J)	—	—	—	—	—	0.12 (J)	0.0135 (J)	—	0.0427 (J)	—
RE33-21-221933	33-61063	0.0–0.5	SOIL	0.00044 (J)	0.0943	—	—	—	—	—	0.177	0.017 (J)	—	0.0635	—
RE33-21-221935	33-61063	5.0–6.0	QBT3	—	—	—	0.0191 (J)	—	—	—	—	—	—	—	—
RE33-21-221936	33-61064	0.0–0.8	SOIL	—	0.347	—	—	0.0609 (J)	—	—	0.541	—	—	0.238	—
RE33-21-221937	33-61064	2.0–3.0	QBT3	—	0.0854	—	0.0251 (J)	0.0131 (J)	—	—	0.17	0.0237 (J)	—	0.0558	—
RE33-21-221938	33-61064	5.0–6.0	QBT3	—	—	—	0.0324 (J)	—	—	—	—	—	—	—	—
RE33-21-221939	33-61065	0.0–0.8	FILL	0.000956 (J)	2.19	—	—	0.281 (J)	—	—	4.7	0.75	—	1.37	—
RE33-21-221940	33-61065	2.0–3.0	QBT3	—	0.0878	—	—	0.0135 (J)	—	—	0.192	0.017 (J)	—	0.0534	—
RE33-21-221942	33-61066	0.0–1.0	FILL	—	0.632	—	—	—	—	—	1.34 (J)	0.17 (J)	—	0.393	—
RE33-21-221943	33-61066	2.0–3.0	FILL	—	0.054	—	0.0284 (J)	—	—	—	0.121	0.0194 (J)	—	0.0327 (J)	—
RE33-21-221944	33-61066	5.0–6.0	FILL	—	0.0659 (J)	—	—	—	—	—	0.14 (J)	—	0.00779 (J-)	—	—

Table 6.13-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Isopropyltoluene[4-]	Methylnaphthalene[1-]	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Tetrachlorobenzene[1,2,4,5]	Toluene
Construction Worker SSL[a]				**2740[h]**	**6060**	**1000**	**159**	**7530**	**7530**	**80.7**	**14,000**
Industrial SSL[a]				**14,200[h]**	**813**	**3370**	**241**	**25,300**	**25,300**	**275**	**61,300**
Residential SSL[a]				**2360[h]**	**172**	**232**	**49.7**	**1740**	**1740**	**18.5**	**5230**
RE33-20-190135	33-01076	2.0–3.0	QBT3	—	—	—	—	—	—	—	—
RE33-20-190149	33-01076	5.0–6.0	QBT3	—	—	—	—	—	—	—	—
RE33-20-190136	33-01077	2.0–3.0	QBT3	—	—	—	—	—	—	—	—
RE33-20-190150	33-01077	5.0–6.0	QBT3	—	—	—	—	—	—	—	—
RE33-20-190137	33-01078	2.0–3.0	QBT3	—	—	—	—	—	—	—	—
RE33-21-218093	33-61001	0.0–1.0	FILL	—	—	—	—	0.0973 (J)	0.0854 (J-)	—	—
RE33-21-218094	33-61001	2.0–3.0	FILL	—	—	—	0.000437 (J)	0.77 (J)	0.715 (J-)	—	—
RE33-21-218095	33-61001	5.0–6.0	QBT3	—	—	—	—	0.107 (J)	0.0887 (J-)	—	—
RE33-21-218096	33-61002	0.0–1.0	FILL	—	—	—	—	—	—	—	—
RE33-21-218099	33-61003	0.0–1.0	FILL	—	—	—	0.0698 (J)	0.499 (J)	0.492 (J-)	—	—
RE33-21-218100	33-61003	2.0–3.0	FILL	—	0.32 (J)	0.38	1.14	4.87 (J)	3.51 (J-)	—	0.000475 (J)
RE33-21-221915	33-61003	2.0–3.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-218101	33-61003	5.0–6.0	QBT3	—	—	—	—	0.0341 (J)	0.0333 (J-)	—	—
RE33-21-218104	33-61004	5.0–6.0	QBT3	—	—	—	—	—	—	—	—
RE33-21-218106	33-61005	2.0–3.0	QBT3	—	—	—	—	—	—	0.118 (J-)	—
RE33-21-218108	33-61006	0.0–1.0	FILL	—	—	—	0.0927 (J-)	0.638 (J-)	0.588 (J-)	—	—
RE33-21-221920	33-61006	0.0–1.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-218110	33-61006	5.0–6.0	QBT3	—	—	—	—	—	—	—	—
RE33-21-218111	33-61007	0.0–1.0	FILL	—	—	—	—	0.101 (J-)	0.115 (J-)	—	—
RE33-21-221923	33-61007	0.0–1.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-218114	33-61008	0.0–0.6	FILL	—	—	—	—	0.131 (J-)	0.147 (J-)	—	—
RE33-21-218116	33-61008	5.0–6.0	QBT3	—	—	—	—	—	—	—	—
RE33-21-218117	33-61009	0.0–1.0	FILL	—	0.316	0.427	1.23 (J)	6.75 (J)	5.71 (J)	—	—
RE33-21-218118	33-61009	2.0–3.0	QBT3	—	—	—	—	0.0442 (J)	0.0431 (J)	—	—

Table 6.13-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Isopropyltoluene[4-]	Methylnaphthalene[1-]	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Tetrachlorobenzene[1,2,4,5]	Toluene
Construction Worker SSL[a]				**2740**[h]	**6060**	**1000**	**159**	**7530**	**7530**	**80.7**	**14,000**
Industrial SSL[a]				**14,200**[h]	**813**	**3370**	**241**	**25,300**	**25,300**	**275**	**61,300**
Residential SSL[a]				**2360**[h]	**172**	**232**	**49.7**	**1740**	**1740**	**18.5**	**5230**
RE33-21-218119	33-61009	5.0–6.0	QBT3	—	—	—	0.0114 (J-)	0.0998 (J)	0.0836 (J)	—	—
RE33-21-218120	33-61010	0.0–1.0	FILL	—	—	—	—	0.0982 (J)	0.112 (J)	—	—
RE33-21-221933	33-61063	0.0–0.5	SOIL	—	—	—	—	0.148	0.173	—	—
RE33-21-221935	33-61063	5.0–6.0	QBT3	—	—	—	—	—	—	—	—
RE33-21-221936	33-61064	0.0–0.8	SOIL	—	—	—	—	0.318	0.607	—	—
RE33-21-221937	33-61064	2.0–3.0	QBT3	0.000399 (J)	—	—	0.0231 (J)	0.168	0.176	—	—
RE33-21-221938	33-61064	5.0–6.0	QBT3	—	—	—	—	—	—	—	—
RE33-21-221939	33-61065	0.0–0.8	FILL	—	0.288 (J)	0.316 (J)	0.935	5.15	4.91	—	0.000494 (J)
RE33-21-221940	33-61065	2.0–3.0	QBT3	—	—	—	0.0201 (J)	0.163	0.189	—	—
RE33-21-221942	33-61066	0.0–1.0	FILL	—	—	0.0598 (J)	0.174 (J)	1.32	1.38	—	—
RE33-21-221943	33-61066	2.0–3.0	FILL	—	—	0.0119 (J)	0.0353 (J)	0.148	0.127	—	—
RE33-21-221944	33-61066	5.0–6.0	FILL	—	—	—	0.000497 (J)	0.162 (J)	0.139 (J)	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] SSLs from NMED (2019, 700550) unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] Construction worker SSLs calculated using the equations outlined in NMED (2019. 700550), incorporating toxicity and chemical-specific parameters from EPA regional screening level (RSL) tables (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[d] Dibenzofuran used as a surrogate based on structural similarity.

[e] SSLs from EPA RSL tables (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[f] — = Not detected.

[g] NA = Not analyzed.

[h] Isopropylbenzene used as a surrogate based on structural similarity.

Table 6.13-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 33-011(a)

Sample ID	Location ID	Depth (ft)	Media	Cesium-137	Plutonium-239/240	Uranium-235/236
Soil Background Value/Fallout Value[a]				**1.65**	**0.054**	**0.2**
Qbt 2,3,4 Background Value[a]				**na[b]**	**na**	**0.09**
Construction Worker SAL[c]				**37**	**200**	**130**
Industrial SAL[c]				**41**	**1200**	**160**
Residential SAL[c]				**12**	**79**	**42**
RE33-20-190162	33-01073	8.0–9.0	QBT3	—[d]	—	0.109
RE33-20-190135	33-01076	2.0–3.0	QBT3	—	—	0.096
RE33-21-218094	33-61001	2.0–3.0	FILL	0.064	—	—
RE33-21-218100	33-61003	2.0–3.0	FILL	0.0971	0.134	—
RE33-21-218101	33-61003	5.0–6.0	QBT3	—	—	0.125
RE33-21-218104	33-61004	5.0–6.0	QBT3	—	—	0.103
RE33-21-218122	33-61010	5.0–6.0	QBT3	—	—	0.126

Note: Results are in pCi/g.
[a] BVs/FVs from LANL (1998, 059730).
[b] na = Not available.
[c] SALs from LANL (2015, 600929).
[d] — = Not detected or not detected above BV/FV.

Table 6.14-1
Samples Collected and Analyses Requested at SWMU 33-011(d)

Sample ID	Location ID	Depth (ft)	Media	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	Perchlorate	Arsenic	Selenium	Thallium	PCBs	VOCs	SVOCs	Cyanide	Nitrate
RE33-20-190308	33-01081	0.0–1.0	FILL	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876	—[a]	—	—	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876
RE33-20-190309	33-01081	2.0–3.0	QBT3	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876	—	—	—	—	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876
RE33-20-190310	33-01081	4.0–5.0	QBT3	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876	—	—	—	—	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876
0333-96-0111	33-01566	0–0.5	FILL	—	—	—	2365, 2366	—	2365	2365	2365	—	—	—	—	—
0333-96-0120	33-01566	0.67–1	FILL	—	—	—	2376, 2377	—	—	—	—	—	—	—	—	—
RE33-20-190313	33-01566	0.0–1.0	FILL	N3B-2020-852	N3B-2020-852	N3B-2020-852	N3B-2020-852	N3B-2020-852	—	—	—	—	N3B-2020-852	N3B-2020-852	N3B-2020-852	N3B-2020-852
RE33-20-190312	33-01566	2.0–3.0	QBT3	N3B-2020-852	N3B-2020-852	N3B-2020-852	N3B-2020-852	N3B-2020-852	—	—	—	—	N3B-2020-852	N3B-2020-852	N3B-2020-852	N3B-2020-852
RE33-20-190311	33-01566	4.0–5.0	QBT3	N3B-2020-862	N3B-2020-862	N3B-2020-862	N3B-2020-862	N3B-2020-862	—	—	—	N3B-2020-862	N3B-2020-862	N3B-2020-862	N3B-2020-862	N3B-2020-862
0333-96-0112	33-01567	0–0.5	FILL	—	—	—	2365, 2366	—	2365	2365	2365	—	—	—	—	—
0333-96-0121	33-01567	0.67–1	FILL	—	—	—	2376, 2377	—	—	—	—	—	—	—	—	—
RE33-20-190314	33-01567	0.0–1.0	FILL	N3B-2020-862	N3B-2020-862	N3B-2020-862	N3B-2020-862	N3B-2020-862	—	—	—	N3B-2020-862	N3B-2020-862	N3B-2020-862	N3B-2020-862	N3B-2020-862
RE33-20-190315	33-01567	2.0–3.0	QBT3	N3B-2020-862	N3B-2020-862	N3B-2020-862	N3B-2020-862	N3B-2020-862	—	—	—	—	N3B-2020-862	N3B-2020-862	N3B-2020-862	N3B-2020-862
RE33-20-190316	33-01567	4.0–5.0	QBT3	N3B-2020-862	N3B-2020-862	N3B-2020-862	N3B-2020-862	N3B-2020-862	—	—	—	—	N3B-2020-862	N3B-2020-862	N3B-2020-862	N3B-2020-862
0333-96-0113	33-01568	0–0.5	FILL	—	—	—	2365, 2366	—	2365	2365	2365	—	—	—	—	—
0333-96-0122	33-01568	0.67–1	FILL	—	—	—	2376, 2377	—	—	—	—	—	—	—	—	—
0333-96-0114	33-01569	0–0.5	FILL	—	—	—	2365, 2366	—	2365	2365	2365	—	—	—	—	—
0333-96-0123	33-01569	0.42–0.67	FILL	—	—	—	2376, 2377	—	—	—	—	—	—	—	—	—
0333-96-0110	33-01570	0–0.5	SED	—	—	2366	—	—	—	—	—	—	—	—	—	—
0333-96-0117	33-01570	0.17–0.58	FILL	—	—	2377	—	—	—	—	—	—	—	—	—	—
0333-96-0115	33-01571	0–0.5	SOIL	—	—	—	2365, 2366	—	2365	2365	2365	—	—	—	—	—
0333-96-0124	33-01571	0.5–0.75	FILL	—	—	—	2376, 2377	—	—	—	—	—	—	—	—	—
RE33-20-190317	33-01571	0.0–0.7	FILL	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	—	—	—	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932
RE33-20-190318	33-01571	2.0–3.0	QBT3	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	—	—	—	—	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932
RE33-20-190319	33-01571	4.0–5.0	QBT3	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	—	—	—	—	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932
0333-96-0116	33-01572	0–0.5	FILL	—	—	—	2365, 2366	—	2365	2365	2365	—	—	—	—	—
0333-96-0125	33-01572	0.5–0.67	FILL	—	—	—	2376, 2377	—	—	—	—	—	—	—	—	—
RE33-20-190320	33-01572	0.0–1.0	FILL	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	—	—	—	—	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932
RE33-20-190321	33-01572	2.0–3.0	QBT3	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	—	—	—	—	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932
RE33-20-190322	33-01572	4.0–5.0	QBT3	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	—	—	—	—	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932
RE33-20-190323	33-60667	0.0–1.0	FILL	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876	—	—	—	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876

Table 6.14-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	Perchlorate	Arsenic	Selenium	Thallium	PCBs	VOCs	SVOCs	Cyanide	Nitrate
RE33-20-190327	33-60667	2.0–3.0	QBT3	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876	—	—	—	—	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876
RE33-20-190331	33-60667	4.0–5.0	QBT3	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876	—	—	—	—	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876
RE33-20-190324	33-60668	0.0–1.0	FILL	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876	—	—	—	—	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876
RE33-20-190328	33-60668	2.0–3.0	FILL	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876	—	—	—	—	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876
RE33-20-190332	33-60668	4.0–5.0	QBT3	N3B-2020-887	N3B-2020-887	N3B-2020-887	N3B-2020-887	N3B-2020-887	—	—	—	—	N3B-2020-887	N3B-2020-887	N3B-2020-887	N3B-2020-887
RE33-20-190325	33-60669	0.0–1.0	FILL	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876	—	—	—	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876
RE33-20-190329	33-60669	2.0–3.0	QBT3	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876	—	—	—	—	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876
RE33-20-190333	33-60669	4.0–5.0	QBT3	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876	—	—	—	—	N3B-2020-876	N3B-2020-876	N3B-2020-876	N3B-2020-876
RE33-20-190326	33-60670	0.0–1.0	FILL	N3B-2020-887	N3B-2020-887	N3B-2020-887	N3B-2020-887	N3B-2020-887	—	—	—	—	N3B-2020-887	N3B-2020-887	N3B-2020-887	N3B-2020-887
RE33-20-190330	33-60670	2.0–2.4	FILL	N3B-2020-887	N3B-2020-887	N3B-2020-887	N3B-2020-887	N3B-2020-887	—	—	—	—	N3B-2020-887	N3B-2020-887	N3B-2020-887	N3B-2020-887
RE33-20-190334	33-60670	4.0–5.0	QBT3	N3B-2020-887	N3B-2020-887	N3B-2020-887	N3B-2020-887	N3B-2020-887	—	—	—	—	N3B-2020-887	N3B-2020-887	N3B-2020-887	N3B-2020-887
RE33-21-218006	33-60998	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	—	N3B-2021-859[b]	—	—
RE33-21-218007	33-60998	2.0–2.8	FILL	—	—	—	—	—	—	—	—	—	—	N3B-2021-859[b]	—	—
RE33-21-218008	33-60998	4.0–5.0	QBT3	—	—	—	—	—	—	—	—	—	—	N3B-2021-859[b]	—	—
RE33-21-218009	33-60999	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	—	N3B-2021-859[b]	—	—
RE33-21-218010	33-60999	2.0–2.8	FILL	—	—	—	—	—	—	—	—	—	—	N3B-2021-859[b]	—	—
RE33-21-218011	33-60999	4.0–5.0	QBT3	—	—	—	—	—	—	—	—	—	—	N3B-2021-859[b]	—	—
RE33-21-222622	33-61107	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	—	N3B-2021-1254[b]	—	—
RE33-21-222623	33-61107	2.0–3.0	QBT3	—	—	—	—	—	—	—	—	—	—	N3B-2021-1254[b]	—	—
RE33-21-222624	33-61107	4.0–5.0	QBT3	—	—	—	—	—	—	—	—	—	—	N3B-2021-1254[b]	—	—

Note: Numbers in analyte columns are request numbers.

[a] — = Analysis not requested.

[b] Sample analyzed for PAHs only.

Table 6.14-2
Inorganic Chemicals above BVs at SWMU 33-011(d)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Calcium	Chromium	Lead	Magnesium	Mercury	Nickel	Nitrate	Selenium	Silver	Thallium	Zinc
Soil Background Value[a]				**0.83**	**295**	**0.4**	**6120**	**19.3**	**22.3**	**4610**	**0.1**	**15.4**	**na[b]**	**1.52**	**1**	**0.73**	**48.8**
Qbt 2,3,4 Background Value[a]				**0.5**	**46**	**1.63**	**2200**	**7.14**	**11.2**	**1690**	**0.1**	**6.58**	**na**	**0.3**	**1**	**1.1**	**63.5**
Construction Worker SSL[c]				**142**	**4390**	**72.1**	**na**	**134[d]**	**800**	**na**	**77.1**	**753**	**566,000**	**1750**	**1770**	**3.54**	**106,000**
Industrial SSL[c]				**519**	**255,000**	**1110**	**na**	**505[d]**	**800**	**na**	**389**	**25,700**	**2,080,000**	**6490**	**6490**	**13**	**389,000**
Residential SSL[c]				**31.3**	**15,600**	**70.5**	**na**	**96.6[d]**	**400**	**na**	**23.5**	**1560**	**125,000**	**391**	**391**	**0.782**	**23,500**
RE33-20-190308	33-01081	0.0–1.0	FILL	—[e]	—	—	10,700	—	—	—	—	—	—	—	—	—	—
RE33-20-190309	33-01081	2.0–3.0	QBT3	0.782 (U)	54.4	—	24,700	18.5	—	2980	—	7.01	—	1.71	—	—	—
RE33-20-190310	33-01081	4.0–5.0	QBT3	—	—	—	21,400	24.2	—	2000	—	—	—	1.46	—	—	—
0333-96-0111	33-01566	0–0.5	FILL	11 (UJ)	—	0.53 (U)	—	—	31	—	0.11 (U)	—	NA[f]	—	2.1 (U)	1.3 (U)	—
RE33-20-190313	33-01566	0.0–1.0	FILL	2.1 (U)	—	—	—	19.8	87.4	—	—	—	—	—	—	—	—
0333-96-0120	33-01566	0.67–1	FILL	8.3 (U)	—	0.73 (U)	—	—	774	—	—	—	NA	—	1.5 (U)	—	94.2
RE33-20-190312	33-01566	2.0–3.0	QBT3	1.15 (U)	—	—	—	15.6	—	—	—	—	0.709 (J)	1.68	—	—	—
RE33-20-190311	33-01566	4.0–5.0	QBT3	—	—	—	—	18.1 (J)	—	—	—	—	0.698 (J)	1.7	—	—	—
0333-96-0112	33-01567	0–0.5	FILL	11 (UJ)	—	0.54 (U)	—	—	300	—	0.11 (U)	—	NA	—	2.2 (U)	1.4 (U)	78 (J+)
RE33-20-190314	33-01567	0.0–1.0	FILL	1.45 (U)	—	—	—	21.2 (J)	61.6	—	—	—	—	—	—	—	—
0333-96-0121	33-01567	0.67–1	FILL	8.4 (U)	—	0.74 (U)	—	—	—	—	—	—	NA	—	1.5 (U)	—	—
RE33-20-190315	33-01567	2.0–3.0	QBT3	—	—	—	—	16.3 (J)	—	—	—	—	—	1.67	—	—	—
RE33-20-190316	33-01567	4.0–5.0	QBT3	0.965 (U)	—	—	—	10.9 (J)	—	—	—	—	—	1.63	—	—	—
0333-96-0113	33-01568	0–0.5	FILL	11 (UJ)	—	0.54 (U)	—	—	—	—	0.11 (U)	—	NA	—	2.2 (U)	1.3 (U)	—
0333-96-0122	33-01568	0.67–1	FILL	8.4 (U)	—	0.74 (U)	—	—	—	—	—	—	NA	—	1.5 (U)	—	—
0333-96-0114	33-01569	0–0.5	FILL	11 (UJ)	—	0.53 (U)	—	—	—	—	0.11 (U)	—	NA	—	2.1 (U)	1.3 (U)	—
0333-96-0123	33-01569	0.42–0.67	FILL	8.5 (U)	—	0.75 (U)	7360	—	—	—	—	—	NA	—	1.5 (U)	—	—
0333-96-0115	33-01571	0–0.5	SOIL	11 (UJ)	—	0.54 (U)	—	—	—	—	0.11 (U)	—	NA	—	2.2 (U)	1.4 (U)	—
RE33-20-190317	33-01571	0.0–0.7	FILL	—	—	1.38	—	—	—	—	—	—	—	—	—	—	—
0333-96-0124	33-01571	0.5–0.75	FILL	8.5 (U)	—	0.75 (U)	—	—	—	—	2	—	NA	—	1.5 (U)	—	—
RE33-20-190318	33-01571	2.0–3.0	QBT3	—	—	—	—	27	—	—	—	—	—	0.968 (J)	—	—	—
RE33-20-190319	33-01571	4.0–5.0	QBT3	—	—	—	—	43.7	—	—	—	—	—	0.915 (J)	—	—	—
0333-96-0116	33-01572	0–0.5	FILL	11 (UJ)	—	0.54 (U)	—	—	—	—	0.11 (U)	—	NA	—	2.2 (U)	1.4 (U)	—
RE33-20-190320	33-01572	0.0–1.0	FILL	—	—	—	19,200	—	—	—	—	—	—	—	—	—	—

Table 6.14-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Calcium	Chromium	Lead	Magnesium	Mercury	Nickel	Nitrate	Selenium	Silver	Thallium	Zinc
Soil Background Value[a]				**0.83**	**295**	**0.4**	**6120**	**19.3**	**22.3**	**4610**	**0.1**	**15.4**	**na[b]**	**1.52**	**1**	**0.73**	**48.8**
Qbt 2,3,4 Background Value[a]				**0.5**	**46**	**1.63**	**2200**	**7.14**	**11.2**	**1690**	**0.1**	**6.58**	**na**	**0.3**	**1**	**1.1**	**63.5**
Construction Worker SSL[c]				**142**	**4390**	**72.1**	**na**	**134[d]**	**800**	**na**	**77.1**	**753**	**566,000**	**1750**	**1770**	**3.54**	**106,000**
Industrial SSL[c]				**519**	**255,000**	**1110**	**na**	**505[d]**	**800**	**na**	**389**	**25,700**	**2,080,000**	**6490**	**6490**	**13**	**389,000**
Residential SSL[c]				**31.3**	**156,000**	**70.5**	**na**	**96.6[d]**	**400**	**na**	**23.5**	**1560**	**125,000**	**391**	**391**	**0.782**	**23,500**
0333-96-0125	33-01572	0.5–0.67	FILL	7.9 (U)	—	0.7 (U)	—	—	—	—	0.77	—	NA	—	1.4 (U)	—	—
RE33-20-190321	33-01572	2.0–3.0	QBT3	—	—	—	—	18.9	—	—	—	—	—	0.972 (J)	—	—	—
RE33-20-190322	33-01572	4.0–5.0	QBT3	—	—	—	—	22.1	—	—	—	—	—	1.05 (J)	—	—	—
RE33-20-190323	33-60667	0.0–1.0	FILL	—	—	—	—	19.7	—	—	—	—	0.907 (J)	—	—	—	—
RE33-20-190327	33-60667	2.0–3.0	QBT3	—	—	—	—	17.6	—	—	—	—	1.34	1.44	—	—	—
RE33-20-190331	33-60667	4.0–5.0	QBT3	—	—	—	—	23.4	—	—	—	—	1.08 (J)	1.32	—	—	—
RE33-20-190324	33-60668	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	1.17	—	—	—	—
RE33-20-190328	33-60668	2.0–3.0	FILL	—	—	—	—	22.3	—	—	—	—	—	—	—	—	—
RE33-20-190332	33-60668	4.0–5.0	QBT3	0.881 (U)	—	—	—	64.1	—	—	—	—	1 (J)	1.1 (J)	—	—	—
RE33-20-190325	33-60669	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	0.788 (J)	—	—	—	—
RE33-20-190329	33-60669	2.0–3.0	QBT3	—	—	—	—	42.6	—	—	—	—	—	1.27	—	—	—
RE33-20-190333	33-60669	4.0–5.0	QBT3	—	—	—	—	17.4	—	—	—	—	—	1.34	—	—	—
RE33-20-190326	33-60670	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190330	33-60670	2.0–2.4	FILL	—	—	—	9210	—	—	—	—	—	1 (J)	—	—	—	—
RE33-20-190334	33-60670	4.0–5.0	QBT3	—	—	—	—	16.5	—	—	—	—	—	1.07	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2019, 700550) unless otherwise noted.

[d] SSL for total chromium.

[e] — = Not detected or not detected above BV.

[f] NA = Not analyzed.

Table 6.14-3
Organic Chemicals Detected at SWMU 33-011(d)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Carbazole	Chrysene	Dibenz(a,h)anthracene	Dibenzofuran	Fluoranthene	Fluorene
Construction Worker SSL[a]				**15,100**	**242,000**	**75,300**	**240**	**15.0**	**240**	**7530[b]**	**2310**	**85[c,d]**	**23,100**	**24**	**85[c]**	**10,000**	**10,000**
Industrial SSL[a]				**50,500**	**960,000**	**253,000**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**1200[d,e]**	**3230**	**3.23**	**1200[e]**	**33,700**	**33,700**
Residential SSL[a]				**3480**	**66,300**	**17,400**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**78[d,e]**	**153**	**0.153**	**78[e]**	**2320**	**2320**
RE33-20-190308	33-01081	0.0–1.0	FILL	—[f]	0.00501 (J)	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190309	33-01081	2.0–3.0	QBT3	—	0.0025 (J)	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190310	33-01081	4.0–5.0	QBT3	—	0.00305 (J)	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190311	33-01566	4.0–5.0	QBT3	—	0.0144	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190314	33-01567	0.0–1.0	FILL	—	0.00711	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190315	33-01567	2.0–3.0	QBT3	—	0.0118	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190316	33-01567	4.0–5.0	QBT3	—	0.00976	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190323	33-60667	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190331	33-60667	4.0–5.0	QBT3	—	0.00314 (J)	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190324	33-60668	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190328	33-60668	2.0–3.0	FILL	—	0.00279 (J)	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190333	33-60669	4.0–5.0	QBT3	—	0.00201 (J)	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190330	33-60670	2.0–2.4	FILL	4.23	—	3.84	5.31	5.64	6.07	2.97	2.4	1.81	5.43	0.965	3.26 (J)	9.6	3.91
RE33-20-190334	33-60670	4.0–5.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	0.0115 (J)	—
RE33-21-218006	33-60998	0.0–1.0	FILL	0.0343 (J+)	NA[g]	0.0549 (J+)	0.151 (J+)	0.141 (J+)	0.172 (J+)	0.0858 (J+)	0.0652 (J+)	NA	0.161 (J+)	0.0275 (J+)	NA	0.329 (J+)	0.0309 (J+)
RE33-21-218007	33-60998	2.0–2.8	FILL	0.335 (J+)	NA	0.404 (J+)	0.636 (J+)	0.794 (J+)	0.965 (J+)	0.568 (J+)	0.328 (J+)	NA	0.684 (J+)	0.164 (J+)	NA	1.27 (J+)	0.26 (J+)
RE33-21-218008	33-60998	4.0–5.0	QBT3	—	NA	—	—	0.00181 (J)	0.00253 (J)	—	—	NA	—	—	NA	0.00362	—
RE33-21-218009	33-60999	0.0–1.0	FILL	—	NA	—	0.0421 (J+)	0.0456 (J+)	0.0666 (J+)	0.0316 (J+)	0.021 (J+)	NA	0.0456 (J+)	—	NA	0.0772 (J+)	—
RE33-21-218010	33-60999	2.0–2.8	FILL	0.0552 (J+)	NA	0.069 (J+)	0.207 (J+)	0.228 (J+)	0.338 (J+)	0.145 (J+)	0.117 (J+)	NA	0.255 (J+)	0.0414 (J+)	NA	0.421 (J+)	0.0414 (J+)
RE33-21-222622	33-61107	0.0–1.0	FILL	—	NA	—	0.0315 (J)	0.0351 (J)	0.0386 (J)	0.0315 (J)	—	NA	0.0315 (J)	—	NA	0.0631 (J)	—
RE33-21-222623	33-61107	2.0–3.0	QBT3	—	NA	—	—	—	—	—	—	NA	—	—	NA	0.00219 (J)	—

Table 6.14-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Indeno(1,2,3-cd)pyrene	Methylnaphthalene[1-]	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene
Construction Worker SSL[a]				**240**	**6060**	**1000**	**159**	**7530**	**7530**
Industrial SSL[a]				**32.3**	**813**	**3370**	**241**	**25,300**	**25,300**
Residential SSL[a]				**1.53**	**172**	**232**	**49.7**	**1740**	**1740**
RE33-20-190308	33-01081	0.0–1.0	FILL	—	—	—	—	—	—
RE33-20-190309	33-01081	2.0–3.0	QBT3	—	—	—	—	—	—
RE33-20-190310	33-01081	4.0–5.0	QBT3	—	—	—	—	—	—
RE33-20-190311	33-01566	4.0–5.0	QBT3	—	—	—	—	—	—
RE33-20-190314	33-01567	0.0–1.0	FILL	—	—	—	—	—	—
RE33-20-190315	33-01567	2.0–3.0	QBT3	—	—	—	—	—	—
RE33-20-190316	33-01567	4.0–5.0	QBT3	—	—	—	—	—	—
RE33-20-190323	33-60667	0.0–1.0	FILL	—	—	—	—	0.057 (J)	0.0748 (J)
RE33-20-190331	33-60667	4.0–5.0	QBT3	—	—	—	—	—	—
RE33-20-190324	33-60668	0.0–1.0	FILL	—	—	—	—	—	0.0739 (J)
RE33-20-190328	33-60668	2.0–3.0	FILL	—	—	—	0.00041 (J)	—	—
RE33-20-190333	33-60669	4.0–5.0	QBT3	—	—	—	—	—	—
RE33-20-190330	33-60670	2.0–2.4	FILL	2.75	2.35	3.31	11	15	12
RE33-20-190334	33-60670	4.0–5.0	QBT3	—	—	—	0.000552 (J)	0.0138 (J)	0.0127 (J)
RE33-21-218006	33-60998	0.0–1.0	FILL	0.0892 (J+)	—	—	—	0.278 (J+)	0.271 (J+)
RE33-21-218007	33-60998	2.0–2.8	FILL	0.575 (J+)	0.144 (J+)	0.178 (J+)	0.52 (J+)	1.61 (J+)	1.63 (J+)
RE33-21-218008	33-60998	4.0–5.0	QBT3	—	—	—	0.00217 (J+)	0.0047	0.00362
RE33-21-218009	33-60999	0.0–1.0	FILL	0.0351 (J+)	—	—	—	0.0491 (J+)	0.0807 (J+)
RE33-21-218010	33-60999	2.0–2.8	FILL	0.152 (J+)	—	—	—	0.359 (J+)	0.49 (J+)
RE33-21-222622	33-61107	0.0–1.0	FILL	0.028 (J)	—	—	—	0.0631 (J)	0.0701 (J)
RE33-21-222623	33-61107	2.0–3.0	QBT3	—	—	—	—	0.00219 (J)	0.00293 (J)

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] SSLs from NMED (2019, 700550) unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] Construction worker SSLs calculated using the equations outlined in NMED (2019, 700550), incorporating toxicity and chemical-specific parameters from EPA regional screening level (RSL) tables (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[d] Dibenzofuran used as a surrogate based on structural similarity.

[e] SSLs from EPA RSL tables (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).

[f] — = Not detected.

[g] NA = Not analyzed.

Table 6.14-4
Radionuclides Detected or
Detected above BVs/FVs at SWMU 33-011(d)

Sample ID	Location ID	Depth (ft)	Media	Uranium-235/236
Qbt 2,3,4 Background Value[a]				**0.09**
Construction Worker SAL[b]				**130**
Industrial SAL[b]				**160**
Residential SAL[b]				**42**
RE33-20-190311	33-01566	4.0–5.0	QBT3	0.189
RE33-20-190319	33-01571	4.0–5.0	QBT3	0.1

Note: Results are in pCi/g.

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

[b] SALs from LANL (2015, 600929).

Table 6.15-1
Samples Collected and Analyses Requested at SWMU 33-012(a)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Tritium	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOCs	SVOCs	Cyanide	Nitrate
RE33-20-190287	33-01086	0.0–1.0	FILL	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926
RE33-20-190288	33-01086	2.0–3.0	FILL	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930
RE33-20-190289	33-01086	4.0–5.0	FILL	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930
RE33-20-190290	33-01087	0.0–1.0	FILL	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926
RE33-20-190291	33-01087	2.0–3.0	FILL	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926
RE33-20-190292	33-01087	4.0–5.0	FILL	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926
RE33-20-195039	33-01089	0.0–1.0	FILL	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926
RE33-20-195040	33-01089	2.0–3.0	FILL	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926
RE33-20-195041	33-01089	4.0–5.0	FILL	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926
RE33-20-190275	33-60658	0.0–1.0	FILL	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902
RE33-20-190279	33-60658	2.0–3.0	FILL	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902
RE33-20-190283	33-60658	4.0–5.0	FILL	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902
RE33-20-190280	33-60659	2.0–3.0	FILL	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902
RE33-20-190284	33-60659	4.0–5.0	FILL	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902

Table 6.15-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Tritium	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOCs	SVOCs	Cyanide	Nitrate
RE33-20-190277	33-60660	0.0–1.0	FILL	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902
RE33-20-190281	33-60660	2.0–3.0	FILL	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902
RE33-20-190285	33-60660	4.0–5.0	FILL	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902	N3B-2020-902
RE33-20-190282	33-60661	2.0–3.0	FILL	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930
RE33-20-190286	33-60661	4.0–5.0	FILL	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930
RE33-20-190293	33-60662	0.0–1.0	FILL	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930
RE33-20-190298	33-60662	2.0–3.0	FILL	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930
RE33-20-190303	33-60662	4.0–5.0	FILL	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930
RE33-20-190294	33-60663	0.0–1.0	FILL	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930
RE33-20-190299	33-60663	2.0–3.0	FILL	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930
RE33-20-190304	33-60663	4.0–5.0	FILL	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932
RE33-20-190295	33-60664	0.0–1.0	FILL	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930
RE33-20-190300	33-60664	2.0–3.0	FILL	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932
RE33-20-190305	33-60664	4.0–5.0	FILL	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932
RE33-20-190296	33-60665	0.0–1.0	FILL	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930
RE33-20-190301	33-60665	2.0–3.0	FILL	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932
RE33-20-190306	33-60665	4.0–5.0	FILL	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932
RE33-20-190297	33-60666	0.0–1.0	FILL	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930	N3B-2020-930
RE33-20-190302	33-60666	2.0–3.0	FILL	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932
RE33-20-190307	33-60666	4.0–5.0	FILL	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932	N3B-2020-932
RE33-21-217989	33-60992	0.0–1.0	ALLH	—[a]	—	—	—	—	N3B-2021-849	—	—	—	—
RE33-21-222520	33-60992	0.0–1.0	FILL	—	—	—	—	—	—	—	N3B-2021-1318[b]	—	—
RE33-21-217990	33-60992	2.0–3.0	FILL	—	—	—	—	—	N3B-2021-849	—	—	—	—
RE33-21-222521	33-60992	2.0–3.0	FILL	—	—	—	—	—	—	—	N3B-2021-1318[b]	—	—
RE33-21-217991	33-60992	4.0–5.0	FILL	—	—	—	—	—	N3B-2021-849	—	—	—	—
RE33-21-222522	33-60992	4.0–5.0	FILL	—	—	—	—	—	—	—	N3B-2021-1318[b]	—	—
RE33-21-217992	33-60993	0.0–1.0	FILL	—	—	—	—	—	N3B-2021-861	—	—	—	—
RE33-21-222523	33-60993	0.0–1.0	FILL	—	—	—	—	—	—	—	N3B-2021-1318[b]	—	—
RE33-21-217993	33-60993	2.0–3.0	FILL	—	—	—	—	—	N3B-2021-861	—	—	—	—
RE33-21-222524	33-60993	2.0–3.0	FILL	—	—	—	—	—	—	—	N3B-2021-1318[b]	—	—
RE33-21-217994	33-60993	4.0–5.0	FILL	—	—	—	—	—	N3B-2021-861	—	—	—	—
RE33-21-222525	33-60993	4.0–5.0	FILL	—	—	—	—	—	—	—	N3B-2021-1318[b]	—	—

Table 6.15-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Tritium	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOCs	SVOCs	Cyanide	Nitrate
RE33-21-217995	33-60994	0.0–1.0	FILL	—	—	—	—	—	N3B-2021-849	—	—	—	—
RE33-21-222526	33-60994	0.0–1.0	FILL	—	—	—	—	—	—	—	N3B-2021-1277[b]	—	—
RE33-21-222527	33-60994	2.0–3.0	FILL	—	—	—	—	—	—	—	N3B-2021-1277[b]	—	—
RE33-21-217996	33-60994	2.0–3.0	FILL	—	—	—	—	—	N3B-2021-849	—	—	—	—
RE33-21-217997	33-60994	4.0–5.0	FILL	—	—	—	—	—	N3B-2021-849	—	—	—	—
RE33-21-222528	33-60994	4.0–5.0	FILL	—	—	—	—	—	—	—	N3B-2021-1277[b]	—	—
RE33-21-217998	33-60995	0.0–1.0	FILL	—	—	—	—	—	N3B-2021-849	—	—	—	—
RE33-21-217999	33-60995	2.0–3.0	FILL	—	—	—	—	—	N3B-2021-849	—	—	—	—
RE33-21-218000	33-60995	4.0–5.0	FILL	—	—	—	—	—	N3B-2021-849	—	—	—	—
RE33-21-218001	33-60996	0.0–1.0	FILL	—	—	—	—	—	—	—	N3B-2021-849[b]	—	—
RE33-21-222529	33-60996	0.0–1.0	FILL	—	—	—	—	—	N3B-2021-1277	—	—	—	—
RE33-21-218002	33-60996	2.0–3.0	FILL	—	—	—	—	—	—	—	N3B-2021-849[b]	—	—
RE33-21-222530	33-60996	2.0–3.0	FILL	—	—	—	—	—	N3B-2021-1277	—	—	—	—
RE33-21-218003	33-60996	4.0–5.0	FILL	—	—	—	—	—	—	—	N3B-2021-849[b]	—	—
RE33-21-222531	33-60996	4.0–5.0	FILL	—	—	—	—	—	N3B-2021-1277	—	—	—	—
RE33-21-222532	33-61085	0.0–1.0	FILL	—	—	—	—	—	N3B-2021-1295	—	N3B-2021-1295[b]	—	—
RE33-21-222533	33-61085	2.0–3.0	FILL	—	—	—	—	—	N3B-2021-1295	—	N3B-2021-1295[b]	—	—
RE33-21-222534	33-61085	4.0–5.0	FILL	—	—	—	—	—	N3B-2021-1295	—	N3B-2021-1295[b]	—	—
RE33-21-222535	33-61086	0.0–1.0	FILL	—	—	—	—	—	—	—	N3B-2021-1277[b]	—	—
RE33-21-222536	33-61086	2.0–3.0	FILL	—	—	—	—	—	—	—	N3B-2021-1277[b]	—	—
RE33-21-222537	33-61086	4.0–5.0	FILL	—	—	—	—	—	—	—	N3B-2021-1278[b]	—	—
RE33-21-222538	33-61087	0.0–1.0	FILL	—	—	—	—	—	—	—	N3B-2021-1277[b]	—	—
RE33-21-222539	33-61087	2.0–3.0	FILL	—	—	—	—	—	—	—	N3B-2021-1277[b]	—	—
RE33-21-222540	33-61087	4.0–5.0	FILL	—	—	—	—	—	—	—	N3B-2021-1277[b]	—	—
RE33-21-222541	33-61088	0.0–1.0	FILL	—	—	—	—	—	—	—	N3B-2021-1277[b]	—	—
RE33-21-222542	33-61088	2.0–3.0	FILL	—	—	—	—	—	—	—	N3B-2021-1277[b]	—	—
RE33-21-222543	33-61088	4.0–5.0	FILL	—	—	—	—	—	—	—	N3B-2021-1277[b]	—	—
RE33-21-222544	33-61089	0.0–1.0	FILL	—	—	—	—	—	N3B-2021-1295	—	N3B-2021-1295[b]	—	—
RE33-21-222545	33-61089	2.0–3.0	FILL	—	—	—	—	—	N3B-2021-1295	—	N3B-2021-1295[b]	—	—
RE33-21-222546	33-61089	4.0–5.0	FILL	—	—	—	—	—	N3B-2021-1295	—	N3B-2021-1295[b]	—	—
RE33-21-222547	33-61090	0.0–1.0	FILL	—	—	—	—	—	N3B-2021-1278	—	N3B-2021-1278[b]	—	—
RE33-21-222548	33-61090	2.0–3.0	FILL	—	—	—	—	—	N3B-2021-1278	—	N3B-2021-1278[b]	—	—

Table 6.15-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Tritium	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOCs	SVOCs	Cyanide	Nitrate
RE33-21-222549	33-61090	4.0–5.0	FILL	—	—	—	—	—	N3B-2021-1278	—	N3B-2021-1278[b]	—	—
RE33-21-222550	33-61091	0.0–1.0	FILL	—	—	—	—	—	N3B-2021-1295	—	N3B-2021-1295[b]	—	—
RE33-21-222551	33-61091	2.0–3.0	FILL	—	—	—	—	—	N3B-2021-1295	—	N3B-2021-1295[b]	—	—
RE33-21-222552	33-61091	4.0–5.0	FILL	—	—	—	—	—	N3B-2021-1295	—	N3B-2021-1295[b]	—	—
RE33-21-222553	33-61092	0.0–1.0	FILL	—	—	—	—	—	N3B-2021-1278	—	N3B-2021-1278[b]	—	—
RE33-21-222554	33-61092	2.0–3.0	FILL	—	—	—	—	—	N3B-2021-1278	—	N3B-2021-1278[b]	—	—
RE33-21-222555	33-61092	4.0–5.0	FILL	—	—	—	—	—	N3B-2021-1278	—	N3B-2021-1278[b]	—	—
RE33-21-222556	33-61093	0.0–1.0	FILL	—	—	—	—	—	N3B-2021-1278	—	N3B-2021-1278[b]	—	—
RE33-21-222557	33-61093	2.0–3.0	FILL	—	—	—	—	—	N3B-2021-1278	—	N3B-2021-1278[b]	—	—
RE33-21-222558	33-61093	4.0–5.0	FILL	—	—	—	—	—	N3B-2021-1278	—	N3B-2021-1278[b]	—	—
RE33-21-222559	33-61094	0.0–1.0	FILL	—	—	—	—	—	N3B-2021-1295	—	N3B-2021-1295[b]	—	—
RE33-21-222560	33-61094	2.0–3.0	FILL	—	—	—	—	—	N3B-2021-1295	—	N3B-2021-1295[b]	—	—
RE33-21-222561	33-61094	4.0–5.0	FILL	—	—	—	—	—	N3B-2021-1296	—	N3B-2021-1296[b]	—	—
RE33-21-222562	33-61095	0.0–1.0	FILL	—	—	—	—	—	N3B-2021-1296	—	N3B-2021-1296[b]	—	—
RE33-21-222563	33-61095	2.0–3.0	FILL	—	—	—	—	—	N3B-2021-1296	—	N3B-2021-1296[b]	—	—
RE33-21-222564	33-61095	4.0–5.0	FILL	—	—	—	—	—	N3B-2021-1296	—	N3B-2021-1296[b]	—	—
RE33-21-222565	33-61096	0.0–1.0	FILL	—	—	—	—	—	N3B-2021-1296	—	N3B-2021-1296[b]	—	—
RE33-21-222566	33-61096	2.0–3.0	FILL	—	—	—	—	—	N3B-2021-1296	—	N3B-2021-1296[b]	—	—
RE33-21-222567	33-61096	4.0–5.0	FILL	—	—	—	—	—	N3B-2021-1296	—	N3B-2021-1296[b]	—	—
RE33-21-222568	33-61097	0.0–1.0	FILL	—	—	—	—	—	N3B-2021-1296	—	N3B-2021-1296[b]	—	—
RE33-21-222569	33-61097	2.0–3.0	FILL	—	—	—	—	—	N3B-2021-1296	—	N3B-2021-1296[b]	—	—
RE33-21-222570	33-61097	4.0–5.0	FILL	—	—	—	—	—	N3B-2021-1296	—	N3B-2021-1296[b]	—	—
RE33-21-222571	33-61098	0.0–1.0	FILL	—	—	—	—	—	N3B-2021-1296	—	N3B-2021-1296[b]	—	—
RE33-21-222572	33-61098	2.0–3.0	FILL	—	—	—	—	—	N3B-2021-1296	—	N3B-2021-1296[b]	—	—
RE33-21-222573	33-61098	4.0–5.0	FILL	—	—	—	—	—	N3B-2021-1296	—	N3B-2021-1296[b]	—	—
RE33-21-222574	33-61099	0.0-1.0	FILL	—	—	—	—	—	N3B-2021-1318	—	N3B-2021-1318[b]	—	—
RE33-21-222575	33-61099	2.0-3.0	FILL	—	—	—	—	—	N3B-2021-1318	—	N3B-2021-1318[b]	—	—
RE33-21-222576	33-61099	4.0-5.0	FILL	—	—	—	—	—	N3B-2021-1318	—	N3B-2021-1318[b]	—	—
RE33-21-222577	33-61100	0.0-1.0	FILL	—	—	—	—	—	N3B-2021-1318	—	N3B-2021-1318[b]	—	—
RE33-21-222578	33-61100	2.0-3.0	FILL	—	—	—	—	—	N3B-2021-1318	—	N3B-2021-1318[b]	—	—
RE33-21-222579	33-61100	4.0-5.0	FILL	—	—	—	—	—	N3B-2021-1318	—	N3B-2021-1318[b]	—	—

Note: Numbers in analyte columns are request numbers.

[a] — = Analysis not requested.

[b] Sample analyzed for PAHs only.

Table 6.15-2
Inorganic Chemicals above BVs at SWMU 33-012(a)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Calcium	Chromium	Copper	Lead	Nitrate	Perchlorate	Zinc
Soil Background Value[a]				**0.83**	**0.4**	**6120**	**19.3**	**14.7**	**22.3**	**na[b]**	**na**	**48.8**
Construction Worker SSL[c]				**142**	**72.1**	**na**	**134[d]**	**14,200**	**800**	**566,000**	**248**	**106,000**
Industrial SSL[c]				**519**	**1110**	**na**	**505[d]**	**51,900**	**800**	**2,080,000**	**908**	**389,000**
Residential SSL[c]				**31.3**	**70.5**	**na**	**96.6[d]**	**3130**	**400**	**125,000**	**54.8**	**23,500**
RE33-20-190287	33-01086	0.0–1.0	FILL	7.09 (U)	0.633	—[e]	482	393	36.7	—	—	638
RE33-20-190288	33-01086	2.0–3.0	FILL	1.24 (U)	—	10,800	—	—	—	1.1 (J)	—	—
RE33-20-190289	33-01086	4.0–5.0	FILL	—	—	—	—	—	—	1.43	—	—
RE33-20-190290	33-01087	0.0–1.0	FILL	1.13 (U)	0.956	—	—	68	—	—	—	112
RE33-20-190291	33-01087	2.0–3.0	FILL	—	—	7510	—	—	—	1.49	—	—
RE33-20-190292	33-01087	4.0–5.0	FILL	1 (U)	—	—	—	—	—	1.09 (J)	—	—
RE33-20-195039	33-01089	0.0–1.0	FILL	1.47 (U)	—	6420	—	24.6 (J+)	—	—	—	68.9
RE33-20-195040	33-01089	2.0–3.0	FILL	1.04 (U)	—	6790	—	—	—	—	—	—
RE33-20-195041	33-01089	4.0–5.0	FILL	1.08 (U)	—	7890	—	—	—	1.61	—	—
RE33-20-190275	33-60658	0.0–1.0	FILL	—	0.545 (J)	—	—	45.3	62.4	—	—	354
RE33-20-190279	33-60658	2.0–3.0	FILL	1.17 (U)	—	—	—	—	—	—	—	—
RE33-20-190283	33-60658	4.0–5.0	FILL	1.5 (U)	—	8680	—	—	—	—	—	—
RE33-20-190280	33-60659	2.0–3.0	FILL	0.998 (U)	—	—	—	—	—	1.09 (J)	—	—
RE33-20-190284	33-60659	4.0–5.0	FILL	—	—	—	—	—	—	—	—	—
RE33-20-190277	33-60660	0.0–1.0	FILL	—	—	—	—	—	—	—	—	66.5
RE33-20-190281	33-60660	2.0–3.0	FILL	—	—	7220	—	119	—	—	—	—
RE33-20-190285	33-60660	4.0–5.0	FILL	—	—	—	—	—	—	—	—	—
RE33-20-190282	33-60661	2.0–3.0	FILL	—	—	7550	—	—	—	6.79	0.00381	—
RE33-20-190286	33-60661	4.0–5.0	FILL	—	—	7820	—	—	—	4.12	0.00986	—
RE33-20-190293	33-60662	0.0–1.0	FILL	—	0.553 (J)	—	—	—	—	—	—	319
RE33-20-190298	33-60662	2.0–3.0	FILL	—	—	—	—	—	37.6	—	—	61.2
RE33-20-190303	33-60662	4.0–5.0	FILL	—	—	—	—	—	—	—	—	—
RE33-20-190294	33-60663	0.0–1.0	FILL	—	—	—	—	69.4	31.3	—	—	219
RE33-20-190299	33-60663	2.0–3.0	FILL	—	—	6300	—	—	—	0.668 (J)	—	—
RE33-20-190304	33-60663	4.0–5.0	FILL	—	—	6290	—	—	—	1.12 (J)	—	—
RE33-20-190295	33-60664	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—

Table 6.15-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Cadmium	Calcium	Chromium	Copper	Lead	Nitrate	Perchlorate	Zinc
Soil Background Value[a]				**0.83**	**0.4**	**6120**	**19.3**	**14.7**	**22.3**	**na[b]**	**na**	**48.8**
Construction Worker SSL[c]				**142**	**72.1**	**na**	**134[d]**	**14,200**	**800**	**566,000**	**248**	**106,000**
Industrial SSL[c]				**519**	**1110**	**na**	**505[d]**	**51,900**	**800**	**2,080,000**	**908**	**389,000**
Residential SSL[c]				**31.3**	**70.5**	**na**	**96.6[d]**	**3130**	**400**	**125,000**	**54.8**	**23,500**
RE33-20-190300	33-60664	2.0–3.0	FILL	—	—	—	—	—	—	1.8	—	—
RE33-20-190305	33-60664	4.0–5.0	FILL	—	—	6340	—	—	—	1.69	—	—
RE33-20-190296	33-60665	0.0–1.0	FILL	—	—	—	—	20.3	26.5	—	—	81.9
RE33-20-190301	33-60665	2.0–3.0	FILL	—	—	6170	—	—	—	—	—	—
RE33-20-190306	33-60665	4.0–5.0	FILL	—	—	9370	—	—	—	—	—	—
RE33-20-190297	33-60666	0.0–1.0	FILL	—	—	—	—	—	22.8	—	—	53.8
RE33-20-190302	33-60666	2.0–3.0	FILL	—	—	—	—	—	—	1.48	—	—
RE33-20-190307	33-60666	4.0–5.0	FILL	—	—	—	—	—	—	1.07 (J)	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2019, 700550) unless otherwise noted.

[d] SSL for total chromium.

[e] — = Not detected or not detected above BV.

Table 6.15-3
Organic Chemicals Detected at SWMU 33-012(a)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acenaphthylene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Carbazole
Construction Worker SSL[a]				**15,100**	**7530**	**242,000**	**75,300**	**4.91**	**85.3**	**240**	**15.0**	**240**	**7530[b]**	**2310**	**85[c,d]**
Industrial SSL[a]				**50,500**	**25,300**	**960,000**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**1200[d,e]**
Residential SSL[a]				**3480**	**1740**	**66,300**	**17,400**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**78[d,e]**
RE33-20-190287	33-01086	0.0–1.0	FILL	—[f]	—	—	—	0.0258	0.0197 (J)	0.138 (J)	—	—	—	—	—
RE33-20-190288	33-01086	2.0–3.0	FILL	—	—	0.0237	—	—	—	—	—	—	—	—	—
RE33-20-190289	33-01086	4.0–5.0	FILL	0.0185 (J)	—	0.0166	0.0238 (J)	—	—	0.0534	0.0547	0.0514	0.0428	0.0218 (J)	—
RE33-20-190290	33-01087	0.0–1.0	FILL	—	—	—	—	0.0269	0.0152	—	—	—	—	—	—
RE33-20-190291	33-01087	2.0–3.0	FILL	—	—	—	—	0.00207 (J)	0.00154 (J)	0.0236 (J)	0.0203 (J)	0.0203 (J)	—	—	—
RE33-20-190292	33-01087	4.0–5.0	FILL	—	—	—	—	0.00163 (J)	0.00154 (J)	0.0237 (J)	0.0241 (J)	0.0225 (J)	0.0176 (J)	0.0122 (J)	—
RE33-20-195039	33-01089	0.0–1.0	FILL	—	—	—	—	2.44	0.935	0.122 (J)	0.1 (J)	0.119 (J)	—	0.0434 (J)	—
RE33-20-195040	33-01089	2.0–3.0	FILL	—	—	—	—	0.00834	0.00386 (J)	0.0266 (J)	0.0258 (J)	0.0207 (J)	0.0171 (J)	0.0155 (J)	—
RE33-20-195041	33-01089	4.0–5.0	FILL	—	—	—	—	0.00263 (J)	0.0013 (J)	0.0128 (J)	—	—	—	—	—
RE33-20-190275	33-60658	0.0–1.0	FILL	—	—	—	—	0.0635	0.0452	0.109 (J)	0.0928 (J)	0.111 (J)	0.0632 (J)	—	—
RE33-20-190279	33-60658	2.0–3.0	FILL	—	—	—	—	—	—	0.0227 (J)	0.0205 (J)	0.0214 (J)	—	—	—
RE33-20-190283	33-60658	4.0–5.0	FILL	0.0148 (J-)	—	—	0.0266 (J-)	—	—	0.065 (J-)	0.0671 (J-)	0.0722 (J-)	0.0329 (J-)	0.0279 (J-)	—
RE33-20-190284	33-60659	4.0–5.0	FILL	0.0577	—	—	0.114	—	—	0.377	0.384	0.449	0.202	0.184	0.0581
RE33-20-190277	33-60660	0.0–1.0	FILL	—	—	—	—	0.02	0.0223	0.147 (J)	0.143 (J)	0.167 (J)	0.105 (J)	0.0655 (J)	—
RE33-20-190281	33-60660	2.0–3.0	FILL	0.562	—	—	0.903	0.256	0.157	1.59	1.86	1.94	1.09	0.811	0.422
RE33-20-190285	33-60660	4.0–5.0	FILL	—	—	—	—	0.0195	0.0102	0.0233 (J)	0.0214 (J)	0.021 (J)	0.0126 (J)	—	—
RE33-20-190282	33-60661	2.0–3.0	FILL	—	—	0.0294	—	0.131	0.0461	0.0153 (J)	0.0125 (J)	0.0125 (J)	—	—	—
RE33-20-190286	33-60661	4.0–5.0	FILL	—	—	0.00903	—	0.317	0.114	0.0203 (J+)	0.0189 (J+)	0.0164 (J+)	0.0122 (J+)	—	—
RE33-20-190293	33-60662	0.0–1.0	FILL	—	—	0.00535 (J)	—	0.161	0.0656 (J)	0.945 (J)	—	—	—	—	—
RE33-20-190298	33-60662	2.0–3.0	FILL	—	—	0.00837	—	—	—	—	—	—	—	—	—
RE33-20-190303	33-60662	4.0–5.0	FILL	0.0744	—	0.048	0.0967	—	—	0.231	0.246	0.234	0.17	0.0901	0.0467
RE33-20-190294	33-60663	0.0–1.0	FILL	—	—	—	—	0.0204 (J)	0.0223 (J)	0.313 (J)	0.202 (J)	0.254 (J)	—	—	—
RE33-20-190299	33-60663	2.0–3.0	FILL	—	—	0.0863	—	—	—	0.0211	0.0202	0.0181	0.016	—	—

Table 6.15-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acenaphthylene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Carbazole
Construction Worker SSL[a]				**15,100**	**753**	**242,000**	**75,300**	**4.91**	**85.3**	**240**	**15.0**	**240**	**753[b]**	**2310**	**85[c,d]**
Industrial SSL[a]				**50,500**	**25,300**	**960,000**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**1200[d,e]**
Residential SSL[a]				**3480**	**1740**	**66,300**	**17,400**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**78[d,e]**
RE33-20-190304	33-60663	4.0–5.0	FILL	0.0153 (J)	—	—	0.0169 (J)	—	0.00224 (J)	0.0598	0.0606	0.0594	0.035 (J)	0.0252 (J)	0.0128 (J)
RE33-20-190295	33-60664	0.0–1.0	FILL	—	—	0.0134	—	0.153	0.0646 (J)	—	—	—	—	—	—
RE33-20-190300	33-60664	2.0–3.0	FILL	—	—	—	—	0.00635	0.00293 (J)	—	—	—	—	—	—
RE33-20-190305	33-60664	4.0–5.0	FILL	—	—	—	—	0.0116	0.00644	—	—	—	—	—	—
RE33-20-190296	33-60665	0.0–1.0	FILL	—	—	—	—	0.0191 (J)	0.0185 (J)	—	—	—	—	—	—
RE33-20-190297	33-60666	0.0–1.0	FILL	—	—	—	—	0.0393 (J)	0.039 (J)	—	—	—	—	—	—
RE33-20-190302	33-60666	2.0–3.0	FILL	—	—	—	—	—	—	0.0234 (J)	0.0192 (J)	—	—	—	—
RE33-20-190307	33-60666	4.0–5.0	FILL	—	—	—	—	—	—	0.014 (J)	—	—	—	—	—
RE33-21-222520	33-60992	0.0–1.0	FILL	0.0354	—	NA[g]	0.0672	NA	NA	0.244	0.237 (J+)	0.294 (J+)	0.173 (J+)	0.11	NA
RE33-21-217989	33-60992	0.0–1.0	SOIL	NA	NA	NA	NA	12.9 (J-)	4.84 (J-)	NA	NA	NA	NA	NA	NA
RE33-21-217990	33-60992	2.0–3.0	FILL	NA	NA	NA	NA	0.652	0.315	NA	NA	NA	NA	NA	NA
RE33-21-222521	33-60992	2.0–3.0	FILL	0.0603	—	NA	0.149	NA	NA	0.415	0.44 (J+)	0.514 (J+)	0.291 (J+)	0.199	NA
RE33-21-217991	33-60992	4.0–5.0	FILL	NA	NA	NA	NA	0.0818	0.0405	NA	NA	NA	NA	NA	NA
RE33-21-222522	33-60992	4.0–5.0	FILL	0.0213 (J)	—	NA	0.0356	NA	NA	0.114	0.114 (J+)	0.139 (J+)	0.0782 (J+)	0.0569	NA
RE33-21-217992	33-60993	0.0–1.0	FILL	NA	NA	NA	NA	9 (J-)	4.05 (J-)	NA	NA	NA	NA	NA	NA
RE33-21-222523	33-60993	0.0–1.0	FILL	0.168	—	NA	0.298	NA	NA	0.918	0.816 (J+)	1.02 (J+)	0.434 (J+)	0.406	NA
RE33-21-217993	33-60993	2.0–3.0	FILL	NA	NA	NA	NA	0.195	0.0928	NA	NA	NA	NA	NA	NA
RE33-21-222524	33-60993	2.0–3.0	FILL	0.0371	—	NA	0.0472	NA	NA	0.196	0.216 (J+)	0.25 (J+)	0.182 (J+)	0.101	NA
RE33-21-217994	33-60993	4.0–5.0	FILL	NA	NA	NA	NA	0.109	0.0611	NA	NA	NA	NA	NA	NA
RE33-21-222525	33-60993	4.0–5.0	FILL	—	—	NA	0.0245 (J+)	NA	NA	0.0806 (J+)	0.0806 (J+)	0.0982 (J+)	0.0526 (J+)	0.0421 (J+)	NA
RE33-21-222526	33-60994	0.0–1.0	FILL	2.35e—005 (J)	—	NA	4.36e—005	NA	NA	0.000322	0.000342	0.00052	0.000221	0.000168	NA
RE33-21-217996	33-60994	2.0–3.0	FILL	NA	NA	NA	NA	0.0152	0.0102	NA	NA	NA	NA	NA	NA
RE33-21-222527	33-60994	2.0–3.0	FILL	0.00533	—	NA	0.00914	NA	NA	0.0339	0.0369	0.0407	0.0255	0.0156	NA
RE33-21-217997	33-60994	4.0–5.0	FILL	NA	NA	NA	NA	0.0029 (J)	0.00224 (J)	NA	NA	NA	NA	NA	NA
RE33-21-222528	33-60994	4.0–5.0	FILL	—	—	NA	0.00229 (J)	NA	NA	0.00649	0.00764	0.0084	0.00573	0.00344 (J)	NA
RE33-21-217998	33-60995	0.0–1.0	FILL	NA	NA	NA	NA	0.0169	0.0154 (J)	NA	NA	NA	NA	NA	NA
RE33-21-217999	33-60995	2.0–3.0	FILL	NA	NA	NA	NA	0.0228	0.0104	NA	NA	NA	NA	NA	NA

Table 6.15-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acenaphthylene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Carbazole
Construction Worker SSL[a]				**15,100**	**753**	**242,000**	**75,300**	**4.91**	**85.3**	**240**	**15.0**	**240**	**753[b]**	**2310**	**85[c,d]**
Industrial SSL[a]				**50,500**	**25,300**	**960,000**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**1200[d,e]**
Residential SSL[a]				**3480**	**1740**	**66,300**	**17,400**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**78[d,e]**
RE33-21-218001	33-60996	0.0–1.0	FILL	0.0549 (J)	—	NA	0.192 (J)	NA	NA	1.01 (J)	1.02 (J)	1.72 (J)	0.57 (J)	0.529 (J)	NA
RE33-21-218002	33-60996	2.0–3.0	FILL	0.0303 (J)	—	NA	0.0468 (J)	NA	NA	0.0809 (J)	0.0916 (J)	0.0947 (J)	0.0541 (J)	0.0368 (J)	NA
RE33-21-222530	33-60996	2.0–3.0	FILL	NA	NA	NA	NA	—	0.00174 (J)	NA	NA	NA	NA	NA	NA
RE33-21-222531	33-60996	4.0–5.0	FILL	NA	NA	NA	NA	—	0.0106	NA	NA	NA	NA	NA	NA
RE33-21-222532	33-61085	0.0–1.0	FILL	0.552 (J)	—	NA	1 (J)	0.115	0.0864	1.71 (J)	1.41 (J)	1.72 (J)	1 (J)	0.673 (J)	NA
RE33-21-222533	33-61085	2.0–3.0	FILL	0.0828 (J)	—	NA	0.133 (J)	0.0626	0.0619	0.271 (J)	0.247 (J)	0.295 (J)	0.188 (J)	0.109 (J)	NA
RE33-21-222534	33-61085	4.0–5.0	FILL	0.124 (J)	—	NA	0.202 (J)	0.0302	0.0314	0.303 (J)	0.277 (J)	0.306 (J)	0.192 (J)	0.121 (J)	NA
RE33-21-222535	33-61086	0.0–1.0	FILL	0.562 (J)	—	NA	3.15 (J)	NA	NA	11.5 (J)	10.4 (J)	14.8 (J)	6.11 (J)	5.06 (J)	NA
RE33-21-222536	33-61086	2.0–3.0	FILL	—	—	NA	0.00415	NA	NA	0.0268	0.0279	0.0415	0.0189	0.0136	NA
RE33-21-222537	33-61086	4.0–5.0	FILL	0.00472 (J)	—	NA	0.0145 (J)	NA	NA	0.066 (J)	0.0704 (J)	0.0995 (J)	0.0562 (J)	0.0322 (J)	NA
RE33-21-222538	33-61087	0.0–1.0	FILL	0.214	—	NA	1.02	NA	NA	5.49	5.5	7.89	3.65	2.74	NA
RE33-21-222539	33-61087	2.0–3.0	FILL	1.44 (J)	0.0642 (J)	NA	2.08 (J)	NA	NA	3.46 (J)	3.66 (J)	3.88 (J)	2.11 (J)	1.3 (J)	NA
RE33-21-222540	33-61087	4.0–5.0	FILL	0.00274 (J)	—	NA	0.00626	NA	NA	0.0266	0.0289	0.0383	0.0207	0.0137	NA
RE33-21-222541	33-61088	0.0–1.0	FILL	0.128 (J)	—	NA	0.692	NA	NA	2.46	2.26	3.22	1.38	1.11	NA
RE33-21-222542	33-61088	2.0–3.0	FILL	0.0197 (J)	—	NA	0.0473	NA	NA	0.154 (J)	0.158 (J)	0.209 (J)	0.122 (J)	0.0749	NA
RE33-21-222543	33-61088	4.0–5.0	FILL	0.00868	—	NA	0.0221	NA	NA	0.0896	0.086	0.115	0.0576	0.0391	NA
RE33-21-222544	33-61089	0.0–1.0	FILL	—	—	NA	0.0585 (J)	0.0886	0.0684	0.161 (J)	0.168 (J)	0.19 (J)	0.146 (J)	0.0731 (J)	NA
RE33-21-222545	33-61089	2.0–3.0	FILL	0.0213 (J)	—	NA	0.0289 (J)	0.0138	0.00955	0.0746 (J)	0.0837 (J)	0.091 (J)	0.0568 (J)	0.0321 (J)	NA
RE33-21-222546	33-61089	4.0–5.0	FILL	0.0185 (J)	—	NA	0.0266 (J)	0.0102	0.00733	0.0639 (J)	0.071 (J)	0.0774 (J)	0.049 (J)	0.0284 (J)	NA
RE33-21-222547	33-61090	0.0–1.0	FILL	—	—	NA	0.0307 (J)	0.0119	0.0105	0.15 (J)	0.188 (J)	0.246 (J)	0.147 (J)	0.0921 (J)	NA
RE33-21-222548	33-61090	2.0–3.0	FILL	0.522 (J)	—	NA	0.761 (J)	1.61	0.647	1.06 (J)	0.917 (J)	1.07 (J)	0.613 (J)	0.416 (J)	NA
RE33-21-222549	33-61090	4.0–5.0	FILL	0.109 (J)	—	NA	0.19 (J)	0.842	0.244	0.372 (J)	0.387 (J)	0.416 (J)	0.27 (J)	0.168 (J)	NA
RE33-21-222550	33-61091	0.0–1.0	FILL	0.171 (J)	—	NA	0.331 (J)	0.0455 (J)	0.0441 (J)	0.662 (J)	0.555 (J)	0.676 (J)	0.331 (J)	0.246 (J)	NA
RE33-21-222551	33-61091	2.0–3.0	FILL	1.12 (J)	—	NA	1.96 (J)	0.0446	0.0291 (J)	3.04 (J)	2.42 (J)	2.97 (J)	1.32 (J)	1.1 (J)	NA
RE33-21-222552	33-61091	4.0–5.0	FILL	0.00588 (J)	—	NA	0.009 (J)	0.00717 (J)	0.00806 (J)	0.0197 (J)	0.0194 (J)	0.0225 (J)	0.0138 (J)	0.0083 (J)	NA
RE33-21-222553	33-61092	0.0–1.0	FILL	0.00467 (J)	—	NA	0.0194 (J)	0.00978	0.00714	0.0447 (J)	0.0527 (J)	0.0567 (J)	0.0354 (J)	0.0227 (J)	NA
RE33-21-222554	33-61092	2.0–3.0	FILL	0.00754 (J)	0.00264 (J)	NA	0.0279 (J)	0.0154	0.00613	0.189 (J)	0.207 (J)	0.307 (J)	0.142 (J)	0.106 (J)	NA

Table 6.15-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acenaphthylene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Carbazole
Construction Worker SSL[a]				**15,100**	**753**	**242,000**	**75,300**	**4.91**	**85.3**	**240**	**15.0**	**240**	**753[b]**	**2310**	**85[c,d]**
Industrial SSL[a]				**50,500**	**25,300**	**960,000**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**1200[d,e]**
Residential SSL[a]				**3480**	**1740**	**66,300**	**17,400**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**78[d,e]**
RE33-21-222555	33-61092	4.0–5.0	FILL	—	—	NA	0.00191 (J)	—	0.00148 (J)	0.00382 (J)	0.00343 (J)	0.0042 (J)	0.00343 (J)	0.00229 (J)	NA
RE33-21-222556	33-61093	0.0–1.0	FILL	0.00298 (J)	—	NA	0.0103 (J)	0.0042	0.00287 (J)	0.054 (J)	0.0587 (J)	0.0818 (J)	0.0431 (J)	0.0292 (J)	NA
RE33-21-222557	33-61093	2.0–3.0	FILL	0.00596 (J)	—	NA	0.0119 (J)	0.135	0.037	0.0306 (J)	0.0339 (J)	0.0373 (J)	0.0227 (J)	0.0145 (J)	NA
RE33-21-222558	33-61093	4.0–5.0	FILL	—	—	NA	—	0.0157	0.00472	0.00402 (J)	0.00402 (J)	0.00438 (J)	—	—	NA
RE33-21-222559	33-61094	0.0–1.0	FILL	0.935 (J+)	0.0167 (J+)	NA	1.47 (J+)	8.66	3.85	2.67 (J+)	2.44 (J+)	2.82 (J+)	1.5 (J+)	1.04 (J+)	NA
RE33-21-222560	33-61094	2.0–3.0	FILL	0.365 (J)	—	NA	0.646 (J)	7.74	3.57	1.08 (J)	0.978 (J)	1.03 (J)	0.703 (J)	0.412 (J)	NA
RE33-21-222561	33-61094	4.0–5.0	FILL	0.22 (J)	—	NA	0.376 (J)	8.17	2.14	0.585 (J+)	0.56 (J+)	0.585 (J+)	0.491 (J+)	0.211	NA
RE33-21-222562	33-61095	0.0–1.0	FILL	1.65 (J)	0.0556 (J)	NA	2.62 (J)	12.3	3.01	3.5 (J+)	3.13 (J+)	3.39 (J+)	1.92 (J+)	1.27	NA
RE33-21-222563	33-61095	2.0–3.0	FILL	1.72 (J)	—	NA	2.88 (J)	17.3	4.61	4.43 (J+)	3.66 (J+)	4.45 (J+)	2.22 (J+)	1.6	NA
RE33-21-222564	33-61095	4.0–5.0	FILL	0.0433 (J)	0.0294	NA	0.104 (J)	1.94	0.47	0.258 (J+)	0.292 (J+)	0.329 (J+)	0.228 (J+)	0.121	NA
RE33-21-222565	33-61096	0.0–1.0	FILL	0.329 (J)	—	NA	0.901 (J)	0.617	0.191	3.97 (J+)	3.6 (J+)	4.26 (J+)	1.77 (J+)	1.65	NA
RE33-21-222566	33-61096	2.0–3.0	FILL	0.331 (J)	—	NA	0.512 (J)	5.35	1.59	0.735 (J+)	0.652 (J+)	0.742 (J+)	0.457 (J+)	0.268	NA
RE33-21-222567	33-61096	4.0–5.0	FILL	—	—	NA	0.309 (J)	3.43	0.998	0.583 (J+)	0.514 (J+)	0.583 (J+)	0.309 (J+)	0.24 (J)	NA
RE33-21-222568	33-61097	0.0–1.0	FILL	0.302 (J)	—	NA	0.611 (J)	11.6	2.85	1.16 (J+)	1.08 (J+)	1.18 (J+)	0.675 (J+)	0.46	NA
RE33-21-222569	33-61097	2.0–3.0	FILL	—	—	NA	—	0.263	0.0602	0.00439 (J+)	0.00475 (J+)	0.00475 (J+)	0.00475 (J+)	0.00219 (J)	NA
RE33-21-222570	33-61097	4.0–5.0	FILL	—	—	NA	0.0177 (J)	0.919	0.221	0.0407 (J+)	0.039 (J+)	0.0407 (J+)	0.0354 (J+)	0.0159 (J)	NA
RE33-21-222571	33-61098	0.0–1.0	FILL	0.0507 (J)	—	NA	0.0978 (J)	7.06	1.69	0.229 (J+)	0.267 (J+)	0.273 (J+)	0.229 (J+)	0.103	NA
RE33-21-222572	33-61098	2.0–3.0	FILL	0.00205 (J)	—	NA	0.00513 (J)	0.649	0.153	0.0154 (J+)	0.0161 (J+)	0.0171 (J+)	0.0161 (J+)	0.00718	NA
RE33-21-222573	33-61098	4.0–5.0	FILL	0.00313 (J)	—	NA	0.00661 (J)	1.3	0.299	0.0153 (J+)	0.0163 (J+)	0.0177 (J+)	0.0163 (J+)	0.00661	NA
RE33-21-222574	33-61099	0.0–1.0	FILL	0.0562	—	NA	0.137	5.93	2.63	0.478	0.499 (J+)	0.59 (J+)	0.33 (J+)	0.232	NA
RE33-21-222575	33-61099	2.0–3.0	FILL	—	—	NA	—	0.634	0.28	0.0411	0.0377 (J+)	0.0445 (J+)	0.0274 (J+)	0.0171 (J)	NA

Table 6.15-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acenaphthylene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Carbazole
Construction Worker SSL[a]				**15,100**	**753**	**242,000**	**75,300**	**4.91**	**85.3**	**240**	**15.0**	**240**	**753[b]**	**2310**	**85[c,d]**
Industrial SSL[a]				**50,500**	**25,300**	**960,000**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**1200[d,e]**
Residential SSL[a]				**3480**	**1740**	**66,300**	**17,400**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**78[d,e]**
RE33-21-222576	33-61099	4.0–5.0	FILL	0.0189	—	NA	0.0276	0.0767	0.0367	0.0451	0.0433 (J+)	0.0475 (J+)	0.0321 (J+)	0.0192	NA
RE33-21-222577	33-61100	0.0–1.0	FILL	0.13	0.13	NA	0.36	8.04	3.86	3.36	4.2 (J+)	5.32 (J+)	2.3 (J+)	1.98	NA
RE33-21-222578	33-61100	2.0–3.0	FILL	0.00478	—	NA	0.00785	0.129	0.0679	0.0232	0.0242 (J+)	0.028 (J+)	0.0174 (J+)	0.0113	NA
RE33-21-222579	33-61100	4.0–5.0	FILL	0.00276 (J)	—	NA	0.00483	0.0972	0.0492	0.0173	0.02 (J+)	0.0217 (J+)	0.0166 (J+)	0.00828	NA

Table 6.15-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Methylnaphthalene[1-]	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Total PAHs	Trichloroethene
Construction Worker SSL[a]				**23,100**	**24**	**10,000**	**10,000**	**240**	**6060**	**1000**	**159**	**7530**	**7530**	**na[h]**	**6.90**
Industrial SSL[a]				**3230**	**3.23**	**33,700**	**33,700**	**32.3**	**813**	**3370**	**241**	**25,300**	**25,300**	**na**	**36.5**
Residential SSL[a]				**153**	**0.153**	**2320**	**2320**	**1.53**	**172**	**232**	**49.7**	**1740**	**1740**	**na**	**6.77**
RE33-20-190287	33-01086	0.0–1.0	FILL	—	—	0.223 (J)	—	—	—	—	—	—	0.235 (J)	459	—
RE33-20-190288	33-01086	2.0–3.0	FILL	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190289	33-01086	4.0–5.0	FILL	0.0419	—	0.0839	0.016 (J)	0.0395 (J)	—	—	0.0206 (J)	0.0946	0.097	409	—
RE33-20-190290	33-01087	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190291	33-01087	2.0–3.0	FILL	0.0174 (J)	—	0.031 (J)	—	—	—	—	—	0.0248 (J)	0.0517	128	—
RE33-20-190292	33-01087	4.0–5.0	FILL	0.0196 (J)	—	0.0318 (J)	—	—	—	—	—	0.0298 (J)	0.0535	150	—
RE33-20-195039	33-01089	0.0–1.0	FILL	0.1 (J)	—	0.206	—	—	—	—	0.000437 (J)	0.122 (J)	0.252	743	—
RE33-20-195040	33-01089	2.0–3.0	FILL	0.0207 (J)	—	0.0357 (J)	—	0.0183 (J)	—	—	—	0.035 (J)	0.0572	164	—
RE33-20-195041	33-01089	4.0–5.0	FILL	—	—	0.0147 (J)	—	—	—	—	—	0.0178 (J)	0.024 (J)	56.5	0.000909 (J)
RE33-20-190275	33-60658	0.0–1.0	FILL	0.0868 (J)	—	0.128 (J)	—	—	—	—	—	—	0.174 (J)	413	—
RE33-20-190279	33-60658	2.0–3.0	FILL	0.0163 (J)	—	0.0304 (J)	—	—	—	—	—	0.0257 (J)	0.0304 (J)	108	—
RE33-20-190283	33-60658	4.0–5.0	FILL	0.0583 (J-)	—	0.0912 (J-)	0.0169 (J-)	0.0359 (J-)	—	—	0.0198 (J-)	0.104 (J-)	0.111 (J-)	470 (J-)	—
RE33-20-190284	33-60659	4.0–5.0	FILL	0.353	0.0516	0.748	0.065	0.223	0.0183 (J)	0.0223 (J)	0.0569	0.475	0.672	2800	—
RE33-20-190277	33-60660	0.0–1.0	FILL	0.133 (J)	—	0.25	—	0.103 (J)	—	—	—	0.156 (J)	0.28	918	—
RE33-20-190281	33-60660	2.0–3.0	FILL	1.55	0.296	2.78	0.564	1.14	0.182 (J)	0.262	0.836	3.26	3.6	15100	—
RE33-20-190285	33-60660	4.0–5.0	FILL	0.0191 (J)	—	0.0362 (J)	—	0.013 (J)	—	—	0.00231	0.0374 (J)	0.0351 (J)	130	—
RE33-20-190282	33-60661	2.0–3.0	FILL	—	—	0.0226 (J)	—	—	—	—	—	0.0171 (J)	0.0216 (J)	73.8	—
RE33-20-190286	33-60661	4.0–5.0	FILL	0.0133 (J+)	—	0.0227 (J+)	—	0.014 (J+)	—	—	—	0.0217 (J+)	0.0259 (J+)	86.7 (J+)	—
RE33-20-190293	33-60662	0.0–1.0	FILL	—	—	1.23 (J)	—	—	—	—	—	1.03 (J)	1.29 (J)	3550	—
RE33-20-190298	33-60662	2.0–3.0	FILL	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190303	33-60662	4.0–5.0	FILL	0.219	0.0471	0.379	0.0727	0.151	0.0298 (J)	0.0331 (J)	0.0913	0.443	0.456	1930	—
RE33-20-190294	33-60663	0.0–1.0	FILL	—	—	0.332 (J)	—	—	—	—	—	0.261 (J)	0.417 (J)	1260	—
RE33-20-190299	33-60663	2.0–3.0	FILL	0.0156	—	0.027	—	0.0164	—	—	—	0.0244	0.0341	104	—

Table 6.15-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Methylnaphthalene[1-]	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Total PAHs	Trichloroethene
Construction Worker SSL[a]				**23,100**	**24**	**10,000**	**10,000**	**240**	**6060**	**1000**	**159**	**7530**	**7530**	**na[h]**	**6.90**
Industrial SSL[a]				**3230**	**3.23**	**33,700**	**33,700**	**32.3**	**813**	**3370**	**241**	**25,300**	**25,300**	**na**	**36.5**
Residential SSL[a]				**153**	**0.153**	**2320**	**2320**	**1.53**	**172**	**232**	**49.7**	**1740**	**1740**	**na**	**6.77**
RE33-20-190304	33-60663	4.0–5.0	FILL	0.0499	—	0.113	0.0186 (J)	0.0388 (J)	—	—	0.0243 (J)	0.101	0.094	453	—
RE33-20-190295	33-60664	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190300	33-60664	2.0–3.0	FILL	—	—	—	—	—	—	—	—	—	0.0546 (J)	54.6	—
RE33-20-190305	33-60664	4.0–5.0	FILL	—	—	—	—	—	—	—	—	—	0.0142 (J)	14.2	—
RE33-20-190296	33-60665	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	0.0639 (J)	63.9	—
RE33-20-190297	33-60666	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	0.0649	64.9	—
RE33-20-190302	33-60666	2.0–3.0	FILL	0.0175 (J)	—	0.0313 (J)	—	—	—	—	—	0.028 (J)	0.043	102	—
RE33-20-190307	33-60666	4.0–5.0	FILL	—	—	0.0179 (J)	—	—	—	—	—	—	0.0136 (J)	31.5	—
RE33-21-222520	33-60992	0.0–1.0	FILL	0.244 (J+)	0.0425	0.407 (J+)	0.0248 (J)	0.191 (J+)	—	—	—	0.262 (J+)	0.548 (J+)	NA	NA
RE33-21-217989	33-60992	0.0–1.0	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217990	33-60992	2.0–3.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222521	33-60992	2.0–3.0	FILL	0.415 (J+)	0.078	0.656 (J+)	0.0532	0.337 (J+)	—	—	0.0213 (J)	0.507 (J+)	0.947 (J+)	NA	NA
RE33-21-217991	33-60992	4.0–5.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222522	33-60992	4.0–5.0	FILL	0.114 (J+)	0.0213 (J)	0.192 (J+)	—	0.0853 (J+)	—	—	—	0.153 (J+)	0.242 (J+)	NA	NA
RE33-21-217992	33-60993	0.0–1.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222523	33-60993	0.0–1.0	FILL	0.883 (J+)	0.137	1.52 (J+)	0.123	0.536 (J+)	0.0245 (J)	0.0175 (J)	0.028 (J)	1.18 (J+)	2.1 (J+)	NA	NA
RE33-21-217993	33-60993	2.0–3.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222524	33-60993	2.0–3.0	FILL	0.206 (J+)	0.0439	0.337 (J+)	0.0202 (J)	0.189 (J+)	—	—	—	0.223 (J+)	0.456 (J+)	NA	NA
RE33-21-217994	33-60993	4.0–5.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222525	33-60993	4.0–5.0	FILL	0.0806 (J+)	—	0.14 (J+)	—	0.0596 (J+)	—	—	—	0.112 (J+)	0.182 (J+)	NA	NA
RE33-21-222526	33-60994	0.0p1.0	FILL	0.000332	5.7e—005	0.00068	—	0.000248	—	—	—	0.000245	0.00066	NA	NA
RE33-21-217996	33-60994	2.0–3.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222527	33-60994	2.0–3.0	FILL	0.0324	0.00685	0.0556	0.00533	0.0282	—	—	0.0019 (J)	0.0419	0.0647	NA	NA
RE33-21-217997	33-60994	4.0–5.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222528	33-60994	4.0–5.0	FILL	0.00687	—	0.0118	—	0.00611	—	—	—	0.00993	0.0134	NA	NA
RE33-21-217998	33-60995	0.0–1.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-217999	33-60995	2.0–3.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 6.15-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Methylnaphthalene[1-]	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Total PAHs	Trichloroethene
Construction Worker SSL[a]				**23,100**	**24**	**10,000**	**10,000**	**240**	**6060**	**1000**	**159**	**7530**	**7530**	**na[h]**	**6.90**
Industrial SSL[a]				**3230**	**3.23**	**33,700**	**33,700**	**32.3**	**813**	**3370**	**241**	**25,300**	**25,300**	**na**	**36.5**
Residential SSL[a]				**153**	**0.153**	**2320**	**2320**	**1.53**	**172**	**232**	**49.7**	**1740**	**1740**	**na**	**6.77**
RE33-21-218001	33-60996	0.0–1.0	FILL	1.24 (J)	0.158 (J)	3.14 (J)	—	0.604 (J)	—	—	—	1.4 (J)	2.79 (J)	NA	NA
RE33-21-218002	33-60996	2.0–3.0	FILL	0.0813 (J)	0.0165 (J)	0.155 (J)	0.0253 (J)	0.0579 (J)	0.00805	0.00997	0.0196 (J)	0.17 (J)	0.17 (J)	NA	NA
RE33-21-222530	33-60996	2.0–3.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222531	33-60996	4.0–5.0	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-21-222532	33-61085	0.0–1.0	FILL	1.62 (J)	0.31	3.4 (J)	0.483 (J)	1.14 (J)	0.103 (J)	0.121 (J)	0.207	3.45 (J)	3.47 (J)	NA	NA
RE33-21-222533	33-61085	2.0–3.0	FILL	0.255 (J)	0.0483	0.532 (J)	0.069 (J)	0.195 (J)	0.0138 (J)	0.0173	0.0483	0.495 (J)	0.587 (J)	NA	NA
RE33-21-222534	33-61085	4.0–5.0	FILL	0.296 (J)	0.0519 (J)	0.634 (J)	0.111 (J)	0.204 (J)	0.0259 (J)	0.0346 (J)	0.0934 (J)	0.695 (J)	0.69 (J)	NA	NA
RE33-21-222535	33-61086	0.0–1.0	FILL	11.7 (J)	1.72 (J)	30.4 (J)	0.337 (J)	7.38 (J)	—	—	—	15.1 (J)	29.5 (J)	NA	NA
RE33-21-222536	33-61086	2.0–3.0	FILL	0.0302	0.0049	0.0736	—	0.0215	—	—	—	0.0279	0.0645	NA	NA
RE33-21-222537	33-61086	4.0–5.0	FILL	0.0739 (J)	0.0142 (J)	0.175 (J)	0.00393 (J)	0.0629 (J)	—	—	—	0.0743 (J)	0.151 (J)	NA	NA
RE33-21-222538	33-61087	0.0–1.0	FILL	6.07	0.998	14.4	0.107 (J)	4.33	—	—	—	5.79	14.6	NA	NA
RE33-21-222539	33-61087	2.0–3.0	FILL	3.13 (J)	0.663 (J)	8.47 (J)	1.87 (J)	2.42 (J)	0.765 (J)	1.17 (J)	3.44 (J)	10.6 (J)	8.72 (J)	NA	NA
RE33-21-222540	33-61087	4.0–5.0	FILL	0.0293	0.00508	0.061	0.00391	0.0235	—	—	0.00235 (J)	0.0325	0.0598	NA	NA
RE33-21-222541	33-61088	0.0–1.0	FILL	2.61	0.383	6.85	—	1.71	—	—	—	3.28	6.41	NA	NA
RE33-21-222542	33-61088	2.0–3.0	FILL	0.173 (J)	0.0276 (J)	0.414 (J)	—	0.134 (J)	—	—	—	0.252 (J)	0.418 (J)	NA	NA
RE33-21-222543	33-61088	4.0–5.0	FILL	0.0916	0.015	0.212	0.0111 (J)	0.0663	0.00355 (J)	0.00474	0.0146 (J)	0.115	0.199	NA	NA
RE33-21-222544	33-61089	0.0–1.0	FILL	0.153 (J)	0.0365 (J)	0.336 (J)	—	0.153 (J)	—	—	—	0.219 (J)	0.248 (J)	NA	NA
RE33-21-222545	33-61089	2.0–3.0	FILL	0.0729 (J)	0.0157	0.13 (J)	0.0234 (J)	0.0634 (J)	0.00871	0.00906	0.023	0.136 (J)	0.158 (J)	NA	NA
RE33-21-222546	33-61089	4.0–5.0	FILL	0.0596 (J)	0.0128	0.11 (J)	0.0185 (J)	0.0546 (J)	0.00639	0.00603	0.011	0.111 (J)	0.132 (J)	NA	NA
RE33-21-222547	33-61090	0.0–1.0	FILL	0.167 (J)	0.0375 (J)	0.307 (J)	—	0.16 (J)	—	—	—	0.137 (J)	0.311 (J)	NA	NA
RE33-21-222548	33-61090	2.0–3.0	FILL	0.987 (J)	0.176 (J)	2.38 (J)	0.458 (J)	0.684 (J)	0.162 (J)	0.183 (J)	0.367 (J)	2.68 (J)	2.76 (J)	NA	NA
RE33-21-222549	33-61090	4.0–5.0	FILL	0.357 (J)	0.0802 (J)	0.708 (J)	0.131 (J)	0.277 (J)	0.0657 (J)	0.0657 (J)	0.168 (J)	0.759 (J)	0.781 (J)	NA	NA
RE33-21-222550	33-61091	0.0–1.0	FILL	0.602 (J)	0.11	1.52 (J)	0.164 (J)	0.402 (J)	0.032 (J)	0.0356	0.0676	1.25 (J)	1 (J)	NA	NA
RE33-21-222551	33-61091	2.0–3.0	FILL	2.75 (J)	0.466	5.87 (J)	0.984 (J)	1.65 (J)	0.199	0.271	0.538	6.6 (J)	5.93 (J)	NA	NA
RE33-21-222552	33-61091	4.0–5.0	FILL	0.0187 (J)	0.00346	0.0363 (J)	0.00519 (J)	0.0149 (J)	—	0.00173 (J)	0.0045	0.0346 (J)	0.0412 (J)	NA	NA
RE33-21-222553	33-61092	0.0–1.0	FILL	0.0447 (J)	0.0103 (J)	0.0891 (J)	0.00667 (J)	0.0407 (J)	—	—	—	0.0661 (J)	0.0724 (J)	NA	NA
RE33-21-222554	33-61092	2.0–3.0	FILL	0.216 (J)	0.0479 (J)	0.492 (J)	0.00792 (J)	0.159 (J)	—	0.00189 (J)	—	0.143 (J)	0.409 (J)	NA	NA

Table 6.15-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Methylnaphthalene[1-]	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Total PAHs	Trichloroethene
Construction Worker SSL[a]				**23,100**	**24**	**10,000**	**10,000**	**240**	**6060**	**1000**	**159**	**7530**	**7530**	**na[h]**	**6.90**
Industrial SSL[a]				**3230**	**3.23**	**33,700**	**33,700**	**32.3**	**813**	**3370**	**241**	**25,300**	**25,300**	**na**	**36.5**
Residential SSL[a]				**153**	**0.153**	**2320**	**2320**	**1.53**	**172**	**232**	**49.7**	**1740**	**1740**	**na**	**6.77**
RE33-21-222555	33-61092	4.0–5.0	FILL	0.00343 (J)	—	0.00611 (J)	—	0.00343 (J)	—	—	—	0.00534 (J)	0.00611 (J)	NA	NA
RE33-21-222556	33-61093	0.0–1.0	FILL	0.0613 (J)	0.0123 (J)	0.127 (J)	0.00232 (J)	0.0507 (J)	—	—	—	0.048 (J)	0.122 (J)	NA	NA
RE33-21-222557	33-61093	2.0–3.0	FILL	0.0294 (J)	0.00671 (J)	0.0641 (J)	0.00596 (J)	0.0257 (J)	—	—	0.00335 (J)	0.044 (J)	0.0488 (J)	NA	NA
RE33-21-222558	33-61093	4.0–5.0	FILL	0.00365 (J)	—	0.00731 (J)	—	0.00365 (J)	—	—	—	0.00621 (J)	0.00767 (J)	NA	NA
RE33-21-222559	33-61094	0.0–1.0	FILL	2.53 (J+)	0.424 (J+)	5.12 (J+)	0.768 (J+)	1.76 (J+)	0.164 (J+)	0.18 (J+)	0.361 (J+)	4.92 (J+)	5.49 (J+)	NA	NA
RE33-21-222560	33-61094	2.0–3.0	FILL	0.988 (J)	0.211	2.47 (J)	0.338 (J)	0.777 (J)	0.077	0.0938	0.228	2.11 (J)	1.83 (J)	NA	NA
RE33-21-222561	33-61094	4.0–5.0	FILL	0.558 (J+)	0.141 (J+)	1.46 (J)	0.189 (J)	0.518 (J+)	0.0395	0.0446 (J+)	0.105 (J)	1.17 (J)	0.971 (J)	NA	NA
RE33-21-222562	33-61095	0.0–1.0	FILL	3.33 (J+)	0.612 (J+)	8.77 (J)	1.56 (J)	2.32 (J+)	0.396	0.563 (J+)	1.51 (J)	8.05 (J)	5.6 (J)	NA	NA
RE33-21-222563	33-61095	2.0–3.0	FILL	4.21 (J+)	0.664 (J+)	9.04 (J)	1.56 (J)	2.6 (J+)	0.339	0.491 (J+)	1.24 (J)	10.3 (J)	10.9 (J)	NA	NA
RE33-21-222564	33-61095	4.0–5.0	FILL	0.256 (J+)	0.0692 (J+)	0.45 (J)	0.0433 (J)	0.273 (J+)	0.0121 (J)	0.0138 (J+)	0.0294 (J)	0.27 (J)	0.305 (J)	NA	NA
RE33-21-222565	33-61096	0.0–1.0	FILL	3.9 (J+)	0.711 (J+)	8.39 (J)	0.243 (J)	2.27 (J+)	—	—	0.104 (J)	2.69 (J)	4.9 (J)	NA	NA
RE33-21-222566	33-61096	2.0–3.0	FILL	0.683 (J+)	0.125 (J+)	1.51 (J)	0.268 (J)	0.498 (J+)	0.0662	0.0871 (J+)	0.227 (J)	1.64 (J)	1.67 (J)	NA	NA
RE33-21-222567	33-61096	4.0–5.0	FILL	0.549 (J+)	—	1.37 (J)	—	0.343 (J+)	—	—	—	0.96 (J)	0.857 (J)	NA	NA
RE33-21-222568	33-61097	0.0–1.0	FILL	1.08 (J+)	0.223 (J+)	2.69 (J)	0.266 (J)	0.783 (J+)	0.0503 (J)	0.0503 (J+)	0.079 (J)	1.87 (J)	1.77 (J)	NA	NA
RE33-21-222569	33-61097	2.0–3.0	FILL	0.00402 (J+)	—	0.00914 (J)	—	0.00475 (J+)	—	—	—	0.00585 (J)	0.00621 (J)	NA	NA
RE33-21-222570	33-61097	4.0–5.0	FILL	0.039 (J+)	0.0106 (J+)	0.0868 (J)	—	0.039 (J+)	—	—	—	0.0549 (J)	0.0585 (J)	NA	NA
RE33-21-222571	33-61098	0.0–1.0	FILL	0.232 (J+)	0.0646 (J+)	0.475 (J)	0.0489 (J)	0.25 (J+)	0.0105 (J)	0.014 (J+)	0.0297 (J)	0.328 (J)	0.314 (J)	NA	NA
RE33-21-222572	33-61098	2.0–3.0	FILL	0.0154 (J+)	0.00479 (J+)	0.0298 (J)	0.00205 (J)	0.0164 (J+)	—	—	—	0.0164 (J)	0.0198 (J)	NA	NA
RE33-21-222573	33-61098	4.0–5.0	FILL	0.0156 (J+)	0.00452 (J+)	0.0337 (J)	0.00382 (J)	0.0167 (J+)	—	—	0.00243 (J)	0.0236 (J)	0.0226 (J)	NA	NA
RE33-21-222574	33-61099	0.0–1.0	FILL	0.502 (J+)	0.0913	0.808 (J+)	0.0456	0.383 (J+)	—	—	—	0.541 (J+)	0.888 (J+)	NA	NA
RE33-21-222575	33-61099	2.0–3.0	FILL	0.0377 (J+)	—	0.0753 (J+)	—	0.0308 (J+)	—	—	—	0.0548 (J+)	0.0616 (J+)	NA	NA

Table 6.15-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Methylnaphthalene[1-]	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Total PAHs	Trichloroethene
Construction Worker SSL[a]				**23,100**	**24**	**10,000**	**10,000**	**240**	**6060**	**1000**	**159**	**7530**	**7530**	**na[h]**	**6.90**
Industrial SSL[a]				**3230**	**3.23**	**33,700**	**33,700**	**32.3**	**813**	**3370**	**241**	**25,300**	**25,300**	**na**	**36.5**
Residential SSL[a]				**153**	**0.153**	**2320**	**2320**	**1.53**	**172**	**232**	**49.7**	**1740**	**1740**	**na**	**6.77**
RE33-21-222576	33-61099	4.0–5.0	FILL	0.0433 (J+)	0.00838	0.104 (J+)	0.0164	0.0353 (J+)	0.00419	0.00629	0.0185	0.101 (J+)	0.1 (J+)	NA	NA
RE33-21-222577	33-61100	0.0–1.0	FILL	3.37 (J+)	0.723	2.51 (J+)	0.103	3 (J+)	0.02 (J)	0.0167 (J)	0.0367	0.887 (J+)	3.84 (J+)	NA	NA
RE33-21-222578	33-61100	2.0–3.0	FILL	0.0225 (J+)	0.00478	0.0423 (J+)	0.00478	0.0198 (J+)	—	—	—	0.0369 (J+)	0.0441 (J+)	NA	NA
RE33-21-222579	33-61100	4.0–5.0	FILL	0.0173 (J+)	0.00449	0.0255 (J+)	0.00276 (J)	0.0186 (J+)	—	—	—	0.0228 (J+)	0.0335 (J+)	NA	NA

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] SSLs from NMED (2019, 700550) unless otherwise noted.

[b] Pyrene used as a surrogate based on structural similarity.

[c] Construction worker SSLs calculated using the equations outlined in NMED (2019, 700550), incorporating toxicity and chemical-specific parameters from EPA regional screening level (RSL) tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

[d] Dibenzofuran used as a surrogate based on structural similarity.

[e] SSLs from EPA RSL tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

[f] — = Not detected.

[g] NA = Not analyzed.

[h] na = Not available.

Table 6.16-1
Samples Collected and Analyses Requested at SWMU 33-017

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOCs	SVOCs	Cyanide	Nitrate
RE33-20-190059	33-01102	2.0–3.0	FILL	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945
RE33-20-190084	33-01102	4.0–5.0	FILL	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948
RE33-20-190035	33-01104	0.0–1.0	FILL	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945
RE33-20-190060	33-01104	2.0–3.0	FILL	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945
RE33-20-190085	33-01104	4.0–5.0	FILL	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948
RE33-20-190036	33-01105	0.0–1.0	SOIL	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903
RE33-20-190061	33-01105	2.0–3.0	SOIL	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903

Table 6.16-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOCs	SVOCs	Cyanide	Nitrate
RE33-20-190086	33-01105	4.0–5.0	SOIL	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903
RE33-20-190062	33-01106	2.0–3.0	QBT3	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903
RE33-20-190087	33-01106	4.0–5.0	QBT2	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903
RE33-20-190063	33-01107	2.0–3.0	QBT3	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912
RE33-20-190088	33-01107	4.0–5.0	QBT3	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913
RE33-20-190039	33-01109	0.0–0.7	SOIL	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912
RE33-20-190064	33-01109	2.0–3.0	QBT3	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912
RE33-20-190089	33-01109	4.0–5.0	QBT3	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913
RE33-20-190040	33-01113	0.0–1.0	SED	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912
RE33-20-190065	33-01113	2.0–3.0	QBT2	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912
RE33-20-190090	33-01113	4.0–5.0	QBT2	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913
RE33-20-190066	33-01114	2.0–3.0	QBT3	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912	N3B-2020-912
RE33-20-190091	33-01114	4.0–5.0	QBT3	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913
RE33-20-190042	33-01116	0.0–1.0	SOIL	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925
RE33-20-190067	33-01116	2.0–3.0	SOIL	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925
RE33-20-190092	33-01116	4.0–5.0	SOIL	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925
RE33-20-190043	33-01120	0.0–1.0	FILL	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945
RE33-20-190068	33-01120	2.0–3.0	QBT3	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945
RE33-20-190093	33-01120	4.0–5.0	QBT3	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945
RE33-20-190044	33-01128	0.0–1.0	FILL	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933
RE33-20-190069	33-01128	2.0–2.8	FILL	N3B-2020-936	N3B-2020-936	N3B-2020-936	N3B-2020-936	N3B-2020-936	N3B-2020-936	N3B-2020-936	N3B-2020-936	N3B-2020-936	N3B-2020-936	N3B-2020-936
RE33-20-190094	33-01128	4.0–5.0	QBT3	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933
RE33-20-190045	33-01130	0.0–1.0	SOIL	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903
RE33-20-190070	33-01130	2.0–3.0	FILL	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933
RE33-20-190095	33-01130	4.0–5.0	FILL	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933
RE33-20-190046	33-01135	0.0–1.0	SOIL	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929
RE33-20-190071	33-01135	2.0–3.0	QBT3	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929
RE33-20-190096	33-01135	4.0–5.0	QBT3	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929
RE33-20-190047	33-01145	0.0–1.0	SOIL	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920
RE33-20-190072	33-01145	2.0–3.0	QBT3	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920
RE33-20-190097	33-01145	4.0–5.0	QBT3	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920

Table 6.16-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOCs	SVOCs	Cyanide	Nitrate
RE33-20-190048	33-01146	0.0–1.0	SOIL	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920
RE33-20-190073	33-01146	2.0–3.0	SOIL	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920
RE33-20-190098	33-01146	4.0–5.0	SOIL	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920
RE33-20-190049	33-01152	0.0–1.0	SOIL	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956
RE33-20-190074	33-01152	2.0–3.0	QBT3	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956
RE33-20-190099	33-01152	4.0–5.0	QBT3	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956	N3B-2020-956
RE33-20-190050	33-01156	0.0–1.0	SOIL	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933
RE33-20-190075	33-01156	2.0–3.0	QBT3	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933
RE33-20-190100	33-01156	4.0–5.0	QBT3	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933
RE33-20-190051	33-01166	0.0–0.2	SOIL	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920
RE33-20-190076	33-01166	2.0–3.0	QBT3	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920
RE33-20-190101	33-01166	4.0–5.0	QBT3	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920	N3B-2020-920
0333-96-0130	33-01585	0–0.5	FILL	—*	—	—	—	—	—	—	—	2339	—	—
0333-96-0131	33-01586	0–0.5	FILL	—	—	—	—	—	—	—	—	2339	—	—
0333-96-0132	33-01587	0–0.5	FILL	—	—	—	—	—	—	—	—	2339	—	—
0333-96-0133	33-01588	0–0.5	FILL	—	—	—	—	—	—	—	—	2339	—	—
0333-96-0134	33-01589	0–0.5	FILL	—	—	—	—	—	—	—	—	2339	—	—
0333-96-0135	33-01590	0–0.5	FILL	—	—	—	—	—	—	—	—	2339	—	—
0333-96-0136	33-01591	0–0.5	FILL	—	—	—	—	—	—	—	—	2339	—	—
0333-96-0137	33-01592	0–0.5	FILL	—	—	—	—	—	—	—	—	2339	—	—
0333-96-0138	33-01593	0–0.5	SED	—	—	—	—	—	—	—	—	2339	—	—
0333-96-0139	33-01594	0–0.5	SED	—	—	—	—	—	—	—	—	2339	—	—
0333-96-0140	33-01595	0–0.5	FILL	—	—	—	—	—	—	—	—	2339	—	—
0333-96-0141	33-01596	0–0.5	FILL	—	—	—	—	—	—	—	—	2339	—	—
0333-96-0142	33-01597	0–0.5	FILL	—	—	—	—	—	—	—	—	2339	—	—
0333-96-0143	33-01598	0–0.5	FILL	—	—	—	—	—	—	—	—	2339	—	—
0333-96-0145	33-01600	0–0.5	FILL	—	—	—	—	—	—	—	—	2339	—	—
0333-96-0144	33-01601	1–1.5	FILL	—	—	—	—	—	—	—	—	2339	—	—
0333-96-0146	33-01601	0–0.5	FILL	—	—	—	—	—	—	—	—	2339	—	—
0333-96-0147	33-01602	0–0.5	FILL	—	—	—	—	—	—	—	—	2339	—	—
0333-96-0149	33-01604	0–0.5	FILL	—	—	—	—	—	—	2364	—		—	—

Table 6.16-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOCs	SVOCs	Cyanide	Nitrate
RE33-20-190052	33-01604	0.0–1.0	FILL	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945
RE33-20-190077	33-01604	2.0–3.0	FILL	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948
RE33-20-190102	33-01604	4.0–5.0	FILL	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948
0333-96-0151	33-01606	0–0.5	FILL	—	—	—	—	—	—	2364	—		—	—
RE33-20-190053	33-01606	0.0–1.0	FILL	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948
RE33-20-190078	33-01606	2.0–3.0	FILL	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948
RE33-20-190103	33-01606	4.0–5.0	FILL	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948
0333-96-0152	33-01607	0–0.5	FILL	—	—	—	—	—	—	2364	—		—	—
RE33-20-190054	33-01607	0.0–1.0	FILL	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933
RE33-20-190079	33-01607	2.0–3.0	FILL	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933
RE33-20-190104	33-01607	4.0–5.0	FILL	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933	N3B-2020-933
RE33-20-190080	33-01612	2.0–3.0	QBT3	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913
RE33-20-190105	33-01612	4.0–5.0	QBT3	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913	N3B-2020-913
0333-96-0159	33-01614	0–0.5	SOIL	—	—	—	—	—	—	2367	—		—	—
RE33-20-190056	33-01614	0.0–1.0	FILL	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948
RE33-20-190081	33-01614	2.0–3.0	FILL	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948
RE33-20-190106	33-01614	4.0–5.0	FILL	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945	N3B-2020-945
0333-96-0160	33-01615	0–0.5	FILL	—	—	—	—	—	—	2367	—		—	—
RE33-20-190057	33-01615	0.0–1.0	FILL	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948
RE33-20-190082	33-01615	2.0–3.0	FILL	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948
RE33-20-190107	33-01615	4.0–5.0	FILL	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948	N3B-2020-948
0333-96-0161	33-01616	0–0.5	SOIL	—	—	—	—	—	—	2367	—		—	—
RE33-20-190058	33-01616	0.0–1.0	SOIL	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903
RE33-20-190083	33-01616	2.0–3.0	QBT2	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903
RE33-20-190108	33-01616	4.0–5.0	QBT2	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903	N3B-2020-903
RE33-20-190109	33-60616	0.0–1.0	SOIL	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925
RE33-20-190114	33-60616	2.0–3.0	QBT3	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926
RE33-20-190119	33-60616	4.0–5.0	QBT3	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926
RE33-20-190110	33-60617	0.0–1.0	QBT3	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925	N3B-2020-925
RE33-20-190115	33-60617	2.0–3.0	QBT3	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929
RE33-20-190120	33-60617	4.0–5.0	QBT3	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929

Table 6.16-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	Gamma-Emitting Radionuclides	Tritium	Isotopic Plutonium	Isotopic Uranium	TAL Metals	Perchlorate	PCBs	VOCs	SVOCs	Cyanide	Nitrate
RE33-20-190111	33-60618	0.0–1.0	QBT3	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929
RE33-20-190116	33-60618	2.0–3.0	QBT3	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929
RE33-20-190121	33-60618	4.0–5.0	QBT3	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929
RE33-20-190112	33-60619	0.0–1.0	SOIL	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926
RE33-20-190117	33-60619	2.5–3.5	QBT3	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926	N3B-2020-926
RE33-20-190122	33-60619	4.0–5.0	QBT3	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929
RE33-20-190113	33-60620	0.0–1.0	QBT2	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929
RE33-20-190118	33-60620	2.0–3.0	QBT2	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929
RE33-20-190123	33-60620	4.0–5.0	QBT2	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929	N3B-2020-929
RE33-21-217922	33-60982	0.0–1.0	ALLH	—	—	—	—	N3B-2021-784	—	—	—		—	—
RE33-21-222611	33-60982	2.0–3.0	QBT3	—	—	—	—	N3B-2021-1342	—	—	—	—	—	—
RE33-21-222612	33-60982	4.0–5.0	QBT3	—	—	—	—	N3B-2021-1342	—	—	—	—	—	—
RE33-21-217923	33-60983	0.0–1.0	ALLH	—	—	—	—	N3B-2021-862	—	—	—	—	—	—
RE33-21-222613	33-60983	2.0–3.0	QBT3	—	—	—	—	N3B-2021-1329	—	—	—	—	—	—
RE33-21-222614	33-60983	4.0–5.0	QBT3	—	—	—	—	N3B-2021-1329	—	—	—	—	—	—
RE33-21-217924	33-60984	0.0–1.0	ALLH	—	—	—	—	N3B-2021-784	—	—	—	—	—	—
RE33-21-222615	33-60984	2.0–3.0	QBT3	—	—	—	—	N3B-2021-1342	—	—	—	—	—	—
RE33-21-222616	33-60984	4.0–5.0	QBT3	—	—	—	—	N3B-2021-1342	—	—	—	—	—	—
RE33-21-217925	33-60985	0.0–1.0	ALLH	—	—	—	—	N3B-2021-784	—	—	—	—	—	—
RE33-21-222617	33-60985	2.0–3.0	QBT3	—	—	—	—	N3B-2021-1342	—	—	—	—	—	—
RE33-21-222618	33-60985	4.0–5.0	QBT3	—	—	—	—	N3B-2021-1342	—	—	—	—	—	—

Note: Numbers in analyte columns are request numbers.
*— = Analysis not requested.

Table 6.16-2
Inorganic Chemicals above BVs at SWMU 33-017

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Sodium	Zinc
Soil Background Value[a]				**0.83**	**295**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**21,500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**na[b]**	**na**	**1.52**	**1**	**915**	**48.8**
Qbt 2,3,4 Background Value[a]				**0.5**	**46**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**14,500**	**11.2**	**1690**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**2770**	**63.5**
Sediment Background Value[a]				**0.83**	**127**	**0.4**	**4420**	**10.5**	**4.73**	**11.2**	**13,800**	**19.7**	**2370**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**	**1470**	**60.2**
Construction Worker SSL[c]				**142**	**4390**	**72.1**	**na**	**134[d]**	**36.7**	**14,200**	**248,000**	**800**	**na**	**464**	**77.1**	**753**	**566,000**	**248**	**1750**	**1770**	**na**	**106,000**
Industrial SSL[c]				**519**	**255,000**	**1110**	**na**	**505[d]**	**388**	**51,900**	**908,000**	**800**	**na**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**na**	**389,000**
Residential SSL[c]				**31.3**	**15,600**	**70.5**	**na**	**96.6[d]**	**23.4**	**3130**	**54,800**	**400**	**na**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**na**	**23,500**
RE33-20-190059	33-01102	2.0–3.0	FILL	—[e]	—	—	6910	—	—	—	—	—	—	—	—	—	—	—	1.63	—	—	—
RE33-20-190084	33-01102	4.0–5.0	FILL	1.02 (U)	—	—	6490	—	—	—	—	—	—	—	—	—	—	—	1.81	—	—	—
RE33-20-190035	33-01104	0.0–1.0	FILL	—	—	1.9	—	—	—	—	—	—	—	—	—	—	1.5	—	—	—	—	208
RE33-20-190060	33-01104	2.0–3.0	FILL	—	—	—	6180	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190085	33-01104	4.0–5.0	FILL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190036	33-01105	0.0–1.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	9.34	0.00155 (J)	—	—	—	—
RE33-20-190061	33-01105	2.0–3.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	1.85	—	—	—	—	—
RE33-20-190086	33-01105	4.0–5.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	3.19	0.000528 (J)	—	—	—	—
RE33-20-190062	33-01106	2.0–3.0	QBT3	1.15 (U)	—	—	—	18.2	—	5.82	—	—	—	—	—	—	—	—	0.915 (J)	2.09	—	—
RE33-20-190087	33-01106	4.0–5.0	QBT2	0.51 (U)	—	—	—	11.1	—	—	—	14.5 (J+)	—	—	—	—	—	—	0.957 (J)	6.7	—	—
RE33-20-190063	33-01107	2.0–3.0	QBT3	—	—	—	—	19.2	—	—	—	—	—	—	—	—	—	—	0.944 (J)	—	—	—
RE33-20-190088	33-01107	4.0–5.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.03 (J)	—	—	—
RE33-20-190039	33-01109	0.0–0.7	SOIL	—	—	—	—	—	—	16	—	24.5	—	—	—	—	1.54	—	—	—	—	93.5
RE33-20-190064	33-01109	2.0–3.0	QBT3	—	—	—	—	15.7	—	—	—	—	—	—	—	—	—	—	0.887 (J)	—	—	—
RE33-20-190089	33-01109	4.0–5.0	QBT3	—	—	—	3140	—	—	—	—	—	—	—	—	—	—	—	1.3	—	—	—
RE33-20-190040	33-01113	0.0–1.0	SED	—	—	0.504 (J)	—	—	—	25.9	—	30.5	—	—	—	—	1.08 (J)	—	0.423 (J)	—	—	142
RE33-20-190065	33-01113	2.0–3.0	QBT2	—	—	—	—	16.4	—	29.6	—	11.7	—	—	—	—	—	—	0.682 (J)	—	—	63.6
RE33-20-190090	33-01113	4.0–5.0	QBT2	0.962 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.822 (J)	—	—	—
RE33-20-190066	33-01114	2.0–3.0	QBT3	—	—	2.53	—	15.1	—	140	—	128	—	—	0.124	6.77	—	—	0.76 (J)	1.11	—	201
RE33-20-190091	33-01114	4.0–5.0	QBT3	—	65.1	3.62	—	12 (J+)	5.25	186	56,600	105	—	1350	—	—	—	—	0.874 (J)	—	—	436
RE33-20-190042	33-01116	0.0–1.0	SOIL	—	—	—	7050	—	—	—	—	—	—	—	—	—	7.64	0.00134 (J)	—	—	—	—
RE33-20-190067	33-01116	2.0–3.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	0.887 (J)	0.00312	—	—	—	—
RE33-20-190092	33-01116	4.0–5.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.000675 (J)	—	—	—	—
RE33-20-190043	33-01120	0.0–1.0	FILL	1.26 (U)	—	—	—	—	—	19.3	—	22.5	—	—	—	—	—	0.0007 (J)	—	—	—	—

Table 6.16-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Sodium	Zinc
Soil Background Value[a]				**0.83**	**295**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**21,500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**na[b]**	**na**	**1.52**	**1**	**915**	**48.8**
Qbt 2,3,4 Background Value[a]				**0.5**	**46**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**14,500**	**11.2**	**1690**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**2770**	**63.5**
Sediment Background Value[a]				**0.83**	**127**	**0.4**	**4420**	**10.5**	**4.73**	**11.2**	**13,800**	**19.7**	**2370**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**	**1470**	**60.2**
Construction Worker SSL[c]				**142**	**4390**	**72.1**	**na**	**134[d]**	**36.7**	**14,200**	**248,000**	**800**	**na**	**464**	**77.1**	**753**	**566,000**	**248**	**1750**	**1770**	**na**	**106,000**
Industrial SSL[c]				**519**	**255000**	**1110**	**na**	**505[d]**	**388**	**51,900**	**908,000**	**800**	**na**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**na**	**389,000**
Residential SSL[c]				**31.3**	**15,600**	**70.5**	**na**	**96.6[d]**	**23.4**	**3130**	**54,800**	**400**	**na**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**na**	**23,500**
RE33-20-190068	33-01120	2.0–3.0	QBT3	—	56.8	—	3010	—	—	—	—	—	—	—	—	—	—	0.000617 (J)	1.36	—	—	—
RE33-20-190093	33-01120	4.0–5.0	QBT3	0.593 (U)	—	—	—	22.9 (J)	—	—	—	—	—	—	—	—	—	—	1.49	—	—	—
RE33-20-190044	33-01128	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	—	—	—	—	3.21	—	—	—	—	—
RE33-20-190069	33-01128	2.0–2.8	FILL	—	—	—	—	—	—	19.8	—	—	—	—	—	39.9	1.25	—	—	—	1190	—
RE33-20-190094	33-01128	4.0–5.0	QBT3	0.791 (U)	—	—	—	25.6	—	—	—	—	—	—	—	—	1.22	—	0.633 (J)	—	—	—
RE33-20-190045	33-01130	0.0–1.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	1.39	—	—	—	—	—
RE33-20-190070	33-01130	2.0–3.0	FILL	1 (U)	—	—	—	—	—	—	—	—	—	—	—	—	15.9	—	—	—	—	—
RE33-20-190095	33-01130	4.0–5.0	FILL	—	—	—	—	—	—	—	—	—	—	—	—	—	5.47	—	—	—	—	—
RE33-20-190046	33-01135	0.0–1.0	SOIL	—	—	—	—	—	—	—	—	31	—	—	—	—	3.84	0.000661 (J)	—	—	—	—
RE33-20-190071	33-01135	2.0–3.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	0.808 (J)	0.000801 (J)	1.11	—	—	—
RE33-20-190096	33-01135	4.0–5.0	QBT3	—	—	—	—	22.4 (J+)	—	—	—	—	—	—	—	—	—	0.000716 (J)	1.05	—	—	—
RE33-20-190047	33-01145	0.0–1.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	0.129	—	57.2	0.00926	—	—	—	—
RE33-20-190072	33-01145	2.0–3.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	1.85	0.00141 (J)	1.15	—	—	—
RE33-20-190097	33-01145	4.0–5.0	QBT3	—	—	—	—	29.7	—	—	—	—	—	—	—	—	8.04	0.0022	0.8 (J)	—	—	—
RE33-20-190048	33-01146	0.0–1.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	1.38 (J)	—	—	—	—	—
RE33-20-190073	33-01146	2.0–3.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00236	—	—	—	—
RE33-20-190098	33-01146	4.0–5.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	1 (J)	0.00405	—	—	—	—
RE33-20-190049	33-01152	0.0–1.0	SOIL	1.02 (U)	—	—	—	—	—	—	—	—	—	—	—	—	14.1	—	—	—	—	—
RE33-20-190074	33-01152	2.0–3.0	QBT3	—	—	—	2380	—	—	—	—	—	—	—	—	—	1.17	—	0.5 (J)	—	—	—
RE33-20-190099	33-01152	4.0–5.0	QBT3	0.802 (U)	—	—	—	14.5	—	—	—	—	—	—	—	—	0.801 (J)	—	0.601 (J)	—	—	—
RE33-20-190050	33-01156	0.0–1.0	SOIL	—	—	—	6290	—	—	—	—	—	—	—	—	—	1.31	—	—	—	—	—
RE33-20-190075	33-01156	2.0–3.0	QBT3	—	—	—	—	14.8	—	—	—	—	—	—	—	—	—	0.000598 (J)	1.41	—	—	—
RE33-20-190100	33-01156	4.0–5.0	QBT3	1.22 (U)	—	—	—	20.8	—	—	—	—	—	—	—	—	0.604 (J)	0.0028	1.04	—	—	—
RE33-20-190051	33-01166	0.0–0.2	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	1.48	—	—	—	—	—
RE33-20-190076	33-01166	2.0–3.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.981	—	—	—
RE33-20-190101	33-01166	4.0–5.0	QBT3	—	—	—	2350	14.8	—	—	—	—	—	—	—	—	—	—	1.19	—	—	—

Table 6.16-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Sodium	Zinc
Soil Background Value[a]				**0.83**	**295**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**21,500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**na[b]**	**na**	**1.52**	**1**	**915**	**48.8**
Qbt 2,3,4 Background Value[a]				**0.5**	**46**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**14,500**	**11.2**	**1690**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**2770**	**63.5**
Sediment Background Value[a]				**0.83**	**127**	**0.4**	**4420**	**10.5**	**4.73**	**11.2**	**13,800**	**19.7**	**2370**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**	**1470**	**60.2**
Construction Worker SSL[c]				**142**	**4390**	**72.1**	**na**	**134[d]**	**36.7**	**14,200**	**248,000**	**800**	**na**	**464**	**77.1**	**753**	**566,000**	**248**	**1750**	**1770**	**na**	**106,000**
Industrial SSL[c]				**519**	**255000**	**1110**	**na**	**505[d]**	**388**	**51,900**	**908,000**	**800**	**na**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**na**	**389,000**
Residential SSL[c]				**31.3**	**15,600**	**70.5**	**na**	**96.6[d]**	**23.4**	**3130**	**54,800**	**400**	**na**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**na**	**23,500**
RE33-20-190052	33-01604	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190077	33-01604	2.0–3.0	FILL	0.882 (U)	—	—	—	—	—	—	—	—	—	—	—	—	0.901 (J)	—	1.55	—	—	—
RE33-20-190102	33-01604	4.0–5.0	FILL	—	—	—	—	—	—	—	—	—	—	—	—	—	0.961 (J)	—	—	—	—	—
RE33-20-190053	33-01606	0.0–1.0	FILL	—	—	0.45 (J)	—	—	—	45.7 (J+)	—	—	—	—	—	—	0.769 (J)	—	—	—	—	147
RE33-20-190078	33-01606	2.0–3.0	FILL	—	—	—	15,500	—	—	—	—	—	—	—	—	—	0.741 (J)	—	1.65	—	—	—
RE33-20-190103	33-01606	4.0–5.0	FILL	—	—	—	—	—	—	—	—	—	—	—	—	—	1.26	—	—	—	—	—
RE33-20-190054	33-01607	0.0–1.0	FILL	1.37 (U)	—	—	—	—	—	—	—	—	—	—	—	—	1.08 (J)	—	—	—	—	—
RE33-20-190079	33-01607	2.0–3.0	FILL	—	—	—	8620	—	—	15.2	—	—	—	—	—	—	1.87	—	—	—	—	—
RE33-20-190104	33-01607	4.0–5.0	FILL	—	—	—	10,600	—	—	—	—	—	—	—	—	—	1.58	—	—	—	—	—
RE33-20-190080	33-01612	2.0–3.0	QBT3	—	—	—	—	8.78 (J+)	—	—	—	—	—	—	—	—	—	—	0.821 (J)	—	—	—
RE33-20-190105	33-01612	4.0–5.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	0.103	—	—	—	0.803 (J)	—	—	—
RE33-20-190056	33-01614	0.0–1.0	FILL	0.892 (U)	—	6.91	—	—	—	63.8 (J+)	—	40.2	—	—	—	—	13.6	0.0193	—	—	—	110
RE33-20-190081	33-01614	2.0–3.0	FILL	—	—	—	8790	—	—	—	—	—	—	—	—	—	22	0.0265	—	—	—	—
RE33-20-190106	33-01614	4.0–5.0	FILL	—	—	—	—	—	—	—	—	—	—	—	—	—	35.4	0.00713	—	—	952	—
RE33-20-190057	33-01615	0.0–1.0	FILL	—	—	—	6910	—	—	34.8 (J+)	—	32.4	—	—	—	—	4.55	0.00631	—	—	—	69
RE33-20-190082	33-01615	2.0–3.0	FILL	—	—	—	7240	—	—	—	—	—	—	—	—	—	4.61	0.0124	—	—	—	—
RE33-20-190107	33-01615	4.0–5.0	FILL	—	—	—	7200	—	—	—	—	—	—	—	—	—	17.1	0.00487	—	—	—	—
RE33-20-190058	33-01616	0.0–1.0	SOIL	1.11 (U)	—	1.09	—	—	—	46.5	—	76.4	—	—	0.155	—	2.13	0.000964 (J)	—	25.9	—	179
RE33-20-190083	33-01616	2.0–3.0	QBT2	—	—	—	—	17.1	—	—	—	—	—	—	—	—	—	—	0.953 (J)	—	—	—
RE33-20-190108	33-01616	4.0–5.0	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.91 (J)	—	—	—
RE33-20-190109	33-60616	0.0–1.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	1.64	—	—	—	—	—
RE33-20-190114	33-60616	2.0–3.0	QBT3	0.984 (U)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.762 (J)	—	—	—
RE33-20-190119	33-60616	4.0–5.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.863 (J)	—	—	—
RE33-20-190110	33-60617	0.0–1.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00131 (J)	0.937 (J)	—	—	—
RE33-20-190115	33-60617	2.0–3.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.14	—	—	—
RE33-20-190120	33-60617	4.0–5.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.000623 (J)	1.07	—	—	—

Table 6.16-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Antimony	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Nitrate	Perchlorate	Selenium	Silver	Sodium	Zinc
Soil Background Value[a]				**0.83**	**295**	**0.4**	**6120**	**19.3**	**8.64**	**14.7**	**21,500**	**22.3**	**4610**	**671**	**0.1**	**15.4**	**na[b]**	**na**	**1.52**	**1**	**915**	**48.8**
Qbt 2,3,4 Background Value[a]				**0.5**	**46**	**1.63**	**2200**	**7.14**	**3.14**	**4.66**	**14,500**	**11.2**	**1690**	**482**	**0.1**	**6.58**	**na**	**na**	**0.3**	**1**	**2770**	**63.5**
Sediment Background Value[a]				**0.83**	**127**	**0.4**	**4420**	**10.5**	**4.73**	**11.2**	**13,800**	**19.7**	**2370**	**543**	**0.1**	**9.38**	**na**	**na**	**0.3**	**1**	**1470**	**60.2**
Construction Worker SSL[c]				**142**	**4390**	**72.1**	**na**	**134[d]**	**36.7**	**14,200**	**248,000**	**800**	**na**	**464**	**77.1**	**753**	**566,000**	**248**	**1750**	**1770**	**na**	**106,000**
Industrial SSL[c]				**519**	**255000**	**1110**	**na**	**505[d]**	**388**	**51,900**	**908,000**	**800**	**na**	**160,000**	**389**	**25,700**	**2,080,000**	**908**	**6490**	**6490**	**na**	**389,000**
Residential SSL[c]				**31.3**	**15,600**	**70.5**	**na**	**96.6[d]**	**23.4**	**3130**	**54,800**	**400**	**na**	**10,500**	**23.5**	**1560**	**125,000**	**54.8**	**391**	**391**	**na**	**23,500**
RE33-20-190111	33-60618	0.0–1.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	0.955 (J)	—	0.885 (J)	—	—	—
RE33-20-190116	33-60618	2.0–3.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.9 (J)	—	—	—
RE33-20-190121	33-60618	4.0–5.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.000696 (J)	0.952 (J)	—	—	—
RE33-20-190112	33-60619	0.0–1.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	1.1 (J)	—	—	—	—	—
RE33-20-190117	33-60619	2.5–3.5	QBT3	0.998 (U)	—	—	—	14	—	—	—	—	—	—	—	—	—	—	0.864 (J)	—	—	—
RE33-20-190122	33-60619	4.0–5.0	QBT3	—	—	—	—	25.2 (J+)	—	—	—	—	—	—	—	—	—	0.00301	1.54	—	—	—
RE33-20-190113	33-60620	0.0–1.0	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	—	1.26	0.00054 (J)	1.22	—	—	—
RE33-20-190118	33-60620	2.0–3.0	QBT2	—	—	—	—	—	—	—	—	—	—	—	—	—	0.909 (J)	—	1.38	—	—	—
RE33-20-190123	33-60620	4.0–5.0	QBT2	—	—	—	—	31.2	—	—	—	—	—	—	—	—	0.871 (J)	—	1.44	—	—	—
RE33-21-217922	33-60982	0.0–1.0	SOIL	1.7 (J)	—	—1.18	—	—	—	49.1	—	126	—	—	0.105	—	NA[f]	NA	—	39.9	—	173
RE33-21-222611	33-60982	2.0–3.0	QBT3	0.851 (J)	—	—	—	—	—	6.06 (J+)	—	—	2050 (J)	—	—	—	NA	NA	1.73	—	—	—
RE33-21-222612	33-60982	4.0–5.0	QBT3	0.612 (J)	—	—	—	—	—	—	—	—	—	—	—	—	NA	NA	1.6	—	—	—
RE33-21-217923	33-60983	0.0–1.0	SOIL	—	—	—0.608	—	—	—	19	—	45	—	—	—	—	NA	NA	—	7.69	—	135
RE33-21-222613	33-60983	2.0–3.0	QBT3	0.917 (U)	—	—	—	—	—	5.41	—	—	—	—	—	—	NA	NA	1.63	—	—	—
RE33-21-222614	33-60983	4.0–5.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	NA	NA	1.76	—	—	—
RE33-21-217924	33-60984	0.0–1.0	SOIL	0.915 (J)	—	—1.09		19.9 (J+)	—	71.3	—	304	—	—	0.12	—	NA	NA	—	72.9	—	171
RE33-21-222615	33-60984	2.0–3.0	QBT3	—	—	—	—	—	—	8.74 (J+)	—	25.6 (J+)	—	—	—	—	NA	NA	1.54	4.73 (J)	—	—
RE33-21-222616	33-60984	4.0–5.0	QBT3	—	—	—	—	—	—	14.7 (J+)	—	37.4 (J+)	—	—	—	—	NA	NA	1.58	3.09 (J)	—	—
RE33-21-217925	33-60985	0.0–1.0	SOIL	1.82 (U)	—	—1.09	—	—	—	47.4	—	124	—	—	0.162	—	NA	NA	—	38.6	—	189
RE33-21-222617	33-60985	2.0–3.0	QBT3	0.761 (J)	—	—	—	—	—	—	—	—	—	—	—	—	NA	NA	1.72	—	—	—
RE33-21-222618	33-60985	4.0–5.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	NA	NA	1.67	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

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

[b] na = Not available.

[c] SSLs from NMED (2019, 700550) unless otherwise noted.

[d] SSL for total chromium.

[e] — = Not detected or not detected above BV.

[f] NA = Not analyzed.

Table 6.16-3
Organic Chemicals Detected at SWMU 33-017

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	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Butylbenzylphthalate	Carbazole	Chrysene
Construction Worker SSL[a]				**15,100**	**242,000**	**75,300**	**4.91**	**85.3**	**240**	**15.0**	**240**	**7530[b]**	**2310**	**1,080,000[c]**	**5380**	**99,000[c]**	**85[c,d]**	**23,100**
Industrial SSL[a]				**50,500**	**960,000**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**3,300,000[e]**	**1830**	**12,000**	**1200[d,e]**	**3230**
Residential SSL[a]				**3480**	**66,300**	**17,400**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**250,000[e]**	**380**	**2900**	**78[d,e]**	**153**
RE33-20-190059	33-01102	2.0–3.0	FILL	0.118	—[f]	0.214	—	—	0.455	0.527	0.526	0.272	0.217	—	—	—	0.113	0.458
RE33-20-190084	33-01102	4.0–5.0	FILL	—	—	0.0153 (J)	—	0.00138 (J)	0.0697	0.0705	0.0845	0.0392 (J)	0.0322 (J)	—	—	—	0.0136 (J)	0.0709
RE33-20-190035	33-01104	0.0–1.0	FILL	—	—	—	0.00987 (J)	0.0101 (J)	0.0779 (J)	—	0.0738 (J)	—	—	—	—	—	—	—
RE33-20-190060	33-01104	2.0–3.0	FILL	—	—	—	—	—	0.0221 (J)	0.0225 (J)	0.0212 (J)	—	—	—	—	—	—	0.0167 (J)
RE33-20-190085	33-01104	4.0–5.0	FILL	—	—	—	—	—	0.0206 (J)	0.0165 (J)	—	—	—	—	—	—	—	0.0136 (J)
RE33-20-190036	33-01105	0.0–1.0	SOIL	0.0167 (J)	—	0.033 (J)	0.759	0.289	0.168	0.175	0.203	0.111	0.0915	—	—	—	0.0266 (J)	0.167
RE33-20-190061	33-01105	2.0–3.0	SOIL	0.015 (J)	—	0.0234 (J)	0.621	0.228	0.0796	0.095	0.105	0.0559	0.0496	—	0.0105 (J)	—	0.0157 (J)	0.0758
RE33-20-190086	33-01105	4.0–5.0	SOIL	—	—	—	0.597	0.205	0.15 (J)	0.163 (J)	0.189	—	—	—	—	—	—	0.136 (J)
RE33-20-190062	33-01106	2.0–3.0	QBT3	0.0209 (J)	—	0.0422	0.037	0.0706	0.182	0.234	0.269	0.145	0.122	—	—	—	0.032 (J)	0.233
RE33-20-190087	33-01106	4.0–5.0	QBT2	—	0.00249 (J)	—	0.0111	0.0222	0.0493	0.0702	0.0676	0.0485	0.0235 (J)	—	0.0134 (J)	—	—	0.0605
RE33-20-190063	33-01107	2.0–3.0	QBT3	—	—	—	0.00485	0.00985	0.0197 (J)	0.0201 (J)	0.0234 (J)	—	—	—	—	—	—	0.0165 (J)
RE33-20-190088	33-01107	4.0–5.0	QBT3	—	0.0121	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190039	33-01109	0.0–0.7	SOIL	0.0479	—	0.0475	0.00215 (J)	0.00288 (J)	0.187	0.209	0.261	0.0986	0.11	—	—	—	0.0434	0.211
RE33-20-190040	33-01113	0.0–1.0	SED	—	—	0.013 (J)	0.0399	0.0374	0.0643	0.0834	0.106	0.0497	0.0379 (J)	—	—	—	—	0.075
RE33-20-190065	33-01113	2.0–3.0	QBT2	—	—	—	0.0113	0.0109	0.038	0.0469	0.0586	0.0263 (J)	0.0206 (J)	—	—	—	—	0.0441
RE33-20-190066	33-01114	2.0–3.0	QBT3	—	—	0.0211 (J)	0.0339	0.0224	0.0718	0.0702	0.0848	0.0418	0.0296 (J)	—	—	—	0.0134 (J)	0.0702
RE33-20-190091	33-01114	4.0–5.0	QBT3	0.0298 (J)	0.0188	0.0665	0.0117	0.00732	0.163	0.144	0.174	0.0768	0.0734	—	0.0138 (J)	—	0.0352 (J)	0.156
RE33-20-190067	33-01116	2.0–3.0	SOIL	—	0.0113	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190092	33-01116	4.0–5.0	SOIL	—	0.00782	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190043	33-01120	0.0–1.0	FILL	—	—	0.118 (J)	—	—	0.351	0.241	0.39	0.129 (J)	0.145 (J)	—	—	—	0.104 (J)	0.303
RE33-20-190044	33-01128	0.0–1.0	FILL	—	0.0188	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190069	33-01128	2.0–2.8	FILL	0.0655 (J)	—	0.0974 (J)	0.00374	0.00752	0.182 (J)	0.176 (J)	0.195	0.0693 (J)	0.0786 (J)	—	—	—	—	0.165 (J)
RE33-20-190094	33-01128	4.0–5.0	QBT3	—	0.0184	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190045	33-01130	0.0–1.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 6.16-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Butylbenzylphthalate	Carbazole	Chrysene
Construction Worker SSL[a]				**15,100**	**242,000**	**75,300**	**4.91**	**85.3**	**240**	**15.0**	**240**	**7530[b]**	**2310**	**1,080,000[c]**	**5380**	**99,000[c]**	**85[c,d]**	**23,100**
Industrial SSL[a]				**50,500**	**960,000**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**3,300,000[e]**	**1830**	**12,000**	**1200[d,e]**	**3230**
Residential SSL[a]				**3480**	**66,300**	**17,400**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**250,000[e]**	**380**	**2900**	**78[d,e]**	**153**
RE33-20-190070	33-01130	2.0–3.0	FILL	—	—	—	0.0113	0.0127	0.0348 (J)	0.0307 (J)	0.0385	—	0.0206 (J)	—	—	—	—	0.0356 (J)
RE33-20-190095	33-01130	4.0–5.0	FILL	—	—	0.0164 (J-)	0.0023 (J)	0.00216 (J)	0.0679 (J-)	0.0718 (J-)	0.0761 (J-)	0.0527 (J-)	0.032 (J-)	—	—	—	0.014 (J-)	0.0628 (J-)
RE33-20-190072	33-01145	2.0–3.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190097	33-01145	4.0–5.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190048	33-01146	0.0–1.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190049	33-01152	0.0–1.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190099	33-01152	4.0–5.0	QBT3	—	0.00232 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190075	33-01156	2.0–3.0	QBT3	—	0.00672	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190100	33-01156	4.0–5.0	QBT3	—	0.0094	—	—	—	—	—	—	—	—	—	—	—	—	—
0333-96-0130	33-01585	0.0–0.5	FILL	0.14 (J)	NA[g]	0.34	NA	NA	0.84	0.78	0.99	0.11 (J)	0.25 (J)	—	—	—	NA	0.8
0333-96-0131	33-01586	0.0–0.5	FILL	—	NA	—	NA	NA	0.54	0.25 (J)	0.43	—	—	—	—	—	NA	0.48
0333-96-0132	33-01587	0.0–0.5	FILL	—	NA	—	NA	NA	0.41	—	—	—	—	—	—	—	NA	0.29 (J)
0333-96-0133	33-01588	0.0–0.5	FILL	0.62 (J)	NA	0.95 (J)	NA	NA	1.5 (J)	1.8 (J)	2.6 (J)	0.67 (J)	1.1 (J)	0.22 (J)	—	—	NA	1.4 (J)
0333-96-0134	33-01589	0.0–0.5	FILL	—	NA	—	NA	NA	0.65 (J)	0.35 (J)	0.78 (J)	—	—	0.21 (J)	—	—	NA	0.57 (J)
0333-96-0135	33-01590	0.0–0.5	FILL	—	NA	—	NA	NA	0.41	—	—	—	—	—	—	—	NA	0.3 (J)
0333-96-0136	33-01591	0.0–0.5	FILL	—	NA	—	NA	NA	0.5 (J)	0.16 (J)	0.53 (J)	—	—	0.19 (J)	—	0.43 (J)	NA	0.41 (J)
0333-96-0137	33-01592	0.0–0.5	FILL	—	NA	—	NA	NA	0.37 (J)	—	0.054 (J)	—	—	—	—	—	NA	0.26 (J)
0333-96-0138	33-01593	0.0–0.5	SED	0.26 (J)	NA	0.42	NA	NA	1.2	1.1	1.4	0.4	—	—	—	—	NA	1.2
0333-96-0139	33-01594	0.0–0.5	SED	—	NA	—	NA	NA	0.084 (J)	0.074 (J)	0.17 (J)	0.096 (J)	—	—	—	—	NA	0.094 (J)
0333-96-0140	33-01595	0.0–0.5	FILL	1.3	NA	2	NA	NA	3.5	2.4	2.7	0.75	0.97	—	—	—	NA	2.5
0333-96-0141	33-01596	0.0–0.5	FILL	0.058 (J)	NA	0.18 (J)	NA	NA	0.6	0.55	0.66	0.23 (J)	0.084 (J)	—	—	—	NA	0.61
0333-96-0142	33-01597	0.0–0.5	FILL	—	NA	—	NA	NA	—	—	—	0.76 (J)	—	—	—	—	NA	—
0333-96-0143	33-01598	0.0–0.5	FILL	0.045 (J)	NA	0.18 (J)	NA	NA	0.44	0.41	0.49	0.21 (J)	—	—	—	—	NA	0.44
0333-96-0145	33-01600	0.0–0.5	FILL	—	NA	—	NA	NA	—	0.12 (J)	0.22 (J)	0.11 (J)	—	—	—	—	NA	0.14 (J)
0333-96-0146	33-01601	0.0–0.5	FILL	—	NA	—	NA	NA	0.12 (J)	0.1 (J)	—	—	—	—	—	—	NA	0.13 (J)
0333-96-0147	33-01602	0.0–0.5	FILL	—	NA	—	NA	NA	0.2 (J)	0.2 (J)	—	0.11 (J)	—	—	—	—	NA	0.23 (J)

Table 6.16-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Butylbenzylphthalate	Carbazole	Chrysene
Construction Worker SSL[a]				**15,100**	**242,000**	**75,300**	**4.91**	**85.3**	**240**	**15.0**	**240**	**7530[b]**	**2310**	**1,080,000[c]**	**5380**	**99,000[c]**	**85[c,d]**	**23,100**
Industrial SSL[a]				**50,500**	**960,000**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**3,300,000[e]**	**1830**	**12,000**	**1200[d,e]**	**3230**
Residential SSL[a]				**3480**	**66,300**	**17,400**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**250,000[e]**	**380**	**2900**	**78[d,e]**	**153**
0333-96-0149	33-01604	0.0–0.5	FILL	NA	NA	NA	0.12	0.13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190052	33-01604	0.0–1.0	FILL	—	—	—	0.008 (J)	0.00886 (J)	—	—	—	—	—	—	—	—	—	—
RE33-20-190077	33-01604	2.0–3.0	FILL	0.296 (J)	—	0.438	0.00487	0.00458	0.813	0.861	0.913	0.565	0.338 (J)	—	—	—	0.21 (J)	0.737
0333-96-0151	33-01606	0.0–0.5	FILL	NA	NA	NA	0.083	0.099	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190053	33-01606	0.0–1.0	FILL	—	—	—	0.186	0.0968	—	—	—	—	—	—	—	—	—	—
RE33-20-190078	33-01606	2.0–3.0	FILL	—	—	—	0.00185 (J)	—	0.0145 (J)	0.0133 (J)	—	—	—	—	—	—	—	—
RE33-20-190103	33-01606	4.0–5.0	FILL	—	—	—	0.00208 (J)	0.00168 (J)	0.046	0.0497	0.0521	0.0257 (J)	0.0224 (J)	—	—	—	—	0.0464
0333-96-0152	33-01607	0.0–0.5	FILL	NA	NA	NA	0.18	0.29	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190054	33-01607	0.0–1.0	FILL	—	0.00325 (J)	—	0.668	0.208	—	—	—	—	—	—	—	—	—	—
RE33-20-190079	33-01607	2.0–3.0	FILL	—	0.0209	—	0.0486	0.0171	0.0226 (J)	0.0254 (J)	0.0205 (J)	—	0.0129 (J)	—	—	—	—	0.0197 (J)
RE33-20-190104	33-01607	4.0–5.0	FILL	—	0.00593 (J)	—	0.0832	0.0155	—	—	—	—	—	—	—	—	—	—
RE33-20-190080	33-01612	2.0–3.0	QBT3	—	—	—	0.0057	0.0133	0.076	0.0795	0.103	0.0389 (J)	0.0415 (J)	—	0.0212 (J)	—	—	0.0804
RE33-20-190105	33-01612	4.0–5.0	QBT3	—	0.0583 (J)	—	0.0121	0.027	0.053	0.0652	0.0704	0.0287 (J)	0.0296 (J)	—	—	—	—	0.0622
0333-96-0159	33-01614	0.0–0.5	SOIL	NA	NA	NA	1.4	0.87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190056	33-01614	0.0–1.0	FILL	0.233	—	0.373	1.56	0.644	1.12	1.01	1.21	0.448	0.508	—	0.404	—	0.3	1.09
RE33-20-190081	33-01614	2.0–3.0	FILL	—	—	0.0164 (J)	0.118	0.0526	0.064	0.0756	0.0705	0.052	0.0291 (J)	—	—	—	—	0.0651
RE33-20-190106	33-01614	4.0–5.0	FILL	—	—	—	0.155	0.0631	0.022 (J)	0.0238 (J)	—	—	—	—	—	—	—	0.0177 (J)
0333-96-0160	33-01615	0.0–0.5	FILL	NA	NA	NA	0.85	0.92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190057	33-01615	0.0–1.0	FILL	0.0334 (J)	—	0.0443	0.952	0.501	0.152	0.167	0.191	0.0949	0.0856	—	—	—	0.0315 (J)	0.16
RE33-20-190082	33-01615	2.0–3.0	FILL	0.0185 (J)	—	0.029 (J)	0.0295	0.0164	0.0838	0.0971	0.0947	0.0587	0.0412	—	—	—	0.0171 (J)	0.0835
RE33-20-190107	33-01615	4.0–5.0	FILL	0.0214 (J)	—	0.0235 (J)	0.0631	0.0261	0.0582	0.0674	0.067	0.046	0.0249 (J)	—	—	—	0.0126 (J)	0.0568
0333-96-0161	33-01616	0.0–0.5	SOIL	NA	NA	NA	—	3.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190058	33-01616	0.0–1.0	SOIL	0.444	—	0.603	0.146	0.285	1.63	1.97	1.01	1.41	0.863	—	0.37	—	0.447	2.15
RE33-20-190083	33-01616	2.0–3.0	QBT2	—	0.00302 (J)	—	0.00371	0.00707	—	—	—	—	—	—	—	—	—	—

Table 6.16-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Acenaphthene	Acetone	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Butylbenzylphthalate	Carbazole	Chrysene
Construction Worker SSL[a]				**15,100**	**242,000**	**75,300**	**4.91**	**85.3**	**240**	**15.0**	**240**	**7530[b]**	**2310**	**1,080,000[c]**	**5380**	**99,000[c]**	**85[c,d]**	**23,100**
Industrial SSL[a]				**50,500**	**960,000**	**253,000**	**11**	**11.1**	**32.3**	**23.6**	**32.3**	**25,300[b]**	**323**	**3,300,000[e]**	**1830**	**12,000**	**1200[d,e]**	**3230**
Residential SSL[a]				**3480**	**66,300**	**17,400**	**1.14**	**2.43**	**1.53**	**1.12**	**1.53**	**1740[b]**	**15.3**	**250,000[e]**	**380**	**2900**	**78[d,e]**	**153**
RE33-20-190108	33-01616	4.0–5.0	QBT2	—	0.00347 (J)	—	0.00176 (J)	0.00323 (J)	0.0224 (J)	—	0.0129 (J)	—	—	—	—	—	—	0.016 (J)
RE33-20-190109	33-60616	0.0–1.0	SOIL	—	—	—	0.00339 (J)	0.00645	0.0221 (J)	0.0245 (J)	0.0394 (J)	—	—	—	0.0164 (J)	—	—	0.0207 (J)
RE33-20-190114	33-60616	2.0–3.0	QBT3	—	—	—	0.00254 (J)	0.0017 (J)	—	—	—	—	—	—	—	—	—	—
RE33-20-190110	33-60617	0.0–1.0	QBT3	—	0.00219 (J)	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 6.16-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Di-n-butylphthalate	Dibenz(a,h)anthracene	Dibenzofuran	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylnaphthalene[1-]	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Toluene	Trichloroethene
Construction Worker SSL[a]				**26,900**	**24**	**85[c]**	**10,000**	**10,000**	**240**	**2740[h]**	**6060**	**1000**	**159**	**7530**	**7530**	**14,000**	**6.90**
Industrial SSL[a]				**91,600**	**3.23**	**1200[e]**	**33,700**	**33,700**	**32.3**	**14,200[h]**	**813**	**3370**	**241**	**25,300**	**25,300**	**61,300**	**36.5**
Residential SSL[a]				**6160**	**0.153**	**78[e]**	**2320**	**2320**	**1.53**	**2360[h]**	**172**	**232**	**49.7**	**1740**	**1740**	**5230**	**6.77**
RE33-20-190059	33-01102	2.0–3.0	FILL	—	0.0739	—	0.853	0.192	0.324	—	0.0735	0.0852	0.25	1.04	1.02	—	—
RE33-20-190084	33-01102	4.0–5.0	FILL	—	—	—	0.182	—	0.0404 (J)	—	—	—	0.0169 (J)	0.0796	0.124	—	—
RE33-20-190035	33-01104	0.0–1.0	FILL	—	—	—	0.135 (J)	—	—	—	—	—	—	—	0.121 (J)	—	—
RE33-20-190060	33-01104	2.0–3.0	FILL	—	—	—	0.0258 (J)	—	0.015 (J)	—	—	—	—	0.0237 (J)	0.0375 (J)	—	—
RE33-20-190085	33-01104	4.0–5.0	FILL	—	—	—	0.028 (J)	—	—	—	—	—	—	0.0194 (J)	0.0214 (J)	—	—
RE33-20-190036	33-01105	0.0–1.0	SOIL	—	—	—	0.236	0.0155 (J)	0.115	—	—	—	—	0.171	0.38	—	—
RE33-20-190061	33-01105	2.0–3.0	SOIL	—	—	—	0.115	0.0154 (J)	0.0604	—	—	—	0.014 (J)	0.104	0.17	—	—
RE33-20-190086	33-01105	4.0–5.0	SOIL	—	—	—	0.191	—	—	—	—	—	0.000393 (J-)	0.208	0.318	—	—
RE33-20-190062	33-01106	2.0–3.0	QBT3	0.0167 (J)	—	—	0.275	0.0171 (J)	0.167	—	—	—	—	0.205	0.503	—	—
RE33-20-190087	33-01106	4.0–5.0	QBT2	—	—	—	0.0724	—	0.0444	—	—	—	—	0.0444	0.127	—	—
RE33-20-190063	33-01107	2.0–3.0	QBT3	—	—	—	0.0274 (J)	—	—	—	—	—	—	0.0153 (J)	0.0318 (J)	—	—
RE33-20-190088	33-01107	4.0–5.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190039	33-01109	0.0–0.7	SOIL	—	0.0295 (J)	—	0.441	0.0368 (J)	0.104	—	—	—	0.0266 (J)	0.307	0.388	—	—
RE33-20-190040	33-01113	0.0–1.0	SED	—	—	—	0.117	—	0.0516	—	—	—	—	0.0769	0.127	0.000405 (J)	—
RE33-20-190065	33-01113	2.0–3.0	QBT2	—	—	—	0.0703	—	0.0295 (J)	—	—	—	—	0.048	0.0767	—	—
RE33-20-190066	33-01114	2.0–3.0	QBT3	—	—	—	0.131	0.013 (J)	0.0422	—	—	—	—	0.0917	0.123	—	—
RE33-20-190091	33-01114	4.0–5.0	QBT3	—	0.0191 (J)	—	0.273	0.0348 (J)	0.0806	—	—	—	0.0126 (J)	0.271	0.321	—	—
RE33-20-190067	33-01116	2.0–3.0	SOIL	—	—	—	—	—	—	0.00259	—	—	—	—	—	0.000549 (J)	—
RE33-20-190092	33-01116	4.0–5.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190043	33-01120	0.0–1.0	FILL	—	—	—	0.73	—	0.143 (J)	—	—	—	—	0.467	0.693	—	—
RE33-20-190044	33-01128	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190069	33-01128	2.0–2.8	FILL	—	—	—	0.36	0.0637 (J)	0.0618 (J)	—	—	—	0.146 (J)	0.363	0.35	—	—
RE33-20-190094	33-01128	4.0–5.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190045	33-01130	0.0–1.0	SOIL	—	—	—	0.0664 (J)	—	—	—	—	—	—	—	0.0804 (J)	—	—

Table 6.16-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Di-n-butylphthalate	Dibenz(a,h)anthracene	Dibenzofuran	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylnaphthalene[1-]	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Toluene	Trichloroethene
Construction Worker SSL[a]				**26,900**	**24**	**85[c]**	**10,000**	**10,000**	**240**	**2740[h]**	**6060**	**1000**	**159**	**7530**	**7530**	**14,000**	**6.90**
Industrial SSL[a]				**91,600**	**3.23**	**1200[e]**	**33,700**	**33,700**	**32.3**	**14,200[h]**	**813**	**3370**	**241**	**25,300**	**25,300**	**61,300**	**36.5**
Residential SSL[a]				**6160**	**0.153**	**78[e]**	**2320**	**2320**	**1.53**	**2360[h]**	**172**	**232**	**49.7**	**1740**	**1740**	**5230**	**6.77**
RE33-20-190070	33-01130	2.0–3.0	FILL	—	—	—	0.0524	—	—	—	—	—	—	0.0243 (J)	0.0625	—	—
RE33-20-190095	33-01130	4.0–5.0	FILL	—	0.0133 (J-)	—	0.124 (J-)	—	0.0472 (J-)	—	—	—	—	0.0698 (J-)	0.127 (J-)	—	—
RE33-20-190072	33-01145	2.0–3.0	QBT3	—	—	—	—	—	—	0.006	—	—	—	—	—	0.00035 (J)	—
RE33-20-190097	33-01145	4.0–5.0	QBT3	—	—	—	—	—	—	0.000833 (J)	—	—	—	—	—	—	—
RE33-20-190048	33-01146	0.0–1.0	SOIL	—	—	—	—	—	—	—	—	—	—	—	0.0199 (J)	—	—
RE33-20-190049	33-01152	0.0–1.0	SOIL	—	—	—	0.0122 (J)	—	—	—	—	—	—	—	0.0157 (J)	—	—
RE33-20-190099	33-01152	4.0–5.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190075	33-01156	2.0–3.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190100	33-01156	4.0–5.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
0333-96-0130	33-01585	0.0–0.5	FILL	—	—	—	1.8	0.088 (J)	0.28 (J)	NA	NA	0.049 (J)	0.062 (J)	1.6	1.2	NA	NA
0333-96-0131	33-01586	0.0–0.5	FILL	—	—	—	0.59	—	0.1 (J)	NA	NA	—	—	0.46	0.72	NA	NA
0333-96-0132	33-01587	0.0–0.5	FILL	—	—	—	0.051 (J)	—	—	NA	NA	—	—	—	0.48	NA	NA
0333-96-0133	33-01588	0.0–0.5	FILL	0.086 (J)	—	0.14 (J)	3.5	0.43 (J)	0.81 (J)	NA	NA	0.12 (J)	0.24 (J)	3.7	3.3	NA	NA
0333-96-0134	33-01589	0.0–0.5	FILL	0.26 (J)	—	—	0.7 (J)	—	0.1 (J)	NA	NA	—	—	0.54 (J)	0.99 (J)	NA	NA
0333-96-0135	33-01590	0.0–0.5	FILL	—	—	—	0.072 (J)	—	—	NA	NA	—	—	—	0.48	NA	NA
0333-96-0136	33-01591	0.0–0.5	FILL	—	—	—	0.32 (J)	—	0.063 (J)	NA	NA	—	—	0.22 (J)	0.8 (J)	NA	NA
0333-96-0137	33-01592	0.0–0.5	FILL	—	—	—	—	—	—	NA	NA	—	—	—	0.42 (J)	NA	NA
0333-96-0138	33-01593	0.0–0.5	SED	—	0.18 (J)	0.046 (J)	2.6	0.24 (J)	0.6	NA	NA	—	0.33 (J)	2.1	2.1	NA	NA
0333-96-0139	33-01594	0.0–0.5	SED	—	—	—	0.042 (J)	—	0.21 (J)	NA	NA	—	—	—	0.15 (J)	NA	NA
0333-96-0140	33-01595	0.0–0.5	FILL	—	0.33 (J)	0.43	6.4	0.94	1	NA	NA	0.15 (J)	0.51	7.1	5.1	NA	NA
0333-96-0141	33-01596	0.0–0.5	FILL	—	—	—	1.4	—	0.37	NA	NA	—	—	1	1.1	NA	NA
0333-96-0142	33-01597	0.0–0.5	FILL	—	—	—	—	—	—	NA	NA	—	—	—	—	NA	NA
0333-96-0143	33-01598	0.0–0.5	FILL	—	—	—	0.96	—	0.34	NA	NA	—	—	0.79	0.81	NA	NA
0333-96-0145	33-01600	0.0–0.5	FILL	0.079 (J)	—	—	0.17 (J)	—	0.22 (J)	NA	NA	—	—	0.13 (J)	0.24 (J)	NA	NA
0333-96-0146	33-01601	0.0–0.5	FILL	—	—	—	0.13 (J)	—	0.21 (J)	NA	NA	—	—	—	0.2 (J)	NA	NA
0333-96-0147	33-01602	0.0–0.5	FILL	0.034 (J)	—	—	0.4	—	0.23 (J)	NA	NA	—	—	0.14 (J)	0.38	NA	NA

Table 6.16-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Di-n-butylphthalate	Dibenz(a,h)anthracene	Dibenzofuran	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylnaphthalene[1-]	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Toluene	Trichloroethene
Construction Worker SSL[a]				**26,900**	**24**	**85[c]**	**10,000**	**10,000**	**240**	**2740[h]**	**6060**	**1000**	**159**	**7530**	**7530**	**14,000**	**6.90**
Industrial SSL[a]				**91,600**	**3.23**	**1200[e]**	**33,700**	**33,700**	**32.3**	**14,200[h]**	**813**	**3370**	**241**	**25,300**	**25,300**	**61,300**	**36.5**
Residential SSL[a]				**6160**	**0.153**	**78[e]**	**2320**	**2320**	**1.53**	**2360[h]**	**172**	**232**	**49.7**	**1740**	**1740**	**5230**	**6.77**
0333-96-0149	33-01604	0.0–0.5	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190052	33-01604	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190077	33-01604	2.0–3.0	FILL	—	0.162 (J)	—	1.72	0.289 (J)	0.582	—	0.114 (J)	0.114 (J)	0.289 (J)	1.66	1.64	—	—
0333-96-0151	33-01606	0.0–0.5	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190053	33-01606	0.0–1.0	FILL	—	—	—	0.26 (J)	—	—	—	—	—	—	—	—	—	—
RE33-20-190078	33-01606	2.0–3.0	FILL	—	—	—	0.0179 (J)	—	—	—	—	—	—	—	0.0162 (J)	—	—
RE33-20-190103	33-01606	4.0–5.0	FILL	—	—	—	0.0778	—	0.0289 (J)	—	—	—	—	0.0497	0.0705	—	0.0065
0333-96-0152	33-01607	0.0–0.5	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190054	33-01607	0.0–1.0	FILL	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190079	33-01607	2.0–3.0	FILL	—	—	—	0.035 (J)	—	—	—	—	—	—	0.0282 (J)	0.0362 (J)	—	—
RE33-20-190104	33-01607	4.0–5.0	FILL	—	—	—	0.0148 (J)	—	—	—	—	—	—	—	0.0123 (J)	—	—
RE33-20-190080	33-01612	2.0–3.0	QBT3	—	—	—	0.101	—	0.0429 (J)	—	—	—	—	0.0804	0.164	—	—
RE33-20-190105	33-01612	4.0–5.0	QBT3	—	—	—	0.07	—	0.0352 (J)	—	—	—	—	0.03 (J)	0.112	—	—
0333-96-0159	33-01614	0.0–0.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190056	33-01614	0.0–1.0	FILL	0.0808 (J)	0.119 (J)	—	2.36	0.171 (J)	0.504	—	—	—	0.0693 (J)	1.5	1.84	—	—
RE33-20-190081	33-01614	2.0–3.0	FILL	—	0.0131 (J)	—	0.12	—	0.0491	—	—	—	—	0.0771	0.115	—	—
RE33-20-190106	33-01614	4.0–5.0	FILL	—	—	—	0.0319 (J)	—	—	—	—	—	—	0.0323 (J)	0.0429	—	—
0333-96-0160	33-01615	0.0–0.5	FILL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190057	33-01615	0.0–1.0	FILL	0.0626	0.0307 (J)	—	0.319	0.035 (J)	0.108	—	—	0.0124 (J)	0.0327 (J)	0.243	0.326	—	—
RE33-20-190082	33-01615	2.0–3.0	FILL	—	0.0157 (J)	—	0.168	0.0238 (J)	0.0636	—	—	—	0.0206 (J)	0.145	0.168	—	—
RE33-20-190107	33-01615	4.0–5.0	FILL	—	—	—	0.119	0.0165 (J)	0.0445	—	—	—	0.0175 (J)	0.101	0.0965	—	—
0333-96-0161	33-01616	0–0.5	SOIL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RE33-20-190058	33-01616	0.0–1.0	SOIL	0.0959 (J)	—	—	3.09	0.423	0.839	—	0.0806 (J)	0.113 (J)	0.309	2.96	4.43	—	—
RE33-20-190083	33-01616	2.0–3.0	QBT2	—	—	—	—	—	—	—	—	—	—	—	0.0196 (J)	—	—

Table 6.16-3 (continued)

Sample ID	Location ID	Depth (ft)	Media	Di-n-butylphthalate	Dibenz(a,h)anthracene	Dibenzofuran	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Isopropyltoluene[4-]	Methylnaphthalene[1-]	Methylnaphthalene[2-]	Naphthalene	Phenanthrene	Pyrene	Toluene	Trichloroethene
Construction Worker SSL[a]				**26,900**	**24**	**85[c]**	**10,000**	**10,000**	**240**	**2740[h]**	**6060**	**1000**	**159**	**7530**	**7530**	**14,000**	**6.90**
Industrial SSL[a]				**91,600**	**3.23**	**1200[e]**	**33,700**	**33,700**	**32.3**	**14,200[h]**	**813**	**3370**	**241**	**25,300**	**25,300**	**61,300**	**36.5**
Residential SSL[a]				**6160**	**0.153**	**78[e]**	**2320**	**2320**	**1.53**	**2360[h]**	**172**	**232**	**49.7**	**1740**	**1740**	**5230**	**6.77**
RE33-20-190108	33-01616	4.0–5.0	QBT2	—	—	—	0.027 (J)	—	—	—	—	—	—	0.0251 (J)	0.0418	—	—
RE33-20-190109	33-60616	0.0–1.0	SOIL	—	—	—	0.0346 (J)	—	—	—	—	—	—	0.0207 (J)	0.0534	—	—
RE33-20-190114	33-60616	2.0–3.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
RE33-20-190110	33-60617	0.0–1.0	QBT3	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.
[a] SSLs from NMED (2019, 700550) unless otherwise noted.
[b] Pyrene used as a surrogate based on structural similarity.
[c] Construction worker SSLs calculated using the equations outlined in NMED (2019, 700550), incorporating toxicity and chemical-specific parameters from EPA regional screening level (RSL) tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).
[d] Dibenzofuran used as a surrogate based on structural similarity.
[e] SSLs from EPA RSL tables (http://www.epa.gov/risk/risk-based-screening-table-generic-tables).
[f] — = Not detected.
[g] NA= Not analyzed.
[h] Isopropylbenzene used as a surrogate based on structural similarity.

Table 6.16-4
Radionuclides Detected or Detected above BVs/FVs at SWMU 33-017

Sample ID	Location ID	Depth (ft)	Media	Plutonium-239/240	Tritium	Uranium-235/236	Uranium-238
Soil Background Value[a]				**0.054**	**na[b]**	**0.2**	**2.29**
Qbt 2,3,4 Background Value[a]				**na**	**na**	**0.09**	**1.93**
Construction Worker SAL[c]				**200**	**1,600,000**	**130**	**470**
Industrial SAL[c]				**1200**	**2,400,000**	**160**	**710**
Residential SAL[c]				**79**	**1700**	**42**	**150**
RE33-20-190042	33-01116	0.0–1.0	SOIL	—[d]	7.54	—	—
RE33-20-190046	33-01135	0.0–1.0	SOIL	0.056 (J)	—	—	—
RE33-20-190071	33-01135	2.0–3.0	QBT3	—	—	0.0954	—
RE33-20-190096	33-01135	4.0–5.0	QBT3	0.0233	—	—	—
RE33-20-190047	33-01145	0.0–1.0	SOIL	—	14.2	—	—
RE33-20-190072	33-01145	2.0–3.0	QBT3	—	—	0.0925	—
RE33-20-190099	33-01152	4.0–5.0	QBT3	—	—	0.126	—
RE33-20-190100	33-01156	4.0–5.0	QBT3	—	—	0.164	—
RE33-20-190076	33-01166	2.0–3.0	QBT3	0.0344	—	—	—
RE33-20-190101	33-01166	4.0–5.0	QBT3	0.0433	—	—	—
RE33-20-190056	33-01614	0.0–1.0	FILL	—	10.8	—	2.59
RE33-20-190058	33-01616	0.0–1.0	SOIL	—	—	—	2.5
RE33-20-190122	33-60619	4.0–5.0	QBT3	0.0362	—	0.104	—
RE33-20-190113	33-60620	0.0–1.0	QBT2	0.0481	—	—	—
RE33-20-190118	33-60620	2.0–3.0	QBT2	—	—	0.0986	—

Note: Results are in pCi/g.

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

[b] na = Not available.

[c] SALs from LANL (2015, 600929).

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

Table 6.17-1
Samples Collected and Analyses Requested at AOC C-33-001

Sample ID	Location ID	Depth (ft)	Media	PCBs
0333-96-2042	33-01748	0.0–0.5	FILL	2393
RE33-20-190414	33-01748	0.0–1.0	FILL	N3B-2020-1002
RE33-20-190415	33-01748	2.0–3.0	QBT3	N3B-2020-1002
RE33-20-190416	33-01748	4.0–5.0	QBT3	N3B-2020-1002
RE33-21-218013	33-01749	0.4–1.4	QBT3	N3B-2021-860
RE33-20-190418	33-01749	2.0–3.0	QBT3	N3B-2020-1027
RE33-20-190419	33-01749	4.0–5.0	QBT3	N3B-2020-1027
0333-96-2045	33-01751	0.0–0.5	SOIL	2393
RE33-20-190420	33-01751	0.0–1.0	FILL	N3B-2020-982
RE33-20-190421	33-01751	2.0–3.0	QBT3	N3B-2020-982
RE33-20-190422	33-01751	4.0–5.0	QBT3	N3B-2020-982
0333-96-2046	33-01752	0.0–0.5	FILL	2393
RE33-20-190423	33-01752	0.0–0.7	FILL	N3B-2020-1027
RE33-20-190424	33-01752	2.0–3.0	QBT3	N3B-2020-1027
RE33-20-190425	33-01752	4.0–5.0	QBT3	N3B-2020-1027
RE33-20-190426	33-60695	0.0–1.0	FILL	N3B-2020-982
RE33-20-190427	33-60695	2.0–3.0	FILL	N3B-2020-982
RE33-20-190428	33-60695	4.0–5.0	QBT3	N3B-2020-982
RE33-20-190429	33-60696	0.0–1.0	FILL	N3B-2020-1002
RE33-20-190430	33-60696	2.0–3.0	FILL	N3B-2020-1002
RE33-20-190431	33-60696	4.0–5.0	QBT3	N3B-2020-1002
RE33-20-190435	33-60700	0.0–0.6	FILL	N3B-2020-1002
RE33-20-190440	33-60700	2.0–3.0	QBT3	N3B-2020-1002
RE33-20-190445	33-60700	4.0–5.0	QBT3	N3B-2020-1027
RE33-21-222597	33-61102	0.0–1.0	QBT3	N3B-2021-1255
RE33-21-222598	33-61102	2.0–3.0	QBT3	N3B-2021-1255
RE33-21-222599	33-61102	4.0–5.0	QBT3	N3B-2021-1255
RE33-21-222600	33-61103	0.0–0.8	FILL	N3B-2021-1255
RE33-21-222601	33-61103	2.0–3.0	QBT3	N3B-2021-1255
RE33-21-222602	33-61103	4.0–5.0	QBT3	N3B-2021-1255
RE33-21-222603	33-61104	0.0–1.0	FILL	N3B-2021-1281

Table 6.17-1 (continued)

Sample ID	Location ID	Depth (ft)	Media	PCBs
RE33-21-222604	33-61104	2.0–3.0	QBT3	N3B-2021-1281
RE33-21-222605	33-61104	4.0–5.0	QBT3	N3B-2021-1281
RE33-21-222606	33-61105	0.0–1.0	FILL	N3B-2021-1281
RE33-21-222607	33-61105	2.0–3.0	QBT3	N3B-2021-1281
RE33-21-222608	33-61105	4.0–5.0	QBT3	N3B-2021-1281

Note: Numbers in analyte columns are request numbers.

Table 6.17-2
Organic Chemicals above BVs at AOC C-33-001

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1254	Aroclor-1260
Construction Worker SSL[a]				**4.91**	**85.3**
Industrial SSL[a]				**11**	**11.1**
Residential SSL[a]				**1.14**	**2.43**
0333-96-2042	33-01748	0.0–0.5	FILL	—[b]	0.15
RE33-20-190414	33-01748	0.0–1.0	FILL	—	0.661
RE33-20-190415	33-01748	2.0–3.0	QBT3	—	0.0218
RE33-20-190416	33-01748	4.0–5.0	QBT3	—	0.016
RE33-21-218013	33-01749	0.4–1.4	QBT3	—	12 (J-)
RE33-20-190418	33-01749	2.0–3.0	QBT3	—	1.88
RE33-20-190419	33-01749	4.0–5.0	QBT3	—	0.786
0333-96-2045	33-01751	0.0–0.5	SOIL	—	3.9
RE33-20-190420	33-01751	0.0–1.0	FILL	—	13.5
RE33-20-190421	33-01751	2.0–3.0	QBT3	—	2.49
RE33-20-190422	33-01751	4.0–5.0	QBT3	—	1.84
0333-96-2046	33-01752	0.0–0.5	FILL	—	6.2
RE33-20-190423	33-01752	0.0–0.7	FILL	—	0.064
RE33-20-190424	33-01752	2.0–3.0	QBT3	—	0.0246
RE33-20-190425	33-01752	4.0–5.0	QBT3	—	0.00137 (J)
RE33-20-190435	33-60700	0.0–0.6	FILL	—	0.00241 (J)
RE33-21-222597	33-61102	0.0–1.0	QBT3	—	3.09

Table 6.17-2 (continued)

Sample ID	Location ID	Depth (ft)	Media	Aroclor-1254	Aroclor-1260
Construction Worker SSL[a]				**4.91**	**85.3**
Industrial SSL[a]				**11**	**11.1**
Residential SSL[a]				**1.14**	**2.43**
RE33-21-222598	33-61102	2.0–3.0	QBT3	—	0.0951
RE33-21-222599	33-61102	4.0–5.0	QBT3	—	0.0459
RE33-21-222600	33-61103	0.0–0.8	FILL	—	233 (J-)
RE33-21-222601	33-61103	2.0–3.0	QBT3	—	39 (J-)
RE33-21-222602	33-61103	4.0–5.0	QBT3	—	2.45
RE33-21-222603	33-61104	0.0–1.0	FILL	—	38.9 (J-)
RE33-21-222604	33-61104	2.0–3.0	QBT3	—	4.02 (J+)
RE33-21-222605	33-61104	4.0–5.0	QBT3	—	0.392
RE33-21-222606	33-61105	0.0–1.0	FILL	—	11.6 (J-)
RE33-21-222607	33-61105	2.0–3.0	QBT3	1.98	3.4
RE33-21-222608	33-61105	4.0–5.0	QBT3	—	2.18

Notes: Results are in mg/kg. Data qualifiers are presented in Appendix A.

[a] SSLs from NMED (2019, 700550) unless otherwise noted.

[b] — = Not detected.

Table 8.1-1
Summary of Investigation Results and Recommendations

SWMU/AOC	Brief Description	Extent Defined or No Further Sampling Warranted?	Potential Unacceptable Risk/Dose?	Recommendation
SWMU 33-001(a)	Disposal Pit (MDA E)	Yes (area outside MDA E fence only)	Not evaluated	Additional extent sampling
SWMU 33-001(b)	Disposal Pit (MDA E)	Yes (area outside MDA E fence only)	Not evaluated	Additional extent sampling
SWMU 33-001(c)	Disposal Pit (MDA E)	Yes (area outside MDA E fence only)	Not evaluated	Additional extent sampling
SWMU 33-001(d)	Disposal Pit (MDA E)	Yes (area outside MDA E fence only)	Not evaluated	Additional extent sampling
SWMU 33-001(e)	Soil Contamination from Underground Chamber and Shaft (MDA E)	Yes (area outside MDA E fence only)	Not evaluated	Additional extent sampling
SWMU 33-004(a)	Septic System	No	Not evaluated	Additional extent sampling
SWMU 33-004(i)	Drainline and Outfall associated with Building 33-39	No	Not evaluated	Soil removal and additional extent sampling
SWMU 33-006(a)	Firing Site	No	Not evaluated	Additional extent sampling
SWMU 33-007(c)	Firing Sites	Yes	Yes (residential)	Corrective action complete with controls
SWMU 33-008(c)	Landfill	No	Not evaluated	Soil removal and additional extent sampling
SWMU 33-010(c)	Surface Disposal Site	No	No	Corrective action complete without controls
SWMU 33-011(a)	Soil Contamination from Former Storage Area	No	Not evaluated	Additional extent sampling
SWMU 33-011(d)	Storage Area	Yes	Yes (residential)	Corrective action complete with controls
SWMU 33-012(a)	Drum Storage Area	No	Not evaluated	Soil removal and additional extent sampling
SWMU 33-017	Operational Release	No	Not evaluated	Additional extent sampling
AOC C-33-001	Former Transformer	No	Not evaluated	Soil removal and additional extent sampling

Appendix A

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

A-1.0 ACRONYMS AND ABBREVIATIONS

%R	percent recovery
%RSD	percent relative standard deviation
ADR	Automated Data Review
AK	acceptable knowledge
ALARA	as low as reasonably achievable
AOC	area of concern
ATSDR	Agency for Toxic Substances and Disease Registry
AUF	area use factor
bgs	below ground surface
B Division	Bioscience Division
BMP	best management practice
BV	background value
CCV	continuing calibration verification
CDC	Centers for Disease Control and Prevention
CFR	Code of Federal Regulations
CMP	corrugated metal pipe
COC	chain of custody
Consent Order	Compliance Order on Consent
CVL	containerized vat leach
COPEC	chemical of potential ecological concern
COPC	chemical of potential concern
cpm	counts per minute
CSM	conceptual site model
D&D	decontamination and decommissioning
DAF	dilution attenuation factor
DGPS	differential global positioning system
DL	detection limit
DOE	Department of Energy (U.S.)
dpm	disintegrations per minute
DRO	diesel range organics
DU	depleted uranium
EcoPRG	ecological preliminary remediation goal
EDD	electronic data deliverable

EDL	estimated detection limit
EIM	Environmental Information Management (database)
EPA	Environmental Protection Agency (U.S.)
EPC	exposure point concentration
EQL	estimated quantitation limit
ER	Environmental Restoration (project)
ESL	ecological screening level
FD	field duplicate
FIMAD	Facility for Information Management, Analysis, and Display
FR	field rinsate
FS	field split
FTB	field trip bank
FV	fallout value
FWHM	full width at half maximum
GC	gas chromatography
GIS	geographic information system
GPS	global positioning system
HE	high explosives
HI	hazard index
HP	Hot Point (site)
HPLC	high-performance liquid chromatography
HQ	hazard quotient
HR	home range
HSDB	Hazardous Substances Data Bank (National Institutes of Health)
HRL	Health Research Laboratory
IA	interim action
ICS	interference check sample
ICV	initial calibration verification
IDW	investigation-derived waste
IM	Interim measure
IS	internal standard
K_d	soil-water partition coefficient
K_{oc}	organic-carbon partition coefficient
K_{ow}	octanol-water partition coefficient
KPA	kinetic phosphorescence analysis

LAL	lower acceptance limit
LAMC	Los Alamos Medical Center
LANL	Los Alamos National Laboratory
LANS	Los Alamos National Security, LLC
LAP	land applied
LCS	laboratory control sample
LLW	low-level waste
LOAEL	lowest observed adverse effect level
Ma	millions of years
MB	method blank
MDA	material disposal area
MDC	minimum detectable concentration
MDL	method detection limit
MLLW	mixed low-level waste
MS	matrix spike
MSD	matrix spike duplicate
MSW	municipal solid waste
N3B	Newport News Nuclear BWXT-Los Alamos, LLC
NFA	no further action
NMED	New Mexico Environment Department
NMSA	New Mexico Statutes Annotated
NOAEL	no-observed-adverse-effect level
NQ	non-qualified
NRAO	National Radio Astronomy Observatory
PAH	polycyclic aromatic hydrocarbon
PAUF	population area use factor
PCB	polychlorinated biphenyl
PID	photoionization detector
PPE	personal protective equipment
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
RCT	radiological control technician
RDX	Royal Demolition Explosive (hexahydro-1,3,5-trinitro-1,3,5-triazine).
RESRAD	Residual Radioactivity computer code

RfD	reference dose
RFI	Resource Conservation and Recovery Act facility investigation
RL	reporting limit
RLWTF	radioactive liquid waste treatment facility
RPD	relative percent difference
RRF	relative response factor
SAA	satellite accumulation area
SAL	screening action level
SCL	sample collection log
SF	slope factor
SGS	segmented gate system
SMO	sample management office
SOP	standard operating procedure
SOW	statement of work
SQL	Structured Query Language
SSL	soil screening level
SVOC	semivolatile organic compound
SWMU	solid waste management unit
TA	technical area
TAL	target analyte list
TCE	trichloroethene
T&E	threatened and endangered
TEF	toxicity equivalence factor
TCB	Tertiary Cerros Basalt
TNT	trinitrotoluene[2,4,6-]
TPH	total petroleum hydrocarbons
TPU	total propagated uncertainty
Triad	Triad National Security, LLC
TRV	toxicity reference value
TSCA	Toxic Substances Control Act
TSDF	treatment, storage, and disposal
UAL	upper acceptance limit
UCL	upper confidence limit
ULR	unassigned land release
UTL	upper tolerance limit

VCA	voluntary corrective action
VCP	vitrified-clay pipe
VISL	vapor-intrusion screening level
VOC	volatile organic compound
WCSF	waste characterization strategy form
WPF	waste profile form
WSWL	western sanitary waste line
XRF	x-ray fluorescence

A-2.0 METRIC CONVERSION TABLE

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

A-3.0 DATA QUALIFIER DEFINITIONS

Data Qualifier	Definition
U	The analyte was analyzed for but not detected.
J	The analyte was positively identified, and the associated numerical value is estimated to be more uncertain than would normally be expected for that analysis.
J+	The analyte was positively identified, and the result is likely to be biased high.
J-	The analyte was positively identified, and the result is likely to be biased low.
UJ	The analyte was not positively identified in the sample, and the associated value is an estimate of the sample-specific detection or quantitation limit.
R	The data are rejected as a result of major problems with quality assurance/quality control (QA/QC) parameters.

Appendix B

Field Methods and Deviations

B-1.0 INTRODUCTION

This appendix summarizes the field methods used during the 2021 investigation of the Chaquehui Canyon Aggregate Area at Los Alamos National Laboratory (LANL or the Laboratory) and presents the deviations from the approved investigation work plan (N3B 2021, 701355; NMED2021, 701546). Table B-1.0-1 presents a summary of the field methods used, and the following sections provide more detailed descriptions of these methods. All activities were conducted in accordance with 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 2021 investigation.

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 Sample Management Office (SMO). Field-screening results for all investigation activities were recorded on sample collection logs (SCLs) provided in Appendix E (on DVD included with this document).

B-3.1 Field-Screening for Organic Vapors

Field screening for organic vapors was conducted using an Ion Science, Ltd, Tiger photoionization detector (PID) ppm volatile organic compound (VOC) detector equipped with an 11.7-electronvolt lamp. Screening was performed in accordance with the manufacturer's specifications. Screening was performed on each sample collected, and screening measurements were recorded on the SCLs, provided in Appendix E (on DVD included with this document).

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 radiological control technician (RCT) conducted radiological screening using an Eberline E-600 with a 380AB probe or ThermoFisher Scientific, Inc., RadEye SX Survey Meter with dual scintillator probe. Screening measurements were recorded on the SCLs and are provided in Appendix E (on DVD included with this document).

B-4.0 FIELD INSTRUMENT CALIBRATION

Instrument calibration and/or function check was completed daily. Several environmental factors affected the instruments' integrity, including air temperature, atmospheric pressure, wind speed, and humidity. Calibration of the PID was conducted by the site-safety officer. Calibration of the Eberline E-600 and RadEye SX is conducted by the Laboratory's Radiation Protection Services (RP-SVS) group on an annual cycle.

B-4.1 Photoionization Detector Calibration

The Ion Science Tiger 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 5% 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 Ion Science Tiger PID met the manufacturer's specifications for standard reference gas calibration.

B-4.2 Eberline E-600 and RadEye SX Calibration and Response Check

Response check of the Eberline E-600 and RadEye SX was conducted by a Newport News Nuclear BWXT-Los Alamos, LLC, (N3B) RCT daily before use to measure levels for radioactivity. All response checks were performed according to approved operating procedures and met the requirements of N3B-P330-2, "Control of Measuring and Test Equipment." Response checks were recorded in daily functional check logs. The Laboratory's RP-SVS group calibrated the instrument using americium-241 and chloride-36 sources for alpha and beta emissions, respectively. Calibration records are maintained by RP-SVS.

B-5.0 SURFACE AND SUBSURFACE SAMPLING

This section summarizes the methods used to collect surface and subsurface samples of soil, fill, tuff, and sediment in accordance with the approved Phase II investigation work plan for Chaquehui Canyon Aggregate Area (N3B 2021, 701355; NMED 2021, 701546).

B-5.1 Surface Sampling Methods

Surface samples were collected within Technical Area 33 using either hand auger or spade-and-scoop methods. Surface samples were collected in accordance with N3B-SOP-ER-2001, "Soil, Tuff, and Sediment Sampling." A hand auger or stainless-steel scoop was used to collect material in approximately 6-in. increments. Samples for VOC analysis were transferred immediately from the sampler to the sample container to minimize the loss of VOCs during the sample-collection process. Containers for VOC samples were filled as completely as possible, leaving no or minimal headspace, and sealed with a Teflon-lined cap. The remaining sample material was placed in a stainless-steel bowl with a stainless-steel scoop, after which it was transferred to sterile sample collection jars or bags. Samples were preserved using coolers with ice packs to maintain the required temperature, in accordance with N3B- SOP-SDM-1100, "Sample Containers, Preservation, and Field Quality Control."

Samples were appropriately labeled, sealed with custody seals, and documented before being transported to the SMO. Samples were managed according to N3B-SOP-SDM-1101, “Sample Control and Field Documentation.”

Sample collection tools were decontaminated (see section B-5.7) immediately before each sample was collected in accordance with N3B-SOP-ER-2002, “Field Decontamination of Equipment.”

B-5.2 Borehole Logging

At all locations, the required sampling depths could be reached by hand augers, and therefore a drill rig with a hollow-stem auger was not used to collect subsurface samples and the boreholes did not require logging.

B-5.3 Subsurface Sampling Methods

Subsurface samples were collected using a stainless-steel hand auger. The samples were collected in accordance with N3B-SOP-ER-2001, “Soil Tuff and Sediment Sampling.”

Samples for VOC analysis were collected immediately to minimize the loss of VOCs during the sample collection process. Containers for VOC samples were filled as completely as possible, leaving no or minimal headspace, and sealed with a Teflon-lined cap. After collection of the VOC samples, the remaining sample material was placed in a stainless-steel bowl and was broken, if necessary, with a decontaminated rock hammer or stainless-steel spoon to fit the material into the sample containers.

A stainless-steel scoop and bowl were used to transfer samples to sterile sample collection jars or bags for transport to the SMO. The sample collection tools were decontaminated immediately before each sample was collected (see section B-5.7) in accordance with a N3B-SOP-ER-2002, “Field Decontamination of Equipment.”

B-5.4 Quality Control Samples

Quality control (QC) samples were collected in accordance with N3B-SOP-SDM-1100, “Sample Containers, Preservation, and Field Quality Control.” The QC samples included field duplicates, field rinsate blanks, and field trip blanks. Field duplicate samples were collected from the same material as a regular investigation sample and submitted for the same analyses. Field duplicate samples were collected at a frequency of at least 1 duplicate sample for every 10 samples at each site.

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 at each site.

Field trip blanks also were collected at a frequency of one per day at the time samples were collected for VOCs. Field trip blanks consisted of containers of certified clean sand opened and kept with the other sample containers during the sampling process. Field trip blanks were collected at a frequency of one per sampling team per day to determine contamination during storage and transport when samples were being collected for VOC analysis. Trip blanks were analyzed for VOCs only.

B-5.5 Sample Documentation and Handling

Field personnel completed a 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 N3B-SOP-SDM-1101, "Sample Control and Field Documentation," and N3B-SOP-SDM-1100, "Sample Container, Preservation, and Field Quality Control." N3B RCTs performed and documented a free-release survey of the exterior of the sample containers 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. The SCLs are provided in Appendix E (on DVD included with this document).

B-5.6 Borehole Abandonment

No boreholes were drilled during the 2021 investigation. However, hand-auger sampling locations deeper than 15-ft below ground surface (bgs) were abandoned in accordance with N3B-SOP-ER-6005, "Monitoring Well and Borehole Abandonment," by filling the boreholes with bentonite chips up to 2.0 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 investigation-derived waste (IDW), as described in Appendix C.

B-5.7 Decontamination of Sampling Equipment

All sampling equipment was decontaminated immediately before each sample was collected to avoid outside contamination and cross-contamination between samples. Decontamination included cleaning the equipment with wire brushes, scrapers, Fantastik, and clean paper towels. To evaluate decontamination activities, field rinsate samples were collected in accordance with N3B-SOP-ER-2002, "Field Decontamination of Equipment" and N3B-SOP-SDM-1100, "Sample Containers, Preservation, and Field Quality Control."

B-5.8 Site Demobilization and Restoration

Before equipment was removed from the site, N3B RCTs performed and documented a free-release survey of equipment. All temporary fencing and staging areas were dismantled and returned to preinvestigation conditions. All excavated and disturbed areas were regraded and stabilized.

B-6.0 SOIL REMEDIATION AND DEBRIS REMOVAL

Contaminated soil was removed from solid waste management units (SWMUs) 33-004(a), 33-004(i), 33-006(a), 33-008(c), 33-010(c), 33-012(a), and 33-017 and area of concern (AOC) C-33-001. Landfill debris was also removed from SWMU 33-008(c).

B-6.1 Target Cleanup Levels

Target cleanup levels were based on current and reasonably foreseeable future land use. Cleanup was conducted at SWMUs and AOCs with unacceptable human health and/or ecological risk.

B-6.2 Excavation and Debris Removal

A backhoe, loader, 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 stabilized with base course as described above in section B-5.8.

B-6.3 Decontamination of Excavation Equipment

Decontamination activities were performed in accordance with N3B-SOP-ER-2002, "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. Additional decontamination and swipe sampling was conducted, if necessary, before equipment was removed from the site.

B-7.0 GEODETIC SURVEYING

Geodetic surveys of sampling locations, excavation boundaries, landfill boundaries, and locations of debris were performed by a licensed State of New Mexico surveyor. Horizontal accuracy of the global positioning system unit 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 sample location 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 the requirements of N3B-P409-0, "N3B Waste Management." This procedure incorporates all applicable U.S. Environmental Protection Agency (EPA) and New Mexico Environment Department (NMED) regulations, U.S. Department of Energy (DOE) orders, and Laboratory implementation requirements. IDW was also managed in accordance with the approved WCSF. Details of IDW management for the Phase II investigation are presented in Appendix C.

B-9.0 DEVIATIONS FROM WORK PLAN

Deviations to sampling and remediation activities proposed in the Phase II investigation work plan (N3B 2021, 701355) are discussed below.

SWMUs 33-001(a–e)/Material Disposal Area E: The radiological walkover and geophysical surveys proposed in the Phase II investigation work plan (N3B 2021, 701355) were not completed because access inside the Material Disposal Area (MDA) E fenced area was not granted by Triad National Security, LLC, until July 8, 2021 (Attachment B-1). The proposed surface and subsurface sampling at nine locations inside the MDA E fenced area were also not completed because of access restrictions. The accessible surface and shallow subsurface sample locations outside the MDA E fenced area were collected and the results are presented in sections 6.2.4, 6.3.4, 6.4.4, 6.5.4, and 6.6.4 of the investigation report.

SWMU 33-004(a): Corrective actions to address potential unacceptable ecological risk and human health risk were performed by removing soil with elevated polycyclic aromatic hydrocarbon (PAH) concentrations at location 33-60601. Additional bounding confirmation samples from four 5-ft step-out locations were collected around the excavation areas centered on locations 33-60596 and 33-60597. Additional samples from 5-ft and 10-ft step-out locations were collected around the excavation area centered on location 33-60601. The results from the step-out sampling around location 33-60601 indicate the extent of PAHs is not defined and the area requiring remediation needs to be increased. The excavation area was not expanded as proposed in the Phase II investigation work plan (N3B 2021, 701355) because additional extent sampling to the south and east of the filter beds is required to define the extent of PAH contamination.

SWMU 33-004(i): Corrective actions to address potential unacceptable human health risks were performed by removing soil with elevated polychlorinated biphenyl (PCB) concentrations at location 33-01058. Bounding confirmation samples were collected around location 33-01058. The step-out sampling results indicate the extent of PCBs around location 33-01058 is not defined and the area requiring remediation needs to be increased. The excavation area was not expanded as proposed in the Phase II investigation work plan (N3B 2021, 701355) because additional sampling is required to define the extent of PCB contamination. DOE will notify EPA of its intent to conduct self-implementing on-site cleanup and disposal of PCB remediation waste, as described in 40 Code of Federal Regulations (CFR) Part 761.61(a) in accordance with the Toxic Substances Control Act (TSCA), for self-implementation actions. The excavation area will be expanded after site characterization is complete, the area requiring excavation is defined, and EPA approvals are obtained.

SWMU 33-006(a): Soil with elevated copper concentrations was removed at locations 33-60416, 33-60417, and 33-60423. Additional bounding confirmation samples from four 5-ft step-out locations were collected around the excavation area centered on location 33-60423. The step-out sampling results indicate the extent of copper is not defined and the area requiring remediation needs to be increased. The excavation area was not expanded as proposed in the Phase II investigation work plan (N3B 2021, 701355) because the extent of contamination is not defined. Additional sampling is required to define the extent of copper contamination at this site. The excavation area will be expanded after the extent of copper contamination is defined.

SWMU 33-007(c): Two samples from 2–3 ft and 4–5 ft bgs were not collected from location 33-60452 because a buried concrete slab was encountered at approximately 1.1 ft bgs and refusal was met. Multiple step-out sample locations were attempted but concrete refusal was encountered at each location.

SWMU 33-008(c): Corrective actions to address potential unacceptable human health and ecological risk was performed by removing soil with elevated chromium, copper, lead, mercury, zinc, and PAH concentrations at locations 33-01671, 33-01672, 33-01673, 33-01674, 33-01680, 33-01681, 33-01682, 33-01684, and 33-01685. Buried debris, including asbestos, was encountered at SMWU 33-008(c) and the excavation area was expanded to the west, north, and south until all debris was removed. The bounding confirmation step-out sampling results indicate the extent of copper and many other chemicals of potential concern are not defined. The excavation area was not expanded as proposed in the Phase II investigation work plan (N3B 2021, 701355) because the extent of contamination is not defined. Additional sampling is required to define the extent of contamination at this site. The excavation area will be expanded after site characterization is complete and the areas requiring excavation are defined.

SWMU 33-012(a): Corrective actions to address potential unacceptable human health and ecological risk were performed by removing soil with elevated PAH concentrations at locations 33-60659 and 33-60661. Samples from one additional location (location 33-60995) were collected at SWMU 33-012(a). The bounding confirmation step-out sampling results indicate the extent of PCBs and PAHs are not defined at

SWMU 33-012(a). The excavation areas were not expanded as proposed in the Phase II investigation work plan (N3B 2021, 701355) because extent of contamination is not defined. Additional samples are required to define the extent of PCB and PAH contamination at this site. If sample results from these investigations determine PCB cleanup is necessary and the requirements set forth per 40 CFR 761.61 apply, then DOE will notify EPA of its intent to conduct self-implementing on-site cleanup and disposal of PCB remediation waste, as described in 40 CFR Part 761.61(a) prepared in accordance with the TSCA, for self-implementation actions. The excavation areas will be expanded after the extent of PCB and PAH contamination is defined and EPA approvals are obtained, as applicable.

SWMU 33-017: Corrective actions to address potential unacceptable ecological risk were performed by removing soil with elevated copper, lead, mercury, zinc, and selenium concentrations at locations 33-01114, 33-01106, 33-01107, and 33-01612. The Phase II investigation work plan (N3B 2021, 701355) proposed excavation to 3 ft bgs at location 33-01114; however, sample RE33-20-190066 collected from 2–3 ft bgs has decreasing concentrations of copper and lead and is a vertical bounding sample for the remediation at this location (N3B 2021, 701355). The excavation around location 33-01114 was excavated to 2 ft bgs to remove elevated copper and lead concentrations.

AOC C-33-001: Corrective actions to address potential unacceptable human health risk were performed by removing soil with elevated Aroclor-1260 concentrations at location 33-01749. The Phase II investigation work plan proposed excavation to 2 ft bgs at location 33-01749 (N3B 2021, 701355). The area around location 33-01749 was excavated to the top of bedrock (0.4 ft bgs) to prevent release and mitigate migration at this work site of a high concentration (798 mg/kg) of Aroclor-1260 at 0–0.4 ft bgs; significantly higher than the next highest concentration at this site (11 mg/kg at 0–0.5 ft bgs). A 2-ft × 2-ft area was excavated to tuff (approximately 0.4 ft bgs) and paused pending notification and approval by EPA of a PCB remediation. The step-out sampling results indicate the extent of PCB contamination around location 33-01749 is not defined. The excavation area will be expanded after additional samples are collected, the extent of PCBs is defined, and EPA notifications are complete. DOE will notify EPA of its intent to conduct self-implementing on-site cleanup and disposal of PCB remediation waste, as described in 40 CFR Part 761.61(a) in accordance with the TSCA, for self-implementation actions.

B-10.0 REFERENCES

The following reference list includes documents cited in this appendix. Parenthetical information following each reference provides the author(s), publication date, and ERID, ESHID, or EMID. This information is also included in text citations. ERIDs were assigned by the Laboratory's Associate Directorate for Environmental Management (IDs through 599999); ESHIDs were assigned by the Laboratory's Associate Directorate for Environment, Safety, and Health (IDs 600000 through 699999); and EMIDs are assigned by N3B (IDs 700000 and above). IDs are used to locate documents in N3B's Records Management System and in the Master Reference Set. The NMED Hazardous Waste Bureau and N3B maintain copies of the Master Reference Set. The set ensures that NMED has the references to review documents. The set is updated when new references are cited in documents.

N3B (Newport News Nuclear BWXT-Los Alamos, LLC), March 2021. "Phase II Investigation Work Plan for Chaquehui Canyon Aggregate Area," Newport News Nuclear BWXT-Los Alamos, LLC, document EM2021-0038, Los Alamos, New Mexico. (N3B 2021, 701355)

NMED (New Mexico Environment Department), July 26, 2021. "Approval, Phase II Investigation Work Plan for Chaquehui Canyon Aggregate Area," New Mexico Environment Department letter to A. Duran (EM-LA) from R. Maestas (NMED-HWB), Santa Fe, New Mexico. (NMED 2021, 701546)

Table B-1.0-1
Summary of Field Investigation Methods

Method	Summary
Field-Screening and Instrument Calibration	Field-screening for radioactivity and volatile organic compounds (VOCs) was performed on each sample collected. Field-screening for high explosives was performed at one solid waste management unit where firing-site debris was observed and subsequently removed. The response check and calibration of instruments used to screen for radioactivity and VOCs were conducted by a qualified representative. All response checks and calibrations were performed daily according to the manufacturers' specifications and requirements with approved operating procedures and recorded on the appropriate forms.
Spade-and-Scoop Collection of Soil Samples	This method was used to collect shallow (i.e., approximately 0-1.0 ft) soil or sediment samples. The spade-and-scoop method involved digging a hole to the desired depth, as prescribed in the approved investigation work plan (N3B 2021, 701355; NMED 2021, 701546), and collecting a discrete grab sample. Samples for VOC analysis were transferred immediately into sample containers. Containers for VOC analysis were filled as completely as possible and sealed with Teflon-lined caps. Remaining sample material was placed in a clean stainless-steel bowl for transfer to 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), creating a vertical hole that can be advanced to the desired sample depth. When the desired depth was reached, the auger was decontaminated before advancing the hole through the sampling depth. Samples for VOC analysis were transferred immediately to sample containers. Containers for VOC analysis were filled as completely as possible and sealed with Teflon-lined caps. The remaining sample material was transferred from the auger bucket to a stainless-steel sampling bowl before the various required sample containers were filled.
Handling, Packaging, and Shipping of Samples	Field team members sealed and labeled samples before packing to ensure the sample and the transport containers were free of external contamination. They 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 Sample Management Office (SMO), which 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 sample collection logs (SCLs), chain of custody (COC) forms, and sample container labels. SCLs were completed at the time of sample collection, and the logs were signed by the sampler and a reviewer who verified the logs for completeness and accuracy. Corresponding labels were initialed and applied to each sample container, and custody seals were placed around each sample container. COC forms were completed and signed to verify that the samples had not been left unattended.
Field Quality Control Samples	Field quality control samples were collected as follows: Field Duplicates – collected at a frequency of 10% at the same time as a regular sample and submitted for the same analyses. Equipment Rinsate Blank – collected at a frequency of 10% by rinsing sampling equipment with deionized water, which was then collected in a sample container and submitted for laboratory analysis. Trip Blanks – required for all field events that included the collection of samples for VOC analysis. Trip-blank containers of certified clean sand were unopened and kept with the other sample containers during the sampling process.
Field Decontamination of Sampling Equipment	Dry decontamination was used to minimize the generation of liquid waste. Dry decontamination consisted of using a wire brush or other tool to remove soil or other material adhering to the sampling equipment, followed by use of a commercial cleaning agent (nonacid, waxless cleaners) and paper wipes.

Table B-1.0-1 (continued)

Method	Summary
Containers and Preservation of Samples	Specific requirements/processes for sample containers, preservation techniques, and holding times are based on U.S. Environmental Protection Agency 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, or polyethylene). All samples were preserved by placement in insulated containers with ice to maintain a temperature of 4ºC.
Excavation and Debris Removal	Excavation and trenching utilized heavy earth-moving equipment, which direct-loaded waste into the designated IP-1 containers. Size reduction of debris was achieved by using the thumb and grapple attachments for the excavator or track hoe. A cultural site was identified near the debris piles, so waste characterization sampling, debris removal, and size reduction were completed using hand methods at this site. Geophysical and radiological walkover surveys were conducted to define the extent of a landfill before excavation. During active operations a designated competent person evaluated the stability of excavations at the beginning of each shift as well as after rain events. Storm water pollution prevention controls were installed before site/soil disturbance and were maintained during fieldwork execution.
Backfilling and Site Restoration	Each excavation was backfilled with clean fill material and stabilized with base course to restore the area to the original grade.
Management of Environmental Remediation Program Waste, Waste Characterization	Investigation-derived waste (IDW) was managed, characterized, and stored in accordance with an approved waste characterization strategy form that documents site history, field activities, and characterization approach for each waste stream managed. During the investigation, waste characterization complied with on- or off-site waste acceptance criteria. All stored IDW was marked with appropriate signage and labels. Drummed IDW was stored on pallets to prevent deterioration of containers. A waste storage area was established before waste was generated. Waste storage areas were located in controlled areas of the Laboratory and were monitored as needed to prevent inadvertent addition to or management of wastes by unauthorized personnel. Each container of waste generated was individually labeled with waste classification, item identification number, and radioactivity (if applicable) immediately following containerization. All waste was segregated by classification and compatibility to prevent cross-contamination. Management of IDW is described in Appendix C.
Coordinating and Evaluating Geodetic Surveys	Geodetic surveys focused on obtaining survey data of acceptable quality to use during project investigations. Geodetic surveys were performed by a Licensed State of New Mexico Surveyor. 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.

Table B-1.0-2
Standard Operating Procedures Used for the Investigation Activities at Chaquehui Canyon Aggregate Area

Procedure Number	Procedure Title
N3B-P409-0	N3B Waste Management
N3B-SOP-ER-2001	Soil, Tuff, and Sediment Sampling
N3B-SOP-ER-2002	Field Decontamination of Equipment
N3B-SOP-ER-6005	Monitoring Well and Borehole Abandonment
N3B-SOP-SDM-1100	Sample Containers, Preservation, and Field Quality Control
N3B-SOP-SDM-1101	Sample Control and Field Documentation

Attachment B-1

Access Approval for Material Disposal Area E

From:	Brenda Bowlby
To:	Brenda Bowlby
Subject:	Feb 26 Security Review Notification MDA E Inside Fenced Area
Date:	Friday, July 9, 2021 8:55:20 AM

From: Douglass, Craig R <craigd@lanl.gov>
Sent: Friday, February 26, 2021 1:30 PM
To: Lauren Marble <Lauren.Marble@EM-LA.DOE.GOV>
Cc: Pattie C. Baucom <Pattie.Baucom@EM-LA.DOE.GOV>; LANL Interface <interface@LANL.GOV>; N3B Interface <N3BInterface@EM-LA.DOE.GOV>; Peter Stilwell <peter.stilwell@em-la.doe.gov>
Subject: Re: BHs at South Ancho

Paul said he would get started, but he will have to obtain the appropriate clearances/sigma's and a Red Network account for TA-33 before he can even get into the files so it is going to be around 6 months before we know anything.

From: Lauren Marble <Lauren.Marble@EM-LA.DOE.GOV>
Sent: Friday, February 26, 2021 1:00:51 PM
To: Douglass, Craig R
Cc: Baucom, Pattie Claudean; LANL Interface; N3B Interface; Peter Stilwell
Subject: [EXTERNAL] FW: BHs at South Ancho

Craig,
What do we need to do to initiate this research into how we might access MDA-E for sampling?

Lauren

From: Pattie C. Baucom
Sent: Friday, February 26, 2021 12:45:20 PM (UTC-07:00) Mountain Time (US & Canada)
To: Lauren Marble
Cc: Peter Stilwell; N3B Interface
Subject: RE: BHs at South Ancho

Hi Lauren,

What is the 6-month process and what needs to happen to get that process started?

Thanks,
Pattie

From: Lauren Marble <Lauren.Marble@EM-LA.DOE.GOV>
Sent: Tuesday, February 23, 2021 9:22 AM
To: Pattie C. Baucom <Pattie.Baucom@EM-LA.DOE.GOV>
Cc: Peter Stilwell <peter.stilwell@em-la.doe.gov>; N3B Interface <N3BInterface@EM-LA.DOE.GOV>
Subject: FW: BHs at South Ancho

Pattie,
Here is the response I got from Triad regarding MDA-E. Let me know if you need anything else from there or if you would like to get together with them to discuss.

Lauren

From: Douglass, Craig R
Sent: Tuesday, February 23, 2021 8:59:43 AM (UTC-07:00) Mountain Time (US & Canada)
To: N3B Interface
Cc: Blumberg, Paul A
Subject: Fw: BHs at South Ancho

Based on a conversation with the TA-33 Facility Operations manager we will have to do some research before we can address entry into the MDA E fenced area. This is expected to take up to 6 months due to the Classified nature of the information being reviewed.

From:	Brenda Bowlby
To:	Brenda Bowlby
Subject:	July 8 Approval to Access MDA E Inside Fence
Date:	Friday, July 9, 2021 8:50:29 AM
Importance:	High

From: Douglass, Craig R
Sent: Thursday, July 8, 2021 9:19:21 AM (UTC-07:00) Mountain Time (US & Canada)
To: Kent Rich; N3B Interface
Subject: Fw: TA33 South Area Inside Fence

Kent,
Based on recent conversations with knowledgeable individuals the STO FOD and TA-33 Programs are now comfortable with granting access to areas inside the fence at MDA E for the purposes of N3B's surveying and surface geophysics to determine the location of the pits, followed by sampling to a depth NO DEEPER THAN 18 inches. The Operations Manager, Paul Blumberg, would like to physically walk the area with N3B project personnel prior to commencing this work to ensure a full understanding of the N3B scope and the Triad conditions of entry between both parties.

Please contact Paul directly, prior to 7/17, to arrange this walkdown: blumberg@lanl.gov

If unable to make the walkdown arrangements before 7/17 please contact me.

Thank you,

Craig Douglass
Triad Interface Office

From: Blumberg, Paul A
Sent: Thursday, July 8, 2021 9:06 AM
To: Douglass, Craig R
Cc: Irwin, Timothy J; Intriere, Rocco; Krause, Mark Richard
Subject: TA33 South Area Inside Fence

Craig,
Tim and I are comfortable to have N3B proceed with dirt sample to the depth of 18 inches. If possible I would like to have a walk down of the area prior to sampling. I will be on vacation 17-31 of July, if N3B wants to do the walk down during that time, please have Rocco attend.

Thank you,
Paul

MEMO TO FILE

Date: July 8, 2021

Subject: Access to MDA E fenced area, TA-33 Chaquehui Canyon Aggregate Area

Material Disposal Area (MDA) E is located within the Chaquehui Canyon Aggregate Area. It includes Solid Waste Management Units (SWMUs) 33-001(a) – (e), which consist of underground waste disposal pits, an underground test chamber and a shaft. The area above the pits, underground test chamber and shaft is located in a high security area surrounded by an 8 foot tall fence. The remaining area of MDA E is located in a lower tiered security area outside the fenced high security area.

Prior to conducting surface disturbing activities at the Los Alamos National Laboratory (LANL), N3B is required to complete a series of project reviews and approvals. The first was a formal and comprehensive Project Planning and Regulatory Review, which was conducted by approximately twelve N3B subject matter experts (SMEs) external to the project. This was completed in December 2018. The Triad and NNSA-required Permits and Requirements Identification Review was completed by seven Triad SMEs and approved on February 28, 2019. The environmental impact analysis per the National Environmental Policy Act (NEPA) was completed and approved by the EM/LA NEPA Compliance Officer on April 17, 2019. The NNSA asset evaluation (septic tanks for removal, etc.) was completed on May 9, 2019. The Operational Control Access request, which is required to be submitted to Triad after all previously described reviews and approvals are obtained, was submitted by N3B on June 14, 2019, and approved by Triad and NNSA on July 17, 2019. The conditions of approval for operational control were received on July 9, 2019. These included a requirement for N3B to communicate working dates and times with the Triad Site Technical Officer and the Weapons Facility Operations (WFO) Field Operations Director (FOD) for sites such as the MDA E fenced area, and to provide a two-week look ahead of specific locations scheduled for investigation.

The approved "Investigation Work Plan for Chaquehui Canyon Aggregate Area, Revision 1" (LANL 2010, 111298.9; NMED 2011, 201242) proposed drilling one borehole directly adjacent to the outside edge of each SWMU within MDA E to determine if any releases have occurred. During the 2019-2020 field investigations, N3B contacted the FOD to provide the required two-week look ahead notifications and to obtain approval to access MDA E. N3B was granted access to conduct field investigations outside of the MDA E fenced area. Despite several requests, access inside of the fence was denied because of the classified nature of the underground materials. Therefore, one borehole was drilled and samples collected outside of the fenced area for each of the five SWMUs. Locations selected were as adjacent to each SWMU as possible. This field effort determined that if releases from the disposal pits, chamber, and shaft had occurred, none had reached the borehole locations. Unfortunately, the drilling of one borehole for each SWMU outside the MDA E fence cannot define the nature and extent of potential contamination within the disposal pits and the underground chamber and shaft located within the fenced area. Therefore, additional investigation at MDA E was recommended.

For the 2020-2021 field investigations, N3B continued to pursue access inside of the fenced area. On February 23, 2021, LANL provided electronic notification that the classified nature of the materials within the MDA E fenced area required LANL to conduct a security review prior to granting access. The security review was initially anticipated to take approximately six months for reviewers to access and review the files, pending availability of resources with the appropriate security clearances and file size. This communication was documented in an email dated February 26, 2021, from Craig Douglass, Triad Interface Office, to Lauren Marble, N3B Interface Office Manager.

Concurrently, the sampling plan was modified to collect approximately 54 surface and subsurface samples from the depth intervals of 0.0–0.5 ft and 1.0–1.5 ft bgs on the mesa top inside and outside the fence on a 50-ft grid spacing. A radiological walkover and geophysical surveys were also proposed within the MDA E fenced area and on the mesa top outside the fence to define the nature and extent of potential contamination associated with the disposal pits. The intent of the radiological survey is to identify any possible radiological contamination from the period when the pits were open. The geophysical surveys will be used to define disposal pit boundaries and the depth of cover material inside the MDA E fence. Approximately 50 surface and subsurface samples were collected at two depth intervals outside of the MDA E fenced area in May 2021 while awaiting LANL approval to gain access inside of the fenced area.

On July 8, 2021, LANL granted access to areas inside the fence at MDA E for the purposes of N3B's surveying and surface geophysics to determine the location of the pits, followed by sampling to a depth no deeper than 18 inches. The condition of access required the LANL Operations Manager to physically walk the area with N3B project personnel prior to commencing this work to ensure a full understanding of the N3B scope and the Triad conditions of entry between both parties. This correspondence is documented in an email from Craig Douglass, Triad Interface Office, to Kent Rich, N3B Regulatory Compliance Program, and the N3B Interface Office. The site walk occurred on July 13th, with the field effort scheduled for Fall 2021.

Appendix C

Investigation-Derived Waste Management

C-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 Chaquehui Canyon Aggregate Area (N3B 2021, 701355; NMED 2021, 701546) at Technical Area 33 of Los Alamos National Laboratory (LANL or the Laboratory).

All IDW generated during the field investigation was managed in accordance with N3B-P409-0, "N3B Waste Management." This procedure incorporates the requirements of applicable U.S. Environmental Protection Agency and New Mexico Environment Department (NMED) regulations, U.S. Department of Energy orders, and Newport News Nuclear BWXT-Los Alamos, LLC (N3B) implementation requirements.

Consistent with N3B procedures, N3B prepared a waste characterization strategy form (WCSF) (N3B 2019, 700299) to address characterization approaches, on-site management, and final disposition options for wastes. Information from previous investigation wastes and analytical data and/or acceptable knowledge (AK) were used to complete the WCSF. The WCSF is included in this appendix as Attachment C-1 (on DVD included with this document).

The selection of waste containers was based on appropriate U.S. Department of Transportation requirements, waste types, and estimated volumes of IDW to be generated. Immediately following containerization, each waste container was individually labeled with a unique identification number and with information regarding waste classification, contents, radioactivity, other potential constituents of concern (e.g., beryllium, asbestos), waste generator, and date generated.

Wastes were staged in clearly marked and appropriately constructed registered staging areas. 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.

C-2.0 WASTE STREAMS

The IDW streams that were generated and managed during the investigation of Chaquehui Canyon Aggregate Area are described below and summarized in Table C-2.0-1.

- *Waste #1:* Contact IDW. This waste stream consists of solid waste generated during investigation and removal activities that has come into contact with contaminated environmental media and equipment. This includes, but is not limited to, personal protective equipment (e.g., gloves), plastic sheeting (e.g., tarps, liners), plastic and glass sample bottles, disposable sampling supplies (e.g., filters, tubing, plastic bags), and dry decontamination wastes (e.g., paper items). Contact waste was disposed of as nonhazardous low-level waste (LLW) off-site at Energy Solutions Clive Disposal Facility, Clive, Utah.
- *Waste #2*: Municipal Solid Waste (MSW). This waste stream consists primarily of noncontact trash including, but not limited to, paper, cardboard, wood, plastic, food and beverage containers, empty solution containers, and other noncontact trash. The MSW was determined to be nonhazardous and nonradioactive. It was stored in plastic-lined trash cans and disposed of at the Los Alamos County landfill.
- *Waste #3*: Environmental Media. This waste stream consists of contaminated soil, sediment, and tuff excavated to remove media that exceeds risk-based cleanup objectives. This waste stream also includes cuttings from surface and subsurface sampling. Environmental Media was disposed of as LLW off-site at Energy Solutions Clive Disposal Facility, Clive, Utah.

- *Waste #4:* Excavated Debris. This waste stream consists of residual manmade debris encountered during soil excavation. Excavated debris was disposed of as either LLW or mixed LLW off-site at Energy Solutions, Clive Disposal Facility, Clive, Utah.

C-3.0 REFERENCES

The following reference list includes documents cited in this appendix. Parenthetical information following each reference provides the author(s), publication date, and ERID, ESHID, or EMID. This information is also included in text citations. ERIDs were assigned by the Laboratory's Associate Directorate for Environmental Management (IDs through 599999); ESHIDs were assigned by the Laboratory's Associate Directorate for Environment, Safety, and Health (IDs 600000 through 699999); and EMIDs are assigned by N3B (IDs 700000 and above). IDs are used to locate documents in N3B's Records Management System and in the Master Reference Set. The NMED Hazardous Waste Bureau and N3B maintain copies of the Master Reference Set. The set ensures that NMED has the references to review documents. The set is updated when new references are cited in documents.

N3B (Newport News Nuclear BWXT-Los Alamos, LLC), February 25, 2019. "Waste Characterization Strategy Form (WCSF) for Chaquehui Canyon Aggregate Area," Newport News Nuclear BWXT-Los Alamos, LLC, document EM2019-0045, Los Alamos, New Mexico. (N3B 2019, 700299)

N3B (Newport News Nuclear BWXT-Los Alamos, LLC), March 2021. "Phase II Investigation Work Plan for Chaquehui Canyon Aggregate Area," Newport News Nuclear BWXT-Los Alamos, LLC, document EM2021-0038, Los Alamos, New Mexico. (N3B 2021, 701355)

NMED (New Mexico Environment Department), July 26, 2021. "Approval, Phase II Investigation Work Plan for Chaquehui Canyon Aggregate Area," New Mexico Environment Department letter to A. Duran (EM-LA) from R. Maestas (NMED-HWB), Santa Fe, New Mexico. (NMED 2021, 701546)

Table C-2.0-1
Summary of IWD Generation and Management

Waste Stream	Waste Type	Volume	Characterization Method	On-Site Management	Disposition
Contact waste (Contact IDW)	LLW	1.04 yd^3	AK and analytical results of site characterization	3.5-yd^3 IP-1 bags, 20-yd^3 IP-1 rolloff container, 5-yd^3 IP-1 bags	Energy Solutions, Clive, Utah
MSW	Municipal	0.56 yd^3	AK	Plastic bags	Los Alamos County Transfer Station
Environmental media	LLW	114.9 yd^3	AK, analytical results of site characterization	3.5-yd^3 IP-1 bags, 5-yd^3 IP-1 bags	Energy Solutions, Clive, Utah
Excavated debris	LLW	3.56 yd^3	AK and analytical results of site characterization	20-yd^3 IP-1 rolloff container, B-25 waste container	Energy Solutions, Clive, Utah

Attachment C-1

Waste Characterization Strategy Form
(on CD included with this document)

Appendix D

Analytical Program

D-1.0 INTRODUCTION

This appendix discusses the analytical methods and data-quality review for samples collected during the Chaquehui Canyon Aggregate Area investigation at Technical Area 33 at Los Alamos National Laboratory (LANL or the Laboratory).

Newport News Nuclear BWXT-Los Alamos, LLC (N3B) uses the Environmental Information Management (EIM) database for data management. This is a cloud-based data management platform used for managing sampling events, tracking the packaging and transportation of samples, and storing the resultant data. In addition to N3B, Triad National Security, LLC (Triad) and the U.S. Department of Energy (DOE) Oversight Bureau of the New Mexico Environment Department (NMED) share EIM for all LANL environmental analytical data. EIM interfaces with Intellus New Mexico (Intellus), a fully searchable database available to the public through the Intellus website (http://www.intellusnm.com).

The system, written and maintained by Locus Technologies, consists of a cloud-based Structured Query Language (SQL) server database platform coupled with a web-based user interface. It is a comprehensive sample and data management application, designed to manage the process from sample planning through data review and reporting. It includes modules for sample planning, sample tracking, manual and electronic field data upload, electronic data deliverables (EDDs) upload, Automated Data Review (ADR) routines, notification emails, and reporting tools.

Laboratory data packages and EDDs adhere to the requirements specified in N3B's Exhibit D: Scope of Work and Technical Specifications for Off-Site Analytical Laboratory Services.

N3B ensures that reported external analytical laboratory data are of sufficient quality to fulfill their intended purpose and that the condition of the data is documented so that future users of analytical laboratory results produced for the Los Alamos Legacy Cleanup Contract can use the data. The data collected must have sufficient quality and quantity to support defensible decision-making as described in U.S. Environmental Protection Agency (EPA) guidance (https://www.epa.gov/quality/guidance-systematic-planning-using-data-quality-objectives-process-epa-qag-4). The N3B Sample Data Management Program has data quality objectives detailing minimum quality assurance (QA)/quality control (QC) requirements.

Data examination, verification, and validation include (1) application of data qualifiers and reason codes to analytical results and (2) modification of detection status, based on outcome of specific laboratory QC sample analyses (e.g., spikes, duplicates, surrogates, method blanks [MBs], laboratory control samples [LCSs], and tracers), holding times, proper preservation, and field QC samples as applicable. The process also includes a best-selection evaluation to determine the best value for multiple analytical results of the same analyte from the same sample. Qualification of 100% of analytical data occurs during verification using the EIM ADR module, and a minimum of 10% of analytical data is also subjected to a more in-depth validation by an N3B chemist.

The entire data validation process includes a description of the reasons for any failure to meet method, procedural, or contractual requirements and an evaluation of the impact of such failure on the associated data or data set.

During this process, individual sample results are qualified as accepted or rejected. Data that are accepted per the validation criteria are classified as follows: not detected (U), estimated but not detected (UJ), estimated (J), or detected without data qualification (NQ). Accepted data can then be used as needed, assuming that no problems occurred during the sampling events. Data that are rejected (R) per the validation criteria are unusable. In addition, the analytical results can also be further labeled with data validation reason codes that explain the reason for the qualification. (See Appendix A of this document, which includes data qualifier definitions.)

The analytical data, instrument printouts, and data validation reports are provided in Appendix E (on DVD included with this document). In addition to the laboratory analytical data, sample collection logs (SCLs) and chain of custody forms (COCs) are also provided in Appendix E.

N3B data validation is performed externally by the analytical laboratory and end users of the data. This data validation process applies a defined set of performance-based criteria to analytical data, which may result in qualification of that data. Data validation provides a level of assurance, based on this technical evaluation, of the data quality. N3B validation of chemistry data includes a technical review of the analytical data package that covers the evaluation of both field and laboratory QA/QC samples, the identification and quantitation of analytes, and the effect of QA/QC deficiencies on analytical data, as well as other factors affecting the data quality.

Sampling and data validation were conducted using standard operating procedures (SOPs) and other documents that are part of N3B's comprehensive QA/QC program. Procedures and other documents include the most current version of the following:

- N3B-SOP-ER-2001, "Soil, Tuff, and Sediment Sampling"
- N3B-SOP-SDM-1100, "Sample Containers, Preservation, and Field Quality Control"
- N3B-SOP-SDM-1101, "Sample Control and Field Documentation"
- N3B-SOP-SDM-1102, "Sample Receiving and Shipping by the N3B Sample Management Office"
- N3B-ER-AP-SDM-3001, "Validation of Volatile Organic Compounds Analytical Data"
- N3B-AP-SDM-3003, "Validation of Organochlorine Pesticides and Herbicides and Polychlorinated Biphenyls Analytical Data"
- N3B-AP-SDM-3005, "Validation of Metals Analytical Data"
- N3B-AP-SDM-3006, "Validation of Radiochemical Analytical Data
- N3B-AP-SDM-3007, "Validation of General Chemistry Analytical Data"
- N3B-AP-SDM-3008, "Validation of High Explosives Analytical Data"
- N3B-AP-SDM-3012, "Validation of Analytical Data by Liquid Chromatography and Liquid Chromatography/Tandem Mass Spectrometry"

After the sampling event is planned using the EIM Sample Request module, sample collection logs are created and printed to serve as COC documents and analytical request forms.

The sampling events included collection of field trip blank (FTB), field rinsate (FR) blank, field duplicate (FD), and field split (FS) field QA/QC samples. Detection of analytes in FTBs may indicate contamination resulting from sample collection, transportation, or the analytical laboratory processes. Differences in analytical results between an FD or an FS and its regular sample may indicate the samples were not uniform or that significant variation in analysis occurred between the two samples. Detection of analytes in FR blanks may indicate contamination from inadequately decontaminated field equipment or from the analytical laboratory process.

The FTBs are amber glass septum containers prefilled with soil that are subjected to the same conditions as regular samples. FTBs are collected when volatile organic compound (VOC) samples are collected at a minimum rate of 1 per day. FTBs are collected from locations where the regular samples are collected.

FR blanks are collected at a minimum rate of 1 per 10 investigation samples to confirm decontamination of the sampling equipment.

FDs are collected at a rate of 1 per 10 investigation samples collected. FDs are split samples collected from locations where the regular samples are collected.

Two FSs were collected during the 1996 investigation. No SCLs associated with these samples could be located to verify sample type. These samples are included in this report as FS.

Following sample collection, sampling personnel deliver the samples and the field collection log to sample management personnel at the N3B Sample Management Office (SMO). An analytical COC is then created, which includes the field sample identification number, the date and time of field sample collection, the analytical parameters group code, and the number of bottles for each analytical parameter group. The N3B SMO ships the samples to the appropriate laboratory for analysis.

The laboratory QA/QC process is defined in the appropriate analytical method and the external analytical laboratory statement of work (SOW).

The external laboratory uploads the EDD and its corresponding analytical data pdf data package to EIM. The data are then validated both manually and in the EIM autovalidation process, then reviewed by an N3B chemist at the appropriate level, and then fully transferred into EIM.

D-2.0 ANALYTICAL DATA ORGANIZATION

The data sets evaluated for the Chaquehui Canyon Aggregate Area include historical data for some sites collected during previous investigations in 1995, 1996, 1999, and 2005. All historical analytical data included in the report were reviewed and revalidated to current data-quality standards. Only analytical data for which complete data packages and sample documentation are available are considered appropriate for decision-making purposes and are thus included in the data set(s). All other data are screening-level data only and are not included in the data tables in the investigation report or in this appendix.

D-3.0 INORGANIC CHEMICAL ANALYSES

Chaquehui Canyon Aggregate Area samples collected during this investigation as well as during historical investigations were analyzed for one or more of the following inorganic chemicals: nitrate, perchlorate, total cyanide, target analyte list (TAL) metals, selenium, mercury, thallium, arsenic, lead, and total uranium. Samples were analyzed for nitrate using EPA SW-846 Methods 9056 and 9056A (2019–2021 samples only) and EPA Method 300.0 (2005 samples only); for perchlorate using EPA SW-846 Method 6850 (2005 and 2019–2021 samples only); and for cyanide using EPA SW-846 Methods 9012A (1995, 1996, and 2005 samples only), and 9012B (2019–2021 samples only). Samples were analyzed for TAL metals using EPA SW-846 Methods 6010 (1995 and 1996 samples only), 6010A (1996 samples only), 6010B (historical samples only), 6020 (1995, 1996, and 2005 samples only), 6010C, and 6020B (2019–2021 samples only). Samples were also analyzed for selenium using EPA SW-846 Method 7740 (1995 and 1996 samples only) and for mercury using EPA SW-846 Methods 7470 (1996 samples only), 7470A (1995, 1996, and 2019–2021 samples only), and 7471A. Only three samples from 1995 were analyzed for lead using EPA SW-846 Method 7420. These three samples as well as six samples from 1996 were also the only samples analyzed for thallium and arsenic using EPA SW-846 Methods 7840 (1995 samples) and 7841 (1996 samples); and SW-846 Methods 7060 (1995 samples) and 7060A (1996 samples), respectively. Total uranium was analyzed only for samples in the 1996 investigation using generic kinetic phosphorescence analysis (KPA). The analytical methods used for inorganic chemicals are listed in Table D-3.0-1.

A total of 842 samples (plus 84 field duplicates and 46 rinsates) collected within the Chaquehui Canyon Aggregate Area were analyzed for inorganic chemicals. Inorganic analyses included TAL metals, nitrate, perchlorate, total cyanide, and hexavalent chromium. The analytical methods used for inorganic chemicals are listed in Table D-3.0-1

All decision-level analytical data are included in Appendix E (on DVD included with this document) and can also be found in the public Intellus database at http://www.intellusnm.com.

D-3.1 Inorganic Chemical Analyses

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, LCSs, MB samples, matrix spike (MS) samples, laboratory duplicate samples, interference check samples (ICSs), and serial dilution samples were analyzed as part of the Chaquehui Canyon Aggregate Area investigation. Each of these QA/QC sample types is defined in the analytical services SOWs (LANL 1995, 049738; LANL 2000, 071233) and is described briefly in the sections below.

The LCS serves as a monitor of the overall performance of each step during the analysis, including sample digestion. For inorganic chemicals in soil/tuff, LCS percent recoveries (%R) should fall between the lower acceptance limit (LAL) and upper acceptance limit (UAL).

A MB is an analyte-free matrix to which all reagents are added in the same volumes or proportions as those used in the environmental sample processing and which is extracted and analyzed in the same manner as the corresponding environmental samples. MBs are used to assess the potential for sample contamination during extraction and analysis. All target analytes in the MB should be below the contract-required detection limit.

MS samples assess the accuracy of inorganic chemical analyses. These samples are designed to provide information about the effect of the sample matrix on the sample preparation procedures and analytical technique. The MS acceptance criterion is between the LAL and UAL, inclusive for all spiked analytes.

Laboratory duplicate samples assess the precision of inorganic chemical analyses. All relative percent differences (RPDs) between the sample and laboratory duplicate should be ±35% for soil (LANL 1995, 049738; LANL 2000, 071233).

The ICSs assess the accuracy of the analytical laboratory's interelement and background correction factors used for inductively coupled plasma emission spectroscopy. The ICS %R should be between the LAL and UAL.

Serial dilution samples measure potential physical or chemical interferences and correspond to a sample dilution ratio of 1:5. The chemical concentration in the undiluted sample must be at least 50 times the method detection limit (MDL) and 100 times the MDL for inductively coupled plasma mass spectroscopy for valid comparison. For sufficiently high concentrations, the RPD should be within 10%.

Details regarding the quality of the inorganic chemical analytical data included in the data set are summarized in the following subsections.

D-3.2 Data Quality Results for Inorganic Chemicals

The majority of the analytical results are qualified as not detected (U) or not qualified (NQ) because the analytes were not detected by the respective analytical methods or were not qualified. These data do not have any quality issues associated with the values presented.

A total of 2655 TAL metals results were qualified as estimated (J) because the analytical laboratory qualified the detected result as estimated.

D-3.2.1 Chain of Custody

COC forms were maintained properly for all samples analyzed for inorganic chemicals (see Appendix E [on DVD included with this document]).

D-3.2.2 Sample Documentation

All samples analyzed for inorganic chemicals were properly documented in the SCLs in the field (see Appendix E [on DVD included with this document]).

D-3.2.3 Sample Dilutions

A total of 20 TAL metal results were qualified as estimated (J) because the serial dilution sample RPD was greater than 10% and the sample result was greater than 100 times the MDL.

D-3.2.4 Sample Preservation

Preservation criteria were met for all samples analyzed for inorganic chemicals.

D-3.2.5 Holding Times

A total of 177 acidity or alkalinity results were qualified as estimated (J) because the extraction/analytical holding time was exceeded by less than 2 times the published method holding times.

One nitrate result was qualified as estimated not detected (UJ) because the holding time was greater than 1 and less than or equal to 2 times the applicable holding-time requirement.

D-3.2.6 Initial and Continuing Calibration Verifications

Initial calibration verifications (ICVs) and continuing calibration verifications (CCVs) were within control limits for all samples analyzed for inorganic chemicals.

D-3.2.7 Interference Check Sample and/or Serial Dilutions

ICS and serial dilution results were within acceptable limits for all samples analyzed for inorganic chemicals.

D-3.2.8 Laboratory Duplicate Samples

A total of 525 TAL metal results were qualified as estimated (J) and 15 TAL metal results were qualified as estimated not detected (UJ) because the sample and duplicates were greater than or equal to 5 times the reporting limit (RL) and the duplicate RPD was greater than 35%.

Thirty-one TAL metal results were qualified as estimated (J) because the duplicate sample RPD exceeded the advisory limit.

A total of 8 antimony results, 24 mercury results, 1 zinc result, and 2 silver results were qualified as estimated not detected (UJ) because the sample and duplicates were greater than or equal to 5 times the RL and the duplicate RPD was greater than 35%.

D-3.2.9 Method Blanks

A total of 452 TAL metal results were qualified as estimated and biased high (J+) because the analyte was identified in the MB but was greater than 5 times the associated sample result.

D-3.2.10 MS Samples

A total of 120 TAL metal results were qualified as estimated and potentially biased low (J-), 582 TAL metal results were qualified as estimated and potentially biased high (J+), and 3 TAL metal results were qualified as estimated not detected (UJ) because the associated MS %R was below the LAL but greater than 10%.

A total of 624 TAL metal results were qualified as estimated and potentially biased high (J+), 4 TAL metal results were qualified as estimated and potentially biased low (J-), and 5 TAL metal results were qualified as estimated (J) because the associated MS %R was above the UAL.

Four TAL metal results were qualified as estimated (J) because the MS/matrix spike duplicate (MSD) %R was greater than 10% but less than 75%.

D-3.2.11 LCS Recoveries

The LCS recoveries were within acceptable limits for all samples analyzed for inorganic chemicals.

D-3.2.12 Detection Limits

A total of 64 TAL metal results were qualified as estimated (J) because the sample result was reported as detected between the instrument detection limit and the estimated detection limit (EDL). Estimated (J) results may be less precise than results that are reported as being above the EDL.

D-3.2.13 Field Blanks

A total of 525 TAL metal results and 36 cyanide results were qualified as estimated (J) and 15 TAL metal results were qualified as estimated not detected (UJ) because the sample and the duplicate sample results were >= 5 times the RL and the duplicate RPD was >20% for water samples and >35% for soil samples.

A total of 451 TAL metal results were qualified as estimate biased high (J+) 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.

A total of 31 TAL metal results were qualified as estimated (J) and 9 TAL metal results were qualified as estimated not detected (UJ) because the duplicate sample RPD was greater than the advisory limit and the sample result is a detection.

D-3.2.14 Rejected Results

Four nitrate results from SWMU 33-011(a) were rejected (R) because the extraction holding time was exceeded by 2 times the acceptable holding time, which indicates the affected analyte should be regarded as estimated.

The rejected data were not used to characterize the extent of contamination. However, sufficient data of good quality were available to characterize the site(s). The results of other qualified data were used as reported and did not affect the usability of the sample results.

D-4.0 ORGANIC CHEMICAL ANALYSES

Soil, tuff, and sediment samples collected during the current and historical investigations were analyzed for one or more of the following organic chemicals: explosive compounds, polychlorinated biphenyls (PCBs), pesticides and PCBs, semivolatile organic compounds (SVOCs), VOCs, dioxins/furans, and total petroleum hydrocarbons (TPH). Samples were analyzed for explosive compounds using EPA SW-846 Methods 8330B (2019–2020 samples only), 8330 (1996 and 2005 samples only), and 8321A_MOD (2005 samples only); for PCBs using EPA SW-846 Methods 8082 (2005 and 2019–2020 samples) and 8082A (2019–2020 samples only); and for pesticides and PCBs using EPA SW-846 Method 8080 (1996 samples only).

Samples were also analyzed for SVOCs using EPA SW-846 Methods 8270 (1995, 1996, and 1999 samples), 8270B (1996 samples only), 8270C (2005 samples only), and 8270D (2019–2020 samples); and for VOCs using EPA SW-846 Methods 8240 (1996 samples only), 8260 (1995, 1996, and 1999 samples), 8260A (1996 samples only), and 8260B (2005, and 2019–2020 samples). Only samples from the 2019–2020 investigation were analyzed for dioxins/furans using EPA SW-846 Method 8290A, and only samples from the 2005 investigation were analyzed for TPH using EPA SW-846 Method 8015M_extractable. All QC procedures were followed as required by the analytical laboratory SOWs (LANL 1995, 049738; LANL 2000, 071233). The analytical methods used for organic chemicals are listed in Table D-4.0-1.

A total of 457 samples (plus 98 FDs and 54 FTBs) collected within the upper Chaquehui Canyon Aggregate Area were analyzed for organic chemicals. Organic analyses included VOCs, SVOCs, PCBs, explosive compounds, and dioxins and furans.

All organic chemical analytical results are included in Appendix E (on DVD included with this document) and can also be found in the public Intellus database at https://www.intellusnm.com.

D-4.1 Organic Chemical QA/QC Samples

The use of QA/QC samples is designed to produce quantitative measures of the reliability of specific parts of an analytical procedure. The results of the QA/QC analyses performed on a sample provide confidence about whether the analyte is present and whether the concentration reported is accurate. Calibration verifications, LCSs, MBs, MS samples, surrogates, and internal standards (ISs) were analyzed to assess the accuracy and precision of organic chemical analyses. Each of these QA/QC sample types is defined in the analytical services SOW (LANL 1995, 049738; LANL 2000, 071233) and described briefly below.

Calibration verification is the establishment of a quantitative relationship between the response of the analytical procedure and the concentration of the target analyte. There are two aspects of calibration verification: initial and continuing. The initial calibration verifies the accuracy of the calibration curve as well as the individual calibration standards used to perform the calibration. The continuing calibration ensures that the initial calibration is still holding and is correct as the instrument is used to process samples. The continuing calibration also serves to determine whether analyte identification criteria such as retention times and spectral matching are being met.

The LCS is a sample of a known matrix that has been spiked with compounds that are representative of the target analytes, and it serves as a monitor of overall performance on a “controlled” sample. The LCS is the primary demonstration, on a daily basis, of the ability to analyze samples with good qualitative and quantitative accuracy. The LCS recoveries should fall between the LAL and UAL.

A MB 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. MBs 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 MB (LANL 1995, 049738; LANL 2000, 071233).

MS samples are used to measure the ability to recover prescribed analytes from a native sample matrix and consist of aliquots of the submitted samples spiked with a known concentration of the target analyte(s). Spiking typically occurs before sample preparation and analysis. The spike sample recoveries should be between the LAL and UAL.

A surrogate compound (surrogate) is an organic compound used in the analyses of target analytes that is similar in composition and behavior to the target analytes but normally is not found in environmental samples. Surrogates are added to every blank, sample, and spike to evaluate the efficiency with which analytes are recovered during extraction and analysis. The recovery percentage of the surrogates must be within specified ranges or the sample may be rejected or assigned a qualifier.

ISs are chemical compounds added to every blank, sample, and standard extract at a known concentration. They are used to compensate for (1) analyte concentration changes that might occur during storage of the extract, and (2) quantitation variations that can occur during analysis. ISs are used as the basis for quantitation of target analytes. The %R for ISs should be within the range of 50% to 200%.

Details regarding the quality of the organic chemical analytical data included in the data sets are summarized in the following subsections.

D-4.2 Data Quality Results for Organic Chemicals

The majority of the analytical results are qualified as estimated not detected (UJ) 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 5990 results were qualified as estimated not detected (UJ), 2548 results were qualified as estimated (J), 124 results were qualified as estimated and potentially biased low (J-), 421 results were qualified as estimated and potentially biased high (J+), and 250 results were qualified as rejected (R).

D-4.2.1 Maintenance of Chain of Custody

COC forms were maintained properly for all samples analyzed for organic chemicals (see Appendix E [on DVD included with this document]).

D-4.2.2 Sample Documentation

All samples analyzed for organic chemicals were properly documented in the SCLs in the field (see Appendix E [on DVD included with this document]).

D-4.2.3 Sample Dilutions

Sample dilution criteria were met for all samples analyzed for organic chemicals.

D-4.2.4 Sample Preservation

Preservation criteria were met for all samples analyzed for organic chemicals.

D-4.2.5 Holding Times

A total of 161 explosive compound results were qualified as estimated not detected (UJ) because the holding time was exceeded by less than or equal to 2 times the applicable holding-time requirement.

A total of 309 SVOC results were qualified as estimated not detected (UJ) because the holding time was exceeded by less than or equal to 2 times the applicable holding-time requirement.

A total of 13 SVOC results were qualified as estimated and potentially biased low (J-) because the holding time was exceeded by less than or equal to 2 times the applicable holding-time requirement.

D-4.2.6 ICVs and CCVs

Seventy-two VOC results were qualified as estimated not detected (UJ) because the affected analytes were analyzed with a relative response factor (RRF) of less than 0.05 in the initial calibration and/or CCV.

Forty-six explosive compound results were qualified as estimated not detected (UJ) and two VOC results were qualified as estimated not detected (UJ) because the affected analytes were analyzed with a RRF of less than 0.05 in the initial calibration and/or CCV. Two dioxin/furan results were qualified as estimated (J) because the affected results were not analyzed with a valid 5-point calibration curve and/or a standard at the RL.

One pyrene result was qualified as estimated not detected (UJ) because the ICV and/or CCV were recovered outside the method limits.

D-4.2.7 Surrogate Recoveries

One PCB result was qualified as estimated and potentially biased high (J+), four PCB results were qualified as estimated and potentially biased low (J-), and 12 PCB results were qualified as estimated not detected (UJ) because the surrogate %R was greater than or equal to the UAL.

A total of 81 VOC results and 305 SVOC results were qualified as estimated not detected (UJ) because the surrogate was less than the LAL but greater than or equal to 10% R.

A total of 49 PCB results were qualified as estimated not detected (UJ) and one VOC result was qualified as estimated and potentially biased high (J+) because the surrogate recovery was less than 10% R.

A total of 82 PCB results were qualified as estimated and potentially biased high (J+) because the %R was greater than or equal to the UAL.

D-4.2.8 Internal Standard Responses

A total of 25 SVOC and 9 VOC results were qualified as estimated (J) because the IS area count for the quantitating IS was outside the -50% to +100% window in relation to the previous continuing calibration. This condition could affect the quantitation accuracy of the associated analytes.

D-4.2.9 Method Blanks

All target analytes were below the contract-required detection limit in the MB.

D-4.2.10 Laboratory Duplicate Samples

Laboratory duplicates collected for organic chemical analyses indicated acceptable precision for all samples analyzed for organic chemicals.

D-4.2.11 Laboratory Control Sample Recoveries

A total of 313 results were qualified as estimated not detected (UJ) because the LCS %R was less than the LAL but greater than 10%.

D-4.2.12 MS Samples

A total of 135 explosive compound results were qualified as estimated not detected (UJ) because the MS/MSD %R was greater than 10%.

Three PCB results, 270 VOC results, and 668 SVOC results were qualified as estimated not detected (UJ) because the MS/MSD %R was below the lower limit.

A total of 430 SVOC results were qualified as estimated not detected (UJ) because the MS/MSD acceptance limit was exceeded.

A total of 135 explosive compound results were qualified as estimated not detected (UJ) because the MS/MSD RPD was greater than 30%.

A total of 78 SVOC results were qualified as estimated (J) because the MS/MSD acceptance limit was exceeded.

Twelve SVOC results were qualified as estimated and potentially biased low (J-) because the MS/MSD %R was less than 10%.

Fourteen PCB results, 12 SVOC results, and 1 VOC result were qualified as estimated and potentially biased low (J-) because the MS/MSD %R was below the lower limit.

A total of 231 SVOC results were qualified as estimated and potentially biased high (J+) because the MS/MSD %R was above the upper limit.

A total of 8 explosive compound results were qualified as rejected (R) because the MS/MSD RPD was less than 10%.

D-4.2.13 Blanks

A total of 9 VOC results were qualified as estimated (J) because these analytes were identified in the MB but were greater than 5 times the concentration of the related analytes in the MB.

Four PCB results were qualified as estimated (J) because the sample and the duplicate sample result are >= 5 times the RL and the RPD exceeds the limits.

A total of 1 SVOC and 31 dioxin/furan results were qualified as estimated (J) because the sample result was less than 5 times the concentration of the related analyte in the MB.

Five PCB results were qualified as estimated and biased high (J) because the result was more than 5 times the concentration of the related analyte in the MB.

A total of 68 VOC results and 3 PCB results were qualified as not detected (U) because the associated sample concentration was less than or equal to 5 times (VOCs) or 10 times (PCBs) the amount in the trip, rinsate, or equipment blank.

D-4.2.14 Rejected Data

A total of 135 SVOC results [12 from SWMU 33-001(a), 19 from SWMU 33-004(a), 15 from SWMU 33-007(c), 6 from SWMU 33-008(c), 3 from SWMU 33-010(c), 4 from SWMU 33-011(a), 26 from SWMU 33-011(d), 9 from SWMU 33-012(a), and 41 from SWMU 33-017] and 8 explosive compound results from SWMU 33-001(a) and 1 from SWMU 33-010(c) were rejected because the LCS %R was less than 10%.

Fifty-one SVOC results from SWMU 33-011(a) were rejected because the surrogate was less than 10%R.

Four VOC results [one from SWMU 33-004(a) and three from SWMU 33-008(c)] were rejected because the affected results were not analyzed with a valid 5-point calibration curve and/or a standard at the RL.

D-5.0 RADIONUCLIDE ANALYSES

Samples were analyzed for radionuclides by gamma spectroscopy using EPA Method 901.1 (2005 and 2019–2021 samples only) or by the generic gamma spectroscopy method (1996 samples only); for tritium by liquid scintillation using EPA Method 906.0 (1996, 2005, and 2019–2021 samples) and LANL procedure ER210 from “Health and Environmental Chemistry: Analytical Techniques, Data Management, and Quality Assurance,” Vol. II, (Gautier 1993, 031794) (two 1996 samples only); and for strontium-90 by beta proportional counting using EPA Method 905.0 (2005 and 2019–2021 samples only). Samples were also analyzed for isotopic uranium, isotopic plutonium (1996, 2005, and 2019–2020 samples only), and americium-241 (2005 and 2019–2021 samples only) by alpha spectroscopy (HASL-300 methods). All QC procedures were followed as required by the analytical laboratories SOW (LANL 1995, 049738; LANL 2000, 071233). The methods used for analyzing radionuclides are listed in Table D-5.0-1.

A total of 542 samples (plus 55 FDs) collected within the Chaquehui Canyon Aggregate Area were analyzed for radionuclides. Radionuclide analyses included americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic uranium, tritium, and strontium-90.

All radionuclide results are included in Appendix E (on DVD included with this document) and can also be found in the public Intellus database at https://www.intellusnm.com.

D-5.1 Radionuclide QA/QC Samples

All procedures were followed as required by the analytical services SOWs (LANL 1995, 049738; LANL 2000, 071233). Some sample results were qualified as not detected (U) because the associated sample concentration was less than or equal to the minimum detectable concentration (MDC). Some sample results were qualified as not detected (U) because the associated sample concentration was less than or equal to 3 times the total propagated uncertainty. This data qualification is related to detection status only and not to data quality issues.

To assess the accuracy and precision of radionuclide analyses, LCSs, MBs, MS samples, laboratory duplicate samples, and tracers were analyzed. Each of these QA/QC sample types is defined in the analytical services SOWs (LANL 1995, 049738; LANL 2000, 071233) and is described briefly below.

The LCS serves as a monitor of the overall performance of each step during the analysis, including sample digestion. For radionuclides in soil/tuff, LCS %Rs should fall between the LAL and UAL.

A MB 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. MBs are used to assess the potential for sample contamination during analysis. All radionuclide results should be below the MDC.

MS samples assess the accuracy of radionuclide chemical analyses. These samples are designed to provide information about the effect of the sample matrix on the sample preparation procedures and analytical technique. The MS acceptance criterion is between the LAL and UAL.

Laboratory duplicate samples assess the precision of inorganic chemical analyses. All RPDs between the sample and laboratory duplicate should be ±35% for soil (LANL 1995, 049738; LANL 2000, 071233).

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.

Details regarding the quality of the radionuclide analytical data included in the data set are summarized in the following subsections.

D-5.2 Data Quality Results for Radionuclides

The majority of radionuclide results were qualified as not detected (U) because the associated sample concentration was less than or equal to the MDC.

The majority of the analytical results are not qualified (NQ). These data do not have any quality issues associated with the values presented.

One isotopic uranium result was qualified as estimated (J) because the full width at half maximum (FWHM) = 0 and the detect flag = Y or the lab qualifier was equivalent to J, and one plutonium result was qualified as estimated (J) because the FWHM was less than 100 in associated tracer.

Thirty-nine sample results were qualified as estimated (J) because the associated duplicate samples had a duplicate error ratio or relative error ratio greater than the analytical laboratory's acceptance limits.

Seventy-eight sample results were qualified as estimated (J) because the count duration of the laboratory duplicates and the field samples from which they were created were different.

A total of 307 sample results were qualified as estimated not detected (UJ) because the radionuclide critical level was less than the laboratory result, which was less than the MDA.

A total of 14 sample results were qualified as estimated not detected (UJ) because the count duration of the laboratory duplicates and the field samples from which they were created were different.

Four isotopic uranium results were qualified as estimated and potentially biased low (J-) because the tracers were less than the LAL but greater than or equal to 10%R.

A total of 12 isotopic uranium results were qualified as estimated and potentially biased high (J+) because the affected analytes were greater than 5 times the concentration of the related analytes in the MB.

Six isotopic uranium results were qualified as rejected (R) because the spectral interferences prevented positive identification of the analytes.

D-5.2.1 Chain of Custody

COC forms were maintained properly for all samples (see Appendix E [on DVD included with this document]).

D-5.2.2 Sample Documentation

All samples were properly documented on the SCLs in the field (see Appendix E [on DVD included with this document]).

D-5.2.3 Sample Dilutions

Some samples were diluted for radionuclide analyses. No qualifiers were applied to any radionuclide sample results because of dilutions.

D-5.2.4 Sample Preservation

Preservation criteria were met for all samples analyzed for radionuclides.

D-5.2.5 Holding Times

Holding-time criteria were met for all samples analyzed for radionuclides.

D-5.2.6 Method Blanks

All radionuclide results were below the MDC.

D-5.2.7 MS Samples

All MS sample results were between the acceptance criterion of 75% to 125%.

D-5.2.8 Tracer Recoveries

A total of four isotopic uranium results were qualified as estimated and potentially biased low (J-) because the tracers were less than the LAL but greater than or equal to 10%R.

D-5.2.9 LCS Recoveries

All LCS %R were between the control limits of 80% and 120%.

D-5.2.10 Laboratory Duplicate Samples Recoveries

Laboratory duplicate samples collected for radionuclide analyses indicated acceptable precision for all samples.

D-5.2.11 Rejected Data

Six isotopic uranium samples were rejected because spectral interferences prevented positive identification of the analytes.

D-6.0 REFERENCES

The following reference list includes documents cited in this appendix. Parenthetical information following each reference provides the author(s), publication date, and ERID, ESHID, or EMID. This information is also included in text citations. ERIDs were assigned by the Laboratory's Associate Directorate for Environmental Management (IDs through 599999); ESHIDs were assigned by the Laboratory's Associate Directorate for Environment, Safety, and Health (IDs 600000 through 699999); and EMIDs are assigned by N3B (IDs 700000 and above). IDs are used to locate documents in N3B's Records Management System and in the Master Reference Set. The NMED Hazardous Waste Bureau and N3B maintain copies of the Master Reference Set. The set ensures that NMED has the references to review documents. The set is updated when new references are cited in documents.

Gautier, M.A., July 1, 1993. "Health and Environmental Chemistry: Analytical Techniques, Data Management, and Quality Assurance," Vol. II, Los Alamos National Laboratory report LA-10300-M, Los Alamos, New Mexico. (Gautier 1993, 031794)

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), December 2000. "University of California, Los Alamos National Laboratory (LANL), I8980SOW0-8S, Statement of Work for Analytical Laboratories," Rev. 1, Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2000, 071233)

Table D-3.0-1
Inorganic Chemical Analytical Methods for
Samples Collected from the Chaquehui Canyon Aggregate Area

Analytical Method	Analytical Description	Analytical Suite
EPA Method 300.0	Ion chromatography	Nitrate
SW-846:9056/9056A	Ion chromatography	Nitrate
SW-846:6010/6010A/6010B/6010C	Inductively coupled plasma-atomic emission spectroscopy	Aluminum, antimony, arsenic, barium, beryllium, calcium, cadmium, cobalt, chromium, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, sodium, silver, thallium, vanadium, and zinc (TAL metals)
SW-846:6020_TCLP	Toxicity characteristic leaching procedure (TCLP) metals by inductively coupled plasma/mass spectrometry	
SW-846:6020/6020B	Inductively coupled plasma/mass spectrometry	Aluminum, antimony, arsenic, barium, beryllium, calcium, cadmium, cobalt, chromium, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, sodium, silver, thallium, uranium, vanadium, and zinc (TAL metals plus uranium)
SW-846:6850	Perchlorate by liquid chromatography/mass spectrometry or by liquid chromatography/mass spectrometry	Perchlorate
SW-846:7060/7060A	Furnace technique	Arsenic
SW-846:7420	Direct aspiration	Lead
SW-846:7470/7470A	Manual cold-vapor technique	Mercury
SW846:7470A_TCLP	TCLP extraction	Mercury
SW-846:7471A	Manual cold-vapor technique	Mercury (TAL metal)
SW-846:7740	Furnace technique	Selenium
SW-846:7840	Direct aspiration	Thallium
SW-846:7841	Furnace technique	Thallium
SW-846:9012A/9012B	Colorimetric method/off-line distillation	Cyanide (total)
Generic: Uranium KPA	Kinetic phosphorescence analysis	Uranium (total)

Table D-4.0-1
Organic Chemical Analytical Methods for
Samples Collected from the Chaquehui Canyon Aggregate Area

Analytical Method	Analytical Description	Target Compound List
SW-846:8015M_EXTRACTABLE	Solvent extraction, gas chromatography (GC)	TPH, Diesel Range Organics (DRO)
SW-846:8080	GC	Organochlorine pesticides and PCBs
SW-846:8082/8082A	GC	PCB Aroclors
SW-846:8240/8260/8260A/8260B	Purge and trap, GC/mass spectrometry	VOCs
SW-846:8270/8270B/8270C/8270DC	Solvent extraction, GC/mass spectrometry	SVOCs
SW-846:8290A	High-resolution GC/mass spectrometry	Dioxins/furans
SW-846:8321A_MOD	High-performance liquid chromatography (HPLC)/mass spectrometry	Explosive compounds
SW-846:8330	HPLC	Explosive compounds, nitroaromatics, and nitramines
SW-846:8330B	HPLC/mass spectrometry	Explosive compounds, nitroaromatics, and nitramines
SW-846:9012A/9012B	Automated colorimetric/off-line distillation	Total and amenable cyanide

Table D-5.0-1
Radionuclide Analytical Methods for
Samples Collected from the Chaquehui Canyon Aggregate Area

Analytical Method	Analytical Description	Target Compound List
EPA Method 905.0	Beta proportional counting	Strontium-90
EPA Method 901.1	Gamma spectroscopy	Cesium-134, cesium-137, cobalt-60, sodium-22
Generic: Gamma Spectroscopy	Gamma spectroscopy	Cesium-134, cesium-137, cobalt-60, sodium-22
EPA Method 906.0	Liquid scintillation	Tritium
LANL ER210 (Gautier 1993, 031794)	Distillation/liquid scintillation	Tritium
HASL-300: Am-241	Alpha spectroscopy	Americium-241
HASL-300: ISOPU	Alpha spectroscopy	Isotopic plutonium
HASL-300: ISOU	Alpha spectroscopy	Isotopic uranium

Appendix E

Analytical Suites and Results and Analytical Reports
(on DVDs included with this document)

Appendix F

Box Plots and Statistical Results

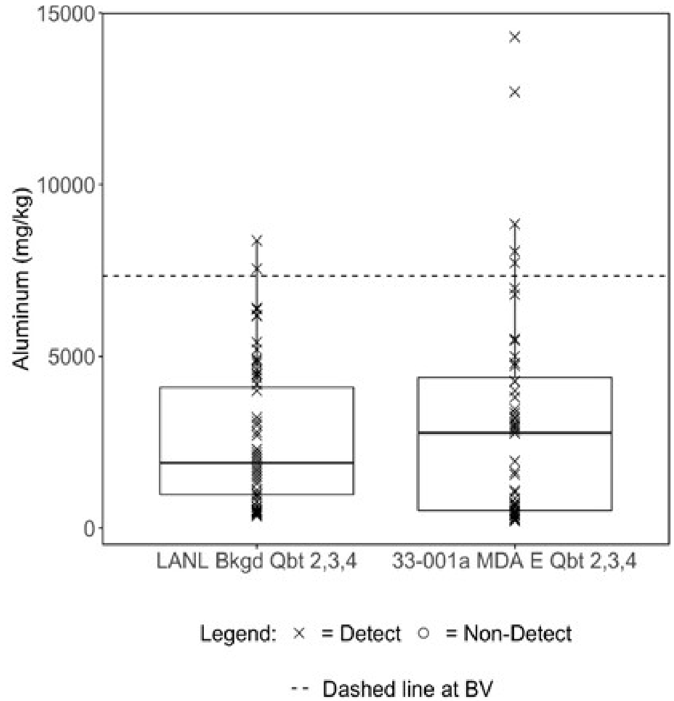


Figure F-1 Box plot for aluminum in Qbt 2,3,4 at SWMUs 33-001(a–e)

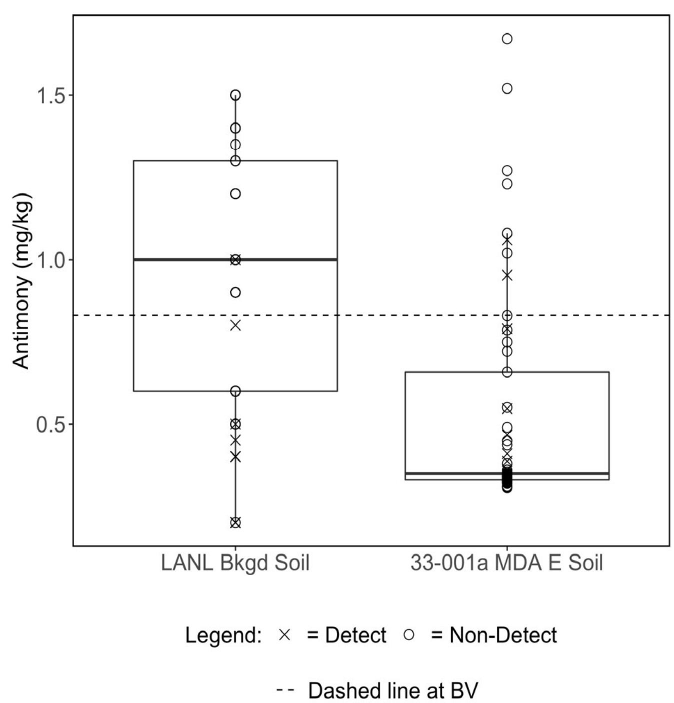


Figure F-2 Box plot for antimony in soil at SWMUs 33-001(a–e)

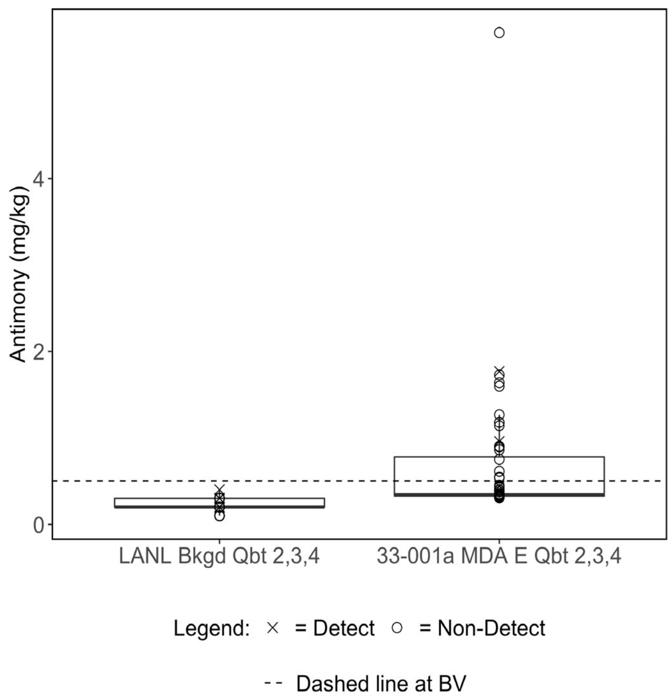


Figure F-3 Box plot for antimony in Qbt 2,3,4 at SWMUs 33-001(a–e)

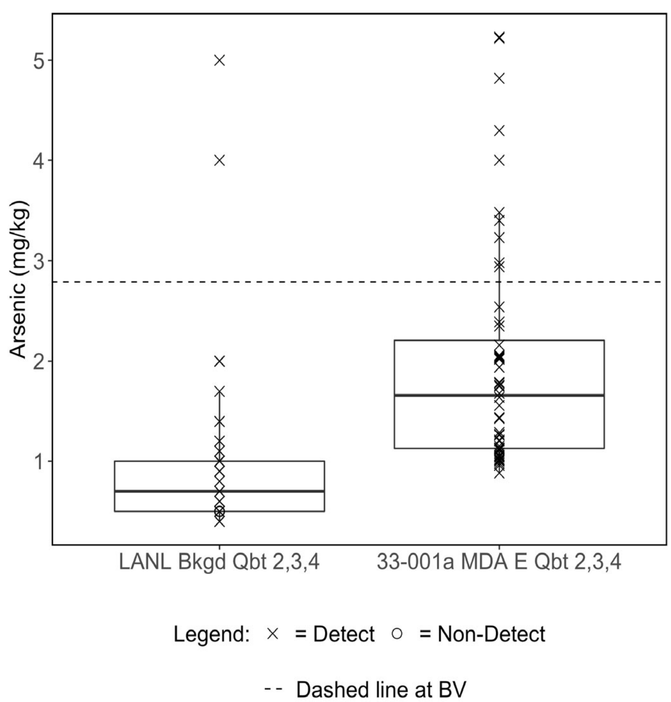


Figure F-4 Box plot for arsenic in Qbt 2,3,4 at SWMUs 33-001(a–e)

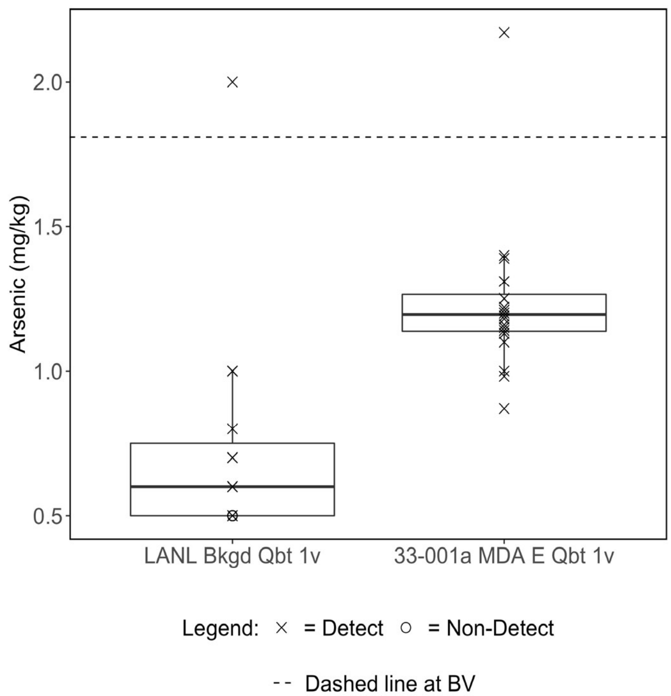


Figure F-5 Box plot for arsenic in Qbt 1v at SWMUs 33-001(a–e)

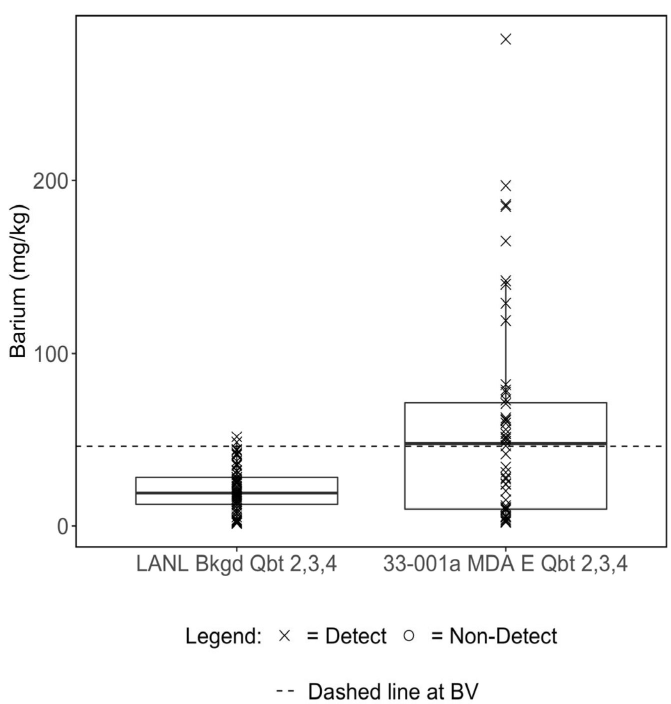


Figure F-6 Box plot for barium in Qbt 2,3,4 at SWMUs 33-001(a–e)

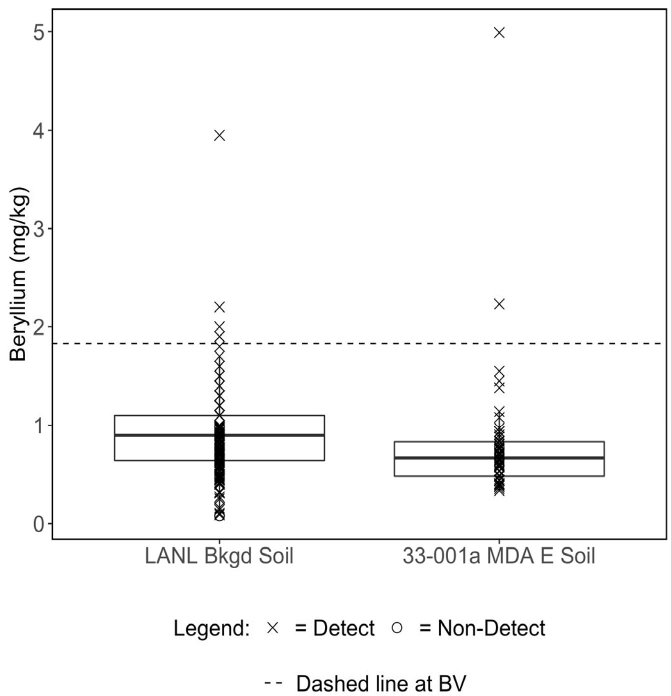


Figure F-7 Box plot for beryllium in soil at SWMUs 33-001(a–e)

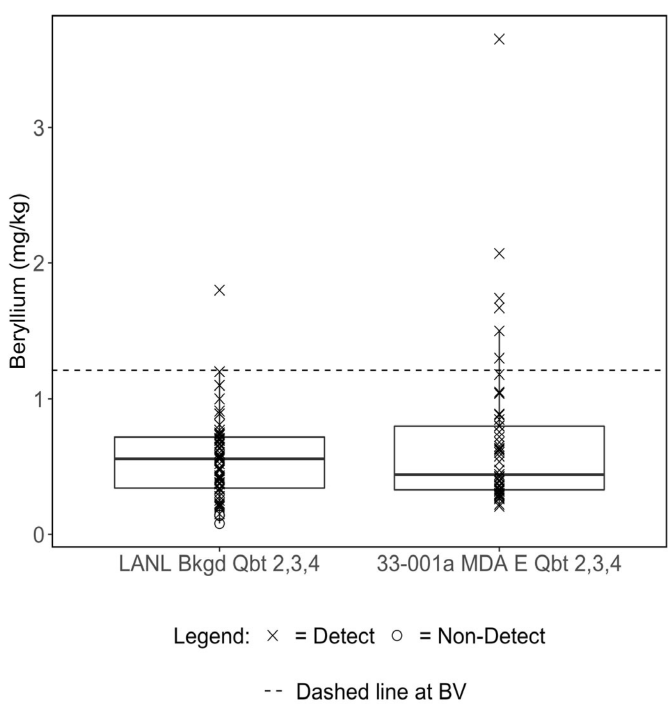


Figure F-8 Box plot for beryllium in Qbt 2,3,4 at SWMUs 33-001(a–e)

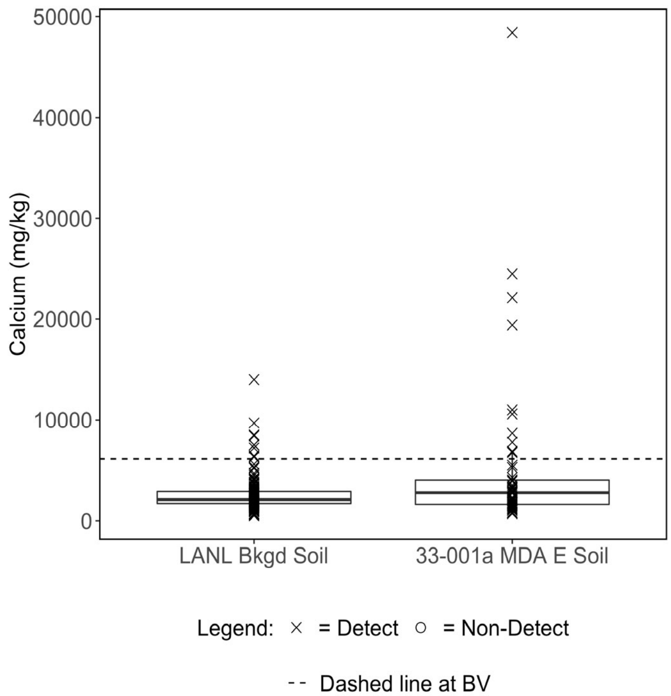


Figure F-9 Box plot for calcium in soil at SWMUs 33-001(a–e)

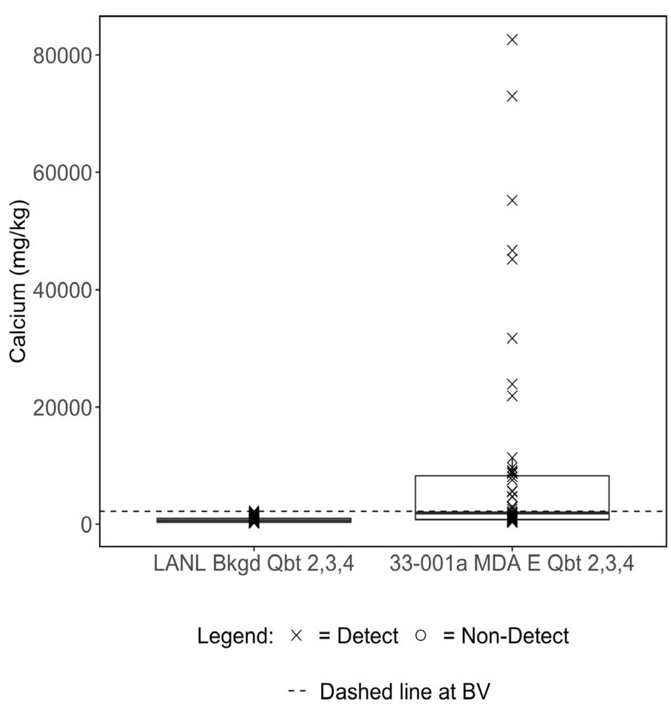


Figure F-10 Box plot for calcium in Qbt 2,3,4 at SWMUs 33-001(a–e)

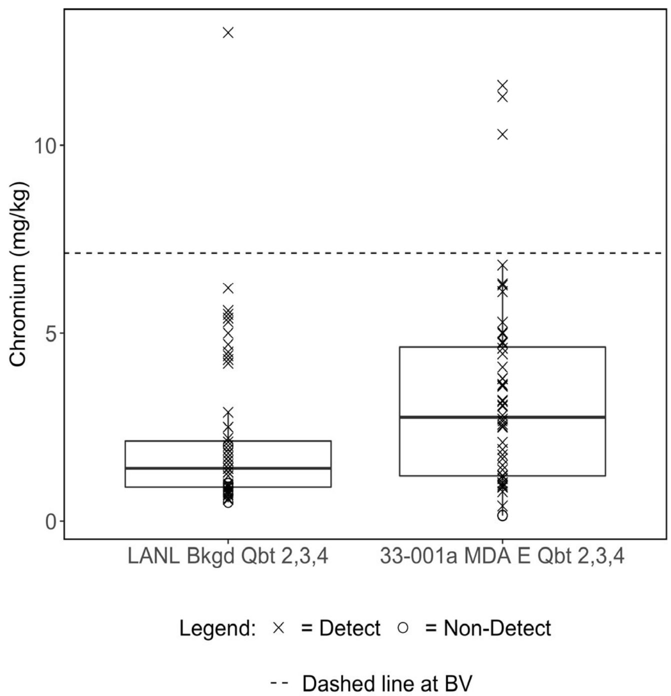


Figure F-11 Box plot for chromium in Qbt 2,3,4 at SWMUs 33-001(a–e)

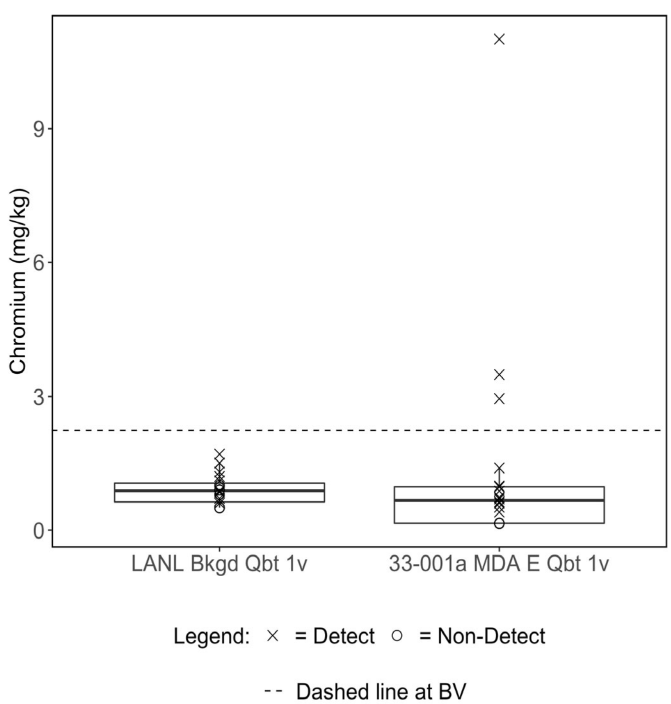


Figure F-12 Box plot for chromium in Qbt 1v at SWMUs 33-001(a–e)

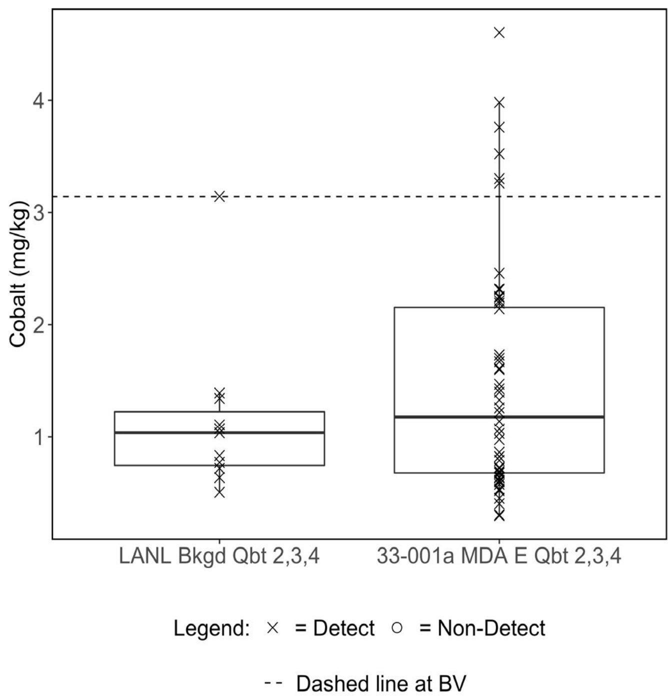


Figure F-13 Box plot for cobalt in Qbt 2,3,4 at SWMUs 33-001(a–e)

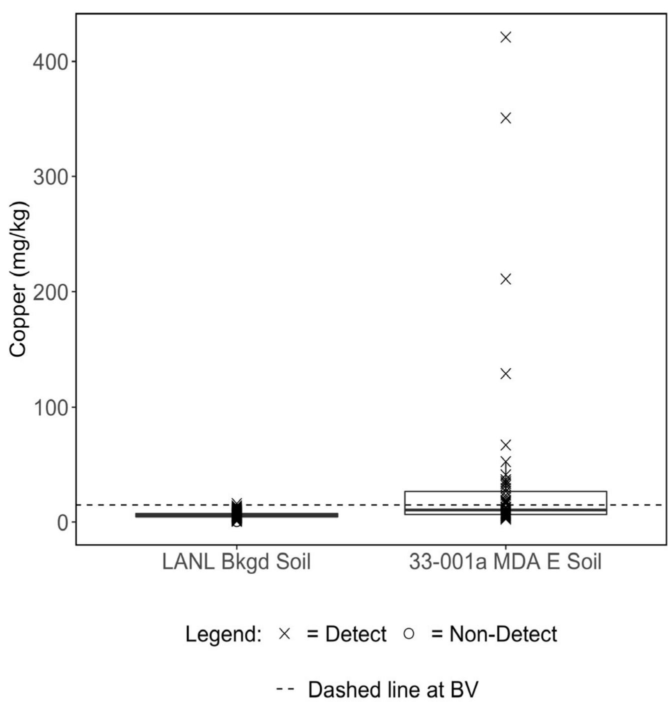


Figure F-14 Box plot for copper in soil at SWMUs 33-001(a–e)

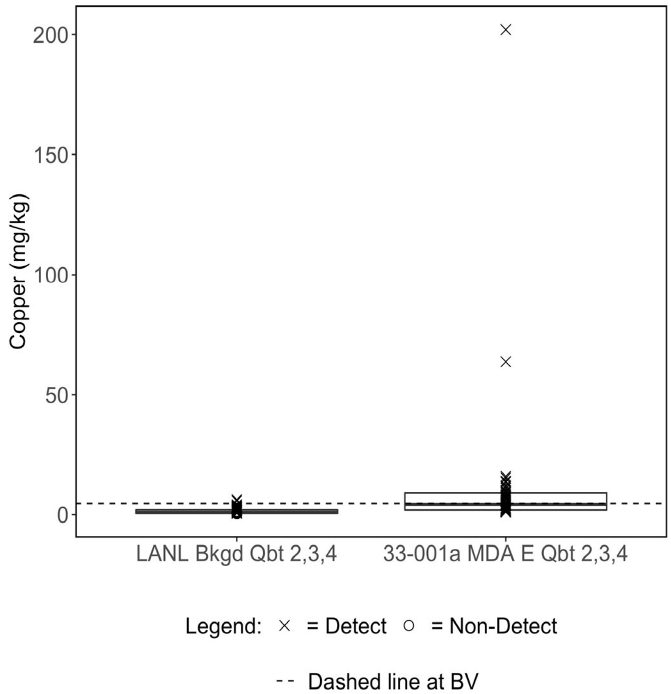


Figure F-15 Box plot for copper in Qbt 2,3,4 at SWMUs 33-001(a–e)

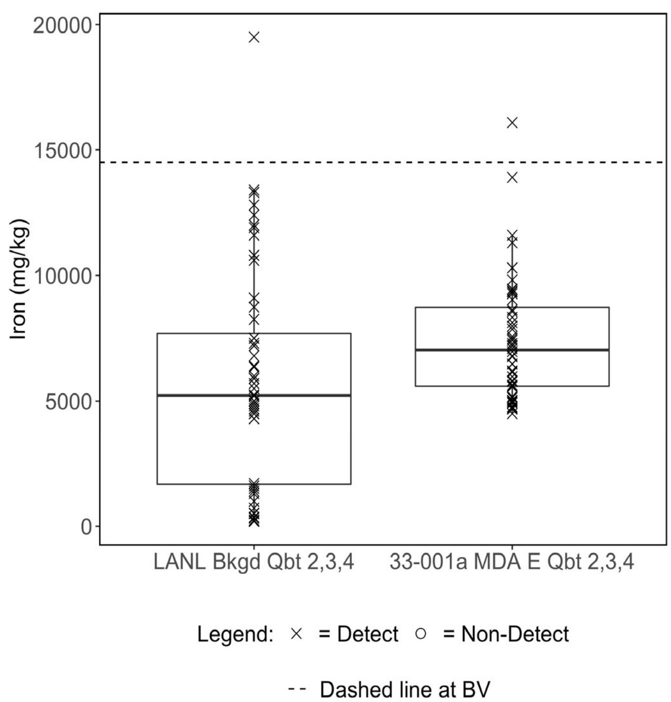


Figure F-16 Box plot for iron in Qbt 2,3,4 at SWMUs 33-001(a–e)

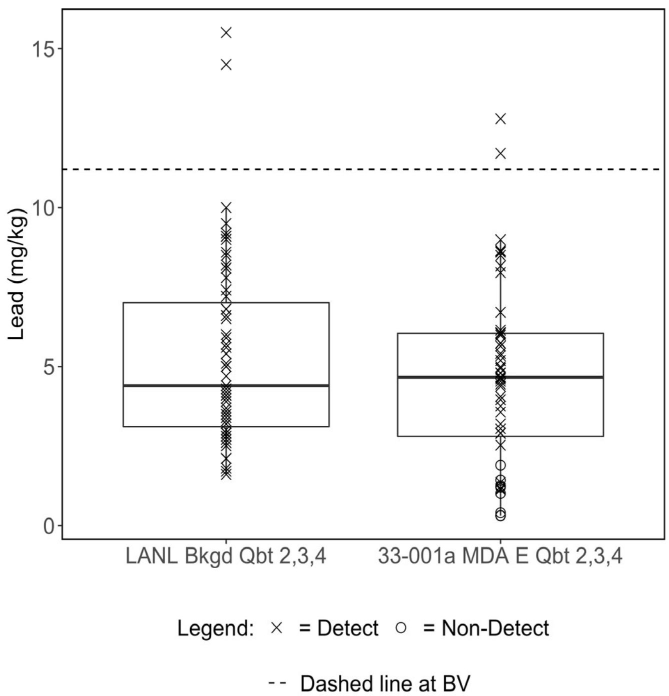


Figure F-17 Bpox plot for lead in Qbt 2,3,4 at SWMUs 33-001(a–e)

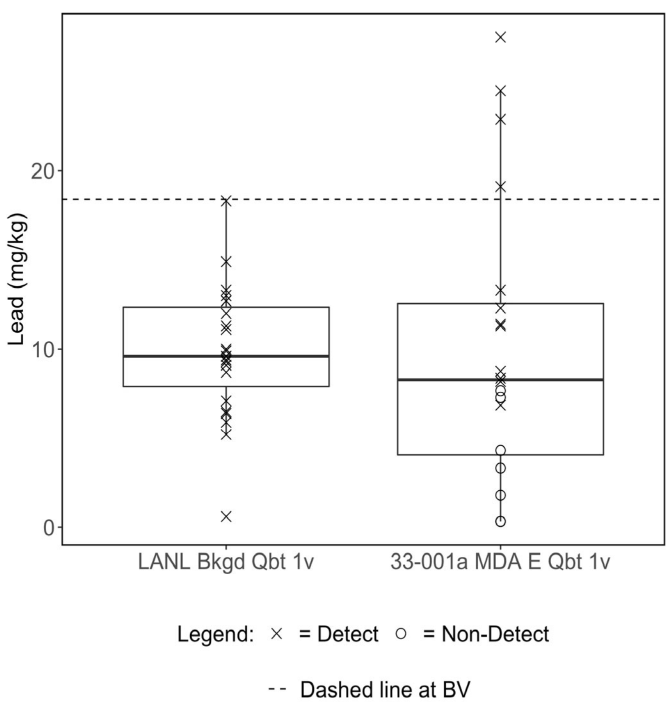


Figure F-18 Box plot for lead in Qbt 1v at SWMUs 33-001(a–e)

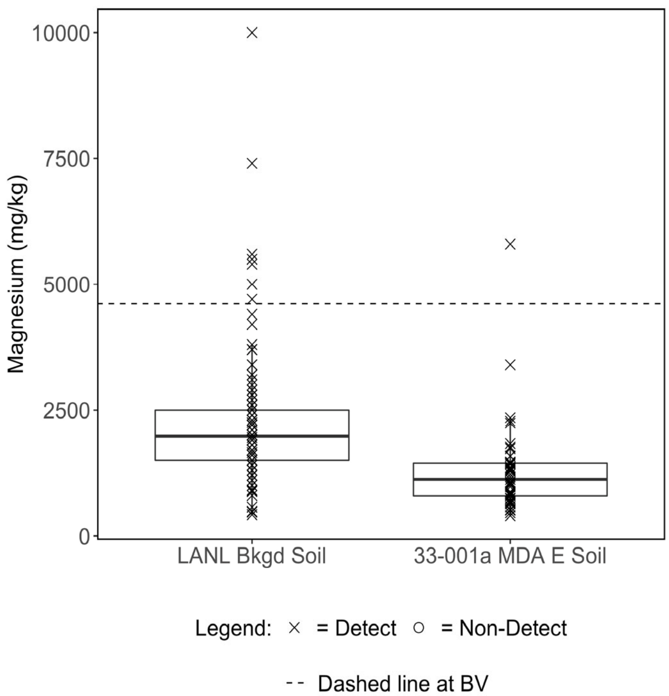


Figure F-19 Box plot for magnesium in soil at SWMUs 33-001(a–e)

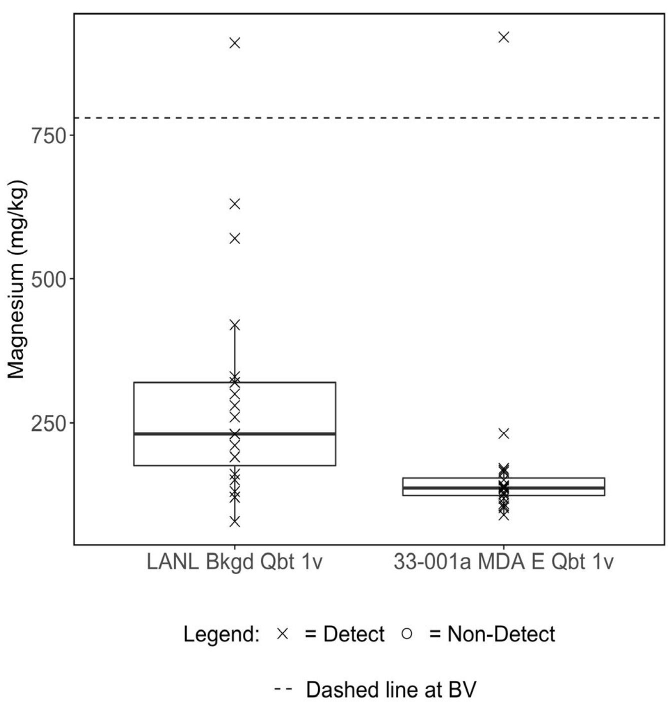


Figure F-20 Box plot for magnesium in Qbt 1v at SWMUs 33-001(a–e)

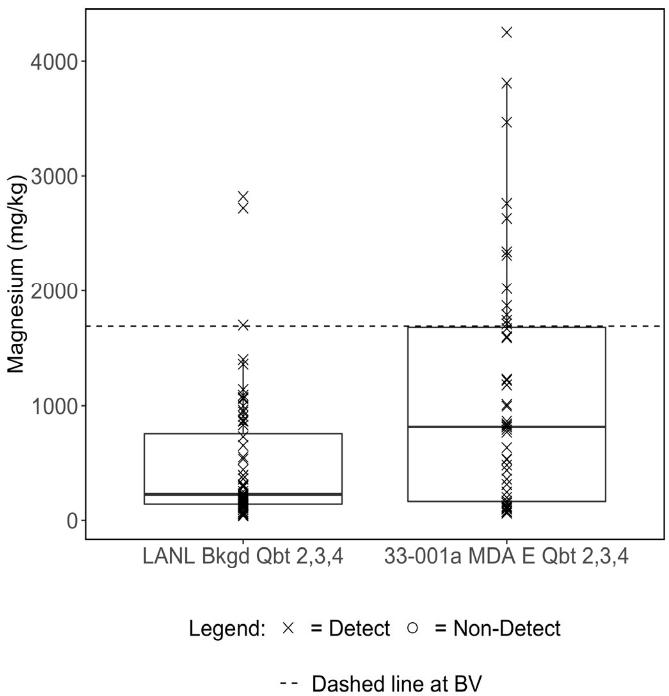


Figure F-21 Box plot for magnesium in Qbt 2,3,4 at SWMUs 33-001(a–e)

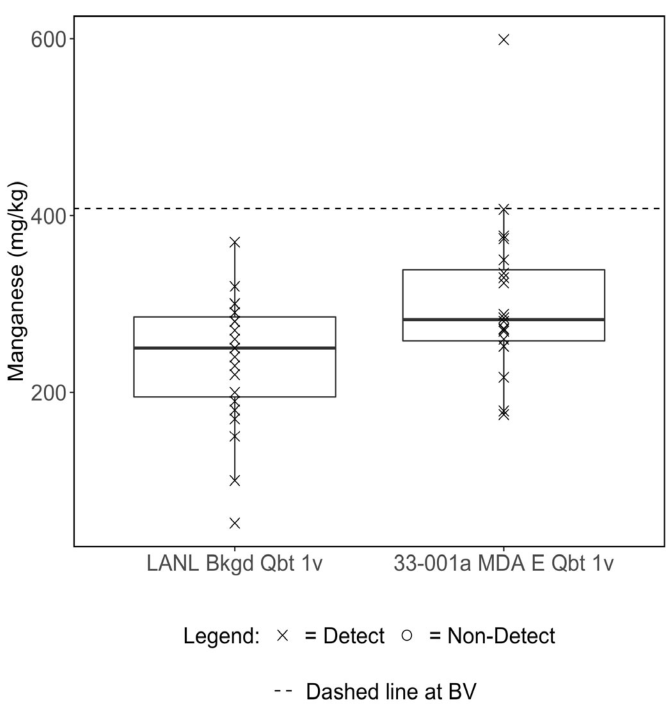
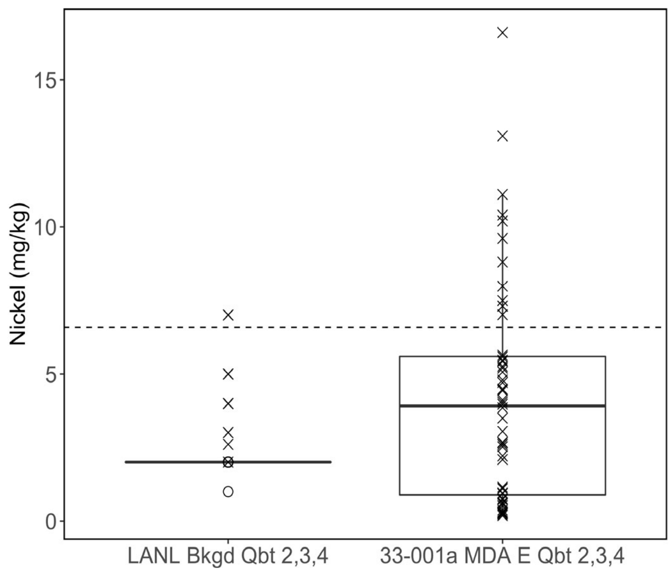


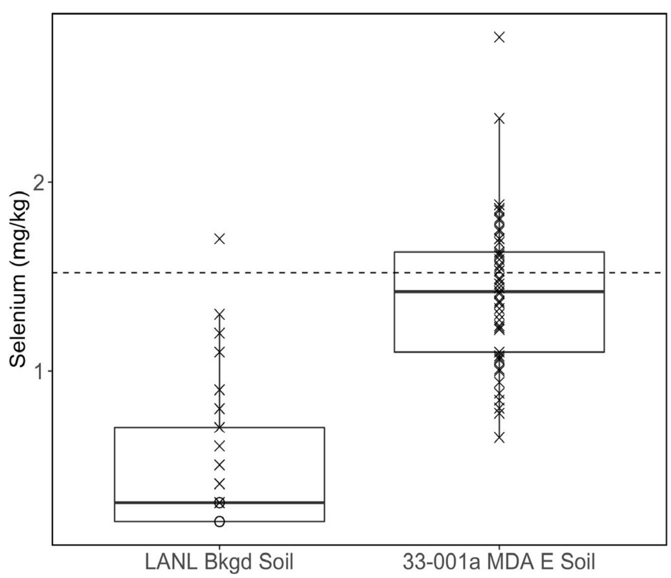
Figure F-22 Box plot for manganese in Qbt 1v at SWMUs 33-001(a–e)



Legend: × = Detect ○ = Non-Detect

-- Dashed line at BV

Figure F-23 Box plot for nickel in Qbt 2,3,4 at SWMUs 33-001(a–e)



Legend: × = Detect ○ = Non-Detect

-- Dashed line at BV

Figure F-24 Box plot for selenium in soil at SWMUs 33-001(a–e)

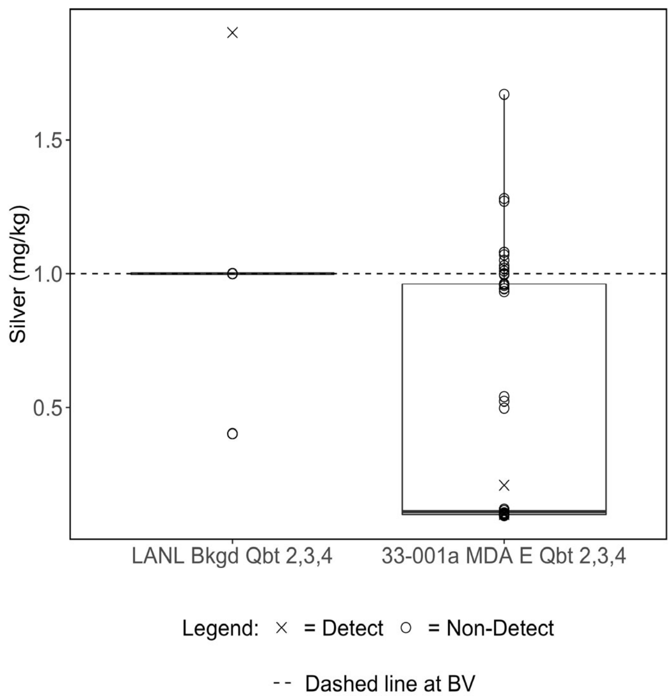


Figure F-25 Box plot for silver in Qbt 2,3,4 at SWMUs 33-001(a–e)

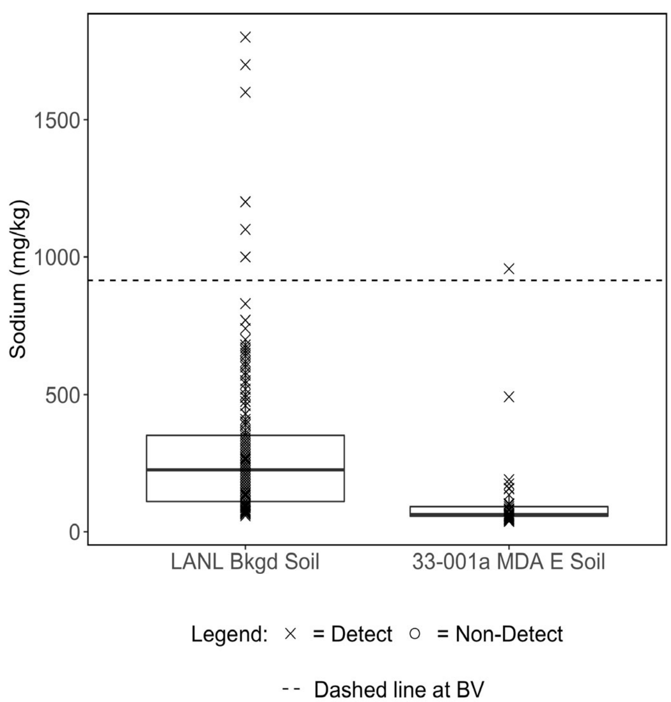


Figure F-26 Box plot for sodium in soil at SWMUs 33-001(a–e)

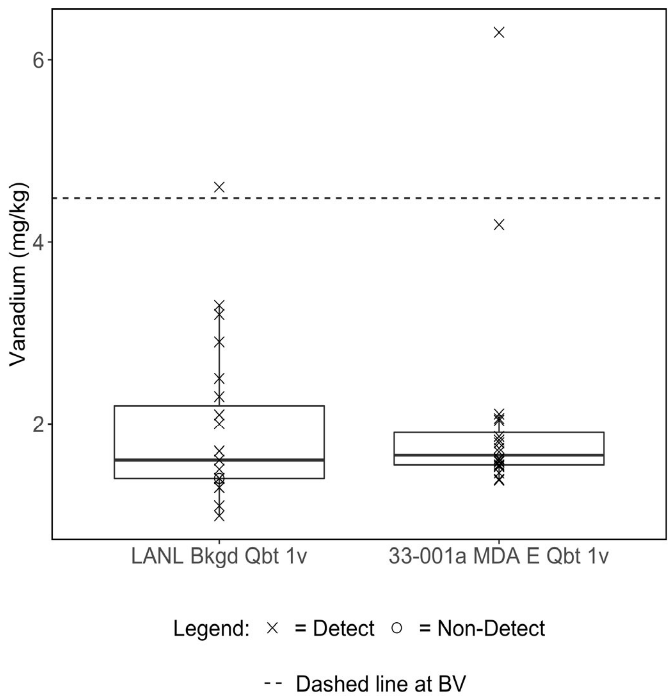


Figure F-27 Box plot for vanadium in Qbt 1v at SWMUs 33-001(a–e)

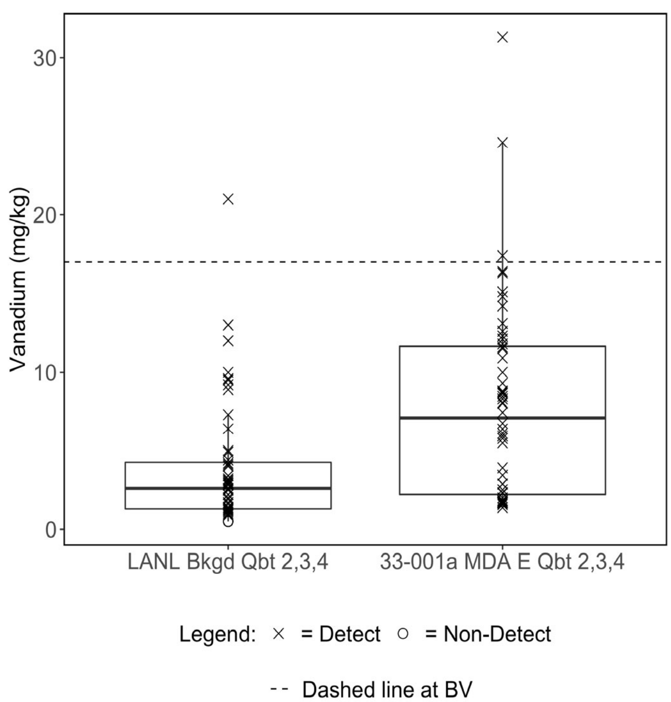


Figure F-28 Box plot for vanadium in Qbt 2,3,4 at SWMUs 33-001(a–e)

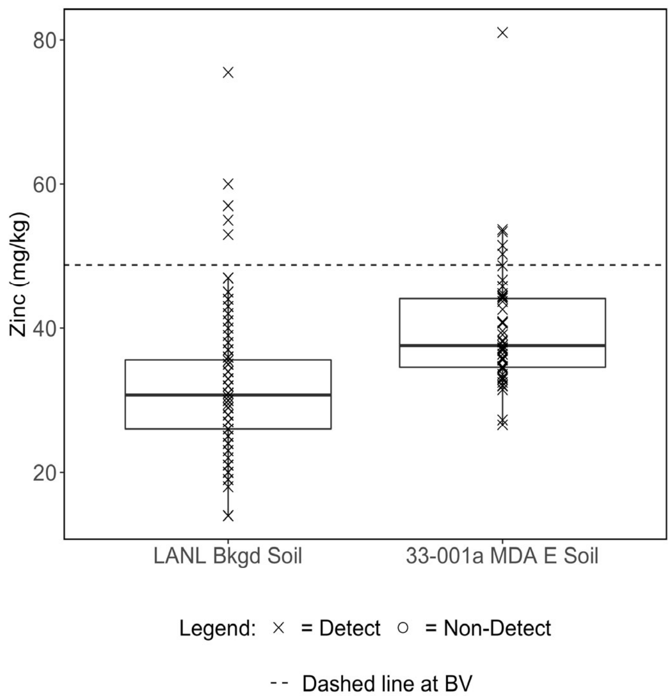


Figure F-29 Box plot for zinc in soil at SWMUs 33-001(a–e)

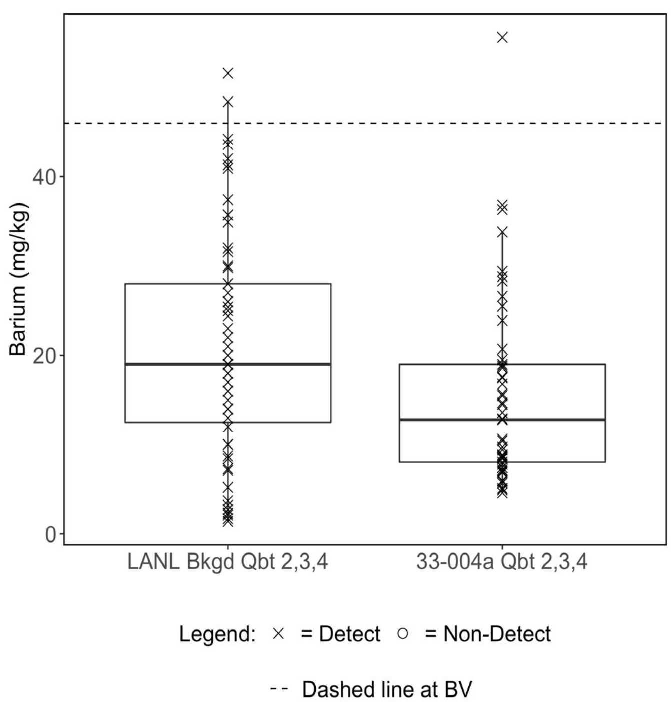


Figure F-30 Box plot for barium in Qbt 2,3,4 at SWMU 33-004(a)

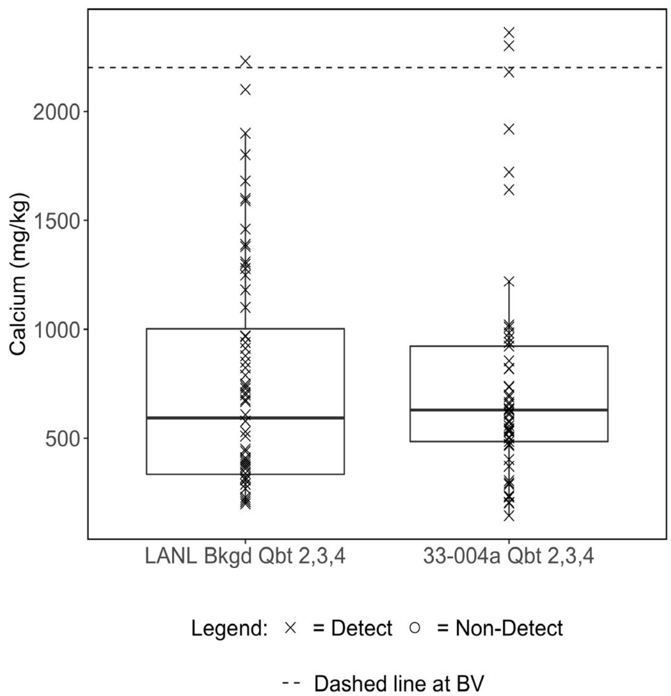


Figure F-31 Box plot for calcium in Qbt 2,3,4 at SWMU 33-004(a)

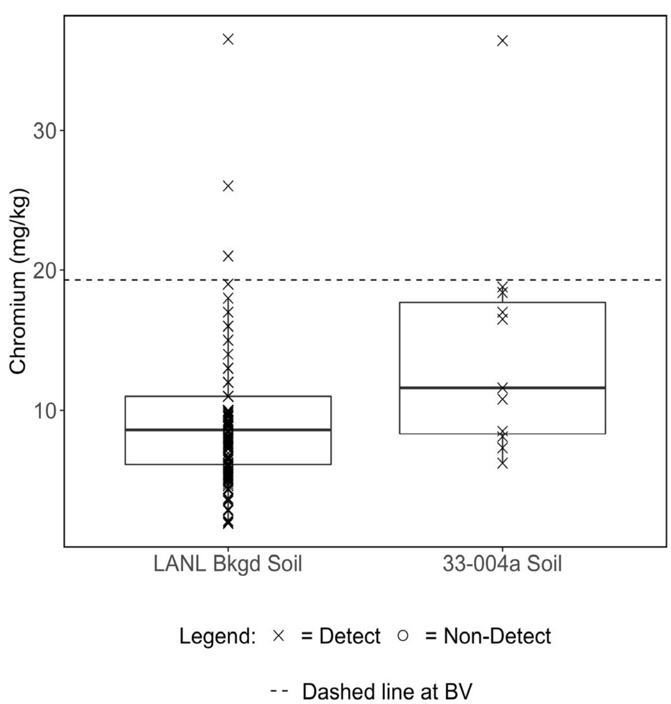


Figure F-32 Box plot for chromium in soil at SWMU 33-004(a)

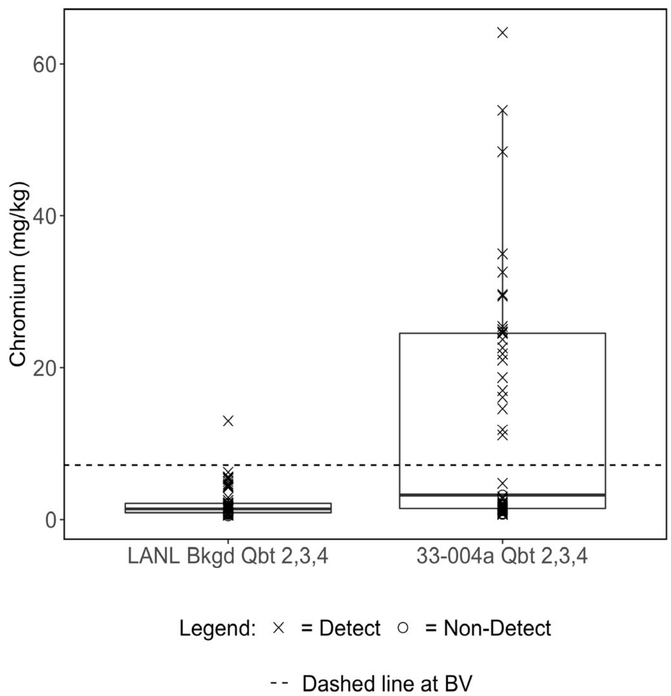


Figure F-33 Box plot for chromium in Qbt 2,3,4 at SWMU 33-004(a)

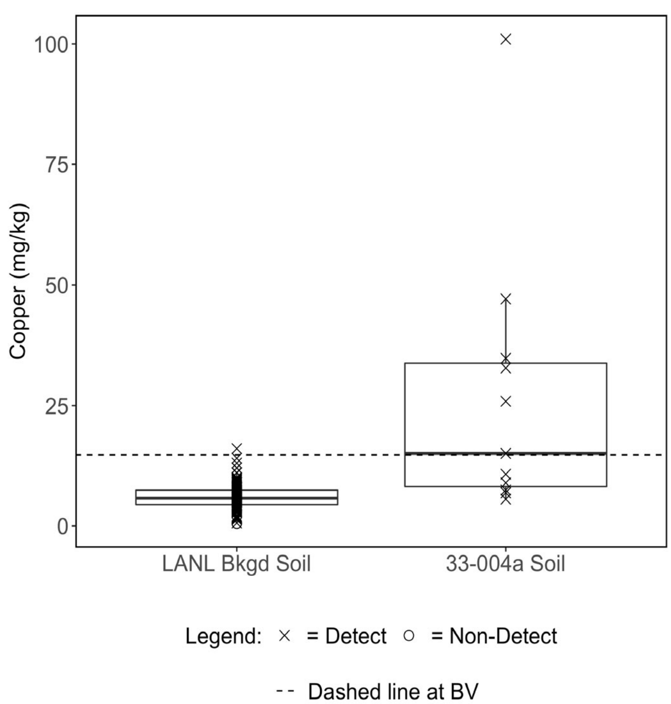


Figure F-34 Box plot for copper in soil at SWMU 33-004(a)

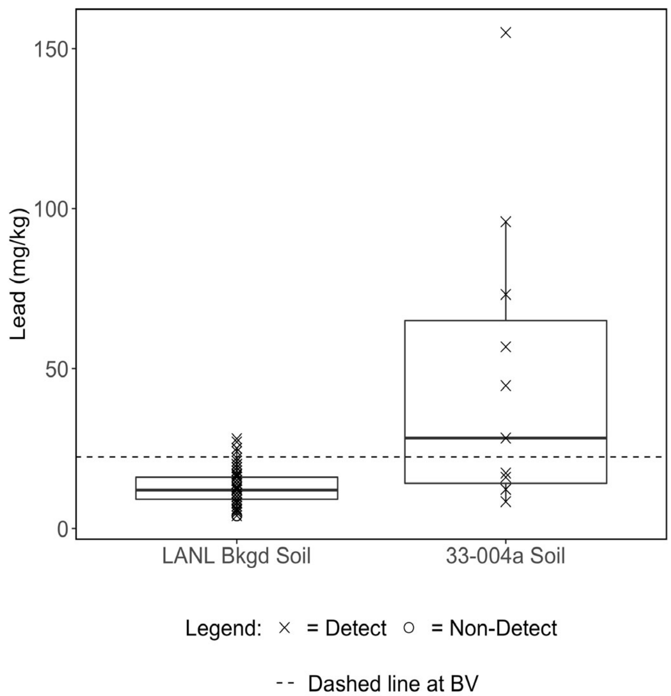


Figure F-35 Box plot for lead in soil at SWMU 33-004(a)

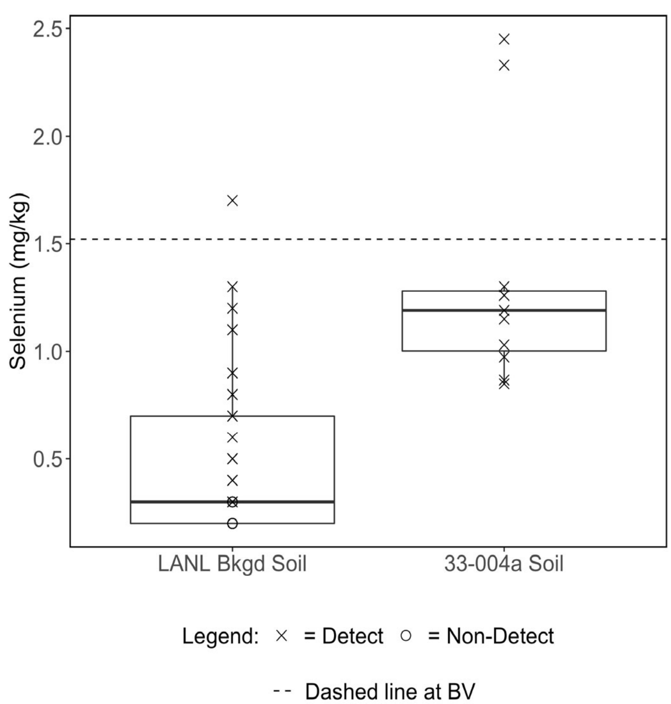


Figure F-36 Box plot for selenium in soil at SWMU 33-004(a)

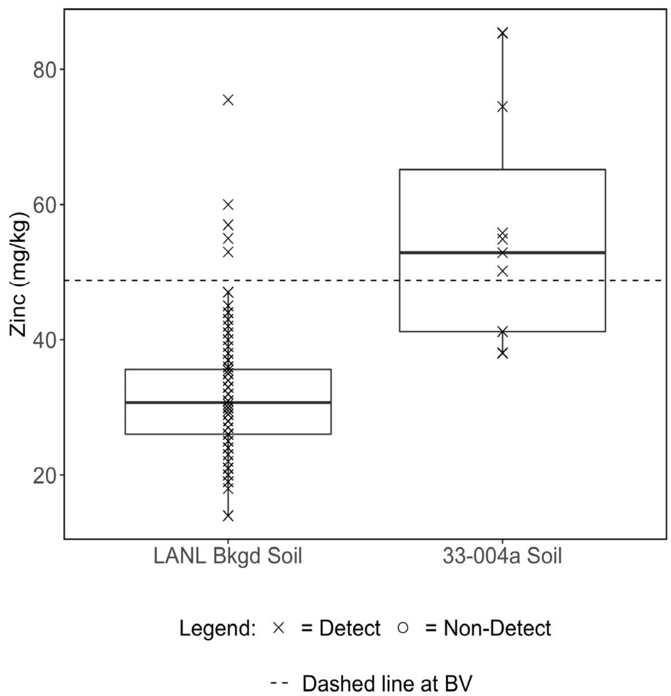


Figure F-37 Box plot for zinc in soil at SWMU 33-004(a)

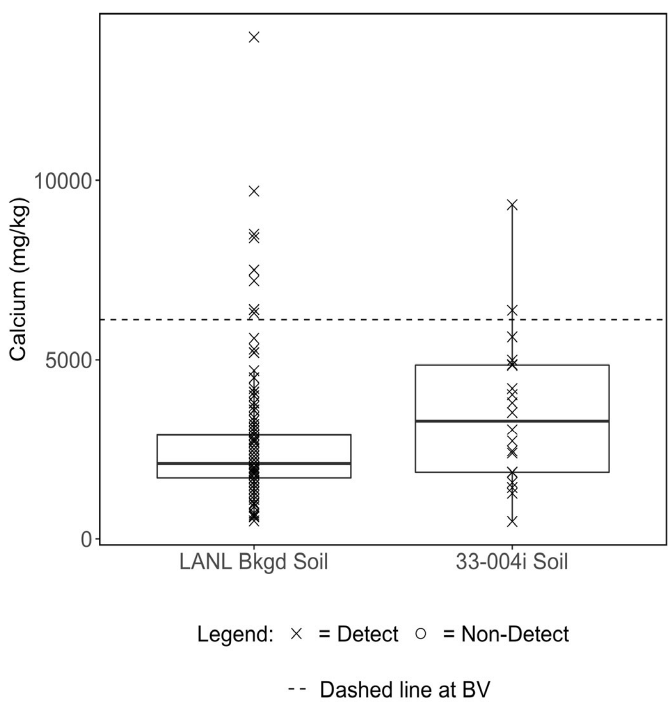


Figure F-38 Box plot for calcium in soil at SWMU 33-004(i)

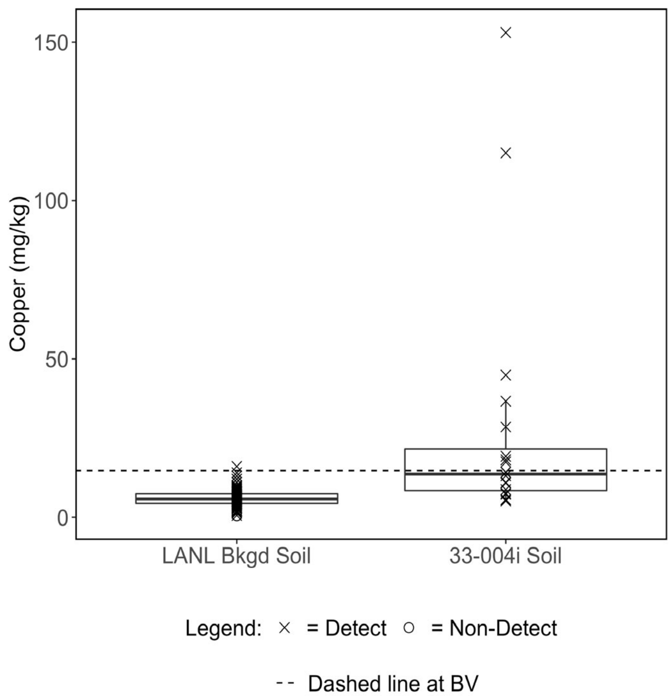


Figure F-39 Box plot for copper in soil at SWMU 33-004(i)

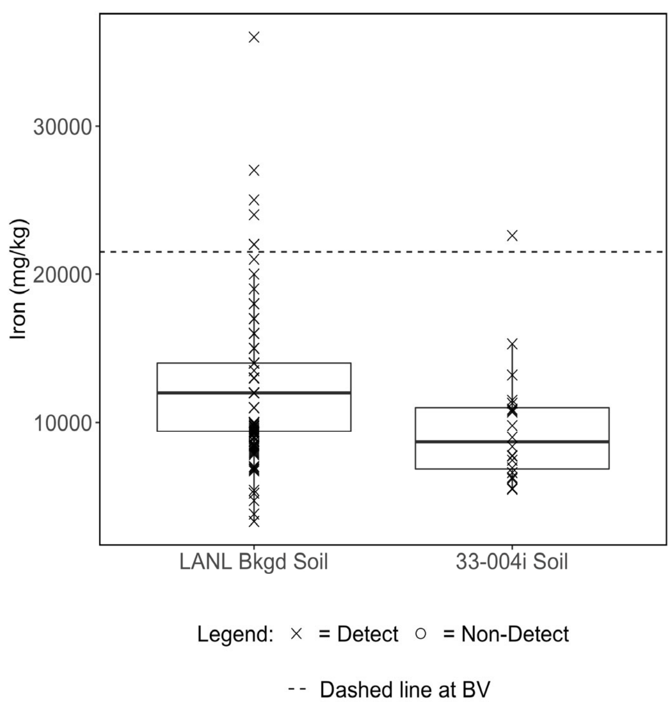


Figure F-40 Box plot for iron in soil at SWMU 33-004(i)

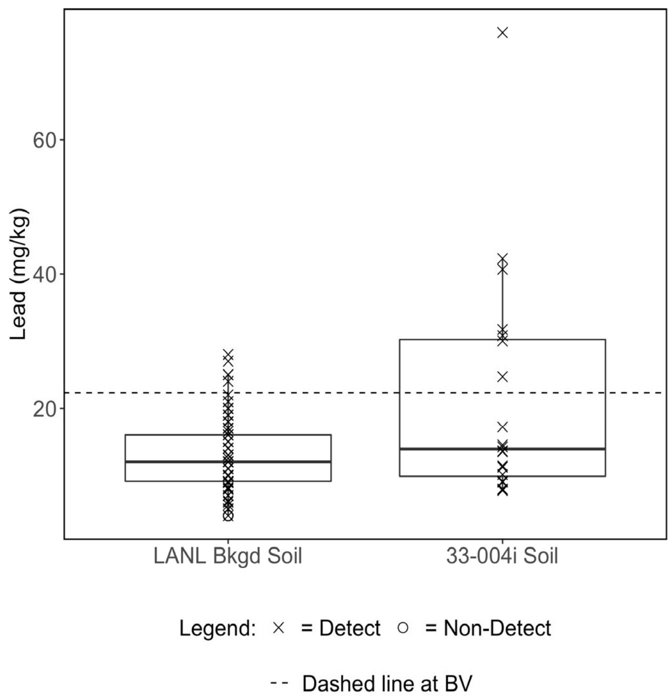


Figure F-41 Box plot for lead in soil at SWMU 33-004(i)

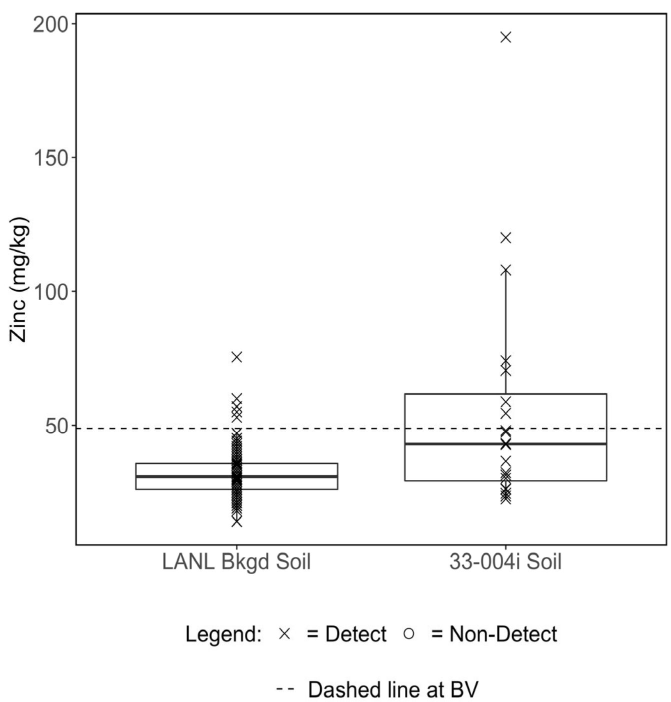


Figure F-42 Box plot for zinc in soil at SWMU 33-004(i)

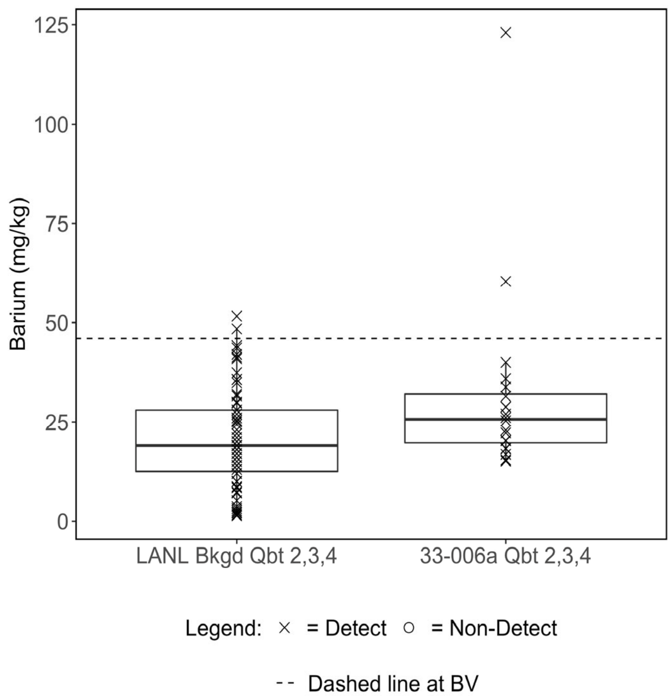


Figure F-43 Box plot for barium in Qbt 2,3,4 at SWMU 33-006(a)

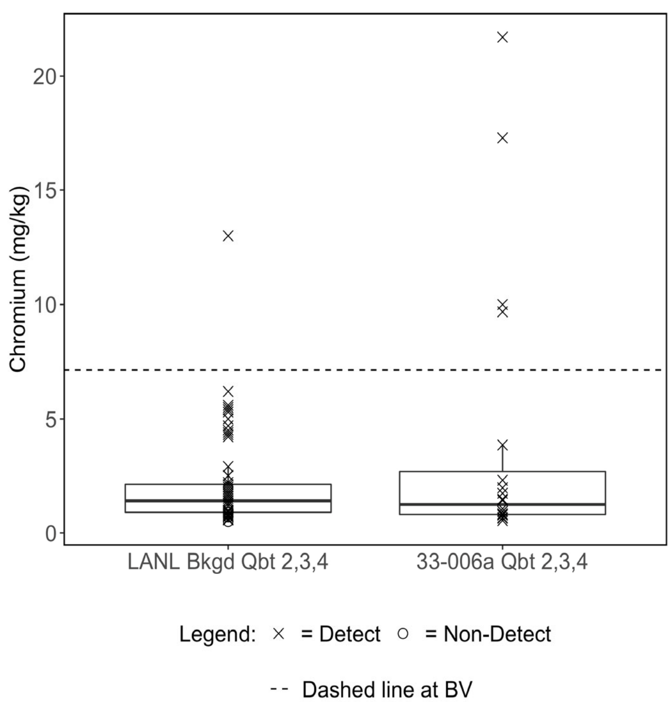


Figure F-44 Box plot for chromium in Qbt 2,3,4 at SWMU 33-006(a)

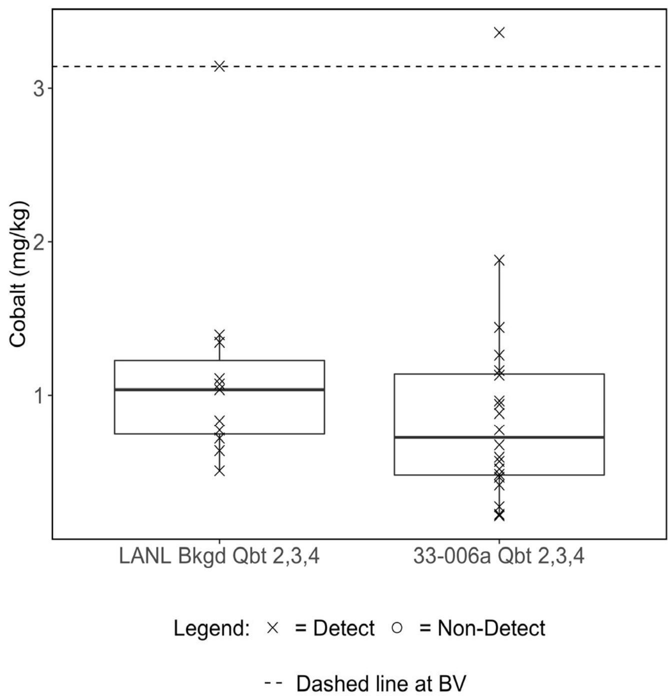


Figure F-45 Box plot for cobalt in Qbt 2,3,4 at SWMU 33-006(a)

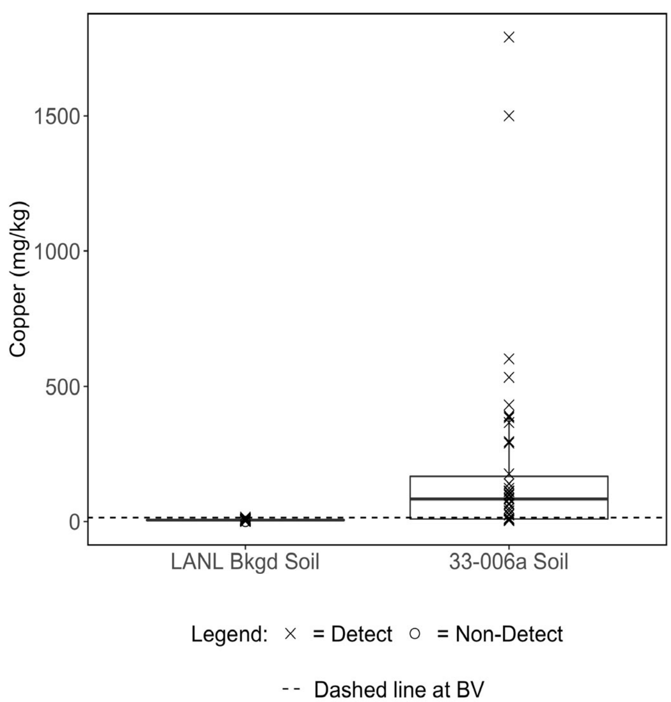


Figure F-46 Box plot for copper in soil at SWMU 33-006(a)

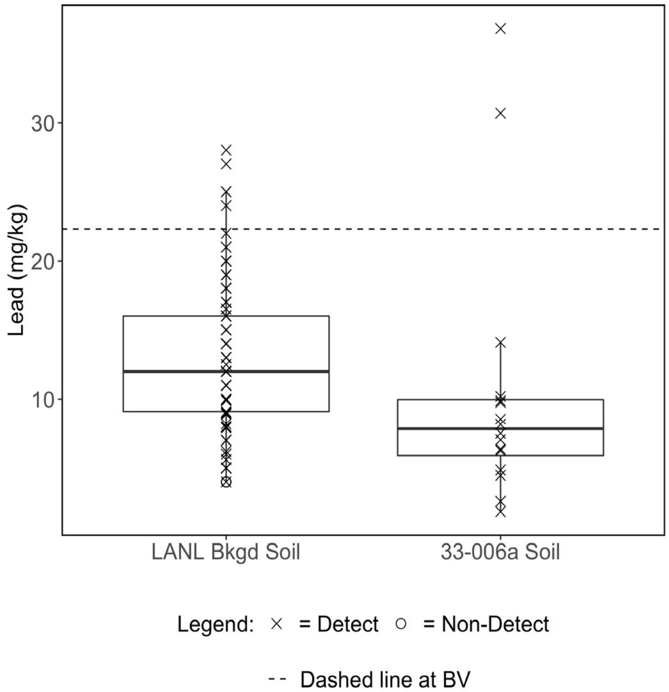


Figure F-47 Box plot for lead in soil at SWMU 33-006(a)

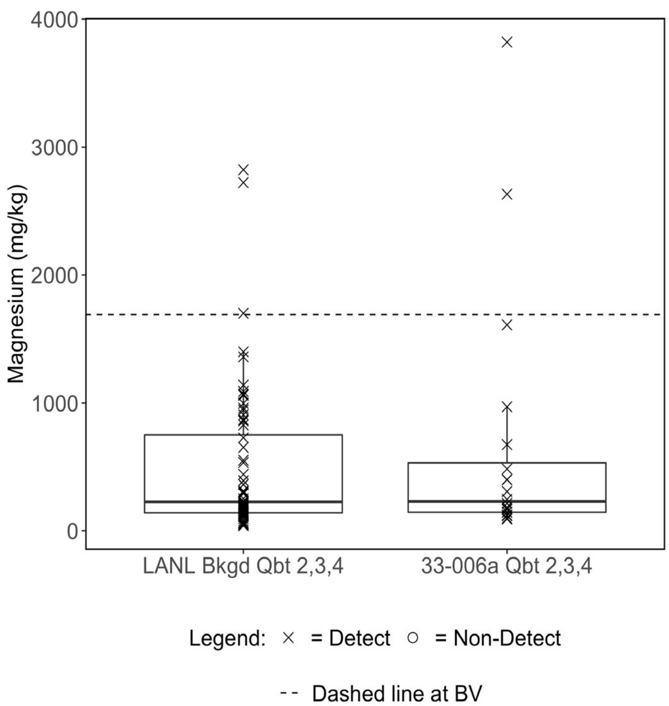


Figure F-48 Box plot for magnesium in Qbt 2,3,4 at SWMU 33-006(a)

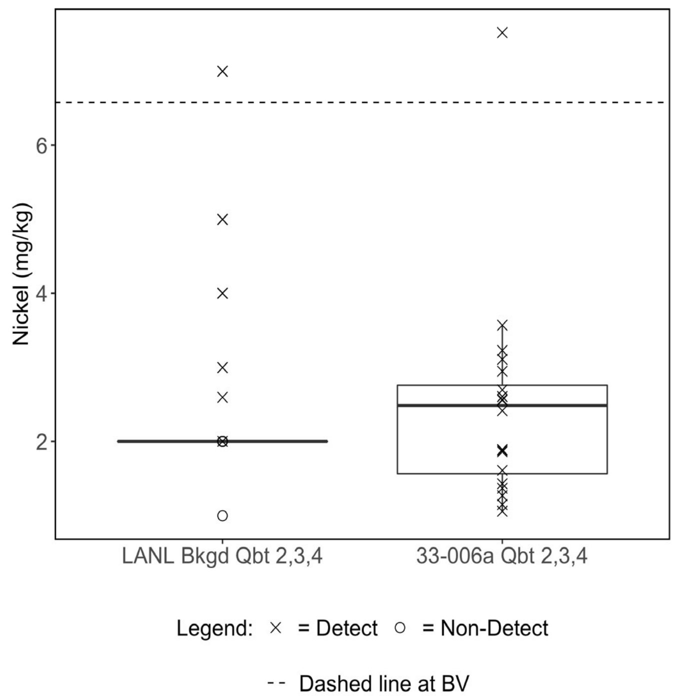


Figure F-49 Box plot for nickel in Qbt 2,3,4 at SWMU 33-006(a)

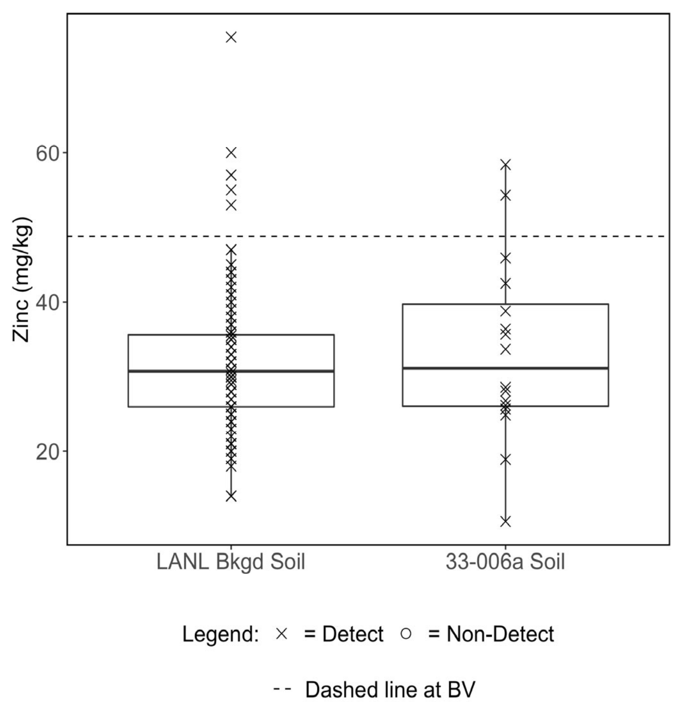


Figure F-50 Box plot for zinc in soil at SWMU 33-006(a)

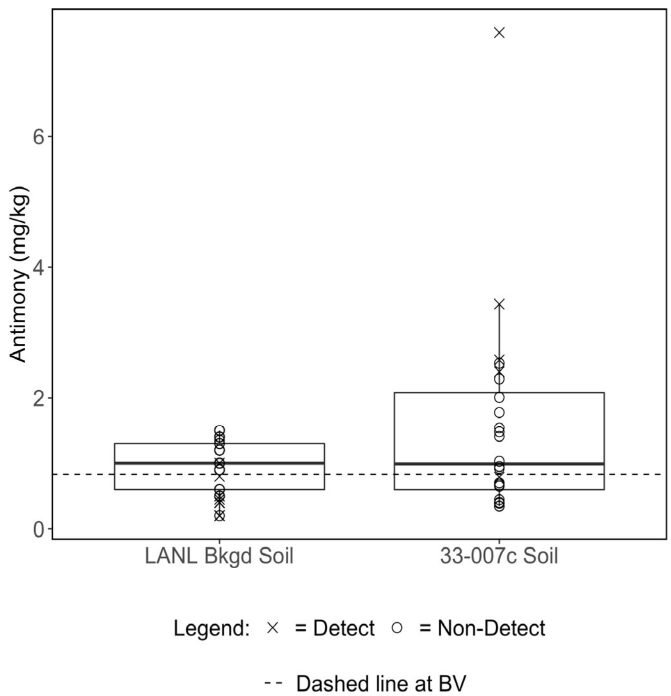


Figure F-51 Box plot for antimony in soil at SWMU 33-007(c)

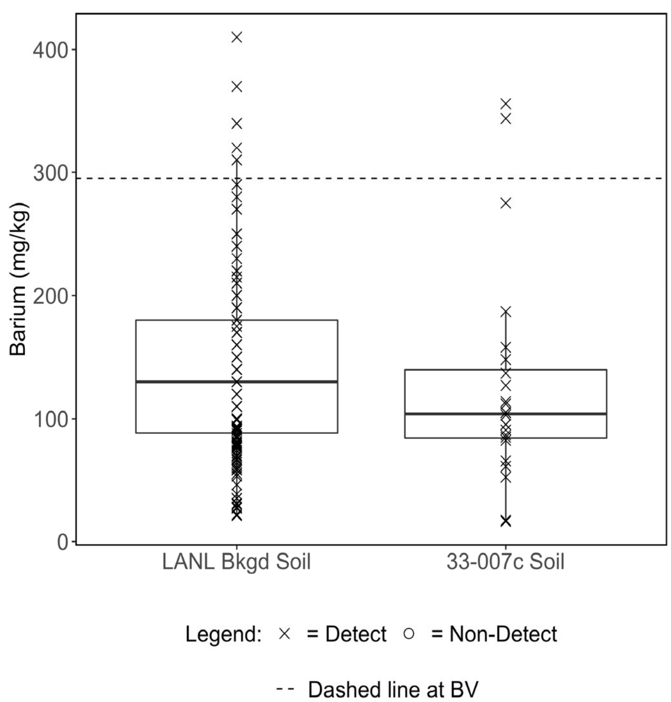


Figure F-52 Box plot for barium in soil at SWMU 33-007(c)

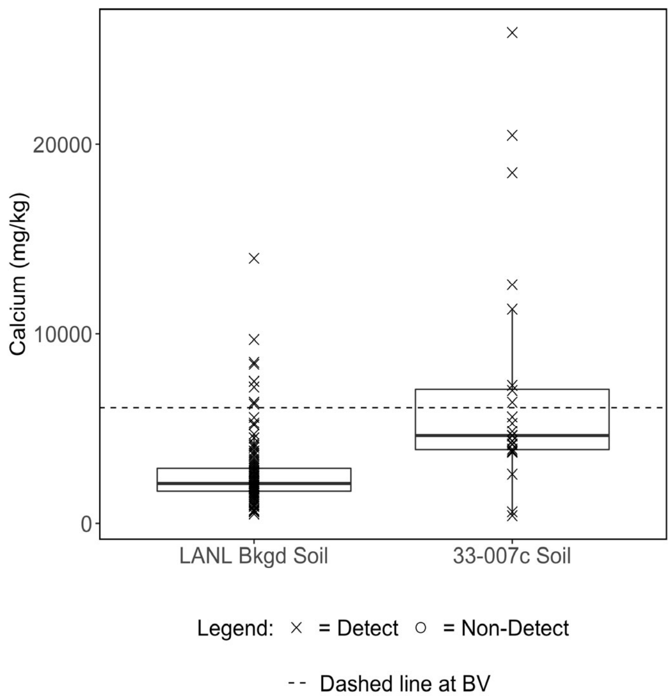


Figure F-53 Box plot for calcium in soil at SWMU 33-007(c)

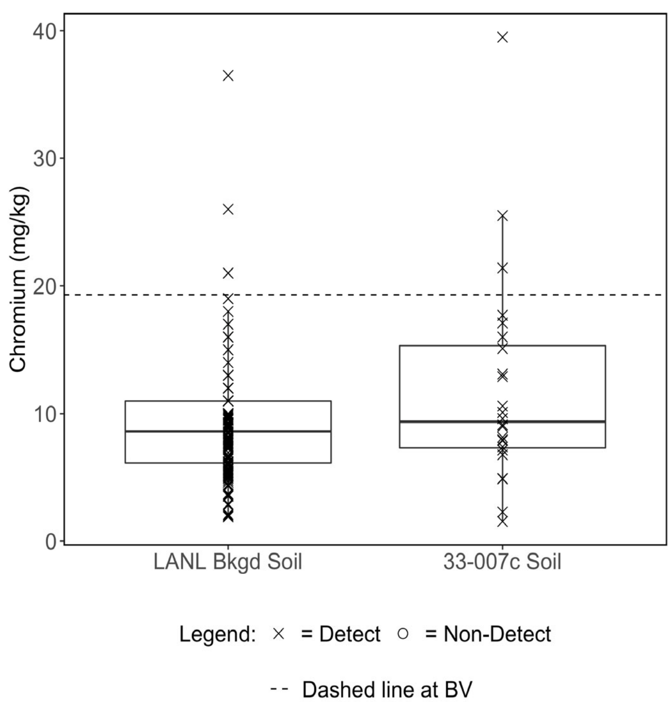


Figure F-54 Box plot for chromium in soil at SWMU 33-007(c)

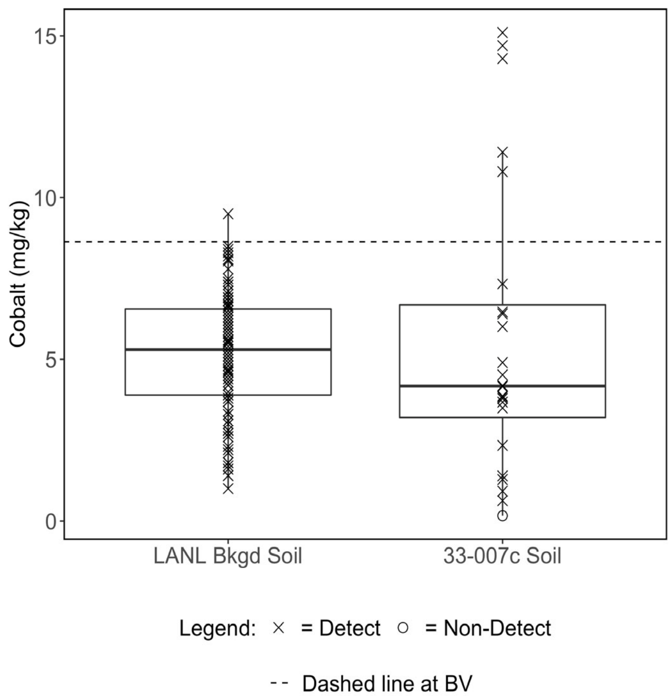


Figure F-55 Box plot for cobalt in soil at SWMU 33-007(c)

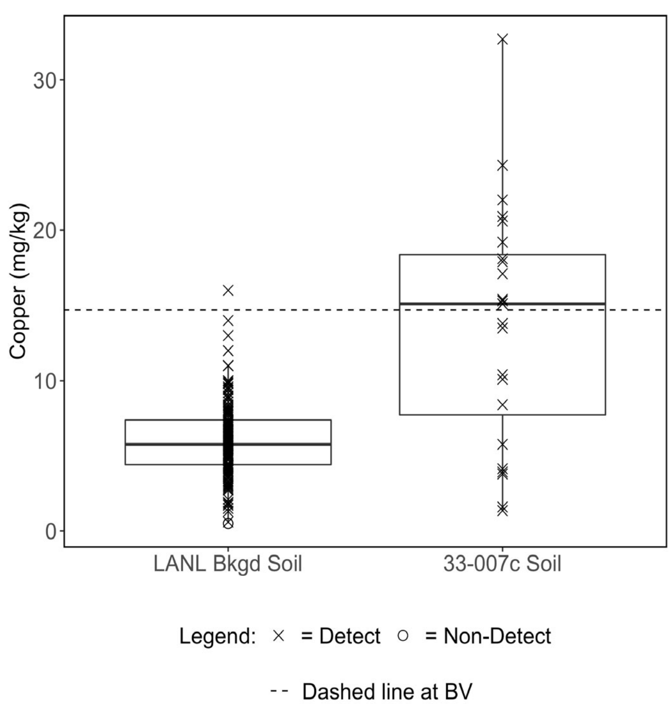


Figure F-56 Box plot for copper in soil at SWMU 33-007(c)

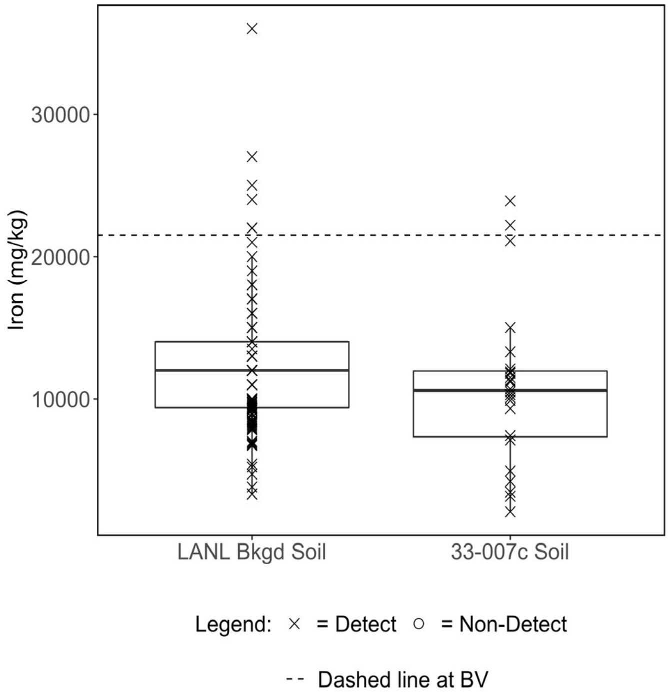


Figure F-57 Box plot for iron in soil at SWMU 33-007(c)

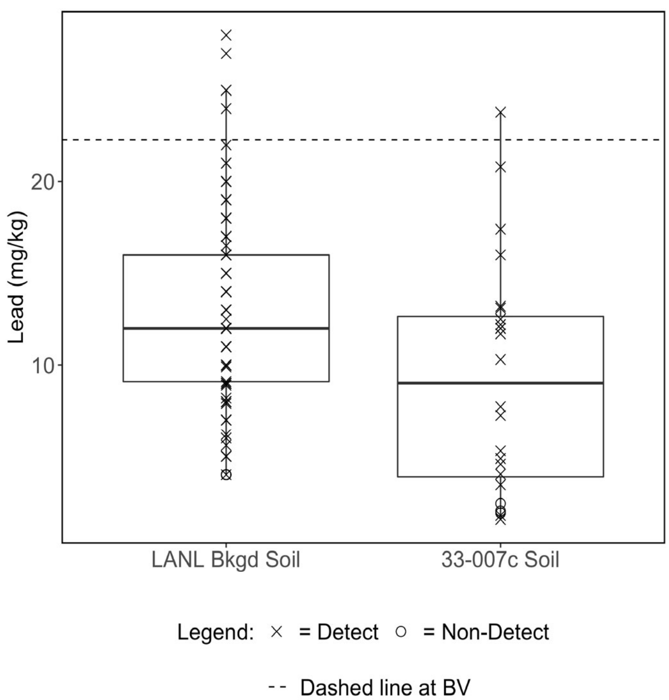


Figure F-58 Box plot for lead in soil at SWMU 33-007(c)

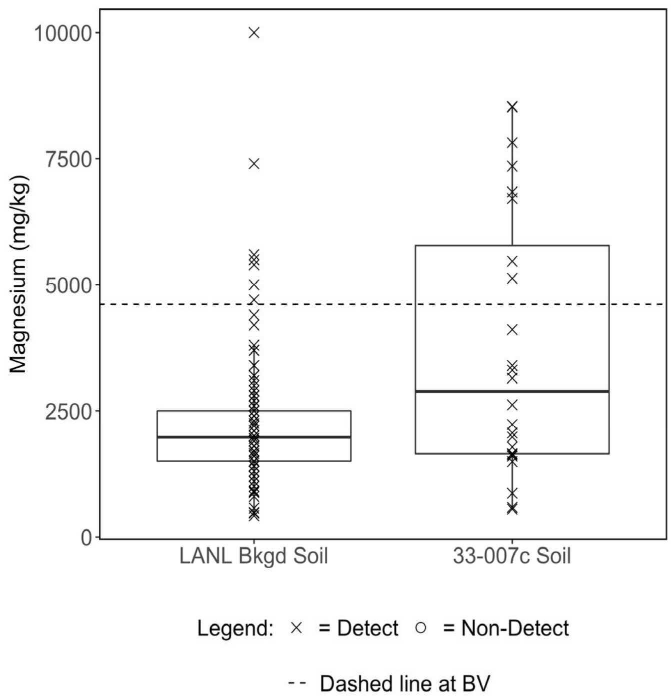


Figure F-59 Box plot for magnesium in soil at SWMU 33-007(c)

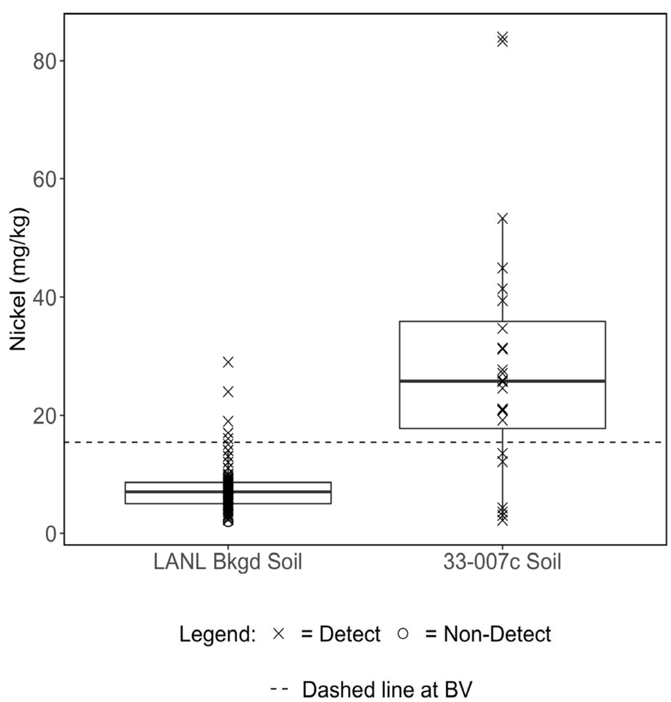


Figure F-60 Box plot for nickel in soil at SWMU 33-007(c)

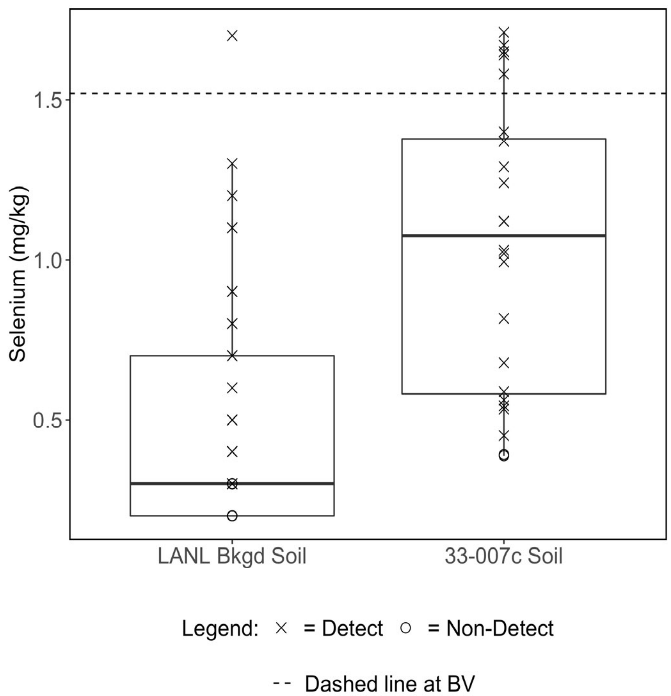


Figure F-61 Box plot for selenium in soil at SWMU 33-007(c)

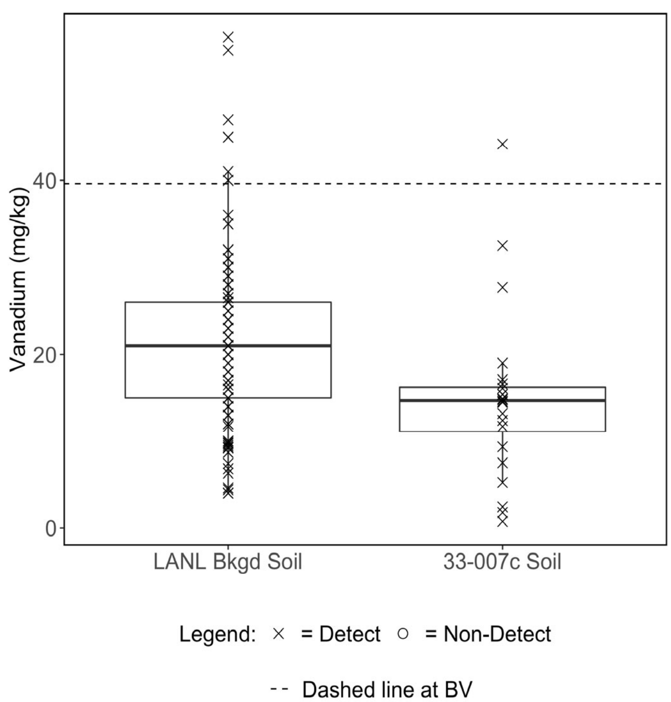


Figure F-62 Box plot for vanadium in soil at SWMU 33-007(c)

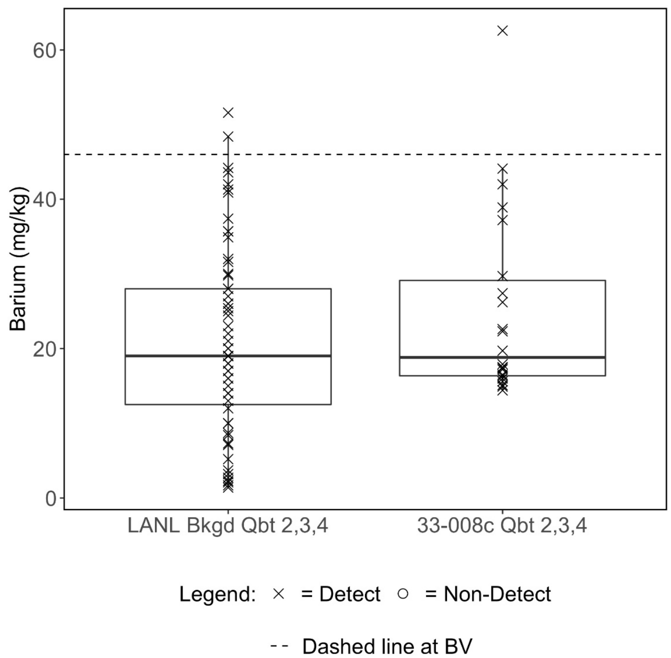


Figure F-63 Box plot for barium in Qbt 2,3,4 at SWMU 33-008(c)

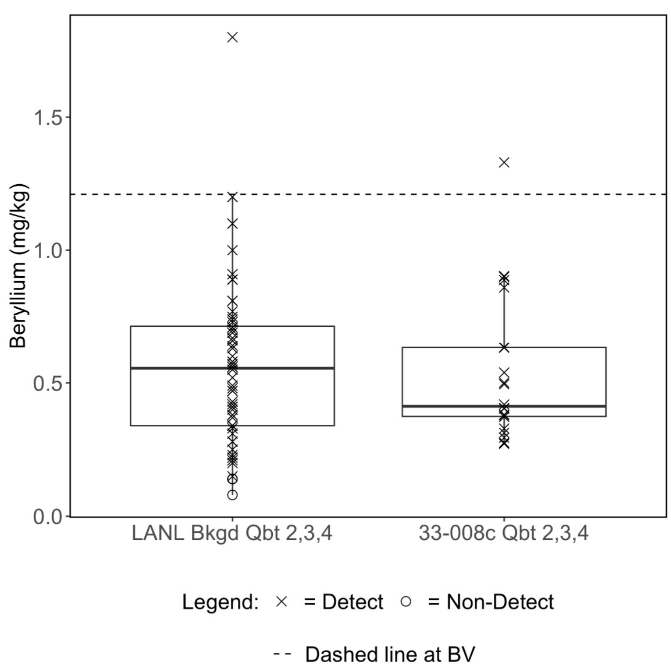


Figure F-64 Box plot for beryllium in Qbt 2,3,4 at SWMU 33-008(c)

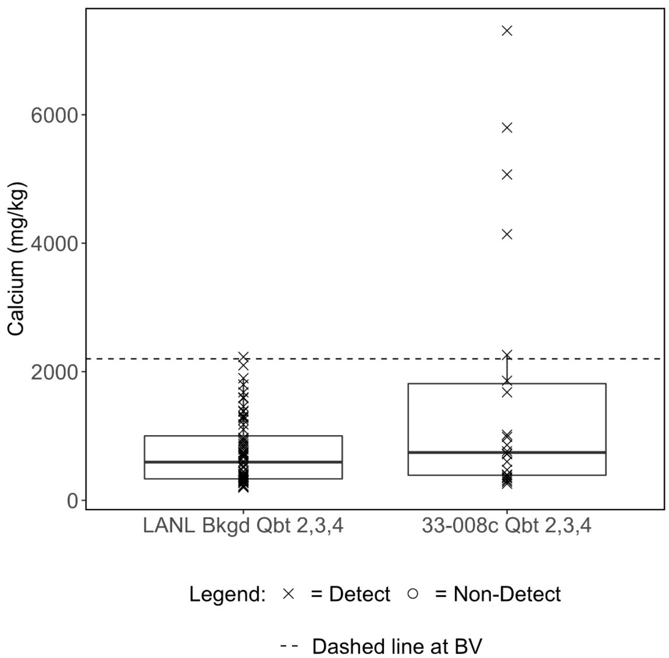


Figure F-65 Box plot for calcium in Qbt 2,3,4 at SWMU 33-008(c)

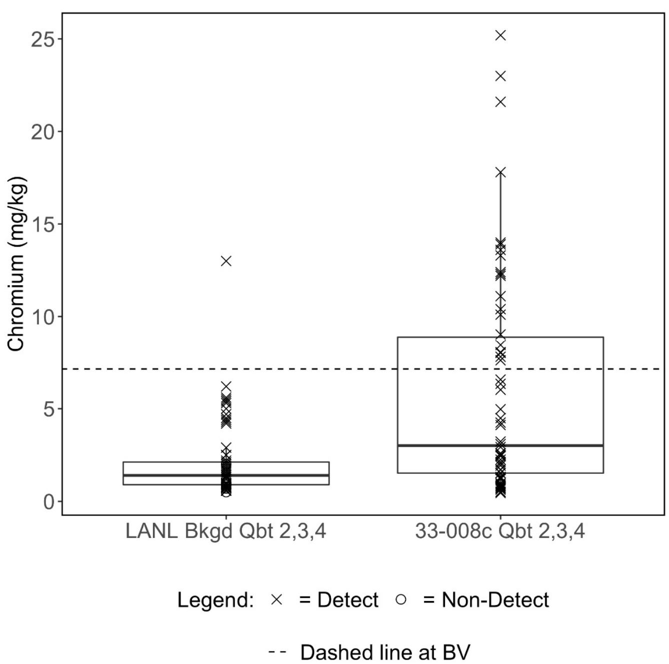


Figure F-66 Box plot for chromium in Qbt 2,3,4 at SWMU 33-008(c)

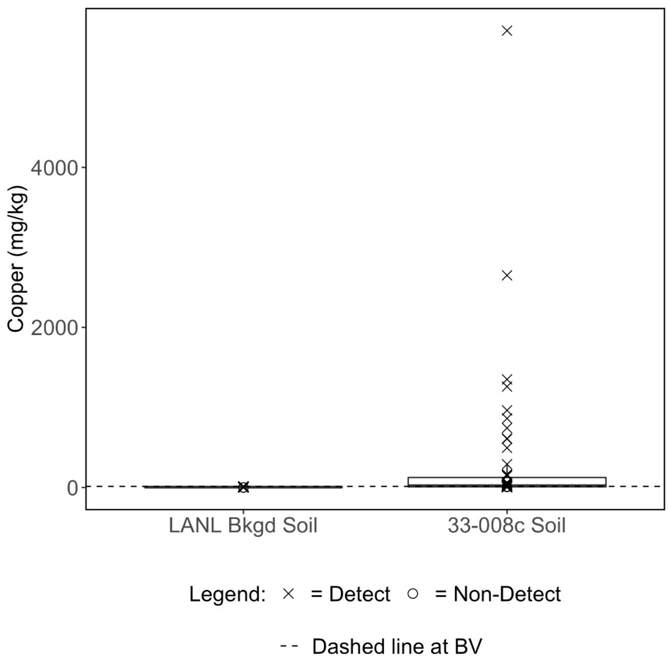


Figure F-67 Box plot for copper in soil at SWMU 33-008(c)

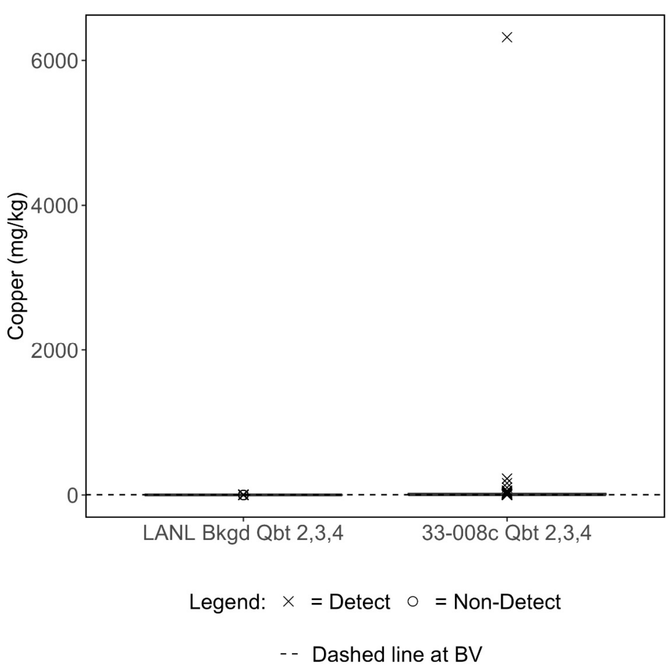


Figure F-68 Box plot for copper in Qbt 2,3,4 at SWMU 33-008(c)

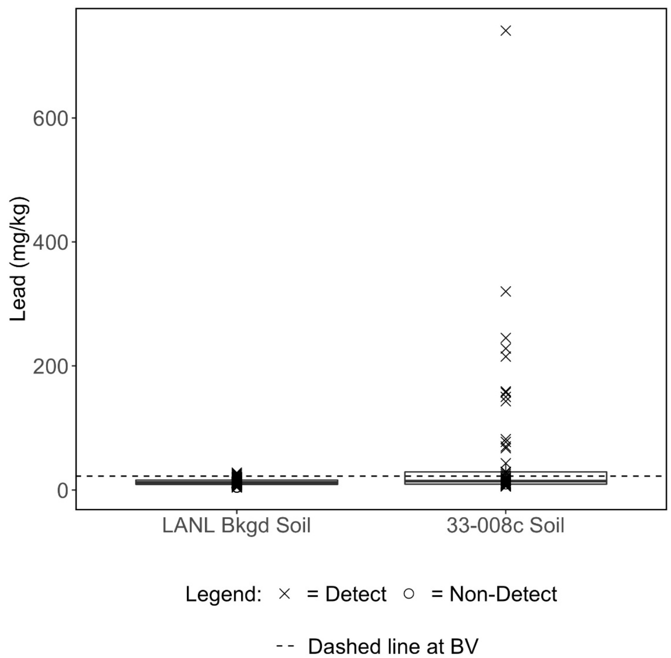


Figure F-69 Box plot for lead in soil at SWMU 33-008(c)

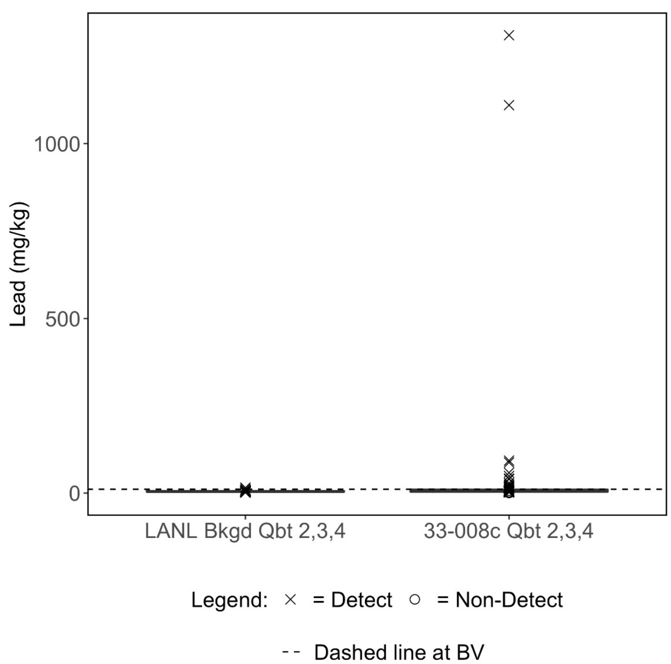


Figure F-70 Box plot for lead in Qbt 2,3,4 at SWMU 33-008(c)

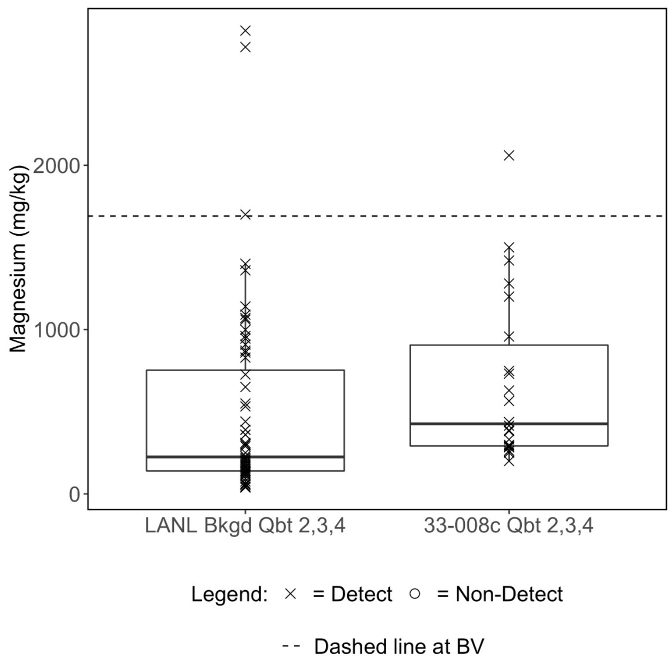


Figure F-71 Box plot for magnesium in Qbt 2,3,4 at SWMU 33-008(c)

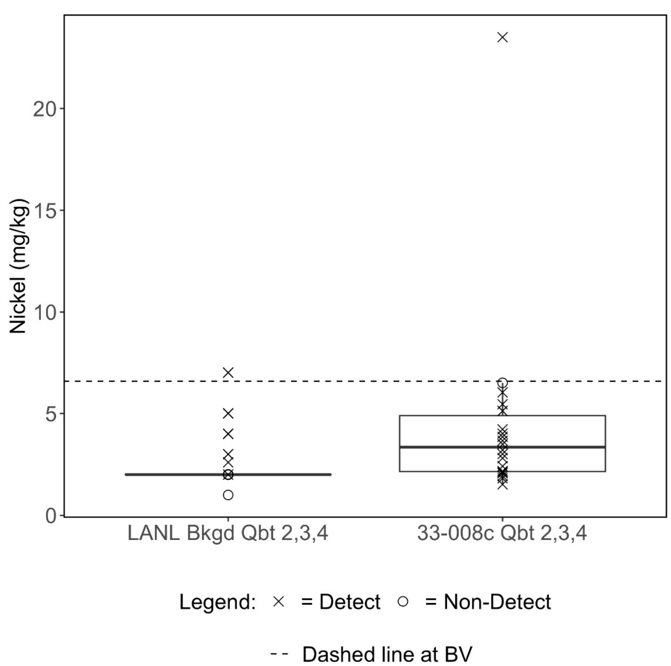


Figure F-72 Box plot for nickel in Qbt 2,3,4 at SWMU 33-008(c)

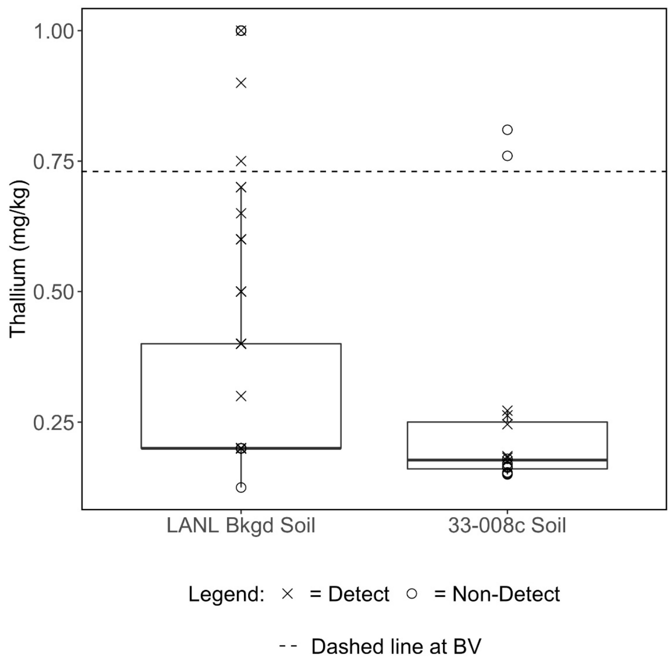


Figure F-73 Box plot for thallium in soil at SWMU 33-008(c)

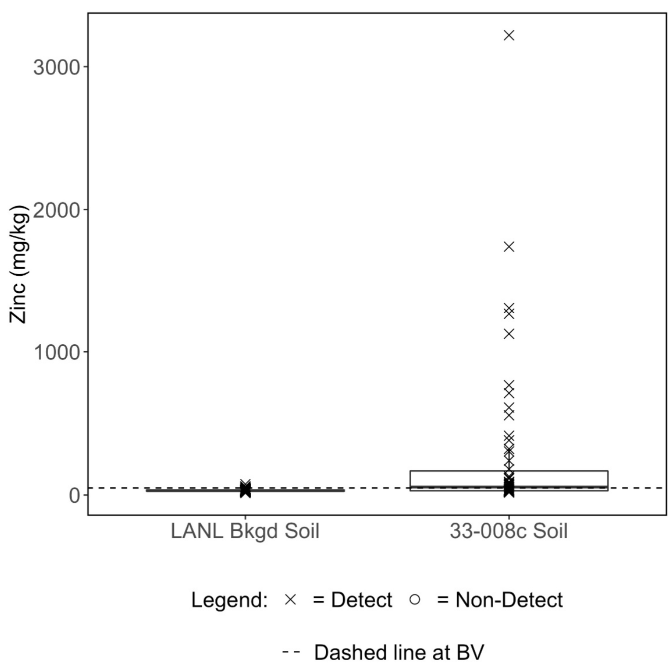


Figure F-74 Box plot for zinc in soil at SWMU 33-008(c)

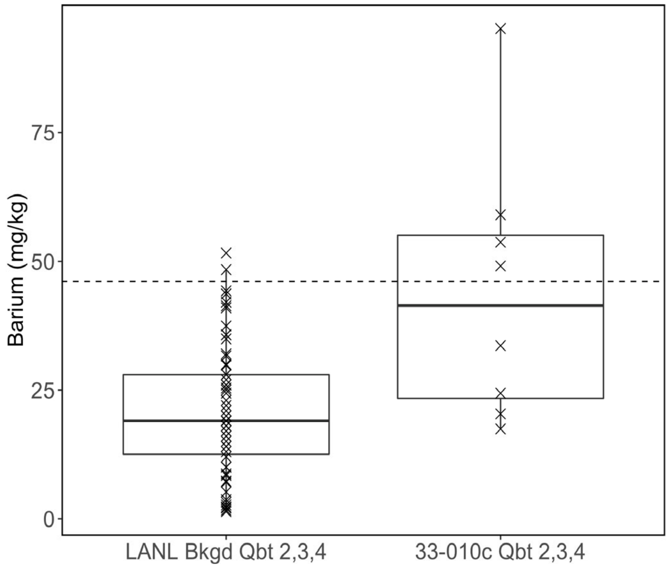


Figure F-75 Box plot for barium in Qbt 2,3,4 at SWMU 33-010(c)

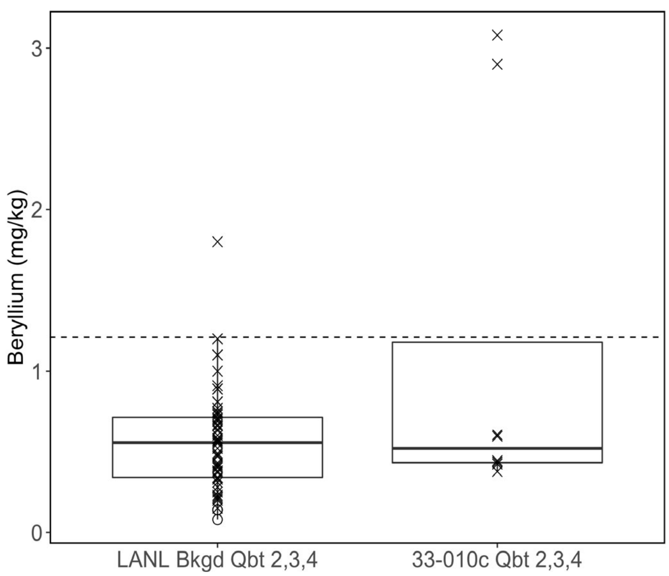


Figure F-76 Box plot for beryllium in Qbt 2,3,4 at SWMU 33-010(c)

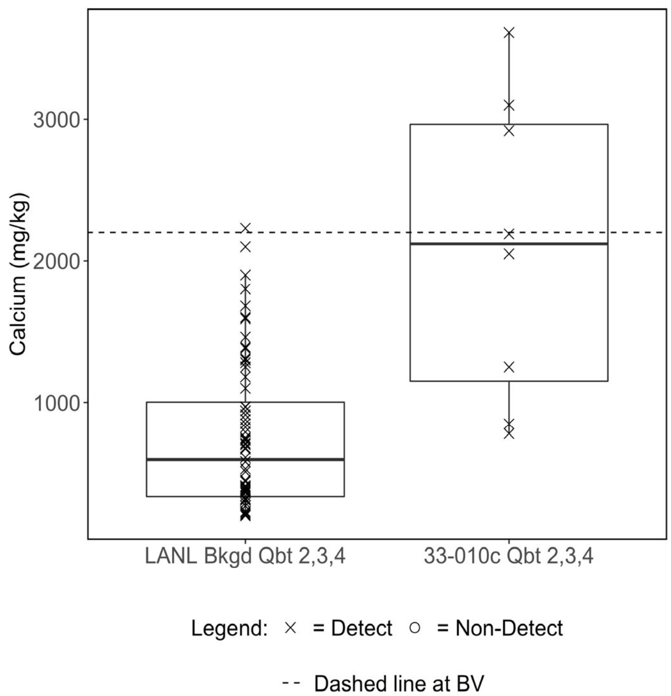


Figure F-77 Box plot for calcium in Qbt 2,3,4 at SWMU 33-010(c)

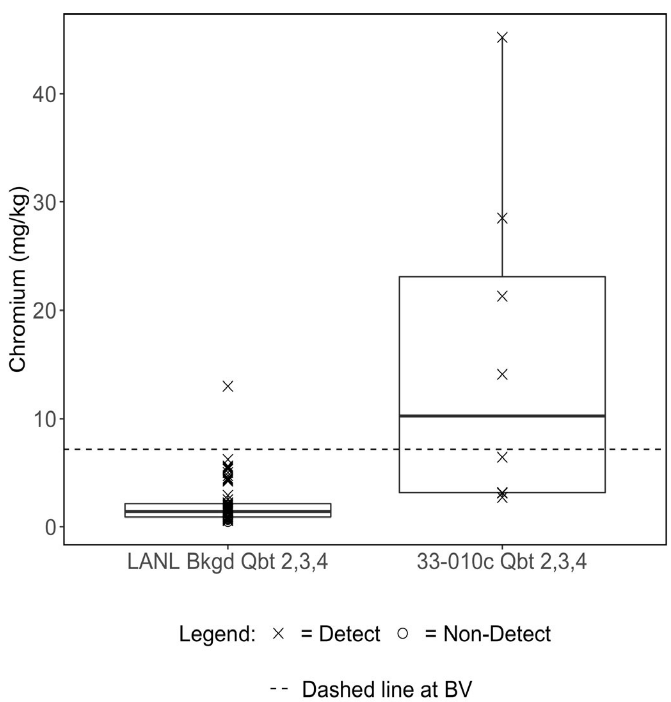


Figure F-78 Box plot for chromium in Qbt 2,3,4 at SWMU 33-010(c)

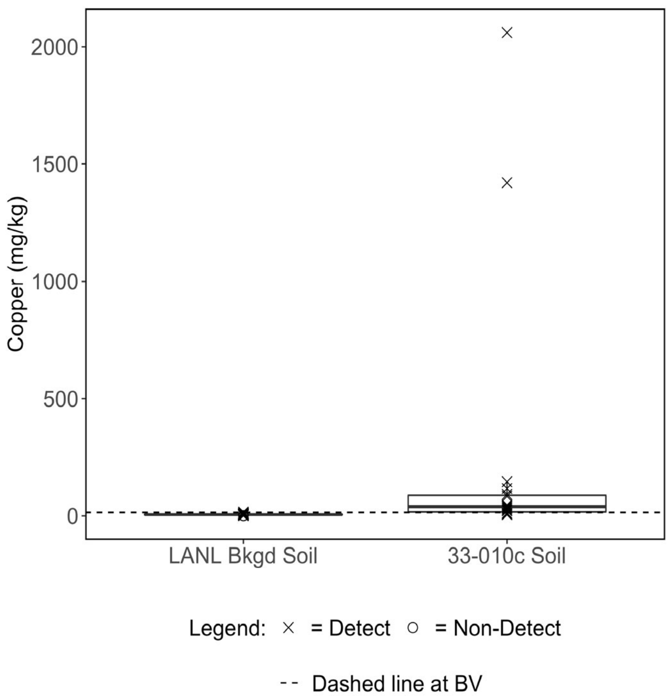


Figure F-79 Box plot for copper in soil at SWMU 33-010(c)

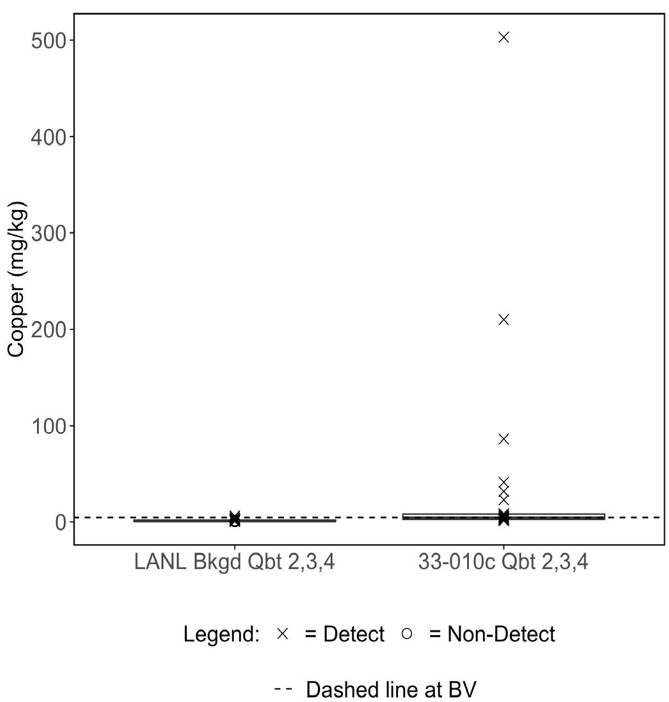


Figure F-80 Box plot for copper in Qbt 2,3,4 at SWMU 33-010(c)

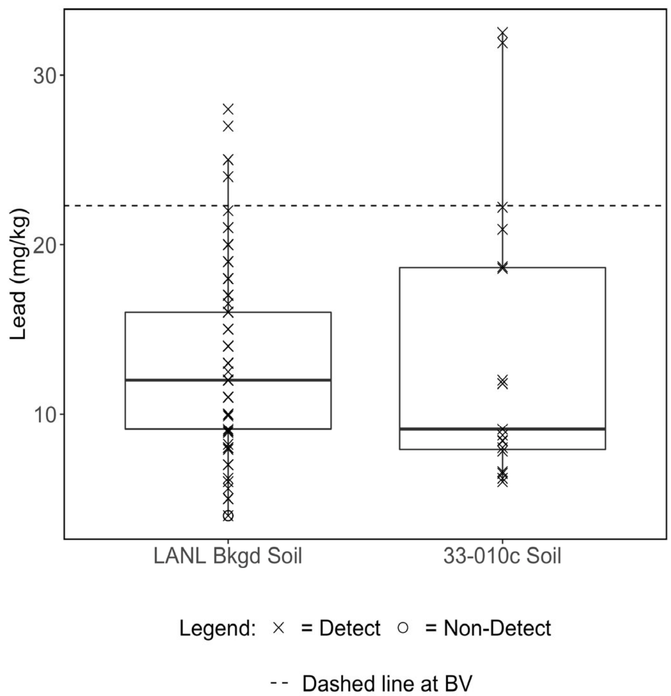


Figure F-81 Box plot for lead in soil at SWMU 33-010(c)

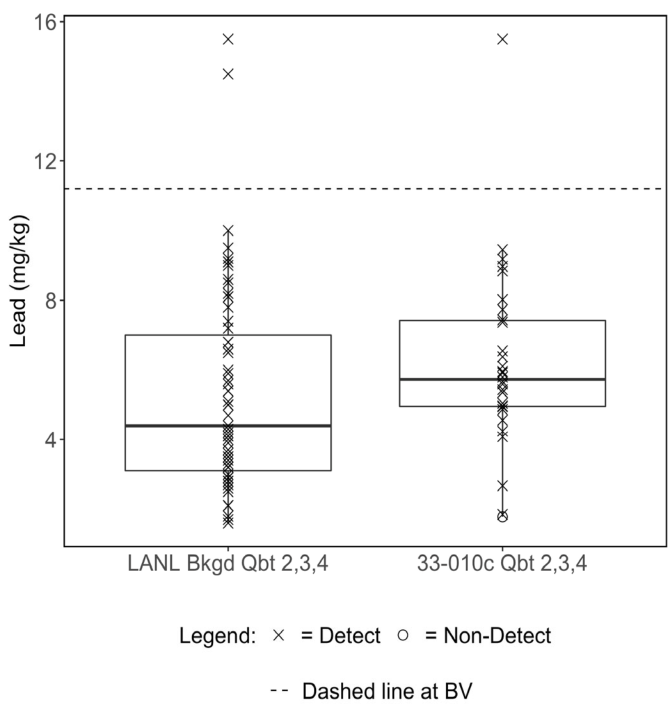


Figure F-82 Box plot for lead in Qbt 2,3,4 at SWMU 33-010(c)

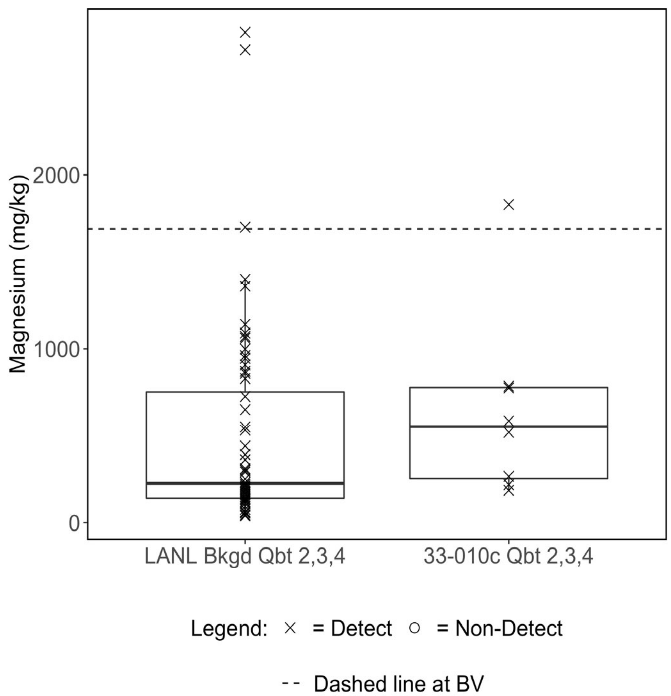


Figure F-83 Box plot for magnesium in Qbt 2,3,4 at SWMU 33-010(c)

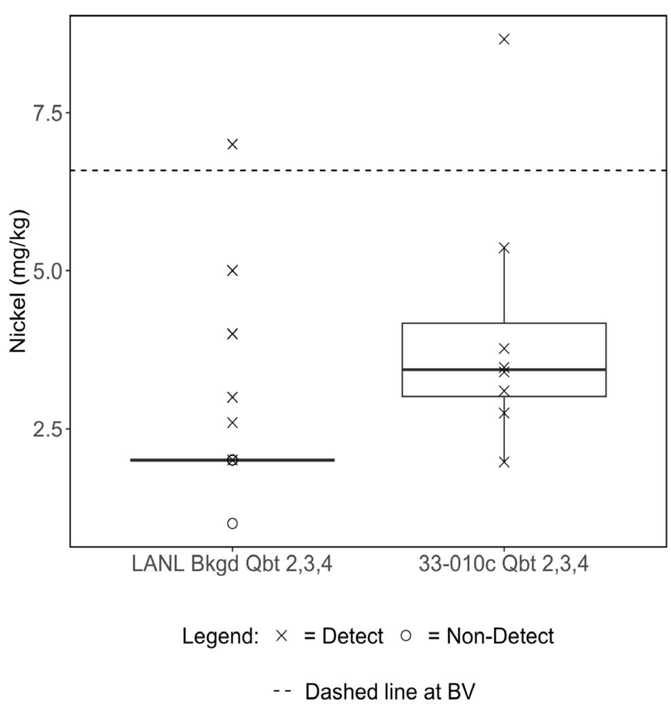


Figure F-84 Box plot for nickel in Qbt 2,3,4 at SWMU 33-010(c)

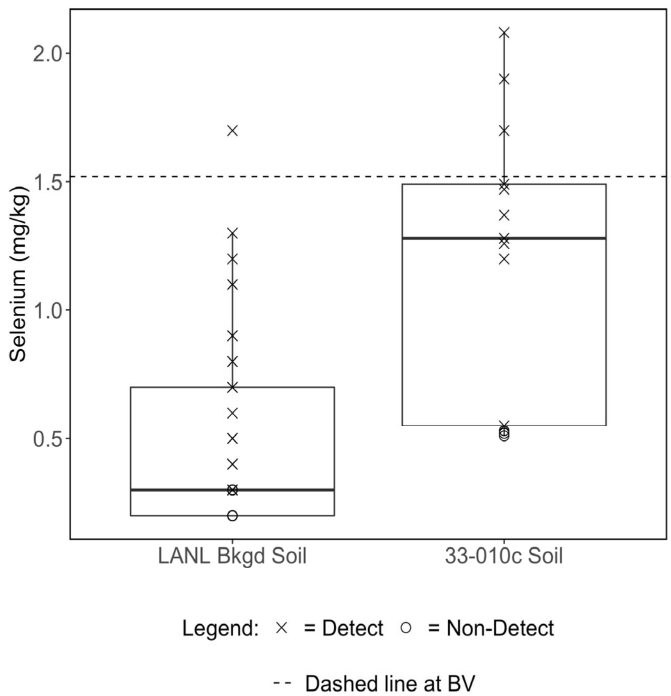


Figure F-85 Box plot for selenium in soil at SWMU 33-010(c)

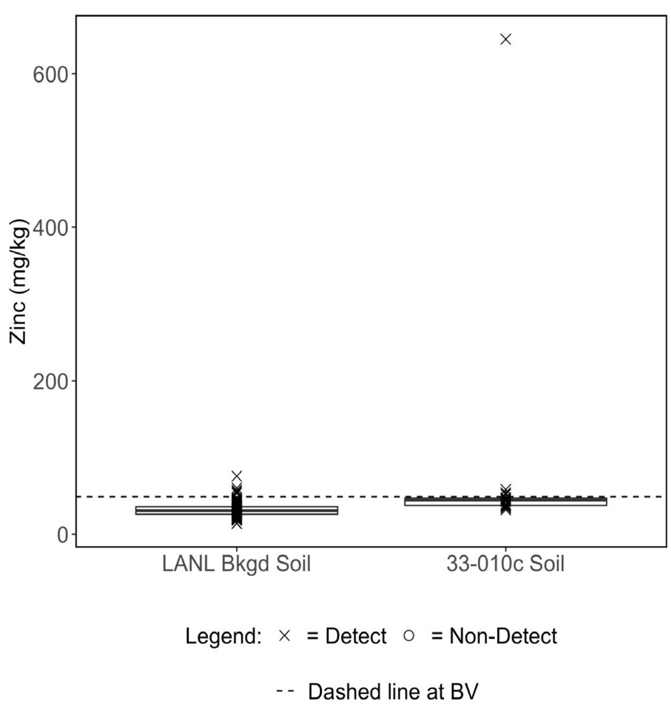


Figure F-86 Box plot for zinc in soil at SWMU 33-010(c)

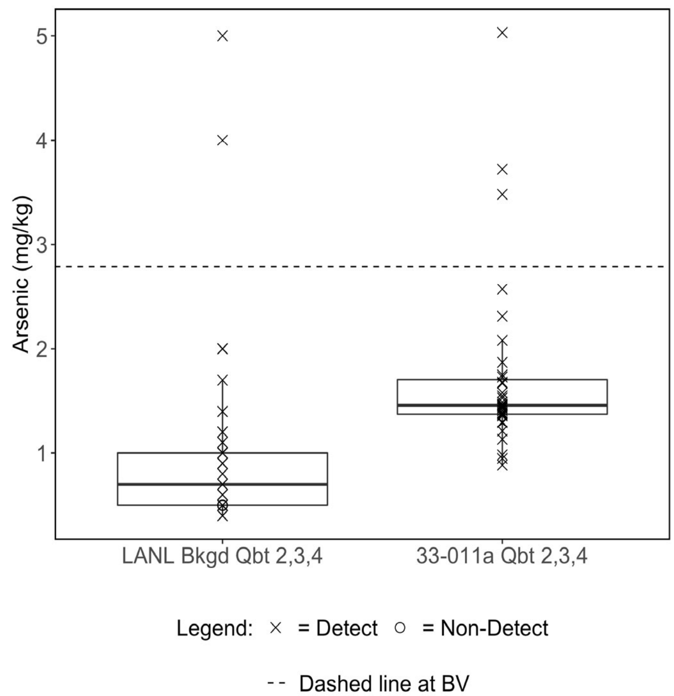


Figure F-87 Box plot for arsenic in Qbt 2,3,4 at SWMU 33-011(a)

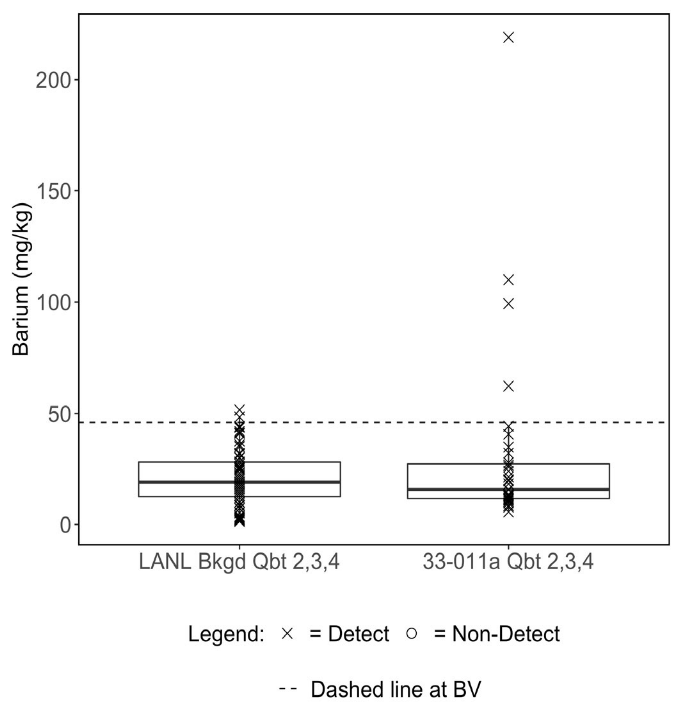


Figure F-88 Box plot for barium in Qbt 2,3,4 at SWMU 33-011(a)

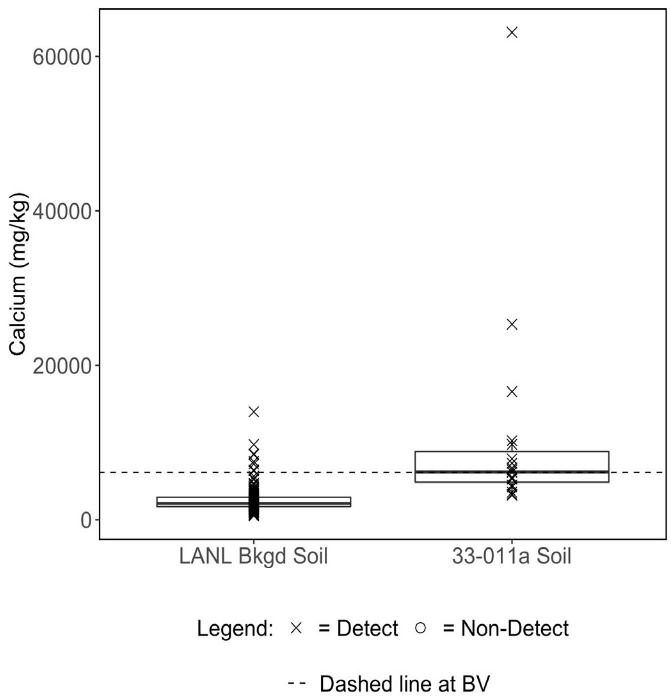


Figure F-89 Box plot for calcium in soil at SWMU 33-011(a)

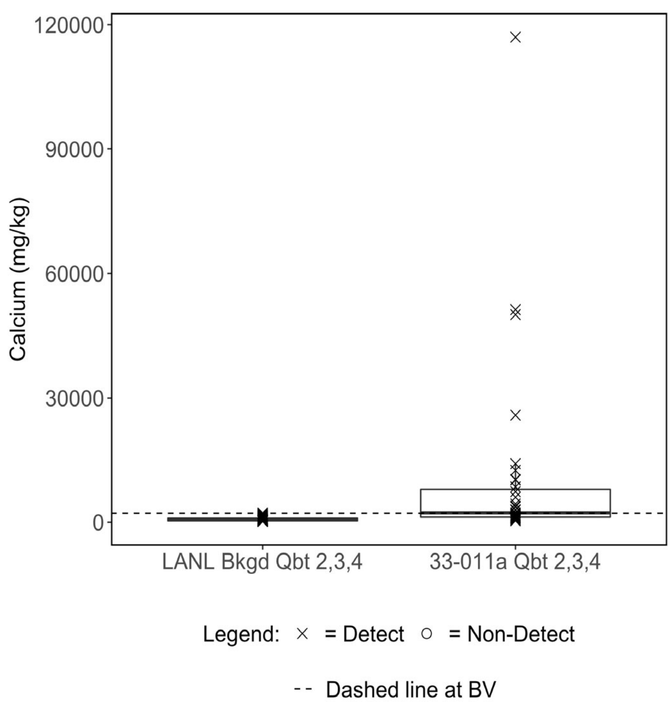


Figure F-90 Box plot for calcium in Qbt 2,3,4 at SWMU 33-011(a)

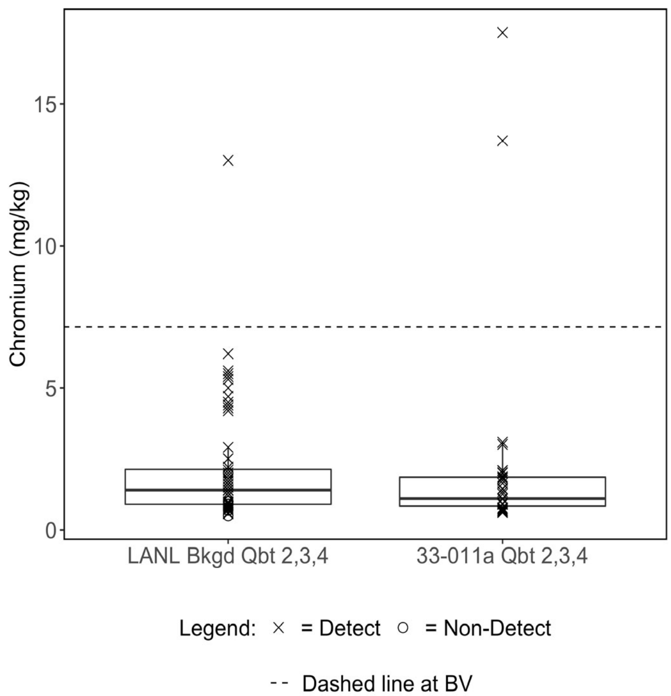


Figure F-91 Box plot for chromium in Qbt 2,3,4 at SWMU 33-011(a)

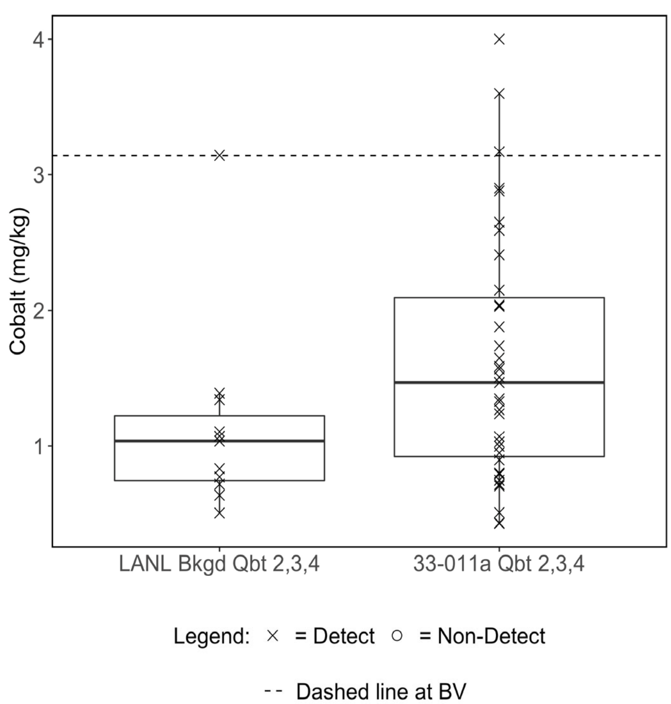


Figure F-92 Box plot for cobalt in Qbt 2,3,4 at SWMU 33-011(a)

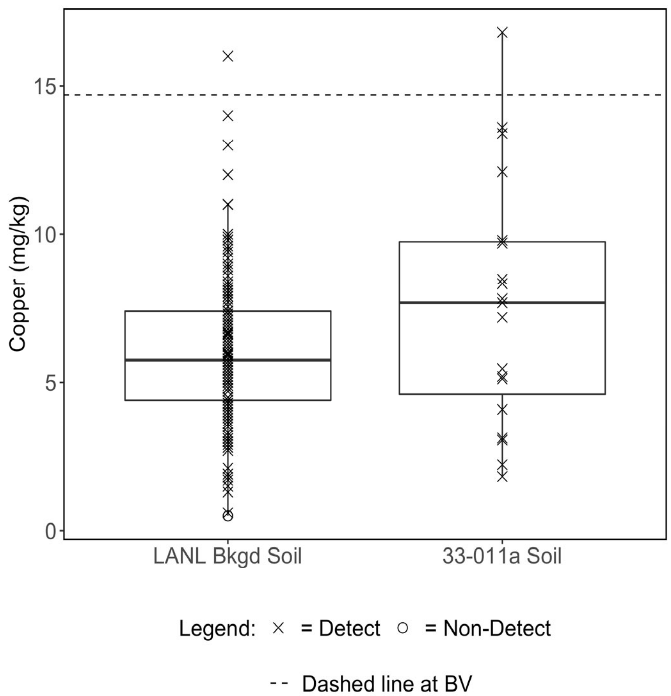


Figure F-93 Box plot for copper in soil at SWMU 33-011(a)

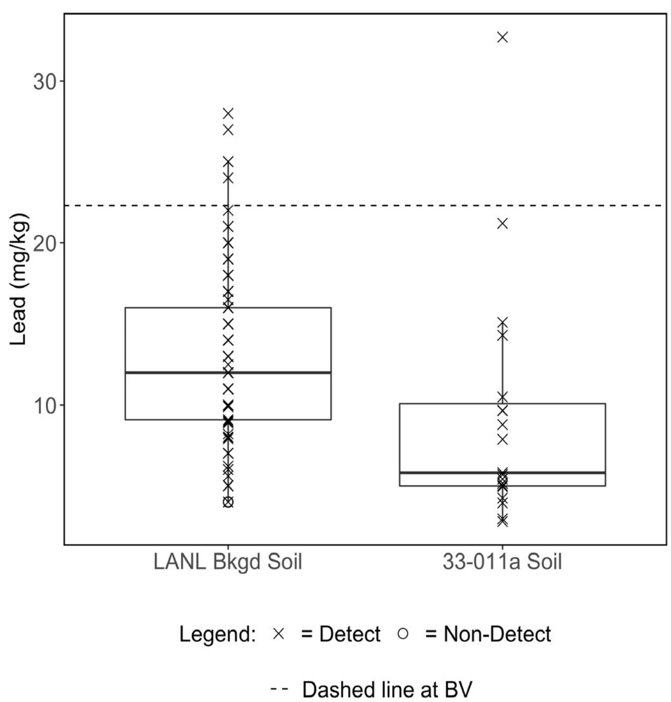


Figure F-94 Box plot for lead in soil at SWMU 33-011(a)

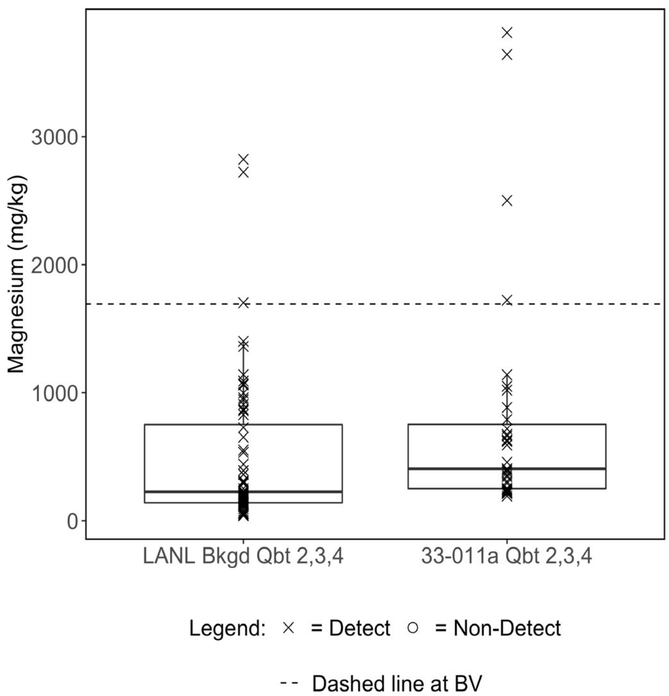


Figure F-95 Box plot for magnesium in Qbt 2,3,4 at SWMU 33-011(a)

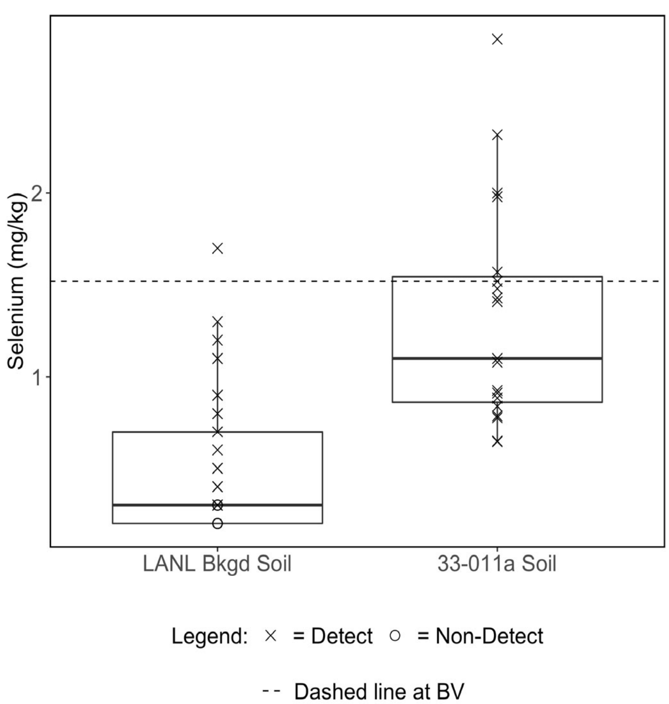


Figure F-96 Box plot for selenium in soil at SWMU 33-011(a)

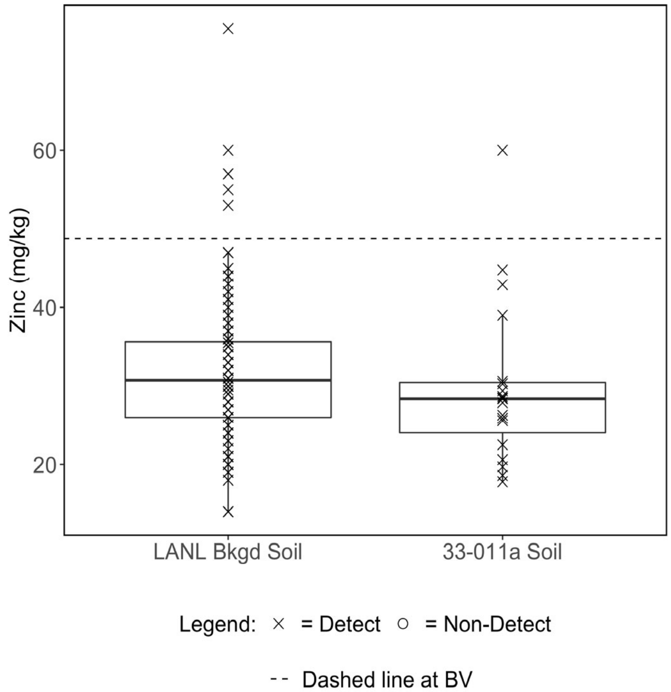


Figure F-97 Box plot for zinc in soil at SWMU 33-011(a)

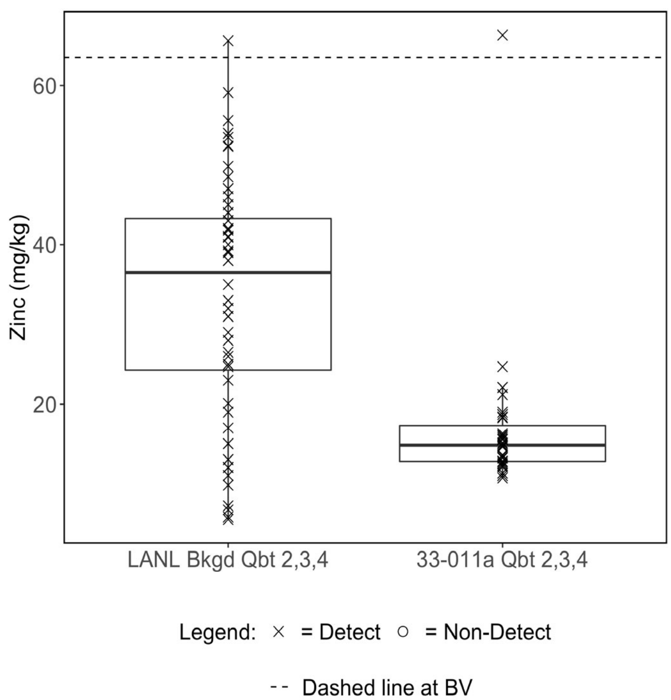


Figure F-98 Box plot for zinc in Qbt 2,3,4 at SWMU 33-011(a)

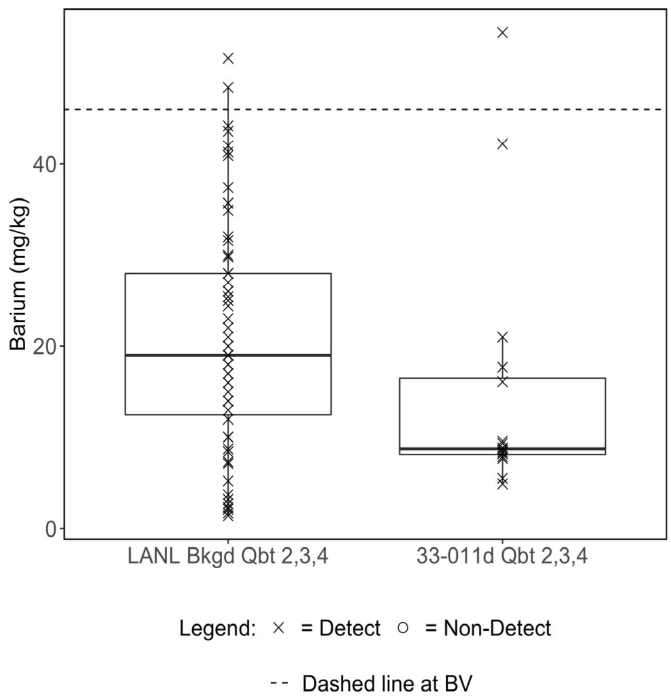


Figure F-99 Box plot for barium in Qbt 2,3,4 at SWMU 33-011(d)

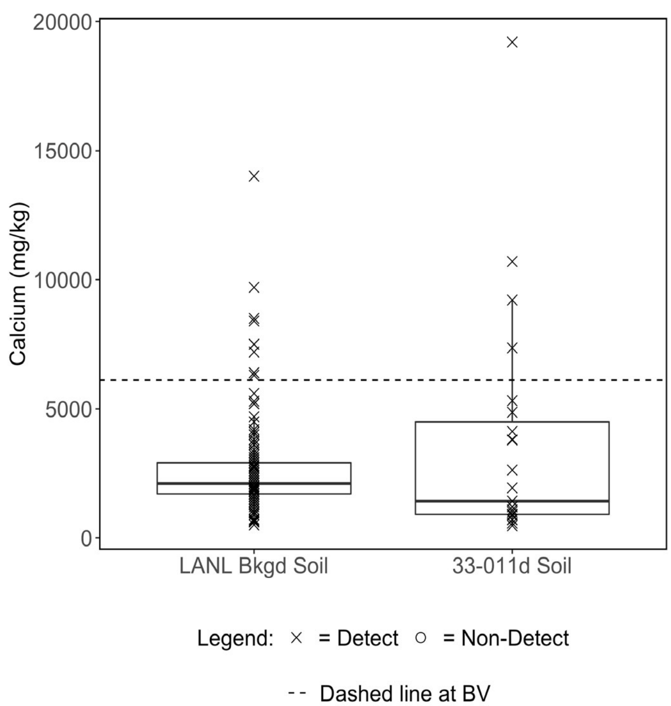


Figure F-100 Box plot for calcium in soil at SWMU 33-011(d)

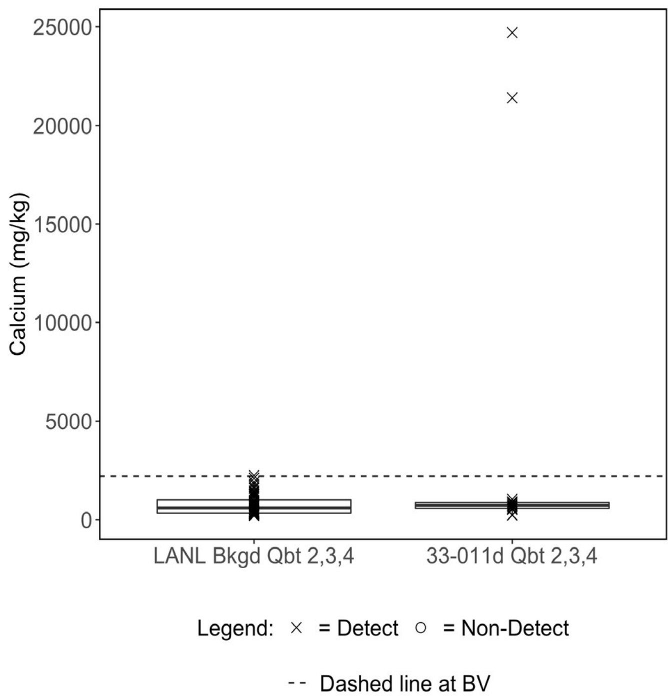


Figure F-101 Box plot for calcium in Qbt 2,3,4 at SWMU 33-011(d)

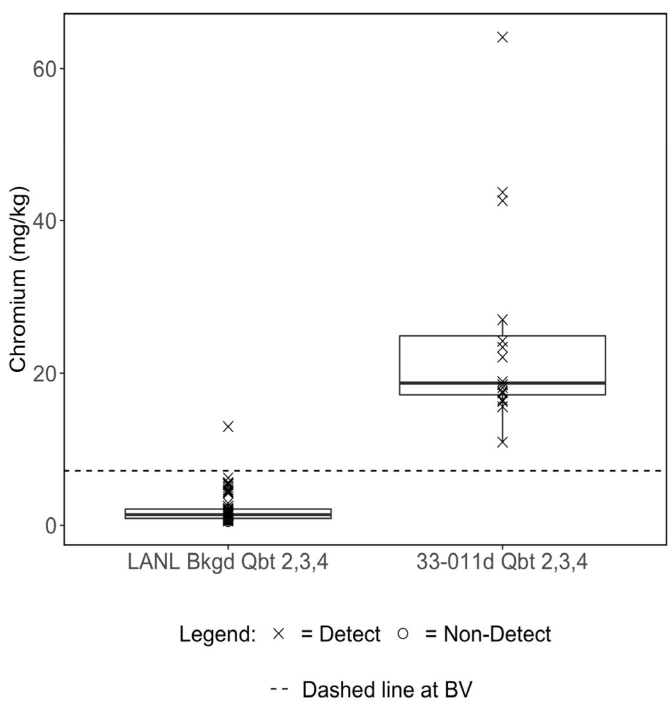


Figure F-102 Box plot for chromium in Qbt 2,3,4 at SWMU 33-011(d)

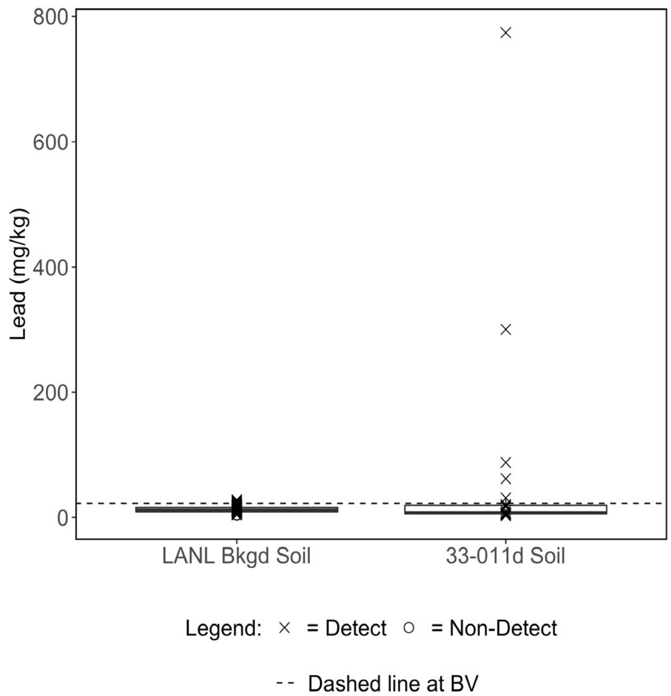


Figure F-103 Box plot for lead in soil at SWMU 33-011(d)

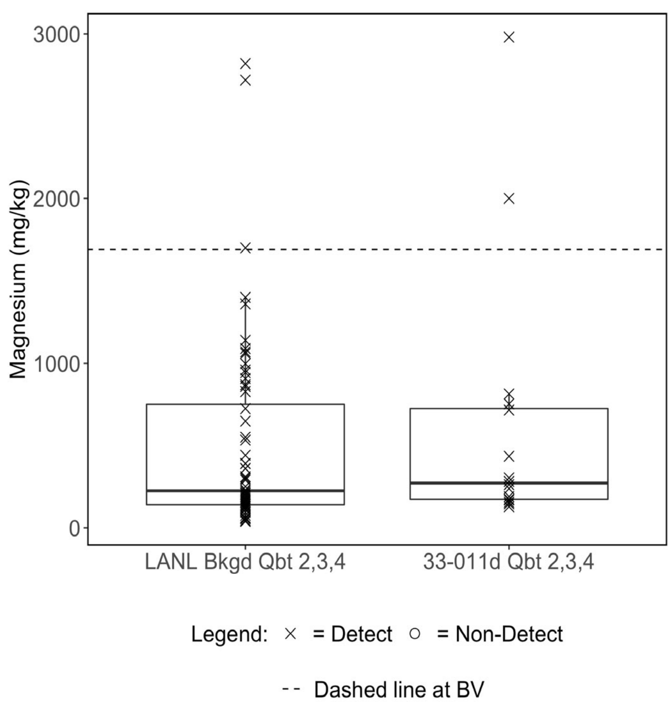


Figure F-104 Box plot for magnesium in Qbt 2,3,4 at SWMU 33-011(d)

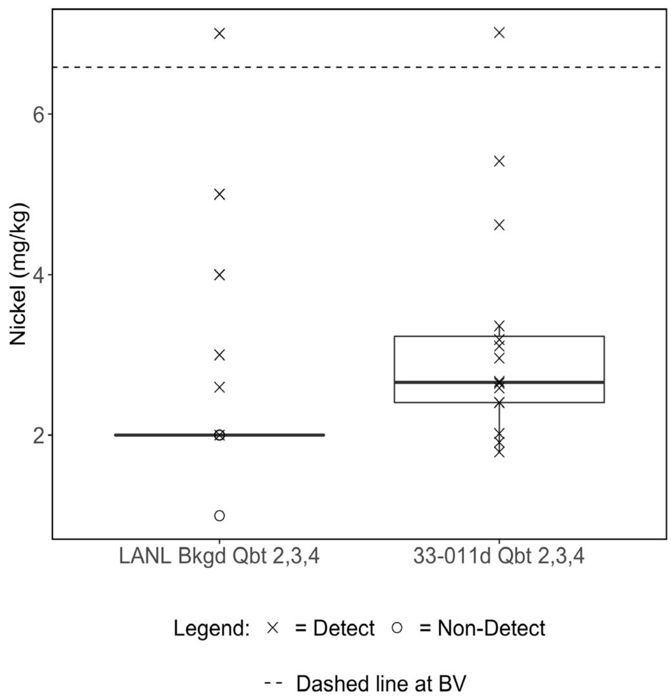


Figure F-105 Box plot for nickel in Qbt 2,3,4 at SWMU 33-011(d)

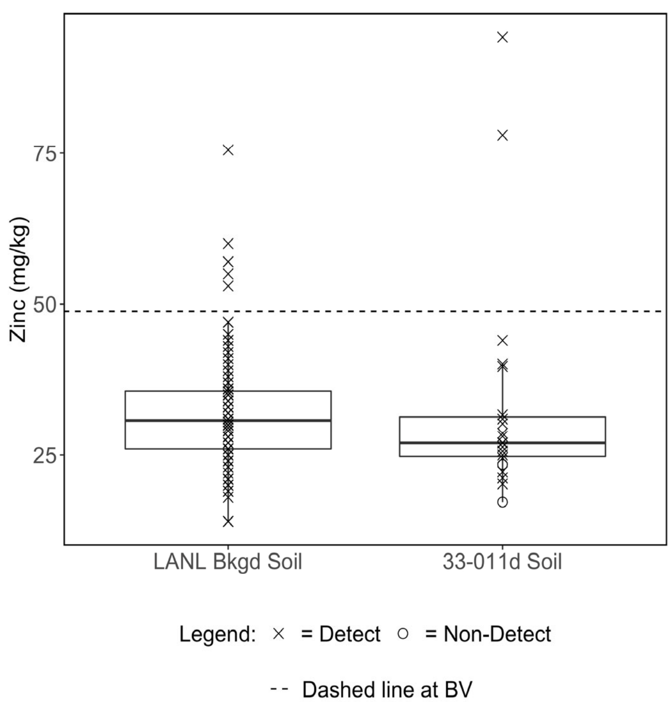


Figure F-106 Box plot for zinc in soil at SWMU 33-011(d)

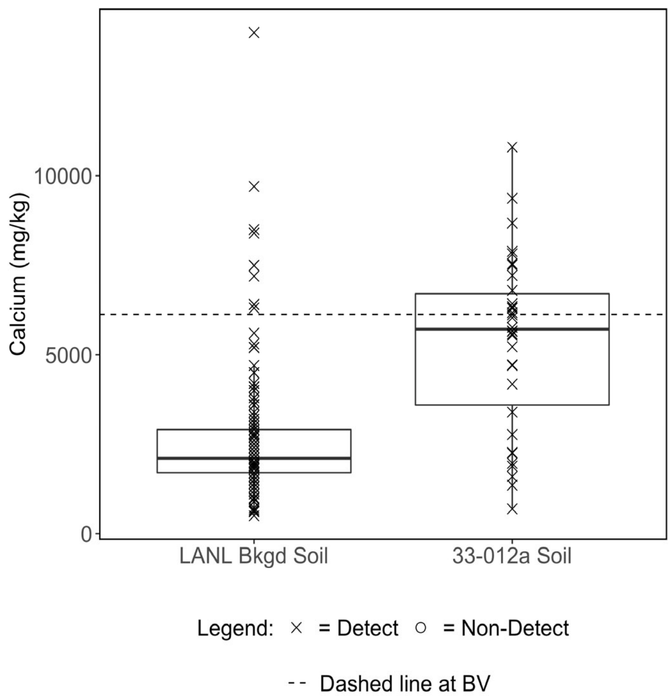


Figure F-107 Box plot for calcium in soil at SWMU 33-012(a)

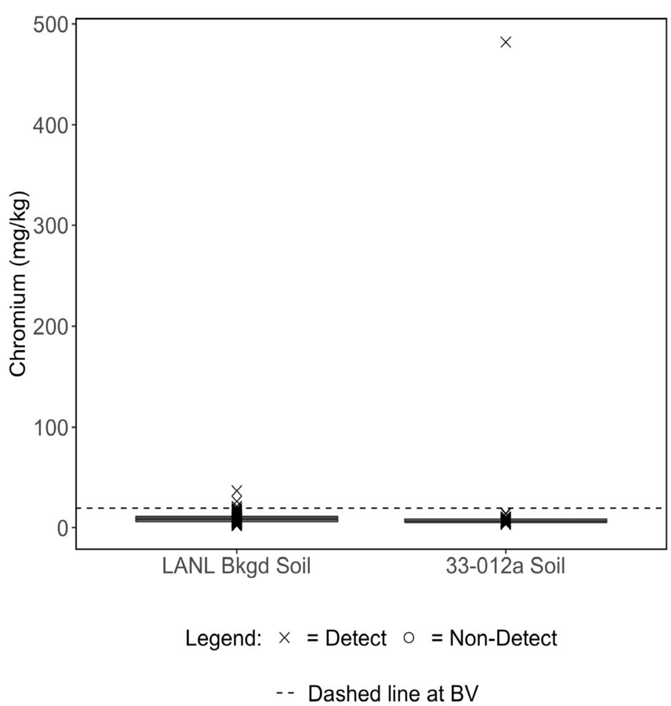


Figure F-108 Box plot for chromium in soil at SWMU 33-012(a)

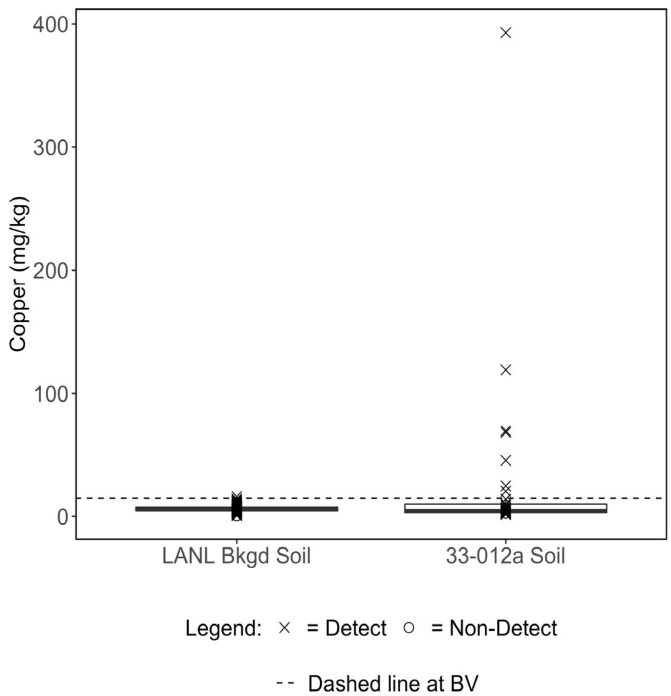


Figure F-109 Box plot for copper in soil at SWMU 33-012(a)

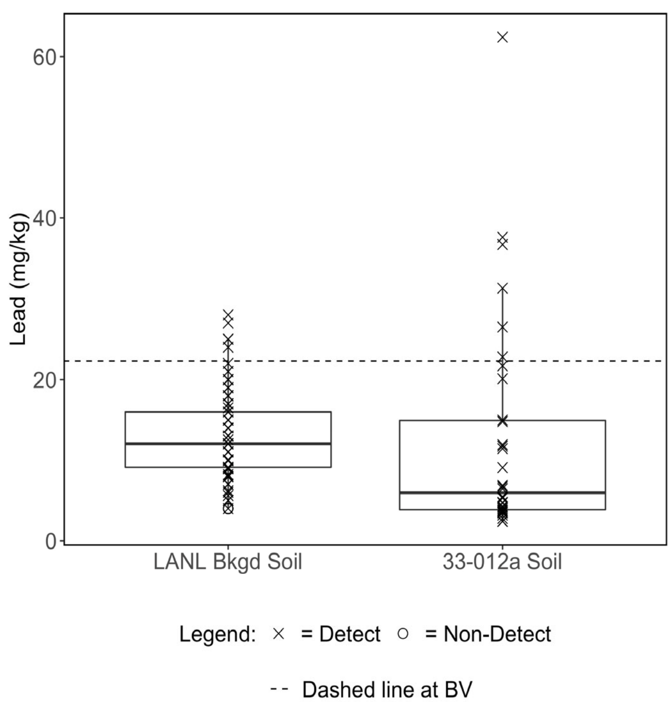


Figure F-110 Box plot for lead in soil at SWMU 33-012(a)

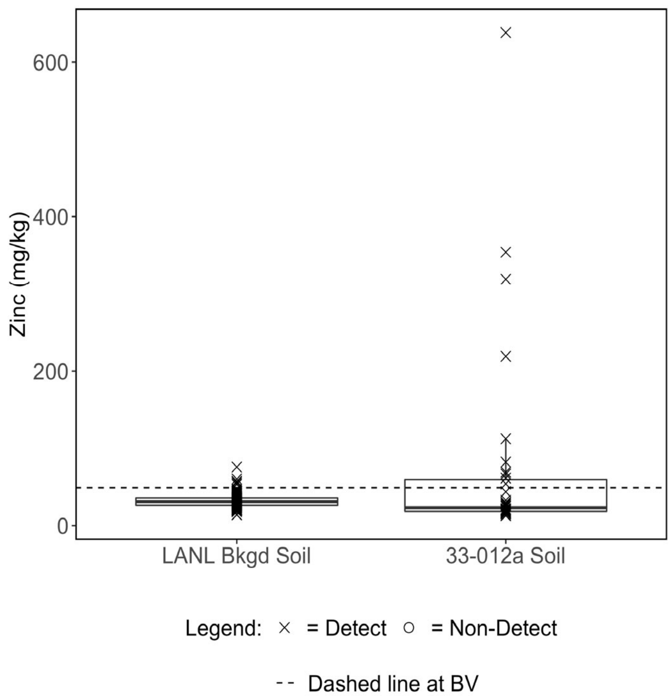


Figure F-111 Box plot for zinc in soil at SWMU 33-012(a)

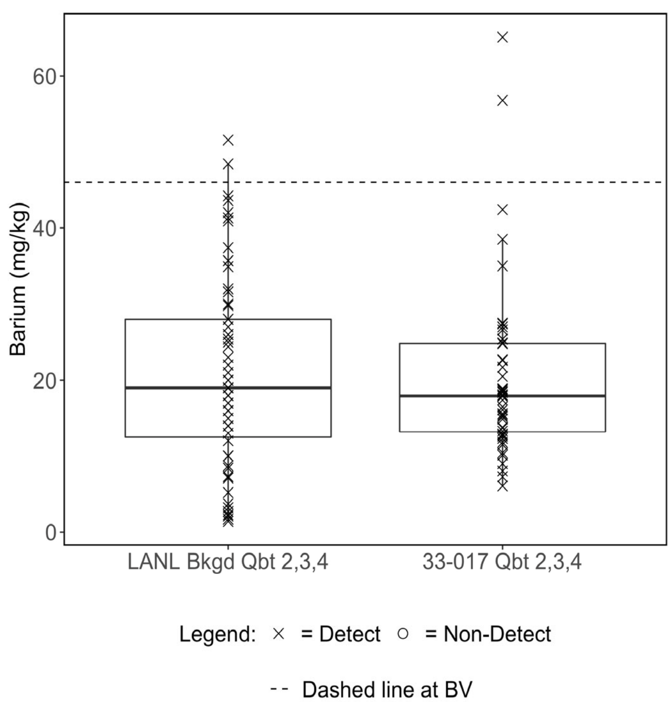


Figure F-112 Box plot for barium in Qbt 2,3,4 at SWMU 33-017

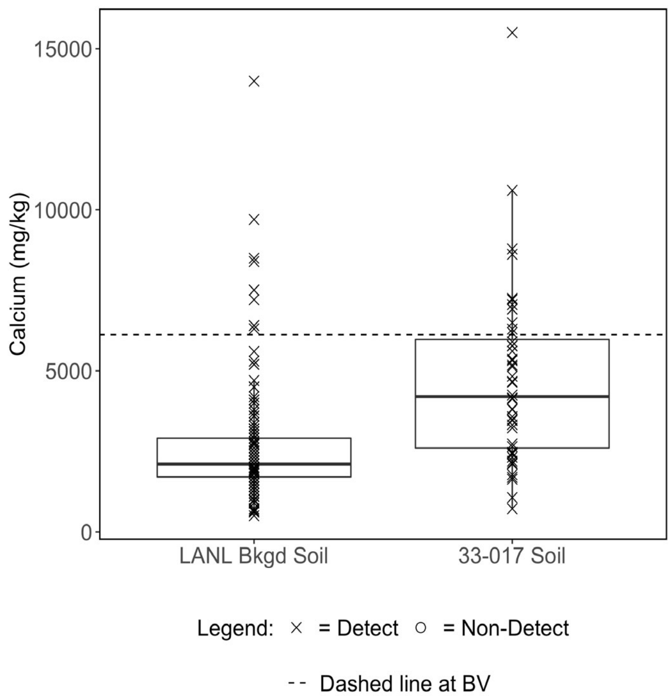


Figure F-113 Box plot for calcium in soil at SWMU 33-017

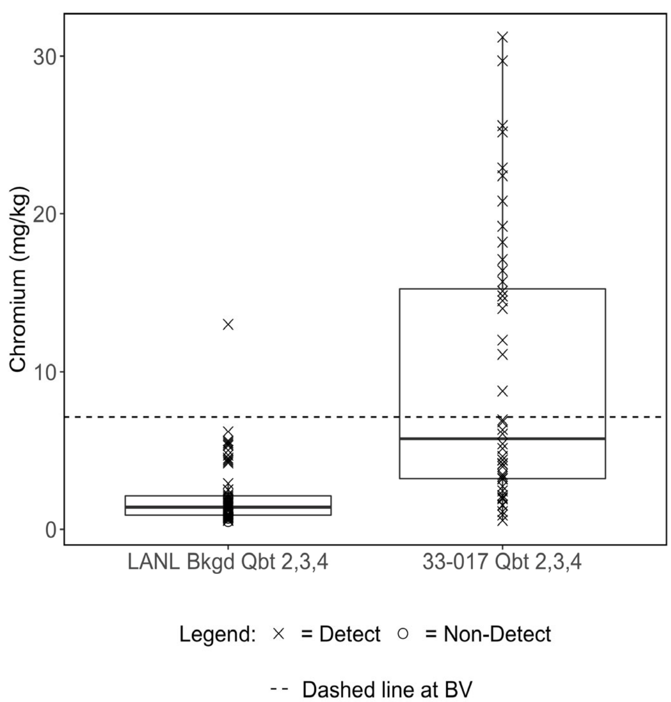


Figure F-114 Box plot for chromium in Qbt 2,3,4 at SWMU 33-017

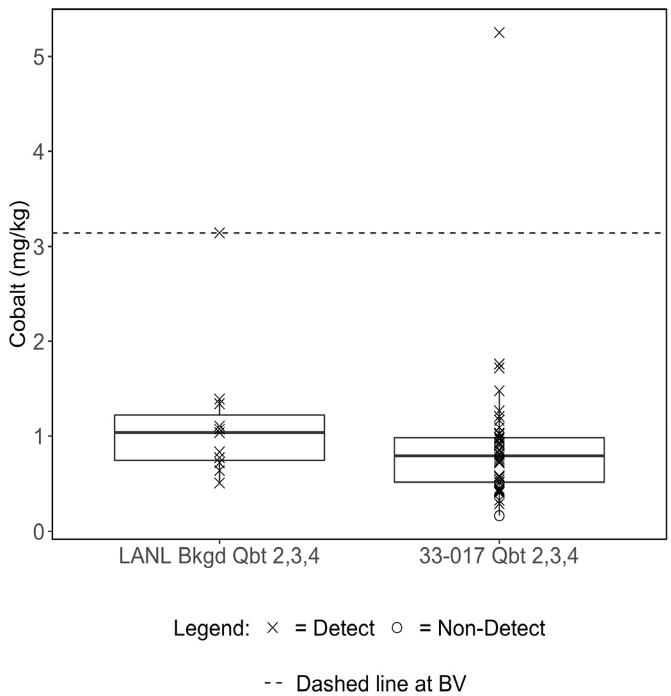


Figure F-115 Box plot for cobalt in Qbt 2,3,4 at SWMU 33-017

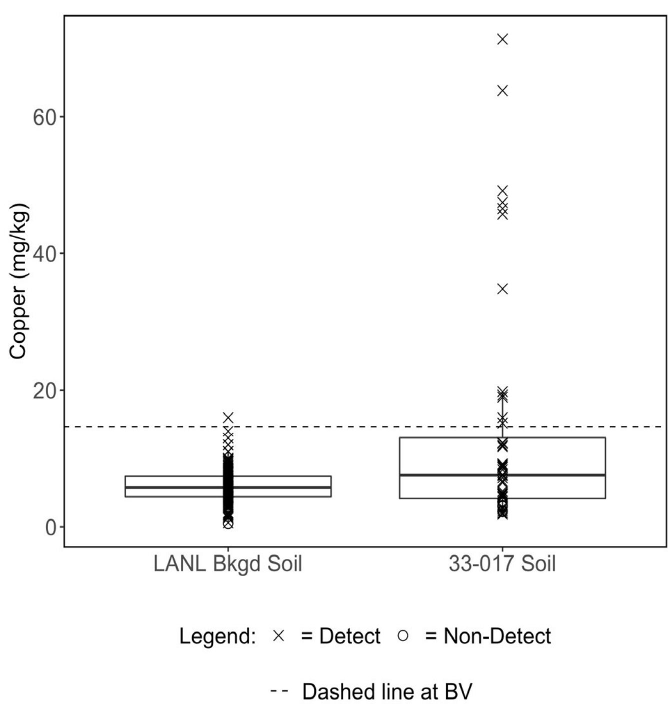


Figure F-116 Box plot for copper in soil at SWMU 33-017

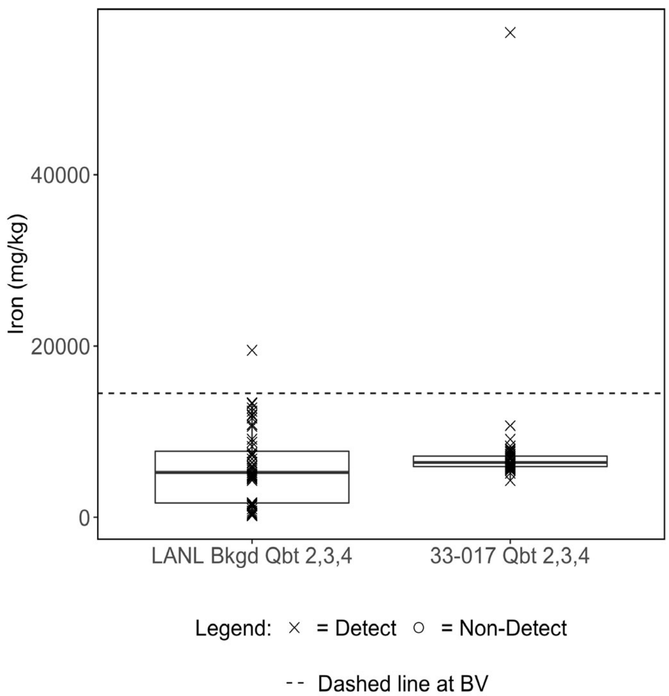


Figure F-117 Box plot for iron in Qbt 2,3,4 at SWMU 33-017

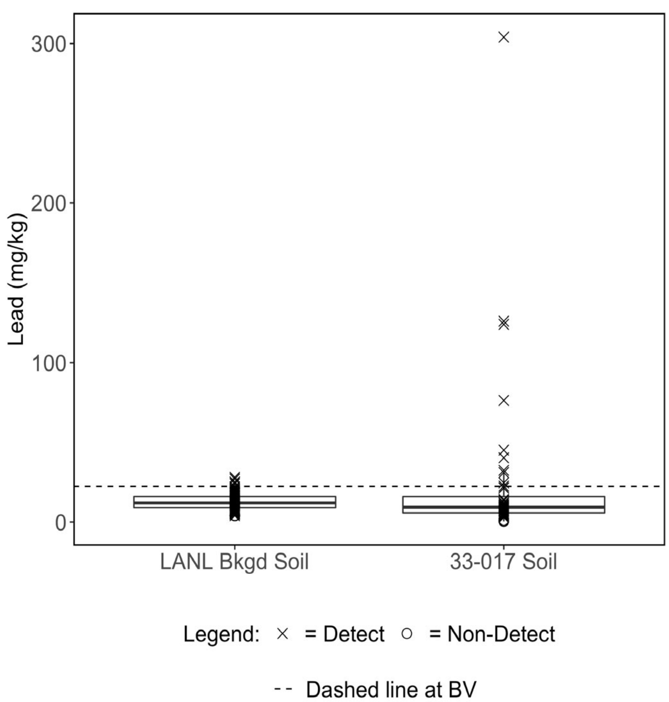


Figure F-118 Box plot for lead in soil at SWMU 33-017

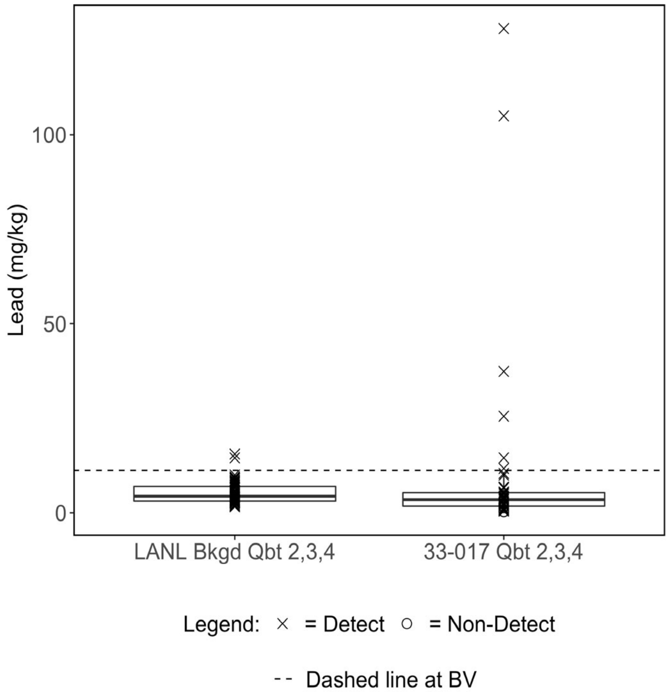


Figure F-119 Box plot for lead in Qbt 2,3,4 at SWMU 33-017

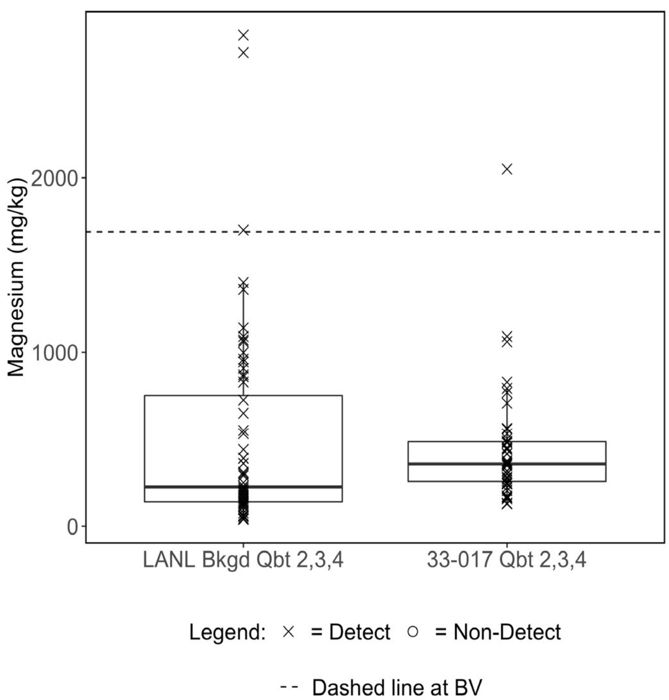


Figure F-120 Box plot for magnesium in Qbt 2,3,4 at SWMU 33-017

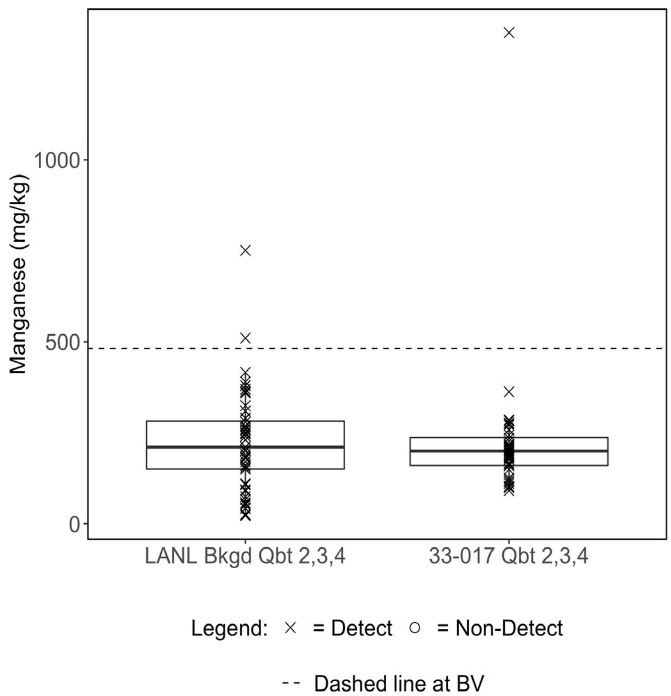


Figure F-121 Box plot for manganese in Qbt 2,3,4 at SWMU 33-017

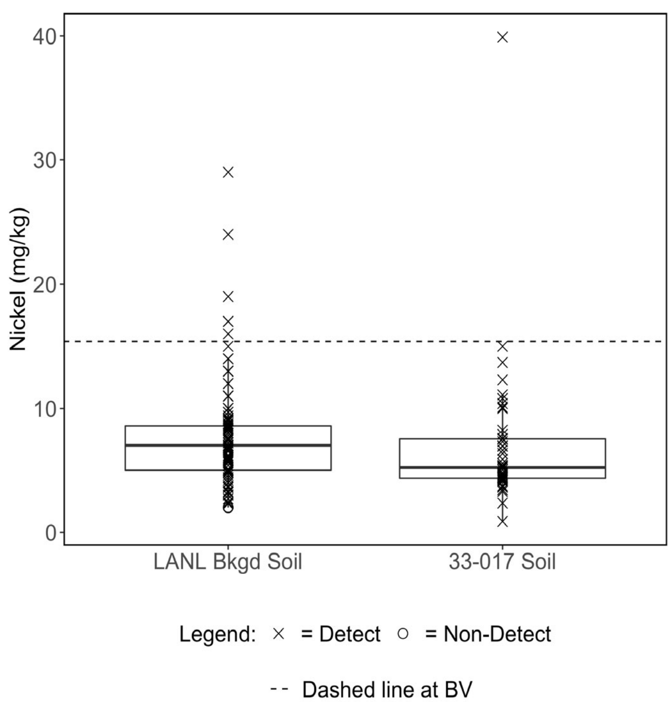


Figure F-122 Box plot for nickel in soil at SWMU 33-017

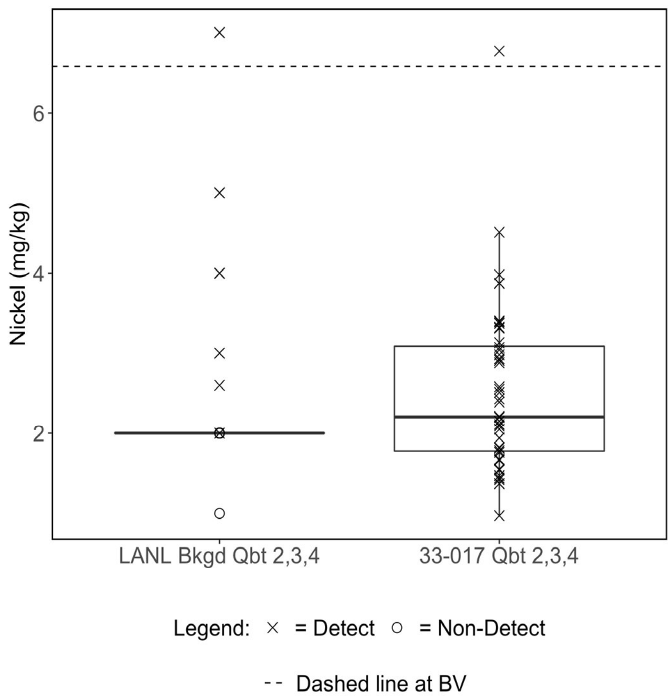


Figure F-123 Box plot for nickel in Qbt 2,3,4 at SWMU 33-017

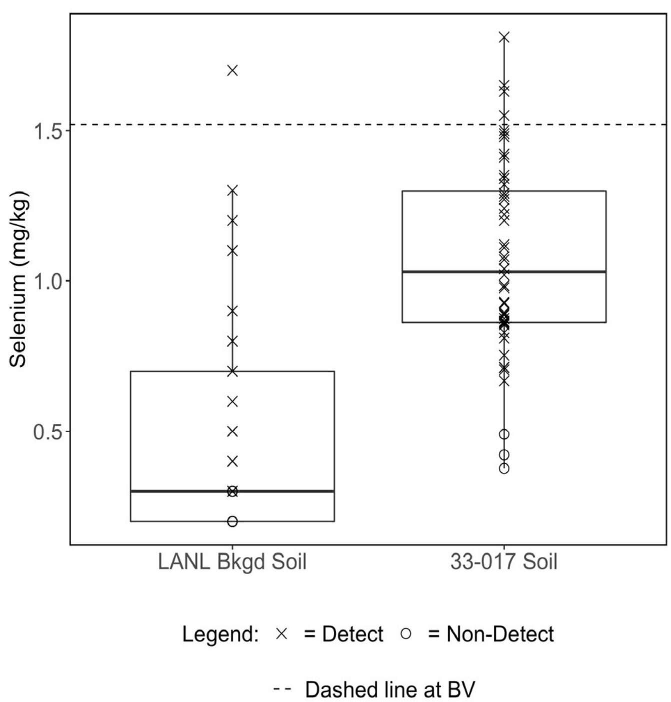


Figure F-124 Box plot for selenium in soil at SWMU 33-017

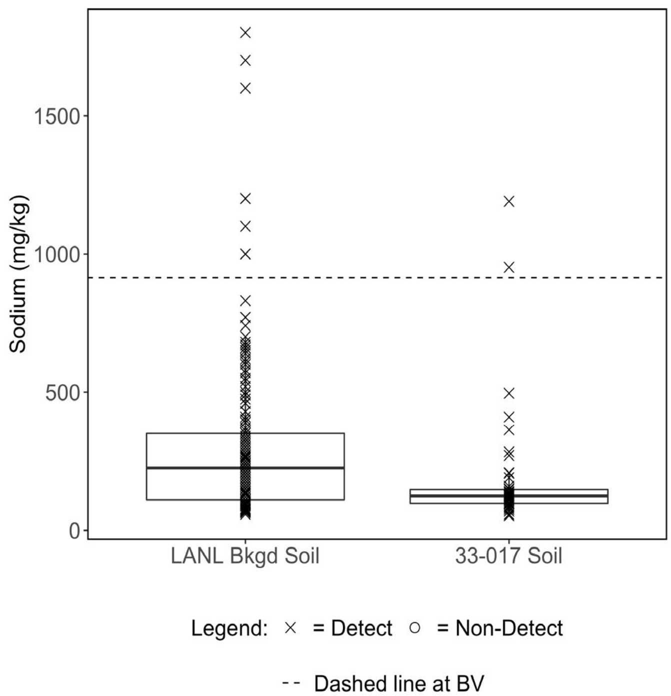


Figure F-125 Box plot for sodium in soil at SWMU 33-017

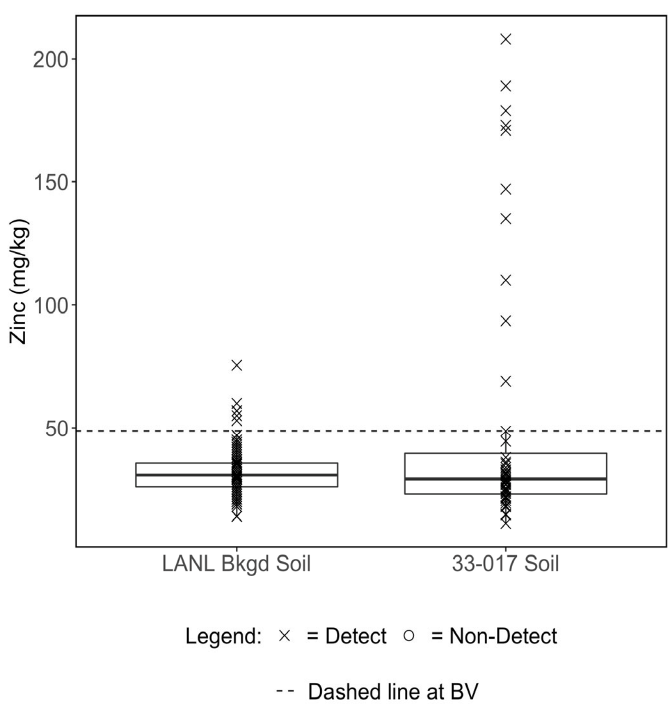


Figure F-126 Box plot for zinc in soil at SWMU 33-017

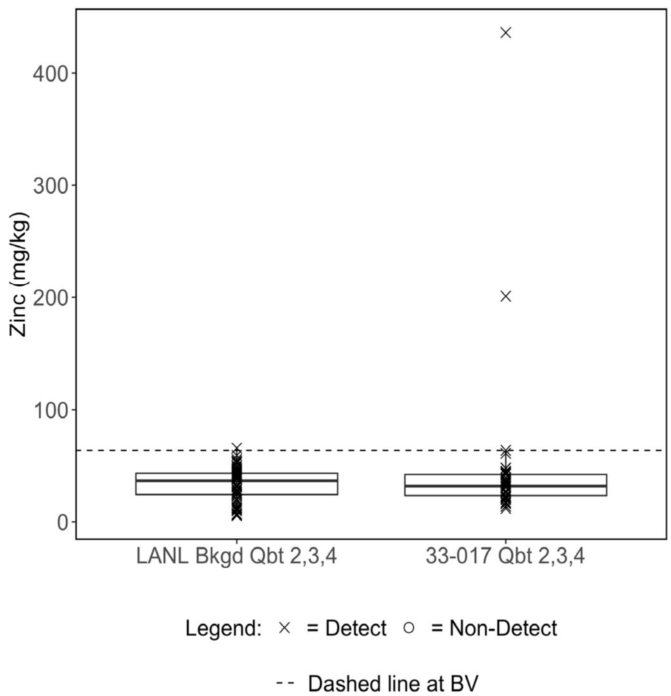


Figure F-127 Box plot for zinc in Qbt 2,3,4 at SWMU 33-017

Table F-1
Results for Statistical Tests for
Inorganic Chemicals in Qbt 2,3,4 at SWMUs 33-001(a–e)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage Test p-Value	COPC?
Aluminum	0.53	0.3	0.09	No
Antimony	n/a*	<0.001	<0.001	Yes
Arsenic	<0.001	<0.001	0.2	Yes
Barium	<0.001	<0.001	<0.001	Yes
Beryllium	0.41	0.22	0.2	No
Calcium	<0.001	<0.001	<0.001	Yes
Chromium	<0.001	0.068	1	No
Cobalt	0.25	0.33	0.3	No
Copper	<0.001	<0.001	<0.001	Yes
Iron	0.0025	0.65	1	No
Lead	0.81	0.81	1	No
Magnesium	0.0012	<0.001	0.087	Yes
Nickel	n/a	<0.001	<0.001	Yes
Silver	n/a	0.0014	1	Yes
Vanadium	<0.001	0.0018	0.2	Yes

* n/a = Not applicable.

Table F-2
Results for Statistical Tests for
Inorganic Chemicals in Soil at SWMUs 33-001(a–e)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage Test p-Value	COPC?
Antimony	n/a*	1	0.078	No
Beryllium	1	0.99	0.23	No
Calcium	0.061	0.091	0.0028	No
Copper	<0.001	<0.001	<0.001	Yes
Magnesium	1	1	1	No
Selenium	<0.001	<0.001	0.0051	Yes
Sodium	1	1	1	No
Zinc	<0.001	<0.001	0.24	Yes

* n/a = Not applicable.

Table F-3
Results for Statistical Tests for
Inorganic Chemicals in Qbt 1v at SWMUs 33-001(a–e)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage Test p-Value	COPC?
Arsenic	<0.001	0.013	0.47	Yes
Chromium	0.63	0.57	0.092	No
Lead	0.86	0.27	0.039	No
Magnesium	1	1	0.47	No
Manganese	0.013	0.013	0.039	Yes
Vanadium	0.21	0.96	0.47	No

Table F-4
Results for Statistical Tests for
Inorganic Chemicals in Qbt 2,3,4 at SWMU 33-004(a)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage Test p-Value	COPC?
Barium	1	0.93	0.44	No
Calcium	0.35	0.93	0.19	No
Chromium	<0.001	<0.001	<0.001	Yes

Table F-5
Results for Statistical Tests for
Inorganic Chemicals in Soil at SWMU 33-004(a)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage Test p-Value	COPC?
Chromium	0.0066	0.041	1	Yes
Copper	<0.001	<0.001	<0.001	Yes
Lead	<0.001	0.0096	<0.001	Yes
Selenium	<0.001	<0.001	0.045	Yes
Zinc	<0.001	<0.001	0.0033	Yes

Table F-6
Results for Statistical Tests for
Inorganic Chemicals in Soil at SWMU 33-004(i)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage Test p-Value	COPC?
Calcium	0.019	0.0038	1	Yes
Copper	<0.001	<0.001	<0.001	Yes
Iron	1	0.91	1	No
Lead	0.043	0.07	<0.001	Yes
Zinc	0.0012	<0.001	<0.001	Yes

Table F-7
Results for Statistical Tests for
Inorganic Chemicals in Qbt 2,3,4 at SWMU 33-006(a)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage Test p-Value	COPC?
Barium	0.013	0.33	0.056	No
Chromium	0.28	0.57	0.054	No
Cobalt	0.9	0.9	0.65	No
Magnesium	0.37	0.57	0.24	No
Nickel	n/a*	0.58	0.24	No

* n/a = Not applicable.

Table F-8
Results for Statistical Tests for
Inorganic Chemicals in Soil at SWMU 33-006(a)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage Test p-Value	COPC?
Copper	<0.001	<0.001	<0.001	Yes
Lead	1	0.9	0.0068	No
Zinc	0.3	0.15	1	No

Table F-9
Results for Statistical Tests for
Inorganic Chemicals in Soil at SWMU 33-007(c)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage Test p-Value	COPC?
Antimony	n/a*	<0.001	<0.001	Yes
Barium	0.95	0.9	1	No
Calcium	<0.001	<0.001	0.0016	Yes
Chromium	0.068	0.03	0.12	No
Cobalt	0.82	0.27	<0.001	No
Copper	<0.001	<0.001	<0.001	Yes
Iron	0.94	0.7	1	No
Lead	1	0.93	1	No
Magnesium	0.0071	<0.001	1	Yes
Nickel	<0.001	<0.001	<0.001	Yes
Selenium	<0.001	0.0051	0.38	Yes
Vanadium	1	0.87	1	No

* n/a = Not applicable.

Table F-10
Results for Statistical Tests for
Inorganic Chemicals in Qbt 2,3,4 at SWMU 33-008(c)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage Test p-Value	COPC?
Barium	0.16	0.46	0.26	No
Beryllium	0.65	0.45	1	No
Calcium	0.066	0.094	<0.001	No
Chromium	<0.001	<0.001	0.002	Yes
Copper	<0.001	<0.001	<0.001	Yes
Lead	0.11	0.015	<0.001	Yes
Magnesium	0.0024	0.23	1	No
Nickel	n/a*	0.71	0.26	No

* n/a = Not applicable.

Table F-11
Results for Statistical Tests for
Inorganic Chemicals in Soil at SWMU 33-008(c)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage Test p-Value	COPC?
Copper	<0.001	<0.001	<0.001	Yes
Lead	0.027	<0.001	<0.001	Yes
Thallium	n/a*	0.84	1	No
Zinc	<0.001	<0.001	<0.001	Yes

* n/a = Not applicable.

Table F-12
Results for Statistical Tests for
Inorganic Chemicals in Qbt 2,3,4 at SWMU 33-010(c)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage Test p-Value	COPC?
Barium	0.0027	0.043	<0.001	Yes
Beryllium	0.21	0.49	0.011	No
Calcium	<0.001	0.0056	<0.001	Yes
Chromium	<0.001	0.0056	<0.001	Yes
Copper	<0.001	<0.001	<0.001	Yes
Lead	0.033	0.76	1	No
Magnesium	0.067	0.84	1	No
Nickel	n/a*	0.5	0.11	No

* n/a = Not applicable.

Table F-13
Results for Statistical Tests for
Inorganic Chemicals in Soil at SWMU 33-010(c)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage Test p-Value	COPC?
Copper	<0.001	<0.001	<0.001	Yes
Lead	0.78	0.13	0.0093	No
Selenium	<0.001	<0.001	0.059	Yes
Zinc	<0.001	<0.001	0.099	Yes

Table F-14
Results for Statistical Tests for
Inorganic Chemicals in Qbt 2,3,4 at SWMU 33-011(a)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage Test p-Value	COPC?
Arsenic	<0.001	0.023	0.35	Yes
Barium	0.54	0.42	0.014	No
Calcium	<0.001	<0.001	<0.001	Yes
Chromium	0.55	0.96	0.12	No
Cobalt	0.047	0.3	0.43	No
Magnesium	0.0012	0.54	0.12	No
Zinc	1	1	0.35	No

Table F-15
Results for Statistical Tests for
Inorganic Chemicals in Soil at SWMU 33-011(a)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage Test p-Value	COPC?
Calcium	<0.001	<0.001	<0.001	Yes
Copper	0.072	0.016	0.098	No
Lead	1	0.94	0.099	No
Selenium	<0.001	<0.001	0.0091	Yes
Zinc	0.92	0.59	1	No

Table F-16
Results for Statistical Tests for
Inorganic Chemicals in Qbt 2,3,4 at SWMU 33-011(d)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage Test p-Value	COPC?
Barium	0.99	0.87	0.2	No
Calcium	0.18	0.89	0.038	No
Chromium	<0.001	<0.001	<0.001	Yes
Magnesium	0.2	0.89	0.2	No
Nickel	n/a*	0.63	0.2	No

* n/a = Not applicable.

Table F-17
Results for Statistical Tests for
Inorganic Chemicals in Soil at SWMU 33-011(d)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage Test p-Value	COPC?
Calcium	0.84	0.027	0.12	No
Lead	0.91	0.058	<0.001	No
Zinc	0.91	0.56	0.013	No

Table F-18
Results for Statistical Tests for
Inorganic Chemicals in Soil at SWMU 33-012(a)

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage Test p-Value	COPC?
Calcium	<0.001	<0.001	1	Yes
Chromium	1	1	0.16	No
Copper	0.69	0.041	<0.001	Yes
Lead	1	0.29	<0.001	No
Zinc	0.96	0.044	<0.001	Yes

Table F-19
Results for Statistical Tests for
Inorganic Chemicals in Qbt 2,3,4 at SWMU 33-017

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage Test p-Value	COPC?
Barium	0.75	0.99	0.18	No
Chromium	<0.001	<0.001	<0.001	Yes
Cobalt	0.95	0.89	0.81	No
Iron	0.0047	0.97	0.43	No
Lead	0.99	0.83	0.032	Yes
Magnesium	0.036	0.97	1	No
Manganese	0.78	0.99	0.43	No
Nickel	n/a*	0.5	1	No
Zinc	0.69	0.74	0.18	No

* n/a = Not applicable.

Table F-20
Results for Statistical Tests for
Inorganic Chemicals in Soil at SWMU 33-017

Analyte	Gehan Test p-Value	Quantile Test p-Value	Slippage Test p-Value	COPC?
Calcium	<0.001	<0.001	0.22	Yes
Copper	0.021	<0.001	<0.001	Yes
Lead	0.98	0.19	<0.001	Yes
Nickel	0.96	0.59	0.22	No
Selenium	<0.001	0.0018	0.55	Yes
Sodium	1	1	1	No
Zinc	0.62	0.1	<0.001	No

Appendix G

Risk Assessments

CONTENTS

Figure

Tables

Attachments

G-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 three sites within the Chaquehui Canyon Aggregate Area, located in the southern portion of Los Alamos National Laboratory (LANL or the Laboratory). The evaluations of potential risk at three solid waste management units (SWMUs) are based on decision-level data from historical (1996 and 1999) and 2019–2021 investigations.

G-2.0 BACKGROUND

Brief descriptions of the three SWMUs in the Chaquehui Canyon Aggregate Area assessed for potential risk and dose are presented below.

G-2.1 Site Descriptions and Operational History

G-2.1.1 SWMU 33-007(c)

SWMU 33-007(c) consists of two abandoned gun firing areas associated with the initiator tests conducted at Area 6 in the west-central portion of Technical Area 33 (TA-33). The first gun firing area included a gun building (former structure 33-16), a gun mount (structure 33-64), and an earthen berm (structure 33-60). Structure 33-16 was completed in 1949 and housed an air gun, and then electronic equipment, to measure neutron production in “gun-type” initiators containing beryllium and polonium-210. Gun sizes with bore diameters ranging from 4-in. to 8-in. fired projectiles into berms where two 6-ft × 6-ft catcher boxes constructed of wood timbers were embedded in the north end of berm structure 33-60. Each catcher box contained soil, wood chips, and vermiculite. The second gun firing area included a large gun (structure 33-65), a hillside embankment (structure 33- 61), and two barricades (structures 33-62 and 33-72) located north and east of the gun.

One concrete firing pad was located immediately west of structure 33-16, on which a large bore gun was mounted. The pad measured 6 ft × 10 ft and was surrounded by a concrete apron. The other two concrete firing pads were located in a level area excavated into a basaltic cinder cone approximately 100 ft southwest of structure 33-16. Two wooden barricades constructed of 8 in. × 8 in. timbers are located north and east of the shot pads. This area was used to test nuclear gun mockups. A 4-in. to 5-in. bore gun was used to fire projectiles into the back of the excavation. The back of the excavation currently extends about 75 ft farther back than when the site was used (Hoard 1991, 009734). The two catcher boxes were located approximately 20 ft south of structure 33-16 and measured approximately 6 ft × 6 ft, constructed of timber and filled with soil, wood chips, and vermiculite. Guns (2-in. to 5-in. bore diameter) were placed on the concrete pads and used to fire projectiles containing test assemblies into targets placed in front of the catcher boxes. Materials used in the projectiles included beryllium, polonium-210, uranium, copper, lead, tungsten, and stainless steel (Hoard 1991, 009733). The projectiles frequently cracked open, contaminating the pads and surrounding area with polonium-210. Contaminated areas on the guns and pads were painted with lead-based paint to fix surface contamination (LANL 1992, 007671, p. 3-42).

A 1951 memorandum describes a test at Area 6 that resulted in a release of radioactive material from a projectile. The site was cleaned up using a bulldozer to scrape away the contaminated soil and embankment (Buckland 1951, 007845). A 1954 memorandum describes decontamination of one of the Area 6 gun barrels. The memorandum describes removing loose material and leaving impregnated spots as high as 1 million counts per minute. Contaminated surface soil was bulldozed from the shot area into the adjacent canyon (LASL 1954, 107465). Shots were discontinued at Area 6 by 1955. In 1956, structure 33-16 was used to make and machine laminating materials containing barium, titanium, lead, and zinc using epoxy resins. An exhaust blower and stack were installed along with an emissions stack. The buildings in Area 6 have been vacant since the late 1950s. The cinder cone has been further excavated. An aluminum tower (structure 33-192) is used for atmospheric physics monitoring within the excavated portion of the cinder cone.

G-2.1.2 SWMU 33-010(c)

SWMU 33-010(c) is a former surface disposal area located at South Site on the northern rim of Chaquehui Canyon at the southern end of TA-33. The disposal area measured approximately 50 ft × 30 ft × 2-ft to 4-ft deep and was approximately 230 ft south of structure 33-26 [SWMU 33-006(a)] along the western edge of the main South Site drainage channel. From approximately 1950 to 1955, this site was used to dispose of debris from the implosion tests conducted at SWMU 33-006(a). Debris disposed of at the site included copper and aluminum shrapnel, pieces of electronic cable, sand and soil with residual high explosives (HE), and wood. Between shots, the shot pad and surrounding area were scraped and the debris bulldozed over the canyon edge and onto the hillside below (LANL 1992, 007671, p. 3-53). During the voluntary correction action performed in 1999, all debris and soil was excavated and removed from the site (LANL 2000, 066889).

Residual debris was removed from SWMU 33-010(c) during the 2019–2020 investigation.

G-2.1.3 SWMU 33-011(d)

SWMU 33-011(d) consists of a former storage area that was located on an asphalt pad around a warehouse (building 33-20) in the southwest corner of Main Site at TA-33. Beryllium and uranium were stored in and outside of building 33-20 from 1950 until 1972. In addition, recovered scrap from shots containing uranium, beryllium, and tungsten was stored on the asphalt south of building 33-20. The amount of uranium stored at this site is reported to have been “tons” (Ahlquist 1983, 006854). Much of the material stored at the site was salvaged for use elsewhere. A 1987 site survey found no materials remaining in storage at this location (LANL 1992, 007671, p. 3-24).

G-2.2 Investigation Sampling

The final data set used to identify chemicals of potential concern (COPCs) for the Chaquehui Canyon Aggregate Area and used in this appendix to evaluate the potential risks to human health and the environment are the qualified analytical results from historical sampling activities (1996 and 1999) and the 2019–2021 investigation. Only those data determined to be of decision-level quality following the data quality assessment (Appendix D) are included in the final data set evaluated in this appendix.

G-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 (DLs) greater than background values (BVs) (inorganic chemicals) and detected (organic chemicals, inorganic chemicals with no BVs, and fallout radionuclides) were retained. The industrial scenario and the ecological screening used data for samples collected at 0.0–1.0 ft and 0.0–5.0 ft below ground surface (bgs), respectively. The residential and construction worker scenarios used data for samples collected at 0.0–10.0 ft bgs. However, sampling depths often overlapped because of multiple investigations. Therefore, samples with a starting depth of less than the lower bound of the interval were included in the risk-screening assessments for a given scenario, as appropriate.

Tables G-2.3-1 to G-2.3-9 summarize the COPCs evaluated for potential risk for each site in the Chaquehui Canyon Aggregate Area. Some of the COPCs identified in this report may not be evaluated for potential risk under one or more scenarios because samples were not collected within the specified depth intervals associated with a given scenario.

G-3.0 CONCEPTUAL SITE MODEL

The primary mechanisms of release related to historical contaminant sources are described in detail in the historical investigation report (LANL 2009, 107348) and summarized in section 2.0 of the approved investigation work plan (LANL 2010, 111298.9; NMED 2011, 201242). Releases from sites within the Chaquehui 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 2009, 107348).

G-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 (approximately 800 ft at the South Site). 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, where appropriate. The exposure pathways are the same as those for surface soil. Sources, exposure pathways, and receptors are shown in the conceptual site model (CSM) (Figure G-3.1-1).

New Mexico Environment Department (NMED) guidance (NMED 2019, 700550) requires that sites larger than 2 acres be evaluated to determine if beef ingestion is a plausible and complete exposure pathway. The Chaquehui Canyon Aggregate Area SWMUs are 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 sites in the Chaquehui Canyon Aggregate Area are industrial areas on Laboratory property. The developed sites provide minimal or no potential habitat for ecological receptors, especially where sites are covered with asphalt. 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 has been excavated and brought to the surface.

Considering unpaved sites or areas where potential habitat is present, exposure pathways are complete to surface soil and tuff for ecological receptors. The potential pathways are root uptake by plants, inhalation of vapors (burrowing animals only), inhalation of dust, dermal contact, incidental ingestion of soil, external irradiation, and food web transport. Pathways from subsurface releases may be complete for plants. Surface water exposure was not evaluated because of the lack of surface water features. Sources, exposure pathways, and receptors are presented in the CSM (Figure G-3.1-1).

G-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 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, organic, and/or radionuclide COPCs in tuff. The limited extent of contamination is related to the absence of the key factors that facilitate migration, as discussed previously. Given how long the contamination has been present in the subsurface, the physical and chemical properties of the COPCs, and the lack of saturated conditions, the potential for contaminant migration to groundwater is very low.

NMED guidance (NMED 2019, 700550) 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 unfounded for cases such as these Chaquehui Canyon Aggregate Area sites, where sampling has shown that contamination is vertically bounded near the surface and the distance from the surface to the water table is considerable. 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 the following:

- 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
- 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 Chaquehui 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.

G-3.2.1 Inorganic Chemicals

In general, and particularly in a semiarid climate, inorganic chemicals are not highly soluble or mobile in the environment, although there are exceptions. The physical and chemical factors that determine the distribution of inorganic COPCs within the soil and tuff at the Chaquehui 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 G-3.2-1 presents the K_d values and water solubility for the inorganic COPCs for the Chaquehui Canyon Aggregate Area. Based on this criterion, the following inorganic COPCs have a low potential to mobilize and migrate through soil and the vadose zone: antimony, barium, cadmium, chromium, cobalt, lead, mercury, nickel, sodium, thallium, and zinc. The K_d values for calcium, copper, iron, magnesium, nitrate, perchlorate, selenium, silver, and uranium are less than 40 and may indicate a greater potential to mobilize and migrate through soil and the vadose zone beneath the sites.

It is important to note that other factors besides the K_d values (e.g., speciation in soil, oxidation-reduction potential, pH, and soil mineralogy) also play significant roles in the likelihood that inorganic chemicals will migrate. The COPCs with K_d values less than 40 are discussed further below. Nutrients necessary for life, such as calcium, magnesium, and sodium, are not discussed. 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); https://www.atsdr.cdc.gov/toxprofiledocs/index.html.

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.

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 lepidocrocite, hematite, and goethite. Iron is not expected to be mobile in the neutral to slightly alkaline, well-drained soil at the Chaquehui Canyon Aggregate Area.

Nitrate is an inorganic water-soluble salt with the potential for rapid migration through soils to surface water and groundwater. Sorption of anions such as nitrate is insignificant in most soils. Leaching of excess soil nitrate into bodies of water is therefore an important consideration. Drainage characteristics of soils are strongly related to nitrate levels in shallow wells near agricultural areas. Other factors affecting leaching potential include the texture of the soil, pH, precipitation rates, tillage, and the types of crops or vegetation that may be planted in the soils. Nitrate has the potential to move into various environmental compartments and is subject to abiotic and biotic degradation processes. Transformation and degradation processes include denitrification to atmospheric nitrogen and plant uptake. Levels of nitrate in soil vary considerably as a function of soil properties, temperature, precipitation rates, nitrogen loadings, farming practices (tillage, crops planted), and seasonal changes. In well-drained aerobic soils, the conversion of ammonia into nitrate (nitrification) increases the soil-nitrate content. In anaerobic soils with high organic matter, such as waterlogged soils or wetlands, denitrification decreases the levels of nitrate in soils. Acidic soils tend to have lower levels of nitrate since the nitrification process ceases at pH levels below 4.5. Nitrate is expected to have moderate mobility under the environmental conditions (neutral to slightly alkaline soil pH and oxidizing near-surface conditions) present at the Chaquehui Canyon Aggregate Area.

Perchlorate is somewhat soluble in water and may migrate with water molecules in saturated soil. As noted above, the subsurface material beneath the sites has low moisture content, which inhibits the mobility of nitrate and perchlorate as well as most other inorganic chemicals.

Selenium is not often found in the environment in its elemental form but is usually combined with sulfide minerals or with silver, copper, lead, and nickel minerals. In soil, pH and Eh are determining factors in the transport and partitioning of selenium. In soil with a pH of greater than 7.5, selenates, which have high solubility and a low tendency to adsorb onto soil particles, are the major selenium species and are very mobile. The soil pH in the Chaquehui Canyon Aggregate Area is neutral to slightly alkaline, indicating that selenium is not likely to migrate.

Silver is released to air and water via natural processes, such as the weathering of rock and the erosion of soil. Silver sorbs onto soil and sediment and tends to form complexes with inorganic chemicals and humic substances in soil. Organic matter complexes with silver and reduces its mobility. Silver compounds tend to leach from well-drained soil so that it may potentially migrate into the subsurface. Site conditions are neutral to slightly alkaline and silver is not expected to be mobile.

Uranium is a natural and commonly occurring radioactive element that is present in nearly all rock and soil. The mobility of uranium in soil and its vertical transport to groundwater depend on properties of the soil such as pH, Eh, concentration of complexing anions, porosity of the soil, soil-particle size, and sorption properties as well as the amount of water available. In general, the actinide nuclides form comparatively insoluble compounds in the environment and therefore are not considered biologically mobile. The actinides are transported in ecosystems mainly by physical and sometimes chemical processes. They tend to attach, sometimes strongly, to surfaces and 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.

G-3.2.2 Organic Chemicals

Table G-3.2-2 presents the physical and chemical properties (organic carbon-water partition coefficient [K_{oc}], logarithm to the base 10 octanol/water partition coefficient [log K_{ow}], and solubility) of the organic COPCs identified for the Chaquehui 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 organic COPCs at the Chaquehui Canyon Aggregate Area. The information is summarized from Ney (1995, 058210).

Water solubility may be the most important chemical characteristic used to assess mobility of organic chemicals. The higher the water solubility of a chemical, the more likely it is to be mobile and the less likely it is to accumulate, bioaccumulate, volatilize, or persist in the environment. A highly soluble chemical (water solubility greater than 1000 mg/L) is prone to biodegradation and metabolism that may detoxify the parent chemical. Several organic COPCs at the Chaquehui Canyon Aggregate Area sites have water solubilities greater than 1000 mg/L, including acenaphthylene, acetone, acrylonitrile, benzene, benzoic acid, 2-butanone, chloroform, 2-chloronaphthalene, di-n-butylphthalate, diethylphthalate, 2-hexanone, isophorone, 4-isopropyltoluene, methylene chloride, pyridine, and trichloroethene (TCE).

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 organic COPCs identified as having water solubilities less than 10 mg/L are 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; butylbenzylphthalate; carbazole; chrysene; di-n-octylphthalate, dibenz(a,h)anthracene; dibenzofuran; fluoranthene; fluorene; indeno(1,2,3-cd)pyrene; phenanthrene; pyrene; and 1,2,4,5-tetrachlorobenzene.

Vapor pressure is a chemical characteristic used to evaluate the tendency of organic chemicals to volatilize. Chemicals with vapor pressure greater than 0.01 mm Hg are likely to volatilize, and concentrations at the site are therefore reduced over time. Vapors of these chemicals are more likely to travel toward the atmosphere and not migrate towards groundwater. Acetone; benzene; 2-hexanone; isophorone; methylene chloride; 1-methylnaphthalene; 2-methylnaphthalene; naphthalene; toluene; 1,2,3-trichlorobenzene; TCE; and 1,3-xylene+1,4-xylene have vapor pressures greater than 0.01 mm Hg.

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; carbazole; chrysene; dibenz(a,h)anthracene; indeno(1,2,3-cd)pyrene; and RDX (Royal Demolition Explosive [1,3,5-trinitro-1,3,5-triazine]) have vapor pressures less than 0.000001 mm Hg.

The K_{ow} is an indicator of an organic 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). No COPCs at the Chaquehui Canyon Aggregate Area sites 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. Acenaphthene; acetone; anthracene; Aroclor-1254; Aroclor-1260; benzene; benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; benzo(k)fluoranthene; bis(2-ethylhexyl)phthalate; butylbenzylphthalate; carbazole; chrysene; di-n-butylphthalate; dibenz(a,h)anthracene; dibenzofuran; diethylphthalate; 2,4-dinitrotoluene; fluoranthene; fluorene; 2-hexanone; indeno(1,2,3-cd)pyrene; isophorone; methylene chloride; 1-methylnaphthalene; 2-methylnaphthalene; naphthalene; phenanthrene; pyrene; RDX; toluene; 1,2,3-trichlorobenzene;TCE; and 1,3-xylene+1,4-xylene all have a K_{ow} much less than 500.

The K_{oc} measures the tendency of a chemical to adsorb to organic carbon in soil. K_{oc} values above 500 cm^3/g indicate a strong tendency to adsorb to soil, leading to low mobility (NMED 2019, 700550). Most organic COPCs have K_{oc} values above 500 cm^3/g, indicating a very low potential to migrate toward groundwater. The organic COPCs with K_{oc} values less than 500 cm^3/g include acetone; benzene; di-n-butylphthalate; diethylphthalate; 2-hexanone; isophorone; methylene chloride; RDX; toluene; TCE; and 1,3-xylene+1,4-xylene.

Aroclors, polycyclic aromatic hydrocarbons (PAHs), and phthalates are the least mobile and the most likely to bioaccumulate. Acetone, benzene, 2-hexanone, isophorone, methylene chloride, and TCE are more soluble and volatile, and are more likely to travel toward the atmosphere and not migrate toward groundwater. Because the organic COPCs were detected at low concentrations and extent is defined, they are not likely to migrate to groundwater.

G-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 G-3.2-3 gives physical and chemical properties of the radionuclide COPCs identified at the Chaquehui Canyon Aggregate Area sites. Based on K_d values, no radionuclide COPCs have a very low potential to migrate towards groundwater at the sites within the Chaquehui Canyon Aggregate Area. The K_d values for tritium, uranium-234, uranium-235/236, and uranium-238 are less than 40 and indicate a potential to migrate towards groundwater.

Tritium's initial behavior in the environment is determined by the source. If it is released as a gas or vapor to the atmosphere, substantial dispersion can be expected, and the rapidity of deposition is dependent on climatic factors. If tritium is released in liquid form, it is diluted in surface water and is subject to physical dispersion, percolation, and evaporation (Whicker and Schultz 1982, 058209, p. 147). Tritium activities in the subsurface at the area of elevated radioactivity are low (generally <1 pCi/g), indicating the area of elevated radioactivity is not a significant source of tritium, although this radionuclide is relatively mobile. Because tritium migrates in association with moisture, the low moisture content of the subsurface limits the potential for tritium to migrate to groundwater.

Uranium is a natural and commonly occurring radioactive element that is present in nearly all rock and soil. The mobility of uranium in soil and its vertical transport to groundwater depend on properties of the soil such as pH, Eh, concentration of complexing anions, porosity of the soil, soil-particle size, and sorption properties as well as the amount of water available. In general, the actinide nuclides form comparatively insoluble compounds in the environment and therefore are not considered biologically mobile. The actinides are transported in ecosystems mainly by physical and sometimes chemical processes. They tend to attach, sometimes strongly, to surfaces and tend to accumulate in soil and sediment, which ultimately serve as strong reservoirs. Subsequent movement is largely associated with geological processes such as erosion and sometimes leaching.

G-3.3 Exposure Point Concentration Calculations

The exposure point concentrations (EPCs) represent upper-bound concentrations of COPCs. For comparison with 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 DLs 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 G-2.3-1 to G-2.3-9.

The UCLs of the mean concentrations were calculated 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). The ProUCL program calculates 95%, 97.5%, and 99% UCLs and recommends a distribution and UCL. The 95% UCL for the recommended calculation method was used as the EPC. The ProUCL software performs distributional tests on the data set for each COPC and calculates the most appropriate UCL based on the distribution of the data set. Environmental data may have a normal, lognormal, or gamma distribution but are often nonparametric (no definable shape to the distribution). The ProUCL documentation strongly recommends against using the maximum detected concentration for the EPC. The maximum detected concentration was used to represent the EPC for COPCs only when there were too few detections to calculate a UCL. Input and output data files for ProUCL calculations are provided on CD as Attachment G-1.

G-4.0 HUMAN HEALTH RISK-SCREENING EVALUATIONS

Human health risk-screening assessments were conducted for three SWMUs in the Chaquehui Canyon Aggregate Area. All sites were screened for construction worker and residential 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. The human health risk-screening assessments compared either the 95% UCL of the mean concentration or the maximum detected concentration of each COPC with SSLs for chemicals and screening action levels (SALs) for radionuclides.

G-4.1 Human Health SSLs and SALs

Human health risk-screening assessments were conducted using SSLs for the construction worker, industrial and residential scenarios obtained from NMED guidance (NMED 2019, 700550). The NMED SSLs are based on a target hazard quotient (HQ) of 1 and a target cancer risk of 1×10^{-5} (NMED 2019, 700550). If SSLs were not available from NMED guidance, the EPA regional screening tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables) were used. However, EPA regional screening levels do not include construction worker values, so if NMED does not have a construction worker SSL, then a construction worker SSL must be calculated using the toxicity data from the EPA regional screening table and the parameters and equations from the NMED guidance (NMED 2019, 700550). Attachment G-2 reports the calculated construction worker values used in this report. 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}. 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, construction worker, and residential SSLs are presented in Table G-4.1-1.

Lead was evaluated separately using an alternative method following NMED soil-screening guidance. See section G-4.4.1 for more information (NMED 2019, 700550).

Radionuclide SALs were used for comparison with radionuclide COPC EPCs and were derived using the Residual Radioactivity (RESRAD) model, Version 7.2 (https://resrad.evs.anl.gov/documents/); (LANL 2015, 600929). The SALs are based on a 25-mrem/yr dose. Exposure parameters used to calculate the SALs are presented in Tables G-4.1-2 and G-4.1-3.

G-4.2 Results of Human Health Screening Evaluation

The EPC of each COPC was compared with the SSLs for the industrial, 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. Lead concentrations were compared with values computed from an alternative evaluation method. See section G-4.4.1 for more information (NMED 2019, 700550). Total doses for each exposure scenario were estimated using SALs. The radionuclide EPCs were divided by the SAL and multiplied by 25 mrem/yr. The results are presented in Tables G-4.2-1 to G-4.2-26 and are described below for each SWMU evaluated.

G-4.2.1 SWMU 33-007(c)

The results of the risk-screening assessment for the industrial scenario are presented in Tables G-4.2-1, G-4.2-2, and G-4.2-3. 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 2019, 700550). The industrial HI is 0.1, which is less than the NMED target HI of 1 (NMED 2019, 700550). Radionuclide EPCs were less than SALs and the total estimated dose is 0.3 mrem/yr.

The results of the risk-screening assessment for the construction worker scenario are presented in Tables G-4.2-4, G-4.2-5, and G-4.2-6. The total excess cancer risk for the construction worker scenario is 7×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2019, 700550). The construction worker HI is 1, which is equivalent to the NMED target HI of 1 (NMED 2019, 700550). Radionuclide EPCs were less than SALs and the total estimated dose is 0.3 mrem/yr.

The results of the risk-screening assessment for the residential scenario are presented in Tables G-4.2-7, G-4.2-8, and G-4.2-9. 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 2019, 700550). The residential HI is 2, which is greater than the NMED target HI of 1 (NMED 2019, 700550). Radionuclide EPCs were less than SALs and the total estimated dose is 1 mrem/yr.

G-4.2.2 SWMU 33-010(c)

The results of the risk-screening assessment for the industrial scenario are presented in Tables G-4.2-10, G-4.2-11, and G-4.2-12. The total excess cancer risk for the industrial scenario is 7×10^{-8}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2019, 700550). The industrial HI is 0.02, which is less than the NMED target HI of 1 (NMED 2019, 700550). Radionuclide EPCs were less than SALs and the total estimated dose is 0.5 mrem/yr.

The results of the risk-screening assessment for the construction worker scenario are presented in Tables G-4.2-13, G-4.2-14, and G-4.2-15. The total excess cancer risk for the construction worker scenario is 3×10^{-7}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2019, 700550). The construction worker HI is 0.2, which is less than the NMED target HI of 1 (NMED 2019, 700550). Radionuclide EPCs were less than SALs and the total estimated dose is 0.8 mrem/yr.

The results of the risk-screening assessment for the residential scenario are presented in Tables G-4.2-16, G-4.2-17, and G-4.2-18. 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 2019, 700550). The residential HI is 0.2, which is less than the NMED target HI of 1 (NMED 2019, 700550). Radionuclide EPCs were less than SALs and the total estimated dose is 3 mrem/yr.

G-4.2.3 SWMU 33-011(d)

The results of the risk-screening assessment for the industrial scenario are presented in Tables G-4.2-19 and G-4.2-20. 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 2019, 700550). The industrial HI is 0.04, which is less than the NMED target HI of 1 (NMED 2019, 700550). No radionuclide COPCs were identified in the 0.0–1.0 ft bgs depth interval.

The results of the risk-screening assessment for the construction worker scenario are presented in Tables G-4.2-21, G-4.2-22, and G-4.2-23. The total excess cancer risk for the construction worker scenario is 1×10^{-6}, which is less than the NMED target risk level of 1×10^{-5} (NMED 2019, 700550). The construction worker HI is 0.4, which is less than the NMED target HI of 1 (NMED 2019, 700550). Radionuclide EPCs were less than SALs and the total estimated dose is 0.01 mrem/yr.

The results of the risk-screening assessment for the residential scenario are presented in Tables G-4.2-24, G-4.2-25, and G-4.2-26. The total excess cancer risk for the residential scenario is 9×10^{-5}, which is greater than the NMED target risk level of 1×10^{-5} (NMED 2019, 700550). The residential HI is 0.7, which is less than the NMED target HI of 1 (NMED 2019, 700550). Radionuclide EPCs were less than SALs and the total estimated dose is 0.03 mrem/yr.

Lead was a COPC for the industrial, construction worker, and residential scenarios and is evaluated in section G-4.4-1.

G-4.3 Vapor-Intrusion Pathway

NMED soil-screening guidance (NMED 2019, 700550, Section 2.5) requires an evaluation of the vapor-intrusion pathway per EPA guidance. Note that NMED guidance cites "OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance" (EPA 2002, 094114); however, EPA's "Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air," is the most current guidance (https://www.epa.gov/vaporintrusion/technical-guide-assessing-and-mitigating-vapor-intrusion-pathway-subsurface-vapor). Residential receptors and commercial/industrial workers could be exposed to volatile compounds vaporized from subsurface media (soil gas and/or groundwater) through pore spaces in the vadose zone and building foundations (or slabs) into indoor air. This pathway must be evaluated if (1) there are compounds present in subsurface media that are sufficiently volatile and toxic and (2) there are existing or planned buildings where exposure could occur. The executive summary of the EPA guidance (https://www.epa.gov/vaporintrusion/technical-guide-assessing-and-mitigating-vapor-intrusion-pathway-subsurface-vapor) specifically states that, among other criteria, the vapor-intrusion pathway is referred to as "complete" only if buildings exist that are occupied by one or more individuals when the vapor-forming chemicals are present indoors. The guidance further states that the vapor-intrusion pathway is incomplete if these conditions are absent and reasonably expected to be absent in the future.

For each site investigated, one of the following three designations was made for the vapor-intrusion pathway: (1) incomplete pathway and no action required, (2) potentially complete pathway and qualitative evaluation required, or (3) complete pathway and quantitative evaluation required. A summary of the vapor-intrusion pathway designations for each site is included in Tables G-4.3-1, G-4.3-2, and G.4.3-3. Because only bulk soil data are available for these sites, NMED vapor-intrusion screening levels are not directly applicable for the evaluation.

Incomplete Pathway: No Action Required

The vapor-intrusion pathway is designated as "incomplete" and will not be evaluated further if one of the following conditions is met:

(1) There are no buildings located near the site and buildings are reasonably expected to be absent in the future (NMED 2019, 700550); https://www.epa.gov/vaporintrusion/technical-guide-assessing-and-mitigating-vapor-intrusion-pathway-subsurface-vapor.

(2) Volatile and toxic compounds are not detected, meaning all the results were 100% nondetections.

(3) The site has no history of containing volatile and toxic compounds and VOC sampling was not conducted during the investigation.

Potentially Complete Pathway: Qualitative Evaluation Required

The vapor-intrusion pathway is designated as potentially complete if each of the following conditions is met:

(1) Detections of volatile and toxic compounds are minimally detected (e.g., once or twice) in site media (soil, tuff).

(2) There are no suspected sources for volatile and toxic compounds.

(3) Concentrations are decreasing with depth.

A qualitative evaluation of the vapor-intrusion pathway will be used for the sites meeting the above criteria. Unless pore-gas sampling was specified in the approved investigation work plan for the site, the qualitative evaluation will be made using bulk soil data rather than pore-gas data. The qualitative evaluation will include all site-specific COPCs that are volatile and toxic (i.e., all COPCs having a Henry's Law constant of 1×10^{-5} atm-m^3/mol or greater, a molecular weight of approximately 200 g/mol or less, and known to pose a potential cancer risk or noncancer hazard through the inhalation pathway). Nondetected organic compounds are not considered COPCs and will not be evaluated.

Complete Pathway: Quantitative Evaluation Required

The vapor-intrusion pathway is designated as “complete” for a specific building or collection of buildings when the following five conditions are met:

(1) A subsurface source of vapor-forming chemicals is present underneath or near the building(s) (e.g., VOCs are found at significant levels within 10 ft of the base of the foundation.

(2) Vapors form and have a route along which to migrate (be transported) toward the building.

(3) The building(s) is (are) susceptible to soil gas entry, which means openings exist for the vapors to enter the building and driving ‘forces’ (e.g., air pressure differences between the building and the subsurface environment) exist to draw the vapors from the subsurface through the openings into the building(s).

(4) One or more vapor-forming chemicals composing the subsurface vapor source(s) is (are) present in the indoor environment.

(5) The building(s) is (are) occupied by one or more individuals when the vapor-forming chemical(s) is (are) present indoors.

SWMU 33-010(c) has no nearby buildings and buildings are not reasonably anticipated to be present in the future; therefore, the vapor-intrusion pathway is incomplete and no action is required. Additional information for SWMU 33-010(c) is presented in section G-4.3.1.

Volatile organic COPCs or VOCs were sampled near vacant buildings for SWMUs 33-007(c) and 33-011(d).Even though these buildings are not reasonably expected to be occupied in the future, the vapor-intrusion pathway is potentially complete. Additional lines of evidence are provided for SWMUs 33-007(c) and 33-011(d) in sections G-4.3.2 and G-4.3.3, respectively.

G-4.3.1 SWMU 33-010(c)

SWMU 33-010(c) is a former surface disposal area located at South Site on the northern rim of Chaquehui Canyon at the southern end of TA-33. The disposal area measured approximately 50 ft × 30 ft × 2-ft to 4-ft deep and was approximately 230 ft south of structure 33-26 [SWMU 33-006(a)] along the western edge of the main South Site drainage channel. From approximately 1950 to 1955, this site was used to dispose of debris from the implosion tests conducted at SWMU 33-006(a). Debris disposed of at the site included copper and aluminum shrapnel, pieces of electronic cable, sand and soil with residual HE, and wood. Between shots, the shot pad and surrounding area were scraped and the debris bulldozed over the canyon edge and onto the hillside below (LANL 1992, 007671, p. 3-53). During the voluntary correction action performed in 1999, debris and soil were excavated and removed from the site (LANL 2000, 066889). Residual debris was removed from SWMU 33-010(c) during the 2019–2020 investigation.

SWMU 33-010(c) is located on the slope of a canyon alongside a drainage channel. There are no existing or planned buildings where exposure could occur at the site. In the highly unlikely event that a structure is constructed at this site in the future, its construction would require significant excavation or placement of fill material to create a level surface for the structure, which would mitigate any volatile COPCs that may be minimally present.

While a VOC and a semivolatile organic compound (SVOC) that meet the NMED criteria for volatility and toxicity were minimally detected at this site, because no buildings are present or reasonably anticipated to be present in the future, the vapor-intrusion pathway is incomplete based upon NMED and EPA guidance

(NMED 2019, 700550); https://www.epa.gov/vaporintrusion/technical-guide-assessing-and-mitigating-vapor-intrusion-pathway-subsurface-vapor. Therefore, no further evaluation is necessary.

G-4.3.2 SWMU 33-007(c)

SWMU 33-007(c) consists of two abandoned gun firing areas associated with the initiator tests conducted at Area 6 in the west-central portion of TA-33. The first gun firing area included a gun building (vacant structure 33-16), a gun mount (structure 33-64), and an earthen berm (structure 33-60). Structure 33-16 was completed in 1949 and housed an air gun, and then electronic equipment, to measure neutron production in gun-type initiators containing beryllium and polonium-210. The second gun firing area included a large gun (structure 33-65), a hillside embankment (structure 33- 61), and two barricades (structures 33-62 and 33-72) located north and east of the gun.

One concrete firing pad was located immediately west of structure 33-16, on which a large bore gun was mounted. The pad measured 6 ft × 10 ft and was surrounded by a concrete apron. The other two concrete firing pads were located in a level area excavated into a basaltic cinder cone approximately 100 ft southwest of structure 33-16.

A 1951 memorandum describes a test at Area 6 that resulted in a release of radioactive material from a projectile. The site was cleaned up using a bulldozer to scrape away the contaminated soil and embankment (Buckland 1951, 007845). A 1954 memorandum describes decontamination of one of the Area 6 gun barrels. The memorandum describes removing loose material and leaving impregnated spots as high as 1 million counts per minute. Contaminated surface soil was bulldozed from the shot area into the adjacent canyon (LASL 1954, 107465). Shots were discontinued at Area 6 by 1955. In 1956, structure 33-16 was used to make and machine laminating materials containing barium, titanium, lead, and zinc using epoxy resins. An exhaust blower and stack were installed along with an emissions stack. The buildings in Area 6 have been vacant since the late 1950s. The cinder cone has been further excavated. An aluminum tower (structure 33-192) is used for atmospheric physics monitoring within the excavated portion of the cinder cone.

Several compounds meeting the criteria for volatility and toxicity were minimally detected at this site. The VOCs, acetone, benzene, naphthalene, methylene chloride, TCE, and xylenes, were all detected in 1 of 37 samples. The estimated concentration of naphthalene was detected by SVOC analysis. Therefore, naphthalene will be evaluated as an SVOC. These compounds are minimally detected (e.g., once or twice) in site media based upon NMED “Risk Assessment Guidance for Investigation and Remediation” (NMED, 2019, 700550). Benzene, TCE, and xylenes were detected at estimated (J-qualified) concentrations at a depth of 0.0–1.0 ft bgs at concentrations below the lowest report DL, with no detections from deeper intervals. Acetone was detected at an estimated (J-qualified) concentration within the range of report DLs at a depth of 4.0–5.0 ft bgs with no detections from deeper intervals. Methylene chloride was detected at an estimated (J-qualified) concentration below the lowest report DL at a depth of 2.0–3.0 ft bgs with no detections from deeper intervals.

The VOC toluene was detected in 8 of 37 samples at depths ranging from 0.0–5.0 ft with only 1 detected concentration above the range of report DLs in a sample collected from 0.0–1.0 ft bgs. Toluene concentrations below the lowest report DL were also estimated (J-qualified) in seven samples at depths of 0.0–1.0 ft bgs (4 samples), 2.0–3.0 ft bgs (2 samples), and 4.0–5.0 ft bgs (1 sample). There were no detections of toluene below 5 ft.

One SVOC (naphthalene) that meets the criteria for volatility and toxicity was detected at this site. Naphthalene was estimated in one sample and therefore meets the definition of minimally detected (e.g., once or twice) in site media based upon NMED’s “Risk Assessment Guidance for Investigation and

Remediation" (NMED 2019, 700550). Naphthalene was detected at a depth of 0.0–1.0 ft bgs at an estimated concentration of 0.0181 mg/kg below the lowest report DL, with no detections from deeper intervals. Two other SVOCs that meet the criteria for volatility, (1-methylnaphthalene and 2-methylnaphthalene) were detected at estimated concentrations in one sample collected from the depth interval of 0.0–1.0 ft, but there is no inhalation toxicity data for these compounds; therefore, they will not be evaluated further for vapor intrusion.

Two Aroclors, 1254 and 1260, were detected at this site. The molecular weights of these two compounds are 326.44 and 395.33 g/mol, respectively. Therefore, these two compounds do not meet the criteria for volatility and toxicity and do not present a vapor-intrusion risk.

Table G-4.3-2 depicts the estimated concentrations and one detection of the seven VOCs along with the range of report DLs for each compound. In addition, while not directly comparable, the table includes the vapor-intrusion screening levels (VISLs) for indoor air for each compound.

Multiple Lines of Evidence Evaluation: The site description does not include any activities associated with solvent usage (or other VOC chemicals) or disposal at this site, therefore, no known source of VOCs exists at this site. One vacant structure exists at the site and it is located approximately 20 ft or more from any detections of VOCs. This structure is not reasonably anticipated to be occupied in the future. All VOCs, with the exception of toluene, meet the definition of minimal detection with only one detection each. No concentrations of VOCs were detected in samples collected from intervals greater than 5 ft bgs and therefore, concentrations have been shown to decrease with depth. In addition, soil gas samples are not recommended within 5 ft of ground surface because of the influence of ambient air (https://www.epa.gov/vaporintrusion/technical-guide-assessing-and-mitigating-vapor-intrusion-pathway-subsurface-vapor) so collection of vapor samples at this site would not provide quantitative data.

All estimated detections are below or within the range of report DLs. The one unqualified detection of toluene is only slightly above the report DL. While bulk soil concentrations are not directly comparable with indoor air VISLs, it is clear that none of the concentrations detected at this site would provide the mass required to exceed the indoor air VISLs for even a brief period of time. If any buildings, including slab-on-grade structures, are constructed at the site in the future, excavation for the purpose of leveling and installing footers would likely remove any impacted soil from beneath the footprint of the building.

Some VOCs were detected and one vacant structure is located at this site. Therefore, the vapor intrusion pathway is potentially complete based upon NMED guidance (NMED 2019, 700550). However, multiple lines of evidence indicate that no further evaluation is necessary.

G-4.3.3 SWMU 33-011(d)

SWMU 33-011(d) consists of a former storage area that was located on an asphalt pad around a warehouse (building 33-20) in the southwest corner of Main Site at TA-33. Beryllium and uranium were stored in and outside of building 33-20 from 1950 until 1972. In addition, recovered scrap from shots containing uranium, beryllium, and tungsten was stored on the asphalt south of building 33-20. The amount of uranium stored at this site is reported to have been "tons" (Ahlquist 1983, 006854). Much of the material stored at the site was salvaged for use elsewhere. A 1987 site survey found no materials remaining in storage at this location (LANL 1992, 007671, p. 3-24). There is a building on-site (33-20). It is in use but with limited and intermittent occupancy.

Two VOCs (acetone and naphthalene) were minimally detected at this site. The maximum detected concentration of acetone was less than the maximum nondetected concentration but greater than the report DL. The maximum detected concentration of naphthalene was greater than the maximum nondetected concentration and the report DL; however, higher concentrations of naphthalene were detected by SVOC analysis. Therefore, naphthalene will be evaluated as an SVOC.

Acetone was detected in 10 of 27 samples (four detections and six estimated concentrations) with a maximum detected concentration of 0.0144 mg/kg at a depth interval of 4.0–5.0 ft bgs in Qbt3. The depth of all samples was up to 5 ft bgs. Three other detected concentrations ranging from 0.00305 mg/kg to 0.00976 mg/kg were detected in the same media and depth interval.

Two SVOCs [benzo(a)anthracene and naphthalene] that meet the NMED volatility and toxicity criteria for potential vapor intrusion were minimally detected at this site. The maximum detected concentration of benzo(a)anthracene was greater than the maximum nondetected concentration and greater than the report DL. The maximum detected concentration of naphthalene was greater than the maximum nondetected concentration and the report DL.

Benzo(a)anthracene was detected in 6 of 36 samples (1 detection and 5 estimated concentrations) with a maximum detected concentration of 5.31 mg/kg at a depth interval of 2.0–2.4 ft bgs in fill material. Three samples collected from 0.0–1.0 ft bgs contained estimated concentrations of benzo(a)anthracene ranging from 0.0315 to 0.151 mg/kg. Two other concentrations of 0.207 mg/kg and 0.636 mg/kg were estimated in the same media at a depth interval of 2.0–2.8 ft bgs. The depth of all samples was up to 5 ft bgs. No benzo(a)anthracene was detected below 2.8 ft bgs, therefore, concentrations decrease with depth.

Naphthalene was detected in 3 of 36 samples (1detection and 2 estimated concentrations) with a maximum detected concentration of 11 mg/kg at a depth interval of 2.0–2.4 ft bgs with a nondetected concentration of 0.0112 mg/kg at the 4.0–5.0 ft bgs interval. The depth of all samples was up to 5 ft bgs. Two concentrations of 0.52 mg/kg and 0.00217 mg/kg were estimated at depth intervals of 2.0–2.8 ft bgs and 4.0–5.0 ft bgs, respectively. Naphthalene was not detected in any other samples; therefore, concentrations of naphthalene decrease with depth.

Note the maximum concentrations for the two SVOCs represent one sample collected from 2.0–2.4 ft bgs approximately 70 ft from building 33-20. A sample without any detections was collected between this sample and building 33-20. All other samples with detected concentrations contained concentrations near or below the DLs.

Several SVOCs that meet the criteria for volatility were minimally detected at this site: acenaphthene, anthracene, fluorene, 1-methylnaphthalene, 2-methylnaphthalene, phenanthrene, and pyrene but there is no inhalation toxicity data for these compounds and therefore they will not be evaluated further for vapor intrusion.

Table G-4.3-3 depicts the detected and estimated concentrations of the VOCs and SVOCs evaluated for vapor intrusion along with the range of report DLs for each compound. In addition, while not directly comparable, the table includes the VISLs for indoor air for each compound.

Multiple Lines of Evidence Evaluation: The site description does not include any activities associated with solvent usage (or other VOC chemicals) or disposal at this site, therefore, no known source of VOCs exists at this site. Building 33-20 is in use but with limited and intermittent occupancy. The source of the PAHs is likely from the asphalt pad making up most of SWMU 33-011(d). No concentrations of VOCs or SVOCs were detected within ten feet of buildings 33-20 or 33-305. No samples were collected from intervals greater than 5 ft bgs and most concentrations have been shown to decrease with depth. In addition, soil gas samples are not recommended within 5 ft of ground surface because of the influence of ambient air (https://www.epa.gov/vaporintrusion/technical-guide-assessing-and-mitigating-vapor-intrusion-pathway-subsurface-vapor), so collection of vapor samples at this site would not provide quantitative data.

While bulk soil concentrations are not directly comparable with indoor air VISLs, it is clear that none of the concentrations detected at this site, including the one sample with the maximum concentrations of benzo(a)anthracene and naphthalene, would provide the mass required to exceed the indoor air VISLs for even a brief period of time. In the unlikely event that a new building is constructed at the site in the distant future, including slab-on-grade structures, excavation for the purpose of leveling and installing footers would likely remove any impacted soil from beneath the building footprint.

A VOC and some SVOCs were detected at this site. There is a building on-site (33-20). It is in use but with limited and intermittent occupancy. Therefore, the vapor-intrusion pathway is potentially complete based upon NMED guidance (NMED 2019, 700550). However, multiple lines of evidence indicate that no further evaluation is necessary.

G-4.4 Other COPCs

G-4.4.1 Lead

NMED has an alternate evaluation for lead. The EPA-recommended levels for lead, which are based on blood-lead modeling, were applied for the residential and industrial/construction worker scenarios. The screening values for these scenarios were based on back-calculations to determine a soil concentration that would not result in an estimated blood-lead concentration of greater than 10 µg/dL (400 mg/kg for residential adult and 800 mg/kg for industrial/construction worker). Though the regulatory standard remains 10 µg/dL, it is important to note that the Centers for Disease Control and Prevention (CDC) now define a blood-lead concentration of 5 µg/dL as an appropriate reference level (http://www.cdc.gov/nceh/lead/acclpp/final_document_010412.pdf).

Because derivation of the lead-screening values is based on a biokinetic model that considers multiple sources of exposure, the lead-screening values are fundamentally different from the SSLs for other metals. Therefore, lead is evaluated separately from other noncarcinogenic COPCs and not included in the HI for noncarcinogens. (Lead is included in the HI calculation for ecological screening.) Soil lead levels were below screening values for all receptor scenarios at SWMU 33-001(d), the SWMU at which lead was detected/evaluated (Table G-4.4-1). For SWMU 33-011(d), the lead HQ is 0.3 for the industrial scenario, 0.2 for the construction worker scenario, and 0.3 for the residential scenario.

G-4.4.2 Essential Nutrients

NMED guidance (NMED 2017, 602273) has SSLs for evaluation of essential nutrients. The maximum concentrations of calcium, magnesium, and sodium were compared with the appropriate NMED SSLs at those sites where they were identified as COPCs. The results of the comparisons found calcium, magnesium, and sodium to be substantially less than the SSLs presented in Table G-4.4-2. Further evaluation of calcium, magnesium, and sodium at these sites is therefore not necessary.

G-4.5 Uncertainty Analysis

G-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 DLs 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 retained for further analysis. Other uncertainties may include errors in sampling, laboratory analysis, and data analysis. However, because concentrations used in the risk-screening evaluations include those detected below the estimated quantitation limits and nondetections above BVs, data evaluation uncertainties are expected to have little effect on the risk-screening results.

G-4.5.2 Exposure Evaluation

The current and reasonably foreseeable future land use is industrial. To the degree that 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 2019, 700550). 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 2019, 700550). The residential SSLs are based on exposure of 24 hr/day, 350 days/yr, and 30 yr (NMED 2019, 700550). As a result, the construction worker, industrial, 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 2019, 700550). When several upper-bound values (as are found in NMED guidance [NMED 2019, 700550]) are combined to estimate exposure for any one pathway, the resulting risk estimate can exceed the 99th percentile, and therefore can exceed the range of risk that may be reasonably expected. Also, the assumption that residual concentrations of chemicals in the tuff are available and result in exposure in the same manner as if they were in soil overestimates the potential exposure and risk to receptors.

Uncertainty is introduced in the concentration aggregation of data for estimating the EPCs at a site. Risk from a single location or area with relatively high COPC concentrations may be underestimated by using a representative sitewide 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 sitewide 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 DL was used as the EPC for some inorganic COPCs with elevated DLs above BVs.

SWMU 33-007(c)

The residential HI at SWMU 33-007(c) is 2, which is greater than the NMED target risk level of 1, due primarily to cobalt (HQ = 1.8). Cobalt was detected in 42 of 43 samples with an EPC of 41.57 mg/kg. The maximum concentration was 225 mg/kg at a depth interval of 4.5–5.5 ft bgs at location 33-60541. The EPCs and the maximum concentration exceeded the Tertiary Cerros Basalt BV (19.3 mg/kg). The EPC and three detections were greater than the residential SSL (23.4 mg/kg). The next two highest concentrations were 94.3 mg/kg at a depth interval of 4.0–5.0 ft bgs at location 33-60547 and 76.5 mg/kg at a depth interval of 7.0-8.0 ft bgs at location 33-60543.

Operational history (firing and initiator testing) at this site involved the use of multiple metals, which may have included cobalt. Given the site is currently under institutional control, no further action is recommended based on residential risk; however, this site may need to be reevaluated if land is transferred in the future for residential use.

SWMU 33-011(d)

The residential chemical cancer risk at SWMU 33-011(d) is 9×10^{-5}, which is greater than the NMED target risk level of 1×10^{-5}. The primary contributors are PAHs including benzo(a)pyrene, dibenz(a,h)anthracene, benzo(a)anthracene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene.

The following PAH contributors collectively sum to 9×10^{-5}: dibenz(a,h)anthracene (6×10^{-5}), benzo(a)pyrene (1×10^{-5}), benzo(b)fluoranthene (8×10^{-6}), benzo(a)anthracene (7×10^{-6}), and indeno(1,2,3-cd)pyrene (3×10^{-6}). All PAH EPCs except dibenz(a,h)anthracene were less than the respective residential SSL. Dibenz(a,h)anthracene was detected in 4 of 36 samples with a maximum concentration of 0.965 mg/kg at a depth interval of 2.0–2.4 ft bgs at location 33-60670. The maximum concentration was used as the EPC and was the only concentration greater than the report DL. The three other detected concentrations were 0.164 mg/kg at location 33-60998 at a depth interval of 2.0–2.8 ft bgs, 0.0414 mg/kg at location 33-60999 at a depth interval of 2.0–2.8 ft bgs, and 0.0275 mg/kg at location 33-60998 at a depth interval of 0.0-1.0 ft bgs. The two highest concentrations and the EPC exceeded the dibenz(a,h)anthracene residential SSL (0.153 mg/kg).

SWMU 33-011(d) is a former storage area that was located on an asphalt pad, which may be the source of PAHs at the site. Given the site is currently under institutional control, no further action is recommended based on residential risk; however, this site may need to be reevaluated if land is transferred in the future for residential use.

G-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 2019, 700550). Uncertainties were identified in five areas with respect to the toxicity values: (1) extrapolation from other animals to humans, (2) variability among individuals 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. This 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.

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 from 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, the COPCs are assumed to be 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 and 4-isopropyltoluene based on structural similarity. The overall impact of surrogates on the risk assessment is minimal because these COPCs were generally detected at low concentrations (less than 1 mg/kg).

G-4.5.4 Additive Approach

For noncarcinogens, the effects of exposure to multiple chemicals are generally unknown. Possible interactions could be synergistic or antagonistic, resulting in either an overestimation or underestimation of the potential risk. In addition, 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.

G-4.6 Interpretation of Human Health Risk Screening Results

G-4.6.1 SWMU 33-007(c)

Industrial Scenario

The total excess chemical cancer risk for the industrial scenario is 1×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The industrial HI is 0.1, which is less than the NMED target HI of 1. Radionuclide EPCs were less than SALs and the total estimated dose is 0.3 mrem/yr. The total dose for the industrial scenario is equivalent to a total risk of 6×10^{-6}, based on conversion from dose using RESRAD Version 7.2 (https://resrad.evs.anl.gov/documents/); (LANL 2015, 600929).

Construction Worker Scenario

The total excess chemical cancer risk for the construction worker scenario is 7×10^{-7}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 1, which is equivalent to the NMED target HI of 1. Radionuclide EPCs were less than SALs and the total estimated dose is 0.3 mrem/yr. 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 7.2 (https://resrad.evs.anl.gov/documents/); (LANL 2015, 600929).

Residential Scenario

The total excess chemical cancer risk for the residential scenario is 3×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The residential HI is 2, which is greater than the NMED target HI of 1. Radionuclide EPCs were less than SALs and the total estimated dose is 1 mrem/yr. The total radiological dose for the residential scenario is equivalent to a total risk of 1×10^{-5}, based on conversion from dose using RESRAD Version 7.2 (https://resrad.evs.anl.gov/documents/); (LANL 2015, 600929).

G-4.6.2 SWMU 33-010(c)

Industrial Scenario

The total excess chemical cancer risk for the industrial scenario is 7×10^{-8}, which is less than the NMED target risk level of 1×10^{-5}. The industrial HI is 0.02, which is less than the NMED target HI of 1. Radionuclide EPCs were less than SALs and the total estimated dose is 0.5 mrem/yr. The total dose for the industrial scenario is equivalent to a total risk of 9×10^{-6}, based on conversion from dose using RESRAD Version 7.2 (https://resrad.evs.anl.gov/documents/); (LANL 2015, 600929).

Construction Worker Scenario

The total excess chemical cancer risk for the construction worker scenario is 3×10^{-7}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 0.2, which is less than the NMED target HI of 1. Radionuclide EPCs were less than SALs and the total estimated dose is 0.8 mrem/yr. The total dose for the construction worker scenario is equivalent to a total risk of 6×10^{-7}, based on conversion from dose using RESRAD Version 7.2 (https://resrad.evs.anl.gov/documents/); (LANL 2015, 600929).

Residential Scenario

The total excess chemical cancer risk for the residential scenario is 5×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The residential HI is 0.2, which is less than the NMED target HI of 1. Radionuclide EPCs were less than SALs and the total estimated dose is 3 mrem/yr. The total radiological dose for the residential scenario is equivalent to a total risk of 3×10^{-5}, based on conversion from dose using RESRAD Version 7.2 (https://resrad.evs.anl.gov/documents/); (LANL 2015, 600929).

G-4.6.3 SWMU 33-011(d)

Industrial Scenario

The total excess chemical cancer risk for the industrial scenario is 5×10^{-7}, which is less than the NMED target risk level of 1×10^{-5}. The industrial HI is 0.04, which is less than the NMED target HI of 1. No radionuclide COPCs were identified in the 0.0–1.0 ft bgs depth interval

Construction Worker Scenario

The total excess chemical cancer risk for the construction worker scenario is 1×10^{-6}, which is less than the NMED target risk level of 1×10^{-5}. The construction worker HI is 0.4, which is less than the NMED target HI of 1. Radionuclide EPCs were less than SALs and the total estimated dose is 0.01 mrem/yr. The total dose for the construction worker scenario is equivalent to a total risk of 8×10^{-9}, based on conversion from dose using RESRAD Version 7.2 (https://resrad.evs.anl.gov/documents/); (LANL 2015, 600929).

Residential Scenario

The total excess chemical cancer risk for the residential scenario is 9×10^{-5}, which is greater than the NMED target risk level of 1×10^{-5}. The residential HI is 0.03, which is less than the NMED target HI of 1. Radionuclide EPCs were less than SALs and the total estimated dose is 0.7 mrem/yr. The total radiological dose for the residential scenario is equivalent to a total risk of 6×10^{-7}, based on conversion from dose using RESRAD Version 7.2 (https://resrad.evs.anl.gov/documents/); (LANL 2015, 600929).

Lead

Lead was identified as a COPC for construction worker and residential scenarios. The back-calculated SSL from NMED for lead was used for the industrial, construction worker, and residential scenarios (NMED 2019, 700550). The industrial lead HQ was 0.3, the construction worker lead HQ was 0.2, and the residential lead HQ was 0.3.

G-5.0 ECOLOGICAL RISK-SCREENING EVALUATIONS

The approach for conducting ecological evaluations is described in the "Screening Level Ecological Risk Assessment Methods, Revision 5.1" (LANL 2018, 602965). The evaluation consists of four parts: a scoping evaluation, a screening evaluation, an uncertainty analysis, and an interpretation of the results.

G-5.1 Scoping Evaluation

The scoping evaluation establishes the breadth and focus of the screening evaluation. The ecological scoping checklist (Attachment G-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 CSM for the Chaquehui Canyon Aggregate Area sites (Attachment G-3). Some of the area on the mesa top is developed and provides minimal potential habitat for ecological receptors. The quality of the habitat varies and, in some cases, includes some sites that have native grasses, forbs, and trees that can be suitable habitat for ecological receptors.

The scoping evaluation indicated that terrestrial receptors were appropriate for evaluating the concentrations of COPCs in soil and tuff. Exposure is assessed across a site to a depth of 0.0–5.0 ft bgs. Aquatic receptors were not evaluated because no aquatic communities and no aquatic habitat or perennial source of water exist at any of the sites. The depth of the regional aquifer (greater than 1000 ft bgs) and the semiarid climate limit transport to groundwater. The potential exposure pathways for terrestrial receptors in soil and tuff are root uptake, inhalation, soil ingestion, dermal contact, and food web transport (Attachment G-3). The weathering of tuff is the only viable natural process that may result in the exposure of receptors to contaminants in tuff. Because of the slow rate of weathering expected for tuff, exposure in tuff is negligible, although it is included in the assessment. Plant exposure in tuff is largely limited to fractures near the surface, which does not produce sufficient biomass to support an herbivore population. Consequently, the contaminants in tuff are unavailable to receptors.

The potential risk was evaluated in the risk-screening assessments for the following ecological receptors representing several trophic levels:

- generic plant
- soil-dwelling invertebrate (represented by the earthworm)
- the deer mouse (mammalian omnivore)

- the montane shrew (mammalian insectivore)
- mountain cottontail (mammalian herbivore)
- gray fox (mammalian carnivore)
- American robin (avian insectivore, avian omnivore, and avian herbivore)
- American kestrel (avian insectivore and avian carnivore)

The rationale for using these receptors is presented in “Screening Level Ecological Risk Assessment Methods, Revision 5.1” (LANL 2018, 602965). The Chaquehui Canyon Aggregate Area lies outside the mapped threatened and endangered (T&E) species core or buffer habitats (Attachment G-3).

G-5.2 Assessment Endpoints

An assessment endpoint is an explicit expression of the environmental value to be protected. The endpoints are ecologically relevant and help sustain the natural structure, function, and biodiversity of an ecosystem or its components (EPA 1998, 062809). In a screening-level ecological evaluation, receptors represent the populations and/or communities, and assessment endpoints are any adverse effects on the chosen ecological receptors. The purpose of the ecological evaluation is to protect populations and communities of biota rather than individual organisms, except for listed or candidate T&E species and treaty-protected species, when individuals must be protected (EPA 1999, 070086). Populations of protected species tend to be small, and the loss of an individual adversely affects the species as a whole (EPA 1997, 059370).

In accordance with this guidance, the Laboratory developed generic assessment endpoints (LANL 1999, 064137) to ensure that values at all levels of ecological organization are considered in the ecological screening process. These general assessment endpoints can be measured using impacts on reproduction, growth, and survival to represent categories of effects that may adversely impact populations. In addition, specific receptor species were chosen to represent each functional group. The receptor species were chosen because of their presence at the site, their sensitivity to the COPCs, and their potential for exposure to those COPCs. These categories of effects and the chosen receptor species were used to select the types of effects seen in toxicity studies considered in the development of the toxicity reference values (TRVs). Toxicity studies used in the development of TRVs included only studies in which the adverse effect evaluated affected reproduction, survival, and/or growth.

The selection of receptors and assessment endpoints is designed to be protective of both the representative species used as screening receptors and the other species within their feeding guilds and the overall food web for the terrestrial and aquatic ecosystems. Focusing the assessment endpoints on the general characteristics of species that affect populations (rather than the biochemical and behavioral changes that may affect only the studied species) also ensures the applicability to the ecosystem of concern.

G-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 DL) with ecological screening levels (ESLs). The EPCs used in the assessments for the Chaquehui Canyon Aggregate Area are presented in Tables G-2.3-1 through G-2.3-9.

The ESLs were obtained from the ECORISK Database, Version 4.2 (N3B 2020, 701067) and are presented in Table G-5.3-1. The ESLs are based on similar species of the test population derived from a variety of toxicity studies and converted to a NOAEL. Lowest observed adverse-effect level– (LOAEL-) based-ESLs are used in the uncertainty analysis for the ecological screening. Information relevant to the calculation of NOAEL-based ESLs and LOAEL-based ESLs, including concentration equations, dose equations, bioconcentration factors, transfer factors, and TRVs, are presented in the ECORISK Database, Version 4.2 (N3B 2020, 701067).

The screening evaluation begins with calculating an HQ by dividing the EPC by the minimum ESL for a given COPC. HQs greater than 0.3 in the minimum ESL table are used to identify COPECs requiring additional evaluation (N3B 2020, 701067). Once COPECs are identified, the next step is performed to determine receptors potentially at risk by calculating the ratio of the COPEC-specific EPC to the receptor-specific NOAEL-based ESL (receptor HQ). Individual NOAEL-based HQs for a receptor are then summed to derive an HI for each ecological receptor. An HI greater than 1 indicates that further assessment is needed for that receptor. Consistent with COPEC identification, the HQ values greater than 0.3 are highlighted in the receptor HQ-HI tables. All COPECs are further evaluated for all receptors in uncertainty analysis section G-5.4.5 using population area use factor– (PAUF-) adjusted NOAEL-based ESLs. Only wildlife have population adjustments because home range (HR) information is available for these receptors. To clarify which receptors require additional evaluation, the HQs greater than 0.1 and the HIs greater than 1 are highlighted in the PAUF-adjusted HI tables. COPCs without NOAEL-based ESLs are retained as COPECs and discussed further in section G-5.4.8. 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.

G-5.3.1 SWMU 33-007(c)

The results of the minimum ESL comparisons are presented in Table G-5.3-2. Antimony, cobalt, copper, mercury, nickel, selenium, silver, Aroclor-1254, bis(2-ethylhexyl)phthalate, di-n-butylphthalate, 2,4-dinitrotoluene, and 2-hexanone were retained as COPECs because the HQs was greater than 0.3.

Calcium, iron, isophorone, magnesium, nitrate, sodium, and 1-methylnaphthalene do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

HQs and HIs for these COPEC and receptor combinations are presented in Table G-5.3-3. The HI analysis indicates that the American kestrel (intermediate carnivore), American robin (all feeding guilds), montane shrew, deer mouse, earthworm, and generic plant have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

G-5.3.2 SWMU 33-010(c)

The results of the minimum ESL comparisons are presented in Table G-5.3-4. Antimony, barium, chromium, copper, selenium, silver, zinc, bis(2-ethylhexyl)phthalate, and di-n-butylphthalate were retained as COPECs because the HQs was greater than 0.3.

Calcium, nitrate, and trichlorobenzene[-1,2,3] do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

HQs and HIs for these COPEC and receptor combinations are presented in Table G-5.3-5. The HI analysis indicates that the American kestrel (intermediate carnivore), American robin (all feeding guilds), mountain cottontail, montane shrew, deer mouse, earthworm, and generic plant have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

G-5.3.3 SWMU 33-011(d)

The results of the minimum ESL comparisons are presented in Table G-5.3-6. Antimony, chromium, lead, mercury, selenium, thallium, acenaphthene, anthracene, benzo(a)anthracene, chrysene, dibenzofuran, fluorene, naphthalene, and phenanthrene were retained as COPECs because the HQs was greater than 0.3.

Calcium, nitrate, and 1-methylnaphthalene do not have ESLs, are retained as COPECs, and are discussed in the uncertainty section.

HQs and HIs for these COPEC and receptor combinations are presented in Table G-5.3-7. The HI analysis indicates that the American kestrel (intermediate carnivore), American robin (all feeding guilds), mountain cottontail, montane shrew, deer mouse, earthworm, and generic plant have HIs greater than 1. The COPECs and receptors are discussed in the uncertainty section.

G-5.4 Uncertainty Analysis

The uncertainty analysis describes the key sources of uncertainty related to the screening evaluations. This analysis can result in either adding or removing chemicals from the list of COPECs for sites. The following narrative contains a qualitative uncertainty analysis of the issues relevant to evaluating the potential ecological risk at these Chaquehui Canyon Aggregate Area sites.

G-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 2018, 602965), and the values were biased toward overestimating the potential risk to receptors.

G-5.4.2 Exposure Assumptions

The EPCs used in the calculations of HQs were the 95% UCL, the maximum detected concentration, or the maximum DL to a depth of 5 ft, thereby conservatively estimating the exposure to each COPC. As a result, the exposure of individuals within a population was evaluated using this specific concentration, which was assumed constant throughout the exposure area. The sampling also focused on areas of known contamination, and receptors were assumed to ingest 100% of their food and spend 100% of their time at the site. The assumptions made regarding exposure for terrestrial receptors result in an overestimation of the potential exposure and risk, because COPECs varied across the site and were infrequently detected.

G-5.4.3 Toxicity Values

The HQs were calculated using ESLs, which are based on NOAELs as threshold effect levels. Actual risk for a given COPEC/receptor combination occurs at a higher level, somewhere between the NOAEL-based threshold and the threshold based on the LOAEL. The use of NOAELs leads to an overestimation of potential risk to ecological receptors. ESLs are based on laboratory studies requiring extrapolation to wildlife receptors. Laboratory studies are typically based on “artificial” and maintained populations with genetically similar individuals and are limited to single chemical exposures in isolated and controlled conditions using a single exposure pathway. Wild species are concomitantly exposed to a variety of chemical and environmental stressors, potentially rendering them more susceptible to chemical stress. On the other hand, wild populations are likely more genetically diverse than laboratory populations, making wild populations, as a whole, less sensitive to chemical exposure than laboratory populations. The uncertainties associated with the ESLs may result in an underestimation or overestimation of potential risk. In addition, ESLs are based on the use of ecological receptor model parameters that produce the most conservative estimate for the ESL. In order to bound the risk with a central tendency comparison value, a comparison to LANL Ecological Preliminary Remediation Goals (EcoPRGs) is included in the site discussions (section G-5.4.7).The EcoPRGs are reported in the ECORISK Database Release 4.2 (N3B 2020, 701067) and the methodology for their development is outlined in LANL 2017, 602647).

G-5.4.4 Area Use Factors

In addition to the direct comparison of the EPC with the ESLs, area use factors (AUFs) are used to account for the amount of time a receptor is likely to spend within the contaminated areas based on the size of the receptor’s 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 G-5.4-1.

The American kestrel (top carnivore) is used as the surrogate receptor for the Mexican spotted owl.

Two sites, SWMUs 33-010(c) and 33-011(d), had NOAEL-based HIs for the kestrel (top carnivore) equivalent to 1. Application of the AUFs for the Mexican spotted owl to the HIs for the kestrel yielded AUF-adjusted NOAEL-based HIs of 0.000566 and 0.000226, respectively. Therefore, there are no potential adverse impacts to the Mexican spotted owl at any of the sites.

G-5.4.5 Population Area Use Factors

Following the initial screening evaluation in section G-5.3, COPECs are further evaluated using PAUFs, which are described below, to ensure that exposure to multiple COPECs at a site will not lead to potential adverse impacts on a given receptor population. The PAUFs calculated for the NOAEL-based ESLs (section G-5.4.5) may also be used to adjust the LOAEL-based ESLs (section G-5.4.7).

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 Chaquehui Canyon Aggregate Area sites is to estimate the spatial extent of the area inhabited by the local population that overlaps with the contaminated area. The population area for a receptor is based on the individual receptor HR and its dispersal distance. Bowman et al. (2002, 073475) estimate that the median dispersal distance for mammals is 7 times the linear dimension of the HR (i.e., the square root of the HR area). If only the dispersal distances for the mammals with HRs within the range of the screening receptors are used (Bowman et al. 2002, 073475), the median dispersal distance becomes 3.6 times the square root of the HR (R^2=0.91). If it is assumed that the receptors can disperse the same distance in any direction, the population area is circular and the dispersal distance is the radius of the circle. Therefore, the population area can be derived by $\pi(3.6\sqrt{HR})^2$ or approximately 40HR.

The PAUFs are calculated by dividing the site area by the population area of each receptor. The HQs are adjusted by multiplying by the PAUFs. HIs are recalculated using the PAUF-adjusted HQs. If the PAUF is above 1, the HQs are not adjusted for that receptor. The HQs for the generic plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs. The adjusted HQs are summed for each receptor to calculate the adjusted HIs.

The HRs for the robin, deer mouse, shrew, mountain cottontail, and gray 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). "Screening-Level Ecological Risk Assessments Methods" (602965, 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.

If the PAUF-adjusted HI for any receptor is greater than 1, then those receptors and any associated COPECs with HQ greater than 0.1 are further evaluated using a LOAEL-based ESL analysis and PAUF-adjusted LOAEL-based ESL analysis described in section G-5.4.6.

G-5.4.5.1 SWMU 33-007(c)

The area of SWMU 33-007(c) is approximately 0.197 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table G-5.4-2). The HQs and HIs are recalculated using the PAUFs. The HIs for the generic plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The PAUF-adjusted HI analysis using NOAEL-based ESLs yielded HIs less than or equal to 1 for all receptors (Table G-5.4-3). The earthworm had an unadjusted NOAEL-based HI of 2 and the generic plant had an unadjusted NOAEL-based HI of 7 (Table G-5.4-3).

G-5.4.5.2 SWMU 33-010(c)

The area of SWMU 33-010(c) is approximately 0.207 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table G-5.4-4). The HQs and HIs are recalculated using the PAUFs. The HIs for the generic plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The PAUF-adjusted HI analysis using NOAEL-based ESLs yielded HIs less than or equal to 1 for all receptors except for American robin (insectivore) (HI = 2) (Table G-5.4-5). The earthworm had an unadjusted NOAEL-based HI of 7 and the generic plant had an unadjusted NOAEL-based HI of 10 (Table G-5.4-5).

G-5.4.5.3 SWMU 33-011(d)

The area of SWMU 33-011(d) is approximately 0.0827 ha. The PAUFs are estimated by dividing the site area by the population area of each receptor population (Table G-5.4-6). The HQs and HIs are recalculated using the PAUFs. The HIs for the generic plant and earthworm are not adjusted by PAUFs because these receptors do not have HRs.

The PAUF-adjusted HI analysis using NOAEL-based ESLs yielded HIs less than or equal to 1 for all receptors (Table G-5.4-7). The earthworm had an unadjusted NOAEL-based HI of 9 and the generic plant had an unadjusted NOAEL-based HI of 30 (Table G-5.4-7).

G-5.4.6 LOAEL Analysis

A LOAEL-based ESL HQ-HI analysis was performed if the HQ-HI analysis using PAUF-adjusted NOAEL-based ESLs (section 5.4.5) resulted in a receptor with an HI greater than 1 and a COPEC for the respective receptor had an HQ greater than 0.1. The LOAEL-based ESLs were used to address the HIs and reduce the associated uncertainty and conservativeness of the NOAEL ESLs used in the initial screening evaluations in section G-5.3. The LOAEL-based ESLs were calculated based on toxicity information in the ECORISK Database, Version 4.2 (N3B 2020, 701067) and are presented in Table G-5.4-8. First, LOAEL-based ESL receptor HQ-HI calculations were completed. Any HI values greater than 1 and any HQ values greater than 0.1 are highlighted in the HI analysis using LOAEL-based ESL tables. If one or more wildlife receptors are identified in the HI analysis using LOAEL-based ESL tables, then a final step involving population-adjusted HI values is completed. The results of the PAUF-adjusted LOAEL-based ESL HQ-HI analysis are presented in the adjusted HI analysis using LOAEL-based ESL tables, and HI values greater than 1 or any HQ values greater than 0.1 are highlighted. The PAUFs used for the LOAEL analyses are the same as those described in section G-5.4.5.

G-5.4.7 Site Discussions

G-5.4.7.1 SWMU 33-007(c)

The HI using PAUF-adjusted NOAEL-based ESLs for SWMU 33-007(c) is greater than 1 for the earthworm and generic plant, with antimony, cobalt, copper, mercury, nickel, selenium, and 2,4-dinitrotoluene being the primary COPECs (Table G-5.4-3). The HI analysis using LOAEL-based ESLs yielded an HI of 0.2 for the earthworm and 0.9 for the generic plant (Table G-5.4-9). Therefore, the HI analysis using LOAEL-based ESLs does not indicate potential risk to the generic plant or other biota.

G-5.4.7.2 SWMU 33-010(c)

The HI using PAUF-adjusted NOAEL-based ESLs for SWMU 33-010(c) is greater than 1 for the American robin (insectivore), earthworm, and generic plant, with antimony, barium, copper, selenium, zinc, and di-n-butylphthalate being the primary COPECs (Table G-5.4-5). The HI analysis using LOAEL-based ESLs yielded an HI of 20 for the American robin (insectivore), 1 for the earthworm, and 2 for the generic plant (Table G-5.4-10). The PAUF-adjusted HI analysis using LOAEL-based ESLs resulted in an HI of 0.3 for the American robin (insectivore) (Table G-5.4-11). Unacceptable risk to the generic plant may exist at SWMU 33-010(c), and is discussed further. The primary contributors for the generic plant are copper (HQ = 0.97), selenium (HQ = 0.55), barium (HQ = 0.30), and zinc (HQ = 0.11).

Barium was detected in all 18 samples in the 0–5.0-ft bgs depth interval with an EPC of 76.89 mg/kg. The maximum concentration of 130 mg/kg was detected at location 33-01720 at a depth interval of 0.0–0.5 ft bgs. Of the 18 samples, all soil detections were less than the BV (295 mg/kg). Two Qbt 2 detections at a depth interval of 3.0–4.0 ft bgs, 59 mg/kg and 95.1 mg/kg at locations 33-60473 and 33-60475, respectively, were greater than the BV (46 mg/kg). Of the 3 sediment detections, 1 was greater than the BV (127 mg/kg), with a concentration of 130 mg/kg at a depth interval of 0.0–0.5 ft bgs at location 33-01720. The barium EPC and all detections were less than the LOAEL-ESL for the generic plant (260 mg/kg). The EPC and all detections were also less than the EcoPRG for the generic plant (1400 mg/kg).

Copper was detected in all 37 samples in the 0.0–5.0-ft bgs depth interval with an EPC of 472.8 mg/kg. The maximum concentration of 2060 mg/kg was detected at location 33-61060 at a depth interval of 0.0–1.0 ft bgs in soil. Of the 37 detections, 14 of 18 soil detections, ranging from 21.5 to 2060 mg/kg at a depth interval of 0.0–4.0 ft bgs at multiple locations, were greater than the BV (14.7 mg/kg). A total of 8 of 16 Qbt 2 and Qbt 3 detections, ranging from 5.22 to 503 mg/kg at a depth interval of 3.0–5.6 ft bgs, were greater than the BV (4.66 mg/kg). All 3 sediment detections, ranging from 270 to 581 mg/kg at a depth interval of 0.0–0.5 ft bgs, were greater than the BV (11.2 mg/kg). The copper EPC of 472.8 mg/kg is less than the LOAEL-ESL and ecological preliminary remediation goal (EcoPRG), which share the same value, for the generic plant (490 mg/kg). Of the 37 detections, 5 detections are greater than the generic plant EcoPRG.

Selenium was detected in 13 of 18 samples in the 0.0–5.0-ft bgs depth interval with an EPC of 1.649 mg/kg. The maximum concentration of 2.8 mg/kg was detected at location 33-60473 at a depth interval of 3.0–4.0 ft bgs in Qbt 2. Of the 13 samples, 3 of 9 soil detections, ranging from 1.7 to 2.08 mg/kg at a depth interval of 0.0–4.0 ft bgs, were greater than the BV (1.52 mg/kg). All 3 Qbt 2 detections at a depth interval of 3.0–4.0 ft bgs, ranging from 2.22 to 2.8 mg/kg, were greater than the BV (0.3 mg/kg). The single sediment detection, 0.89 mg/kg at a depth interval of 0.0–0.5 ft bgs at location 33-01721, was greater than the BV (0.3 mg/kg). The EPC and all detections are less than the generic plant LOAEL-ESL (3 mg/kg). The EPC and all detections are less than the generic plant EcoPRG (15 mg/kg).

Zinc was detected in all 37 samples in the 0.0–5.0 depth interval with an EPC of 85.61 mg/kg. The maximum concentration of 645 mg/kg was detected at location 33-60475 at a depth interval of 0.0–1.0 ft bgs in soil. Of 18 soil detections, 4 were greater than the BV (48.8 mg/kg), ranging from 51.7 to 645 mg/kg at a depth interval of 0.0–1.0 ft bgs. All 16 Qbt 2 and Qbt 3 detections were less than the BV (63.5 mg/kg). All 3 sediment detections were less than the BV (60.2 mg/kg). The zinc EPC and all detections were less than both the LOAEL-ESL and EcoPRG, which share the same value, for the generic plant (810 mg/kg).

SWMU 33-010(c) is a former surface disposal area located at South Site on the northern rim of Chaquehui Canyon at the southern end of TA-33. Runoff from SWMU 33-010(c) enters a storm water drainage channel that leads to a tributary of Chaquehui Canyon, just a few feet east of the SWMU. Debris disposed of at the site included copper and aluminum shrapnel, pieces of electronic cable, sand and soil with residual HE, wood, and shot material from the nearby shot pad. As a result, the ecological risk screening may overestimate risk to the generic plant as the metal COPCs are likely in a low bioavailable form, which is different from the more bioavailable forms used in studies to produce LOAEL-ESLs. Furthermore, the ecological risk assessment assesses population-level risk and given that the site is a small area (0.207 ha), the risk to plant populations is likely overestimated by the HI analysis. In addition, ecoscoping notes described no indication of adverse effects from COPECs on the plant community and also found bird tracks at the snow-covered site, thus indicating the HI analysis is likely overestimating risk

(Attachment G-3). Based on multiple lines of evidence, the analysis shows there is no potential unacceptable risk to the generic plant or other biota.

G-5.4.7.3 SWMU 33-011(d)

The HI using PAUF-adjusted NOAEL-based ESLs for SWMU 33-011(d) is greater than 1 for the earthworm and generic plant, with antimony, lead, mercury, selenium, thallium, acenaphthene, anthracene, dibenzofuran, fluorene, naphthalene, and phenanthrene being the primary COPECs. The HI analysis using LOAEL-based ESLs yielded an HI of 1 for the earthworm and 4 for the generic plant (Table G-5.4-12).

SWMU 33-011(d) consists of a former storage area that was located on an asphalt pad around a warehouse (building 33-20) in the southwest corner of Main Site at TA-33. Beryllium and uranium were stored in and outside of building 33-20 from 1950 until 1972. In addition, recovered scrap from shots containing uranium, beryllium, and tungsten was stored on the asphalt south of building 33-20. Furthermore, ecoscoping at this site noted it is primarily asphalt and does not provide habitat for ecological receptors. The high PAH detections are most likely related to paving at the site, and given the lack of habitat noted during ecoscoping, no unacceptable risk to ecological receptors is present at this site.

G-5.4.8 Chemicals without ESLs

Several COPECs do not have ESLs for any receptor in Version 4.2 of the ECORISK Database (N3B 2020, 701067). 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 included EPA Ecotox Database, EPA Office of Pesticide Programs Aquatic Life Benchmarks, U.S. Army Corps of Engineers/EPA Environmental Residue-Effects, California Cal/Ecotox Database, Pesticide Action Network Pesticide Database, U.S. Army Wildlife Toxicity Assessment Program, U.S. Department of Agriculture Integrated Pesticide Management Database, American Bird Conservancy Pesticide Toxicity Database, and Oak Ridge National Laboratory Risk Assessment Information System. Some COPECs without ESLs do not have chemical-specific toxicity data or surrogate chemicals to be used in the screening assessments and cannot be assessed quantitatively for potential ecological risk.

Toxicity data are not available for calcium; iron; magnesium; nitrate; sodium; isophorone; 1-methylnaphthalene; and 1,2,3-trichlorobenzene. For calcium, iron, magnesium, nitrate, sodium, and isophorone, no surrogate or other toxicity information is available. For 1-methylnaphthalene and 1,2,3-trichlorobenzene, a surrogate based on structural similarity is used to evaluate the potential toxicity.

Calcium was identified as a COPC from 0.0 to 5.0 ft bgs at three sites, with maximum concentrations ranging from 4450 mg/kg to 81,800 mg/kg. As presented in Table G-4.4-2, 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 bgs at one site, SWMU 33-007(c), with a maximum concentration of 25,600 mg/kg. Iron is an essential micronutrient for plants and animals. Consequently, the EPA ecological 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 Chaquehui Canyon Aggregate Area. In addition, the NMED residential SSL is 54,800 mg/kg, indicating that potential toxicity is very low. No concentrations of iron exceed the NMED residential SSL (54,800 mg/kg). Therefore, iron is eliminated as a COPEC.

Magnesium was identified as a COPC from 0.0 to 5.0 ft bgs at one site, SWMU 33-007(c), with a maximum concentration of 22,700 mg/kg. As presented in Table G-4.4-2, 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 bgs at three sites, with maximum concentrations ranging from 1.34 mg/kg to 112 mg/kg. The NMED residential SSL for nitrate is 125,000 mg/kg, indicating that potential toxicity is very low. Because nitrate is infrequently detected at elevated concentrations and the potential toxicity is low, nitrate is eliminated as a COPEC.

Sodium was identified as a COPC from 0.0 to 5.0 ft bgs at one site, SWMU 33-007(c), with a maximum concentration of 4750 mg/kg. As presented in Table G-4.4-2, the concentration of sodium is substantially less than the NMED essential nutrient SSLs. Because sodium is infrequently detected and the potential toxicity is low, it is eliminated as a COPEC.

Isophorone was identified as a COPC from 0.0 to 5.0 ft bgs at one site, SWMU 33-007(c), with a maximum concentration of 0.287 mg/kg. The NMED carcinogenic and noncarcinogenic residential SSLs for isophorone are 5610 mg/kg and 12,300 mg/kg, respectively, indicating that potential toxicity is low. Because isophorone is infrequently detected and the potential toxicity is low, it is eliminated as a COPEC.

Methylnaphthalene[1-] was identified as a COPC from 0.0 to 5.0 ft bgs at two sites, SWMUs 33-007(c) and 33-011(d), with maximum concentrations ranging from 0.0149 mg/kg to 2.35 mg/kg. Based on its structural similarity, 2-methylnaphthalene is used as a surrogate. The minimum ESL for 2-methylnaphthalene (16 mg/kg for shrew) is used to screen 1-methylnaphthalene and yields a maximum HQ of 0.15. Because the maximum HQ is less than 0.3, 1-methylnaphthalene is eliminated as a COPEC.

Trichlorobenzene[1,2,3-] was identified as a COPC from 0.0 to 5.0 ft bgs at one site, SWMU 33-010(c), with a maximum concentration of 0.000368 mg/kg. Trichlorobenzene[1,2,4-] is used as a surrogate based on structural similarity. The minimum ESL for 1,2,4-trichlorobenzene (1.2 mg/kg for the earthworm) is used to screen 1,2,3-trichlorobenzene and yields a maximum HQ of 0.0003. Because the maximum HQ is less than 0.3, 1,2,3-trichlorobenzene is eliminated as a COPEC.

G-5.5 Interpretation of Ecological Risk-Screening Results

G-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 Chaquehui Canyon Aggregate Area sites. Receptors were evaluated using several lines of evidence: minimum ESL comparisons, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and the relationship of detected concentrations and DLs to background concentrations.

Generic plant

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs for all of the receptors, including the generic plant, were less than 0.3.
- The HI analyses using the NOAEL-based ESLs yielded HIs greater than 1 for the generic plant at all sites.
- The HI analyses using the LOAEL-based ESLs yielded HIs less than or equivalent to 1 for all sites, except for SWMUs 33-010(c) and 33-011(d).

- Field observations made during the site visits found no indication of adverse effects on the generic plant community from COPECs. In addition, SWMU 33-011(d) is partially or fully developed, but most of the SWMUs provide quality habitat for all ecological receptors.
- As discussed in section G-5.4.7, the potential risks to the generic plant are overestimated and/or are not representative of the sites.

These lines of evidence support the conclusion that no potential ecological risk to the generic plant exists at the three sites in the Chaquehui 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 HI analyses using the NOAEL-based ESLs yielded HIs greater than 1 for the earthworm at SWMUs 33-007(c), 33-010(c), and 33-011(d).
- The HI analyses using the LOAEL-based ESLs yielded HIs less than or equivalent to 1 for all three sites.

These lines of evidence support the conclusion that no potential ecological risk to the earthworm exists at the three sites in the Chaquehui 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 adjusted by the PAUF, which is the ratio of the site area to the shrew's population area.
- The HI analyses using the PAUF-adjusted NOAEL-based ESLs yielded HIs less than 1 or equivalent to 1 for the shrew at all sites.

These lines of evidence support the conclusion that no potential ecological risk to the montane shrew exists at the three sites in the Chaquehui 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 adjusted by the PAUF, which is the ratio of the site area to the deer mouse's population area.
- The HI analyses using the PAUF-adjusted NOAEL-based ESLs yielded HIs less than or equivalent to 1 for the deer mouse at all sites.

These lines of evidence support the conclusion that no potential ecological risk to the deer mouse exists at the three sites in the Chaquehui Canyon Aggregate Area.

Mountain Cottontail (Herbivore)

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs for all of the receptors, including the mountain cottontail, were less than 0.3.
- The HIs were adjusted by the PAUF, which is the ratio of the site area to the mountain cottontail's population area.
- The HI analyses using the PAUF-adjusted NOAEL-based ESLs yielded HIs less than or equivalent to 1 for the mountain cottontail at all sites.

These lines of evidence support the conclusion that no potential ecological risk to the mountain cottontail exists at the three sites in the Chaquehui Canyon Aggregate Area.

Gray Fox (Carnivore)

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs for all of the receptors, including the gray fox, were less than 0.3.
- The HIs were adjusted by the PAUF, which is the ratio of the site area to the gray fox's population area.
- The HI analyses using the PAUF-adjusted NOAEL-based ESLs yielded HIs less than or equivalent to 1 for the gray fox at all sites.

These lines of evidence support the conclusion that no potential ecological risk to the gray fox exists at the three sites in the Chaquehui Canyon Aggregate Area.

American 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 American robin, were less than 0.3.
- The HIs were adjusted by the PAUF, which is the ratio of the site area to the American robin's population area.
- The HI analyses using the PAUF-adjusted NOAEL-based ESLs yielded HIs greater than 1 for the American robin (insectivore) at SWMU 33-010(c).
- The HI analyses using the LOAEL-based ESLS yielded HIs greater than 1 for the American robin (insectivore) at SWMU 33-010(c).
- The HI analyses using the PAUF-adjusted LOAEL-based ESL yielded HIs less than or equivalent to 1 for the American robin (insectivore) at SWMU 33-010(c).

These lines of evidence support the conclusion that no potential ecological risk to the American robin (all feeding guilds) exists at the three sites at the Chaquehui Canyon Aggregate Area.

American Kestrel (Intermediate Carnivore)

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs for all of the receptors, including the American kestrel, were less than 0.3.
- The HIs were adjusted by the PAUF, which is the ratio of the site area to the kestrel's (intermediate carnivore) population area.

- The HI analyses using the PAUF-adjusted NOAEL-based ESLs yielded HIs less than or equivalent to 1 for the kestrel (intermediate carnivore) at all sites.

These lines of evidence support the conclusion that no potential ecological risk to the kestrel (intermediate carnivore) exists at the three sites at the Chaquehui Canyon Aggregate Area.

American Kestrel (Top Carnivore)

- Initial screening using the minimum ESLs eliminated a number of COPECs because the HQs for all of the receptors, including the American kestrel, were less than 0.3.
- The HIs were adjusted by the PAUF, which is the ratio of the site area to the kestrel's (top carnivore) population area.
- The HI analyses using the PAUF-adjusted NOAEL-based ESLs yielded HIs less than or equivalent to 1 for the kestrel (top carnivore) at all sites.

These lines of evidence support the conclusion that no potential ecological risk to the kestrel (top carnivore) exists at the three sites at the Chaquehui Canyon Aggregate Area.

G-5.5.2 COPECs with No ESLs

COPECs without ESLs were eliminated based on comparisons with 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 three sites at the Chaquehui Canyon Aggregate Area.

G-5.5.3 Summary

Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, multiple lines of evidence, and COPECs without ESLs, no potential ecological risks to the earthworm, generic plant, American robin, American kestrel, deer mouse, montane shrew, mountain cottontail, or gray fox exist for the three sites at the Chaquehui Canyon Aggregate Area.

G-6.0 CONCLUSIONS

G-6.1 Human Health Risk

For the industrial scenario, all sites had total excess cancer risks less than the NMED target risk of 1×10^{-5}, HIs less than the target of 1, and estimated doses below the target of 25 mrem/yr. No radionuclide COPCs were identified in the 0.0–1.0 ft bgs depth interval for SWMU 33-011(d).

For the construction worker scenario, all sites had total excess cancer risk less than the NMED target risk of 1×10^{-5} and estimated doses below the target of 25 mrem/yr. All sites had noncarcinogenic HIs less than the target of 1, except SWMU 33-007(c), which had an HI equivalent to 1 due to cobalt (HQ = 1).

For the residential scenario, all sites had estimated doses below the target of 25 mrem/yr. All sites had total excess cancer risk less than the NMED target risk of 1×10^{-5}, except SWMU 33-011(d), which had cancer risk of 9×10^{-5}, due to PAHs (HQ = 9×10^{-5}). PAHs at the site were likely from the asphalt covering the majority of SWMU 33-011(d). All sites had HIs less than the target hazard of 1, except SWMU 33-007(c), which had an HI of 2. Cobalt was the primary contributor (HQ = 1.8) at SWMU 33-007(c). Although residential cancer risk at SWMU 33-011(d) and residential hazard at

SWMU 33-007(c) exceed current risk thresholds, the sites are currently under institutional control and land use will remain industrial for the foreseeable future. Therefore, no further action is recommended based on residential risk at this time.

Lead was identified as a COPC at one site, SWMU 33-011(d); protective soil concentrations for the industrial, construction worker, and residential scenarios were not exceeded at this site.

Volatile organic COPCS or VOCs were sampled near buildings at SWMU 33-011(d); therefore, the vapor-intrusion pathway is potentially complete for this site. However, no further action is recommended based on the lack of solvent usage described at the site and because most toxic and organic volatiles were minimally detected at SWMU 33-011(d).

The radionuclide EPCs were less than SALs and the total estimated dose is less than 25 mrem/yr for the industrial, construction worker, and residential scenarios at all SWMUs.

The total doses were equivalent to total excess radiological risks of 6×10^{-6} to 9×10^{-6} for the industrial scenario, 8×10^{-9} to 6×10^{-7} for the construction worker scenario, and from 6×10^{-7} to 3×10^{-5} for the residential scenario, based on conversion from dose using RESRAD Version 7.2 (https://resrad.evs.anl.gov/documents/); (LANL 2015, 600929).

No sites within the Chaquehui Canyon Aggregate Area are accessible to the public and are not planned for release by the U.S. Department of Energy (DOE) in the foreseeable future. Therefore, an as low as reasonably achievable (ALARA) evaluation for radiological exposure to the public is not currently required. Should DOE's plans for releasing these areas change, an ALARA evaluation will be conducted at that time.

G-6.2 Ecological Risk

Based on evaluations of the minimum ESLs, HI analyses, LOAEL analyses, and COPECs without ESLs, no potential ecological risks to the Mexican spotted owl, gray fox, American kestrel, American robin, mountain cottontail, montane shrew, deer mouse, earthworm, or generic plant exist at the three sites at the Chaquehui Canyon Aggregate Area.

G-7.0 REFERENCES

The following reference list includes documents cited in this appendix. Parenthetical information following each reference provides the author(s), publication date, and ERID, ESHID, or EMID. This information is also included in text citations. ERIDs were assigned by the Laboratory's Associate Directorate for Environmental Management (IDs through 599999); ESHIDs were assigned by the Laboratory's Associate Directorate for Environment, Safety, and Health (IDs 600000 through 699999); and EMIDs are assigned by N3B (IDs 700000 and above). IDs are used to locate documents in N3B's Records Management System and in the Master Reference Set. The NMED Hazardous Waste Bureau and N3B maintain copies of the Master Reference Set. The set ensures that NMED has the references to review documents. The set is updated when new references are cited in documents.

Ahlquist, A.J., November 1, 1983. "Conversations with Harlow Russ RE TA-33, 10/27/83," Los Alamos Scientific Laboratory memorandum to file from A.J. Ahlquist (HSE-8), Los Alamos, New Mexico. (Ahlquist 1983, 006854)

ATSDR (Agency for Toxic Substances and Disease Registry), 1997. ATSDR's Toxicology Profiles on CD-ROM. (ATSDR 1997, 056531)

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.W., October 20, 1951. "12 October 1951 Spill at TA-33," Los Alamos Scientific Laboratory memorandum to D.P. MacMillan (W-3) from C. Buckland (H-1), Los Alamos, New Mexico. (Buckland 1951, 007845)

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), November 2002. "OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance)," EPA530-D-02-004, Washington, D.C. (EPA 2002, 094114)

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), 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)

Hoard, D., September 17, 1991. "Conversation with John Dougherty RE TA-33," Los Alamos National Laboratory memorandum (CLS-1/91-303-DH) to file from D. Hoard (CLS-1), Los Alamos, New Mexico. (Hoard 1991, 009733)

Hoard, D., September 17, 1991. "Conversation with Harlow Russ," Los Alamos National Laboratory memorandum (CLS-1/91-304-DH) to file from D. Hoard (CLS-1), Los Alamos, New Mexico. (Hoard 1991, 009734)

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), May 1992. "RFI Work Plan for Operable Unit 1122," Los Alamos National Laboratory document LA-UR-92-925, Los Alamos, New Mexico. (LANL 1992, 007671)

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), August 18, 2000. "Submittal of Response to Request for Supplemental Information (RSI) for the Voluntary Corrective Action (VCA) Plan for Potential Release Sites (PRSs) 33-007(b), 33-010(c), and C-33-003 [and attached 'Segmented Gate System, Voluntary Corrective Action Status Report for Potential Release Sites 33-007(b), 33-010(c), C-33-033]," Los Alamos National Laboratory letter (ER2000-0171) to J. Kieling (NMED-HWB) from J.A. Canepa (LANL) and T.J. Taylor (DOE-LAAO), Los Alamos, New Mexico. (LANL 2000, 066889)

LANL (Los Alamos National Laboratory), November 2009. "Historical Investigation Report for Chaquehui Canyon Aggregate Area," Los Alamos National Laboratory document LA-UR-09-7402, Los Alamos, New Mexico. (LANL 2009, 107348)

LANL (Los Alamos National Laboratory), November 2010. "Investigation Work Plan for Chaquehui Canyon Aggregate Area, Revision 1," Los Alamos National Laboratory document LA-UR-10-7226, Los Alamos, New Mexico. (LANL 2010, 111298.9)

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), April 2018. "Screening-Level Ecological Risk Assessment Methods, Revision 5.1," Los Alamos National Laboratory document LA-UR-18-22418, Los Alamos, New Mexico. (LANL 2018, 602965)

LASL (Los Alamos Scientific Laboratory), November 1954. Excerpted pages from "H-Division Progress Report, October 20 - November 20, 1954," Los Alamos Scientific Laboratory, Los Alamos, New Mexico. (LASL 1954, 107465)

N3B (Newport News Nuclear BWXT-Los Alamos, LLC), November 2020. “ECORISK Database (Release 4.2),” on CD, Newport News Nuclear BWXT-Los Alamos, LLC, document EM2020-0575, Los Alamos, New Mexico. (N3B 2020, 701067)

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)

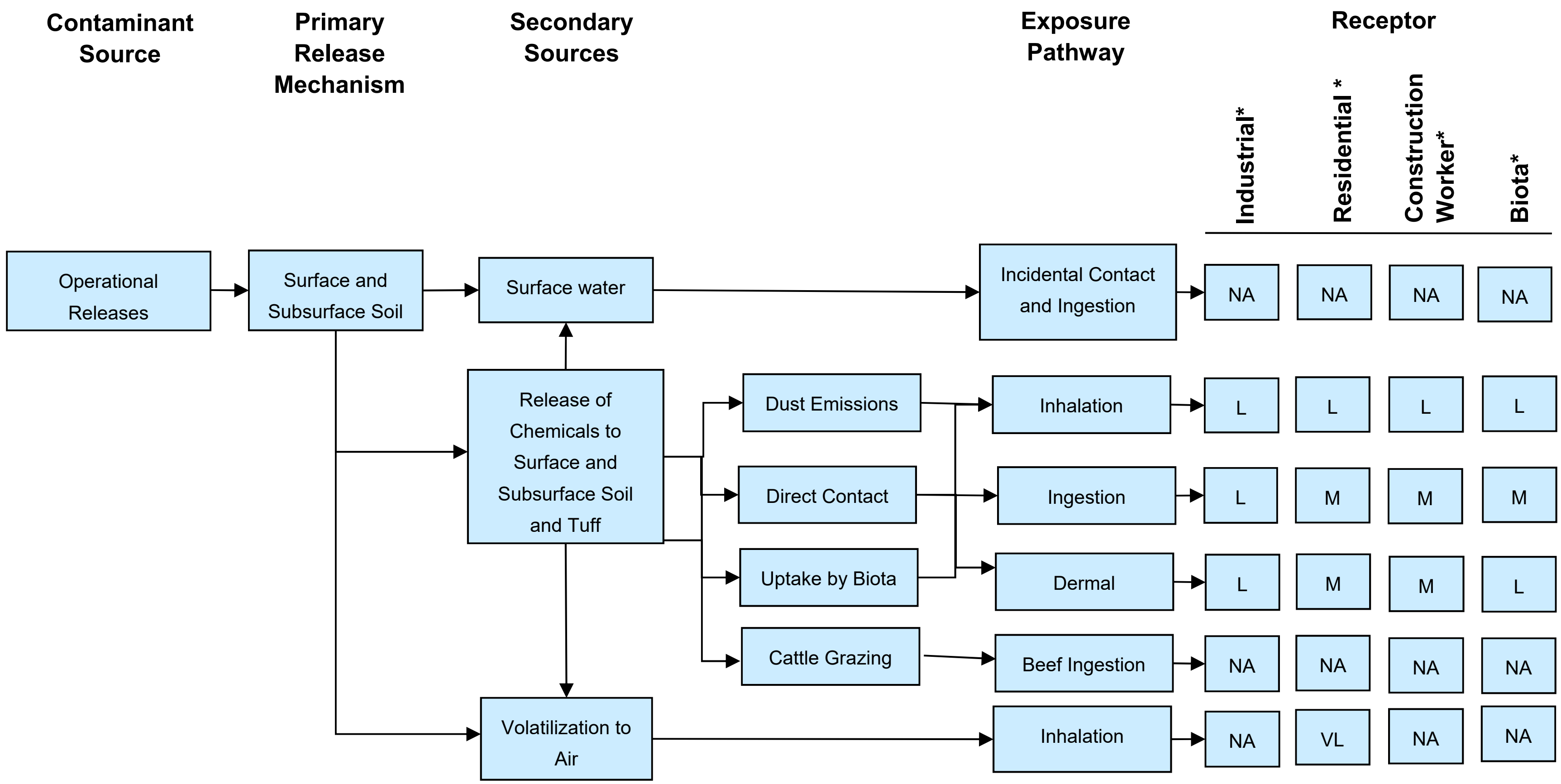
NMED (New Mexico Environment Department), November 24, 2003. “LANL's Risk Reduction and Environmental Stewardship (RRES) Remediation Services Project Use of Surrogate Chemicals in Risk Assessments,” New Mexico Environment Department letter to D. Gregory (DOE-LASO) and G.P. Nanos (LANL Director) from J.E. Kieling (NMED-HWB), Santa Fe, New Mexico. (NMED 2003, 081172)

NMED (New Mexico Environment Department), March 3, 2011. “Approval with Modifications for the Investigation Work Plan for Chaquehui Canyon Aggregate Area, Revision 1,” New Mexico Environment Department letter to G.J. Rael (DOE-LASO) and M.J. Graham (LANL) from J.E. Kieling (NMED-HWB), Santa Fe, New Mexico. (NMED 2011, 201242)

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), June 19, 2019. “Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Soil Screening Guidance for Human Health Risk Assessments,” February 2019 (Revision 2, 6/19/19), Hazardous Waste Bureau and Ground Water Quality Bureau, Santa Fe, New Mexico. (NMED 2019, 700550)

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 G-3.1-1 Conceptual site model for the Chaquehui Canyon Aggregate Area

Table G-2.3-1
EPCs at SWMU 33-007(c) for the Industrial Scenario

COPC	Number of Analyses	Number of Detections	Minimum Concentration	Maximum Concentration[a]	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	13	4	0.403(U)	3.43	n/a[b]	3.43	Maximum detected concentration
Calcium	13	13	3740	12,600	n/a	12,600	Maximum detected concentration
Cobalt	13	13	1.28	15.1	Gamma	10.9	95% Adjusted Gamma
Copper	13	13	3.78	24.3	Normal	19.59	95% Student's-t
Iron	13	13	4200	23,900	Normal	15,847	95% Student's-t
Magnesium	13	13	586	7820	n/a	7820	Maximum detected concentration
Mercury	13	12	0.00838(U)	0.174	Gamma	0.107	95% Gamma Adjusted KM
Nickel	13	13	2.19	53.3	Normal	34.9	95% Student's-t
Nitrate	13	10	0.355(U)	3.65	Gamma	2.257	95% Gamma Adjusted KM
Perchlorate	13	2	0.000477(U)	0.0009	n/a	0.0009	Maximum detected concentration
Selenium	13	13	0.534	1.71	Normal	1.458	95% Student's-t
Organic Chemicals (mg/kg)							
Aroclor-1254	10	9	0.00151(U)	1.18	Gamma	0.852	95% KM Bootstrap t
Aroclor-1260	10	8	0.00145(U)	0.292	Gamma	0.184	95% KM Bootstrap t
Benzene	13	1	0.000353(U)	0.000727	n/a	0.000727	Maximum detected concentration
Benzo(b)fluoranthene	13	1	0.0105(U)	0.0602(U)	n/a	0.0535	Maximum detected concentration
Benzo(g,h,i)perylene	13	1	0.0105(U)	0.108	n/a	0.108	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	13	1	0.0105(U)	0.0783	n/a	0.0783	Maximum detected concentration
Di-n-butylphthalate	13	3	0.0105(U)	1	n/a	1	Maximum detected concentration
Dinitrotoluene[2,4-]	13	1	0.13(U)	1.88	n/a	1.88	Maximum detected concentration
Methylnaphthalene[1-]	13	1	0.0105(U)	0.0602(U)	n/a	0.0149	Maximum detected concentration
Methylnaphthalene[2-]	13	1	0.0105(U)	0.0602(U)	n/a	0.0213	Maximum detected concentration
Naphthalene	13	1	0.000353(U)	0.0181	n/a	0.0181	Maximum detected concentration

Table G-2.3-1 (continued)

COPC	Number of Analyses	Number of Detections	Minimum Concentration	Maximum Concentration[a]	Distribution	EPC	EPC Method
Toluene	13	5	0.000353(U)	0.00458	Lognormal	0.00165	95% BCA Bootstrap
Trichloroethene	13	1	0.000353(U)	0.000484	n/a	0.000484	Maximum detected concentration
Xylene[1,3]+ Xylene[1,4-]	13	1	0.000707(U)	0.000909(U)	n/a	0.000806	Maximum detected concentration
Radionuclides (pCi/g)							
Uranium-234	13	13	0.63	6.82	Nonparametric	6.82	Maximum detected concentration
Uranium-235/236	13	8	0.0272(U)	0.437	Normal	0.274	95% KM (t)
Uranium-238	13	13	0.685	6.93	Nonparametric	6.93	Maximum detected concentration

Note: Data qualifiers are defined in Appendix A.

[a] Essential nutrients use the maximum detected concentration as the exposure point concentration (EPC) even if there are enough samples to compute an upper confidence limit.

[b] n/a = Not applicable.

Table G-2.3-2
EPCs at SWMU 33-007(c) for the Residential and Construction Worker Scenarios

COPC	Number of Analyses	Number of Detections	Minimum Concentration	Maximum Concentration[a]	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	37	5	0.344(U)	7.58	Normal	1.178	95% KM (t)
Calcium	37	37	407	81,800	n/a[b]	81,800	Maximum detected concentration
Cobalt	42	41	0.164(U)	225	Nonparametric	41.57	95% KM (Chebyshev)
Copper	37	37	1.35	50.1	Nonparametric	22.1	95% Chebyshev (Mean, Sd)
Iron	37	37	2070	25,600	Normal	13,512	95% Student's-t
Magnesium	37	37	551	22,700	n/a	22,700	Maximum detected concentration
Mercury	37	26	0.00787(U)	0.174	Nonparametric	0.0601	95% KM (Chebyshev)
Nickel	37	37	2.19	84	Normal	41.17	95% Student's-t
Nitrate	37	23	0.355(U)	112	Lognormal	15.67	95% BCA Bootstrap

Table G-2.3-2 (continued)

COPC	Number of Analyses	Number of Detections	Minimum Concentration	Maximum Concentration[a]	Distribution	EPC	EPC Method
Perchlorate	37	6	0.000477(U)	0.0117	Gamma	0.00195	95% Gamma Adjusted KM
Selenium	37	34	0.378(U)	1.71	Normal	1.138	95% KM (t)
Silver	37	5	0.099(U)	18.5	Normal	2.331	95% KM (t)
Sodium	37	37	34.1	4750	n/a	4750	Maximum detected concentration
Organic Chemicals (mg/kg)							
Acetone	37	1	0.00177(U)	0.0387(U)	n/a	0.00656	Maximum detected concentration
Aroclor-1254	28	13	0.00118(U)	1.18	Gamma	0.264	95% Gamma Adjusted KM
Aroclor-1260	28	10	0.00118(U)	0.292	Gamma	0.0636	95% Gamma Adjusted KM
Benzene	37	1	0.000353(U)	0.000727	n/a	0.000727	Maximum detected concentration
Benzo(a)pyrene	37	1	0.0105(U)	0.0602(U)	n/a	0.014	Maximum detected concentration
Benzo(b)fluoranthene	37	2	0.0105(U)	0.0602(U)	n/a	0.0535	Maximum detected concentration
Benzo(g,h,i)perylene	37	2	0.0105(U)	0.108	n/a	0.108	Maximum detected concentration
Benzo(k)fluoranthene	37	1	0.0105(U)	0.0602(U)	n/a	0.0292	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	37	6	0.0105(U)	0.085	Nonparametric	0.0275	95% KM (Chebyshev)
Chrysene	37	1	0.0105(U)	0.0602(U)	n/a	0.0358	Maximum detected concentration
Di-n-butylphthalate	37	8	0.0105(U)	1	Nonparametric	0.165	95% KM (Chebyshev)
Diethylphthalate	37	2	0.0105(U)	0.0602(U)	n/a	0.0262	Maximum detected concentration
Dinitrotoluene[2,4-]	37	1	0.123(U)	1.88	n/a	1.88	Maximum detected concentration
Hexanone[2-]	37	2	0.00177(U)	0.157	n/a	0.157	Maximum detected concentration
Isophorone	37	3	0.105(U)	0.602(U)	n/a	0.287	Maximum detected concentration
Methylene Chloride	37	1	0.00177(U)	0.00256	n/a	0.00256	Maximum detected concentration
Methylnaphthalene[1-]	37	1	0.0105(U)	0.0602(U)	n/a	0.0149	Maximum detected concentration
Methylnaphthalene[2-]	37	1	0.0105(U)	0.0602(U)	n/a	0.0213	Maximum detected concentration
Naphthalene	37	1	0.000353(U)	0.0181	n/a	0.0181	Maximum detected concentration
RDX[c]	37	1	0.123(U)	0.182	n/a	0.182	Maximum detected concentration
Toluene	37	8	0.000353(U)	0.00458	Lognormal	0.000667	95% BCA Bootstrap

Table G-2.3-2 (continued)

COPC	Number of Analyses	Number of Detections	Minimum Concentration	Maximum Concentration[a]	Distribution	EPC	EPC Method
Trichloroethene	37	1	0.000353(U)	0.000484	n/a	0.000484	Maximum detected concentration
Xylene[1,3-]+Xylene[1,4-]	37	1	0.000707(U)	0.000909(U)	n/a	0.000806	Maximum detected concentration
Radionuclides (pCi/g)							
Uranium-234	37	37	0.63	6.82	Nonparametric	3.802	95% Chebyshev (Mean, Sd)
Uranium-235/236	37	19	0.0272(U)	0.452	Gamma	0.17	95% Gamma Adjusted KM
Uranium-238	37	37	0.685	6.93	Nonparametric	3.827	95% Chebyshev (Mean, Sd)

Note: Data qualifiers are defined in Appendix A.

[a] Essential nutrients use the maximum detected concentration as the exposure point concentration (EPC) even if there are enough samples to compute an upper confidence limit.

[b] n/a = Not applicable.

[c] RDX = Royal Demolition Explosive (hexahydro-1,3,5-trinitro-1,3,5-triazine).

Table G-2.3-3
EPCs at SWMU 33-007(c) for Ecological Risk

COPC	Number of Analyses	Number of Detections	Minimum Concentration	Maximum Concentration[a]	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	36	5	0.344(U)	7.58	Normal	1.202	95% KM (t)
Calcium	36	36	407	81,800	n/a[b]	81,800	Maximum detected concentration
Cobalt	36	35	0.164(U)	225	Lognormal	35.54	95% BCA Bootstrap
Copper	36	36	1.35	50.1	Nonparametric	22.21	95% Chebyshev (Mean, Sd)
Iron	36	36	2070	25,600	Normal	13,607	95% Student's-t
Magnesium	36	36	551	22,700	n/a	22,700	Maximum detected concentration
Mercury	36	26	0.00787(U)	0.174	Nonparametric	0.0614	95% KM (Chebyshev)
Nickel	36	36	2.19	84	Normal	41.13	95% Student's-t
Nitrate	36	22	0.355(U)	112	Lognormal	14.91	95% BCA Bootstrap

Table G-2.3-3 (continued)

COPC	Number of Analyses	Number of Detections	Minimum Concentration	Maximum Concentration[a]	Distribution	EPC	EPC Method
Perchlorate	36	6	0.000477(U)	0.0117	Gamma	0.002	95% Gamma Adjusted KM
Selenium	36	33	0.378(U)	1.71	Normal	1.147	95% KM (t)
Silver	36	4	0.099(U)	18.5	n/a	18.5	Maximum detected concentration
Sodium	36	36	34.1	4750	n/a	4750	Maximum detected concentration
Organic Chemicals (mg/kg)							
Acetone	36	1	0.00177(U)	0.0387(U)	n/a	0.00656	Maximum detected concentration
Aroclor-1254	28	13	0.00118(U)	1.18	Gamma	0.264	95% Gamma Adjusted KM
Aroclor-1260	28	10	0.00118(U)	0.292	Gamma	0.0636	95% Gamma Adjusted KM
Benzene	36	1	0.000353(U)	0.000727	n/a	0.000727	Maximum detected concentration
Benzo(a)pyrene	36	1	0.0105(U)	0.0602(U)	n/a	0.014	Maximum detected concentration
Benzo(b)fluoranthene	36	2	0.0105(U)	0.0602(U)	n/a	0.0535	Maximum detected concentration
Benzo(g,h,i)perylene	36	2	0.0105(U)	0.108	n/a	0.108	Maximum detected concentration
Benzo(k)fluoranthene	36	1	0.0105(U)	0.0602(U)	n/a	0.0292	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	36	5	0.0105(U)	0.085	Nonparametric	0.0281	95% KM (Chebyshev)
Chrysene	36	1	0.0105(U)	0.0602(U)	n/a	0.0358	Maximum detected concentration
Di-n-butylphthalate	36	7	0.0105(U)	1	Lognormal	0.119	95% BCA Bootstrap
Diethylphthalate	36	2	0.0105(U)	0.0602(U)	n/a	0.0262	Maximum detected concentration
Dinitrotoluene[2,4-]	36	1	0.123(U)	1.88	n/a	1.88	Maximum detected concentration
Hexanone[2-]	36	2	0.00177(U)	0.157	n/a	0.157	Maximum detected concentration
Isophorone	36	3	0.105(U)	0.602(U)	n/a	0.287	Maximum detected concentration
Methylene Chloride	36	1	0.00177(U)	0.00256	n/a	0.00256	Maximum detected concentration
Methylnaphthalene[1-]	36	1	0.0105(U)	0.0602(U)	n/a	0.0149	Maximum detected concentration
Methylnaphthalene[2-]	36	1	0.0105(U)	0.0602(U)	n/a	0.0213	Maximum detected concentration
Naphthalene	36	1	0.000353(U)	0.0181	n/a	0.0181	Maximum detected concentration
Toluene	36	8	0.000353(U)	0.00458	Lognormal	0.000688	95% BCA Bootstrap
Trichloroethene	36	1	0.000353(U)	0.000484	n/a	0.000484	Maximum detected concentration
Xylene[1,3-]+Xylene[1,4-]	36	1	0.000707(U)	0.000909(U)	n/a	0.000806	Maximum detected concentration

Table G-2.3-3 (continued)

COPC	Number of Analyses	Number of Detections	Minimum Concentration	Maximum Concentration[a]	Distribution	EPC	EPC Method
Radionuclides (pCi/g)							
Uranium-234	36	36	0.63	6.82	Lognormal	3.04	95% BCA Bootstrap
Uranium-235/236	36	18	0.0272(U)	0.452	Gamma	0.173	95% Gamma Adjusted KM
Uranium-238	36	36	0.685	6.93	Lognormal	3.07	95% BCA Bootstrap

Note: Data qualifiers are defined in Appendix A.

[a] Essential nutrients use the maximum detected concentration as the exposure point concentration (EPC) even if there are enough samples to compute an upper confidence limit.

[b] n/a = Not applicable.

Table G-2.3-4
EPCs at SWMU 33-010(c) for the Industrial Scenario

COPC	Number of Analyses	Number of Detections	Minimum Concentration	Maximum Concentration[a]	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	12	0	0.357(U)	1.96(U)	n/a[b]	1.96	Maximum detection limit
Barium	12	12	49.1	130	Normal	84.8	95% Student's-t
Copper	21	21	1.39	2060	Gamma	574.3	95% Adjusted Gamma
Nitrate	5	5	1.14	13.7	n/a	13.7	Maximum detected concentration
Perchlorate	5	2	0.000498(U)	0.000826	n/a	0.000826	Maximum detected concentration
Selenium	12	7	0.44(U)	1.9	Normal	1.223	95% KM (t)
Silver	12	2	0.0967(U)	4.6	n/a	4.6	Maximum detected concentration
Zinc	21	21	28.6	645	Nonparametric	195.3	95% Chebyshev (Mean, Sd)

Table G-2.3-4 (continued)

COPC	Number of Analyses	Number of Detections	Minimum Concentration	Maximum Concentration[a]	Distribution	EPC	EPC Method
Organic Chemicals (mg/kg)							
Anthracene	5	1	0.0101(U)	0.0158	n/a	0.0158	Maximum detected concentration
Aroclor-1254	2	1	0.00118(U)	0.00428	n/a	0.00428	Maximum detected concentration
Aroclor-1260	2	1	0.00118(U)	0.0188	n/a	0.0188	Maximum detected concentration
Benzo(a)anthracene	5	3	0.0105(U)	0.0391	n/a	0.0391	Maximum detected concentration
Benzo(a)pyrene	5	3	0.0105(U)	0.0351	n/a	0.0351	Maximum detected concentration
Benzo(b)fluoranthene	5	3	0.0105(U)	0.0462	n/a	0.0462	Maximum detected concentration
Benzo(g,h,i)perylene	5	1	0.0101(U)	0.0222	n/a	0.0222	Maximum detected concentration
Benzo(k)fluoranthene	5	1	0.0101(U)	0.0179	n/a	0.0179	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	5	3	0.0101(U)	0.135	n/a	0.135	Maximum detected concentration
Chrysene	5	2	0.0102(U)	0.0351	n/a	0.0351	Maximum detected concentration
Di-n-butylphthalate	5	2	0.0102(U)	1.08	n/a	1.08	Maximum detected concentration
Fluoranthene	5	3	0.0105(U)	0.094	n/a	0.094	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	5	1	0.0101(U)	0.0216	n/a	0.0216	Maximum detected concentration
Phenanthrene	5	2	0.0102(U)	0.0617	n/a	0.0617	Maximum detected concentration
Pyrene	5	3	0.0105(U)	0.0792	n/a	0.0792	Maximum detected concentration
Radionuclides (pCi/g)							
Tritium	5	1	-0.368(U)	4.68	n/a	4.68	Maximum detected concentration
Uranium-234	12	12	1.51	16.3	Normal	9.019	95% Student's-t
Uranium-235/236	12	11	0.0718(U)	0.785	Normal	0.491	95% KM (t)
Uranium-238	12	12	1.48	17.2	Normal	9.496	95% Student's-t

Note: Data qualifiers are defined in Appendix A.

[a] Essential nutrients use the maximum detected concentration as the exposure point concentration (EPC) even if there are enough samples to compute an upper confidence limit.

[b] n/a = Not applicable.

Table G-2.3-5
EPCs at SWMU 33-010(c) for the Residential and Construction Worker Scenarios

COPC	Number of Analyses	Number of Detections	Minimum Concentration	Maximum Concentration[a]	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	24	0	0.322(U)	2.24(U)	n/a[b]	2.24	Maximum detection limit
Barium	24	24	17.4	130	Normal	69.1	95% Student's-t
Calcium	24	24	779	4450	n/a	4450	Maximum detected concentration
Chromium	24	24	1.4	45.2	Lognormal	13.25	95% BCA Bootstrap
Copper	52	52	1.39	2060	Nonparametric	343.9	95% Chebyshev (Mean, Sd)
Nitrate	17	14	0.339(U)	13.7	Nonparametric	5.922	95% KM (Chebyshev)
Perchlorate	17	4	0.000496(U)	0.00114	n/a	0.00114	Maximum detected concentration
Selenium	24	19	0.44(U)	3.21	Normal	1.751	95% KM (t)
Silver	24	2	0.0967(U)	4.6	n/a	4.6	Maximum detected concentration
Zinc	52	52	28.6	645	Nonparametric	72.51	95% Student's-t
Organic Chemicals (mg/kg)							
Acetone	17	3	0.00161(U)	0.0105(U)	n/a	0.00461	Maximum detected concentration
Anthracene	17	2	0.00998(U)	0.0158	n/a	0.0158	Maximum detected concentration
Aroclor-1254	4	1	0.00113(U)	0.00428	n/a	0.00428	Maximum detected concentration
Aroclor-1260	4	1	0.00113(U)	0.0188	n/a	0.0188	Maximum detected concentration
Benzo(a)anthracene	17	5	0.00998(U)	0.162	Gamma	0.0556	95% Gamma Adjusted KM
Benzo(a)pyrene	17	5	0.00998(U)	0.0921	Normal	0.0264	95% KM (t)
Benzo(b)fluoranthene	17	4	0.00998(U)	0.229	n/a	0.229	Maximum detected concentration
Benzo(g,h,i)perylene	17	2	0.00998(U)	0.0485	n/a	0.0485	Maximum detected concentration
Benzo(k)fluoranthene	17	2	0.00998(U)	0.0758	n/a	0.0758	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	17	7	0.00998(U)	0.368	Lognormal	0.142	95% KM (Chebyshev)
Butylbenzylphthalate	17	1	0.00998(U)	0.0128	n/a	0.0128	Maximum detected concentration
Chrysene	17	4	0.00998(U)	0.252	n/a	0.252	Maximum detected concentration
Di-n-butylphthalate	17	3	0.00998(U)	1.08	n/a	1.08	Maximum detected concentration
Dibenz(a,h)anthracene	17	1	0.00998(U)	0.0156	n/a	0.0156	Maximum detected concentration

Table G-2.3-5 (continued)

COPC	Number of Analyses	Number of Detections	Minimum Concentration	Maximum Concentration[a]	Distribution	EPC	EPC Method
Fluoranthene	17	5	0.00998(U)	0.183	Normal	0.0488	95% KM (t)
Indeno(1,2,3-cd)pyrene	17	2	0.00998(U)	0.0533	n/a	0.0533	Maximum detected concentration
Phenanthrene	17	4	0.00998(U)	0.0617	n/a	0.0617	Maximum detected concentration
Pyrene	17	5	0.00998(U)	0.137	Normal	0.0397	95% KM (t)
Trichlorobenzene[1,2,3-]	17	1	0.000321(U)	0.00037(U)	n/a	0.000368	Maximum detected concentration
Radionuclides (pCi/g)							
Tritium	17	2	-2.11(U)	6.62	n/a	6.62	Maximum detected concentration
Uranium-234	24	24	1.22	17.7	Nonparametric	9.305	95% Chebyshev (Mean, Sd)
Uranium-235/236	24	20	0.0407(U)	0.933	Normal	0.372	95% KM (t)
Uranium-238	24	24	1.16	19.1	Nonparametric	9.863	95% Chebyshev (Mean, Sd)

Note: Data qualifiers are defined in Appendix A.

[a] Essential nutrients use the maximum detected concentration as the exposure point concentration (EPC) even if there are enough samples to compute an upper confidence limit.

[b] n/a = Not applicable.

Table G-2.3-6
EPCs at SWMU 33-010(c) for Ecological Risk

COPC	Number of Analyses	Number of Detections	Minimum Concentration	Maximum Concentration[a]	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	18	0	0.322(U)	2.24(U)	n/a[b]	2.24	Maximum detection limit
Barium	18	18	24.4	130	Normal	76.89	95% Student's-t
Calcium	18	18	848	4450	n/a	4450	Maximum detected concentration
Chromium	18	18	1.4	21.3	Lognormal	8.222	95% BCA Bootstrap
Copper	37	37	1.39	2060	Lognormal	472.8	95% Chebyshev (Mean, Sd)
Nitrate	11	11	0.67	13.7	Nonparametric	8.431	95% Chebyshev (Mean, Sd)
Perchlorate	11	3	0.000496(U)	0.00097	n/a	0.00097	Maximum detected concentration
Selenium	18	13	0.44(U)	2.8	Normal	1.649	95% KM (t)

Table G-2.3-6 (continued)

COPC	Number of Analyses	Number of Detections	Minimum Concentration	Maximum Concentration[a]	Distribution	EPC	EPC Method
Silver	18	2	0.0967(U)	4.6	n/a	4.6	Maximum detected concentration
Zinc	37	37	28.6	645	Nonparametric	85.61	95% Student's-t
Organic Chemicals (mg/kg)							
Acetone	11	2	0.00161(U)	0.00743(U)	n/a	0.00461	Maximum detected concentration
Anthracene	11	1	0.01(U)	0.0158	n/a	0.0158	Maximum detected concentration
Aroclor-1254	3	1	0.00118(U)	0.00428	n/a	0.00428	Maximum detected concentration
Aroclor-1260	3	1	0.00118(U)	0.0188	n/a	0.0188	Maximum detected concentration
Benzo(a)anthracene	11	4	0.01(U)	0.0391	n/a	0.0391	Maximum detected concentration
Benzo(a)pyrene	11	4	0.01(U)	0.0351	n/a	0.0351	Maximum detected concentration
Benzo(b)fluoranthene	11	3	0.01(U)	0.0462	n/a	0.0462	Maximum detected concentration
Benzo(g,h,i)perylene	11	1	0.01(U)	0.0222	n/a	0.0222	Maximum detected concentration
Benzo(k)fluoranthene	11	1	0.01(U)	0.0179	n/a	0.0179	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	11	5	0.0101(U)	0.368	Normal	0.123	95% KM (t)
Chrysene	11	3	0.01(U)	0.0351	n/a	0.0351	Maximum detected concentration
Di-n-butylphthalate	11	3	0.01(U)	1.08	n/a	1.08	Maximum detected concentration
Fluoranthene	11	4	0.01(U)	0.094	n/a	0.094	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	11	1	0.01(U)	0.0216	n/a	0.0216	Maximum detected concentration
Phenanthrene	11	3	0.01(U)	0.0617	n/a	0.0617	Maximum detected concentration
Pyrene	11	4	0.01(U)	0.0792	n/a	0.0792	Maximum detected concentration
Trichlorobenzene[1,2,3-]	11	1	0.000321(U)	0.00037(U)	n/a	0.000368	Maximum detected concentration
Radionuclides (pCi/g)							
Tritium	11	2	-2.11(U)	6.62	n/a	6.62	Maximum detected concentration
Uranium-234	18	18	1.26	17.7	Gamma	9.042	95% Adjusted Gamma
Uranium-235/236	18	15	0.0407(U)	0.933	Normal	0.446	95% KM (t)
Uranium-238	18	18	1.16	19.1	Normal	8.623	95% Student's-t

Note: Data qualifiers are defined in Appendix A.

[a] Essential nutrients use the maximum detected concentration as the exposure point concentration (EPC) even if there are enough samples to compute an upper confidence limit.

[b] n/a = Not applicable.

Table G-2.3-7
EPCs at SWMU 33-011(d) for the Industrial Scenario

COPC	Number of Analyses	Number of Detections	Minimum Concentration	Maximum Concentration[a]	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	21	0	0.33(U)	11(UJ)	n/a[b]	11	Maximum detection limit
Calcium	21	21	468	19,200	n/a	19,200	Maximum detected concentration
Chromium	21	21	1.2	21.2	Lognormal	9.93	95% BCA Bootstrap
Lead	21	21	2.7	774	Nonparametric	232.2	95% Chebyshev (Mean, Sd)
Mercury	21	6	0.00747(U)	2	Nonparametric	0.605	95% KM (Chebyshev)
Nitrate	9	3	0.338(U)	1.17	n/a	1.17	Maximum detected concentration
Silver	21	0	0.0972(U)	2.2(U)	n/a	2.2	Maximum detection limit
Thallium	21	1	0.138(U)	1.4(U)	n/a	0.151	Maximum detected concentration
Organic Chemicals (mg/kg)							
Acenaphthene	12	1	0.0116(U)	0.113(U)	n/a	0.0343	Maximum detected concentration
Acetone	9	2	0.00178(U)	0.00711	n/a	0.00711	Maximum detected concentration
Anthracene	12	1	0.0116(U)	0.113(U)	n/a	0.0549	Maximum detected concentration
Benzo(a)anthracene	12	3	0.0315	0.151	n/a	0.151	Maximum detected concentration
Benzo(a)pyrene	12	3	0.0351	0.141	n/a	0.141	Maximum detected concentration
Benzo(b)fluoranthene	12	3	0.0386	0.172	n/a	0.172	Maximum detected concentration
Benzo(g,h,i)perylene	12	3	0.0315	0.113(U)	n/a	0.0858	Maximum detected concentration
Benzo(k)fluoranthene	12	2	0.0116(U)	0.113(U)	n/a	0.0652	Maximum detected concentration
Chrysene	12	3	0.0315	0.161	n/a	0.161	Maximum detected concentration
Dibenz(a,h)anthracene	12	1	0.0116(U)	0.113(U)	n/a	0.0275	Maximum detected concentration
Fluoranthene	12	3	0.0534(U)	0.329	n/a	0.329	Maximum detected concentration
Fluorene	12	1	0.0116(U)	0.113(U)	n/a	0.0309	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	12	3	0.028	0.113(U)	n/a	0.0892	Maximum detected concentration
Phenanthrene	12	4	0.0491	0.278	n/a	0.278	Maximum detected concentration
Pyrene	12	5	0.0536(U)	0.271	Nonparametric	0.164	95% KM (Chebyshev)

Note: Data qualifiers are defined in Appendix A.

[a] Essential nutrients use the maximum detected concentration as the exposure point concentration (EPC) even if there are enough samples to compute an upper confidence limit.

[b] n/a = Not applicable.

Table G-2.3-8
EPCs at SWMU 33-011(d) for Residential and Construction Worker Scenarios

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration[a]	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	39	0	0.33(U)	11(UJ)	n/a[b]	11	Maximum detection limit
Calcium	39	39	225	24,700	n/a	24,700	Maximum detected concentration
Chromium	39	39	1.2	64.1	Gamma	19.03	95% Adjusted Gamma
Lead	39	34	0.349(U)	774	Nonparametric	128.3	95% KM (Chebyshev)
Mercury	39	10	0.00747(U)	2	Nonparametric	0.326	95% KM (Chebyshev)
Nitrate	27	9	0.338(U)	1.34	Normal	0.658	95% KM (t)
Selenium	39	27	0.22(UJ)	1.71	Normal	1.092	95% KM (t)
Silver	39	1	0.0972(U)	2.2(U)	n/a	0.165	Maximum detected concentration
Thallium	39	1	0.138(U)	1.4(U)	n/a	0.151	Maximum detected concentration
Organic Chemicals (mg/kg)							
Acenaphthene	36	4	0.00118(U)	4.23	n/a	4.23	Maximum detected concentration
Acetone	27	10	0.00178(U)	0.0197(U)	Normal	0.00507	95% KM (t)
Anthracene	36	4	0.00118(U)	3.84	n/a	3.84	Maximum detected concentration
Benzo(a)anthracene	36	6	0.00118(U)	5.31	Gamma	1.044	95% Gamma Adjusted KM
Benzo(a)pyrene	36	7	0.00118(U)	5.64	Gamma	1.101	95% Gamma Adjusted KM
Benzo(b)fluoranthene	36	7	0.00118(U)	6.07	Gamma	1.168	95% Gamma Adjusted KM
Benzo(g,h,i)perylene	36	6	0.00118(U)	2.97	Gamma	0.563	95% Gamma Adjusted KM
Benzo(k)fluoranthene	36	5	0.00118(U)	2.4	Gamma	0.466	95% Gamma Adjusted KM
Carbazole	27	1	0.0112(U)	1.81	n/a	1.81	Maximum detected concentration
Chrysene	36	6	0.00118(U)	5.43	Gamma	1.06	95% Gamma Adjusted KM
Dibenz(a,h)anthracene	36	4	0.00118(U)	0.965	n/a	0.965	Maximum detected concentration
Dibenzofuran	27	1	0.112(U)	3.26	n/a	3.26	Maximum detected concentration
Fluoranthene	36	9	0.00118(U)	9.6	Gamma	1.874	95% Gamma Adjusted KM

Table G-2.3-8 (continued)

COPC	Number of Analyses	Number of Detects	Minimum Concentration	Maximum Concentration[a]	Distribution	EPC	EPC Method
Fluorene	36	4	0.00118(U)	3.91	n/a	3.91	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	36	6	0.00118(U)	2.75	Gamma	0.516	95% Gamma Adjusted KM
Methylnaphthalene[1-]	36	2	0.00118(U)	2.35	n/a	2.35	Maximum detected concentration
Methylnaphthalene[2-]	36	2	0.00118(U)	3.31	n/a	3.31	Maximum detected concentration
Naphthalene	36	5	0.00035(U)	11	Gamma	2.381	95% Gamma Adjusted KM
Phenanthrene	36	10	0.00118(U)	15	Gamma	3.025	95% Gamma Adjusted KM
Pyrene	36	11	0.00118(U)	12	Gamma	2.346	95% Gamma Adjusted KM
Radionuclides (pCi/g)							
Uranium-235/236	27	6	0.0253(U)	0.189	Normal	0.0543	95% KM (t)

Note: Data qualifiers are defined in Appendix A.

[a] Essential nutrients use the maximum detected concentration as the exposure point concentration (EPC) even if there are enough samples to compute an upper confidence limit.

[b] n/a = Not applicable.

Table G-2.3-9
EPCs at SWMU 33-011(d) for Ecological Risk

COPC	Number of Analyses	Number of Detections	Minimum Concentration	Maximum Concentration[a]	Distribution	EPC	EPC Method
Inorganic Chemicals (mg/kg)							
Antimony	39	0	0.33(U)	11(UJ)	n/a[b]	11	Maximum detection limit
Calcium	39	39	225	24,700	n/a	24,700	Maximum detected concentration
Chromium	39	39	1.2	64.1	Gamma	19.03	95% Adjusted Gamma
Lead	39	34	0.349(U)	774	Nonparametric	128.3	95% KM (Chebyshev)
Mercury	39	10	0.00747(U)	2	Nonparametric	0.326	95% KM (Chebyshev)
Nitrate	27	9	0.338(U)	1.34	Normal	0.658	95% KM (t)
Selenium	39	27	0.22(UJ)	1.71	Normal	1.092	95% KM (t)
Silver	39	1	0.0972(U)	2.2(U)	n/a	0.165	Maximum detected concentration

Table G-2.3-9 (continued)

COPC	Number of Analyses	Number of Detections	Minimum Concentration	Maximum Concentration[a]	Distribution	EPC	EPC Method
Thallium	39	1	0.138(U)	1.4(U)	n/a	0.151	Maximum detected concentration
Organic Chemicals (mg/kg)							
Acenaphthene	36	4	0.00118(U)	4.23	n/a	4.23	Maximum detected concentration
Acetone	27	10	0.00178(U)	0.0197(U)	Normal	0.00507	95% KM (t)
Anthracene	36	4	0.00118(U)	3.84	n/a	3.84	Maximum detected concentration
Benzo(a)anthracene	36	6	0.00118(U)	5.31	Gamma	1.044	95% Gamma Adjusted KM
Benzo(a)pyrene	36	7	0.00118(U)	5.64	Gamma	1.101	95% Gamma Adjusted KM
Benzo(b)fluoranthene	36	7	0.00118(U)	6.07	Gamma	1.168	95% Gamma Adjusted KM
Benzo(g,h,i)perylene	36	6	0.00118(U)	2.97	Gamma	0.563	95% Gamma Adjusted KM
Benzo(k)fluoranthene	36	5	0.00118(U)	2.4	Gamma	0.466	95% Gamma Adjusted KM
Carbazole	27	1	0.0112(U)	1.81	n/a	1.81	Maximum detected concentration
Chrysene	36	6	0.00118(U)	5.43	Gamma	1.06	95% Gamma Adjusted KM
Dibenz(a,h)anthracene	36	4	0.00118(U)	0.965	n/a	0.965	Maximum detected concentration
Dibenzofuran	27	1	0.112(U)	3.26	n/a	3.26	Maximum detected concentration
Fluoranthene	36	9	0.00118(U)	9.6	Gamma	1.874	95% Gamma Adjusted KM
Fluorene	36	4	0.00118(U)	3.91	n/a	3.91	Maximum detected concentration
Indeno(1,2,3-cd)pyrene	36	6	0.00118(U)	2.75	Gamma	0.516	95% Gamma Adjusted KM
Methylnaphthalene[1-]	36	2	0.00118(U)	2.35	n/a	2.35	Maximum detected concentration
Methylnaphthalene[2-]	36	2	0.00118(U)	3.31	n/a	3.31	Maximum detected concentration
Naphthalene	36	5	0.00035(U)	11	Gamma	2.381	95% Gamma Adjusted KM
Phenanthrene	36	10	0.00118(U)	15	Gamma	3.025	95% Gamma Adjusted KM
Pyrene	36	11	0.00118(U)	12	Gamma	2.346	95% Gamma Adjusted KM
Radionuclides (pCi/g)							
Uranium-235/236	27	6	0.0253(U)	0.189	Normal	0.0543	95% KM (t)

Note: Data qualifiers are defined in Appendix A.

[a] Essential nutrients use the maximum detected concentration as the exposure point concentration (EPC) even if there are enough samples to compute an upper confidence limit.

[b] n/a = Not applicable.

Table G-3.2-1
Physical and Chemical Properties of
Inorganic COPCs for the Chaquehui Canyon Aggregate Area

COPC	K_d[a] (cm^3/g)	Water Solubility[a,b] (g/L)
Antimony	45	Insoluble
Arsenic	29	Insoluble
Barium	41	Insoluble
Cadmium	75	Insoluble
Calcium	na[c]	Soluble
Chromium	850	Insoluble
Cobalt	45	Insoluble
Copper	35	Insoluble
Iron	25	Insoluble
Lead	900	Insoluble
Magnesium	4.5	Insoluble
Manganese	65	Insoluble
Mercury	52	Insoluble
Nickel	65	Insoluble
Nitrate	na	Soluble
Perchlorate	na	245
Selenium	5	Insoluble
Silver	8.3	Insoluble
Sodium	100	Insoluble
Thallium	71	Insoluble
Uranium	0.4	Insoluble
Zinc	62	Insoluble

[a] Information from https://rais.ornl.gov/cgi-bin/tools/TOX_search.

[b] Denotes reference information from https://www.epa.gov/superfund/superfund-chemical-data-matrix-scdm.

[c] na = Not available.

Table G-3.2-2
Physical and Chemical Properties of
Organic COPCs for the Chaquehui Canyon Aggregate Area

COPC	Water Solubility[a] (mg/L)	Organic Carbon Coefficient K_{oc}[a] (L/kg)	Log Octanol-Water Partition Coefficient K_{ow}[a]	Vapor Pressure[a] (mm Hg at 25°C)
Acenaphthene	3.90E+00	5.03E+03	3.92E+00	2.15E-03
Acenaphthylene	1.61E+01	5.03E+03	3.94E+00	6.68E-03
Acetone	1.00E+06[b]	1.98E+00	-2.40E-01[b]	2.31E+02[b]
Acrylonitrile	7.45E+04	8.51E+00	2.50E+01	1.08E+02
Anthracene	4.34E-02[b]	2.04E+04	4.45E+00[b]	2.67E-06[b]
Aroclor-1254	3.40E-03[b]	5.30E+05[c]	6.79E+00[b]	6.53E-06[b]
Aroclor-1260	2.84E-04[b]	5.30E+05[c]	8.27E+00[b]	4.05E-05[b]
Benzene	1.79E+03	1.46E+02	2.13E+00	9.48E+01
Benzo(a)anthracene	9.40E-03[b]	2.31E+05	5.76E+00[b]	1.90E-06[b]
Benzo(a)pyrene	1.62E-03[b]	7.87E+05	6.13E+00[b]	5.49E-09[b]
Benzo(b)fluoranthene	1.50E-03[b]	8.03E+05	5.78E+00[b]	5.00E-07[b]
Benzo(g,h,i)perylene	2.60E-04[b]	2.68E+06	6.63E+00[b]	1.00E-10[b]
Benzo(k)fluoranthene	8.00E-04[b]	7.87E+05	6.10E+00[b]	9.65E-10[b]
Benzoic acid	3.40E+03[b]	1.45E+01	1.87E+00[b]	7.00E+04[b]
Bis(2-ethylhexyl)phthalate	2.70E-01[b]	1.65E+05	7.60E+00[b]	1.42E-07[b]
Butanone[2-]	2.23E+05	3.83E+00	2.90E+01	9.06E+01
Butylbenzylphthalate	2.69E+00	9.36E+03	4.73E+00	8.25E-06
Carbazole	1.80E+00	9.16E+03	3.72E+00	7.50E-07
Chloroform	7.95E+03	3.18E+01	1.97E+00	1.97E+02
Chloronaphthalene[2-]	2.98E+03	3.98E+00	1.17E+01	9.03E-03
Chrysene	6.30E-03[b]	2.36E+05	5.81E+00[b]	6.23E-09[b]
Di-n-butylphthalate	1.46E+03	4.50E+00	4.70E+00[b]	2.01E-05
Di-n-octylphthalate	2.20E-02	1.45E+05	8.10E+00	1.00E-07
Dibenz(a,h)anthracene	2.49E-03	1.91E+06	6.75E+00	9.55E-10
Dibenzofuran	3.10E+00	1.13E+04	4.12E+00	2.48E-03
Diethylphthalate	1.08E+03	1.05E+02	2.42E+00	2.10E-03
Dinitrotoluene[2,4-]	2.00E+02	5.76E+02	1.98E+00	1.47E-04
Fluoranthene	2.06E-01[c]	7.09E+04[c]	5.16E+00[c]	9.22E-06[c]
Fluorene	1.69E+00	9.16E+03	4.18E+00	6.00E-04
Hexanone[2-]	1.75E+04	1.30E+01	1.38E+00	1.16E+01
Indeno(1,2,3-cd)pyrene	1.90E-04	1.95E+06	6.70E+00	1.25E-12
Isophorone	1.20E+04	6.52E+01	1.70E+00	4.38E-01
Isopropyltoluene[4-]	2.34E+01[b]	na[d]	4.10E+00[b]	1.64E+00[b]
Methylene chloride	1.30E+04[b]	2.37E+01	1.30E+00[b]	4.30E+02[b]

Table G-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)
Methylnaphthalene[1-]	2.58E+01	2.53E+03	3.87E+00	6.70E-02
Methylnaphthalene[2-]	2.46E+01	2.48E+03	3.86E+00	5.50E-02
Naphthalene	3.10E+01	1.54E+03	3.30E+00	8.50E-02
Phenanthrene	1.15E+00[b]	2.08E+04	4.46E+00[b]	1.12E-04[b]
Pyrene	1.35E-01[b]	6.94E+04	4.88E+00[b]	4.50E-06[b]
Pyridine	1.00E+06	7.17E+01	6.50E-01	2.08E+01
RDX	5.97E+01[e]	1.05E+02[e]	8.70E-01[e]	4.10E-09[e]
Styrene	3.10E+02	4.46E+02	2.95E+00	6.40E+00
Tetrachlorobenzene[1,2,4,5-]	5.95E-01	2.22E+03	4.64E+00	5.40E-03
Tetrachloroethene	3.06E+02	9.49E+01	3.40E+00	1.85E+01
Toluene	5.26E+02	2.68E+02	2.73E+00	2.84E+01
Trichlorobenzene[1,2,3-]	1.80E+01	1.38E+03	4.05E+00	2.10E-01
Trichloroethene	1.28E+03	6.07E+01	2.42E+00	6.90E+01
Xylene[1,3]+Xylene[1,4-]	1.62E+02[e]	3.75E+02[f]	3.18E+00[f]	8.57E+00[f]

[a] Information from https://rais.ornl.gov/cgi-bin/tools/TOX_search.

[b] Denotes reference information from https://www.epa.gov/superfund/superfund-chemical-data-matrix-scdm.

[c] Information from NMED (2019, 700550).

[d] n/a = Not applicable.

[e] Information from the National Institutes of Health Hazardous Substances Data Bank (HSDB) found at https://pubchem.ncbi.nlm.nih.gov/ formerly at (https://pubchem.ncbi.nlm.nih.gov/source/11933).

[f] Average of xylene[1,3-] and xylene[1,4-].

Table G-3.2-3
Physical and Chemical Properties of
Radionuclide COPCs for the Chaquehui Canyon Aggregate Area

COPC	Soil-Water Partition Coefficient, K_d[a] (cm^3/kg)	Water Solubility[b] (g/L)
Cesium-137	1000	Insoluble
Plutonium-239/240	4500	Insoluble
Tritium	9.9	Soluble
Uranium-234	0.4	Insoluble
Uranium-235/236	0.4	Insoluble
Uranium-238	0.4	Insoluble

[a] Superfund Chemical Data Matrix (EPA 1996, 064708).

[b] Information from https://www.epa.gov/superfund/superfund-chemical-data-matrix-scdm.

Table G-4.1-1
Exposure Parameters Used to Calculate
Chemical SSLs for the Industrial, Construction Worker, and Residential Scenarios

Parameters	Industrial Values[a]	Construction Worker Values[a]	Residential Values[a]
Target HQ	1	1	1
Target cancer risk	10^{-5}	10^{-5}	10^{-5}
Averaging time (carcinogen/mutagen)	70 yr × 365 days	70 yr × 365 days	70 yr × 365 days
Averaging time (noncarcinogen)	Exposure duration × 365 days	Exposure duration × 365 days	Exposure duration × 365 days
Skin absorption factor	SVOC[b] = 0.1	SVOC = 0.1	SVOC = 0.1
	Chemical-specific	Chemical-specific	Chemical-specific
Adherence factor–child	n/a[c]	n/a	0.2 mg/cm^2
Body weight–child	n/a	n/a	15 kg (0–6 yr of age)
Cancer slope factor–oral (chemical-specific)	(mg/kg-day)$^{-1}$	(mg/kg-day)$^{-1}$	(mg/kg-day)$^{-1}$
Inhalation unit risk (chemical-specific)	(µg/m^3)	(µg/m^3)	(µg/m^3)
Exposure frequency	225 days/yr	225 days/yr	350 days/yr
Exposure time	8 hr/day	8 hr/day	24 hr/day
Exposure duration–child	n/a	n/a	6 yr[d]
Age-adjusted ingestion factor for carcinogens	n/a	n/a	36,750 mg/kg
Age-adjusted ingestion factor for mutagens	n/a	n/a	25,550 mg/kg
Soil ingestion rate–child	n/a	n/a	200 mg/day
Particulate emission factor	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-day)	(mg/kg-day)	(mg/kg-day)
Reference dose–inhalation (chemical-specific)	(mg/kg-day)	(mg/kg-day)	(mg/kg-day)
Exposed surface area–child	n/a	n/a	2690 cm^2/day
Age-adjusted skin contact factor for carcinogens	n/a	n/a	112,266 mg/kg
Age-adjusted skin contact factor for mutagens	n/a	n/a	166,833 mg/kg
Volatilization factor for soil (chemical-specific)	(m^3/kg)	(m^3/kg)	(m^3/kg)
Body weight–adult	80 kg	80 kg	80 kg
Exposure duration[e]	25 yr	1 yr	30 yr[f]

Table G-4.1-1 (continued)

Parameters	Industrial Values[a]	Construction Worker Values[a]	Residential Values[a]
Adherence factor–adult	0.12 mg/cm^2	0.3 mg/cm^2	0.07 mg/cm^2
Soil ingestion rate–adult	100 mg/day	330 mg/day	100 mg/day
Exposed surface area–adult	3470 cm^2/day	3470 cm^2/day	6032 cm^2/day

[a] Parameter values from NMED (2019, 700550) unless otherwise noted.

[b] SVOC = Semivolatile organic compound.

[c] n/a = Not applicable.

[d] The child exposure duration for mutagens is subdivided into 0–2 yr and 2–6 yr.

[e] Exposure duration for lifetime resident is 26 yr. For carcinogens, the exposures are combined for child (6 yr) and adult (20 yr).

[f] The adult exposure duration for mutagens is subdivided into 6–16 yr and 16–30 yr.

Table G-4.1-2
Parameter Values Used to Calculate Radionuclide SALs for the Industrial and Construction Worker Scenarios

Parameters	Industrial, Adult	Construction Worker, Adult
Inhalation rate (m^3/yr)	7780[a]	7780[a]
Mass loading (g/m^3)	1.5×10^{-7}[b]	0.0004[c]
Outdoor time fraction	0.2053[d]	0.2282[e]
Indoor time fraction	0[f]	0
Soil ingestion (g/yr)	109.6[g]	362[h]

[a] Calculated as [21.3 m^3/day × 365.25 days/yr], where 21.3 m^3/day 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) × 1000 g/kg, where 6.6 × 10^9 m^3/kg is the particulate emission factor (NMED 2019, 700550).

[c] Calculated as (1/2.1 × 10^6 m^3/kg) × 1000 g/kg, where 2.1 × 10^6 m^3/kg is the particulate emission factor (NMED 2019, 700550).

[d] Calculated as (8 hr/day × 225 days/yr)/8766 hr/yr, where 8 hr/day is an estimate of the average length of the work day and 225 days/yr is the exposure frequency (NMED 2019, 700550).

[e] Calculated as (8 hr/day × 250 days/yr /8766 hr/yr, where 8 hr/day is an estimate of the average length of the work day and 250 days/yr is the exposure frequency (NMED 2019, 700550).

[f] The commercial/industrial worker is defined as someone who “spends most of the work day conducting maintenance or manual labor activities outdoors” (NMED 2019, 700550).

[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/day × 225 days/yr]/ [indoor + outdoor time fractions], where 0.1 g/day is the site-related daily adult soil-ingestion rate (NMED 2019, 700550).

[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/day × 250 days/yr]/ [indoor + outdoor time fractions], where 0.33 g/day is the site-related daily soil ingestion rate for a construction worker (NMED 2019, 700550).

Table G-4.1-3
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/day × 365.25 days/yr, where 12.9 m^3/day is the mean upper percentile daily inhalation rate of a child (EPA 2011, 208374, Table 6-1).

[b] Calculated as 21.3 m^3/day × 365.25 days/yr, where 21.3 m^3/day is the mean upper percentile daily inhalation rate of an adult from 21 to less than 61 yr old (EPA 2011, 208374, Table 6-1).

[c] Calculated as ($1/6.6 \times 10^9$ m^3/kg) × 1000 g/kg, where 6.6×10^9 m^3/kg is the particulate emission factor (NMED 2019, 700550).

[d] Calculated as (2.32 hr/day × 350 day/yr)/8766 hr/yr, where 2.32 hr/day (139 min) is the largest amount of time spent outdoors for child age groups between 1 to less than 3 months 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 hr/day × 350 days/yr)/8766 hr/yr, where 4.68 hr/day 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 hr/day) 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 hr/day–2.32 hr/day) × 350 days/yr]/8766 hr/yr.

[g] Calculated as [(24 hr/day–2.34 hr/day) × 350 days/yr]/8766 hr/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/day × 350 days/yr)/(indoor + outdoor time fractions), where 0.2 g/day is the upper percentile site-related daily child soil ingestion rate (NMED 2019, 700550; 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/day × 350 days/yr)/(indoor + outdoor time fractions), where 0.1 g/day is the site-related daily adult soil ingestion rate (NMED 2019, 700550).

Table G-4.2-1
Industrial Carcinogenic
Screening Evaluation for SWMU 33-007(c)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Cobalt	10.9	83,400	1.31E-09
Nickel	34.9	2,890,000	1.21E-10
Aroclor-1254	0.852	11	7.75E-07
Aroclor-1260	0.184	11.1	1.66E-07
Benzene	0.000727	87.2	8.34E-11
Benzo(b)fluoranthene	0.0535	32.3	1.66E-08
Bis(2-ethylhexyl)phthalate	0.0783	1830	4.28E-10
Dinitrotoluene[2,4-]	1.88	82.3	2.28E-07
Methylnaphthalene[1-]	0.0149	813	1.83E-10
Naphthalene	0.0181	241	7.51E-10
Trichloroethene	0.000484	112	4.32E-11
		Total Excess Cancer Risk	**1E-06**

* SSLs from NMED (2019, 700550).

Table G-4.2-2
Industrial Noncarcinogenic
Screening Evaluation for SWMU 33-007(c)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Antimony	3.43	519	6.61E-03
Cobalt	10.9	388	2.81E-02
Copper	19.59	51,900	3.77E-04
Iron	15,847	908,000	1.75E-02
Mercury	0.107	389	2.75E-04
Nickel	34.9	25,700	1.36E-03
Nitrate	2.257	2,080,000	1.09E-06
Perchlorate	0.0009	908	9.91E-07
Selenium	1.458	6490	2.25E-04
Aroclor-1254	0.852	16.4	5.20E-02
Benzene	0.000727	729	9.97E-07
Benzo(g,h,i)perylene	0.108	25,300[b]	4.27E-06
Bis(2-ethylhexyl)phthalate	0.0783	18,300	4.28E-06
Di-n-butylphthalate	1	91,600	1.09E-05
Dinitrotoluene[2,4-]	1.88	1820	1.03E-03
Methylnaphthalene[1-]	0.0149	58,900	2.53E-07
Methylnaphthalene[2-]	0.0213	3370	6.32E-06
Naphthalene	0.0181	843	2.15E-05
Toluene	0.00165	61,300	2.69E-08
Trichloroethene	0.000484	36.5	1.33E-05
Xylene[1,3-]+Xylene[1,4-]	0.000806	4280[c]	1.88E-07
		Hazard Index	**0.1**

[a] SSLs from NMED (2019, 700550).

[b] Pyrene used as a surrogate based on structural similarity.

[c] Total xylenes used as a surrogate.

Table G-4.2-3
Industrial Radionuclide
Screening Evaluation for SWMU 33-007(c)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Uranium-234	6.82	3100	5.50E-02
Uranium-235/236	0.274	160	4.28E-02
Uranium-238	6.93	710	2.44E-01
		Total Dose	**0.3**

* SALs from LANL (2015, 600929).

Table G-4.2-4
Construction Worker Carcinogenic
Screening Evaluation for SWMU 33-007(c)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Cobalt	41.57	722	5.76E-07
Nickel	41.17	25,000	1.65E-08
Aroclor-1254	0.264	85.3	3.09E-08
Aroclor-1260	0.0636	85.3	7.46E-09
Benzene	0.000727	423	1.72E-11
Benzo(a)pyrene	0.014	173	8.09E-10
Benzo(b)fluoranthene	0.0535	240	2.23E-09
Benzo(k)fluoranthene	0.0292	2310	1.26E-10
Bis(2-ethylhexyl)phthalate	0.0275	13,400	2.05E-11
Chrysene	0.0358	23,100	1.55E-11
Dinitrotoluene[2,4-]	1.88	600	3.13E-08
Isophorone	0.287	198,000	1.45E-11
Methylene Chloride	0.00256	89,600	2.86E-13
Methylnaphthalene[1-]	0.0149	6060	2.46E-11
Naphthalene	0.0181	1110	1.63E-10
RDX	0.182	2960	6.15E-10
Trichloroethene	0.000484	5370	9.01E-13
		Total Excess Cancer Risk	**7E-07**

* SSLs from NMED (2019, 700550).

Table G-4.2-5
Construction Worker Noncarcinogenic
Screening Evaluation for SWMU 33-007(c)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Antimony	1.178	142	8.30E-03
Cobalt	41.57	36.7	1.13E+00
Copper	22.1	14,200	1.56E-03
Iron	13,512	248,000	5.45E-02
Mercury	0.0601	77.1	7.80E-04
Nickel	41.17	753	5.47E-02
Nitrate	15.67	566,000	2.77E-05
Perchlorate	0.00195	248	7.86E-06
Selenium	1.138	1750	6.50E-04
Silver	2.331	1770	1.32E-03

Table G-4.2-5 (continued)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Acetone	0.00656	242,000	2.71E-08
Aroclor-1254	0.264	4.91	5.38E-02
Benzene	0.000727	142	5.12E-06
Benzo(a)pyrene	0.014	15	9.33E-04
Benzo(g,h,i)perylene	0.108	7530[b]	1.43E-05
Bis(2-ethylhexyl)phthalate	0.0275	5380	5.11E-06
Di-n-butylphthalate	0.165	26,900	6.13E-06
Diethylphthalate	0.0262	215,000	1.22E-07
Dinitrotoluene[2,4-]	1.88	536	3.51E-03
Hexanone[2-]	0.157	340[c]	4.62E-04
Isophorone	0.287	53,700	5.34E-06
Methylene Chloride	0.00256	1210	2.12E-06
Methylnaphthalene[1-]	0.0149	17,600	8.47E-07
Methylnaphthalene[2-]	0.0213	1000	2.13E-05
Naphthalene	0.0181	159	1.14E-04
RDX	0.182	1350	1.35E-04
Toluene	0.000667	14,000	4.76E-08
Trichloroethene	0.000484	6.9	7.01E-05
Xylene[1,3-]+Xylene[1,4-]	0.000806	798[d]	1.01E-06
		Hazard Index	**1**

[a] SSLs from NMED (2019, 700550).

[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 in NMED (2019, 700550).

[d] Total xylenes used as a surrogate.

Table G-4.2-6
Construction Worker Radionuclide Screening Evaluation for SWMU 33-007(c)

COPC	EPC (pCi/g)	Construction Worker SAL* (pCi/g)	Dose (mrem/yr)
Uranium-234	3.802	1000	9.51E-02
Uranium-235/236	0.17	130	3.27E-02
Uranium-238	3.827	470	2.04E-01
		Total Dose	**0.3**

* SALs from LANL (2015, 600929).

Table G-4.2-7
Residential Carcinogenic
Screening Evaluation for SWMU 33-007(c)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Cobalt	41.57	17,200	2.42E-08
Nickel	41.17	595,000	6.92E-10
Aroclor-1254	0.264	2.43	1.09E-06
Aroclor-1260	0.0636	2.43	2.62E-07
Benzene	0.000727	17.8	4.08E-10
Benzo(a)pyrene	0.014	1.12	1.25E-07
Benzo(b)fluoranthene	0.0535	1.53	3.50E-07
Benzo(k)fluoranthene	0.0292	15.3	1.91E-08
Bis(2-ethylhexyl)phthalate	0.0275	380	7.24E-10
Chrysene	0.0358	153	2.34E-09
Dinitrotoluene[2,4-]	1.88	17.1	1.10E-06
Isophorone	0.287	5610	5.12E-10
Methylene Chloride	0.00256	766	3.34E-11
Methylnaphthalene[1-]	0.0149	172	8.66E-10
Naphthalene	0.0181	49.7	3.64E-09
RDX	0.182	83.1	2.19E-08
Trichloroethene	0.000484	15.5	3.12E-10
		Total Excess Cancer Risk	**3E-06**

* SSLs from NMED (2019, 700550).

Table G-4.2-8
Residential Noncarcinogenic
Screening Evaluation for SWMU 33-007(c)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	1.178	31.3	3.76E-02
Cobalt	41.57	23.4	1.78E+00
Copper	22.1	3130	7.06E-03
Iron	13,512	54,800	2.47E-01
Mercury	0.0601	23.5	2.56E-03
Nickel	41.17	1560	2.64E-02
Nitrate	15.67	125,000	1.25E-04
Perchlorate	0.00195	54.8	3.56E-05
Selenium	1.138	391	2.91E-03
Silver	2.331	391	5.96E-03

Table G-4.2-8 (continued)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Acetone	0.00656	66,300	9.89E-08
Aroclor-1254	0.264	1.14	2.32E-01
Benzene	0.000727	114	6.38E-06
Benzo(a)pyrene	0.014	17.4	8.05E-04
Benzo(g,h,i)perylene	0.108	1740[b]	6.21E-05
Bis(2-ethylhexyl)phthalate	0.0275	1230	2.24E-05
Di-n-butylphthalate	0.165	6160	2.68E-05
Diethylphthalate	0.0262	49,300	5.31E-07
Dinitrotoluene[2,4-]	1.88	123	1.53E-02
Hexanone[2-]	0.157	200[c]	7.85E-04
Isophorone	0.287	12,300	2.33E-05
Methylene Chloride	0.00256	409	6.26E-06
Methylnaphthalene[1-]	0.0149	4060	3.67E-06
Methylnaphthalene[2-]	0.0213	232	9.18E-05
Naphthalene	0.0181	162	1.12E-04
RDX	0.182	301	6.05E-04
Toluene	0.000667	5230	1.27E-07
Trichloroethene	0.000484	6.77	7.15E-05
Xylene[1,3-]+Xylene[1,4-]	0.000806	871[d]	9.25E-07
		Hazard Index	**2**

[a] SSLs from NMED (2019, 700550).

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSL from EPA regional screening tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

[d] Total xylenes used as a surrogate.

Table G-4.2-9
Residential Radionuclide
Screening Evaluation for SWMU 33-007(c)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Uranium-234	3.802	290	3.28E-01
Uranium-235/236	0.17	42	1.01E-01
Uranium-238	3.827	150	6.38E-01
		Total Dose	**1**

* SALs from LANL (2015, 600929).

Table G-4.2-10
Industrial Carcinogenic
Screening Evaluation for SWMU 33-010(c)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Aroclor-1254	0.00428	11	3.89E-09
Aroclor-1260	0.0188	11.1	1.69E-08
Benzo(a)anthracene	0.0391	32.3	1.21E-08
Benzo(a)pyrene	0.0351	23.6	1.49E-08
Benzo(b)fluoranthene	0.0462	32.3	1.43E-08
Benzo(k)fluoranthene	0.0179	323	5.54E-10
Bis(2-ethylhexyl)phthalate	0.135	1830	7.38E-10
Chrysene	0.0351	3230	1.09E-10
Indeno(1,2,3-cd)pyrene	0.0216	32.3	6.69E-09
		Total Excess Cancer Risk	**7E-08**

* SSLs from NMED (2019, 700550).

Table G-4.2-11
Industrial Noncarcinogenic
Screening Evaluation for SWMU 33-010(c)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Antimony	1.96	519	3.78E-03
Barium	84.8	255,000	3.33E-04
Copper	574.3	51,900	1.11E-02
Nitrate	13.7	2,080,000	6.59E-06
Perchlorate	0.000826	908	9.10E-07
Selenium	1.223	6490	1.88E-04
Silver	4.6	6490	7.09E-04
Zinc	195.3	389,000	5.02E-04
Anthracene	0.0158	253,000	6.25E-08
Aroclor-1254	0.00428	16.4	2.61E-04
Benzo(a)pyrene	0.0351	251	1.40E-04
Benzo(g,h,i)perylene	0.0222	25,300[b]	8.77E-07
Bis(2-ethylhexyl)phthalate	0.135	18,300	7.38E-06
Di-n-butylphthalate	1.08	91,600	1.18E-05
Fluoranthene	0.094	33,700	2.79E-06
Phenanthrene	0.0617	25,300	2.44E-06
Pyrene	0.0792	25,300	3.13E-06
		Hazard Index	**0.02**

[a] SSLs from NMED (2019, 700550).

[b] Pyrene used as a surrogate based on structural similarity.

Table G-4.2-12
Industrial Radionuclide
Screening Evaluation for SWMU 33-010(c)

COPC	EPC (pCi/g)	Industrial SAL* (pCi/g)	Dose (mrem/yr)
Tritium	4.68	2,400,000	4.88E-05
Uranium-234	9.019	3100	7.27E-02
Uranium-235/236	0.491	160	7.67E-02
Uranium-238	9.496	710	3.34E-01
Tritium	4.68	2,400,000	4.88E-05
		Total Dose	**0.5**

* SALs from LANL (2015, 600929).

Table G-4.2-13
Construction Worker Carcinogenic
Screening Evaluation for SWMU 33-010(c)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	Cancer Risk
Chromium	13.25	468	2.83E-07
Aroclor-1254	0.00428	85.3	5.02E-10
Aroclor-1260	0.0188	85.3	2.20E-09
Benzo(a)anthracene	0.0556	240	2.32E-09
Benzo(a)pyrene	0.0264	173	1.53E-09
Benzo(b)fluoranthene	0.229	240	9.54E-09
Benzo(k)fluoranthene	0.0758	2310	3.28E-10
Bis(2-ethylhexyl)phthalate	0.142	13,400	1.06E-10
Butylbenzylphthalate	0.0128	99,000[b]	1.29E-12
Chrysene	0.252	23,100	1.09E-10
Dibenz(a,h)anthracene	0.0156	24	6.50E-09
Indeno(1,2,3-cd)pyrene	0.0533	240	2.22E-09
		Total Excess Cancer Risk	**3E-07**

[a] SSLs from NMED (2019, 700550).

[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 in NMED (2019, 700550).

Table G-4.2-14
Construction Worker Noncarcinogenic
Screening Evaluation for SWMU 33-010(c)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Antimony	2.24	142	1.58E-02
Barium	69.1	4390	1.57E-02
Chromium	13.25	134	9.89E-02
Copper	343.9	14,200	2.42E-02
Nitrate	5.922	566,000	1.05E-05
Perchlorate	0.00114	248	4.60E-06
Selenium	1.751	1750	1.00E-03
Silver	4.6	1770	2.60E-03
Zinc	72.51	106,000	6.84E-04
Acetone	0.00461	242,000	1.90E-08
Anthracene	0.0158	75,300	2.10E-07
Aroclor-1254	0.00428	4.91	8.72E-04
Benzo(a)pyrene	0.0264	15	1.76E-03
Benzo(g,h,i)perylene	0.0485	7530[b]	6.44E-06
Bis(2-ethylhexyl)phthalate	0.142	5380	2.64E-05
Di-n-butylphthalate	1.08	26,900	4.01E-05
Fluoranthene	0.0488	10,000	4.88E-06
Phenanthrene	0.0617	7530	8.19E-06
Pyrene	0.0397	7530	5.27E-06
Trichlorobenzene[1,2,3-]	0.000368	68[c]	5.41E-06
		Hazard Index	**0.2**

[a] SSLs from NMED (2019, 700550).

[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 in NMED (2019, 700550).

Table G-4.2-15
Construction Worker Radionuclide
Screening Evaluation for SWMU 33-010(c)

COPC	EPC (pCi/g)	Construction Worker SAL* (pCi/g)	Dose (mrem/yr)
Tritium	6.62	1,600,000	1.03E-04
Uranium-234	9.305	1000	2.33E-01
Uranium-235/236	0.372	130	7.15E-02
Uranium-238	9.863	470	5.25E-01
		Total Dose	**0.8**

* SALs from LANL (2015, 600929).

Table G-4.2-16
Residential Carcinogenic
Screening Evaluation for SWMU 33-010(c)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	Cancer Risk
Chromium	13.25	96.6	1.37E-06
Aroclor-1254	0.00428	2.43	1.76E-08
Aroclor-1260	0.0188	2.43	7.74E-08
Benzo(a)anthracene	0.0556	1.53	3.63E-07
Benzo(a)pyrene	0.0264	1.12	2.36E-07
Benzo(b)fluoranthene	0.229	1.53	1.50E-06
Benzo(k)fluoranthene	0.0758	15.3	4.95E-08
Bis(2-ethylhexyl)phthalate	0.142	380	3.74E-09
Butylbenzylphthalate	0.0128	2900[b]	4.41E-11
Chrysene	0.252	153	1.65E-08
Dibenz(a,h)anthracene	0.0156	0.15	1.04E-06
Indeno(1,2,3-cd)pyrene	0.0533	1.53	3.48E-07
		Total Excess Cancer Risk	**5E-06**

[a] SSLs from NMED (2019, 700550).

[b] SSL from EPA regional screening tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

Table G-4.2-17
Residential Noncarcinogenic
Screening Evaluation for SWMU 33-010(c)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	2.24	31.3	7.16E-02
Barium	69.1	15,600	4.43E-03
Chromium	13.25	45,200	2.93E-04
Copper	343.9	3130	1.10E-01
Nitrate	5.922	125,000	4.74E-05
Perchlorate	0.00114	54.8	2.08E-05
Selenium	1.751	391	4.48E-03
Silver	4.6	391	1.18E-02
Zinc	72.51	23,500	3.09E-03
Acetone	0.00461	66,300	6.95E-08
Anthracene	0.0158	17,400	9.08E-07
Aroclor-1254	0.00428	1.14	3.75E-03

Table G-4.2-17 (continued)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Benzo(a)pyrene	0.0264	17.4	1.52E-03
Benzo(g,h,i)perylene	0.0485	1740[b]	2.79E-05
Bis(2-ethylhexyl)phthalate	0.142	1230	1.15E-04
Di-n-butylphthalate	1.08	6160	1.75E-04
Fluoranthene	0.0488	2320	2.10E-05
Phenanthrene	0.0617	1740	3.55E-05
Pyrene	0.0397	1740	2.28E-05
Trichlorobenzene[1,2,3-]	0.000368	63[c]	5.84E-06
		Hazard Index	**0.2**

[a] SSLs from NMED (2019, 700550).

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSL from EPA regional screening tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

Table G-4.2-18
Residential Radionuclide
Screening Evaluation for SWMU 33-010(c)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Tritium	6.62	1700	9.74E-02
Uranium-234	9.305	290	8.02E-01
Uranium-235/236	0.372	42	2.21E-01
Uranium-238	9.863	150	1.64E+00
		Total Dose	**3**

* SALs from LANL (2015, 600929).

Table G-4.2-19
Industrial Carcinogenic
Screening Evaluation for SWMU 33-011(d)

COPC	EPC (mg/kg)	Industrial SSL* (mg/kg)	HQ
Cadmium	1.38	417,000	3.31E-11
Chromium	9.93	505	1.97E-07
Benzo(a)anthracene	0.151	32.3	4.67E-08
Benzo(a)pyrene	0.141	23.6	5.97E-08
Benzo(b)fluoranthene	0.172	32.3	5.33E-08
Benzo(k)fluoranthene	0.0652	323	2.02E-09
Chrysene	0.161	3230	4.98E-10
Dibenz(a,h)anthracene	0.0275	3.23	8.51E-08
Indeno(1,2,3-cd)pyrene	0.0892	32.3	2.76E-08
		Total Excess Cancer Risk	**5E-07**

* SSLs from NMED (2019, 700550).

Table G-4.2-20
Industrial Noncarcinogenic
Screening Evaluation for SWMU 33-011(d)

COPC	EPC (mg/kg)	Industrial SSL[a] (mg/kg)	HQ
Antimony	11	519	2.12E-02
Chromium	9.93	314,000	3.16E-05
Mercury	0.605	389	1.56E-03
Nitrate	1.17	2,080,000	5.63E-07
Silver	2.2	6490	3.39E-04
Thallium	0.151	13	1.16E-02
Acenaphthene	0.0343	50,500	6.79E-07
Acetone	0.00711	960,000	7.41E-09
Anthracene	0.0549	253,000	2.17E-07
Benzo(a)pyrene	0.141	251	5.62E-04
Benzo(g,h,i)perylene	0.0858	25,300[b]	3.39E-06
Fluoranthene	0.329	33,700	9.76E-06
Fluorene	0.0309	33,700	9.17E-07
Phenanthrene	0.278	25,300	1.10E-05
Pyrene	0.164	25,300	6.48E-06
		Hazard Index	**0.04**

[a] SSLs from NMED (2019, 700550).

[b] Pyrene used as a surrogate based on structural similarity.

Table G-4.2-21
Construction Worker Carcinogenic
Screening Evaluation for SWMU 33-011(d)

COPC	EPC (mg/kg)	Construction Worker SSL* (mg/kg)	Cancer Risk
Chromium	19.03	468	4.07E-07
Benzo(a)anthracene	1.044	240	4.35E-08
Benzo(a)pyrene	1.101	173	6.36E-08
Benzo(b)fluoranthene	1.168	240	4.87E-08
Benzo(k)fluoranthene	0.466	2310	2.02E-09
Chrysene	1.06	23,100	4.59E-10
Dibenz(a,h)anthracene	0.965	24	4.02E-07
Indeno(1,2,3-cd)pyrene	0.516	240	2.15E-08
Methylnaphthalene[1-]	2.35	6060	3.88E-09
Naphthalene	2.381	1110	2.15E-08
		Total Excess Cancer Risk	**1E-06**

* SSLs from NMED (2019, 700550).

Table G-4.2-22
Construction Worker Noncarcinogenic
Screening Evaluation for SWMU 33-011(d)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Antimony	11	142	7.75E-02
Chromium	19.03	134	1.42E-01
Mercury	0.326	77.1	4.23E-03
Nitrate	0.658	566,000	1.16E-06
Selenium	1.092	1750	6.24E-04
Silver	0.165	1770	9.32E-05
Thallium	0.151	3.54	4.27E-02
Acenaphthene	4.23	15,100	2.80E-04
Acetone	0.00507	242,000	2.10E-08
Anthracene	3.84	75,300	5.10E-05
Benzo(a)pyrene	1.101	15	7.34E-02
Benzo(g,h,i)perylene	0.563	7530[b]	7.48E-05
Carbazole	1.81	85[c,d]	2.13E-02
Dibenzofuran	3.26	85[c]	3.84E-02
Fluoranthene	1.874	10,000	1.87E-04
Fluorene	3.91	10,000	3.91E-04

Table G-4.2-22 (continued)

COPC	EPC (mg/kg)	Construction Worker SSL[a] (mg/kg)	HQ
Methylnaphthalene[1-]	2.35	17,600	1.34E-04
Methylnaphthalene[2-]	3.31	1000	3.31E-03
Naphthalene	2.381	159	1.50E-02
Phenanthrene	3.025	7530	4.02E-04
Pyrene	2.346	7530	3.12E-04
		Hazard Index	**0.4**

[a] SSLs from NMED (2019, 700550).

[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 in NMED (2019, 700550).

[d] Dibenzofuran used as a surrogate based on structural similarity.

Table G-4.2-23
Construction Worker Radionuclide
Screening Evaluation for SWMU 33-011(d)

COPC	EPC (pCi/g)	Construction Worker SAL* (pCi/g)	Dose (mrem/yr)
Uranium-235/236	0.0543	130	1.04E-02
		Total Dose	**0.01**

* SAL from LANL (2015, 600929).

Table G-4.2-24
Residential Carcinogenic
Screening Evaluation for SWMU 33-011(d)

COPC	EPC (mg/kg)	Residential SSL* (mg/kg)	Cancer Risk
Chromium	19.03	96.6	1.97E-06
Benzo(a)anthracene	1.044	1.53	6.82E-06
Benzo(a)pyrene	1.101	1.12	9.83E-06
Benzo(b)fluoranthene	1.168	1.53	7.63E-06
Benzo(k)fluoranthene	0.466	15.3	3.05E-07
Chrysene	1.06	153	6.93E-08
Dibenz(a,h)anthracene	0.965	0.15	6.43E-05
Indeno(1,2,3-cd)pyrene	0.516	1.53	3.37E-06
Methylnaphthalene[1-]	2.32	172	1.37E-07
Naphthalene	2.381	49.7	4.79E-07
Total Excess Cancer Risk			**9E-05**

* SSLs from NMED (2019, 700550).

Table G-4.2-25
Residential Noncarcinogenic
Screening Evaluation for SWMU 33-011(d)

COPC	EPC (mg/kg)	Residential SSL[a] (mg/kg)	HQ
Antimony	11	31.3	3.51E-01
Chromium	19.03	45,200	4.21E-04
Mercury	0.326	23.5	1.39E-02
Nitrate	0.658	125,000	5.26E-06
Selenium	1.092	391	2.79E-03
Silver	0.165	391	4.22E-04
Thallium	0.151	0.78	1.94E-01
Acenaphthene	4.23	3480	1.22E-03
Acetone	0.00507	66,300	7.65E-08
Anthracene	3.84	17,400	2.21E-04
Benzo(a)pyrene	1.12	17.4	6.33E-02
Benzo(g,h,i)perylene	0.563	1740[b]	3.24E-04
Carbazole	1.81	78[c,d]	2.32E-02
Dibenzofuran	3.26	78[c]	4.18E-02
Fluoranthene	1.874	2320	8.08E-04
Fluorene	3.91	2320	1.69E-03
Methylnaphthalene[1-]	2.35	4060	5.79E-04
Methylnaphthalene[2-]	3.31	232	1.43E-02
Naphthalene	2.381	162	1.47E-02
Phenanthrene	3.025	1740	1.74E-03
Pyrene	2.346	1740	1.35E-03
		Hazard Index	**0.7**

[a] SSLs from NMED (2019, 700550).

[b] Pyrene used as a surrogate based on structural similarity.

[c] SSL from EPA regional screening tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

[d] Dibenzofuran used as a surrogate based on structural similarity.

Table G-4.2-26
Residential Radionuclide
Screening Evaluation for SWMU 33-011(d)

COPC	EPC (pCi/g)	Residential SAL* (pCi/g)	Dose (mrem/yr)
Uranium-235/236	0.0543	42	3.23E-02
		Total Dose	**0.03**

* SAL from LANL (2015, 600929).

Table G-4.3-1
Summary of Vapor-Intrusion Pathway Designations

SWMU	Brief Description	Vapor Intrusion Pathway Designation	Comments
SWMU 33-007(c)	Firing Sites	Potentially complete	• No solvent source known to the site, and most volatile and toxic organics are minimally detected. • One vacant structure onsite. No buildings are reasonably anticipated to be present in the future. • Multiple lines of evidence indicate that no further evaluation is necessary.
SWMU 33-010(c)	Surface Disposal Site	Incomplete	• No nearby buildings. No buildings are reasonably anticipated in the future. • No further evaluation required.
SWMU 33-011(d)	Storage Area	Potentially complete	• No solvent source known to the site, and most volatile and toxic organic chemicals are minimally detected. • Multiple lines of evidence indicate that no further evaluation is necessary.

Table G-4.3-2
Summary of Detected Volatile Organic Compounds, Range of Report Detection Limits and Concentrations, and Indoor Air VISLs at SWMU 33-007(c)

Compound	Range of Report Detection Limits (mg/kg)	Range of Estimated or Detected Concentrations (mg/kg)	Indoor Air VISL (µg/m^3)
Acetone	0.0053–0.00682	0.00656	32,300
Benzene	0.00106–0.00136	0.000727	3.6
Methylene chloride	0.0053–0.00682	0.00256	626
Toluene	0.00106–0.00136	0.000408–0.00458	5210
Trichloroethene	0.00106–0.00136	0.000484	2.09
Xylenes	0.00212–0.00273	0.000806	104
Naphthalene	0.0352–0.201	0.0181	0.826

Table G-4.3-3
Summary of Detected Volatile Organic Compounds, Range of Report Detection Limits and Concentrations, and Indoor Air VISLs at SWMU 33-011(d)

Compound	Range of Report Detection Limits (mg/kg)	Range of Estimated or Detected Concentrations (mg/kg)	Indoor Air VISL (µg/m^3)
Acetone	0.00526–0.00588	0.00201–0.0144	32,300
Benzo(a)anthracene	0.00357–0.377	0.0315–5.31*	0.0922
Naphthalene	0.00357–0.377	0.00217–11*	0.826

* The maximum concentrations for these COPCs represent one sample collected from 2.0 to 2.4 ft bgs approximately 70 ft from building 33-20. All other samples contained concentrations near or below the detection limits.

Table G-4.4-1
Lead Screening Assessment

SWMU	Scenario	COPC	EPC (mg/kg)	Soil Screening Value* (mg/kg)	Ratio
33-011(d)	Industrial	Lead	232.2	800	2.90E-01
33-011(d)	Construction Worker	Lead	128.3	800	1.60E-01
33-011(d)	Residential	Lead	128.3	400	3.21E-01

* Lead screening values from NMED (2019, 700550).

Table G-4.4-2
Essential Nutrient Screening Assessment

SWMU	Scenario	COPC	Maximum Concentration (mg/kg)	SSL* (mg/kg)	Ratio
33-007(c)	Industrial	Calcium	12,600	32,400,000	3.89E-04
33-007(c)	Construction Worker	Calcium	81,800	8,850,000	9.24E-03
33-007(c)	Residential	Calcium	81,800	13,000,000	6.29E-03
33-007(c)	Industrial	Magnesium	7820	5,680,000	1.38E-03
33-007(c)	Construction Worker	Magnesium	22,700	1,550,000	1.46E-02
33-007(c)	Residential	Magnesium	22,700	15,600,000	1.46E-03
33-007(c)	Construction Worker	Sodium	4750	10,200,000	4.66E-04
33-007(c)	Residential	Sodium	4750	7,820,000	6.07E-04
33-010(c)	Construction Worker	Calcium	4450	8,850,000	5.03E-04
33-010(c)	Residential	Calcium	4450	13,000,000	3.42E-04
33-011(d)	Industrial	Calcium	19,200	32,400,000	5.93E-04
33-011(d)	Construction Worker	Calcium	24,700	8,850,000	2.79E-03
33-011(d)	Residential	Calcium	24,700	13,000,000	1.90E-03

* SSLs from NMED (2019, 700550).

Table G-5.3-1
Ecological Screening Levels for Terrestrial Receptors

COPEC	Gray 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)	Mountain Cottontail (mammalian herbivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil-dwelling invertebrate)	Generic Plant (terrestrial autotroph-producer)
Inorganic Chemicals (mg/kg)											
Antimony	46[a]	na[b]	na	na	na	na	2.7	7.9	2.3	78	11
Barium	41,000	24,000	7500	720	770	820	2900	2100	1800	330	110
Cadmium	550	430	1.3	4.3	0.54	0.29	10	0.27	0.5	140	32
Chromium	1800	860	170	51	32	23	410	63	110	na	na
Cobalt	5400	2300	620	130	97	76	1000	240	400	na	13
Copper	4000	1100	80	34	20	14	260	42	63	80	70
Lead	3700	540	83	18	14	11	310	93	120	1700	120
Mercury	76	0.32	0.058	0.067	0.022	0.013	23	1.7	3	0.05	34
Nickel	1200	2000	110	120	35	20	270	10	20	280	38
Perchlorate	3.3	2	3.9	0.12	0.24	31	0.26	31	0.21	3.5	40
Selenium	92	74	3.7	0.98	0.83	0.71	2.2	0.7	0.82	4.1	0.52
Silver	4400	600	13	10	4.1	2.6	150	14	24	na	560
Thallium	5	100	48	6.9	5.5	4.5	1.2	0.42	0.72	na	0.05
Zinc	9600	2600	220	330	83	47	1800	99	170	120	160

Table G-5.3-1 (continued)

COPEC	Gray 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)	Mountain Cottontail (mammalian herbivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil-dwelling invertebrate)	Generic Plant (terrestrial autotroph-producer)
Organic Chemicals (mg/kg)											
Acenaphthene	29,000	na	na	na	na	na	530	130	160	na	0.25
Acetone	7800	66,000	840	7.5	14	170	1.6	15	1.2	na	na
Anthracene	38,000	na	na	na	na	na	1200	210	300	na	6.8
Aroclor-1254	7.2	7.6	0.19	1.1	0.079	0.041	44	0.45	0.87	na	na
Aroclor-1260	15	400	4.2	37	1.7	0.88	1800	10	20	na	na
Benzene	18,000	na	na	na	na	na	38	49	24	na	na
Benzo(a)anthracene	110	28	6.4	0.73	0.8	0.88	6.1	4	3.4	na	18
Benzo(a)pyrene	3400	na	na	na	na	na	260	62	84	na	na
Benzo(b)fluoranthene	2400	na	na	na	na	na	130	44	51	na	18
Benzo(g,h,i)perylene	3600	na	na	na	na	na	470	25	46	na	na
Benzo(k)fluoranthene	4300	na	na	na	na	na	330	71	99	na	na
Bis(2-ethylhexyl)phthalate	500	9.3	0.096	16	0.04	0.02	1900	0.6	1.1	na	na
Carbazole	13,000	na	na	na	na	na	140	110	79	na	na
Chrysene	110	na	na	na	na	na	6.3	3.1	3.1	na	na
Di-n-butylphthalate	62,000	2	0.052	0.38	0.021	0.011	17,000	180	360	na	160
Dibenz(a,h)anthracene	850	na	na	na	na	na	84	14	22	na	na
Dibenzofuran	na	na	na	na	na	na	na	na	na	na	6.1
Diethylphthalate	2,500,000	na	na	na	na	na	8800	3600	3600	na	100

Table G-5.3-1 (continued)

COPEC	Gray 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)	Mountain Cottontail (mammalian herbivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil-dwelling invertebrate)	Generic Plant (terrestrial autotroph-producer)
Dinitrotoluene[2,4-]	2000	na	na	na	na	na	74	14	20	18	6
Fluoranthene	3900	na	na	na	na	na	270	22	38	10	na
Fluorene	50,000	na	na	na	na	na	1100	250	340	3.7	na
Hexanone[2-]	5900	290	1.7	0.47	0.41	0.36	17	5.4	6.1	na	na
Indeno(1,2,3-cd)pyrene	4600	na	na	na	na	na	510	71	110	na	na
Methylene chloride	4300	na	na	na	na	na	3.8	9.2	2.6	na	1600
Methylnaphthalene[2-]	4900	na	na	na	na	na	110	16	24	na	na
Naphthalene	5800	2100	78	3.4	5.7	15	14	28	9.6	na	1
Phenanthrene	1900	na	na	na	na	na	62	11	15	5.5	na
Pyrene	3100	3000	160	68	44	33	110	23	31	10	na
Toluene	12,000	na	na	na	na	na	66	23	25	na	200
Trichloroethene	42,000	na	na	na	na	na	190	42	54	na	na
Xylene[1,3-]+Xylene[1,4-]	750	13000	190	89	56	41	7.6	1.4	1.9	na	100
Radionuclides (pCi/g)											
Tritium	240,000	550,000	610,000	300,000	440,000	600,000	270,000	340,000	330,000	48,000	36,000
Uranium-234	110,000	260,000	260,000	14,000	27,000	69,000	36,000	140,000	120,000	2200	440
Uranium-235/236	5200	10,000	10,000	6300	7900	9500	4700	5200	5200	1600	440
Uranium-238	2100	4200	4200	3300	3700	4000	2000	2100	2100	1100	400

[a] ESLS are based on NOAELS and were obtained from the ECORISK Database, Version 4.2 (N3B 2020, 701067).

[b] na = Not available.

Table G-5.3-2
Minimum ESL Comparison for SWMU 33-007(c)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	1.202	2.3	Deer Mouse	**5.23E-01**
Cobalt	35.54	13	Generic Plant	**2.73E+00**
Copper	22.21	14	American Robin (insectivore)	**1.59E+00**
Mercury	0.0614	0.013	American Robin (insectivore)	**4.72E+00**
Nickel	41.13	10	Shrew	**4.11E+00**
Perchlorate	0.002	0.12	American Robin (herbivore)	1.67E-02
Selenium	1.147	0.52	Generic Plant	**2.21E+00**
Silver	18.5	2.6	American Robin (insectivore)	**7.12E+00**
Organic Chemicals (mg/kg)				
Acetone	0.00656	1.2	Deer Mouse	5.47E-03
Aroclor-1254	0.264	0.041	American Robin (insectivore)	**6.44E+00**
Aroclor-1260	0.0636	0.88	American Robin (insectivore)	7.23E-02
Benzene	0.000727	24	Deer Mouse	3.03E-05
Benzo(a)pyrene	0.014	62	Shrew	2.26E-04
Benzo(b)fluoranthene	0.0535	18	Generic Plant	2.97E-03
Benzo(g,h,i)perylene	0.108	25	Shrew	4.32E-03
Benzo(k)fluoranthene	0.0292	71	Shrew	4.11E-04
Bis(2-ethylhexyl)phthalate	0.0281	0.02	American Robin (insectivore)	**1.41E+00**
Chrysene	0.0358	3.1	Shrew	1.15E-02
Diethylphthalate	0.0262	100	Generic Plant	2.62E-04
Di-n-butylphthalate	0.119	0.011	American Robin (insectivore)	**1.08E+01**
Dinitrotoluene[2,4-]	1.88	6	Generic Plant	**3.13E-01**
Hexanone[2-]	0.157	0.36	American Robin (insectivore)	**4.36E-01**
Methylene chloride	0.00256	2.6	Deer Mouse	9.85E-04
Methylnaphthalene[2-]	0.0213	16	Shrew	1.33E-03
Naphthalene	0.0181	1	Generic Plant	1.81E-02
Toluene	0.000688	23	Shrew	2.99E-05
Trichloroethene	0.000484	42	Shrew	1.15E-05
Xylene[1,3-]+xylene[1,4-]	0.000806	1.4	Shrew	5.76E-04
Radionuclides (pCi/g)				
Uranium-234	3.04	440	Generic plant	6.91E-03
Uranium-235/236	0.173	440	Generic plant	3.93E-04
Uranium-238	3.07	400	Generic plant	7.68E-03

Note: Bolded values indicate HQs greater than 0.3.

Table G-5.3-3
HI Analysis Using NOAEL-Based ESLs for SWMU 33-007(c)

COPEC	EPC (mg/kg)	Gray 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)	Mountain Cottontail (mammalian herbivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil-dwelling invertebrate)	Generic Plant (terrestrial autotroph-producer)
Antimony	1.202	2.61E-02	na*	na	na	na	na	**4.45E-01**	1.52E-01	**5.23E-01**	1.54E-02	1.09E-01
Cobalt	35.54	6.58E-03	1.55E-02	5.73E-02	2.73E-01	**3.66E-01**	**4.68E-01**	3.55E-02	1.48E-01	8.89E-02	na	**2.73E+00**
Copper	22.21	5.55E-03	2.02E-02	2.78E-01	**6.53E-01**	**1.11E+00**	**1.59E+00**	8.54E-02	**5.29E-01**	**3.53E-01**	2.78E-01	**3.17E-01**
Mercury	0.0614	8.08E-04	1.92E-01	**1.06E+00**	**9.16E-01**	**2.79E+00**	**4.72E+00**	2.67E-03	3.61E-02	2.05E-02	**1.23E+00**	1.81E-03
Nickel	41.13	3.43E-02	2.06E-02	**3.74E-01**	**3.43E-01**	**1.18E+00**	**2.06E+00**	1.52E-01	**4.11E+00**	**2.06E+00**	1.47E-01	**1.08E+00**
Selenium	1.147	1.25E-02	1.55E-02	**3.10E-01**	**1.17E+00**	**1.38E+00**	**1.62E+00**	**5.21E-01**	**1.64E+00**	**1.40E+00**	2.80E-01	**2.21E+00**
Silver	18.5	4.20E-03	3.08E-02	**1.42E+00**	**1.85E+00**	**4.51E+00**	**7.12E+00**	1.23E-01	**1.32E+00**	**7.71E-01**	na	3.30E-02
Aroclor-1254	0.264	3.67E-02	3.47E-02	**1.39E+00**	2.40E-01	**3.34E+00**	**6.44E+00**	6.00E-03	**5.87E-01**	**3.03E-01**	na	1.65E-03
Bis(2-ethylhexyl)phthalate	0.0281	5.62E-05	3.02E-03	2.93E-01	1.76E-03	**7.03E-01**	**1.41E+00**	1.48E-05	4.68E-02	2.55E-02	na	na
Di-n-butylphthalate	0.119	1.92E-06	5.95E-02	**2.29E+00**	**3.13E-01**	**5.67E+00**	**1.08E+01**	7.00E-06	6.61E-04	3.31E-04	na	7.44E-04
Dinitrotoluene[2,4-]	1.88	9.40E-04	na	na	na	na	na	2.54E-02	1.34E-01	9.40E-02	1.04E-01	**3.13E-01**
Hexanone[2-]	0.157	2.66E-05	5.41E-04	9.24E-02	**3.34E-01**	**3.83E-01**	**4.36E-01**	9.24E-03	2.91E-02	2.57E-02	na	na
	HI	1E-01	4E-01	**8E+00**	**6E+00**	**2E+01**	**4E+01**	1E+00	**9E+00**	**6E+00**	**2E+00**	**7E+00**

Note: Bolded values indicate HQs greater than 0.3 or HIs greater than 1.

* na = Not available.

Table G-5.3-4
Minimum ESL Comparison for SWMU 33-010(c)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	2.24	2.3	Deer Mouse	**9.74E-01**
Barium	76.89	110	Generic Plant	**6.99E-01**
Chromium	8.222	23	American Robin (insectivore)	**3.57E-01**
Copper	472.8	14	American Robin (insectivore)	**3.38E+01**
Perchlorate	0.00097	0.12	American Robin (herbivore)	8.08E-03
Selenium	1.649	0.52	Generic Plant	**3.17E+00**
Silver	4.6	2.6	American Robin (insectivore)	**1.77E+00**
Zinc	85.61	47	American Robin (insectivore)	**1.82E+00**
Organic Chemicals (mg/kg)				
Acetone	0.00461	1.2	Deer Mouse	3.84E-03
Anthracene	0.0158	6.8	Generic Plant	2.32E-03
Aroclor-1254	0.00428	0.041	American Robin (insectivore)	1.04E-01
Aroclor-1260	0.0188	0.88	American Robin (insectivore)	2.14E-02
Benzo(a)anthracene	0.0391	0.73	American Robin (herbivore)	5.36E-02
Benzo(a)pyrene	0.0351	62	Shrew	5.66E-04
Benzo(b)fluoranthene	0.0462	18	Generic Plant	2.57E-03
Benzo(g,h,i)perylene	0.0222	25	Shrew	8.88E-04
Benzo(k)fluoranthene	0.0179	71	Shrew	2.52E-04
Bis(2-ethylhexyl)phthalate	0.123	0.02	American Robin (insectivore)	**6.15E+00**
Chrysene	0.0351	3.1	Shrew	1.13E-02
Di-n-butylphthalate	1.08	0.011	American Robin (insectivore)	**9.82E+01**
Fluoranthene	0.094	10	Earthworm	9.40E-03
Indeno(1,2,3-cd)pyrene	0.0216	71	Shrew	3.04E-04
Phenanthrene	0.0617	5.5	Earthworm	1.12E-02
Pyrene	0.0792	10	Earthworm	7.92E-03
Radionuclides (pCi/g)				
Tritium	6.62	36,000	Generic Plant	1.84E-04
Uranium-234	9.04	440	Generic Plant	2.06E-02
Uranium-235/236	0.446	440	Generic Plant	1.01E-03
Uranium-238	8.623	400	Generic Plant	2.16E-02

Note: Bolded values indicate HQs greater than 0.3.

Table G-5.3-5
HI Analysis Using NOAEL-Based ESLs for SWMU 33-010(c)

COPEC	EPC (mg/kg)	Gray 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)	Mountain Cottontail (mammalian herbivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil-dwelling invertebrate)	Generic Plant (terrestrial autotroph-producer)
Antimony	2.24	4.87E-02	na*	na	na	na	na	**8.30E-01**	2.84E-01	**9.74E-01**	2.87E-02	2.04E-01
Barium	76.89	1.88E-03	3.20E-03	1.03E-02	1.07E-01	9.99E-02	9.38E-02	2.65E-02	3.66E-02	4.27E-02	2.33E-01	**6.99E-01**
Chromium	8.222	4.57E-03	9.56E-03	4.84E-02	1.61E-01	2.57E-01	**3.57E-01**	2.01E-02	1.31E-01	7.47E-02	na	na
Copper	472.8	1.18E-01	**4.30E-01**	**5.91E+00**	**1.39E+01**	**2.36E+01**	**3.38E+01**	**1.82E+00**	**1.13E+01**	**7.50E+00**	**5.91E+00**	**6.75E+00**
Selenium	1.649	1.79E-02	2.23E-02	**4.46E-01**	**1.68E+00**	**1.99E+00**	**2.32E+00**	**7.50E-01**	**2.36E+00**	**2.01E+00**	**4.02E-01**	**3.17E+00**
Silver	4.6	1.05E-03	7.67E-03	**3.54E-01**	**4.60E-01**	**1.12E+00**	**1.77E+00**	3.07E-02	**3.29E-01**	1.92E-01	na	8.21E-03
Zinc	85.61	8.92E-03	3.29E-02	**3.89E-01**	2.59E-01	**1.03E+00**	**1.82E+00**	4.76E-02	**8.65E-01**	**5.04E-01**	**7.13E-01**	**5.35E-01**
Bis(2-ethylhexyl)phthalate	0.123	2.46E-04	1.32E-02	**1.28E+00**	7.69E-03	**3.08E+00**	**6.15E+00**	6.47E-05	2.05E-01	1.12E-01	na	na
Di-n-butylphthalate	1.08	1.74E-05	**5.40E-01**	**2.08E+01**	**2.84E+00**	**5.14E+01**	**9.82E+01**	6.35E-05	6.00E-03	3.00E-03	na	6.75E-03
	HI	2E-01	1E+00	**3E+01**	**2E+01**	**8E+01**	**1E+02**	**4E+00**	**2E+01**	**1E+01**	**7E+00**	**1E+01**

Note: Bolded values indicate HQs greater than 0.3 or HIs greater than 1.

* na = Not available.

Table G-5.3-6
Minimum ESL Comparison for SWMU 33-011(d)

COPC	EPC	ESL	Receptor	HQ
Inorganic Chemicals (mg/kg)				
Antimony	11	2.3	Deer Mouse	**4.78E+00**
Chromium	19.03	23	American Robin (insectivore)	**8.27E-01**
Lead	128.3	11	American Robin (insectivore)	**1.17E+01**
Mercury	0.326	0.013	American Robin (insectivore)	**2.51E+01**
Selenium	1.092	0.52	Generic Plant	**2.10E+00**
Silver	0.165	2.6	American Robin (insectivore)	6.35E-02
Thallium	0.151	0.05	Generic Plant	**3.02E+00**
Organic Chemicals (mg/kg)				
Acenaphthene	4.23	0.25	Generic Plant	**1.69E+01**
Acetone	0.00507	1.2	Deer Mouse	4.23E-03
Anthracene	3.84	6.8	Generic Plant	**5.65E-01**
Benzo(a)anthracene	1.044	0.73	American Robin (herbivore)	**1.43E+00**
Benzo(a)pyrene	1.101	62	Shrew	1.78E-02
Benzo(b)fluoranthene	1.168	18	Generic Plant	6.49E-02
Benzo(g,h,i)perylene	0.563	25	Shrew	2.25E-02
Benzo(k)fluoranthene	0.466	71	Shrew	6.56E-03
Carbazole	1.81	79	Deer mouse	2.29E-02
Chrysene	1.06	3.1	Shrew	**3.42E-01**
Dibenz(a,h)anthracene	0.965	14	Shrew	6.89E-02
Dibenzofuran	3.26	6.1	Generic Plant	**5.34E-01**
Fluoranthene	1.874	10	Earthworm	1.87E-01
Fluorene	3.91	3.7	Earthworm	**1.06E+00**
Indeno(1,2,3-cd)pyrene	0.516	71	Shrew	7.27E-03
Methylnaphthalene[2-]	3.31	16	Shrew	2.07E-01
Naphthalene	2.381	1	Generic Plant	**2.38E+00**
Phenanthrene	3.025	5.5	Earthworm	**5.50E-01**
Pyrene	2.346	10	Earthworm	2.35E-01
Radionuclides (pCi/g)				
Uranium-235/236	0.0543	440	Generic Plant	1.23E-04

Note: Bolded values indicate HQs greater than 0.3.

Table G-5.3-7
HI Analysis Using NOAEL-Based ESLs for SWMU 33-011(d)

COPEC	EPC (mg/kg)	Gray 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)	Mountain Cottontail (mammalian herbivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil-dwelling invertebrate)	Generic Plant (terrestrial autotroph-producer)
Antimony	11	2.39E-01	na*	na	na	na	na	**4.07E+00**	**1.39E+00**	**4.78E+00**	1.41E-01	**1.00E+00**
Chromium	19.03	1.06E-02	2.21E-02	1.12E-01	**3.73E-01**	**5.95E-01**	**8.27E-01**	4.64E-02	**3.02E-01**	1.73E-01	na	na
Lead	128.3	3.47E-02	2.38E-01	**1.55E+00**	**7.13E+00**	**9.16E+00**	**1.17E+01**	**4.14E-01**	**1.38E+00**	**1.07E+00**	7.55E-02	**1.07E+00**
Mercury	0.326	4.29E-03	**1.02E+00**	**5.62E+00**	**4.87E+00**	**1.48E+01**	**2.51E+01**	1.42E-02	1.92E-01	1.09E-01	**6.52E+00**	9.59E-03
Selenium	1.092	1.19E-02	1.48E-02	2.95E-01	**1.11E+00**	**1.32E+00**	**1.54E+00**	**4.96E-01**	**1.56E+00**	**1.33E+00**	2.66E-01	**2.10E+00**
Thallium	0.151	3.02E-02	1.51E-03	3.15E-03	2.19E-02	2.75E-02	3.36E-02	1.26E-01	**3.60E-01**	2.10E-01	na	**3.02E+00**
Acenaphthene	4.23	1.46E-04	na	na	na	na	na	7.98E-03	3.25E-02	2.64E-02	na	**1.69E+01**
Anthracene	3.84	1.01E-04	na	na	na	na	na	3.20E-03	1.83E-02	1.28E-02	na	**5.65E-01**
Benzo(a)anthracene	1.044	9.49E-03	3.73E-02	1.63E-01	**1.43E+00**	**1.31E+00**	**1.19E+00**	1.71E-01	2.61E-01	**3.07E-01**	na	5.80E-02
Chrysene	1.06	9.64E-03	na	na	na	na	na	1.68E-01	**3.42E-01**	**3.42E-01**	na	na
Dibenzofuran	3.26	na	na	na	na	na	na	na	na	na	na	**5.34E-01**
Fluorene	3.91	7.82E-05	na	na	na	na	na	3.55E-03	1.56E-02	1.15E-02	**1.06E+00**	na
Naphthalene	2.381	4.11E-04	1.13E-03	3.05E-02	**7.00E-01**	**4.18E-01**	1.59E-01	1.70E-01	8.50E-02	2.48E-01	na	**2.38E+00**
Phenanthrene	3.025	1.59E-03	na	na	na	na	na	4.88E-02	2.75E-01	2.02E-01	**5.50E-01**	na
	HI	4E-01	1E+00	**8E+00**	**2E+01**	**3E+01**	**4E+01**	**6E+00**	**6E+00**	**9E+00**	**9E+00**	**3E+01**

Note: Bolded values indicate HQs greater than 0.3 or HIs greater than 1.

* na = Not available.

Table G-5.4-1
Mexican Spotted Owl AUFs
for Chaquehui Canyon Aggregate Area

Site	Site Area (ha)	AUF*
33-007(c)	0.197	0.000538
33-010(c)	0.207	0.000566
33-011(d)	0.0827	0.000226

* AUF is calculated as the area of the site divided by the owl HR of 366 ha.

Table G-5.4-2
PAUFs for Ecological Receptors for SWMU 33-007(c)

Receptor	HR (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	4.65E-05
American Robin	0.42	16.8	1.17E-02
Deer Mouse	0.077	3	6.57E-02
Mountain Cottontail	3.1	124	1.59E-03
Montane Shrew	0.39	15.6	1.26E-02
Gray Fox	1038	41,520	4.74E-06

[a] Values from EPA (1993, 059384)

[b] PAUF is calculated as the area of the site (0.197 ha) divided by the population area. The population area can be derived by $\pi(3.6\sqrt{HR})^2$ or approximately 40 HR.

Table G-5.4-3
PAUF-Adjusted HI Analysis Using NOAEL-Based ESLs for SWMU 33-007(c)

COPEC	EPC (mg/kg)	Gray 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)	Mountain Cottontail (mammalian herbivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil-dwelling invertebrate)	Generic Plant (terrestrial autotroph-producer)
Antimony	1.202	1.24E-07	na*	na	na	na	na	7.07E-04	1.92E-03	3.43E-02	1.54E-02	**1.09E-01**
Cobalt	35.54	3.12E-08	7.18E-07	2.66E-06	3.21E-03	4.30E-03	5.48E-03	5.65E-05	1.87E-03	5.83E-03	na	**2.73E+00**
Copper	22.21	2.63E-08	9.38E-07	1.29E-05	7.66E-03	1.30E-02	1.86E-02	1.36E-04	6.68E-03	2.32E-02	**2.78E-01**	**3.17E-01**
Mercury	0.0614	3.83E-09	8.91E-06	4.92E-05	1.07E-02	3.27E-02	5.54E-02	4.24E-06	4.56E-04	1.34E-03	**1.23E+00**	1.81E-03
Nickel	41.13	1.63E-07	9.55E-07	1.74E-05	4.02E-03	1.38E-02	2.41E-02	2.42E-04	5.19E-02	**1.35E-01**	**1.47E-01**	**1.08E+00**
Selenium	1.147	5.92E-08	7.20E-07	1.44E-05	1.37E-02	1.62E-02	1.89E-02	8.28E-04	2.07E-02	9.19E-02	**2.80E-01**	**2.21E+00**
Silver	18.5	1.99E-08	1.43E-06	6.61E-05	2.17E-02	5.29E-02	8.34E-02	1.96E-04	1.67E-02	5.06E-02	na	3.30E-02
Aroclor-1254	0.264	1.74E-07	1.61E-06	6.46E-05	2.81E-03	3.92E-02	7.55E-02	9.53E-06	7.41E-03	1.99E-02	na	1.65E-03
Bis(2-ethylhexyl)phthalate	0.0281	2.67E-10	1.40E-07	1.36E-05	2.06E-05	8.24E-03	1.65E-02	2.35E-08	5.91E-04	1.68E-03	na	na
Di-n-butylphthalate	0.119	9.11E-12	2.76E-06	1.06E-04	3.67E-03	6.64E-02	**1.27E-01**	1.11E-08	8.35E-06	2.17E-05	na	7.44E-04
Dinitrotoluene[2,4-]	1.88	4.46E-09	na	na	na	na	na	4.04E-05	1.70E-03	6.17E-03	**1.04E-01**	**3.13E-01**
Hexanone[2-]	0.157	1.26E-10	2.52E-08	4.29E-06	3.92E-03	4.49E-03	5.11E-03	1.47E-05	3.67E-04	1.69E-03	na	na
	HI	6E-07	2E-05	4E-04	7E-02	3E-01	4E-01	2E-03	1E-01	4E-01	**2E+00**	**7E+00**

Note: Bolded values indicate HQs greater than 0.1 or HIs greater than 1.

*na = Not available.

Table G-5.4-4
PAUFs for Ecological Receptors for SWMU 33-010(c)

Receptor	HR (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	4.88E-05
American Robin	0.42	16.8	1.23E-02
Deer Mouse	0.077	3	6.90E-02
Mountain Cottontail	3.1	124	1.67E-03
Montane Shrew	0.39	15.6	1.33E-02
Gray Fox	1038	41,520	4.99E-06

[a] Values from EPA (1993, 059384)

[b] PAUF is calculated as the area of the site (0.207 ha) divided by the population area. The population area can be derived by $\pi(3.6\sqrt{HR})^2$ or approximately 40 HR.

Table G-5.4-5
PAUF-Adjusted HI Analysis Using NOAEL-Based ESLs for SWMU 33-010(c)

COPEC	EPC (mg/kg)	Gray 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)	Mountain Cottontail (mammalian herbivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil-dwelling invertebrate)	Generic Plant (terrestrial autotroph-producer)
Antimony	2.24	2.43E-07	na*	na	na	na	na	1.38E-03	3.76E-03	6.72E-02	2.87E-02	**2.04E-01**
Barium	76.89	9.35E-09	1.56E-07	5.01E-07	1.32E-03	1.23E-03	1.16E-03	4.43E-05	4.86E-04	2.95E-03	**2.33E-01**	**6.99E-01**
Chromium	8.222	2.28E-08	4.67E-07	2.36E-06	1.99E-03	3.17E-03	4.40E-03	3.35E-05	1.73E-03	5.16E-03	na	na
Copper	472.8	5.89E-07	2.10E-05	2.89E-04	**1.71E-01**	**2.91E-01**	**4.16E-01**	3.04E-03	**1.49E-01**	**5.18E-01**	**5.91E+00**	**6.75E+00**
Selenium	1.649	8.94E-08	1.09E-06	2.18E-05	2.07E-02	2.45E-02	2.86E-02	1.25E-03	3.13E-02	**1.39E-01**	**4.02E-01**	**3.17E+00**
Silver	4.6	5.21E-09	3.74E-07	1.73E-05	5.67E-03	1.38E-02	2.18E-02	5.12E-05	4.36E-03	1.32E-02	na	8.21E-03
Zinc	85.61	4.45E-08	1.61E-06	1.90E-05	3.20E-03	1.27E-02	2.24E-02	7.94E-05	1.15E-02	3.47E-02	**7.13E-01**	**5.35E-01**
Bis(2-ethylhexyl)phthalate	0.123	1.23E-09	6.46E-07	6.26E-05	9.47E-05	3.79E-02	7.58E-02	1.08E-07	2.72E-03	7.72E-03	na	na
Di-n-butylphthalate	1.08	8.68E-11	2.64E-05	1.01E-03	3.50E-02	**6.34E-01**	**1.21E+00**	1.06E-07	7.96E-05	2.07E-04	na	6.75E-03
	HI	1E-06	5E-05	1E-03	2E-01	1E+00	**2E+00**	6E-03	2E-01	8E-01	**7E+00**	**1E+01**

Note: Bolded values indicate HQs greater than 0.1 or HIs greater than 1.

* na = Not available.

Table G-5.4-6
PAUFs for Ecological Receptors for SWMU 33-011(d)

Receptor	HR (ha)[a]	Population Area (ha)	PAUF[b]
American Kestrel	106	4240	1.95E-05
American Robin	0.42	16.8	4.92E-03
Deer Mouse	0.077	3	2.76E-02
Mountain Cottontail	3.1	124	6.67E-04
Montane Shrew	0.39	15.6	5.30E-03
Gray Fox	1038	41,520	1.99E-06

[a] Values from EPA (1993, 059384)

[b] PAUF is calculated as the area of the site (0.0827 ha) divided by the population area. The population area can be derived by $\pi(3.6\sqrt{HR})^2$ or approximately 40 HR.

Table G-5.4-7
PAUF-Adjusted HI Analysis Using NOAEL-Based ESLs for SWMU 33-011(d)

COPEC	EPC (mg/kg)	Gray 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)	Mountain Cottontail (mammalian herbivore)	Montane Shrew (mammalian insectivore)	Deer Mouse (mammalian omnivore)	Earthworm (soil-dwelling invertebrate)	Generic Plant (terrestrial autotroph-producer)
Antimony	11	4.76E-07	na*	na	na	na	na	2.72E-03	7.38E-03	**1.32E-01**	**1.41E-01**	**1.00E+00**
Chromium	19.03	2.11E-08	4.32E-07	2.18E-06	1.84E-03	2.93E-03	4.07E-03	3.10E-05	1.60E-03	4.77E-03	na	na
Lead	128.3	6.91E-08	4.63E-06	3.02E-05	3.51E-02	4.51E-02	5.74E-02	2.76E-04	7.31E-03	2.95E-02	7.55E-02	**1.07E+00**
Mercury	0.326	8.54E-09	1.99E-05	1.10E-04	2.40E-02	7.29E-02	**1.23E-01**	9.45E-06	1.02E-03	3.00E-03	**6.52E+00**	9.59E-03
Selenium	1.092	2.36E-08	2.88E-07	5.76E-06	5.49E-03	6.48E-03	7.57E-03	3.31E-04	8.27E-03	3.67E-02	**2.66E-01**	**2.10E+00**
Thallium	0.151	6.02E-08	2.95E-08	6.14E-08	1.08E-04	1.35E-04	1.65E-04	8.39E-05	1.91E-03	5.78E-03	na	**3.02E+00**
Acenaphthene	4.23	2.91E-10	na	na	na	na	na	5.32E-06	1.72E-04	7.29E-04	na	**1.69E+01**
Anthracene	3.84	2.01E-10	na	na	na	na	na	2.13E-06	9.69E-05	3.53E-04	na	**5.65E-01**
Benzo(a)anthracene	1.044	1.89E-08	7.27E-07	3.18E-06	7.04E-03	6.42E-03	5.84E-03	1.14E-04	1.38E-03	8.46E-03	na	5.80E-02
Chrysene	1.06	1.92E-08	na	na	na	na	na	1.12E-04	1.81E-03	9.43E-03	na	na
Dibenzofuran	3.26	na	na	na	na	na	na	na	na	na	na	**5.34E-01**
Fluorene	3.91	1.56E-10	na	na	na	na	na	2.37E-06	8.29E-05	3.17E-04	**1.06E+00**	na
Naphthalene	2.381	8.18E-10	2.21E-08	5.95E-07	3.45E-03	2.06E-03	7.81E-04	1.13E-04	4.51E-04	6.84E-03	na	**2.38E+00**
Phenanthrene	3.025	3.17E-09	na	na	na	na	na	3.25E-05	1.46E-03	5.56E-03	**5.50E-01**	na
	HI	7E-07	3E-05	2E-04	8E-02	1E-01	2E-01	4E-03	3E-02	2E-01	**9E+00**	**3E+01**

Note: Bolded values indicate HQs greater than 0.1 or HI greater than 1.

* na = Not available.

Table G-5.4-8
Summary of LOAEL-Based ESLs for Terrestrial Receptors

COPEC	Receptor	LOAEL-Based ESL* (mg/kg)
Antimony	Earthworm	780
	Generic Plant	58
Barium	Earthworm	3200
	Generic Plant	260
Cobalt	Generic Plant	130
Copper	American Robin (insectivore)	43
	Earthworm	530
	Generic Plant	490
Lead	Generic Plant	570
Mercury	Earthworm	0.5
Nickel	Earthworm	1300
	Generic Plant	270
Selenium	Earthworm	41
	Generic Plant	3
Thalium	Generic Plant	0.5
Zinc	Earthworm	930
	Generic Plant	810
Acenaphthene	Generic Plant	2
Anthracene	Generic Plant	9
Di-n-butylphthalate	American Robin (insectivore)	0.11
Dibenzofuran	Generic Plant	61
Dinitrotoluene[2,4-]	Earthworm	180
	Generic Plant	60
Fluorene	Earthworm	19
Naphthalene	Generic Plant	10
Phenanthrene	Earthworm	12

* LOAEL-based ESLs from ECORISK Database, Version 4.2 (N3B 2020, 701067).

Table G-5.4-9
HI Analysis Using LOAEL-Based ESLs for SWMU 33-007(c)

COPEC	EPC (mg/kg)	Earthworm	Generic Plant
Antimony	1.202	n/a[a]	2.07E-02
Cobalt	35.54	na[b]	**2.73E-01**
Copper	22.21	4.19E-02	4.53E-02
Mercury	0.0614	**1.23E-01**	n/a
Nickel	41.13	3.16E-02	**1.52E-01**
Selenium	1.147	2.80E-02	**3.82E-01**
Dinitrotoluene[2,4-]	1.88	1.04E-02	3.13E-02
	HI	2E-01	9E-01

Note: Bolded values indicate HQ greater than 0.1 or HIs greater than 1.

[a] n/a = Not applicable.

[b] na = Not available.

Table G-5.4-10
HI Analysis Using LOAEL-Based ESLs for SWMU 33-010(c)

COPEC	EPC (mg/kg)	American Robin (insectivore)	Earthworm	Generic Plant
Antimony	2.24	na[a]	n/a[b]	3.86E-02
Barium	76.89	n/a	2.40E-02	**2.96E-01**
Copper	472.8	**1.10E+01**	**8.92E-01**	**9.65E-01**
Selenium	1.649	n/a	4.02E-02	**5.50E-01**
Zinc	85.61	n/a	9.21E-02	**1.06E-01**
Di-n-butylphthalate	1.08	9.82E+00	na	n/a
	HI	**2E+01**	1E+00	**2E+00**

Note: Bolded values indicate HQ greater than 0.1 or HIs greater than 1.

[a] na = Not available.

[b] n/a = Not applicable.

Table G-5.4-11
PAUF-Adjusted HI Analysis Using LOAEL-Based ESLs for SWMU 33-010(c)

COPEC	EPC (mg/kg)	American Robin (insectivore)	Earthworm	Generic Plant
Antimony	2.24	na[a]	n/a[b]	3.86E-02
Barium	76.89	n/a	2.40E-02	**2.96E-01**
Copper	472.8	**1.35E-01**	**8.92E-01**	**9.65E-01**
Selenium	1.649	n/a	4.02E-02	**5.50E-01**
Zinc	85.61	n/a	9.21E-02	**1.06E-01**
Di-n-butylphthalate	1.08	**1.21E-01**	na	n/a
	HI	3E-01	1E+00	**2E+00**

Note: Bolded values indicate HQ greater than 0.1 or HI greater than 1.

[a] n/a = Not applicable.

[b] na = Not available.

Table G-5.4-12
HI Analysis Using LOAEL-Based ESLs for SWMU 33-011(d)

COPEC	EPC (mg/kg)	Earthworm	Generic Plant
Antimony	11	1.41E-02	**1.90E-01**
Lead	128.3	n/a[a]	**2.25E-01**
Mercury	0.326	**6.52E-01**	n/a
Selenium	1.092	2.66E-02	**3.64E-01**
Thallium	0.151	na[b]	**3.02E-01**
Acenaphthene	4.23	na	**2.12E+00**
Anthracene	3.84	na	**4.27E-01**
Dibenzofuran	3.26	na	5.34E-02
Fluorene	3.91	**2.06E-01**	na
Naphthalene	2.381	na	**2.38E-01**
Phenanthrene	3.025	**2.52E-01**	na
	HI	1E+00	**4E+00**

Note: Bolded values indicate HQ greater than 0.1 or HI greater than 1.

[a] n/a = Not applicable.

[b] na = Not available.

Attachment G-1

ProUCL Files
(on CD included with this document)

Attachment G-2

Calculated Construction Worker SSLs
(on CD included with this document)

Attachment G-3

Ecological Scoping Checklist

H3-1.0 PART A—SCOPING MEETING DOCUMENTATION

Site IDs	Area of Concern (AOC) C-33-001, Solid Waste Management Units (SWMUs) 33-001(a), 33-001(b), 33-001(c), 33-001(d), 33-001(e), 33-004(a), 33-004(i), 33-006(a), 33-007(c), 33-008(c), 33-010(c), 33-011(a), 33-011(d), 33-012(a), 33-017
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.	The Chaquehui Canyon Aggregate Area is entirely comprised by sites in Technical Area 33 (TA-33). TA-33 was initially developed in 1947 as a test site for implosion-type initiator experiments using conventional high explosives (HE), depleted uranium, and beryllium. The experiments were performed in underground chambers, on surface firing pads, and at firing sites equipped with large guns that fired projectiles into earthen berms. Initiator testing at TA-33 ceased in 1972. After 1972, TA-33 has been used for offices, laboratories, and storage in support of electronics design and fabrication and experiments formerly conducted at the Hot Dry Rock Program. An antenna for the National Radio Astronomy Observatory (NRAO) Very Long Baseline Array radiotelescope was sited at TA-33 in 1985 and is operational. The high-pressure tritium facility (former building 33-0086) was constructed at TA-33 in 1955 and operated until 1990. The tritium facility was decommissioned and demolished in the mid-1990s. Site descriptions are sorted by spatial subareas of the aggregate area: Main Site, South Site, and Area 6.There are no sites in this investigation report located in the NRAO area. **Main Site** SWMU 33-004(i) – Two inactive drainlines and outfalls associated with a former machine shop (building 33-39) located near the east side of Main Site. SWMU 33-008(c) – A former surface disposal area. The former disposal area consists of two areas where debris, consisting of glass bottles, metal turnings, and cables, was located. SWMU 33-011(a) – A former drum storage area that was used to store steel drums containing waste oil. SWMU 33-012(a) – A former drum storage area for a machine shop located on an asphalt pad (building 33-0039). The area was used to accumulate 55-gal drums of solvents and solvent-contaminated oil that may have been contaminated with polychlorinated biphenyls (PCBs) and metal. SWMU 33-017 – Potential soil contamination. Consists of areas potentially impacted by operational releases from TA-33 Main Site. Operations within Main Site included uranium processing and machining, cadmium and silver welding and soldering, lead melting and casting, cadmium and beryllium machining, and tritium processing and decontamination. AOC C-33-001 – A former electrical transformer (former structure 33-0124) on a concrete pad at the TA-33 Main Site. Leaked oil from the transformer may have contained PCBs.

Form of site releases (cont.)	**South Site** SWMU 33-001(a) – A deep disposal pit located inside MDA E at South Site. The pit may contain polonium-beryllium contaminated targets, uranium components, and explosive test shot debris. Excess debris and equipment were removed from the site and radiation signs posted. SWMU 33-001(b) – A disposal pit 2, is located along the southern edge of the fenced area of MDA E (Figure 4.3-1). Pit dimensions are approximately 15 ft × 45 ft × 7 ft deep. Explosive test shot debris and a spent explosives device were buried in pit 2. According to engineering drawing R-3644, pit 2 was open in November 1962 and was backfilled sometime during 1963 (Rogers 1977, 005708, p. E-1). SWMU 33-001(c) – A disposal pit 3, is located near the southeast corner of the fenced area of MDA E (Figure 4.3-1). Pit dimensions are approximately 5 ft in diameter and 7 ft deep. Pit 3 reportedly contains a can of beryllium dust immersed in kerosene (Rogers 1977, 005708, p. E-1) and may have contained other explosive test shot debris. Pit 3 was closed in September 1951 and backfilled. SWMU 33-001(d) – A deep disposal pit located inside MDA E at South Site. The pit may contain polonium-beryllium contaminated targets, uranium components, and explosive test shot debris. Excess debris and equipment were removed from the site and radiation signs posted. SWMU 33-001(e) – The site consists of an underground chamber, designated chamber 3 (structure 33-0029), and an associated underground elevator shaft (structure 33-0003) (Figure 4.3-1). A portable cable building (33-0030) was attached to the elevator shaft and housed electrical and ventilation equipment for both the chamber and the shaft. The chamber and shaft were constructed between 1949 and 1950. The chamber was constructed of 2-ft-thick concrete walls, and its dimensions were 11 ft ×14 ft. The chamber was situated 46 ft below ground surface (bgs). The elevator shaft was constructed of wood, iron, and concrete, and its dimensions were 6 ft × 8 ft × 60 ft tall. The bottom of the shaft was 48 ft bgs. Chamber 33-0029 collapsed during an experiment conducted in April 1950 and was left in place. According to engineering drawing R-152, the portable cable building and the aboveground portions of the elevator shaft were removed in 1954. The chamber was used to conduct tests involving explosives, beryllium, and tungsten (LANL 1992, 007671, p. 3-51). SWMU 33-006(a) – A shot pad at South Site where implosion studies were conducted. Implosion tests performed at the shot pad contained up to 5000 lb of HE. The pad is covered with up to a foot or more of sand and firing site debris. SWMU 33-010(c) – A former surface disposal area at South Site. Used to dispose of debris from the implosion tests conducted at SWMU 33-006(a), which includes copper and aluminum shrapnel. **Area 6** SWMU 33-007(c) – Consists of abandoned firing sites (including two catcher boxes) associated with the initiator tests conducted at Area 6. Materials used at the site contained beryllium, polonium-210, uranium, copper, lead, tungsten, and stainless steel. Lead-based paint was used to fix surface contamination. Potential areas of release were to surface and subsurface soil and tuff. There is potential for liquid releases via outfalls and releases of solids from experimental sites and transport with storm events.

Form of site releases (cont.)	**Surface soil –** X **Surface water/sediment –** NA **Subsurface –** X **Groundwater –** NA **Other, explain –** NA
List of Primary Impacted Media **(Indicate all that apply.)**	**Water** – NA **Bare ground/unvegetated** – X **Spruce/fir/aspen/mixed conifer** – NA **Ponderosa pine –** X **Piñon juniper/juniper savannah** – X **Grassland/shrubland** – X **Developed** – X **Burned –** NA
Vegetation Class Based on GIS Vegetation Coverage **(Indicate all that apply.)**	The Chaquehui Canyon Aggregate Area lies outside of the mapped threatened and endangered (T&E) species core or buffer habitats (LANL 2017, 701039).
Is T&E habitat present? **If applicable, list species known or suspected of using the site for breeding or foraging.**	The Chaquehui Canyon Aggregate Area includes sites only located in TA-33. The activities and types of contaminants overlap greatly across TA-33 and therefore the ecological exposure pathways are discussed for the entire collection of sites in the Chaquehui Canyon Aggregate Area.
Provide list of neighboring/ contiguous/upgradient sites, include a brief summary of COPCs and the form of releases for relevant sites, and reference a map as appropriate. **(Use this information to evaluate the need to aggregate sites for screening.)**	There is runoff from some sites located around the perimeter of the mesa top or extend from the mesa top into the canyons.
Surface Water Erosion Potential Information Surface water erosion potential is based on site observations	

H3-2.0 PART B—SITE VISIT DOCUMENTATION

Site ID	AOC C-33-001, SWMUs 33-001(a), 33-001(b), 33-001(c), 33-001(d), 33-001(e), 33-004(a), 33-004(i), 33-006(a), 33-007(c), 33-008(c), 33-010(c), 33-011(a), 33-011(d), 33-012(a), 33-017
Date of Site Visit	02/13/2020
Site Visit Conducted by	Aharon Fleury, Randall Ryti, Patricia Wald-Hopkins, Tracy McFarland, Tessa Hermes

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)** = None to High
Field Notes on the GIS Vegetation Class to Assist in Verifying the Arcview Information	Chaquehui Canyon Aggregate Area includes areas that are still active and some that are inactive or decommissioned. There is, in general, a medium relative vegetative cover across the sites. The aggregate area includes piñon-juniper woodland, shrubs, and grassland. Some large ponderosa pines were also noted during the site visit.
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.**	Terrestrial receptors, including mammals and birds, could use the sites for both foraging and nesting. The site visit occurred in winter following a small snow event. Therefore the ground was covered in a thin layer of melting snow. Some animal tracks were noted in the snow and birds were observed in the aggregate 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)	Runoff potential at many sites is high because they are situated on the mesa edge or near a drainage area, but there was no evidence for significant surface water erosion at these sites (e.g., lack of head cuts). Some of the drainage areas include storm water barriers and permanent weirs. However, other sites are flat with little to no potential for runoff.
Are there any off-site transport pathways (surface water, air, or groundwater) **(yes/no/uncertain)?** **Provide explanation.**	Yes. Surface water run-on to the sites and runoff leaving the sites generally enters Chaquehui Canyon. There may be some air dispersion when the area is dry, but it is a minor transport pathway. A pathway to groundwater is unlikely, because regional groundwater is greater than 500 ft bgs to the aquifer. Intermediate groundwater exists in some areas at a depth of more than 100 ft bgs. No alluvial groundwater is in the vicinity of the sites.

Ecological Effects Information:

Physical Disturbance **(Provide list of major types of disturbances, including erosion and construction activities; review historical aerial photos where appropriate.)**	Many of the sites in the Chaquehui Canyon Aggregate Area are on developed land and have been disturbed in the past. A few sites remain under asphalt or concrete pads. Some sites recently underwent removal of septic tanks, incinerators, and debris, or removal of vegetation.
Are there obvious ecological effects (yes/no/uncertain)? **Provide explanation and apparent cause (e.g., contamination, physical disturbance, other).**	Yes. Chamisa shrubs were removed from SWMU 33-008(c) to facilitate remediation activities and fill was used in SWMU 33-007(c) that underwent debris removal. These sites will be reseeded to mitigate these effects.

No Exposure/Transport Pathways:

If there are no complete exposure pathways to ecological receptors on-site and no transport pathways to off-site receptors, the remainder of the checklist should not be completed. Stop here, and provide additional explanation/justification for proposing an ecological No Further Action recommendation (if needed). At a minimum, the potential for future transport should include the likelihood that future construction activities could make contamination more available for exposure or transport.
Not applicable

Adequacy of Site Characterization:

Do existing or proposed data provide information on the nature and extent of contamination (yes/ no/uncertain)? **Provide explanation (consider whether the maximum value was captured by existing sample data).**	Yes. The sampling approach in the approved work plans (LANL 2010, 111298.9; NMED 2011, 201242; N3B 2021, 701355; NMED 2021, 701546) included biased sampling to determine the nature and extent of contamination within the canyon area.
Do existing or proposed data for the site address potential transport pathways of site contamination (yes/ no/uncertain)? **Provide explanation (consider whether other sites should be aggregated to characterize potential ecological risk).**	Yes. Existing and planned data from samples collected within the SWMUs and AOCs address potential transport pathways and characterize the potential ecological risk. The results indicate that the nature and extent of contamination at the sites has been defined, or will be defined through the data evaluation process being used for this aggregate area.

Additional Field Notes:

Provide additional field notes on the site setting and potential ecological receptors.

Site descriptions are sorted by spatial subareas of the aggregate area: Main Site, South Site, and Area 6

Main Site

SWMU 33-004(a) – Active septic drainline and leach field adjacent to the security-controlled area of TA-33. Site has abundant grass cover and shrubs (primarily chamisa).

SWMU 33-004(i) – Two outfalls from a building in the security-controlled area of TA-33. Lots of vegetation including a couple of very large trees were noted in this drainage.

SWMU 33-008(c) – Debris recently removed from this surface disposal site. Lots of vegetation. High mercury result in surface soil.

SWMU 33-011(a) – Samples located near a former drum storage area. Chamisa in gravel lot and piñon-juniper behind the tanks and in drainage area.

SWMU 33-011(d) – Former storage area within main security area of TA-33, primarily asphalt. No habitat.

SWMU 33-012(a) – Former drum storage area within main security area of TA-33, primarily asphalt. Some unpaved areas on slope off of main buildings with a little vegetation including grasses, shrubs, and small trees.

SWMU 33-017 – Potential soil contamination. Samples are spread over a large area surrounding the main buildings. Includes large oak tree and other shrubs in the drainage sample area.

AOC C-33-001 – Former electrical transformer within the security area of TA-33, which includes asphalt and disturbed soil. Only grasses present.

South Site
SWMU 33-001(a) – Deep disposal pit at MDA E at South Site. Site is within a small fenced area with partially destroyed concrete bunkers under the surface. Grass, shrubs, and piñon-juniper woodland growing inside and outside of the fenced area.
SWMU 33-001(b) – No field notes; at the time it was noted that no samples were collected in the 0–5 ft interval at this site.
SWMU 33-001(c) – No field notes; at the time it was noted that no samples were collected in the 0–5 ft interval at this site.
SWMU 33-001(d) – Deep disposal pit at MDA E at South Site. Site is within a small fenced area with partially destroyed concrete bunkers under the surface. Grass, shrubs, and piñon-juniper woodland growing inside and outside of the fenced area.
SWMU 33-001(e) – No field notes; at the time it was noted that no samples were collected in the 0–5 ft interval at this site.
SWMU 33-006(a) – Shot pad; no vegetation directly on bunker, but piñon-juniper woodland where samples were taken for surrounding debris.
SWMU 33-010(c) – Former surface disposal area that includes a rocky drainage with large weir installed for storm water control, very sparse shrubs and trees growing in drainage. Bird tracks observed in snow.
Area 6
SWMU 33-007(c) – Large abandoned firing site with catcher box and a couple of concrete pads with a large berm towards the slope. Areas around the firing site are disturbed. Some grass on berm, and small trees in a corner of the firing site and above it.

H3-3.0 PART C—ECOLOGICAL PATHWAYS CONCEPTUAL EXPOSURE MODEL

Provide answers to Questions A to V to develop the Ecological Pathways Conceptual Exposure Model

<u>Question A:</u>

Could soil contaminants reach receptors through vapors?

- **Volatility of the hazardous substance (volatile chemicals generally have Henry's law constant >10^{-5} atm-m^3/mol and molecular weight <200 g/mol).**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: Volatile organic compounds (VOCs) were detected. Most of the detected concentrations were below or similar to the estimated quantitation limits.

<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: Some chemicals of potential concern (COPCs) were detected in the surface interval.

<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 and/or AOC included in the site is equal to zero, this suggests that erosion at the site is not a transport pathway. (*Note that the runoff score is not the entire erosion potential score; rather, it is a subtotal of this score with a maximum value of 46 points.)**
- **If erosion is a transport pathway, evaluate the terminal point to see whether aquatic receptors could be affected by contamination from this site.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: No aquatic communities are present in the aggregate area or in close proximity.

<u>**Question D:**</u>

Is contaminated groundwater potentially available to biological receptors through seeps, springs, or shallow groundwater?

- **Known or suspected presence of contaminants in groundwater.**
- **The potential exists for contaminants to migrate through groundwater and discharge into habitats and/or surface waters.**
- **Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone.**
- **Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: The depth to regional groundwater is approximately 600 to 1200 ft. Intermediate-perched groundwater has been found at certain locations on the plateau at depths ranging from 100 to 400 ft. Drilling to a depth of 315 ft during the investigation of MDA K in Main Site did not encounter perched water. Groundwater discharges from four springs located in lower Chaquehui Canyon east of South Site above the Rio Grande. At South Site, the depth to groundwater is assumed to be 800 ft, based on elevation of Doe Spring.

Question E:

Is infiltration/percolation from contaminated subsurface material a viable transport and exposure pathway?

- **The potential exists for contaminants to migrate to groundwater.**
- **The potential exists for contaminants to migrate through groundwater and discharge into habitats and/or surface waters.**
- **Contaminants may be taken up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone.**
- **Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface.**

Answer (likely/unlikely/uncertain): Unlikely

Provide explanation: The depth to regional groundwater is approximately 600 to 1200 ft. Intermediate-perched groundwater has been found at certain locations on the plateau at depths ranging from 100 to 400 ft. Drilling to a depth of 315 ft during the investigation of MDA K in Main Site did not encounter perched water. Groundwater discharges from four springs located in lower Chaquehui Canyon east of South Site above the Rio Grande. At South Site, the depth to groundwater is assumed to be 800 ft, based on elevation of Doe Spring.

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: Most sites are not located near the main canyon edge, so mass wasting is not relevant. There is minimal evidence of erosion at the sites.

Question G:

Could airborne contaminants interact with receptors through the respiration of vapors?

- **Contaminants must be present as volatiles in the air.**
- **Consider the importance of the inhalation of vapors for burrowing animals.**
- **Foliar uptake of vapors is typically not a significant exposure pathway.**

Provide quantification of exposure pathway (0 = no pathway, 1 = unlikely pathway, 2 = minor pathway, 3 = major pathway):

Terrestrial Plants: 2

Terrestrial Animals: 2

Provide explanation: VOCs were detected but at low concentrations.

<u>Question H:</u>

Could airborne contaminants interact with plants through the deposition of particulates or with animals through the inhalation of fugitive dust?

- **Contaminants must be present as particulates in the air or as dust for this exposure pathway to be complete.**
- **Exposure through the inhalation of fugitive dust is particularly applicable to ground-dwelling species that would be exposed to dust disturbed by their foraging or burrowing activities or by wind movement.**

Provide quantification of exposure pathway (0 = no pathway, 1 = unlikely pathway, 2 = minor pathway, 3 = major pathway):

Terrestrial Plants: 3

Terrestrial Animals: 3

Provide explanation: Surface soil contamination is present.

<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 is present in particulates deposited on leaf and stem surfaces by rain striking contaminated soils (i.e., rain splash).**

Provide quantification of exposure pathway (0 = no pathway, 1 = unlikely pathway, 2 = minor pathway, 3 = major pathway):

Terrestrial Plants: 3

Provide explanation: Surface soil contamination is present.

<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: 3

Provide explanation: COPCs are present in the surface soil.

<u>Question K:</u>

Could contaminants interact with receptors through the incidental ingestion of surficial soils?

- **Incidental ingestion of contaminated soil could occur while animals grub for food resident in the soil, feed on plant matter covered with contaminated soil, or groom themselves clean of soil.**

Provide quantification of exposure pathway (0 = no pathway, 1 = unlikely pathway, 2 = minor pathway, 3 = major pathway):

Terrestrial Animals: 3

Provide explanation: COPCs are present in the surface soil.

<u>Question L:</u>

Could contaminants interact with receptors through dermal contact with surficial soils?

- **Significant exposure through dermal contact would generally be limited to organic contaminants that are lipophilic and can cross epidermal barriers.**

Provide quantification of exposure pathway (0 = no pathway, 1 = unlikely pathway, 2 = minor pathway, 3 = major pathway):

Terrestrial Animals: 2

Provide explanation: Low to moderate concentrations of lipophilic COPCs were detected in surface soil.

<u>Question M:</u>

Could contaminants interact with plants or animals through external irradiation?

- **External irradiation effects are most relevant for gamma-emitting radionuclides.**
- **Burial of contamination attenuates radiological exposure.**

Provide quantification of exposure pathway (0 = no pathway, 1 = unlikely pathway, 2 = minor pathway, 3 = major pathway):

Terrestrial Plants: 2

Terrestrial Animals: 2

Provide explanation: Some radionuclides were identified as COPCs.

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 water or sediment with aquatic pathways is present. Fluvial sediments were sampled but have terrestrial ecological receptors and pathways.

Question O:

Could contaminants interact with receptors through food-web transport from water and sediment?

- **The chemicals may bioconcentrate in food items.**
- **Animals may ingest contaminated food items.**

Provide quantification of exposure pathway (0 = no pathway, 1 = unlikely pathway, 2 = minor pathway, 3 = major pathway):

Terrestrial Animals: 0

Provide explanation: No water or sediment with aquatic pathways is present. Fluvial sediments were sampled but have terrestrial ecological receptors and pathways.

Question P:

Could contaminants interact with receptors through the ingestion of water and suspended sediments?

- **If sediments are present in an area that is only periodically inundated with water, terrestrial receptors may incidentally ingest sediments.**
- **Terrestrial receptors may ingest water-borne contaminants if contaminated surface waters are used as a drinking water source.**

Provide quantification of exposure pathway (0 = no pathway, 1 = unlikely pathway, 2 = minor pathway, 3 = major pathway):

Terrestrial Animals: 0

Provide explanation: No water or sediment with aquatic pathways is present. Fluvial sediments were sampled but have terrestrial ecological receptors and pathways.

<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 water or sediment with aquatic pathways is present. Fluvial sediments were sampled but have terrestrial ecological receptors and pathways.

<u>Question R:</u>

Could suspended or sediment-based contaminants interact with plants or animals through external irradiation?

- **External irradiation effects are most relevant for gamma-emitting radionuclides.**
- **Burial of contamination attenuates radiological exposure.**

Provide quantification of exposure pathway (0 = no pathway, 1 = unlikely pathway, 2 = minor pathway, 3 = major pathway):

Terrestrial Plants: 0

Terrestrial Animals: 0

Provide explanation: No water or sediment with aquatic pathways is present. Fluvial sediments were sampled but have terrestrial ecological receptors and pathways.

<u>**Question S:**</u>

Could contaminants bioconcentrate in free-floating aquatic plants, attached aquatic plants, or emergent vegetation?

- **Aquatic plants are in direct contact with water.**
- **Contaminants in sediment may partition into pore water, making them available to submerged roots.**

Provide quantification of exposure pathway (0 = no pathway, 1 = unlikely pathway, 2 = minor pathway, 3 = major pathway):

Aquatic Plants/Emergent Vegetation: 0

Provide explanation: There is no aquatic habitat at the sites.

<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: There is no aquatic habitat at the sites.

<u>**Question U:**</u>

Could contaminants bioaccumulate in sedimentary or water-column organisms?

- **Lipophilic organic contaminants and some metals may concentrate in an organism's tissues.**
- **Ingestion of contaminated food items may result in contaminant bioaccumulation through the food web.**

Provide quantification of exposure pathway (0 = no pathway, 1 = unlikely pathway, 2 = minor pathway, 3 = major pathway):

Aquatic Animals: 0

Provide explanation: There is no aquatic habitat at the sites.

Question V:

Could contaminants interact with aquatic plants or animals through external irradiation?

- **External irradiation effects are most relevant for gamma-emitting radionuclides.**
- **The water column acts to absorb radiation; therefore, external irradiation is typically more important for sediment-dwelling organisms.**

Provide quantification of exposure pathway (0 = no pathway, 1 = unlikely pathway, 2 = minor pathway, 3 = major pathway):

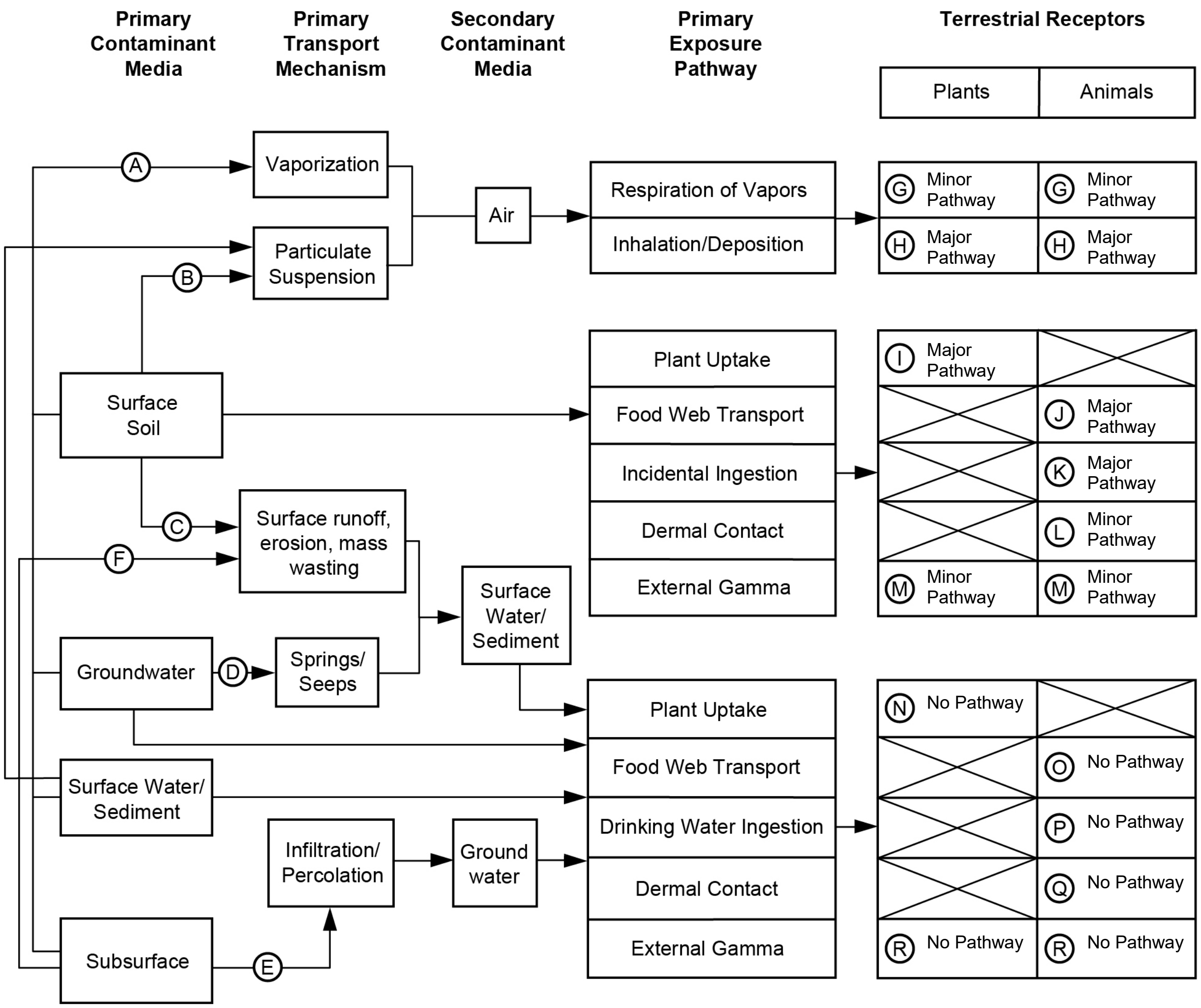
Aquatic Plants: 0

Aquatic Animals: 0

Provide explanation: There is no aquatic habitat at the sites.

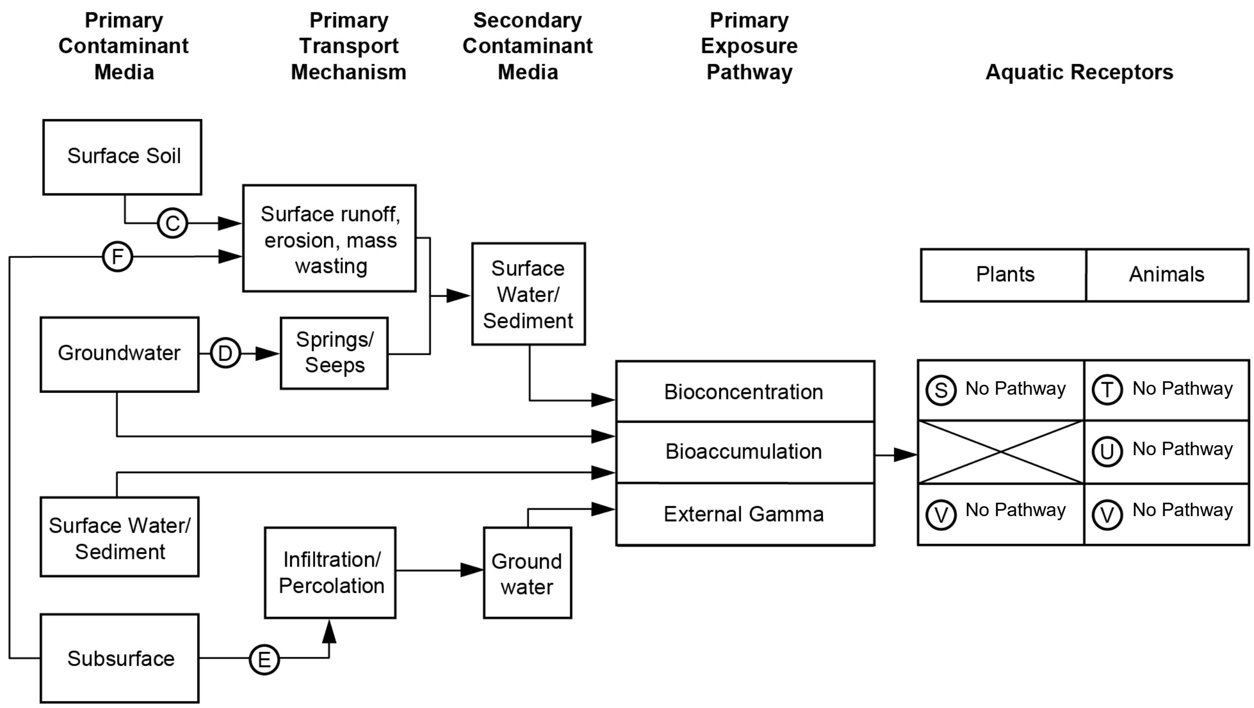
Ecological Scoping Checklist
Terrestrial Receptors
Ecological Pathways Conceptual Exposure Model

NOTE:
Letters in circles refer to questions on the scoping checklist.



NOTE:
Letters in circles refer to questions on the scoping checklist.

Ecological Scoping Checklist
Aquatic Receptors
Ecological Pathways Conceptual Exposure Model



SIGNATURES AND CERTIFICATION

Checklist completed by:

Name (printed): Aharon Fleury

Name (signature): Aharon Fleury Digitally signed by Aharon Fleury Date: 2021-08-10 17:05:12

Organization: Neptune and Company, Inc.

Date completed: August 10, 2021

Checklist reviewed by:

Name (printed): Patricia Wald-Hopkins

Name (signature): Patricia Wald-Hopkins Digitally signed by Patricia Wald-Hopkins Date: 2021.08.10 14:48:00 -06'00'

Organization: N3B

Date reviewed: August 10, 2021

H3-4.0 REFERENCES

The following list includes all documents cited in this appendix. Parenthetical information following each reference provides the author(s), publication date, and ER ID or ESH ID. This information is also included in text citations. ER IDs were assigned by the Environmental Programs Directorate's Records Processing Facility (IDs through 599999), and ESH IDs are assigned by the Environment, Safety, and Health (ESH) Directorate (IDs 600000 and above). IDs are used to locate documents in the Laboratory's Electronic Document Management System and, where applicable, in the master reference set.

Copies of the master reference set are maintained at the New Mexico Environment Department Hazardous Waste Bureau and the ESH Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

LANL (Los Alamos National Laboratory), May 1992. "RFI Work Plan for Operable Unit 1122," Los Alamos National Laboratory document LA-UR-92-925, Los Alamos, New Mexico. (LANL 1992, 007671)

LANL (Los Alamos National Laboratory), November 2010. "Investigation Work Plan for Chaquehui Canyon Aggregate Area, Revision 1," Los Alamos National Laboratory document LA-UR-10-7226, Los Alamos, New Mexico. (LANL 2010, 111298.9)

LANL (Los Alamos National Laboratory), October 2017. "Threatened and Endangered Species Habitat Management Plan for Los Alamos National Laboratory," Los Alamos National Laboratory document LA-UR-17-29454, Los Alamos, New Mexico. (LANL 2017, 701039)

N3B (Newport News Nuclear BWXT-Los Alamos, LLC), March 2021. "Phase II Investigation Work Plan for Chaquehui Canyon Aggregate Area," Newport News Nuclear BWXT-Los Alamos, LLC, document EM2021-0038, Los Alamos, New Mexico. (N3B 2021, 701355)

NMED (New Mexico Environment Department), March 3, 2011. "Approval with Modifications for the Investigation Work Plan for Chaquehui Canyon Aggregate Area, Revision 1," New Mexico Environment Department letter to G.J. Rael (DOE-LASO) and M.J. Graham (LANL) from J.E. Kieling (NMED-HWB), Santa Fe, New Mexico. (NMED 2011, 201242)

NMED (New Mexico Environment Department), July 26, 2021. "Approval, Phase II Investigation Work Plan for Chaquehui Canyon Aggregate Area," New Mexico Environment Department letter to A. Duran (EM-LA) from R. Maestas (NMED-HWB), Santa Fe, New Mexico. (NMED 2021, 701546)

Rogers, M.A., June 1977. "History and Environmental Setting of LASL Near-Surface Land Disposal Facilities for Radioactive Wastes (Areas A, B, C, D, E, F, G, and T)," Vol. II, Los Alamos Scientific Laboratory report LA-6848-MS, Los Alamos, New Mexico. (Rogers 1977, 005708)