

FINAL REPORT
JANUARY 2026

2024 Fall Semiannual Cell 1, 2, and 4 Groundwater Monitoring and Remediation System Operation and Maintenance Report

Fort Hall Mine Landfill
1500 North Fort Hall Mine Road
Pocatello, Idaho



Prepared for:

Bannock County
624 E Center Street
Pocatello, Idaho 83204

Prepared by:

CDM Smith
560 North Park Avenue, Suite 300
Helena, Montana 59601





Contents

Acronyms and Abbreviations	i
1.0 Introduction	1-1
1.1 Purpose of Report	1-1
1.2 Report Organization	1-2
1.3 Background.....	1-2
1.3.1 Site History and Description	1-3
1.3.2 Site Geology	1-7
1.3.3 Site Hydrogeology and Water Balance	1-9
1.3.4 Nature and Extent of Chemicals of Concern.....	1-11
1.3.5 Fate and Transport of Chlorinated Ethenes.....	1-12
1.3.6 Mobilization of Redox-Sensitive Metals	1-13
1.3.7 Geochemical Conditions in the Cell 1 Source Area and Offsite Plume.....	1-13
1.3.8 Remediation System	1-14
2.0 Field Activities	2-1
2.1 Groundwater Sampling	2-1
2.1.1 Private Property Access	2-1
2.1.2 Water Level Measurement	2-1
2.1.3 Groundwater Sampling Procedures.....	2-2
2.1.4 Sample Analysis.....	2-2
2.1.5 Decontamination and Investigation-Derived Waste	2-3
2.1.6 Deviations	2-3
2.2 Remediation System Maintenance Activities.....	2-3
2.2.1 Remediation Well Rehabilitation	2-3
2.2.2 Remediation System Operation and Maintenance	2-3
3.0 Groundwater Monitoring Results	3-1
3.1 Groundwater Data Usability Assessment.....	3-1
3.1.1 Precision.....	3-1
3.1.2 Accuracy.....	3-2
3.1.3 Comparability.....	3-2
3.1.4 Completeness.....	3-2
3.1.5 Sensitivity.....	3-2
3.1.6 Deviations	3-2
3.2 Groundwater Elevations.....	3-3
3.2.1 Horizontal Gradient Evaluation.....	3-3
3.2.2 Vertical Gradient Evaluation	3-3
3.3 Cell 1, Remediation System, and Offsite Sampling Results	3-3

3.3.1 VOCs.....	3-4
3.3.2 Inorganics.....	3-5
3.3.3 Field Purge and Redox Parameters.....	3-5
3.4 Performance of the Remediation System	3-5
3.4.1 Extraction Well Operations.....	3-6
3.4.2 Mass Removal	3-6
3.4.3 Remediation System Effluent	3-7
3.5 Cell 2 and 4 Sampling Results	3-7
3.5.1 Cell 2 Monitoring Wells.....	3-7
3.5.2 Cell 4 Monitoring Wells.....	3-8
4.0 Groundwater Data Analysis.....	4-1
4.1 Updated Plume Extent	4-1
4.2 Landfill Monitoring Requirements	4-2
4.2.1 Detection Monitoring	4-2
4.2.2 Assessment Monitoring	4-2
4.2.3 Corrective Action	4-3
4.3 Cell 1 Source Area.....	4-3
4.3.1 Statistical Approach	4-3
4.3.2 VOCs.....	4-4
4.3.3 Inorganics.....	4-6
4.3.4 Cell 1 Statistical Summary.....	4-7
4.4 Cell 2	4-7
4.4.1 Statistical Approach	4-8
4.4.2 Organic Parameters	4-9
4.4.3 Inorganic Parameters.....	4-9
4.4.4 Cell 2 Statistical Summary.....	4-11
4.5 Cell 4	4-11
4.5.1 Statistical Approach	4-11
4.5.2 VOCs.....	4-12
4.5.3 Inorganics.....	4-13
4.5.4 Cell 4 Statistical Summary.....	4-13
5.0 Conclusions and Recommendations	5-1
5.1 Cell 1 Source Area and Offsite Plume.....	5-1
5.1.1 Conclusions and Key Changes	5-1
5.1.2 Recommendations and Future Changes.....	5-1
5.2 Cells 2 and 4.....	5-2
5.2.1 Conclusions and Key Changes.....	5-2
5.2.2 Recommendations and Future Changes.....	5-2

5.3 Operation of Pump-and-Treat System 5-3

 5.3.1 Conclusions and Key Changes 5-3

 5.3.2 Recommendations and Future Changes 5-3

6.0 References..... 6-1

Figures

Figure 1.1 Site Location Map

Figure 1.2 Fort Hall Mine Landfill

Figure 1.3 Municipal Supply Wells and Groundwater Monitoring Wells of the Fort Hall Mine Landfill

Figure 1.4 Groundwater Monitoring Well Network of the Fort Hall Mine Landfill

Figure 1.5 Seasonal Precipitation: Onsite weather station (A) and NOAA weather station USW00024156 (B)

Figure 1.6 Chlorinated Ethene Degradation Pathways

Figure 2.1 Fall 2024 Onsite Groundwater Sample Locations

Figure 3.1 Onsite Potentiometric Contour Map

Figure 3.2 Fall 2024 Chlorinated Ethene Results for Cell 1 North and Offsite Wells

Figure 3.3 Fall 2024 Chlorinated Ethene Results for Cell 1 South

Figure 3.4 Remediation System Well Locations

Figure 3.5 Treatment System Monitoring Trends

Figure 3.6 Fall 2024 Chlorinated Ethene Results for Cell 2 and 4 Wells

Figure 4.1 Tetrachloroethene Plume Extent and Trend Analysis

Figure 4.2 Trichloroethene Plume Extent and Trend Analysis

Tables

Table 2.1 Summary of Sample Locations and Analysis Fall 2024

Table 2.2 Well Construction Summary

Table 3.1 Monitoring Well Water Levels, Screened Intervals, and Vertical Gradients

Table 3.2 Cell 1 Monitoring Well Field Parameter and VOC Results

Table 3.3 Remediation System Extraction Well Field Parameter and VOC Results

Table 3.4 Offsite Monitoring Well Field Parameter and VOC Results

Table 3.5 Cell 1 Monitoring Well Inorganic Results

Table 3.6 Remediation Well Status and Groundwater Production Summary

Table 3.7 Remediation System Injection Well Results

Table 3.8 Cell 2 Monitoring Well Field Parameter, Inorganic, SVOC, and VOC Results

Table 3.9 Cell 4 Monitoring Well Field Parameter, Inorganic, and VOC Results

Table 4.1 Cell 1 Statistical Summary – VOCs

Table 4.2 Offsite Statistical Summary – VOCs

Table 4.3 Remediation System Extraction Well Statistical Summary – PCE and TCE

Table 4.4 Recent PCE and TCE Trends Comparison

Table 4.5 Cell 1 Statistical Summary – Inorganics

Table 4.6 Cell 2 Statistical Summary – VOCs

Table 4.7 Cell 2 Statistical Summary – Other Organics

Table 4.8 Cell 2 Statistical Summary – Inorganics

Table 4.9 Cell 4 Statistical Summary – VOCs

Table 4.10 Cell 4 Statistical Summary – Inorganics

Table 5.1 Recommendations for Spring 2025 Sampling

Table 5.2 Recommendations for Fall 2025 Sampling

Appendices

Appendix A Sampling Plan

Appendix B Field Documentation

Appendix C Fall 2024 Groundwater Data

Appendix D Data Usability Assessment Report

Appendix E Laboratory Reports (Data Packages)

Appendix F Time Series Charts

Appendix G Statistical Methods, Approach, and Analysis



Acronyms and Abbreviations

%	percent
2,3,7,8-TCDD	2,3,7,8-tetrachloro-p-dibenzodioxin
amsl	above mean sea level
bgs	below ground surface
CAS	compliance agreement schedule
CFR	Code of Federal Regulations
cis-1,2-DCE	cis-1,2-dichloroethene
City	the City of Pocatello
cm/s	centimeter per second
CO	Consent Order
COC	chemical of concern
CSM	conceptual site model
DO	dissolved oxygen
DQO	data quality objective
EPA	U.S. Environmental Protection Agency
feet/day	feet per day
FHML	Fort Hall Mine Landfill
GCL	geocomposite clay liner
gpm	gallons per minute
HDPE	high-density polyethylene
IDAPA	Idaho Administrative Procedures Act
IDEQ	Idaho Department of Environmental Quality
IDGW	Idaho Groundwater Rule
IDWR	Idaho Department of Water Resources
INJ	injection well
J	estimated result
LCL	lower confidence limit
LCS/LCSD	laboratory control sample/laboratory control sample duplicate
LFG	landfill gas
LPRV	Lower Portneuf River Valley
MCL	maximum contaminant level
MDL	method detection limit
µg/L	microgram per liter

μS/cm	microSiemen per centimeter
mg/L	milligram per liter
MS/MSD	matrix spike/matrix spike duplicate
MSW	municipal solid waste
MW	monitoring well
O&M	operations and maintenance
ORP	oxidation-reduction potential
Paragon	Paragon Consulting, Inc.
PCA	principal component analysis
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PVA	Portneuf Valley Aquifer
QAPP	quality assurance project plan
QC	quality control
RCRA	Resource Conservation and Recovery Act
RL	reporting limit
RPD	relative percent difference
RW	remediation wells
S/D	shallow/deep (well)
SOP	standard operating procedure
SVOC	semivolatile organic compound
TCE	trichloroethene
UJ	estimated nondetect result
UCL	upper confidence limit
UPL	upper prediction limit
VC	vinyl chloride
VOC	volatile organic compound



1.0 Introduction

CDM Smith implemented groundwater sampling at select monitoring wells and remediation system extraction wells at the Fort Hall Mine Landfill (FHML) during the fall 2024 sampling event (September 3 through September 11, 2024) under Amendment No. 1 to Task Order No. 12 of the Bannock County Master Services Agreement contract executed July 24, 2018. CDM Smith presented the sampling results in this groundwater monitoring report to satisfy monitoring requirements associated with the following:

- Idaho Department of Environmental Quality (IDEQ) Consent Order (CO) pursuant to the Idaho Environmental Protection and Health Act, Idaho Code §39-101 et seq. and the Idaho Solid Waste Facilities Act, §39-7401 et seq., to address chemicals of concern (COCs) (e.g., trichloroethene [TCE] and tetrachloroethene [PCE]) known to originate in Cell 1, the historical landfill operated before land disposal regulations were promulgated.
- IDEQ Compliance Agreement Schedule (CAS) pursuant to the Idaho Environmental Protection and Health Act, Idaho Code §39-101 et seq. and the Idaho Solid Waste Facilities Act, §39-7401 et seq., to bring FHML into compliance with Idaho Code §39-7401 and the Subtitle D requirements in Title 40 Code of Federal Regulations (CFR) Part 258 et seq. for monitoring of municipal solid waste (MSW) landfills (Criteria for Municipal Solid Waste Landfills, 40 CFR, §258, Subpart E, Appendices I and II, Federal Register Volume 56, Issue 196 [October 9, 1991]).

The groundwater sampling was completed under the *Final Fort Hall Mine Landfill, Groundwater Monitoring Program Plan Quality Assurance Project Plan (QAPP)*, dated May 25, 2021 (CDM Smith 2021b). A summary of planned sampling is provided in **Appendix A**.

1.1 Purpose of Report

CDM Smith conducted the fall 2024 groundwater sampling event in accordance with the current CO and CAS between Bannock County and IDEQ. To comply with both the remedy performance monitoring for Cell 1 and the Resource Conservation and Recovery Act (RCRA) monitoring requirements for Cells 2 and 4, samples were collected from the Cell 1, 2, and 4 monitoring wells, and select offsite monitoring wells.

The purposes of this report are the following:

- Present analytical and field data that were collected during the fall 2024 groundwater sampling event.
- Update PCE and TCE groundwater plume extents and groundwater elevation potentiometric contour maps for the FHML Cell 1 source area and downgradient plume.
- Evaluate the current remediation system performance.
- Report operations and maintenance (O&M) activities for the remediation system.
- Update COC trend data and statistical analysis of COC trends.
- Provide the status of RCRA compliance monitoring at Cells 2 and 4 and the statistical analysis of detected parameters from Appendices I and II of 40 CFR §258, *Criteria for Municipal Solid Waste Landfills* (Federal Register 1991) against background levels and promulgated standards.

- Provide recommendations for operating the groundwater treatment system.

1.2 Report Organization

This report is organized into the following sections:

1.0 Introduction: This section describes the purpose and organization of the report and provides a summary of site background information and the conceptual site model (CSM), which includes the site location, sources of contamination, geologic and hydrogeologic framework, nature and extent of contamination, and a description of the remediation system.

2.0 Field Activities: This section presents a summary of the fall 2024 sampling activities and analysis, including private property notifications, groundwater sampling and analysis, decontamination and handling of investigation-derived waste, and deviations from the QAPP (CDM Smith 2021b). This section also summarizes the remediation system O&M, including well rehabilitation and equipment replacement.

3.0 Groundwater Monitoring Results: This section presents the results of the fall 2024 groundwater sampling activities and summarizes data quality and usability, potentiometric surface data, groundwater analytical results, and the performance of the remediation system.

4.0 Groundwater Data Analysis: This section presents the current nature and extent of the FHML TCE and PCE plumes and an updated evaluation of the COC trends and statistical analyses.

5.0 Conclusions and Recommendations: This section presents the conclusions of the data analysis and provides recommendations according to the decision criteria developed in the QAPP (CDM Smith 2021b) for treatment system maintenance activities at FHML.

6.0 References: This section presents references used to prepare this report.

The following appendices are also included:

Appendix A – Sampling Plan

Appendix B – Field Documentation

Appendix C – Fall 2024 Groundwater Data

Appendix D – Data Usability Assessment Report

Appendix E – Laboratory Reports (Data Packages)

Appendix F – Time Series Charts

Appendix G – Statistical Methods, Approach, and Analysis

1.3 Background

The following sections briefly describe the site history and CSM, which are described further in the QAPP (CDM Smith 2021b). These sections include brief descriptions of the site location and history, sources of

contamination, the geologic and hydrogeologic framework, previous investigations, and ongoing remediation system operations.

1.3.1 Site History and Description

FHML is located on North Fort Hall Mine Road in Bannock County, Idaho, approximately 7 miles southeast and hydrologically upgradient of Pocatello, Idaho (**Figure 1.1**). The landfill is alternately known as the Fort Hall Canyon Landfill or Bannock County Landfill (IDEQ 2016a), and it has received hazardous and nonhazardous waste since 1943.

1.3.1.1 Landfill Construction and Use

FHML currently consists of four cells, as shown in **Figure 1.2** (IDEQ 2016a). Cell 1 is closed and unlined and has historically received hazardous waste. Cells 2 and 4 are lined and currently receive waste under RCRA Subtitle D regulations. Cell 3 began operations around 1993 and receives construction and demolition waste (IDEQ 2016a).

Cell 1 received domestic and MSW, construction and demolition debris, and unknown commercial and industrial waste during active operation from 1943 to 1993 (Brown and Caldwell 1992; Maxim 2000a, 2000b). There is no leachate collection system for Cell 1, but a final cover was installed in 1993 (Maxim 2000b). In 2012, landfill gas (LFG) extraction wells and associated piping were installed (Paragon Consulting, Inc. [Paragon] 2015).

Cell 1 started operating in 1943 as an unpermitted valley-fill dump. No information is available regarding landfill base construction, but because of the nature of the dump, it is assumed that no base preparation was constructed. Based on LFG collection system record drawings for wells in the Old Landfill Well Field (Paragon 2015) and discussions in the geotechnical investigation for the LFG-to-energy project (American Geotechnics 2012), the thickness of waste in Cell 1 varies from minimal (less than 5 feet) at the fill area edges to greater than 85 feet. Based on observations from the LFG extraction well installations, the bottom of waste ranges from approximately 4,900 feet above mean sea level (amsl) in the southern and central portions of the cell to approximately 4,730 feet amsl in the northern and western portions. Cell 1 area encompasses approximately 60 acres (**Figure 1.2**).

Landfill operations in Cell 1 ceased in 1993. Based on closure plans provided in the *Final Revisions to Preliminary Engineering Report, Bannock County, Idaho* (Brown and Caldwell 1993), the landfill was proposed to be closed with a cover consisting of 12 inches of onsite loess material excavated from the Cell 2 area followed by an 18-inch barrier layer of compacted fill with a permeability of less than or equal to 10^{-5} centimeters per second (cm/s). The barrier layer was to consist of 12 inches of soil plus another 6 inches of topsoil. The cover was designed to prevent, via evapotranspiration, approximately 90 percent (%) of precipitation from infiltrating the cover during a normal precipitation and evaporation year (Brown and Caldwell 1993). No as-built information was available regarding the actual placement of the Cell 1 cover.

Cell 2 began operating in 1993 and currently receives compost and MSW as a Subtitle D cell, complete with a leachate collection system that gravity drains to a collection pond (IDEQ 2016b). Under RCRA, assessment-level monitoring is currently required at Cell 2. In 2012, LFG extraction wells were installed (Paragon 2015).

The Cell 2 area is approximately 24 acres (**Figure 1.2**). The first phase of Cell 2 (Phase 1A-P1) was constructed in 1993 and began receiving waste shortly thereafter. Cell 2 was constructed under the Subtitle D regulations. According to the *Preliminary Engineering Report* (Brown and Caldwell 1993), the landfill base was constructed with a 60-millimeter high-density polyethylene (HDPE) membrane liner above 2 feet of compacted soil with a permeability less than or equal to 10^{-7} cm/s. There is a 2-foot-thick sand/gravel drainage layer above the liner that directs leachate to the leachate collection system. A heavy nonwoven geotextile was placed between the liner and the drainage layer (Maxim 2000a). This liner design was used for the first two phases (1A-P1 and 1A-P2) of the Cell 2 landfill (Maxim 2003).

Reportedly, during construction of the 1A-P1 landfill, the liner was ripped during placement of the leachate drainage layer. The rip was repaired during construction of the 1A-P2 landfill by placing the 1A-P2 liner over the ripped area and welding to the 1A-P1 liner below the rip (Maxim 2000a).

An alternative liner demonstration was submitted in 2000 for Phase 3 (1A-P3) construction (Maxim 2000a). The alternative liner demonstration recommended the use of a 0.25-inch geocomposite clay liner (GCL) as a replacement for the 2 feet of compacted soil below the HDPE liner. The GCL is reported to have a hydrated hydraulic conductivity of approximately 5×10^{-9} cm/s (Maxim 2000a). IDEQ approved the alternative liner prior to construction of the Phase 3 expansion (1A-P3) (elevation from 5,110 to 5,150 feet amsl). The alternative liner is reported to be constructed with 1 foot of compacted silt or native soil, GCL, 60-millimeter textured HDPE, a nonwoven geotextile, and 1.5 to 2 feet of well-graded sand (Maxim 2003). The Phase 4 expansion (1A-P4) was constructed with the same alternative liner as Phase 3 (1A-P3).

Leachate in the Cell 2 landfill is collected via a gravity drain system. The leachate collection system gravity drains from the cell sump to the Cell 2 lined leachate collection pond. Based on hydrologic evaluation of landfill performance models completed by Brown and Caldwell during the Cell 2 design, leachate generation is anticipated to be minimal (between zero and 100,000 gallons per year) (Brown and Caldwell 1993). Leachate that discharges to the Cell 2 leachate pond is managed by evaporation. According to Bannock County personnel, during higher-than-normal precipitation, excess generated leachate is pumped from the leachate pond and reapplied to the Cell 2 landfill working areas for promotion of LFG generation and dust control. Current monthly leachate generation estimates are unknown.

As originally designed, Cell 2 was intended to operate through 2012; however, evaluation of the side slopes indicated that substantial permitted airspace was not being used. Recovery of the unused airspace extended the landfill life. Further slope stability and capacity analysis performed by Paragon indicated that the final landfill elevation buildout could be increased, thereby extending the landfill life (Paragon 2017). Currently, Cell 2 receives MSW but is nearing the end of its operational life.

Cell 4 opened in 2016 and receives MSW (IDEQ 2016a). It was constructed with an alternative base liner similar to the last two phases of the Cell 2 landfill. The liner construction consists of the following components (starting from the uppermost layer):

1. A 2-foot operations layer of native material provides liner protection.
2. A 1-foot drainage gravel layer provides lateral drainage to the cell sump.

3. A woven geotextile provides separation between the operations layer and the drainage gravel layer.
4. A 16-ounce nonwoven geotextile, placed directly under the gravel layer, provides puncture protection for the HDPE geomembrane.
5. A composite barrier layer consisting of a textured 60-millimeter HDPE geomembrane and a GCL provides leachate containment.
6. A prepared subgrade with a cushion material layer provides a smooth and uniform surface for the composite barrier layer.

A gravity drain system collects leachate. The leachate collection system gravity drains from the cell sump to the Cell 4 lined leachate collection pond, where leachate is managed by evaporation. Leachate generation quantities are not measured at FHML. Currently, the Cell 4 landfill expansion is under construction and will provide airspace through 2025. Final design and buildout reportedly will provide landfill airspace through 2048. All stormwater is diverted to channels that ultimately discharge to a containment basin for evaporation. Under RCRA, detection-level monitoring is currently required at Cell 4.

1.3.1.2 Historical Contamination and Regulatory Actions

In October 1991, volatile organic compound (VOC) contamination was identified in monitoring wells installed immediately downgradient of Cell 1 (Brown and Caldwell 1992). By 1993, high concentrations of TCE were detected in downgradient domestic wells within the Portneuf Valley Aquifer (PVA), and two municipal supply wells #14 and #33 (shown in **Figure 1.3**) were subsequently closed because of high TCE concentrations (Brown and Caldwell 1994).

In May 1993, Bannock County entered into a CO with the Idaho Department of Health and Welfare (now IDEQ) pursuant to the Idaho Environmental Protection and Health Act, Idaho Code §39-108, to assess and mitigate the impacts of TCE, PCE, and other VOCs originating from Cell 1 of FHML (IDEQ 2016a). In 2002, Bannock County installed a groundwater remediation system downgradient of Cell 1, at the mouth of Fort Hall Canyon. The purpose of the remediation system has been to capture and treat groundwater impacted by the unlined Cell 1 before the groundwater enters the PVA. The PVA is the sole source of drinking water for the Pocatello and Chubbuck, Idaho, communities, as well as the surrounding unincorporated Bannock County land.

In March 2015, IDEQ reviewed the remediation system and found it to be ineffective at removing environmental contamination. Concentrations of COCs were reported to be trending upward in wells located both upgradient and downgradient of the remediation system. The CSM for FHML was determined to not accurately represent the nature and extent of groundwater contamination associated with FHML (IDEQ 2016a). Therefore, in November 2016, IDEQ and Bannock County terminated the 1993 CO and entered into a new CO for the systemic development of a revised remediation plan for Cell 1 (IDEQ 2016a). Separately, in November 2016, IDEQ and Bannock County entered into a CAS to address groundwater contamination and groundwater monitoring in compliance with RCRA at landfill Cells 2 and 4 (IDEQ 2016b).

Since 2018, CDM Smith has been conducting a groundwater monitoring program in accordance with the CAS and CO and reporting data in semiannual monitoring reports. In addition, site characterization activities, including surface and borehole geophysics, and a Cell 1 cap evaluation were performed under the *Final Site Characterization Plan* (CDM Smith 2019) to fill data gaps and improve the CSM. Ultimately, the remedy will be optimized to achieve containment of the COC plume. An injection pilot study and tracer study were conducted in 2023 in accordance with the *Pilot Study Work Plan* (CDM Smith 2023c) to evaluate potential technologies for remedy optimization. The results will be discussed in an upcoming report.

1.3.1.3 Groundwater Monitoring Well Network

An extensive monitoring well network has been established throughout FHML and the PVA to evaluate the impacts of FHML on groundwater (**Figures 1.3** and **1.4**).

The data quality objectives (DQOs) of the groundwater monitoring well network are the following:

- Monitor the Cell 1 impacts to groundwater within the FHML and the offsite plume.
- Monitor and report in accordance with RCRA Subtitle D MSW requirements for Cells 2 and 4, according to Idaho Solid Waste Rules (Idaho Code §39-74) and 40 CFR §258.
- Monitor remediation system performance.

To satisfy these DQOs, the monitoring well network consists of multiple well groups, as follows:

- **Cell 1 Source and Offsite Plume Wells:**
 - **Cell 1 Monitoring Wells.** The Cell 1 monitoring well group currently consists of approximately 30 Bannock County groundwater monitoring wells sampled semiannually. These wells are downgradient of Cell 1 on FHML property (**Figure 1.4**) and are monitored to assess the extent of COCs immediately north-northeast of the Cell 1 boundary. Although Cell 1 is not regulated under the Subtitle D requirements in 40 CFR §258, a subset of monitoring wells is monitored for the parameters in Appendices I and II to evaluate whether the substantive requirements are being met and whether other COC impacts are observed downgradient from Cell 1. Additionally, the offsite monitoring well group comprises eight offsite monitoring wells located outside the FHML property boundary, three of which are monitored semiannually to assess the extent of offsite groundwater COC impacts.
 - **Domestic Wells.** There are at least 46 domestic groundwater wells in the PVA that have been monitored at various frequencies between 1992 and 2024 to assess the extent of the offsite groundwater plume and monitor COC concentrations within and surrounding impacted domestic water wells.
 - **Pocatello City Monitoring Wells.** The City of Pocatello (City) installed 16 groundwater monitoring wells to evaluate groundwater quality and track the COC plume migrating toward the municipal supply wells.
 - **Pocatello City Municipal Supply Wells.** The City has 21 municipal supply wells. The City uses some of these wells to monitor the extent of the plume and the presence of COCs in the City's drinking water supply. Municipal supply wells #33 and #14 are the closest to FHML

that have historically observed COC impacts. Neither well is currently operated for municipal supply.

- **Remediation System Wells.** Nine groundwater extraction wells and two injection wells (**Figure 1.4**) were installed as part of the remediation system for Cell 1. Remediation well RW-16 was drilled but never hooked up to the remediation system.
- **Cell 2 and 4 Monitoring Well Network.** The Cell 2 monitoring well group consists of five Bannock County groundwater monitoring wells, and the Cell 4 monitoring well group consists of five groundwater monitoring wells. Nine wells were installed to evaluate compliance with RCRA Subtitle D requirements. Monitoring well MW-4 was originally a part of the monitoring network for Cell 1; however, upon IDEQ request, it was transferred to the Cell 4 monitoring network. MW-4 (Cell 4) and MW-7 (Cell 2) were impacted by waste originating from Cell 1 (AEEC 2018b); therefore, they are not used to evaluate RCRA compliance for Cells 2 and 4. MW-7 is no longer sampled. The monitoring wells in Cells 2 and 4 are sampled semiannually for the parameters listed in Appendices I and/or II from 40 CFR §258.

1.3.2 Site Geology

Mapped by Rodgers et al. (2006), the FHML site is underlain by four geologic units. In order from youngest to oldest, these units are as follows:

- **Alluvial fan deposits (Qfp):** Alluvial fan deposits consist of poorly consolidated mud, silt, sand, and gravel deposited by the Fort Hall Canyon Creek as it exits Fort Hall Canyon. This unit is up to 100-feet thick. The alluvial fan deposits extend northward from the mouth of Fort Hall Canyon, thinning toward the Portneuf River. The alluvial fan deposits grade into the Lower Portneuf River Valley (LPRV) fill deposits that predate upper gravels from the Bonneville Flood event and form the benches along the southwestern edge of the LPRV (AEEC 2018a).
- **Alluvium (Qal):** Alluvium consists of unconsolidated mud, silt, sand, and gravel deposited in the Fort Hall Canyon Creek valley and is up to 80-feet thick. Alluvium is found in the bottom of the canyon adjacent to Fort Hall Creek. These deposits grade into the alluvial fan deposits (Qfp) at the north end of the canyon.
- **Loess (Ql):** Loess is unconsolidated silt. Loess mantles the canyon hillsides, can be up to 70-feet thick, and overlies the Starlight Formation Conglomerate unit (Tsuc) in places onsite. Lewis and Fosberg (1982) classified the loess in the Fort Hall Canyon area as the Fort Hall Geosol, consisting of more than 75% silt.
- **Starlight Formation Conglomerate unit (Tsuc):** This is a clast-supported, moderately indurated cobble conglomerate with clasts derived from pre-Tertiary rocks in the region. The matrix supporting the clasts is reddish orange to reddish brown and is typically sandy but locally tuffaceous. The Starlight Formation Conglomerate unit (Tsuc) contains two persistent but discontinuous air-fall tuff beds (Tsur3 and Tsur4) and other lenses of air-fall tuff (e.g., Tsur). The rhyolite air-fall tuff unit (Tsur), mapped by Rodgers et al. (2006), is laminated to thick-bedded, white to light-gray air-fall tuff, up to 18-feet thick in several outcrops in the canyon south of the landfill and dips 20 degrees east-northeast.

In September 2019, boring MW-1903 was advanced to a depth of 198 feet below ground surface (bgs) to characterize the Starlight Formation below the existing remediation system extraction wells, which are typically 100 feet deep or less. Boring MW-1903 is in the canyon bottom near existing well pairs MW-104 shallow/deep (S/D) screened intervals, MW-105S/D, and the remediation wells (**Figure 1.4**).

In September and October 2019, boring MW-1902, located near the existing well pair MW-111S/D, was advanced to 258 feet bgs to characterize the Starlight Formation on the western flank of the canyon at the northeast toe of Cell 1 (**Figure 1.4**). In September 2020, the boring for MW-123 was completed on the east bank of the Fort Hall Canyon Creek (inset on **Figure 1.4**), and MW-122 was completed on the west bank.

The Starlight Formation Conglomerate unit (Tsuc) observed in boreholes MW-1902, MW-1903, MW-122, and MW-123 consisted of loose-to-cohesive, moist-to-saturated, and sandy gravel and gravelly sand with silt and some clay with intercalated dry rhyolitic tuff. Saturated intervals of sandy gravel and gravelly sand were infrequent (13 were observed over 450 feet of drilling in the borings for MW-1092 and MW-1093) and thin (ranging from 1- to 5-feet thick, with most 1- or 2-feet thick). Rock was not observed in any of these four borings. **Section 2.3** includes additional information about the completion of the borings for wells MW-122 and MW-123.

As part of the initial site investigations at the mouth of the Fort Hall Canyon in 1992 and 1993, Brown and Caldwell (1992 and 1994) observed the Fort Hall Canyon fault in the seismic refraction geophysical surveys. In this survey, Brown and Caldwell (1992 and 1994) estimated the fault was located 100 to 200 feet bgs at the mouth of the canyon and was approximately 180-foot wide. Trimble (1976) mapped the Fort Hall Canyon fault as a thrust fault. Rodgers et al. (2006) determined that the fault was a normal fault, with the Fort Hall Canyon on the downthrown side, and mapped it trending north through the Fort Hall Canyon and then west-northwest as it exits the canyon. The fault is estimated to have a dip of 15 to 20 degrees southwest, and it has a surface exposure on the west-facing slope of the canyon.

Fort Hall Canyon intersects the LPRV. The following six lithologic groups have been defined in the southern portion of the LPRV by Welhan et al. (1996):

- Bedrock, of variable composition, dominated by pink to white quartzite and varicolored shale or argillite, predominantly of Proterozoic age (Caddy Canyon Formation)
- Middle to late Tertiary basin-filling sediments and volcanoclastics of the Starlight Formation
- Quaternary valley-fill and alluvial deposits composed of nonindurated silty gravels and cobbles with lenses of sand, silt, and intercalated clays
- Portneuf Basalt deposited along the eastern edge of the LPRV
- Coarse-grained clean gravel and cobbles in the center of the LPRV, known as the Upper Gravels (equivalent to the Michaud Gravels in the northern LPRV), deposited by the Bonneville Flood event that compromised the most productive portion of the underlying PVA
- Silt "mantle" of variable thickness (0 to 43 feet) that overlies the Upper Gravels, originating from overbank flood material from periodic Portneuf River flooding

1.3.3 Site Hydrogeology and Water Balance

1.3.3.1 Hydrogeology

The aquifer system beneath FHML consists of loess, alluvium (associated with Fort Hall Canyon Creek), the alluvial fan extending to the north of the canyon, and the underlying Starlight Formation. The aquifer system is primarily unconfined beneath FHML, but some areas have evidence of confined conditions, particularly on the west side of Fort Hall Canyon Creek near the landfill and on the east side of the creek near MW-123. The water table is situated within the Starlight Formation in some areas and in the alluvium or loess in other areas. Units in the aquifer system are hydraulically connected and chemicals likely migrate between them. Groundwater in the alluvium and the Starlight Formation discharges into the PVA near monitoring well pair MW-103S/D, MW-118D, and MW-116S, downgradient of the remediation system.

Groundwater flowing through the mouth of Fort Hall Canyon discharges to the PVA. The PVA comprises northern, eastern, and southern subaquifers and is the sole source of drinking water for the communities of Pocatello and Chubbuck. In the southern portion of the PVA, wells have high yields because they are completed in coarse, clean, upper gravels at depths less than 100 to 150 feet bgs. The transmissivity of the upper gravels was estimated at approximately 10 square feet per second, with aquifer storage estimated at 0.005 (unitless), based on constant discharge pumping tests of municipal wells (CH2M HILL 1994).

Observations of borings in MW-1902, MW-1903, MW-122, and MW-123 showing thin and infrequent saturated intervals in the Starlight Formation are separated by dry rhyolitic tuff and loose-to-cohesive, dry-to-moist, sandy gravel and gravelly sand with silt and some clay. Similar lithology was observed in other borings completed into the Starlight Formation, which indicates that the vertical downward movement of groundwater near the remedy wells is limited by the lithology of the Starlight Formation. Therefore, groundwater flow near the remediation wells is predominately in the higher transmissivity alluvium and shallow Starlight Formation. During the spring, when recharge to the Starlight Formation from upgradient sources increases, the dry-to-moist sandy gravel and gravelly sand with silt units may become saturated, thereby increasing flow. At the same time, flow in the overlying alluvium and shallow Starlight Formation will also increase.

Seventeen wells were slug tested in 2020 to estimate hydraulic conductivity within the alluvium and Starlight Formation. Of the 17 wells tested, 1 is screened completely within the alluvium, 6 are screened in the shallow Starlight Formation, 1 is screened in the deeper Starlight Formation, and 9 are screened across portions of the alluvium and shallow Starlight Formation. Wells screened across both the alluvium and Starlight Formation include MP-1, MP-2, MP-3, and MP-9 near the treatment system, three remediation extraction wells, and downgradient wells MW-118D and MW-120D.

Hydraulic conductivity estimates from slug tests conducted in these wells ranged from 0.3 to 20.5 feet per day (feet/day). The highest hydraulic conductivity was recorded at RW-15, which has historically been the most productive of the remedy wells. Hydraulic conductivity at nearby wells RW-17, MP-1, and RW-16 were estimated at 5.0, 9.7, and 6.2 feet/day, respectively. The hydraulic conductivity on the west and east sides of the site were estimated to be lower than in the central portion where RW-15 is located. The hydraulic conductivity at MP-2—the westernmost well screened within the alluvium that

was tested—was estimated to be 0.3 feet/day, which was consistent with historically low yields from the colocated RW-3. On the eastern side of the canyon, MP-3 was estimated to have a hydraulic conductivity of 0.6 feet/day. Of the seven wells screened exclusively within the Starlight Formation, low hydraulic conductivity of 0.004 to 0.3 feet/day, with an average of 0.18 feet/day, was observed at all six locations.

During a site walk in 2020, CDM Smith observed that groundwater springs to the south, and at higher elevations, discharges along a line across the entire hillside. The line of springs corresponds to the contact between the Quaternary loess (Ql) and Starlight Formation (Tsuc) on the Inkom geologic map (Rodgers et al. 2006). These observations suggest that the up-canyon springs are discharging along an aquitard, which was also observed from 58.3 to 68 feet bgs at MW-123. It is reasonable to assume that a tuff unit might serve as an aquitard because in the borings completed in 2019 and 2020, the tuff units are weakly cemented and dry. Moreover, tuffs are laterally extensive because they form from volcanic ash falls that cover large areas.

To assess if the upper aquitard observed in the MW-123 boring corresponds to the line of springs, a plane was inserted into the Leapfrog Works 3D model, and the orientation was adjusted to intersect the aquitard observed from 58.3 to 68 feet bgs at MW-123 and the contact between the Quaternary loess and Starlight Formation up-canyon from MW-123. This plane strikes north 80 degrees east (N80E) and dips 7 degrees north. The orientation of the rhyolite air-fall tuff, Unit 3 (Tsur3) at three locations and the rhyolite air-fall tuff (Tsur) at one location, are reported on the Inkom geologic map (Rodgers et al. 2006). The strike of the rhyolite air-fall tuff, Unit 3 is about N30E with dips ranging from 21 to 31 degrees east-southeast. The strike of the rhyolite air-fall tuff at one location is about N30W with a dip of 29 degrees east-northeast. Strike and dip data for the tuff along Fort Hall Canyon Creek and closer to the monitoring well network is necessary to determine whether the plane inserted in the model coincides with a mapped tuff unit.

1.3.3.2 Water Balance

Inflows to the aquifer system underlying the FHML area include direct recharge from precipitation, seepage from Fort Hall Canyon Creek, and seepage through portions of Cell 1. Outflows from the aquifer system underlying the FHML area include evapotranspiration and extraction via the pumping wells.

Recent average precipitation recorded at the landfill weather stations were approximately 12 inches per year. Total precipitation recorded at the weather station located onsite and the National Oceanic and Atmospheric Administration station at the Pocatello Regional Airport (Station USW00024156) are shown in **Figure 1.5**.

Maxim (2000b) observed that nearly all the surface water flows within Fort Hall Canyon Creek seeped into the underlying aquifer upgradient of the mouth of the Fort Hall Canyon upgradient of the remedy wells and Cell 1 waste area. As noted, observation of surface water discharge via Fort Hall Canyon Creek downgradient of the remediation system is rare; however, this discharge occurred as recently as 2024. Seepage in the Cell 1 area is currently being investigated; results will be presented in a forthcoming report.

Welhan (1996) estimated that evapotranspiration loss from the system was approximately 80% of precipitation in nearby watersheds, with evapotranspiration loss assumed to be inversely proportional to altitude. If 80% of rainfall evapotranspires (Welhan 1996) and surface runoff downstream of the pumping and treat system is minimal or rare, approximately 3 inches of recharge would be estimated to have occurred annually in the area upgradient of the pump-and-treat system.

A portion of the recharge is concentrated along the creek bed where surface water seepage is known to occur. Data collection continues to better understand this relationship and will be described in an upcoming report.

1.3.4 Nature and Extent of Chemicals of Concern

As discussed in **Section 1.3.1.3**, the nature and extent of groundwater contamination are monitored via an extensive well network, which includes multiple well groups (shown in **Figures 1.3** and **1.4**). The primary COCs at the FHML and associated groundwater plume are VOCs, specifically PCE and TCE. The following sections briefly summarize the nature and extent of these COCs and select inorganic parameters in each well network. More detailed summaries and the extent of various contaminants, including metals, semivolatile organic compounds (SVOCs), pesticides, herbicides, polychlorinated biphenyls (PCBs), and dioxins/furans throughout FHML and the surrounding area can be found in recent CDM Smith monitoring reports (e.g., CDM Smith 2023b).

1.3.4.1 Cell 1 Source and Offsite Plume

PCE and TCE are frequently detected throughout the Cell 1 source area and offsite plume. Recent sampling results are summarized briefly below and are generally representative of site conditions over the past 5 years:

- In Cell 1 monitoring wells, PCE and TCE are detected at higher concentrations than elsewhere within or downgradient of FHML, with TCE commonly detected above 100 micrograms per liter ($\mu\text{g}/\text{L}$) in some wells. In sampling events over the last 5 years, TCE and PCE have been detected in all sampled Cell 1 Monitoring Wells except for MW-111S and FW-1. PCE and TCE have exceeded the U.S. Environmental Protection Agency (EPA) maximum contaminant level (MCL) of 5 $\mu\text{g}/\text{L}$ in most monitoring wells (except for MW-1 [PCE], MW-102S [PCE/TCE], MW-110D [PCE], MW-111D [PCE], and MW-121[PCE/TCE]).
- In remediation system extraction wells, TCE and PCE have frequently exceeded the MCLs.
- In offsite monitoring wells, TCE frequently exceeds the MCL in MW-103S and MW-116S. PCE has exceeded the MCL in MW-103S and MW-116S.
- In domestic wells in the PVA, PCE and TCE are detected frequently and have exceeded the MCLs in the following wells: RW-2076F, RW-2140H, RW-2151H (TCE only), RW-2172H, RW-2203H, RW-2237H (TCE only), RW-7677P (TCE only), and RW-8030P (TCE only).
- In City municipal supply wells #14 and #33, PCE and TCE have been detected; however, there has been no MCL exceedance since May 2018 (TCE in municipal supply well #33).

Reductive daughter products of PCE and TCE, such as cis-1,2-dichloroethene (cis-1,2-DCE), trans-1,2-dichloroethene, and vinyl chloride (VC), were also frequently detected, with some detections exceeding the MCLs for drinking water in the Cell 1 monitoring area.

Inorganic parameters are frequently detected throughout Cell 1 and the offsite plume when analyzed. Inorganic parameters are not analyzed in these wells for every sampling event. Recent results are as follows:

- Arsenic and barium have frequently exceeded MCLs, with the highest concentrations occurring in MW-111S/D.
- Mercury has exceeded the MCL in recent sampling (2018, 2019, and 2021). However, mercury has not been detected in Cell 1 monitoring wells since 2021. Cyanide and sulfide have been detected below the MCL in several wells.
- Elevated levels of major and trace elements (iron, manganese, barium, arsenic, chromium, cobalt, and/or nickel) have also been observed throughout the Cell 1 monitoring network.
- In offsite monitoring wells and domestic wells, antimony, arsenic, barium, beryllium, chromium, cobalt, copper, lead, nickel, vanadium, and zinc have recently been detected, although no concentrations have exceeded the MCL.

1.3.4.2 Cell 2

From 2018 to 2022, PCE was detected at less than 0.5 µg/L in Cell 2 compliance monitoring well MW-13. TCE has also been sporadically detected in MW-13, also at or below 0.5 µg/L. Other VOCs, including cis-1,2-dichloroethene and VC, have also been detected at concentrations below their respective MCLs in MW-9, MW-12, and MW-13 since 2020. MCL exceedances for metals are rare and have not occurred in recent sampling.

1.3.4.3 Cell 4

From 2020 to fall 2024, several VOCs were detected in Cell 4 compliance monitoring wells. TCE was detected at low concentrations in MW-3A and MW-4A in 2020 and 2021, respectively. Several other VOCs were also detected in MW-3A in 2021. In new compliance monitoring well MW-5AR, carbon disulfide was detected in 2021 and 2022 and toluene was detected in 2021. VOCs are regularly detected at low concentrations in MW-4, which is not a compliance well. No metals have recently exceeded MCLs in the current Cell 4 network.

1.3.5 Fate and Transport of Chlorinated Ethenes

Natural biodegradation of chlorinated ethenes such as PCE and TCE is well established in peer-reviewed literature and is shown to occur most efficiently under anaerobic (without oxygen) conditions. PCE is considered recalcitrant (i.e., it does not degrade biologically) under aerobic conditions, and TCE degradation is very slow. This is part of the reason these chemicals persist in aerobic aquifers and tend to form relatively large plumes in transmissive aquifers.

Under anaerobic conditions, however, PCE and TCE can undergo biotic transformation via anaerobic reductive dechlorination, where bacteria use them as alternate electron acceptors in the absence of oxygen. During anaerobic dechlorination, sequential transformation most commonly occurs from PCE to

TCE to cis-1,2-DCE to VC to ethene (**Figure 1.6**). At each step in this process, the organic molecule loses a chloride anion. A less common pathway includes the generation of 1,1-Dichloroethene or trans-1,2-Dichloroethene in addition to cis-1,2-DCE. Ethene is commonly transformed to ethane after reductive dechlorination.

In addition to the anaerobic pathway, other degradation mechanisms for the lower chlorinated ethenes and ethanes, such as cis-1,2-DCE and VC, include anaerobic oxidation coupled with sulfate or iron reduction and aerobic oxidation (i.e., use as a food source for aerobic microorganisms), generating carbon dioxide and water. These alternate degradation mechanisms are important when there is significant sulfate or iron available anaerobically, in redox transition zones where anaerobic groundwater comes into contact with aerobic groundwater in the downgradient/distal plumes, or there is periodic infiltration of aerobic precipitation during rain events. Areas where these alternate degradation mechanisms occur can be either downgradient or cross-gradient from the anaerobic source zone or below the anaerobic source zone if there is a vertical gradient resulting in vertical mixing with aerobic groundwater.

In addition to the chlorinated ethenes, reductive daughter products ethene and ethane can be oxidized (i.e., used as food sources) by aerobic and/or anaerobic sulfate-reducing or iron-reducing microorganisms. Under conditions in which reductive daughter products are directly oxidized, a complete mass balance to cis-1,2-DCE, VC, ethene, and/or ethane is not observed.

1.3.6 Mobilization of Redox-Sensitive Metals

Redox processes (oxidation and reduction) control the chemical speciation and subsequent mobility of many major and trace elements, including arsenic, barium, chromium, copper, iron, manganese, mercury, molybdenum, selenium, sulfur, and vanadium. The mobility of other redox-sensitive elements (e.g., sulfate) can be indirectly affected by redox transformations of organic matter and minerals, particularly iron and manganese oxyhydroxides, clays, and sulfur minerals. The oxidized form of iron (Fe[III]) is insoluble in near-neutral pH environments, and trace elements strongly sorb to Fe(III) (i.e., ferrous iron) minerals. Under reducing conditions, Fe(III) can be reduced to Fe(II), thereby dissolving iron minerals and releasing trace elements. Barium, as the insoluble salt barium sulfate (BaSO_4), can be mobilized under reducing conditions as sulfate is reduced to sulfide. Furthermore, many redox-sensitive elements are more mobile in their reduced speciation state (e.g., arsenic As[III] is more mobile than As[V]).

In environments with sources of carbon (e.g., landfill leachate), redox conditions become reduced and anaerobic reductive dechlorination is observed, resulting in increased concentrations of redox-sensitive major and trace elements. Conversely, where redox conditions become more oxidized, the redox-sensitive major and trace element concentrations are reduced. For example, arsenic and ferrous iron are typically observed in anaerobic groundwater environments (e.g., anaerobic areas impacted by landfill leachate) and concentrations are quickly reduced once oxidized (i.e., aerobic) conditions are reestablished downgradient from the landfill leachate discharge area.

1.3.7 Geochemical Conditions in the Cell 1 Source Area and Offsite Plume

The following geochemical parameters have been collected from wells in the Cell 1 source area and offsite plume: dissolved gases (methane, ethane, ethene), sulfate, alkalinity, total organic carbon, field

parameters (dissolved oxygen [DO], pH, and oxidation-reduction potential [ORP]), and ferrous iron. These geochemical parameters and the concentrations of chlorinated ethenes (PCE, TCE, cis-1,2-DCE, and VC) were used in a principal component analysis (PCA). PCA enables the reduction of large data sets by revealing patterns in the data through identifying the principal components of the data. Only wells that have results for each of these geochemical parameters can be used in the PCA; therefore, only a subset of onsite and offsite wells were used in the analysis.

The PCA revealed groundwater sampled from monitoring wells at the site grouped in four distinct geochemical conditions:

- Methanogenic conditions were identified in the Cell 1 source area on the west side of the remediation system (MW-111S/D, MW-113S/D, and MW-105S).
- Iron- and sulfate-reducing conditions were identified in the Cell 1 source area near the remediation system (MW-119S, MW-120S/D, MW-110S, MW-104S/D, MW-118D, RW-3, RW-4, RW-9R, RW-15, and RW-17).
- Aerobic conditions were identified on the east side of the remediation system (MW-101S, MW-112M/D, MW-109S/D, RW-10, MW-119D) and in the PVA (MW-103 and RW-8030P).
- Aerobic conditions and low concentrations of chlorinated ethenes were identified in the PVA (RW-2203H, PA-1, PA-3, MW-38, RW7677P, and RW-2140H) and upgradient of the treatment system (MW-110D and MW-7).

1.3.8 Remediation System

The purpose of the remediation system is to extract groundwater contaminated by chemicals leaching from the old, unlined landfill area (Cell 1), remove VOCs, and then reinject the treated groundwater into the aquifer. The CO requires that the system remain in operation until otherwise directed by IDEQ. The system includes the following major components:

- A network of groundwater remediation wells currently consists of six pumping wells (RW-4, RW-5, RW-9R [replaced RW-9], RW-10, RW-15, and RW-17) and four non-pumping wells (RW-1, RW-2, RW-3, and RW-16). Each operating well is equipped with a submersible pump and a pressure transducer set above the pump. The pressure transducer monitors the water level in the well and allows the pump controller to tell the pump to speed up or slow down to maintain a water level setpoint. Maxim installed the first seven wells with the intent of intercepting as much of the contaminated groundwater as possible before it flowed through the mouth of the Fort Hall Mine Canyon and into the PVA. RW-15 and RW-17 were installed in 2012 to improve system performance. In 2018, RW-1 was taken offline, and in 2020, RW-2 and RW-3 were taken offline. The pumps in these wells were also removed. RW-16 was never connected to the treatment system.
- The monitoring well network includes wells within the groundwater remediation area located both upgradient and downgradient to the area. The network allows for evaluation of the system performance.

- Individual conveyance piping from the remediation wells directs water back to the remediation shed.
- A climate-controlled remediation shed contains all the ex situ treatment equipment.
- The influent manifold with pressure gauges, flowmeters, and sample ports allows for collecting process data and water samples from each of the remediation wells.
- A shallow tray air stripper volatilizes dissolved VOCs and discharges them to the atmosphere.
- A metering pump pulls antiscalant from a drum and injects it into the water to reduce inorganic buildup in the air stripper and injection wells.
- The shed houses the system's power distribution, control panels, variable frequency drives for each Remediation Well pump, and other associated equipment.
- Two injection wells and an overflow evaporation pond are downgradient of the remediation zone.

Periodic monitoring of the remediation wells and the air stripper influent is necessary to understand trends in VOC concentrations and the overall loading into the remediation system, respectively. Samples must be collected quarterly from the air stripper effluent to confirm that the air stripper is removing VOCs from the extracted groundwater prior to injection and that the effluent injection remains compliant with the injection permit.

The Injection Well Permit No. 29W-006-001 for INJ-1 and 29W-006-002 for INJ-1R, expiring March 15, 2025, specifies the following:

- Violating the water quality standards stated in Idaho Administrative Procedures Act (IDAPA) 37.03.03.070.05, degrading the quality of the groundwater, or impacting a beneficial use of the groundwater resource through the use of this injection well is prohibited and cause for cancellation of this permit.
- If the Idaho Department of Water Resources (IDWR) suspects existing or future points of diversion for beneficial use to be contaminated by injection activities at this well, IDWR will require injection activities at this well to cease immediately. The injection well owner is responsible for providing burden of proof that injection activities at this well are not contaminating existing or future points of diversion.

Currently, treated groundwater is only being injected via INJ-1R.

The IDAPA regulation specified in the permit, Class V Shallow Injection Well Requirements, includes the following general requirements:

- Compliance with all groundwater quality standards for injected water.
- No impact relative to the temperature, color, odor, turbidity, conductivity, pH, or other characteristics that may result in a reduction of suitability for beneficial uses of groundwater.
- Routine monitoring of the injection flow rate, volume, and injection pressure.

Given these general requirements, the air stripper effluent is sampled quarterly for site COCs and semiannually for other chemicals to compare against groundwater quality standards, as outlined in Worksheet #20 of the QAPP (CDM Smith 2021b).



2.0 Field Activities

This section describes field activities that were completed at the site in fall 2024, including groundwater sampling and remediation system O&M. Fall groundwater sampling was performed in September.

2.1 Groundwater Sampling

During the fall 2024 monitoring event, groundwater samples were collected from 50 locations from the Cell 1, Cell 2, Cell 4, and offsite monitoring well networks; the remediation extraction wells; and the air stripper effluent (INJ-1R). **Figure 2.1** presents the fall 2024 sample locations, and **Table 2.1** provides a summary of samples collected. **Table 2.2** presents a summary of well construction information. The fall 2024 sampling activities were consistent with the QAPP (CDM Smith 2021b) and sampling plan (**Appendix A**), except as described in **Section 2.1.6**.

Appendix B contains the field documentation for the fall 2024 groundwater monitoring events, including equipment calibration forms, groundwater purge forms, synoptic water level forms, and the field logbook. The following sections describe groundwater sampling in further detail.

2.1.1 Private Property Access

Consent to access and collect samples or water levels from groundwater wells on private property was obtained from property owners prior to the fall 2024 sampling event via signed consent forms or verbal agreement. Unrestricted access was granted previously to the following wells:

- MW-103S/D
- MW-106S/D
- MW-115S/D

Restricted access to MW-116S/D is granted by arranging an appointment with the property owner. During the fall 2024 event, CDM Smith was able to make an appointment to access and sample the wells. CDM Smith also sampled the domestic tap RW-2140H at this property, as access was not granted during sampling for the 2024 offsite sampling event conducted in June 2024 (CDM Smith 2024a).

2.1.2 Water Level Measurement

Synoptic water levels were collected following procedures outlined in Standard Operating Procedure (SOP) 1-6, "Groundwater Level Measurement" (CDM Smith 2021b). Manual water level measurements were recorded for the wells at the landmark indicated on the casing (or, in the absence of a mark, the northern edge) using electronic water level meters. Water levels from domestic wells are not collected because of well construction.

On September 3, 2024, water levels were measured while the treatment system was operational, as discussed in Section 3.2. To minimize private property access, the water level at MW-116S was measured during sampling rather than during the synoptic water level event as planned (**Appendix A**).

2.1.3 Groundwater Sampling Procedures

2.1.3.1 Monitoring Wells

All monitoring wells and offline remediation system wells RW-1, RW-2, and RW-3 were sampled according to the procedures outlined in SOP 1-12, “Low-Stress (Low-Flow) Groundwater Sampling” (CDM Smith 2021b) or according to the HydraSleeve passive sampling procedure (CDM Smith 2024c). For wells sampled via the low-flow sampling procedure, a pump was positioned within the screened interval and set to pump at flow rates of 50 to 500 milliliters per minute. Minimal drawdown and/or stabilized drawdown was used to ensure that the water to be sampled was representative of the formation surrounding the screened interval and not the stagnant water column. Purge volumes were calculated based on water column height, inner diameter of tubing and inner diameter of casing. Water quality parameters were monitored continuously using a water quality meter with a flow-through cell, and when stabilization was achieved, a groundwater sample was collected. Bladder pumps were used when numerous analyses were being performed and therefore a high (greater than 1 liter) volume of sample was needed.

The HydraSleeve passive sampling method was used at locations without a dedicated bladder pump and, when possible, given sufficient water, at locations that had previously been bailed because of minimal water column. This method was first introduced in fall 2023, where 11 monitoring wells were sampled using both HydraSleeves and low-flow passive sampling in a comparability study (CDM Smith 2024c). It was determined that HydraSleeve passive sampling was an acceptable substitute for low-flow sampling via bladder pumps.

2.1.3.2 Remediation System Wells and Effluent

The online remediation system wells were sampled according to the procedures outlined in SOP 1-9, “Tap Water Sampling” (CDM Smith 2021b). Because extraction wells cycle on and off at varying intervals and the influent and effluent production are continuous, a set purge volume prior to sampling is not necessary. All remediation system well grab samples were collected from taps within the treatment building.

2.1.4 Sample Analysis

Samples were analyzed according to the sampling plan in **Appendix A**, except as noted in Section 2.1.6. As shown in the table, all wells are analyzed for VOCs, Cells 2 and 4 are sampled for RCRA Subtitle D parameters, and select Cell 1 monitoring wells were sampled for supplemental parameters for the pilot and tracer studies performance monitoring.

Water quality parameters were collected at each location prior to collecting groundwater samples using a YSI Pro Digital Sampling System (ProDDS) or YSI ProPlus multiparameter meter. Turbidity was measured using a stand-alone HACH turbidity meter. Water quality parameters included the following:

- DO
- ORP
- pH
- Turbidity

- Temperature
- Specific conductance

All groundwater analytical samples were submitted to Eurofins TestAmerica (Denver, Colorado) for analysis.

Field quality control (QC) samples, including trip blanks, rinsate blanks, field duplicates, and extra volume for matrix spike/matrix spike duplicate (MS/MSD) samples, were collected per the QAPP. QC sample results were evaluated as part of the data validation effort and are discussed in the data usability assessment in **Section 3.1**.

2.1.5 Decontamination and Investigation-Derived Waste

All nondedicated sampling equipment (e.g., bladder pump equipment, water level meters) were decontaminated following the procedure outlined in SOP 4-5, “Field Equipment Decontamination at Nonradioactive Sites” (CDM Smith 2021b). A triple-wash system was used, following decontamination procedures for groundwater sampling equipment. The first wash used potable water and laboratory-grade detergent, the second wash used potable water, and the third wash used distilled water for rinsing. Before use, reuse, and at the end of the sampling event, all bladder pump equipment was disassembled, scrubbed, and decontaminated using this triple-wash system. Decontamination water and purge water from monitoring well sampling were contained and disposed of onsite at the Cell 2 leachate pond. Disposable personal protective equipment was disposed of onsite at the landfill.

2.1.6 Deviations

Except where noted below, sampling did not deviate from the sampling plan (**Appendix A**). **Section 3.1** provides information on any analytical data quality deviations.

One deviation occurred during the fall 2024 groundwater sampling event:

- A domestic tap sample was collected at RW-2140H while the property was accessed to sample well MW-116S. RW-2140H could not be sampled during the June 2024 offsite sampling event because the property owner did not grant access.

2.2 Remediation System Maintenance Activities

Remediation system maintenance activities were conducted during and prior to the current reporting period to support O&M of the remediation system. The following sections describe these field activities.

2.2.1 Remediation Well Rehabilitation

No record exists of rehabilitation of the remediation system wells prior to 2020. Based on an evaluation of remediation well performance and potential for fouling, a rehabilitation program was implemented in 2020 to optimize the performance of the extraction wells (CDM Smith 2020 and 2021a). Remediation well performance continues to be monitored to evaluate future well rehabilitation needs. No rehabilitation was performed during this reporting period (June 17, 2024, through November 23, 2024).

2.2.2 Remediation System Operation and Maintenance

The following activities describe and list the frequency of system O&M activities.

2.2.2.1 Operations

Daily inspection of mechanical and electrical equipment at the remediation shed was generally conducted daily by Bannock County staff. The following items were verified during the inspections:

- Water pipes inside the building were not leaking.
- The metering system was operational.
- Recovery well pumps were cycling as expected.
- The air stripper blower was operating.

Inspection of mechanical and electrical equipment at the remediation shed was generally conducted weekly by Bannock County staff. The following items were verified or recorded during the inspections:

- Operating pressure of the air stripper.
- Flow totals from each of the individual flowmeters and the system totalizer.
- Adequate antiscalant in the metering pump drum.

2.2.2.2 Maintenance

Each recovery well-level transducer was checked for proper pumping operations monthly. Each level transducer self-adjusts for variations in atmospheric pressure through the desiccant tube. The desiccant protects the transducer's electrical elements from moisture and if nearly exhausted must be replaced. Failure to do so will degrade the quality of the level data provided by the transducer and reduce the functionality of the associated recovery well pump. When CDM Smith staff visited the site, they inspected the desiccant within the tubes (it changes color when exhausted).

- An approved contractor performed the annual air stripper blower maintenance from October 17 to October 28, 2024. During this time, the remediation system was turned off.

2.2.2.3 System Upgrades and Repairs

The RW-17 flowmeter stopped working and was replaced twice during the current reporting period. RW-17 was shut off while the flowmeter was being replaced. Beginning in late 2023, several flowmeters at RW-17 have stopped working and required replacement, potentially because of an increase in suspended solids. To address this ongoing issue, a new ultrasonic flowmeter has been ordered to replace the current turbine-style flowmeter. An ultrasonic flowmeter uses electronic metering, which is less susceptible to measurement errors and potential failures caused by suspended solids compared to a turbine rotor. The new flowmeter is expected onsite in early 2025.



3.0 Groundwater Monitoring Results

This section presents the groundwater monitoring results from the fall 2024 sampling event. **Figure 3.1** presents the updated potentiometric surface map, and **Table 3.1** presents the corresponding water level measurement data. **Figures 3.2** through **3.6** and **Tables 3.2** through **3.9** present groundwater sampling results and updated remediation system monitoring data. **Appendix C** contains all historical groundwater analytical results, to which the results from the fall 2024 sampling event have been added.

3.1 Groundwater Data Usability Assessment

Data validation was performed in accordance with the analytical methods, *National Functional Guidelines for Inorganic Superfund Methods Data Review* (EPA 2020a), *National Functional Guidelines for Organic Superfund Methods Data Review* (EPA 2020b), and *National Functional Guidelines for High-Resolution Superfund Methods Data Review* (EPA 2020c), as applicable.

The review included holding times, sample preparation blanks (method, equipment, source, trip), duplicates (field), surrogate compound recovery, MS/MSDs, laboratory control sample/ laboratory control sample duplicates (LCS/LCSDs), interferences, reporting limits (RLs), and compound identification and quantification. The review for the 2,3,7,8-tetrachloro-p-dibenzodioxin (2,3,7,8-TCDD) included initial calibration and continuing calibration data.

CDM Smith validated laboratory analytical data using the EQUIS Data Quality Module for VOCs, SVOCs, organochlorine pesticides, PCBs, organophosphorus compounds, chlorinated herbicides, dioxin/furans (2,3,7,8-TCDD), total metals, total cyanide, and total sulfide. **Appendix D** provides the validation narrative, and **Appendix E** includes the final laboratory data packages for each laboratory sample delivery group. All data were received from the laboratory in final form, and validation was performed on the final data.

For the semiannual sampling event in September 2024 (groundwater and treatment system sampling), all data are suitable for their intended use with the following exceptions:

- The 8321B herbicide analysis for sample MW-12-20240904 was performed 1 day past the holding time owing to an instrument issue that was not resolved until the holding time had expired. No herbicides were detected in the preliminary report for the sample, but because validation guidance would result in rejecting the data, the analysis was not reported.

Some of the usable results should be used with caution, as noted by the “J/ UJ” (estimated/estimated nondetect) qualifiers applied during the data validation process, as discussed in **Appendix D**.

3.1.1 Precision

Precision was assessed by comparing the relative percent differences (RPDs) or absolute differences for laboratory duplicate samples, field duplicate samples, MS/MSD analyses, and LCS/LCSD analyses. Laboratory in-house limits were used for laboratory duplicate samples, LCS/LCSD, and MS/MSD duplicate analyses. An RPD field duplicate criterion of 30% was used for field duplicates. For field duplicates in which results were greater than five times the level of quantification, the RPD was

calculated and compared with the 30% precision criterion. Where results were less than five times the RL, the absolute difference was calculated and compared with a precision criterion of less than or equal to the RL. **Table D.3 (Appendix D)** presents comparisons of results for primary samples and associated field duplicates. All duplicate RPDs and absolute differences met their respective control limits, as noted in **Appendix D**.

3.1.2 Accuracy

Accuracy was assessed with percent recoveries in MS/MSD, LCS/LCSD, surrogate recoveries, and calibration data (2,3,7,8-TCDD only). Laboratory in-house control limits and EPA Method 8290A were used for evaluation of these parameters. All percent recoveries in LCS/LCSDs met the control limit criteria, with the exceptions noted in **Appendix D**; exceptions that required qualification of data (“J” or “UJ”) are noted in **Appendix D**. All percent recoveries in MS/MSDs and LCS/LCSDs met the control limit criteria, when applicable, with the exceptions noted in **Appendix D**; exceptions that required qualification of data (“J” or “UJ”) are noted in **Appendix D**. All surrogate recoveries met the control limit criteria, with the exceptions noted in **Appendix D**. All 2,3,7,8-TCDD calibration data met the control limit. Selected pesticide compounds and metals data were qualified as not detected at the RL because of blank contamination, as noted in **Appendix D**.

3.1.3 Comparability

Comparability from one sampling event to another is achieved by structuring the field sampling program and protocol for sample collection and analyses. CDM Smith follows technical SOPs to ensure consistent sampling techniques. In addition, EPA-approved analytical methods and RLs are defined and used to ensure comparability of data.

All data included in this report have been validated and are considered acceptable for use, except for the rejected data previously discussed. **Appendix D** provides the full validation narrative and results.

3.1.4 Completeness

An analytical completeness goal of 90% for each analytical group was used to determine completeness. Analytical completeness was evaluated for each analytical group through a comparison of the number of nonrejected data to the number of requested analyses. For the fall 2024 sampling event, all analyses for field samples that were submitted to the laboratory were successfully analyzed, except for the potentially rejected data previously discussed. The 8321B herbicide analysis was not reported for one sample. A total of 5,208 organic results of the anticipated 5,212 organic results were obtained. This yields a completeness value of 99.99% for the organic analyses, which meets the QAPP goal of 90%.

3.1.5 Sensitivity

The RLs achieved for all samples were adequate to meet the DQOs.

3.1.6 Deviations

- Eurofins TestAmerica Denver ended the inclusion of p-phenylenediamine and a, a-dimethyl phenethylamine as target analytes in the semivolatiles analyses in early 2023, which means these compounds are not included in the calibration or included in matrix and LCS spikes. They now analyze for them as targeted tentatively identified compounds. Because they have analyzed

these two compounds previously, they have information regarding what their retention time would be in their semivolatiles analyses. As a targeted tentatively identified compound, they could then compare spectra for compounds that met the retention time criteria of these two compounds, if present, to determine if these compounds were detected. These two compounds were reported as not detected in all the samples analyzed for SVOCs.

- The 8321 herbicide analysis for one sample (MW-12-20240904) was not reported because an instrument issue at the laboratory prevented the analysis from being conducted within the holding time, which would have resulted in rejected data.

3.2 Groundwater Elevations

During the fall 2024 sampling event, synoptic water levels were collected from monitoring wells following procedures outlined in SOP 1-6, “Groundwater Level Measurement” (CDM Smith 2021b). **Table 3.1** presents the water levels. Using data collected on October 9, 2023, **Figure 3.1** shows the potentiometric surface map, representing water levels while the treatment system was in operation.

3.2.1 Horizontal Gradient Evaluation

Groundwater flows in a northeastern direction through the valley of Fort Hall Mine Canyon, with a horizontal gradient of approximately 0.14 foot per foot between MW-4A (the furthest upgradient well with data) and MW-102S (the furthest downgradient well with data within the Fort Hall Mine Canyon), based on September 3, 2024, water level elevation data.

3.2.2 Vertical Gradient Evaluation

The fall 2024 synoptic water level survey completed on September 3, 2024, included several sets of nested monitoring wells while the remediation system was operational. **Table 3.1** includes calculated vertical gradients for this data set. A review of these calculated values shows the following:

- Downward vertical gradients were observed at most well pairs, ranging from 0.07 to 0.40 feet/foot, with the strongest downward vertical gradient observed at MW-109S/D. In each of these instances, the shallower well is screened exclusively within the alluvium and the deeper well is screened within the top of the Starlight Formation.
- Negligible upward vertical gradients were observed for MW-103S/D, MW-112M/D, and MW-113S/D at 0.02 feet/foot for all.

3.3 Cell 1, Remediation System, and Offsite Sampling Results

This section summarizes sampling results from the fall 2024 groundwater monitoring event from Cell 1 monitoring wells, remediation system extraction wells, and offsite monitoring wells. Cell 1 is currently in corrective action monitoring (**Section 4.2**). **Appendix C** contains all historical groundwater analytical results, to which results from the fall 2024 sampling event have been added. **Appendix F** presents time series plots for all chlorinated ethenes and corresponding field and redox parameter results for each well.

3.3.1 VOCs

Table 3.2 presents results for VOCs detected in at least one well in Cell 1 screened against the EPA MCLs and Idaho Groundwater Rule (IDGW) primary and secondary standards for drinking water. **Table 3.3** presents remediation system extraction well detections, and **Table 3.4** presents offsite monitoring well detections. **Figures 3.2** and **3.3** present results for PCE, TCE, cis-1,2-DCE, and VC.

3.3.1.1 Cell 1 Source and Dissolved Phase Plume

In the Cell 1 monitoring wells, the following chemicals exceeded their promulgated standard:

- PCE exceeds the MCL standard in most Cell 1 monitoring wells (detections ranging 0.58 J to 34 µg/L).
- TCE exceeds the MCL standard in most Cell 1 monitoring wells (detections ranging 2 to 180 µg/L).
- VC, a product of reductive dechlorination, exceeds the MCL in eleven wells (detections ranged from 0.62 J to 67 µg/L).
- Benzene exceeds the MCL standard in MW-111D (13 J µg/L), MW-111S (9.8 µg/L), and MW-113S (6.1 µg/L).
- 1,2-Dibromo-3-chloropropane exceeds the MCL standard in MW-113D (0.92 µg/L).

Additional reductive daughter products that were detected are shown in **Table 3.2**.

3.3.1.2 Remediation System Extraction Wells

In the remediation system extraction wells, the following exceedances were observed:

- PCE exceeds the MCL and IDGW standard in all remediation system extraction wells (detections ranging from 8.5 to 17 µg/L).
- TCE exceeds the MCL and IDGW standard in all remediation system extraction wells (detections ranging from 36 to 96 µg/L).
- VC exceeds the MCL in RW-9R (5.5 µg/L) and RW-15 (2.8 µg/L).

Additional reductive daughter products that were detected are shown in **Table 3.3**.

3.3.1.3 Offsite Monitoring Wells

MW-103S, MW-115S, and MW-116S were the only offsite monitoring wells sampled in fall 2024. The only VOC detections were the following:

- PCE was detected at MW-116S (1.9 µg/L).
- TCE exceeds the MCL standard at MW-116S (10 µg/L) and was detected in MW-115S (0.94 J µg/L).
- cis-1,2-DCE, a reductive daughter product, was detected in MW-116S (0.73 J µg/L).

3.3.2 Inorganics

In Cell 1, inorganics were only measured in MW-121 (**Table 3.5**). The arsenic concentration exceeded the MCL in the spring 2024 sample but did not exceed in the fall. There were no detections that exceeded MCLs or primary IDGW standards. Iron and manganese exceeded the IDGW secondary standards. A more comprehensive evaluation of inorganics in Cell 1 monitoring wells is performed annually during the spring sampling event (CDM Smith 2024b). Section 4 includes an analysis of background levels for inorganic chemicals.

3.3.3 Field Purge and Redox Parameters

Tables 3.2, 3.3, and 3.4 present field parameters (conductivity, pH, temperature, turbidity, DO, and ORP) for Cell 1, remediation system extraction, and offsite monitoring wells, respectively. As discussed in **Section 1.3.7**, these results are used to assess conditions in groundwater affected by the landfill leachate/waste and to evaluate conditions that facilitate COC degradation. This section provides an abbreviated summary of the fall 2024 geochemistry based on field purge parameter results. A comprehensive assessment of all geochemical results from fall 2024 sampling will be included in the forthcoming pilot study evaluation report.

Specific conductance was measured at all monitoring wells in Cell 1, remediation system extraction wells, and offsite monitoring wells (**Tables 3.2, 3.3, and 3.4**, respectively). Low specific conductance in Cell 1 wells ranged from 657 to 933 microSiemens per centimeter ($\mu\text{S}/\text{cm}$). Higher specific conductance ranged from 1,046 to 8,685 $\mu\text{S}/\text{cm}$ in the Cell 1 wells. Specific conductance in remediation system extraction wells ranged from 1,075 to 1,781 $\mu\text{S}/\text{cm}$. Specific conductance in offsite monitoring wells ranged from 489 to 719 $\mu\text{S}/\text{cm}$.

MW-111D and MW-113S were the only wells where anaerobic conditions were observed with both low DO (less than 1.5 milligrams per liter [mg/L]) and negative ORP. Nine Cell 1 wells and one remediation system extraction well exhibited a low DO (less than 1.5 mg/L) but had a positive ORP. Three Cell 1 wells exhibited a negative ORP but had a DO concentration above 1.5 mg/L. All other well locations in Cell 1, remediation system extraction wells, and offsite monitoring wells were aerobic, as indicated by DO greater than 1.5 mg/L and positive ORP (**Table 3.2**).

pH values ranged from 6.27 to 7.32 in wells in Cell 1, 6.38 to 6.66 in remediation system extraction wells, and 6.98 to 7.32 in offsite monitoring wells, as presented in **Tables 3.2, 3.3, and 3.4**.

3.4 Performance of the Remediation System

This section describes the performance of the remediation system as it relates to both main performance objectives of the system (Maxim 2001):

- Prevent further downgradient migration of contaminated groundwater through hydraulic containment and extraction of impacted groundwater.
- Treat extracted groundwater prior to reinjection in accordance with the injection permit (IDWR 2023).

The following sections provide additional information regarding the overall operation and functionality of the treatment system as it relates to these performance objectives.

3.4.1 Extraction Well Operations

The current reporting period for remediation system operation is June 17, 2024, through November 23, 2024. All permit compliance items summarized in **Section 1.3.8** were met for this reporting period.

The remediation well system and air stripper are inspected daily when operational and when Bannock County staff are onsite. Observations from daily inspections and weekly flowmeter readings are recorded on weekly operation and maintenance field forms. Flow data from these field forms are then entered into an online database to assess trends, identify abnormal data, and calculate overall groundwater extraction flow rates.

For the duration of the current reporting period, June 17, 2024, through November 23, 2024, the system was not shut down, except for routine maintenance and the activities listed in **Section 2.2.2**.

Table 3.6 presents well status and groundwater flow data.

Figure 3.4 shows injection, extraction, offline (not in use), and other monitoring wells near the remediation system. **Figure 3.5** shows calculated average extraction flow rates (Panel A), cumulative groundwater extraction volumes (Panel B), and cumulative TCE mass extracted (Panel C) for all wells and for the overall system influent.

The average of the weekly flow rates from June 17, 2024, through November 23, 2024, produced the following approximate data (Panel A):

- RW-4 – 1.4 gallons per minute (gpm)
 - RW-5 – 5.6 gpm
 - RW-9R – 1.6 gpm
 - RW-10 – 8.8 gpm
 - RW-15 – 8.9 gpm
 - RW-17 – 7.7 gpm
- The average of the weekly combined air stripper influent flow rates from June 17, 2024, through November 23, 2024, was approximately 34.4 gpm.

Figure 3.5, Panel B shows the cumulative volume of groundwater extracted from each of the remediation wells and the system overall since September 26, 2018. Flowmeter data from prior to the replacement on April 2, 2019, are inaccurate and underrepresent the actual volume of water removed because of mechanical failure and fouling; therefore, the cumulative totals presented in this graph are low. Based on readings collected from June 17, 2024, through November 23, 2024, the system treated approximately 7.5 million gallons. **Table 3.6** presents estimates of average flow rates and cumulative volumes of groundwater removed.

3.4.2 Mass Removal

Remediation well groundwater extraction rates, volumes, and COC concentrations were evaluated to understand the relationship between groundwater and COC mass discharge from

the subsurface. Following each weekly inspection, the amount of water estimated to have been removed by each remediation well was multiplied by the closest TCE concentration data point, whether it was before or after that specific week's flow total. The resulting weekly mass totals for each remediation well were then summed to estimate the mass removal from the wells and the total mass removal for the remediation system (**Figure 3.5**, Panel C). Mass removal prior to September 2018 was estimated by multiplying totalizer readings collected in September 2018 by concentrations measured in remediation well samples collected in October 2018.

Issues with inaccurate flow measurements caused the total mass removal estimates to underestimate similarly the amount of mass removed from the remediation wells prior to the April 2, 2019, flowmeter replacement. **Figure 3.5** (Panel C) shows the recent mass removal extraction rates. As shown in the figure, from June 17, 2024, through November 23, 2024, mass removal rates range in TCE removal from 0.23 to 1.35 pounds. RW-15 extracts the most mass. The estimated TCE mass removed from June 17, 2024, through November 23, 2024, was approximately 3.66 pounds.

3.4.3 Remediation System Effluent

As noted in **Section 1.3.8**, the main purpose of the remediation system is to remove VOCs in extracted groundwater prior to injection. According to the permits, it is necessary to confirm that injected water remains compliant with groundwater standards, and to monitor flow rate, volume, and injection pressure.

Table 3.7 presents all analytical results for the system effluent compared against the EPA MCLs and IDGW primary and secondary standards for drinking water. There were no VOCs detected throughout the reporting period.

Measurement of the injection flow rate and cumulative volume is tracked using the system influent flowmeter and the individual remediation well flowmeters. **Section 3.4.1** presents these data.

The system does not include an injection pressure gauge, because the discharge of the air stripper is by gravity and flows down the hill toward the injection wells (INJ-1 and INJ-1R). However, the piping to the injection wells prevents the wells from being pressurized, because any water that is not able to infiltrate via the well overflows to Bannock County's stormwater retention ponds south of the wells.

3.5 Cell 2 and 4 Sampling Results

This section summarizes Cell 2 and 4 monitoring wells sampling results from the fall 2024 groundwater monitoring event. **Appendix C** contains all historical groundwater analytical results, to which results from the fall 2024 sampling event have been added. **Appendix F** presents time series plots for all chlorinated ethenes and corresponding field and redox parameter results for each well.

3.5.1 Cell 2 Monitoring Wells

Cell 2 is in assessment monitoring, as described in **Section 4.2**. Cell 2 monitoring wells comprise MW-8, MW-9, and MW-13, and background well MW-12. Results for analytes detected in at least one well in Cell 2 are presented in **Table 3.8**.

3.5.1.1 VOCs

No detections of VOCs exceeded the EPA MCLs and IDGW standards in Cell 2. Detections included the following:

- TCE at MW-13 (0.31 J µg/L)
- cis-1,2-DCE at MW-13 (1.3 µg/L)
- VC at MW-9 (0.72 J µg/L)
- Dichlorodifluoromethane at MW-13 (0.97 J µg/L)
- 1,1-Dichloroethane at MW-13 (0.26 µg/L)

3.5.1.2 Inorganics

There were no detections that exceeded MCLs or primary IDGW standards in Cell 2 wells. Iron and manganese exceeded the IDGW secondary standard in MW-9. **Section 4** includes an analysis of background levels for inorganic chemicals.

3.5.1.3 Non-VOC Organics

No non-VOC organics were detected in Cell 2 wells.

3.5.1.4 Field Purge Parameters

Table 3.8 presents field parameter (conductivity, pH, temperature, turbidity, DO, and ORP) results in Cell 2 wells. As discussed in **Section 1.3.7**, these results are used to assess conditions in groundwater affected by the landfill leachate/waste. This section provides an abbreviated summary of the fall 2024 geochemistry based on field purge parameter results.

Specific conductance was measured at all monitoring wells in Cells 2 (**Table 3.8**). Low specific conductance in Cell 2 wells ranged from 598 to 738 µS/cm. Higher specific conductance (3,938 µS/cm) was observed at MW-9.

MW-9 was the only well where anaerobic conditions were observed with low DO (less than 1.5 mg/L) and negative ORP. All other well locations in Cell 2 were aerobic, as indicated by DO greater than 1.5 mg/L and positive ORP (**Table 3.8**).

pH values ranged from 6.79 to 7.44 in Cell 2 monitoring wells, as presented in **Table 3.8**.

3.5.2 Cell 4 Monitoring Wells

Cell 4 is in detection monitoring, as described in **Section 4.2**. Cell 4 monitoring wells comprise MW-3A, MW-5AR, and MW-6A, and background well MW-4A. MW-4 is monitored as a Cell 4 monitoring well but not as an RCRA compliance well because this well is impacted by waste originating from Cell 1. Results for analytes detected in at least one well in Cell 4 are presented in **Table 3.9**.

3.5.2.1 VOCs

1,1-Dichloroethane, 1,2-Dichloroethane, cis-1,2 DCE, TCE, and VC were detected below the MCL and IDGW standard in MW-4, which is not a compliance well. No VOCs were detected in Cell 4 compliance monitoring wells.

3.5.2.2 Inorganics

There were no detections that exceeded MCLs or primary IDGW standards in Cell 4 wells. Iron and manganese exceeded the IDGW secondary standards in background well MW-4A. **Section 4** includes an analysis of background levels for inorganic chemicals.

3.5.2.3 Field Purge Parameters

Table 3.9 present field parameters (conductivity, pH, temperature, turbidity, DO, and ORP) in Cell 4 wells.

Specific conductance was measured at all monitoring wells in Cell 4 (**Table 3.9**). Low specific conductance (665 to 963 $\mu\text{S}/\text{cm}$) was observed in Cell 4 wells MW-3A, MW-4A, and MW-6A. Higher specific conductance (1,464 to 1,858 $\mu\text{S}/\text{cm}$) was observed at the remaining Cell 4 wells.

MW-4 was the only well where anaerobic conditions were observed with low DO (less than 1.5 mg/L) or negative ORP. All other well locations in Cell 4 were aerobic, as indicated by DO greater than 1 mg/L and positive ORP (**Table 3.9**).

pH values ranged from 6.61 to 7.39 in Cell 4 monitoring wells, as presented in **Table 3.9**.



4.0 Groundwater Data Analysis

Fall 2024 data were used to update the groundwater PCE and TCE plume extents (Section 4.1) and the statistical analysis of parameters analyzed at the site (Sections 4.3 through 4.5) according to specific monitoring requirements for each area (Section 4.2). **Appendix F** presents time series data plots for chlorinated ethenes, geochemical parameters, and inorganic parameters for wells sampled in fall 2024. **Appendix G** presents the statistical methods and comprehensive statistical results for wells sampled in fall 2024. Data and interpretation related to the pilot study conducted in 2023 to 2024 will be presented in an upcoming report.

4.1 Updated Plume Extent

Groundwater sampling results from the fall 2024 semiannual monitoring event were used to update the lateral extents of PCE and TCE groundwater plumes via data interpolation with the modeling software Leapfrog Works, v.2024.1.1. The data used for isoconcentration interpolation include annual 2024 sampling results from domestic wells and municipal supply wells (#14 and #33) (CDM Smith 2024a), and fall 2024 sampling results from Cells 1, 2, and 4 (presented herein). Approximately 100 locations onsite and offsite contribute to the contouring. Data from wells not sampled during the fall 2024 event are presented in previous CDM Smith monitoring reports. Results for offsite domestic wells included in the contouring were reported under a separate cover (CDM Smith 2024d).

Figures 4.1 and **4.2** present the updated PCE and TCE plume extents, respectively, and show the fall 2024 analytical and statistical trends results for wells, where evaluated. Plume extents are presented as isoconcentration contours for 5 µg/L (both PCE and TCE) and 100 µg/L (TCE only).

As shown in **Figure 4.1**, PCE above 5 µg/L is present predominantly in the groundwater along the eastern boundary of Cell 1, throughout the remediation system area, and along the Fort Hall Mine Canyon into the PVA, extending north-northwest from the base of the landfill to MW-118D and eventually to MW-117R. The highest PCE concentration observed and used in the contouring through fall 2024 was 34 µg/L at MW-105D, upgradient of treatment system pumping wells.

As shown in **Figure 4.2**, the TCE plume greater than 5 µg/L has a similar footprint to PCE within the landfill boundary, but the isoconcentration contour is wider in the mouth of the canyon near the remediation system, and it extends farther to the northwest, offsite and along the PVA northwest toward the City of Pocatello. The highest TCE concentration observed and used in the contouring through fall 2024 was 180 µg/L in MW-112D, near the treatment system pumping wells. The 100 µg/L TCE plume extent is generally positioned near the treatment system at the throat of the canyon.

For both PCE and TCE plume extents, relatively higher concentrations are found at the base of Cell 1 near the remediation system. There are poor bounding data available west of the remediation system in the offsite area between the FHML property boundary and MW-116S because of (1) no access to the private properties located there, and (2) a steep slope on the northern boundary of Cell 1 with no monitoring or domestic wells.

A description of the model development is provided in the Final QAPP (CDM Smith 2021b). The PCE and TCE plume contours were estimated with a kriging algorithm to create a contour map of the most recent PCE and TCE plumes available through 2024. A three-dimensional representation of TCE concentrations in groundwater is shown at the 5 and 100 µg/L isoconcentration levels. Nondetect results are entered as one-tenth of the reporting detection limit, with some nondetect results omitted because of high RLs. Analytical data were log transformed as part of the interpolation process. The interpolations are accurate at each data point but are estimated between data points. Groundwater interpolations have a dynamic surface resolution of 50 feet, and horizontal-to-vertical anisotropy is 10:1. Model settings were revised according to site conditions, and contours were further revised manually in reported data figures. For instance, there are limited bounding data in the distal portions of the plume, on the western side of the plume as mentioned above, and to the east of the remediation system; therefore, the original interpolations were revised to adjust for this.

4.2 Landfill Monitoring Requirements

Monitoring requirements for landfills, including FHML Cell 2 and 4, are set forth by the *Criteria for Municipal Solid Waste Landfills* (40 CFR §258, Subpart E). Appendix I and Appendix II parameters mentioned herein correspond to the parameter lists provided in Appendices I and II of 40 CFR §258, Subpart E. There are three tiers of monitoring for RCRA compliance, briefly described in the following sections.

4.2.1 Detection Monitoring

Cell 4 is currently managed under detection monitoring requirements. Under detection monitoring, semiannual monitoring of Appendix I parameters is conducted. Appendix I parameters include VOCs and metals.

Background threshold values are developed for the parameters and periodically updated with ongoing data collection as appropriate. Detectable background concentrations of metals are expected, whereas background concentrations of anthropogenic organic compounds are typically considered to be the method detection limit (MDL).

If a statistically significant increase over background for an inorganic chemical or a statistically significant detection of an organic chemical is observed that cannot be attributed to sampling or analytical error, natural variation, or a source outside of the landfill cell, then assessment monitoring is initiated within 90 days.

4.2.2 Assessment Monitoring

Cell 2 is currently managed under assessment monitoring requirements. Under assessment monitoring, the analytical list is expanded to include the Appendix II parameters, which include SVOCs, mercury, tin, cyanide, sulfide, pesticides, herbicides, PCBs, and 2,3,7,8-TCDD, in addition to all Appendix I parameters required by detection monitoring. The monitoring is conducted semiannually; during one event (i.e., fall), all Appendix II parameters are analyzed, and during the other event (i.e., spring), all Appendix I parameters are analyzed, along with any additional Appendix II parameters detected during the prior event.

Background threshold values are developed for any detected Appendix II parameter. Detectable background concentrations of metals are expected, whereas background concentrations of anthropogenic organic compounds are typically considered to be the MDL. Groundwater protection standards are also established for any detected parameters; these are typically federal MCLs or state-specific standards.

If concentrations of all Appendix II parameters are at or below background for two consecutive sampling events, then the groundwater monitoring program for the area can revert back to semiannual detection monitoring. However, if concentrations of any of the Appendix II parameters are significantly greater than background but less than the groundwater protection standard, then assessment monitoring continues. If any parameter exceeds a groundwater protection standard and the exceedance cannot be explained as a statistical anomaly, alternate sources, or natural background, corrective measures must be initiated.

4.2.3 Corrective Action

Cleanup measures must be undertaken at that site. Rather than creating a rigid regulatory framework, the RCRA corrective action cleanup process focuses on results instead of specific steps and is flexible, depending on site-specific conditions. A typical cleanup may include steps such as initial site assessment, site characterization, interim actions, evaluation of remedial alternatives, and implementation of the selected remedy. Cell 1 is currently managed under corrective action requirements but is not regulated under RCRA.

4.3 Cell 1 Source Area

Cell 1 is currently in corrective action monitoring, which includes semiannual sampling of VOCs, metals, geochemical parameters, and other parameters sampled to support evaluation of the ongoing injection pilot study, which was conducted in April 2023 in accordance with the *Pilot Study Work Plan* (CDM Smith 2023c) to evaluate potential technologies for remedy optimization. Performance monitoring and data analysis are ongoing, and the preliminary outcomes of the pilot study will be presented under a separate cover. A pump-and-treat groundwater extraction system has been in operation since 2002.

This section presents the statistical analysis of VOCs and inorganics in wells sampled in fall 2024 that are located in and downgradient of the Cell 1 source area, which includes original Cell 1 monitoring wells, remediation system extraction wells (currently online or offline and repurposed as monitoring wells) and select offsite Bannock County monitoring wells. In online extraction wells, only PCE and TCE trends are statistically analyzed. Data sets for monitoring wells not sampled in fall 2024 have been previously analyzed and presented in respective groundwater monitoring reports and are not discussed herein.

Appendix F provides comprehensive time series plots for chlorinated ethenes, daughter products, geochemical parameters, and inorganics data collected in monitoring wells since 2002.

4.3.1 Statistical Approach

Appendix G presents the complete statistical approach (**Section G.2.1**) and analysis, which is summarized below.

- Cell 1 Statistical Tests

- Comparison of upper confidence limit (UCL) of the mean to standard if the standard is available.
- Mann–Kendall trend analysis and Theil–Sen regression.
- Parameters with data sets consisting entirely of MDL values were not analyzed and are not shown.
- **Analyzed Data Range:** August 2017 through September 2024. In the future, when there are enough data to conduct meaningful statistics, performance monitoring wells for the April 2023 injection pilot study will be statistically analyzed starting at the time of the pilot study injections.
- **Exceedance Criteria:** UCL of the mean of a COC exceeds the standard in Cell 1 or offsite monitoring wells (does not apply to remediation system wells). Cell 1 is not regulated under RCRA; however, the organic and inorganic parameter lists match the RCRA Appendix I list.
- **Source Background Data:** Not applicable to Cell 1 or offsite monitoring wells.
- **Confidence Limits Criteria:** UCL of the mean is calculated with a 95% confidence interval for data sets at least two distinct detected results.
- Trend Analysis Criteria:
 - Trends are only calculated for data sets with at least 50% detected results and at least six data points.
 - Trends are only calculated for data sets where the UCL of the mean exceeds the standard.
 - A statistically significant trend is present if the confidence level is greater than 95% for increasing and decreasing results, with a direction corresponding to the sign of the Mann–Kendall S statistic. As described in **Appendix G**, Mann–Kendall test results for Cell 1 wells use a range for alpha to define probably significant trends where the confidence level is between 90% and 95%. Additionally, the coefficient of variation is used to distinguish between no trend and no trend with stable concentrations (i.e., low variability) for data sets with confidence levels below 90% and for which no statistically significant trend has been identified (Connor et al. 2012).

The following sections provide a results summary for the statistical analysis of Cell 1, organized by parameter group.

4.3.2 VOCs

Tables G.1 through **G.3** present the complete statistical analysis for VOCs in Cell 1, offsite, and remediation system extraction wells. **Tables 4.1** through **4.3** summarize key statistical results.

4.3.2.1 Comparison Latest Value to Standard

Consistent with past results, benzene, PCE, TCE, and VC exceeded MCLs in one or more Cell 1 monitoring wells in fall 2024 (**Table 3.2**). The maximum concentrations were detected in the following wells:

- Benzene: MW-111D (13 µg/L)
- PCE: MW-105D (34 µg/L)

- TCE: MW-112D (180 µg/L)
- VC: MW-113S (67 µg/L)

4.3.2.2 Comparison of UCL to Standard

UCLs of the mean for PCE or TCE exceeded the standard in all Cell 1 monitoring wells currently sampled semiannually, except for MW-111S (**Table 4.1**).

Other parameters analyzed in fall 2024 with a UCL exceeding the standard were as follows:

- Benzene in MW-111S/D and MW-113S
- Chloroform in MW-105D and MW-113S
- VC in MP-1, MP-2, MW-110S, MW-111D, MW-113S/D, MW-120D, MW-124, MW-125, RW-1, and RW-2

Additionally, the UCL of the mean exceeded the standard for TCE in offsite monitoring wells MW-103S and MW-116S (**Table 4.2**).

These results are generally consistent with previous results presented in recent CDM Smith monitoring reports (e.g., CDM Smith 2023b).

4.3.2.3 Trend Analysis

The following VOC trends were evaluated in Cell 1 monitoring wells (**Table 4.1**):

- PCE exhibited increasing trends in MW-101S, MW-109D, and MW-119D and a probably increasing trend in MW-105D and MW-119S. PCE exhibited decreasing trends in MP-2, MW-113S, MW-118D, MW-120S/D, MW-125, RW-2, and RW-3. PCE exhibited stable trends in MP-3, MW-105S, MW-110D, MW-112D, MW-113D, MW-124, and RW-1. The remainder of the evaluated data sets yielded no significant trends.
- TCE exhibited increasing trends in MW-101S and a probably increasing trend in MW-102S, MW-119S, and MW-120D. TCE exhibited decreasing trends in MP-2, MW-105S, MW-113S/D, MW-117R, MW-118D, MW-120S, MW-125, RW-2, and RW-3. TCE exhibited stable trends in MP-1, MP-3, MP-4, MW-105D, MW-109S/D, MW-112D/M, MW-123, MW-124, and RW-1. The remainder of the evaluated data sets yielded no significant trends.
- VC exhibited an increasing trend in MW-105D, MW-125, and RW-2; stable trends in MP-2, MW-110S, MW-120D, and MW-124; and decreasing trends in MW-105S and MW-113S. The remainder of the evaluated data sets yielded no significant trends.
- Benzene exhibited decreasing trends in MW-111S/D and MW-113S.
- Chloroform exhibited an increasing trend in MW-105D and a decreasing trend in MW-113S.

The following trends were evaluated in offsite monitoring wells (**Table 4.2**):

- TCE exhibited a stable trend in MW-103S and a decreasing trend in MW-116S.

The following trends were evaluated in online remediation system extraction wells (**Table 4.3**):

- TCE exhibited decreasing and probably decreasing trends in RW-4 and RW-9R.
- PCE and TCE exhibited no significant or stable trends in all other wells sampled.

In addition to the statistical results tables, **Figures 4.1** and **4.2** present a visual trend analysis summary for PCE and TCE in the Cell 1 source area wells.

Table 4.4 presents a comparison of Mann–Kendall trends results for PCE and TCE reported for the last three sampling events. About one-third of the data sets exhibiting increasing or probably increasing trends as of spring 2023 are no longer exhibiting statistically significant trends after fall 2024 sampling. Correspondingly, the number of decreasing or probably decreasing data sets for the same wells between spring 2023 and fall 2024 has nearly doubled. Additionally, about one-third of the data sets have different trend results in fall 2024 than in spring 2024.

There are several possible explanations for this shift in contaminant trends. First, the 2023 pilot study may be impacting concentrations such that overall data set trends are beginning to shift. The performance of the pilot study, and these shifts in concentrations and trends over time, will be evaluated in more detail in a forthcoming pilot study report. Second, as discussed in the spring 2023 report, the trendlines for many of these data sets are relatively shallow, as indicated by the Theil–Sen slope shown in **Appendix G** tables. Additionally, many of the p-values for Mann–Kendall trends are close to the significance level range (alpha between 0.1 and 0.05, corresponding to confidence levels of 90% and 95%, respectively). Finally, the evaluated time frame has lengthened over the last few reporting events. In Cell 1 monitoring wells, most data sets have higher concentrations prior to 2018, followed by lower concentrations around 2018, which have been slowly increasing in concentration in some wells. The statistical evaluation time frame starts mid-2017 or 2018, depending on available data for the well, and by now, the statistical confidence level for the Mann–Kendall trend analysis for some data sets has reached the level where a trend is considered statistically relevant for the evaluated time frame. Therefore, it is not unexpected that small shifts in concentrations from event to event influence the statistical confidence just above or below the threshold at which a trend is considered statistically significant. **Appendix F** includes all COC time series plots for visual context of concentration changes over time, and **Appendix G** provides more information about the statistical approach.

4.3.3 Inorganics

Comprehensive metals analysis has not been conducted since 2021. Select wells have been sampled of total and/or dissolved metals under pilot study performance monitoring. Consistent with prior statistical evaluations, this section focuses on total fraction metals analyzed from the current sampling event for fall 2024. **Table G.4** presents the complete statistical analysis for inorganics in Cell 1. **Table 4.5** summarizes key statistical results.

4.3.3.1 Comparison Latest Value to Standard

No RCRA regulated inorganic parameter exceeded its promulgated standard in Cell 1 monitoring wells in fall 2024.

In MW-121, both iron and manganese exceeded IDGW secondary standards.

4.3.3.2 Comparison of UCL to Standard

In MW-121, both iron and manganese UCLs of the mean exceeded IDGW secondary standards.

MW-121 is near the April 2023 pilot study treatment area, which will be reported under a separate cover. The pilot study involved the injection of fermentable carbon and zero-valent iron amendments into the subsurface to enhance reducing conditions that facilitate degradation of COCs. Elevated iron concentrations are likely directly related to iron delivered to the aquifer, and elevated manganese concentrations are likely indirectly related to the more reducing conditions enhanced by the amendment. **Appendix F** includes inorganics time series plots of these metals.

4.3.3.3 Trend Analysis

Trend analysis was not performed for wells sampled in fall 2024 because there were not enough data points in each data set (i.e., fewer than six).

4.3.4 Cell 1 Statistical Summary

Cell 1 is currently managed under corrective action requirements. Cell 1 monitoring wells are located throughout the FHML site—upgradient, cross-gradient, and downgradient of the remediation system. If the remediation system effectively captured COC mass from Cell 1, downgradient Cell 1 monitoring wells would be expected to have lower concentrations of COCs than upgradient and cross-gradient wells. Furthermore, downgradient wells would be expected to have decreasing trends along the time period of effective remediation system operation.

However, although there are fewer increasing COC trends exhibited now than recently reported (CDM Smith 2024b, c, e), PCE and TCE exceedances above the MCL persist in Cell 1 monitoring wells to the west, east, and downgradient of the remediation system, and PCE and TCE exhibit statistically increasing trends in some Cell 1 monitoring wells, which indicates a continuing source of contamination and incomplete capture of the remediation system, consistent with previous interpretations (CDM Smith 2023a). As shown in **Figures 4.1** and **4.2**, decreasing trends are typically observed in wells on the west side of the canyon, and increasing trends are typically observed in wells on the east side of the canyon, with many stable or insignificant trends observed in wells throughout and in the middle of the canyon.

Because multiple COCs continue to exceed standards and exhibit increasing trends, corrective action management continues to be appropriate for Cell 1. Data collected from sampling events will be used to evaluate the performance of the April 2023 pilot study and will be presented in a forthcoming pilot study report now that the 1-year performance monitoring period (May 2023 through May 2024) is complete.

4.4 Cell 2

Cell 2 is currently in assessment monitoring. MW-12 is the background well, and MW-8, MW-9, and MW-13 are downgradient compliance wells. MW-7 is not a compliance well and has been impacted by waste in the Cell 1 area; therefore, it was not sampled or evaluated herein. Samples collected from Cell 2 monitoring wells during the fall 2024 monitoring event were analyzed for all Appendix II parameters, according to assessment monitoring requirements (Section 4.2.2).

This section presents the statistical analysis of Appendix II organic and inorganic parameters in Cell 2 monitoring wells sampled in fall 2024. **Appendix F** provides comprehensive time series plots for chlorinated ethenes, daughter products, geochemical parameters, and inorganics.

4.4.1 Statistical Approach

Appendix G presents the complete statistical approach and analysis, which is summarized below.

- Cell 2 Statistical Analyses:
 - Comparison of latest value to standard if available.
 - Comparison of lower confidence limit (LCL) of the mean to standard if available.
 - Comparison of latest value to upper prediction limit (UPL) of background for inorganics if the standard is not available.
 - Mann–Kendall trend analysis and Theil–Sen regression.
 - Parameters with data sets consisting entirely of MDL values were not statistically analyzed and are not shown. The only data sets presented with 100% MDL values are those for inorganic parameters in background well MW-12, which are shown for comparison to downgradient compliance wells.
- **Analyzed Data Range:** August 2017 through September 2024.
- Exceedance Criteria:
 - LCL of the mean that exceeds the promulgated standard may trigger corrective action.
 - Either a fall 2024 Appendix II inorganic result that exceeds UPL of background or a fall 2024 detection (exceedance of background) of Appendix II organic requires continuation of the assessment monitoring management tier.
- Source of Background Data:
 - Organic parameters: Not applicable. All detections of organic Appendix I or Appendix II parameters (40 CFR §258, Subpart E) are considered exceedances of background.
 - Inorganic parameters: Background compliance well MW-12, interwell method.
- **UPL of Background Criteria:** The UPL is calculated for background data sets with at least two distinct detected results.
- **Confidence Limits Criteria:** LCL of the mean is calculated with a 95% confidence interval for data sets with at least two distinct detected results.
- **Trend Analysis Criteria:**
 - Trends are only calculated for data sets with at least 50% detected results and at least six results.
 - Trends are only calculated for RCRA Appendix II parameters with an exceedance of the standard (LCL) or background (detection for organics).

- A statistically significant trend is present if the confidence level is greater than 95% for increasing and decreasing results, with a direction corresponding to the sign of S. No trend is established for confidence levels below 95%.

The following sections provide a results summary for the statistical analysis of Cell 2 wells, organized by parameter group.

4.4.2 Organic Parameters

Tables G.5 and **G.6** present the complete statistical analysis for VOCs and non-VOC organics, respectively, in Cell 2. **Table 4.6** summarizes key statistical results.

4.4.2.1 Comparison of Latest Value and LCLs to Standard

For Appendix II organics in Cell 2 monitoring wells, neither fall 2024 results nor LCLs of the data set mean exceeded promulgated standards, where standards exist.

4.4.2.2 Comparison of Latest Value to Background

Background concentrations of Appendix II organic parameters are considered to be the MDL; therefore, any detections constitute an exceedance of background (Section 4.2.2), which include the following data sets for fall 2024:

- VOCs: **Appendix G** presents time series plot data for these parameters.
 - In MW-9, VC (J-qualified) was detected. VC is typically detected in this well.
 - In MW-13, dichlorodifluoromethane, 1,1-Dichloroethane (J-qualified, no standard), TCE (J-qualified), and cis-1,2-DCE were detected. cis-1,2-DCE and dichlorodifluoromethane have consistently been detected in recent sampling at low concentrations. TCE has been detected occasionally at low concentrations in the past. Low concentrations of several VOCs are often detected in MW-13.
- Non-VOC organics: In MW-13, benzo[a]pyrene (J-qualified, no standard) was detected.

4.4.2.3 Trend Analysis

Mann–Kendall trend results were as follows (**Table 4.6**):

- VOCs: In MW-13, increasing trends for cis-1,2-DCE, dichlorodifluoromethane, and PCE. In MW-9, there was not a statistically significant trend for VC.
- Non-VOC organics: Trend analysis was not performed because data sets almost entirely consist of nondetect results.

4.4.3 Inorganic Parameters

Table G-7 presents the complete statistical analysis for inorganics in Cell 2. **Table 4.8** summarizes key statistical results.

4.4.3.1 Comparison of Latest Value and Standards and LCLs

No Appendix II inorganic parameter exceeded its promulgated standard in fall 2024. Additionally, LCLs of the mean in Cell 2 compliance wells did not exceed RCRA Appendix II parameters for inorganics. Parameters without a standard include cobalt, nickel, sulfide, tin, and vanadium.

In MW-9, iron and manganese results exceeded their respective standards and LCLs of the mean exceeded IDGW secondary standards. Inorganics with secondary IDGW standards include iron, manganese, silver, and zinc.

4.4.3.2 Comparison of Latest Value to Background

All fall 2024, inorganics results were compared to background, which is defined by the UPL of the background data sets for MW-12. **Appendix G** presents individual data graphs for RCRA parameters exceeding background, which included the following data sets:

- MW-8: arsenic, which has been detected in this well in every sample since 2002.
- MW-9: nickel and zinc, both of which have been detected in this well in every sample since 2002; lead; and selenium, frequently detected in this well.
- MW-13: Arsenic and barium, both of which have been detected in this well in every sample since 2002.

Fall 2024 results exceeding background were about one to two orders of magnitude lower than the standard for the respective parameter. Nickel is the only parameter without a standard.

Inorganics with secondary IDGW standards that exceeded background included iron in MW-9 and manganese in MW-13. These metals are not regulated under RCRA.

4.4.3.3 Trend Analysis

The Mann–Kendall trend results for RCRA parameters per Section 4.4.1 are summarized below.

Downgradient Compliance Wells

The following concentration trends were observed for Cell 2 compliance wells in which the fall 2024 result exceeded background (**Table 4.8**):

- MW-8: Arsenic is decreasing.
- MW-9: Nickel and zinc are decreasing, and lead exhibits no significant trend.
- MW-13: Arsenic and barium exhibit no significant trend.

Upgradient Background Well

Background compliance well MW-12 exhibited no statistically significant trends, except for barium and potassium, which exhibited decreasing trends with very shallow Theil–Sen slopes (**Table G.7**). Most parameters were not evaluated for trends in MW-12 because of the high percentage of MDL results in the evaluated period.

4.4.4 Cell 2 Statistical Summary

In assessment monitoring, if any RCRA Appendix II parameter exceeds a promulgated standard and the exceedance cannot be explained as a statistical anomaly, alternate sources, or natural background, then corrective measures must be initiated. However, if concentrations of any of the Appendix II parameters are significantly greater than background but less than the groundwater protection standard, then assessment monitoring continues. Exceedances of background do not trigger corrective action unless there is a statistically significant increasing trend, which highlights COCs with future potential to exceed their standard (**Section 4.2**).

In Cell 2 monitoring wells, no Appendix II parameters exceeded promulgated standards in fall 2024. Several VOCs were detected at low concentrations (**Table 4.6**), and several inorganics exceeded the UPL of background (**Table 4.8**) in MW-8, MW-9, and MW-13. These results are generally consistent with recent evaluations, and non-VOC organics detected in fall 2024 were not previously observed in spring 2024.

Because of the exceedances of background (both UPL and MDL) in Cell 2, assessment monitoring management continues to be appropriate (**Section 4.2.2**).

4.5 Cell 4

Cell 4 is currently in detection monitoring. MW-4A is the background well, and MW-3A, MW-5AR, and MW-6A are the downgradient compliance wells. MW-4 is not a compliance well, but it is part of the monitoring network for Cell 2 and is used in the Cell 1 performance monitoring program. Samples collected from Cell 4 monitoring wells during the fall 2024 monitoring event were analyzed for Appendix I VOCs and metals, according to detection monitoring requirements (**Section 4.2.1**).

This section includes a discussion on the statistical analysis of Appendix I organic and inorganic parameters in Cell 4 compliance monitoring wells sampled in fall 2024. **Appendix F** provides comprehensive time series plots for chlorinated ethenes, daughter products, geochemical parameters, and inorganics.

4.5.1 Statistical Approach

Appendix G presents the complete statistical approach and analysis, which is summarized below.

- Cell 4 Statistical Analyses:
 - Comparison of latest value to standard, if the standard is available
 - If latest value exceeds the standard, comparison of LCL to standard
 - Comparison of latest value to MDL for organics
 - Comparison UPL of background for inorganics
 - Mann–Kendall trend analysis and Theil–Sen regression
 - Parameters with data sets consisting entirely of MDL values were not statistically analyzed and are not shown. The only data sets presented with 100% MDL values are those for

inorganic parameters in background wells, which are shown for comparison to downgradient compliance wells.

- **Analyzed Data Range:** August 2017 through September 2024.
- **Exceedance Criteria:**
 - Fall 2024 result or LCL of the mean exceeds the promulgated standard (may trigger corrective action).
 - Fall 2024 result exceeds the UPL of background (inorganic) or MDL of the parameter (organic) (may trigger assessment monitoring).
- **Source of Background Data:**
 - Organic parameters: Not applicable. All detections of organic Appendix I parameters (40 CFR §258, Subpart E) are considered exceedances of background.
 - Inorganic parameters: Background compliance well MW-4A, interwell method.
- **UPL of Background Criteria:** The UPL is calculated for background data sets with at least two distinct detected results.
- **Confidence Limits Criteria:** LCL of the mean is calculated with a 95% confidence interval for data sets at least two distinct detected results.
- **Trend Analysis Criteria:**
 - Trends are only calculated for data sets with at least 50% detected results and at least six results.
 - Trends are only calculated in compliance wells for data sets with an exceedance of background.
 - A statistically significant trend is present if the confidence level is greater than 95% for increasing and decreasing results, with a direction corresponding to the sign of S. No trend is established for confidence levels below 95%.

The following sections provide a results summary for the statistical analysis of Cell 4 wells, organized by parameter group.

4.5.2 VOCs

Table G.8 presents the complete statistical analysis for VOCs in Cell 4. **Table 4.9** summarizes key statistical results.

4.5.2.1 Comparison of Latest Value to MDL and Standard

Background concentrations of Appendix I organic parameters are typically considered to be the MDL; therefore, any detection constitutes an exceedance of background (Section 4.2.1). VOCs were not detected in compliance wells; however, several VOCs were detected in MW-4 (not a compliance well).

4.5.2.2 Trend Analysis

Mann–Kendall analysis was not performed for any VOC data from the compliance and background wells because there were no VOC detections (i.e., exceedances of background) in wells with sufficient data to perform the test. Several VOCs exhibited statistically significant trends in MW-4 (not a compliance well), as shown in **Table 4.9**.

4.5.3 Inorganics

The Appendix I inorganics group consists of 15 metals. Tin, an Appendix II parameter, was also analyzed in Cell 4 samples. **Table G.9** presents the complete statistical analysis for inorganics in Cell 4. **Table 4.10** summarizes key statistical results.

4.5.3.1 Comparison of Latest Value to Standards

No Appendix I inorganic parameter value exceeded promulgated standards in Cell 4 compliance monitoring wells, which is consistent with recent results. Cobalt, nickel, and vanadium do not have standards.

In MW-4, iron and manganese exceeded their respective IDGW secondary standards.

4.5.3.2 Comparison of Latest Value to Background

All fall 2024 inorganics results were compared to background, which is defined by the UPL of the data sets from background well MW-4A. No RCRA parameters exceeded background in compliance wells in fall 2024.

In MW-4 (not a compliance well), no RCRA parameters exceeded background. Inorganics with secondary IDGW standards that exceeded background included iron and manganese in MW-4.

4.5.3.3 Trend Analysis

A Mann–Kendall trend analysis was performed for RCRA parameters per **Section 4.5.1**.

Downgradient Wells

Several inorganics exhibited statistically significant trends in MW-4 (not a compliance well), as shown in **Table 4.10**.

Upgradient Background Well

Background compliance well MW-4A exhibited no significant trends for arsenic, barium, selenium, and vanadium. Other parameters were not evaluated for trends in MW-4A because of the high percentage of MDL results in the evaluated period.

4.5.4 Cell 4 Statistical Summary

In detection monitoring, if a statistically significant increase over background or a detection above the standard cannot be attributed to sampling or analytical error, natural variation, or a source outside of the landfill cell, then assessment monitoring is initiated within 90 days. For FHML, background levels are considered to be the MDL for organic Appendix II parameters, because no background levels are expected for these chemicals; therefore, detections of organics constitute an exceedance of background.

In Cell 4 monitoring wells, no Appendix I parameters exceeded promulgated standards in fall 2024 (**Tables 4.9** and **4.10**). VOCs were not detected (i.e., did not exceed background) in compliance wells. Inorganics did not exceed background in compliance wells. These results are generally consistent with recent evaluations. Detection monitoring is an appropriate management tier for Cell 4.



5.0 Conclusions and Recommendations

Groundwater samples were collected in September during the fall 2024 sampling event to achieve the following objectives:

- Evaluate groundwater gradients and flow within and downgradient from the FHML Cell 1 source area and offsite plume and within Cell 2 and 4 areas.
- Evaluate the Cell 1 remedy and determine the current nature and extent of the PCE and TCE plume discharging from Cell 1, the impact of the remediation system, and impacts within PVA.
- Evaluate the status of RCRA compliance monitoring at Cells 2 and 4 with updated statistical analysis of RCRA Subtitle D Appendix I and/or II parameters.
- Evaluate the spatial and time concentration trends in the Cell 1 source area, offsite plume, and Cells 2 and 4 for regulated chemicals above promulgated standards and/or background.
- Determine whether the air stripper remediation system is meeting the discharge permit requirements.

5.1 Cell 1 Source Area and Offsite Plume

5.1.1 Conclusions and Key Changes

In fall 2024, VOCs were analyzed from all sampled locations (**Table 2.1**). Chemicals that exceeded MCLs in the Cell 1 source area and offsite monitoring wells included PCE and TCE, as presented in **Section 3.3**. Additionally, PCE, TCE, benzene, chloroform, and VC data sets statistically exceed promulgated standards in one or more wells, as indicated by calculation of the UCLs of the mean, presented in **Section 4.3**. Statistically significant increasing and stable trends of PCE and TCE concentrations have been observed in wells upgradient, downgradient, and throughout the remediation system area, which indicates that there is a continuing source of contamination and incomplete capture of contamination by the existing remediation system. These findings are generally consistent with previous interpretations (CDM Smith 2024c). However, about one-third of the data sets exhibiting increasing or probably increasing trends as of spring 2023 are no longer exhibiting statistically significant trends after fall 2024 sampling. Correspondingly, the number of decreasing or probably decreasing data sets for the same wells between spring 2023 and fall 2024 has nearly doubled. Additional changes in concentrations will be evaluated for the pilot study under a separate cover.

5.1.2 Recommendations and Future Changes

Tables 5.1 and 5.2 present the recommended FHML sampling plans for spring 2025 and fall 2025 sampling, respectively. The following tasks would be conducted:

- A comprehensive synoptic groundwater level measurement across Cells 1, 2, and 4
- Semiannual spring and fall sampling of monitoring wells for various monitoring objectives:
 - Downgradient and FHML boundary wells to monitor performance of the existing treatment system and capture

- Source area wells to evaluate COC discharge to the groundwater plume
- Upgradient wells to track input of COCs to the remediation system
- Offsite wells for performance monitoring in the distal plume
- Pilot study area wells to monitor conditions prior to additional remedial action

Changes to the sampling approach for spring 2025 include:

- Total metals analysis in MW-121 because the spring 2024 sample exceeded the MCL for arsenic. While there was not an exceedance in fall 2024, an additional spring sample is recommended to assess potential seasonal impacts to water quality in the well. If continued exceedances are not observed in spring 2025, MW-121 will be removed from the sampling plan as it is adjacent and redundant to RW-3 (**Figure 1.4**).

No other changes to the sampling plan approach are recommended at this time.

5.2 Cells 2 and 4

5.2.1 Conclusions and Key Changes

Cell 2 is in assessment monitoring. In Cell 2 monitoring wells, no Appendix II parameters exceeded promulgated standards in fall 2024. However, several VOCs were detected at low concentrations in MW-9 and MW-13 and several inorganics exceeded the UPL of background in MW-8, MW-9, and MW-13. Manganese and iron exceeded secondary IDGW standards (**Section 4.4**). These results are generally consistent with recent evaluations. Exceedances of background (both UPL and MDL) require the continuation of assessment monitoring management for Cell 2.

Cell 4 is in detection monitoring. In Cell 4 compliance monitoring wells, no Appendix I parameters exceeded promulgated standards in fall 2024. VOCs were not detected in compliance wells, and inorganics did not exceed background in compliance wells (**Section 4.5**). MW-4 continues to have detections and exceedances of some parameters. These results are generally consistent with recent evaluations and require the continuation of detection monitoring management for Cell 4.

No key changes were incorporated into the sampling event or observed in sampling results.

5.2.2 Recommendations and Future Changes

Tables 5.1 and **5.2** present the recommended FHML sampling plans for spring 2025 and fall 2025 sampling, respectively. The following tasks would be conducted:

- In spring 2025, Cell 2 monitoring wells will be sampled for all Appendix I parameters and Appendix II SVOCs. SVOCs will be assessed in the spring owing to the detection of benzo[a]pyrene (0.051 J µg/L) in MW-13 in fall 2024. Cell 4 monitoring wells will be sampled for all Appendix I parameters.
- In fall 2025, Cell 2 monitoring wells will be sampled for all Appendix II parameters, and Cell 4 monitoring wells will be sampled for Appendix I parameters.

5.3 Operation of Pump-and-Treat System

5.3.1 Conclusions and Key Changes

The remediation system efficiently operated throughout the monitoring period with minimal unplanned shutdowns. Quarterly compliance sampling from the injection well indicate that the air stripper system is meeting the requirements of the discharge permit.

5.3.2 Recommendations and Future Changes

Operation of the remediation system will continue throughout 2024 to ensure that the system will continue operating to meet requirements of the CO, including the following:

- Operation and maintenance of the system:
 - Operators will continue to confirm the system is operating as intended.
 - Operators will confirm continued operation of the air stripper and blower, continued level control of extraction pumps, and continued operation of the antiscalant metering pump.
 - Operators will collect weekly extraction well data, including flow totals, instantaneous flow rates, instantaneous pump speeds, operational runtime, and pump starts/stops.

If appropriate, the following maintenance and optimization activities may be considered for 2025, based on their expected value:

- Further optimization of pumping based on operational data.
- Operational data listed above will be supplemented with periodic evaluation of well-specific capacity for analysis to determine when well efficiency is dropping and when additional rehabilitation may be needed. Rehabilitation may also be considered for wells that have not been recently rehabilitated.
- Flowmeters and pumps will be evaluated and replaced as needed, depending on performance.

Performance and compliance monitoring will be continued, with quarterly sampling of the injection well. In the first and third quarter of each year, VOCs will be analyzed using EPA Method 8260. In the second and fourth quarter of each year, VOCs will be analyzed using EPA Methods 8260 and 8011 and the extended suite of parameters (**Tables 5.1** and **5.2**).



6.0 References

AEEC. 2018a. *2017 Offsite Groundwater Monitoring Report, Fort Hall Mine Landfill, Bannock County, Idaho*. Salt Lake City, Utah. Report prepared for Bannock County Public Works.

AEEC. 2018b. *Cell 2 Assessment Report, Fort Hall Mine Landfill, Bannock County, Idaho*. Salt Lake City, Utah. Report prepared for Bannock County Public Works.

American Geotechnics. 2012. *Geotechnical Investigation, MSW Landfill Gas to Energy Project, Bannock County Landfill, Pocatello, Idaho*.

Brown and Caldwell. 1994. *Phase II Hydrogeologic Assessment Draft Report, Bannock County, Idaho*.

Brown and Caldwell. 1993. *Final Revisions to Preliminary Engineering Report, Bannock County, Idaho*.

Brown and Caldwell. 1992. *Preliminary Hydrogeologic Assessment in the Vicinity of Fort Hall Canyon Landfill, Bannock County, Idaho*.

CDM Smith. 2024a. *Draft 2024 Offsite Groundwater Monitoring Report*. Helena, Montana. Report prepared for Bannock County Public Works.

CDM Smith. 2024b. *Draft 2024 Spring Semiannual Cell 1, 2 and 4 Groundwater Monitoring and Remediation System Operation and Maintenance Report*. Helena, Montana. Prepared for Bannock County Public Works.

CDM Smith. 2024c. *Final 2023 Fall Semiannual Cell 1, 2 and 4 Groundwater Monitoring and Remediation System Operation and Maintenance Report*. Helena, Montana. Report prepared for Bannock County Public Works.

CDM Smith. 2024d. *Final 2023 Offsite Groundwater Monitoring Report*. Helena, Montana. Report prepared for Bannock County Public Works.

CDM Smith. 2024e. *Final 2023 Spring Semiannual Cell 1, 2 and 4 Groundwater Monitoring and Remediation System Operation and Maintenance Report*. Helena, Montana. Prepared for Bannock County Public Works.

CDM Smith. 2023a. *Final 2022 Fall Semiannual Cell 1, 2 and 4 Groundwater Monitoring and Remediation System Operation and Maintenance Report*. Helena, Montana. Report prepared for Bannock County Public Works.

CDM Smith. 2023b. *Final 2022 Spring Semiannual Cell 1, 2 and 4 Groundwater Monitoring and Remediation System Operation and Maintenance Report*. Helena, Montana. Prepared for Bannock County Public Works.

CDM Smith. 2023c. *Final 2023 Pilot Study Work Plan*. Helena, Montana. Report prepared for Bannock County Public Works.

- CDM Smith. 2021a. *Final 2020 Fall Semi-annual Cell 1, 2 and 4 Groundwater Monitoring and Remediation System Operation and Maintenance Report*. Helena, Montana. Prepared for Bannock County Public Works.
- CDM Smith. 2021b. *Final Groundwater Monitoring Program Plan Quality Assurance Project Plan Revision 1*, Fort Hall Mine Landfill, Bannock County, Idaho. Helena, Montana. Prepared for Bannock County Public Works.
- CDM Smith. 2020. *Final 2020 Spring Semi-annual Cell 1,2 and 4 Groundwater Monitoring and Remediation System Operation and Maintenance Report*. Helena, Montana. Prepared for Bannock County Public Works.
- CDM Smith. 2019. *Final Site Characterization Plan*.
- CH2M HILL. 1994. *Hydrogeology and Assessment of TCE Contamination in the Southern Portion of the Pocatello Aquifer – Phase I Aquifer Management Plan Final Report*, City of Pocatello Water Department, Pocatello, Idaho. Boise, Idaho. Prepared for The City of Pocatello Water Department.
- Connor, J., S. Farhat, and M. Vanderford. 2012. *Software User’s Manual GSI Mann-Kendall Toolkit for Constituent Trend Analysis*. Version 1. https://www.gsienv.com/gsi-technical-guidance/?resource_search=mann%20kendall
- Criteria for Municipal Solid Waste Landfills. 40 CFR §258, Subpart E, Appendices I and II.
- EPA. 2020a. *National Functional Guidelines for Inorganic Superfund Methods Data Review*. EPA-542-R-20-006.
- EPA. 2020b. *National Functional Guidelines for Organic Superfund Methods Data Review*. EPA-540-R-20-005.
- EPA. 2020c. *National Functional Guidelines for High Resolution Superfund Methods Data Review*. EPA 542-R-20-007.
- IDEQ. 2016a. *Consent Order in the Matter of Contamination of Groundwater Near the Fort Hall Municipal Solid Waste Landfill*.
- IDEQ. 2016b. *Compliance Agreement Schedule between Bannock County and the Idaho Department of Environmental Quality*.
- IDWR. 2023. *Injection Well Permit 29W-006-002*.
- Lewis, G.C., and M.A. Fosberg. 1982. “Distribution and character of loess and loess soils in southeastern Idaho.” *Idaho Bureau of Mines and Geology Bulletin* 26, 705–716.
- Maxim. 2003. *Slope Stability Evaluation, Phase 1A Part 4, Fort Hall Canyon Landfill, Bannock County, Idaho*.
- Maxim. 2001. *Preliminary Remedial Design Report, Fort Hall Canyon Landfill, Bannock County, Idaho*.

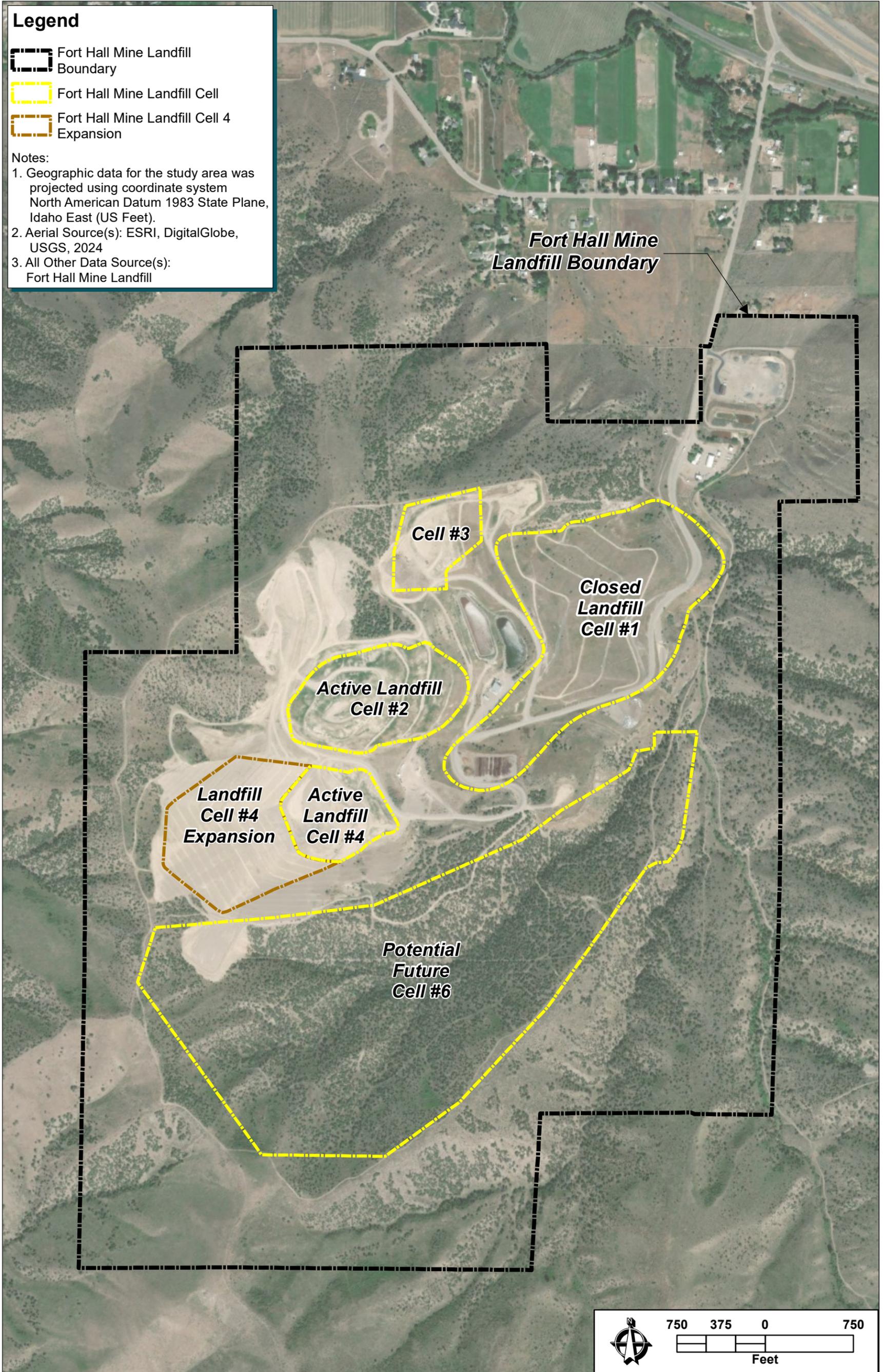
- Maxim. 2000a. *Alternative Liner Demonstration, Phase 1A Part 2, Fort Hall Canyon Landfill, Bannock County, Idaho.*
- Maxim. 2000b. *Final Phase 3 Remedial Investigation Report for the Fort Hall Canyon Landfill Area, Bannock County, Idaho.*
- Paragon. 2017. *Cell 2 Final Cover Demonstrations and Updated Closure/Post-Closure Plan.*
- Paragon. 2015. *Bannock County Solid Waste Department Landfill Gas System Record Drawings (August 2015) Detail Sheet.*
- Rodgers, D.W., S.P. Long, N. McQuarrie, W.D. Burgel, and C.F. Hersley. 2006. *Geologic Map of the Inkom Quadrangle, Bannock County, Idaho.* Idaho State University.
- Trimble, D.E. 1976. *Geology of the Michaud and Pocatello Quadrangles, Bannock and Power Counties, Idaho.* United States Geological Survey, 024-001-02811-5.
- Welhan, J., C. Meehan, and T. Reid. 1996. *The Lower Portneuf River Valley Aquifer: A Geologic/Hydrologic Model and its Implications for Wellhead Protection Strategies, EPA Wellhead Protection Demonstration Project and City of Pocatello Aquifer Geologic Characterization Project.*

Legend

-  Fort Hall Mine Landfill Boundary
-  Fort Hall Mine Landfill Cell
-  Fort Hall Mine Landfill Cell 4 Expansion

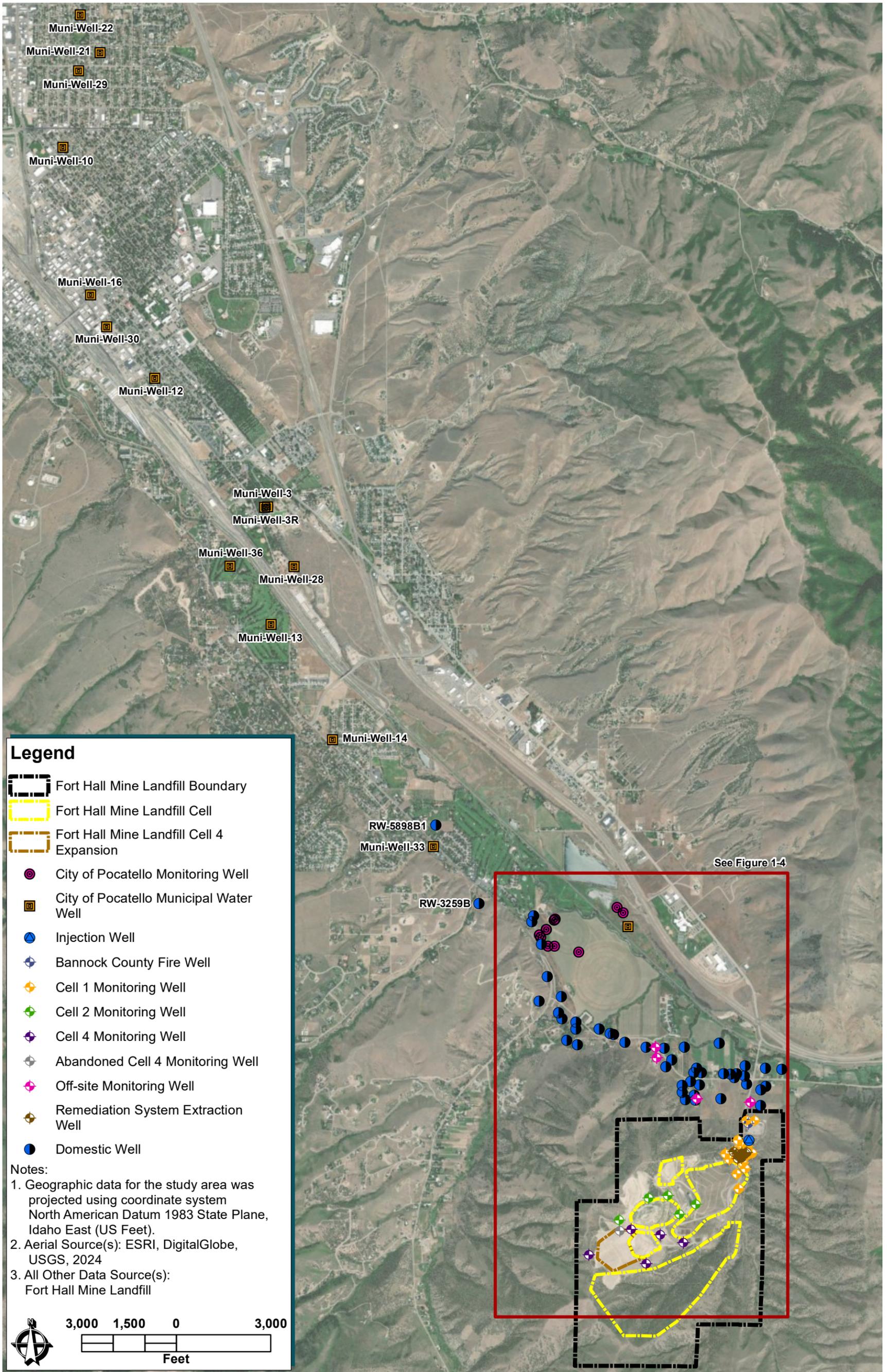
Notes:

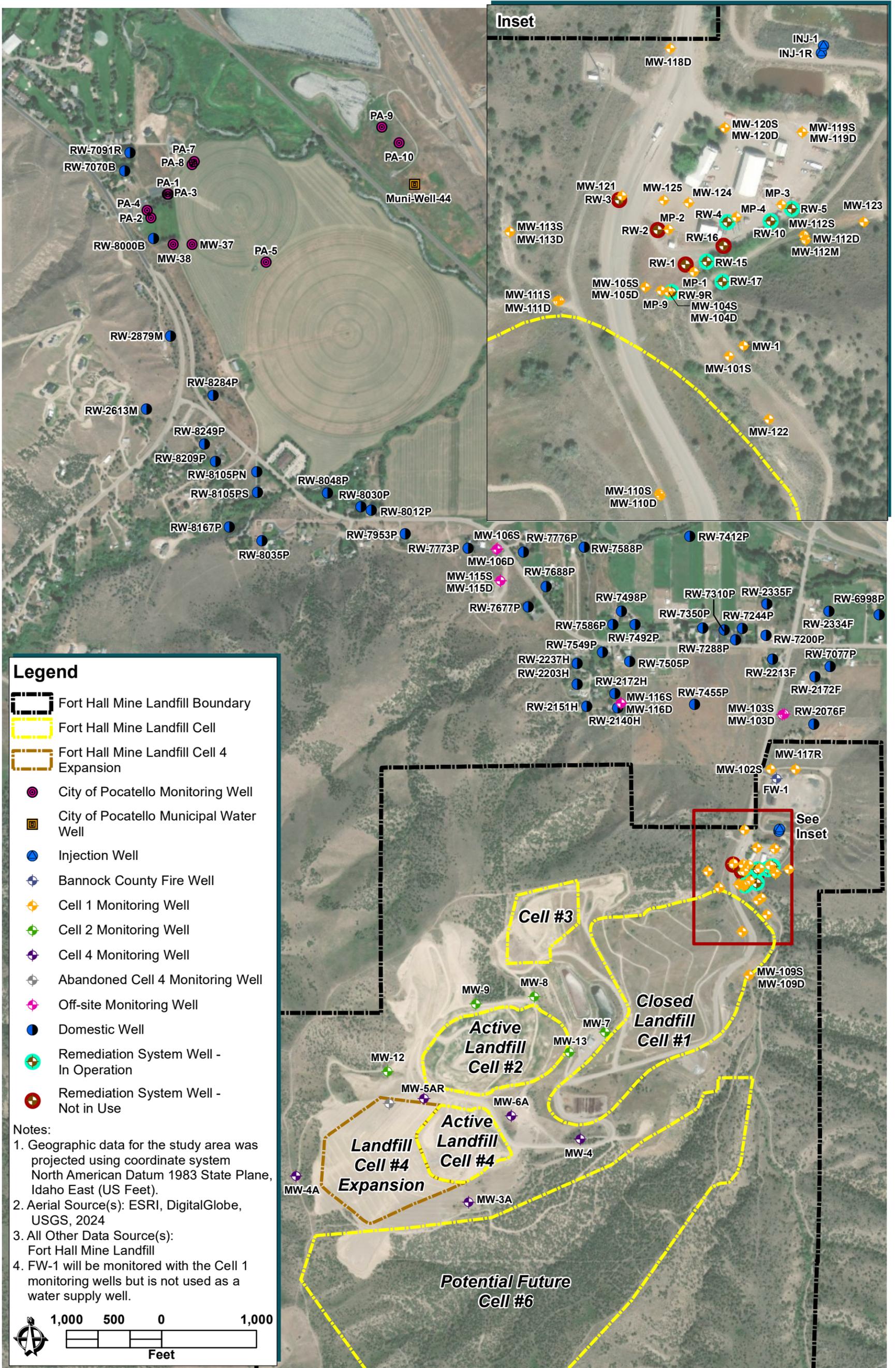
1. Geographic data for the study area was projected using coordinate system North American Datum 1983 State Plane, Idaho East (US Feet).
2. Aerial Source(s): ESRI, DigitalGlobe, USGS, 2024
3. All Other Data Source(s): Fort Hall Mine Landfill



Draft By: K. Scheller Date: 11/11/2024 | Check By: L. Mulrooney Date: 11/12/2024 | Update By: Date: | Backcheck By: Date:





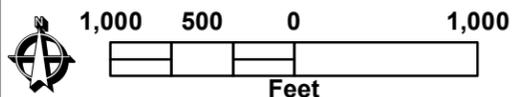


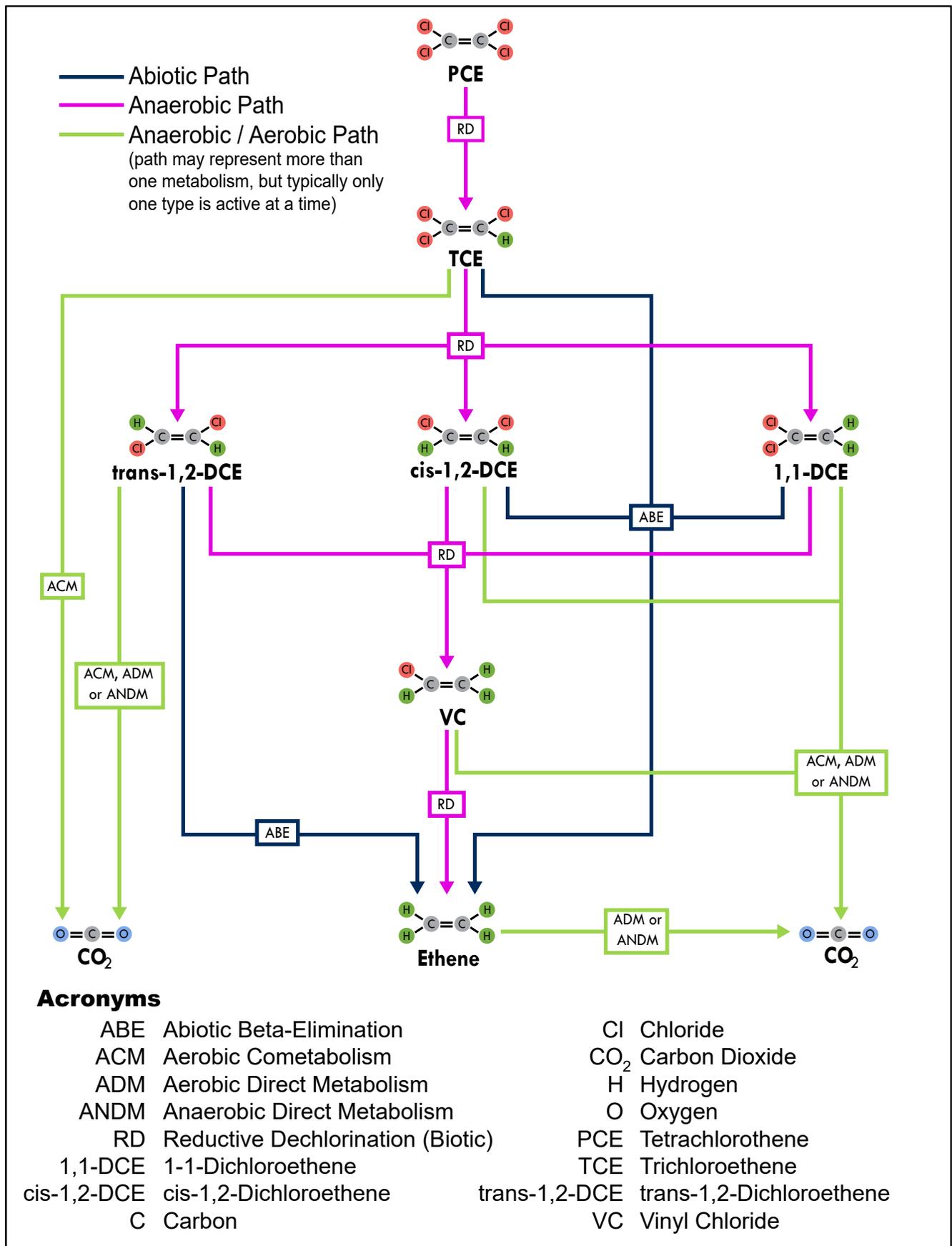
Legend

- Fort Hall Mine Landfill Boundary
- Fort Hall Mine Landfill Cell
- Fort Hall Mine Landfill Cell 4 Expansion
- City of Pocatello Monitoring Well
- City of Pocatello Municipal Water Well
- Injection Well
- Bannock County Fire Well
- Cell 1 Monitoring Well
- Cell 2 Monitoring Well
- Cell 4 Monitoring Well
- Abandoned Cell 4 Monitoring Well
- Off-site Monitoring Well
- Domestic Well
- Remediation System Well - In Operation
- Remediation System Well - Not in Use

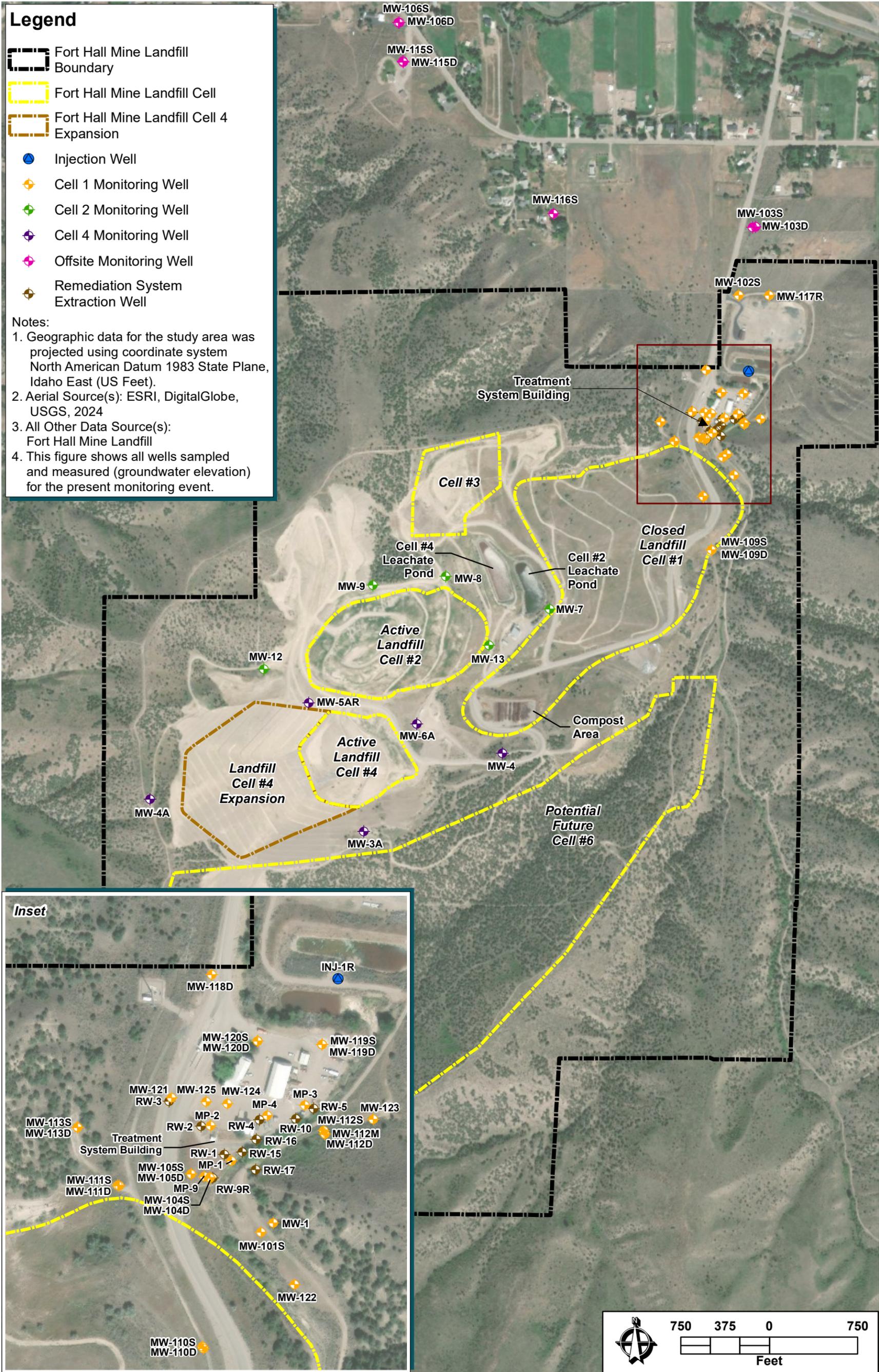
Notes:

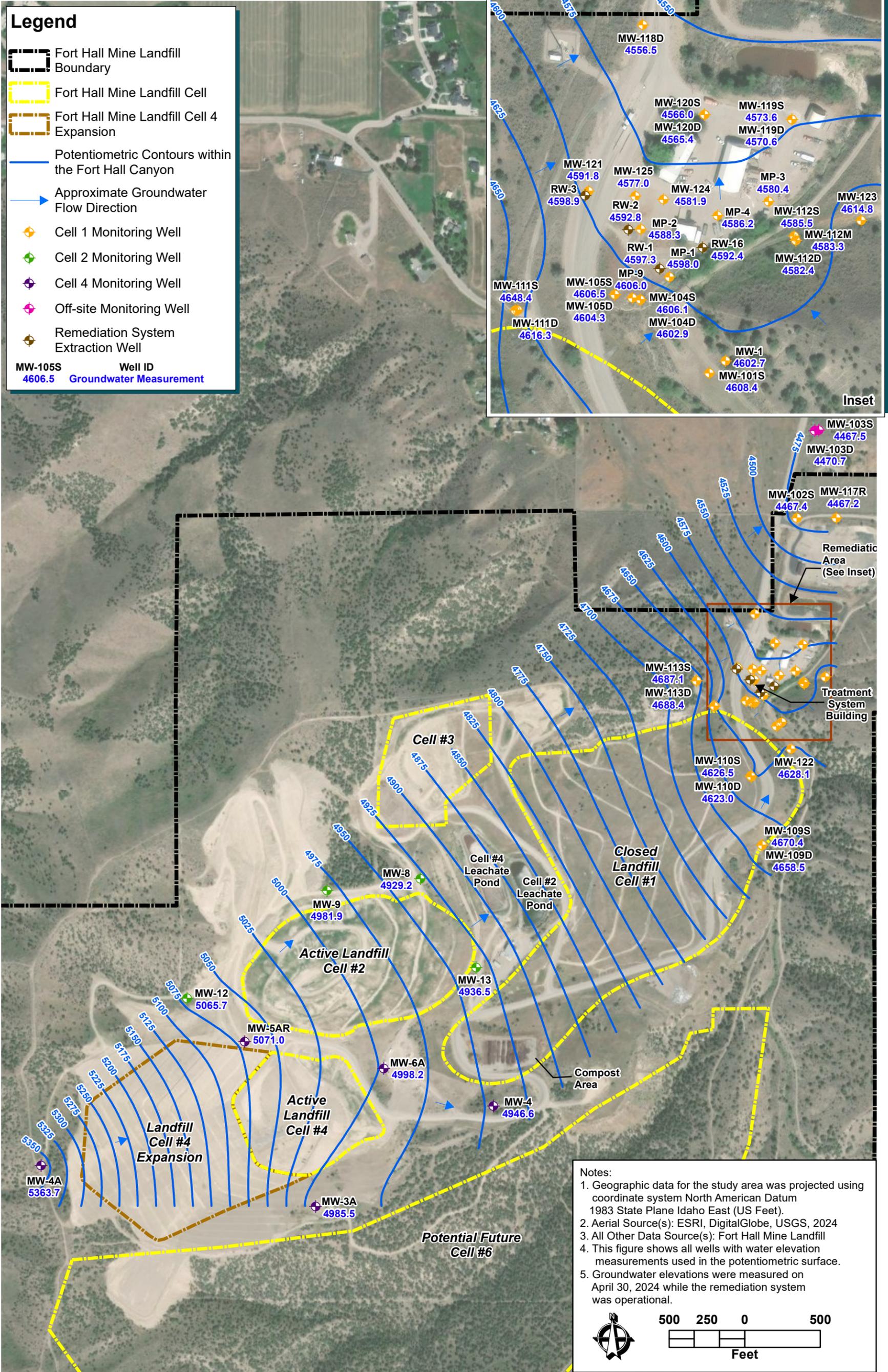
1. Geographic data for the study area was projected using coordinate system North American Datum 1983 State Plane, Idaho East (US Feet).
2. Aerial Source(s): ESRI, DigitalGlobe, USGS, 2024
3. All Other Data Source(s): Fort Hall Mine Landfill
4. FW-1 will be monitored with the Cell 1 monitoring wells but is not used as a water supply well.





Draft By: K. Scheller | Date: 11/11/2024 | Check By: L. Mulrooney | Date: 11/12/2024 | Update By: | Date: | Backcheck By: | Date:





Draft By: K. Scheller Date: 12/19/2024 | Check By: L. Mulrooney Date: 12/20/2024 | Update By: Date: | Backcheck By: Date:



Figure 3.1
Onsite Potentiometric Contour Map

MW-115S	
Date	9/8/2024
PCE	0.4 U
TCE	0.94 J
cis-1,2-DCE	0.32 U
VC	0.23 U

MW-102S	
Date	9/9/2024
PCE	0.58 J
TCE	4.3
cis-1,2-DCE	0.32 U
VC	0.23 U

MW-117R	
Date	9/10/2024
PCE	7.5
TCE	37
cis-1,2-DCE	2.3
VC	0.23 U

MW-103S	
Date	9/9/2024
PCE	0.4 U
TCE	0.3 U
cis-1,2-DCE	0.32 U
VC	0.23 U

MW-116S	
Date	9/8/2024
PCE	1.9
TCE	10
cis-1,2-DCE	0.73 J
VC	0.23 U

RW-2140H	
Date	9/8/2024
PCE	2.6
TCE	16
cis-1,2-DCE	0.6 J
VC	0.23 U

MW-118D	
Date	9/5/2024
PCE	4.6
TCE	34
cis-1,2-DCE	1.8
VC	0.23 U

MW-120S	
Date	9/5/2024
PCE	10
TCE	99
cis-1,2-DCE	20
VC	1.7

MW-120D	
Date	9/4/2024
PCE	11
TCE	150
cis-1,2-DCE	11
VC	1.8

INJ-1R	
Date	9/10/2024
PCE	0.4 U
TCE	0.3 U
cis-1,2-DCE	0.32 U
VC	0.23 U

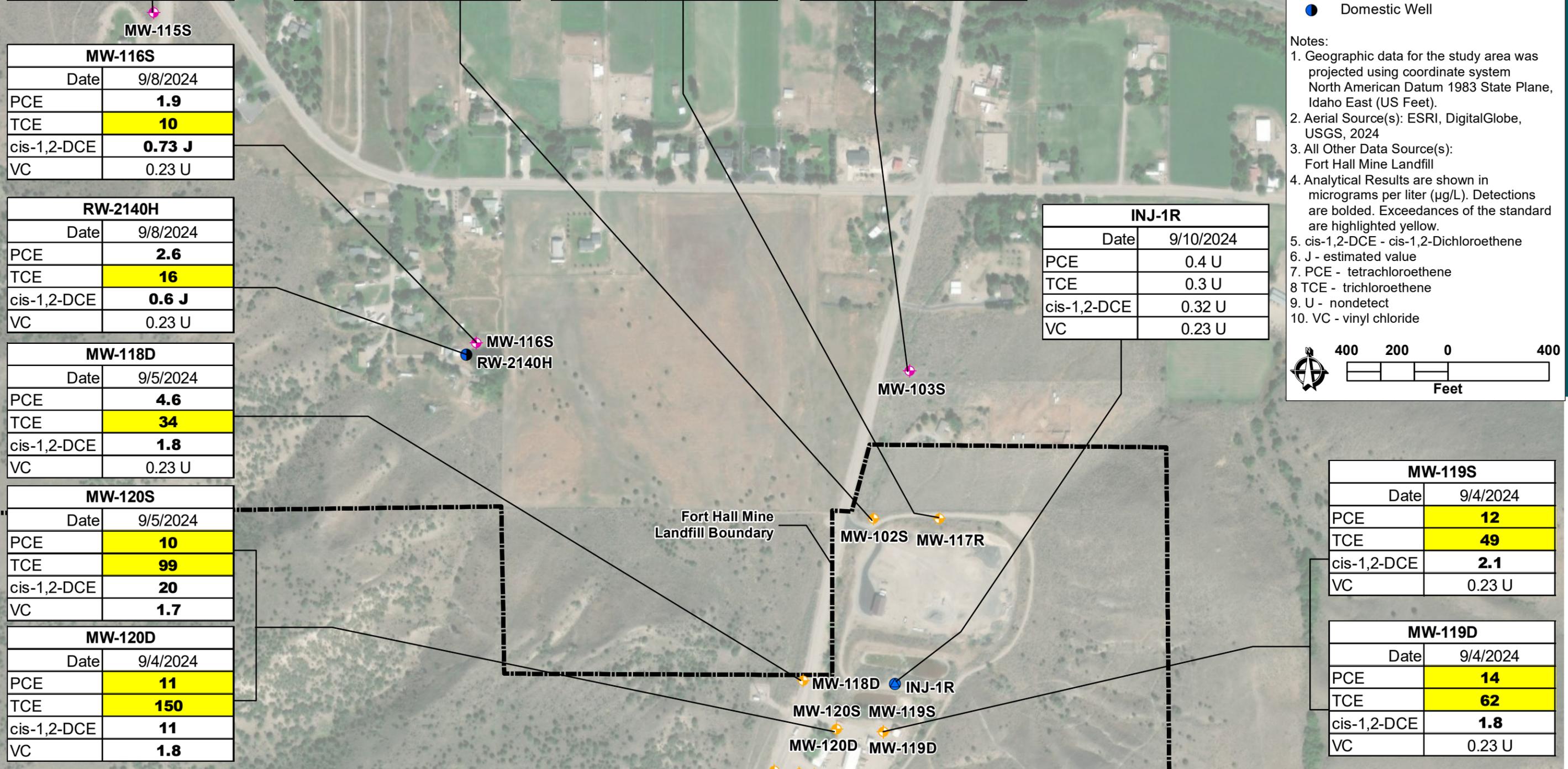
Legend

- Fort Hall Mine Landfill Boundary
- Injection Well
- Cell 1 Monitoring Well
- Off-site Sample Location
- Domestic Well

Notes:

- Geographic data for the study area was projected using coordinate system North American Datum 1983 State Plane, Idaho East (US Feet).
- Aerial Source(s): ESRI, DigitalGlobe, USGS, 2024
- All Other Data Source(s): Fort Hall Mine Landfill
- Analytical Results are shown in micrograms per liter (µg/L). Detections are bolded. Exceedances of the standard are highlighted yellow.
- cis-1,2-DCE - cis-1,2-Dichloroethene
- J - estimated value
- PCE - tetrachloroethene
- TCE - trichloroethene
- U - nondetect
- VC - vinyl chloride

400 200 0 400
Feet

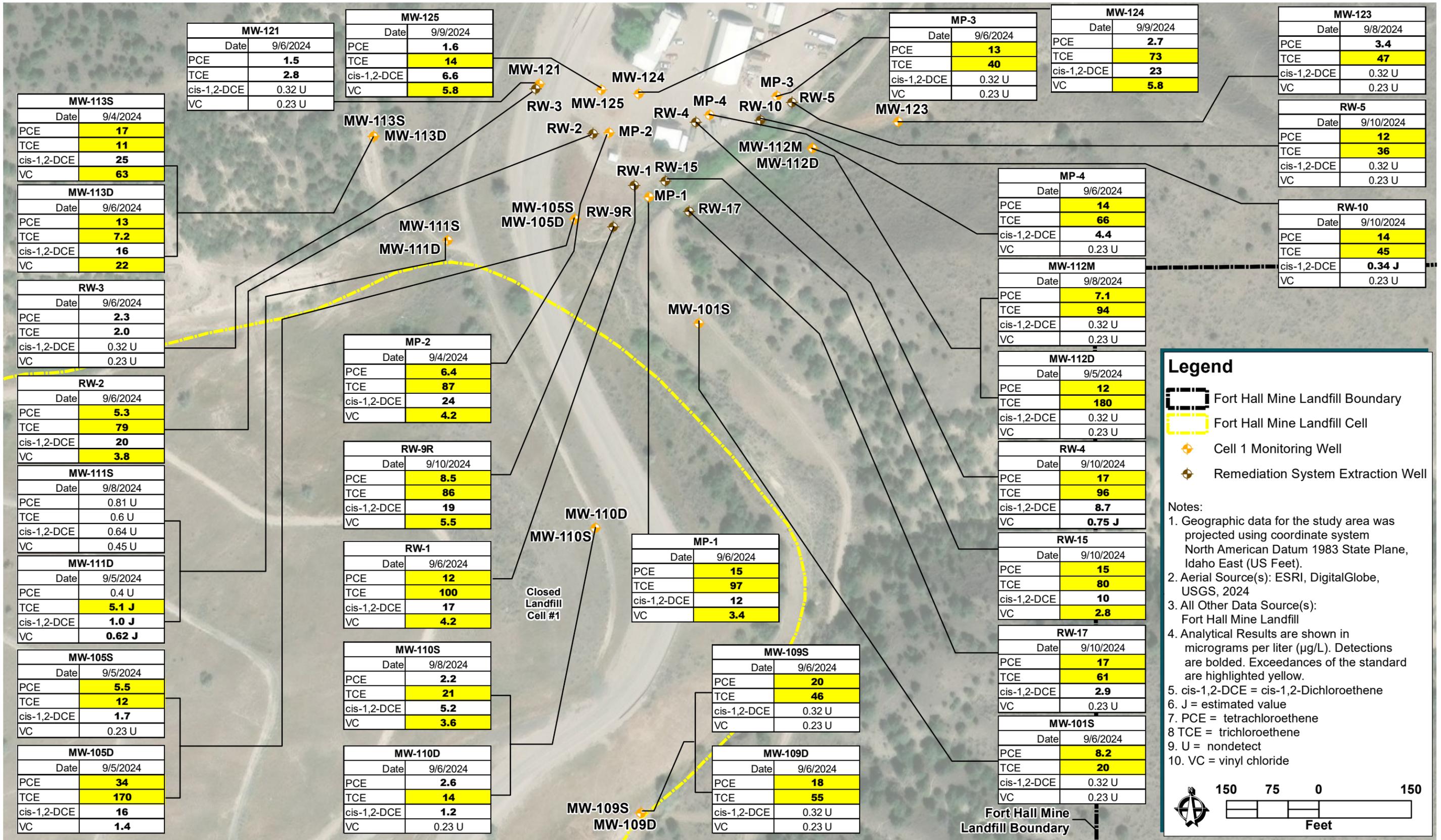


Draft By: K. Scheller | Date: 12/19/2024 | Check By: L. Mulrooney | Date: 12/20/2024 | Update By: | Date: | Backcheck By: | Date:



2024 Fall Semiannual Cell 1, 2 and 4 Groundwater Monitoring and Remediation System Operation and Maintenance Report
Fort Hall Mine Landfill, Bannock County, Idaho

Figure 3.2
Fall 2024 Chlorinated Ethene Results for Cell 1 North and Offsite Wells



Draft By: K. Scheller Date: 12/19/2024 | Check By: LM Date: 12/20/24 | Update By: KS Date: 12/24/24 | Backcheck By: HMR Date: 12/24/24



2024 Fall Semiannual Cell 1, 2 and 4 Groundwater Monitoring and Remediation System Operation and Maintenance Report
Fort Hall Mine Landfill, Bannock County, Idaho

Figure 3.3
Fall 2024 Chlorinated Ethene Results
for Cell 1 South

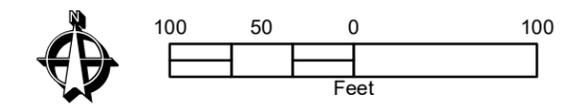
Legend

-  Fort Hall Mine Landfill Boundary
-  Fort Hall Mine Landfill Cell
-  Cell 1 Monitoring Well
-  Injection Well - In Operation
-  Cell 1 Observation Well
-  Remediation System Well - In Operation
-  Remediation System Well - Not in Use



Notes:

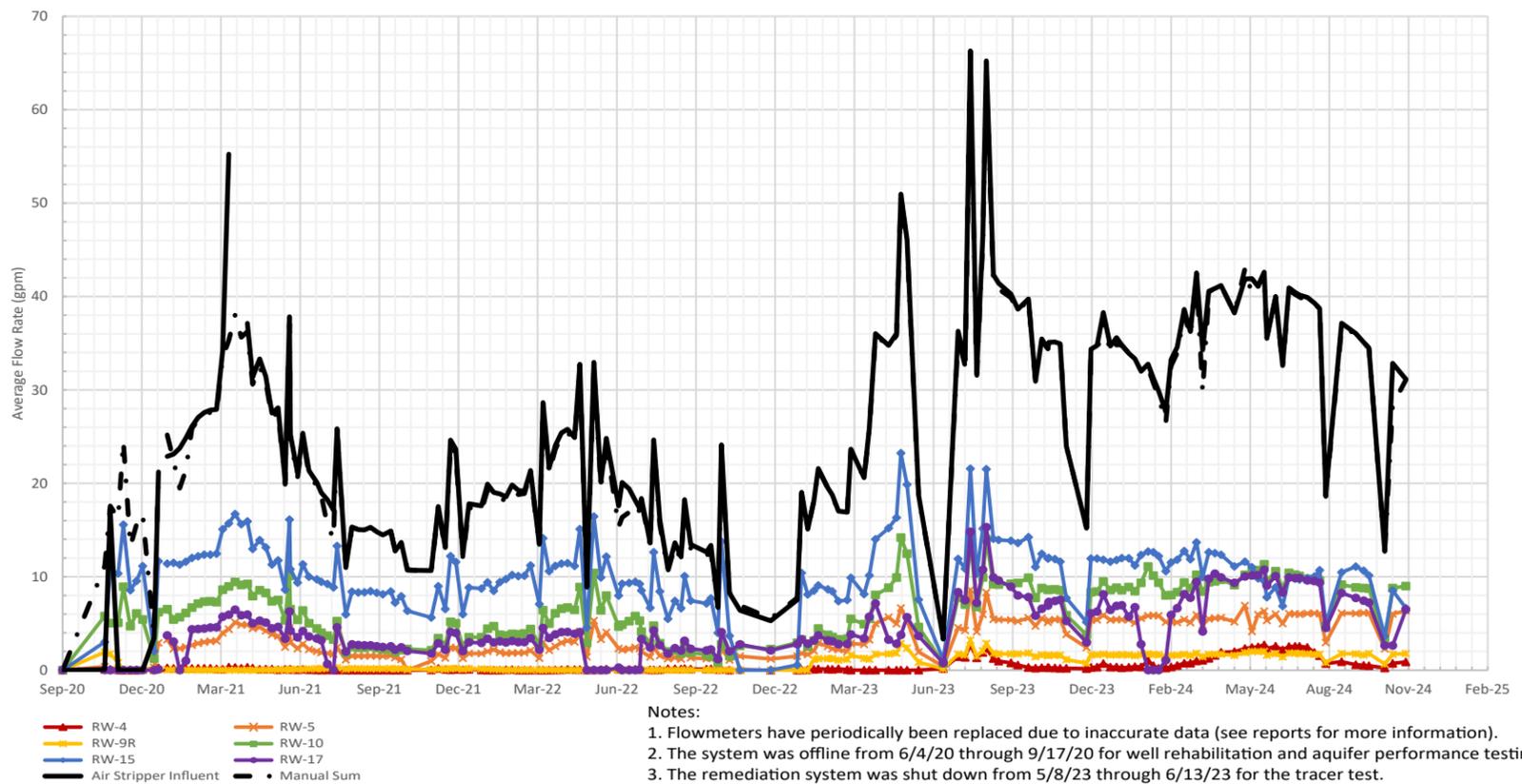
1. Geographic data for the study area was projected using coordinate system North American Datum 1983 State Plane Idaho East (US Feet).
2. Aerial Source(s): ESRI, DigitalGlobe, USGS, 2024
3. All Other Data Source(s): Fort Hall Mine Landfill
4. FHML - Fort Hall Mine Landfill



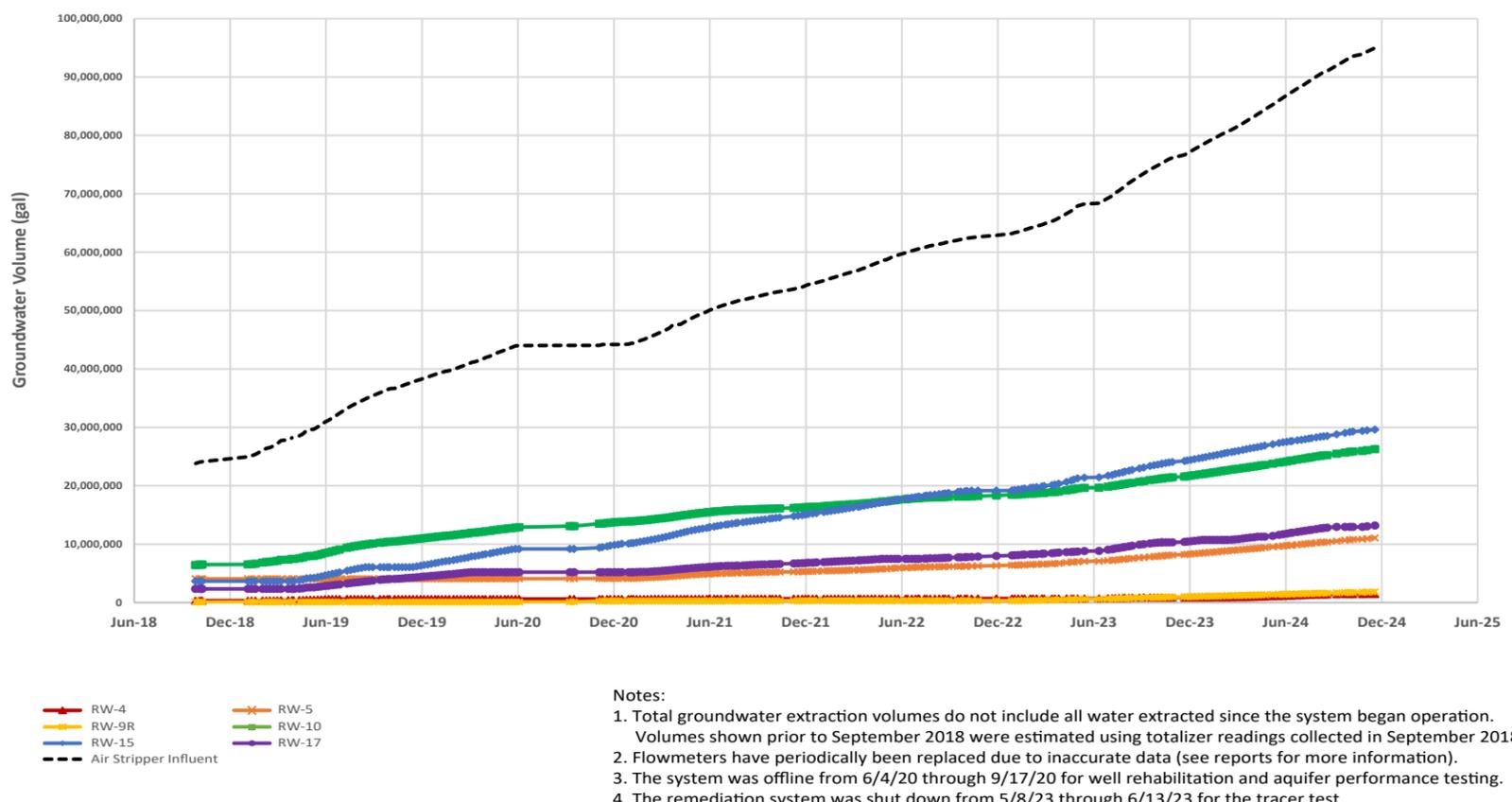
Draft By: K. Scheller | Date: 12/19/2024 | Check By: L. Mulrooney | Date: 12/23/2024 | Update By: | Date: | Backcheck By: | Date:



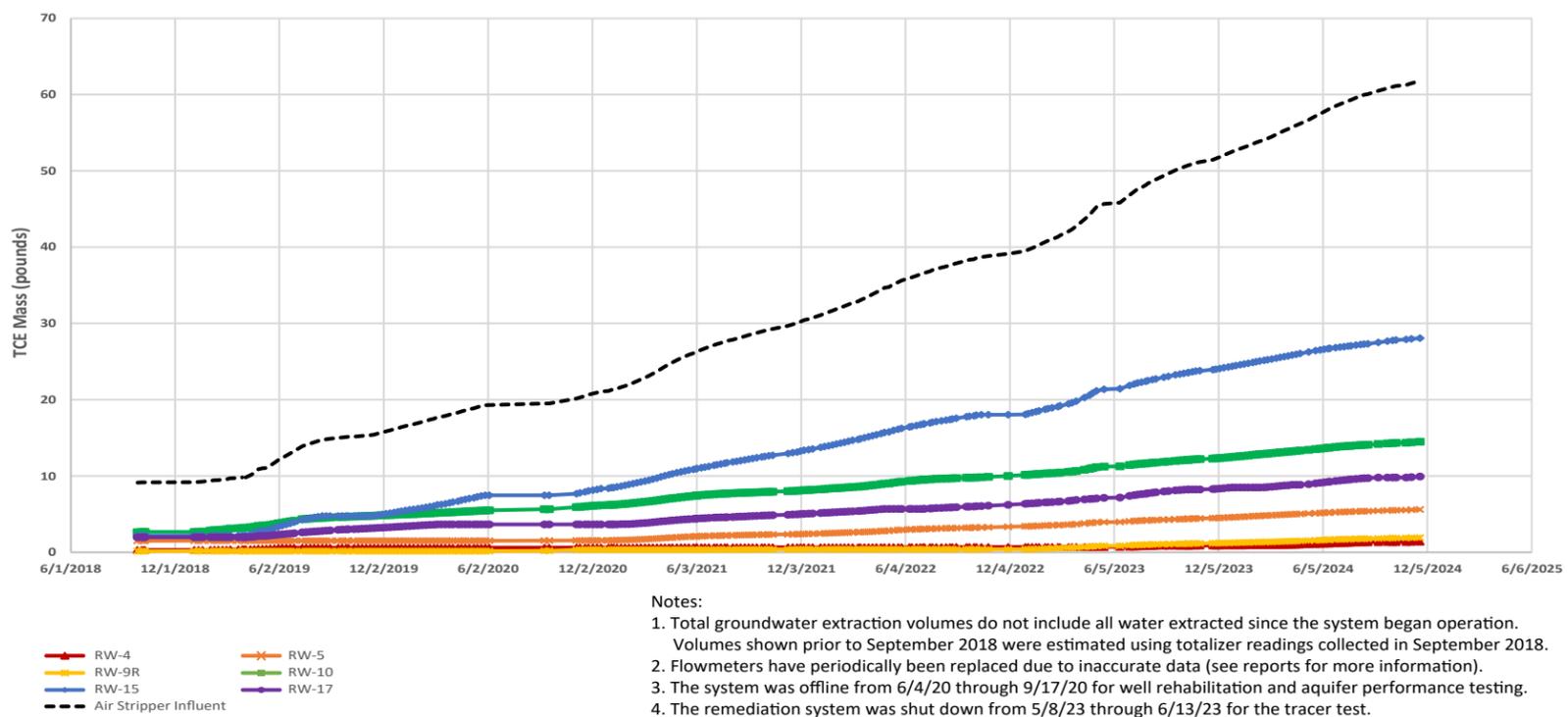
Panel A - Average Groundwater Extraction Flow Rates



Panel B - Cumulative Groundwater Extracted



Panel C - Cumulative Trichloroethene Mass Extracted



Draft By: K. Scheller | Date: 12/19/2024 | Check By: C. Scheil | Date: 12/20/2024 | Update By: | Date: | Backcheck By: | Date:

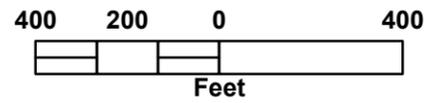


Legend

-  Fort Hall Mine Landfill Boundary
-  Fort Hall Mine Landfill Cell
-  Fort Hall Mine Landfill Cell 4 Expansion
-  Cell 2 Monitoring Well
-  Cell 4 Monitoring Well

Notes:

1. Geographic data for the study area was projected using coordinate system North American Datum 1983 State Plane, Idaho East (US Feet).
2. Aerial Source(s): ESRI, DigitalGlobe, USGS, 2024
3. All Other Data Source(s): Fort Hall Mine Landfill
4. Analytical Results are shown in micrograms per liter (µg/L). Detections are bolded. Exceedances of the standard are highlighted yellow.
5. cis-1,2-DCE - cis-1,2-dichloroethene
6. J - estimated value
7. PCE - tetrachloroethene
8. TCE - trichloroethene
9. U - nondetect
10. VC - vinyl chloride



MW-9	
Date	9/9/2024
PCE	0.4 U
TCE	0.3 U
cis-1,2-DCE	0.32 U
VC	0.72 J

MW-12	
Date	9/4/2024
PCE	0.4 U
TCE	0.3 U
cis-1,2-DCE	0.32 U
VC	0.23 U

MW-8	
Date	9/6/2024
PCE	0.4 U
TCE	0.3 U
cis-1,2-DCE	0.32 U
VC	0.23 U

MW-13	
Date	9/8/2024
PCE	0.4 U
TCE	0.3 U
cis-1,2-DCE	1.3
VC	0.23 U

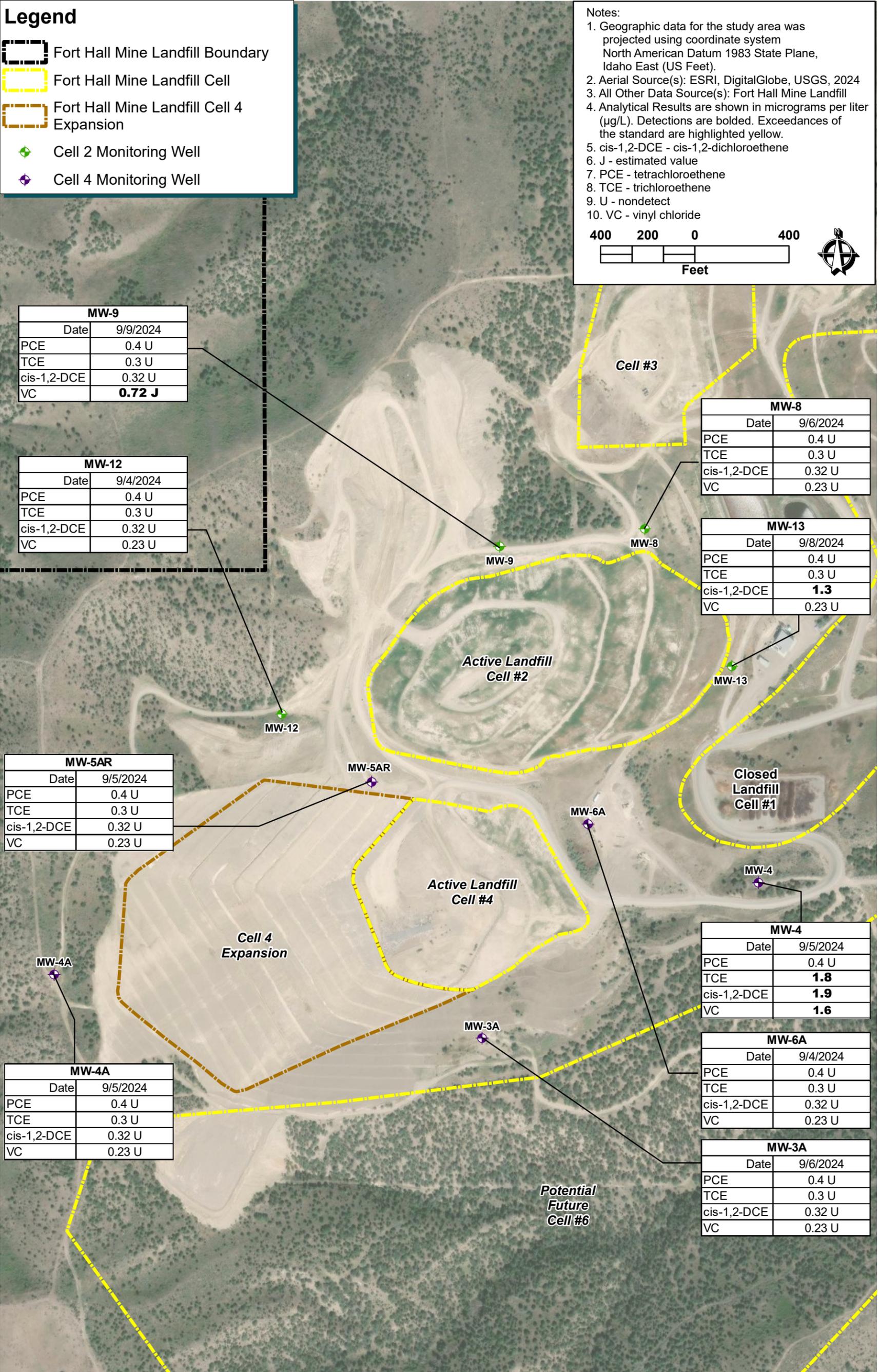
MW-5AR	
Date	9/5/2024
PCE	0.4 U
TCE	0.3 U
cis-1,2-DCE	0.32 U
VC	0.23 U

MW-4	
Date	9/5/2024
PCE	0.4 U
TCE	1.8
cis-1,2-DCE	1.9
VC	1.6

MW-6A	
Date	9/4/2024
PCE	0.4 U
TCE	0.3 U
cis-1,2-DCE	0.32 U
VC	0.23 U

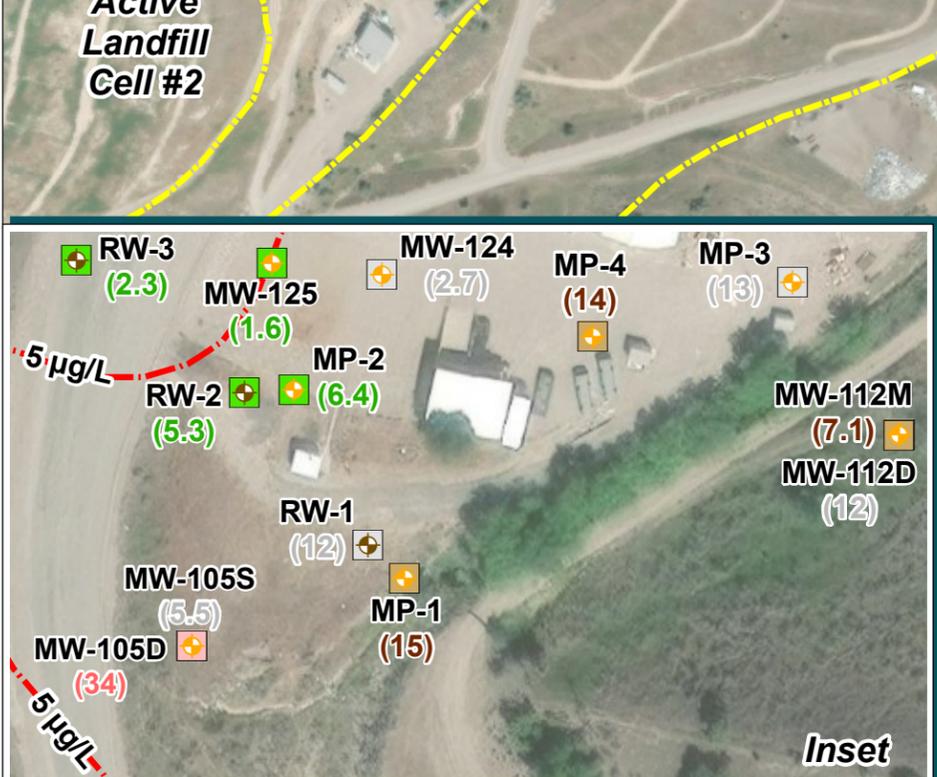
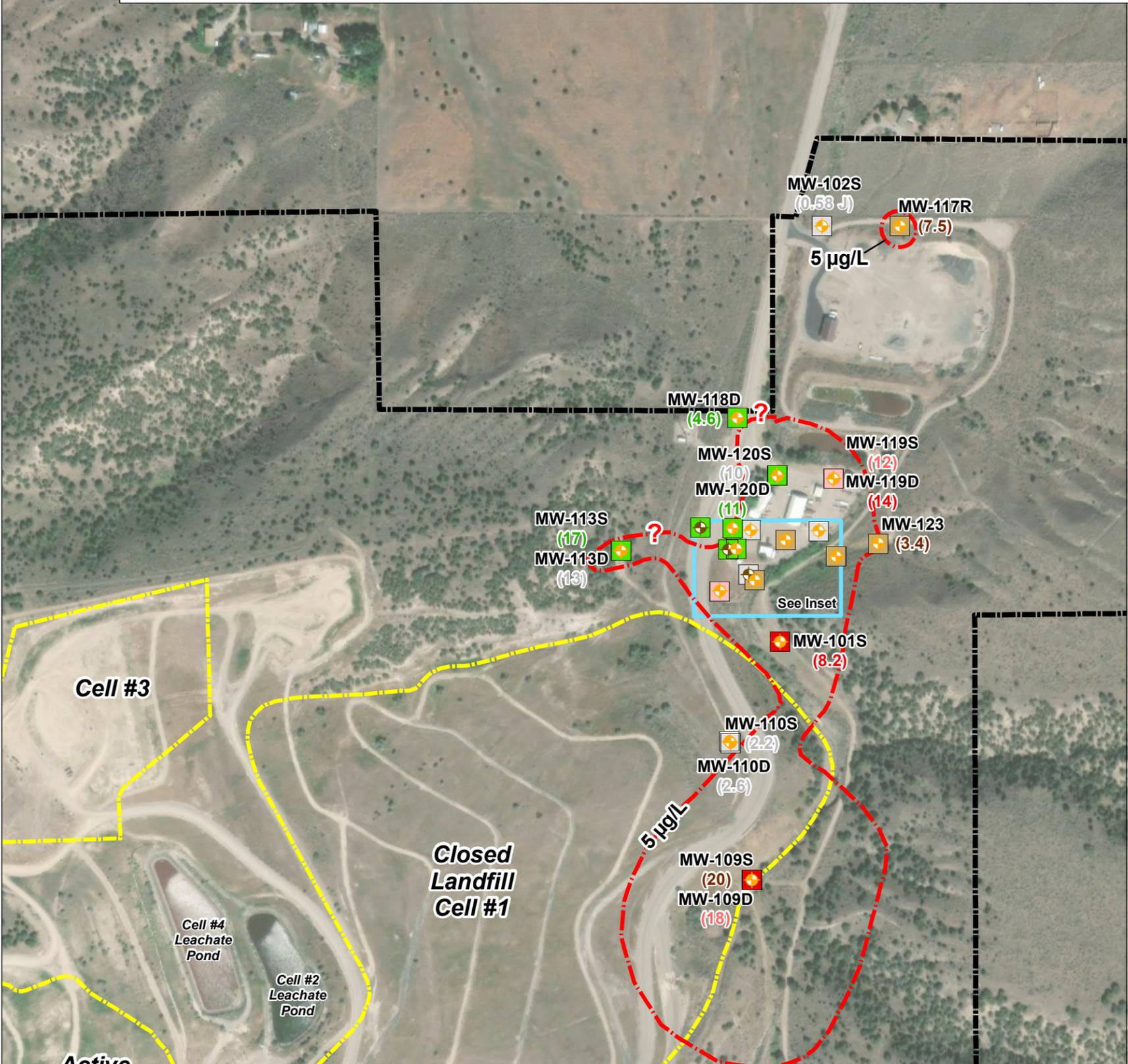
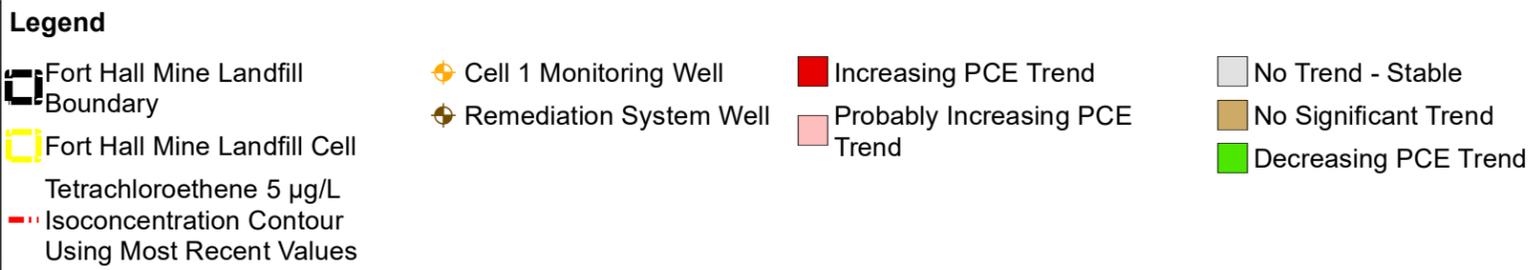
MW-4A	
Date	9/5/2024
PCE	0.4 U
TCE	0.3 U
cis-1,2-DCE	0.32 U
VC	0.23 U

MW-3A	
Date	9/6/2024
PCE	0.4 U
TCE	0.3 U
cis-1,2-DCE	0.32 U
VC	0.23 U



Draft By: K. Scheller Date: 12/19/2024 | Check By: L. Mulrooney Date: 12/23/2024 | Update By: _____ Date: _____ | Backcheck By: _____ Date: _____



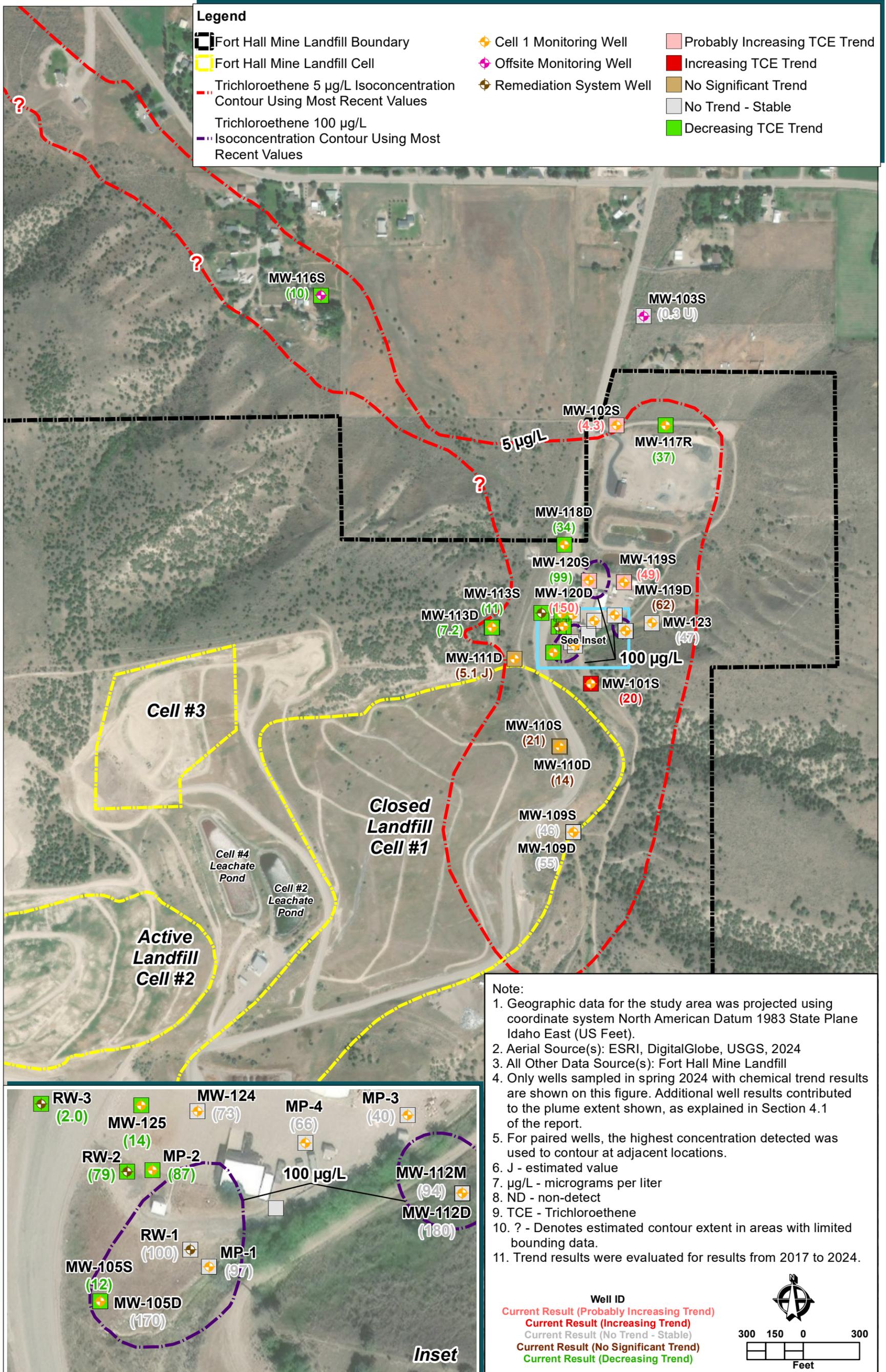


Note:

- Geographic data for the study area was projected using coordinate system North American Datum 1983 State Plane Idaho East (US Feet).
- Aerial Source(s): ESRI, DigitalGlobe, USGS, 2024
- All Other Data Source(s): Fort Hall Mine Landfill
- Only wells sampled in spring 2024 with chemical trend results are shown on this figure. Additional well results contributed to the plume extent shown, as explained in Section 4.1 of the report.
- For paired wells, the highest concentration detected was used to contour at adjacent locations.
- J - estimated value
- µg/L - micrograms per liter
- ND - non-detect
- PCE - Tetrachloroethene
- ? - Denotes estimated contour extent in areas with limited bounding data.
- Trend results were evaluated for results from 2017 to 2024.

Well ID
Current Result (Probably Increasing Trend)
Current Result (Increasing Trend)
Current Result (No Trend - Stable)
Current Result (No Significant Trend)
Current Result (Probably Decreasing Trend)
Current Result (Decreasing Trend)

200 100 0 200
Feet



Draft By: K. Scheller Date: 12/20/2024 | Check By: H. Rolston Date: 01/07/2025 | Update By: K. Scheller Date: 01/07/2025 | Backcheck By: L. Mulrooney Date: 01/07/2025

**Table 2.1
Summary of Sample Locations and Analysis Fall 2024**

Location Group	Location	Sampling Approach	Water Levels	Field parameters ¹	Appendix II RCRA Subtitle D Parameters												
					Appendix I				Additional Appendix II								
					water quality meter	VOCs			Total metals	SVOCs		O/C Pest ²	O/P Pest	Chlor Herb	PCBs ²	Dioxin/Furan	Mercury
	8260D	8260D unpreserved	8011	6020B/6010C	8270E	8270E SIM	8081B	8141B	8321B	8082A	8290A	7470A	SM4500-CN-E	SM 4500S-2			
Cell 1	MP-1	Passive	X	X	X												
Cell 1	MP-2	Portable Pump	X	X	X												
Cell 1	MP-3	Passive	X	X	X												
Cell 1	MP-4	Passive	X	X	X												
Cell 1	MP-9	NA	X														
Cell 1	MW-1	NA	X														
Cell 1	MW-101S	Passive	X	X	X												
Cell 1	MW-102S	Dedicated	X	X	X												
Cell 1	MW-104D	NA	X														
Cell 1	MW-104S	NA	X														
Cell 1	MW-105D	Dedicated	X	X		X											
Cell 1	MW-105S	Dedicated	X	X		X											
Cell 1	MW-109D	Passive	X	X	X												
Cell 1	MW-109S	Passive	X	X	X												
Cell 1	MW-110D	Passive	X	X	X												
Cell 1	MW-110S	Passive	X	X	X												
Cell 1	MW-111D	Dedicated	X	X		X											
Cell 1	MW-111S	Passive	X	X		X											
Cell 1	MW-112D	Dedicated	X	X	X												
Cell 1	MW-112M	Passive	X	X	X												
Cell 1	MW-112S	Bail (If Not DRY)	X														
Cell 1	MW-113D	Passive	X	X	X												
Cell 1	MW-113S	Dedicated	X	X	X												
Cell 1	MW-117R	Passive	X	X	X												
Cell 1	MW-118D	Dedicated	X	X	X												
Cell 1	MW-119D	Dedicated	X	X	X												
Cell 1	MW-119S	Dedicated	X	X	X												
Cell 1	MW-120D	Dedicated	X	X	X												
Cell 1	MW-120S	Dedicated	X	X	X												
Cell 1	MW-121	Portable Pump	X	X	X			X									
Cell 1	MW-122	Bail (If Not DRY)	X														
Cell 1	MW-123	Passive	X	X	X												
Cell 1	MW-124	Portable Pump	X	X	X												
Cell 1	MW-125	Portable Pump	X	X	X												
Cell 1	RW-1	Passive	X	X	X												
Cell 1	RW-16	NA	X														
Cell 1	RW-2	Portable Pump	X	X	X												
Cell 1	RW-3	Passive	X	X	X												
Cell 2	MW-12	Dedicated	X	X	X		X	X	X	X	X	X	X	X	X	X	X
Cell 2	MW-13	Dedicated	X	X	X		X	X	X	X	X	X	X	X	X	X	X
Cell 2	MW-7	NA	X														
Cell 2	MW-8	Dedicated	X	X	X		X	X	X	X	X	X	X	X	X	X	X
Cell 2	MW-9	Dedicated	X	X	X		X	X	X	X	X	X	X	X	X	X	X
Cell 4	MW-3A	Dedicated	X	X	X		X	X									
Cell 4	MW-4	Dedicated	X	X	X		X	X									
Cell 4	MW-4A	Dedicated	X	X	X		X	X									
Cell 4	MW-5AR	Dedicated	X	X	X		X	X									
Cell 4	MW-6A	Dedicated	X	X	X		X	X									
Offsite	MW-103D	NA	X														
Offsite	MW-103S	Dedicated	X	X	X												

**Table 2.1
Summary of Sample Locations and Analysis Fall 2024**

Location Group	Location	Sampling Approach	Water Levels	Field parameters ¹	Appendix II RCRA Subtitle D Parameters												
					Appendix I				Additional Appendix II								
					VOCs			Total metals	SVOCs		O/C Pest ²	O/P Pest	Chlor Herb	PCBs ²	Dioxin/Furan	Mercury	Cyanide
water quality meter	8260D	8260D unpreserved	8011	6020B/6010C	8270E	8270E SIM	8081B	8141B	8321B	8082A	8290A	7470A	SM4500-CN-E	SM 4500S-2			
Offsite	MW-106D	NA	X														
Offsite	MW-106S	NA	X														
Offsite	MW-115D	NA	X														
Offsite	MW-115S	Passive	X	X	X												
Offsite	MW-116D	NA															
Offsite	MW-116S	Portable Pump		X	X												
RSE	RW-10	Tap		X	X												
RSE	RW-15	Tap		X	X												
RSE	RW-17	Tap		X	X												
RSE	RW-4	Tap		X	X												
RSE	RW-5	Tap		X	X												
RSE	RW-9R	Tap		X	X												
System Effluent*	INJ-1R	Tap			X		X	X	X	X	X	X	X	X	X	X	X

Notes
Parameters specified for analysis are for routine monitoring and may not include those analyzed for pilot or tracer study monitoring.
* INJ-1R will also be sampled for VOCs (8260D) in the winter and summer
¹ Field parameters include pH, oxidation reduction potential, turbidity, dissolved oxygen, specific conductivity, and temperature
² PCBs and O/C Pest are collected in the same bottle
³ Anions include sulfate, chloride, and bromide

Acronyms and Abbreviations
Chlor Herb = chlorinated herbicides
Herb = herbicide
O/C = organochlorine
O/P = organophosphate
PCBs = polychlorinated biphenyls
Pest = pesticide
RCRA = Resource Conservation and Recovery Act
RSE = remediation system extraction
SVOCs = semivolatile organic compounds
VOCs = volatile organic compounds

**Table 2.2
Well Construction Summary**

Location						Construction					Sampling - General		Low-Flow Sampling Calculations		
Well Group	Well ID	Geologic Zone of Screened Interval	Easting (x-coordinate)	Northing (y-coordinate)	Elevation (ft msl)	Casing Elevation (ft msl)	Stickup Height (ft)	Screen Start (ft bgs)	Screen End (ft bgs)	Well Diameter (inches)	Sample Type	Target Sample Depth (ft btoc)	Allowable Drawdown (ft)	Sample Tubing Diameter (in)	Minimum Purge Volume (gal)
Cell 1	FW-1	Alluvium	603045.45	409431.82	4605.13	4607.50	2.37	200	430	6	NA	315	0.1	0.25	NA
Cell 1	MP-1	Starlight	602761.69	408352.38	4654.48	4656.68	2.20	60	100	4	Passive	83.5	0.3	0.25	NA
Cell 1	MP-2	Both	602701.14	408455.07	4653.60	4655.17	1.57	50	90	4	Passive	70	0.3	0.25	NA
Cell 1	MP-3	Starlight	602977.01	408513.44	4643.72	4643.23	-0.49	60	100	4	Passive	80.8	0.3	0.25	NA
Cell 1	MP-4	Starlight	602866.15	408483.99	4646.10	4645.64	-0.46	60	100	4	Passive	80.8	0.3	0.25	NA
Cell 1	MP-9	NA	602681.26	408307.11	4659.98	4663.05	3.07	65	70	2	NA	68	0.1	0.25	NA
Cell 1	MW-1	Shallow Starlight	602884.14	408171.01	4662.04	4664.90	2.86	77	97	--	NA	87	0.1	0.25	NA
Cell 1	MW-101S	Overburden	602849.09	408144.91	4664.25	4666.40	2.15	55	75	4	Passive	68.4	0.1	0.25	NA
Cell 1	MW-102S	Overburden	602985.40	409527.94	4591.95	4594.20	2.25	125	145	4	Dedicated Pump	136	0.1	0.25	1.2
Cell 1	MW-104D	Starlight	602701.80	408302.41	4659.09	4660.08	0.99	79	89	2	NA	84	0.1	0.25	NA
Cell 1	MW-104S	Overburden	602701.58	408302.37	4659.41	4660.22	0.81	47	67	2	NA	57	0.1	0.25	NA
Cell 1	MW-105D	Starlight	602648.19	408312.73	4661.94	4662.60	0.66	72	82	2	Dedicated Pump	77	2.0	0.25	1.0
Cell 1	MW-105S	Overburden	602647.98	408312.75	4661.76	4662.60	0.84	45	65	2	Dedicated Pump	55	0.1	0.25	0.5
Cell 1	MW-109D	Starlight	602755.03	407352.69	4717.98	4719.60	1.62	75	95	2	Passive	87.9	2.0	0.25	NA
Cell 1	MW-109S	Overburden	602754.98	407352.97	4717.64	4719.70	2.06	42	62	2	Passive	58.8	0.1	0.25	NA
Cell 1	MW-110D	Starlight	602682.88	407809.65	4745.80	4747.83	2.03	154	159	2	Passive	159.8	2.0	0.25	NA
Cell 1	MW-110S	Starlight	602679.68	407814.61	4745.53	4747.19	1.66	107.5	127.5	2	Passive	129.2	0.1	0.25	NA
Cell 1	MW-111D	Starlight	602441.43	408278.97	4697.63	4699.10	1.47	104	124	2	Dedicated Pump	114	2.0	0.25	1.2
Cell 1	MW-111S	Starlight	602436.53	408279.31	4697.17	4699.40	2.23	54	74	2	Passive	64	0.1	0.25	NA
Cell 1	MW-112D	Starlight	603032.31	408428.91	4646.29	4648.21	1.92	93	103	2	Dedicated Pump	95	2.0	0.25	1.1
Cell 1	MW-112M	Shallow Starlight	603032.11	408428.81	4646.66	4648.22	1.56	66	76	2	Passive	73.8	1.0	0.25	NA
Cell 1	MW-112S	Shallow Starlight	603028.35	408438.57	4645.94	4647.52	1.58	41	61	2	NA	51	0.1	0.25	NA
Cell 1	MW-113D	Starlight	602319.67	408447.93	4709.59	4711.71	2.12	115	135	2	Passive	128.4	1.0	0.25	NA
Cell 1	MW-113S	Starlight	602319.75	408447.84	4709.70	4711.58	1.88	74	94	2	Dedicated Pump	82	3.0	0.25	1.2
Cell 1	MW-117R	Shallow Starlight	603245.33	409527.52	4580.47	4583.10	2.63	113	123	2	Passive	118	0.1	0.25	NA
Cell 1	MW-118D	Starlight	602707.80	408888.74	4640.08	4641.50	1.42	82	102	2	Dedicated Pump	88	0.1	0.25	0.7
Cell 1	MW-119D	Starlight	603024.86	408687.13	4639.85	4641.50	1.65	90	100	2	Dedicated Pump	92	1.0	0.25	0.9
Cell 1	MW-119S	Shallow Starlight	603024.89	408687.06	4639.82	4641.10	1.28	70	80	2	Dedicated Pump	72	0.3	0.25	0.6
Cell 1	MW-120D	Shallow Starlight	602838.95	408697.20	4642.45	4643.50	1.05	90	100	2	Dedicated Pump	92	0.3	0.25	0.8
Cell 1	MW-120S	Starlight	602838.70	408697.16	4642.42	4643.50	1.08	70	80	2	Dedicated Pump	79	0.1	0.25	0.7
Cell 1	MW-121	Starlight	602592.09	408533.57	4651.78	4651.50	-0.28	67	87	2	NA	77	0.1	0.25	NA
Cell 1	MW-122	Starlight	602945.48	407993.05	4675.92	4679.06	3.14	38	48	4	Bail (If Not DRY)	43	0.1	0.25	0.4
Cell 1	MW-123	Alluvium	603172.68	408470.89	4651.04	4653.68	2.64	67.3	71.3	4	Passive	73.9	0.1	0.25	NA
Cell 1	MW-124	Starlight	602759.92	408518.61	4645.97	4645.29	-0.68	60	90	6	Passive	75	0.1	0.25	NA
Cell 1	MW-125	Starlight	602694.76	408523.14	4647.08	4646.43	-0.65	60	90	4	Passive	75	0.1	0.25	NA
Cell 1	RW-1	Alluvium	602744.15	408367.93	4654.27	4655.40	1.13	60	100	6	Passive	80	0.1	0.25	NA
Cell 1	RW-16	Both	602835.21	408412.40	4651.23	4653.50	2.27	43	103	6	Passive	73	0.1	0.25	NA
Cell 1	RW-2	Starlight	602676.91	408451.36	4653.81	4655.23	1.42	70	90	6	Passive	80	0.1	0.25	NA
Cell 1	RW-3	Starlight	602585.05	408523.94	4653.23	4652.61	-0.62	50	90	6	Passive	70	0.1	0.25	NA
Cell 2	MW-12	Alluvium	598951.47	406337.29	5225.05	5227.80	2.75	168.5	208.5	4	Dedicated Pump	189	1.0	0.25	2.1
Cell 2	MW-13	Alluvium	600863.67	406542.90	5008.62	5010.70	2.08	157	177	2	Dedicated Pump	167	2.5	0.25	1.7
Cell 2	MW-7	Alluvium	601380.90	406847.70	4953.16	4953.90	0.74	169.5	189.5	4	NA	NA	NA	NA	NA
Cell 2	MW-8	Alluvium	600494.07	407129.37	5121.20	5123.00	1.80	189.5	229.5	4	Dedicated Pump	210	0.4	0.25	1.9
Cell 2	MW-9	Alluvium	599877.48	407052.69	5191.52	5193.50	1.98	229.5	269.5	4	Dedicated Pump	250	2.0	0.25	3.3
Cell 4	MW-3A	Alluvium	599802.12	404955.76	5265.23	5267.90	2.67	379	399	4	Dedicated Pump	389	4.0	0.25	5.6
Cell 4	MW-4	Alluvium	600977.01	405619.70	5074.22	5075.90	1.68	141	181	4	Dedicated Pump	161	1.0	0.25	1.9
Cell 4	MW-4A	Starlight	597985.08	405227.62	5502.49	5505.20	2.71	179	199	4	Dedicated Pump	189	0.3	0.25	1.7
Cell 4	MW-5AR	Alluvium	599343.78	406055.29	5223.36	5225.83	2.47	195	215	4	Dedicated Pump	205	0.5	0.25	1.9
Cell 4	MW-6A	Alluvium	600252.50	405869.49	5084.57	5088.00	3.43	145.4	165.4	4	Dedicated Pump	155	2.5	0.25	2.9

**Table 2.2
Well Construction Summary**

Location						Construction					Sampling - General		Low-Flow Sampling Calculations		
Well Group	Well ID	Geologic Zone of Screened Interval	Easting (x-coordinate)	Northing (y-coordinate)	Elevation (ft msl)	Casing Elevation (ft msl)	Stickup Height (ft)	Screen Start (ft bgs)	Screen End (ft bgs)	Well Diameter (inches)	Sample Type	Target Sample Depth (ft btoc)	Allowable Drawdown (ft)	Sample Tubing Diameter (in)	Minimum Purge Volume (gal)
Offsite	MW-103D	Overburden	603103.39	410107.66	4557.56	4560.10	2.54	173.5	183.5	4	NA	179	0.1	0.25	NA
Offsite	MW-103S	Overburden	603129.08	410112.39	4558.35	4560.00	1.65	90	110	4	Dedicated Pump	105	0.1	0.25	0.9
Offsite	MW-106D	Overburden	600093.80	411850.82	4514.18	4516.10	1.92	89	99	4	NA	94	0.1	0.25	NA
Offsite	MW-106S	Overburden	600104.55	411853.60	4514.19	4516.90	2.71	55	75	4	NA	65	0.1	0.25	NA
Offsite	MW-115D	Overburden	600137.10	411517.23	4536.95	4538.80	1.85	100	120	6	NA	110	0.1	0.25	NA
Offsite	MW-115S	Overburden	600134.12	411522.93	4536.86	4538.70	1.84	80	90	6	Passive	91.8	0.1	0.25	NA
Offsite	MW-116D	Overburden	601405.50	410224.99	4535.66	4535.66	0.00	122	142	6	NA	132	0.1	0.25	NA
Offsite	MW-116S	Overburden	601412.65	410222.65	4535.81	4535.81	0.00	78	93	6	Portable Pump	86	0.1	0.25	0.9
RSE	RW-10	Alluvium	602949.24	408472.87	4644.68	4647.22	2.54	50	85	6	Tap	NA	NA	NA	NA
RSE	RW-15	Both	602794.84	408374.90	4652.35	4654.64	2.29	45	105	6	Tap	NA	NA	NA	NA
RSE	RW-17	Both	602833.34	408326.09	4650.13	4652.03	1.90	43.5	103.5	6	Tap	NA	NA	NA	NA
RSE	RW-4	Shallow Starlight	602844.29	408470.28	4648.26	4647.49	-0.77	50	100	6	Tap	NA	NA	NA	NA
RSE	RW-5	Starlight	603000.32	408502.41	4643.70	4645.08	1.38	60	100	6	Tap	NA	NA	NA	NA
RSE	RW-9R	Overburden	602710.18	408301.04	4658.51	4660.70	2.19	51	76	6	Tap	NA	NA	NA	NA
System Effluent	INJ-1R	Alluvium	603070.28	408879.42	4628.91	4631.77	2.86	30 and 100	85 and 110	6	Tap	NA	NA	NA	NA

Notes

XY coordinates are in Idaho State Plane East.

Sample Types Dedicated and Portable Pump refer to low-flow bladder pumps.

Target Sample Depth is pump depth for dedicated or portable pump locations OR tether deployment depth for passive locations. For passive and portable pump sampling, the depth may vary with water level.

Acronyms and Abbreviations

bgs - below ground surface

btoc - below top of casing

ft - feet

gal - gallons

in - inches

msl - mean sea level

RSE - remediation system extraction

Section 3 Tables Notes

Only detected chemicals are shown. Full analytical results are in Appendix C.

Results greater than the MCL

Underline indicates values greater than the ID GW Standard

Bold indicates detected values

Italic indicates non-detected values

pH values <6.5 or >8.5

D = Dissolved

EPA = U.S. Environmental Protection Agency

ID GW = Idaho Groundwater Standards

J = Result is estimated

J- = Result is estimated biased low

J+ = Result is estimated biased high

MCL = maximum contaminant level

mg/L = milligrams per liter

µg/L = micrograms per liter

µS/cm = microsiemens per centimeter

NTU = Nephelometric Turbidity Unit

PCB = Polychlorinated Biphenyl

pg/L = picograms per liter

Q = qualifier

R = Result is Rejected

su = standard unit

SVOCs = semivolatile organic compounds

T = Total

U = Analyte was not detected at the associated value

UJ = The non-detection at the associated value is an estimate

VOCs = volatile organic compounds

Table 3.1
Monitoring Well Water Levels, Screened Intervals, and Vertical Gradients

Well ID	Water Level Elevation (ft amsl)	Direction of Gradient^	Gradient^ (ft/ft)
MP-1	4598.0	NA	NA
MP-2	4588.3	NA	NA
MP-3	4580.4	NA	NA
MP-4	4586.2	NA	NA
MP-9	4606.0	NA	NA
MW-1	4602.7	NA	NA
MW-101S	4608.4	NA	NA
MW-102S	4467.4	NA	NA
MW-103D	4470.7	up	-0.04
MW-103S	4467.5		
MW-104D	4602.9	down	0.13
MW-104S	4606.1		
MW-105D	4604.3	down	0.13
MW-105S	4606.5		
MW-106D	4465.0	none	0.00
MW-106S	4465.0		
MW-109D	4658.5	down	0.39
MW-109S	4670.4		
MW-110D	4623.0	down	0.11
MW-110S	4626.5		
MW-111D	4616.3	down	0.62
MW-111S	4648.4		
MW-112D	4582.4	down	0.03
MW-112M	4583.3		
MW-112S	4585.5	NA	NA
MW-113D	4688.4	up	-0.02
MW-113S	4687.1		
MW-115D	4465.2	none	0.00
MW-115S	4465.1		
MW-117R	4467.2	NA	NA
MW-118D	4556.5	NA	NA
MW-119D	4570.6	down	0.14
MW-119S	4573.6		
MW-120D	4565.4	--	--
MW-120S	4566.0		
MW-121	4591.8	NA	NA
MW-122	4628.1	NA	NA
MW-123	4614.8	NA	NA
MW-124	4581.9	NA	NA
MW-125	4577.0	NA	NA
MW-12	5065.7	NA	NA
MW-13	4936.5	NA	NA
MW-3A	4985.5	NA	NA
MW-4	4946.6	NA	NA
MW-4A	5363.7	NA	NA
MW-5AR	5071.0	NA	NA
MW-6A	4998.2	NA	NA

Table 3.1
Monitoring Well Water Levels, Screened Intervals, and Vertical Gradients

Well ID	Water Level Elevation (ft amsl)	Direction of Gradient [^]	Gradient [^] (ft/ft)
MW-8	4929.2	NA	NA
MW-9	4981.9	NA	NA
RW-1	4597.3	NA	NA
RW-2	4592.8	NA	NA
RW-3	4598.9	NA	NA
RW-16	4592.4	NA	NA

Notes

ft btoc = feet below top of casing

ft amsl = feet above mean sea level

ft bgs = feet below ground surface

NA = not applicable

[^]Direction and magnitude of gradient is calculated between shallow and deep paired wells

Table 3.2
Cell 1 Monitoring Well Field Parameter and VOC Results

Analyte	EPA MCL	ID GW - PRIMARY	ID GW - SECONDARY	Well ID	MP-1		MP-2		MP-3	
				Sample Name	MP-1-20240906		MP-2-20240904		MP-3-20240906	
				Sample Date	2024-09-06		2024-09-04		2024-09-06	
				Unit	Result	Qualifier	Result	Qualifier	Result	Qualifier
Field and Redox Parameters										
Dissolved Oxygen				mg/L	3.44		1.25		6.25	
Ethane				µg/L			0.57	U		
Ethene				µg/L			0.4	U		
Ferrous Iron				mg/L			0.18			
Manganese			0.05	mg/L						
Methane				mg/L			1.4			
Oxidation-Reduction Potential				mV	159.4		15.9		165.1	
pH			6.5 - 8.5	su	6.36		6.54		6.55	
Propane				µg/L			0.56	U		
Specific Conductance				µS/cm	1536		1402		1046	
Temperature				Celsius	17.76		16.06		16.46	
Total Organic Carbon				mg/L			4.7			
Turbidity				ntu	1		1.06		8.56	
VOCs										
1,1-Dichloroethane				µg/L	0.22	J	1.1		0.22	U
1,1-Dichloroethene	7	7		µg/L	0.23	U	0.3	J	0.23	U
1,2-Dibromo-3-Chloropropane	0.2	0.2		µg/L	0.42	U	0.42	U	0.42	U
1,2-Dichlorobenzene	600	600		µg/L	1.6		1.4		0.14	U
1,2-Dichloroethane	5	5		µg/L	0.28	U	0.28	U	0.28	U
1,2-Dichloropropane	5	5		µg/L	0.24	U	0.52	J	0.24	U
1,4-Dichlorobenzene	75	75		µg/L	0.39	U	0.39	U	0.39	U
Benzene	5	5		µg/L	0.14	U	0.25	J	0.14	U
Chlorobenzene	100	100		µg/L	0.092	U	0.28	J	0.092	U
Chloroethane				µg/L	0.64	U	0.64	U	0.64	U
Chloroform	80	2		µg/L	0.36	U	0.56	J	0.36	U
cis-1,2-Dichloroethene	70	70		µg/L	12		24		0.32	U
Dichlorodifluoromethane				µg/L	0.3	U	0.46	J	0.3	U
Ethylbenzene	700	700		µg/L	0.14	U	0.14	U	0.14	U
m,p-Xylene	10000			µg/L	0.36	U	0.36	U	0.36	U
o-xylene	10000			µg/L	0.11	U	0.11	U	0.11	U
Tetrachloroethene	5	5		µg/L	15		6.4		13	
trans-1,2-Dichloroethene	100	100		µg/L	0.37	U	0.37	U	0.37	U
Trichloroethene	5	5		µg/L	97		87		40	
Trichlorofluoromethane				µg/L	0.2	U	0.2	U	0.2	U
Vinyl chloride	2	2		µg/L	3.4		4.2		0.23	U
Xylenes, total	10000	10000		µg/L	0.11	U	0.11	U	0.11	U

Table 3.2
Cell 1 Monitoring Well Field Parameter and VOC Results

Analyte	MP-4		MW-101S		MW-102S		MW-105D		MW-105S	
	MP-4-20240906		MW-101S-20240906		MW-102S-20240909		MW-105D-20240905		MW-105S-20240905	
	2024-09-06		2024-09-06		2024-09-09		2024-09-05		2024-09-05	
	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
Field and Redox Parameters										
Dissolved Oxygen	3.19		9.24		5.3		0.73		0.73	
Ethane										
Ethene										
Ferrous Iron										
Manganese										
Methane										
Oxidation-Reduction Potential	54.1		48.3		112.8		22.5		165.5	
pH	6.64		7.3		7.21		6.66		6.63	
Propane										
Specific Conductance	1345		657		795		1593		4697	
Temperature	19.14		17.12		21.23		17.18		14.61	
Total Organic Carbon										
Turbidity	16.34		2.5		0		0.17		0.07	
VOCs										
1,1-Dichloroethane	0.22	U	0.22	U	0.22	U	3.8		0.52	J
1,1-Dichloroethene	0.23	U	0.23	U	0.23	U	0.92	J	0.23	U
1,2-Dibromo-3-Chloropropane	0.42	U	0.42	U	0.42	U	0.42	U	0.42	U
1,2-Dichlorobenzene	0.25	J	0.14	U	0.14	U	0.48	J	1.1	
1,2-Dichloroethane	0.28	U	0.28	U	0.28	U	0.28	U	0.28	U
1,2-Dichloropropane	0.24	U	0.24	U	0.24	U	0.24	U	1.3	
1,4-Dichlorobenzene	0.39	U	0.39	U	0.39	U	0.39	U	0.39	U
Benzene	0.14	U	0.14	U	0.14	U	0.21	J	0.14	U
Chlorobenzene	0.092	U	0.092	U	0.092	U	0.092	U	0.092	U
Chloroethane	0.64	U	0.64	U	0.64	U	0.64	U	0.64	U
Chloroform	0.36	U	0.36	U	0.36	U	2		0.98	J
cis-1,2-Dichloroethene	4.4		0.32	U	0.32	U	16		1.7	
Dichlorodifluoromethane	0.3	U	0.3	U	0.3	U	3.3		0.3	U
Ethylbenzene	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U
m,p-Xylene	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U
o-xylene	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U
Tetrachloroethene	14		8.2		0.58	J	34		5.5	
trans-1,2-Dichloroethene	0.37	U	0.37	U	0.37	U	0.37	U	0.37	U
Trichloroethene	66		20		4.3		170		12	
Trichlorofluoromethane	0.2	U	0.2	U	0.2	U	0.96	J	0.2	U
Vinyl chloride	0.23	U	0.23	U	0.23	U	1.4		0.23	U
Xylenes, total	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U

Table 3.2
Cell 1 Monitoring Well Field Parameter and VOC Results

Analyte	MW-105S		MW-109D		MW-109S		MW-110D		MW-110S	
	MW-105SQ-20240905		MW-109D-20240906		MW-109S-20240906		MW-110D-20240906		MW-110S-20240908	
	2024-09-05		2024-09-06		2024-09-06		2024-09-06		2024-09-08	
	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
Field and Redox Parameters										
Dissolved Oxygen			6.5		3.37		2.55		3.3	
Ethane										
Ethene										
Ferrous Iron										
Manganese										
Methane										
Oxidation-Reduction Potential			54.1		63.3		-121		193.1	
pH			7.09		6.82		7.03		6.27	
Propane										
Specific Conductance			907		793		933		1139	
Temperature			18.29		16.34		17.98		14.62	
Total Organic Carbon										
Turbidity			2.33		6.23		4.91		9.56	
VOCs										
1,1-Dichloroethane	0.59	J	0.22	U	0.22	U	0.22	U	0.41	J
1,1-Dichloroethene	0.23	U	0.23	U	0.23	U	0.23	U	0.23	U
1,2-Dibromo-3-Chloropropane	0.42	U	0.42	U	0.42	U	0.42	U	0.42	U
1,2-Dichlorobenzene	0.99	J	0.14	U	0.14	U	0.14	U	1.3	
1,2-Dichloroethane	0.28	U	0.28	U	0.28	U	0.28	U	0.28	U
1,2-Dichloropropane	1.3		0.24	U	0.24	U	0.24	U	0.4	J
1,4-Dichlorobenzene	0.39	U	0.39	U	0.39	U	0.39	U	0.56	J
Benzene	0.14	U	0.14	U	0.14	U	0.14	U	0.29	J
Chlorobenzene	0.092	U	0.092	U	0.092	U	0.092	U	0.33	J
Chloroethane	0.64	U	0.64	U	0.64	U	0.64	U	0.64	U
Chloroform	0.99	J	0.36	U	0.36	U	0.36	U	0.36	U
cis-1,2-Dichloroethene	1.7		0.32	U	0.32	U	1.2		5.2	
Dichlorodifluoromethane	0.3	U	0.3	U	0.3	U	1	J	0.3	U
Ethylbenzene	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U
m,p-Xylene	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U
o-xylene	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U
Tetrachloroethene	5.5		18		20		2.6		2.2	
trans-1,2-Dichloroethene	0.37	U	0.37	U	0.37	U	0.37	U	0.37	U
Trichloroethene	12		55		46		14		21	
Trichlorofluoromethane	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Vinyl chloride	0.23	U	0.23	U	0.23	U	0.23	U	3.6	
Xylenes, total	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U

Table 3.2
Cell 1 Monitoring Well Field Parameter and VOC Results

Analyte	MW-111D		MW-111S		MW-112D		MW-112M		MW-113D	
	MW-111D-20240905		MW-111S-20240908		MW-112D-20240905		MW-112M-20240908		MW-113D-20240906	
	2024-09-05		2024-09-08		2024-09-05		2024-09-08		2024-09-06	
	Result	Qualifier								
Field and Redox Parameters										
Dissolved Oxygen	0.2		2.31		5.4		9.42		2.95	
Ethane										
Ethene										
Ferrous Iron										
Manganese										
Methane										
Oxidation-Reduction Potential	-150.7		-129.1		35.5		-5.1		167.4	
pH	6.6		6.58		7.32		6.83		6.82	
Propane										
Specific Conductance	8685		6845		721		710		1081	
Temperature	14.23		13.46		14.74		13.9		16.01	
Total Organic Carbon										
Turbidity	0.6		8.47		1.97		30.8		16.23	
VOCs										
1,1-Dichloroethane	4	J	1.3	J	0.22	U	0.22	U	11	
1,1-Dichloroethene	0.23	U	0.46	U	0.61	J	0.23	U	0.23	U
1,2-Dibromo-3-Chloropropane	0.42	U	0.85	U	0.42	U	0.42	U	0.92	J
1,2-Dichlorobenzene	15	J	15		0.14	U	0.14	U	0.14	U
1,2-Dichloroethane	0.28	U	0.56	U	0.28	U	0.28	U	2	
1,2-Dichloropropane	1.8	J	1.5	J	0.24	U	0.24	U	1.6	
1,4-Dichlorobenzene	10	J	13		0.39	U	0.39	U	0.39	U
Benzene	13	J	9.8		0.14	U	0.14	U	1.5	
Chlorobenzene	67	J	63		0.092	U	0.092	U	0.092	U
Chloroethane	0.64	U	1.3	U	0.64	U	0.64	U	0.64	U
Chloroform	0.36	U	0.72	U	0.36	U	0.36	U	0.75	J
cis-1,2-Dichloroethene	1	J	0.64	U	0.32	U	0.32	U	16	
Dichlorodifluoromethane	1.3	J	0.6	U	1.5	J	0.3	U	17	
Ethylbenzene	1.4	J	1.7	J	0.14	U	0.14	U	0.14	U
m,p-Xylene	0.45	J	5		0.36	U	0.36	U	0.36	U
o-xylene	0.73	J	1.4	J	0.11	U	0.11	U	0.11	U
Tetrachloroethene	0.4	U	0.81	U	12		7.1		13	
trans-1,2-Dichloroethene	0.37	U	0.74	U	0.37	U	0.37	U	0.37	U
Trichloroethene	5.1	J	0.6	U	180		94		7.2	
Trichlorofluoromethane	0.2	U	0.4	U	0.72	J	0.2	U	1.4	J
Vinyl chloride	0.62	J	0.45	U	0.23	U	0.23	U	22	
Xylenes, total	1.2	J	6.4		0.11	U	0.11	U	0.11	U

Table 3.2
Cell 1 Monitoring Well Field Parameter and VOC Results

Analyte	MW-113S		MW-113S		MW-117R		MW-118D		MW-119D	
	MW-113S-20240904		MW-113SQ-20240904		MW-117R-20240910		MW-118D-20240905		MW-119D-20240904	
	2024-09-04		2024-09-04		2024-09-10		2024-09-05		2024-09-04	
	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
Field and Redox Parameters										
Dissolved Oxygen	0.55				8.87		0.28		2.35	
Ethane										
Ethene										
Ferrous Iron										
Manganese										
Methane										
Oxidation-Reduction Potential	-4.5				87.9		6.1		235.3	
pH	6.43				6.87		6.56		6.56	
Propane										
Specific Conductance	2360				1450		3968		1173	
Temperature	13.35				15.48		14.05		15.37	
Total Organic Carbon										
Turbidity	0.38				4.74		0.42		0.14	
VOCs										
1,1-Dichloroethane	21		21		0.22	U	5.3		0.24	J
1,1-Dichloroethene	0.65	J	0.54	J	0.23	U	0.23	U	0.23	U
1,2-Dibromo-3-Chloropropane	0.85	U	0.42	U	0.42	U	0.42	U	0.42	U
1,2-Dichlorobenzene	10		11		0.14	U	3.5		0.21	J
1,2-Dichloroethane	4.3		4.4		0.28	U	0.28	U	0.28	U
1,2-Dichloropropane	4.4		4.6		0.24	U	0.78	J	0.24	U
1,4-Dichlorobenzene	5.6		6.2		0.39	U	1.8		0.39	U
Benzene	6.1		6.2		0.14	U	1.5		0.14	U
Chlorobenzene	0.68	J	0.64	J	0.092	U	10		0.092	U
Chloroethane	1.3	U	0.99	J	0.64	U	0.64	U	0.64	U
Chloroform	0.98	J	1.1		0.36	U	0.36	U	0.71	J
cis-1,2-Dichloroethene	25		26		2.3		1.8		1.8	
Dichlorodifluoromethane	13		14		0.3	U	1.6	J	0.3	U
Ethylbenzene	0.29	U	0.14	U	0.14	U	0.14	U	0.14	U
m,p-Xylene	0.71	U	0.36	U	0.36	U	0.36	U	0.36	U
o-xylene	1	J	0.99	J	0.11	U	0.11	U	0.11	U
Tetrachloroethene	17		17		7.5		4.6		14	
trans-1,2-Dichloroethene	1.2	J	1.1		0.37	U	0.37	U	0.37	U
Trichloroethene	11		12		37		34		62	
Trichlorofluoromethane	0.4	U	0.91	J	0.2	U	0.2	U	0.2	U
Vinyl chloride	63		67		0.23	U	0.23	U	0.23	U
Xylenes, total	1	J	0.99	J	0.11	U	0.11	U	0.11	U

Table 3.2
Cell 1 Monitoring Well Field Parameter and VOC Results

Analyte	MW-119S		MW-120D		MW-120S		MW-121		MW-123	
	MW-119S-20240904		MW-120D-20240904		MW-120S-20240905		MW-121-20240906		MW-123-20240908	
	2024-09-04		2024-09-04		2024-09-05		2024-09-06		2024-09-08	
	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
Field and Redox Parameters										
Dissolved Oxygen	2.27		1.27		0.61		0.6		8.86	
Ethane										
Ethene										
Ferrous Iron										
Manganese							1.1	J		
Methane										
Oxidation-Reduction Potential	237.7		221.4		24.3		97.9		12.6	
pH	6.47		6.7		6.47		6.66		6.94	
Propane										
Specific Conductance	1218		1287		1396		2139		763	
Temperature	14.93		18.21		14.46		17.14		12.29	
Total Organic Carbon										
Turbidity	0.32		0.81		0		32.2		39.1	
VOCs										
1,1-Dichloroethane	0.22	U	1.1		0.48	J	0.22	U	0.22	U
1,1-Dichloroethene	0.23	U	0.95	J	0.23	U	0.23	U	0.23	U
1,2-Dibromo-3-Chloropropane	0.42	U	0.42	U	0.42	U	0.42	U	0.42	U
1,2-Dichlorobenzene	0.18	J	0.4	J	1.5		0.24	J	0.14	U
1,2-Dichloroethane	0.28	U	0.28	U	0.28	U	0.28	U	0.28	U
1,2-Dichloropropane	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U
1,4-Dichlorobenzene	0.39	U	0.39	U	0.39	U	0.39	U	0.39	U
Benzene	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U
Chlorobenzene	0.092	U	0.092	U	0.092	U	2.3		0.092	U
Chloroethane	0.64	U	0.64	U	0.64	U	0.64	U	0.64	U
Chloroform	0.52	J	0.36	U	0.36	U	0.36	U	0.36	U
cis-1,2-Dichloroethene	2.1		11		20		0.32	U	0.32	U
Dichlorodifluoromethane	0.3	U	1.6	J	0.3	U	0.96	J	0.3	U
Ethylbenzene	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U
m,p-Xylene	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U
o-xylene	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U
Tetrachloroethene	12		11		10		1.5		3.4	
trans-1,2-Dichloroethene	0.37	U	0.37	U	0.37	U	0.37	U	0.37	U
Trichloroethene	49		150		99		2.8		47	
Trichlorofluoromethane	0.2	U	0.54	J	0.2	U	0.2	U	0.2	U
Vinyl chloride	0.23	U	1.8		1.7		0.23	U	0.23	U
Xylenes, total	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U

Table 3.2
Cell 1 Monitoring Well Field Parameter and VOC Results

Analyte	MW-124		MW-125		RW-1		RW-2		RW-2	
	MW-124-20240909		MW-125-20240909		RW-1-20240906		RW-2-20240906		RW-2Q-20240906	
	2024-09-09		2024-09-09		2024-09-06		2024-09-06		2024-09-06	
	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
Field and Redox Parameters										
Dissolved Oxygen	0.71		0.43		2.08		4.16			
Ethane	0.64	J	6.7				0.57	U	0.6	J
Ethene	1.3	J	12				1.1	J	1	J
Ferrous Iron	0.08		0				0			
Manganese										
Methane	0.12	J	8.2				0.69		0.68	
Oxidation-Reduction Potential	15.4		57.7		120.2		71.3			
pH	6.56		6.72		6.39		6.57			
Propane	0.94	J	3.7	J			0.56	U	0.56	U
Specific Conductance	1531		1741		1662		1631			
Temperature	15.94		16.07		16.14		16.13			
Total Organic Carbon	5.3		3.1	J			5.9		6.2	
Turbidity	7.23		0.85		43.7		3.27			
VOCs										
1,1-Dichloroethane	0.68	J	0.35	J	0.44	J	0.85	J	0.85	J
1,1-Dichloroethene	0.23	U	0.23	U	0.23	U	0.23	U	0.23	U
1,2-Dibromo-3-Chloropropane	0.42	U	0.42	U	0.42	U	0.42	U	0.42	U
1,2-Dichlorobenzene	1.2		0.47	J	2.3		1.6		1.5	
1,2-Dichloroethane	0.28	U	0.28	U	0.28	U	0.28	U	0.28	U
1,2-Dichloropropane	0.24	U	0.24	U	0.24	U	0.42	J	0.24	U
1,4-Dichlorobenzene	0.39	U	0.39	U	0.39	U	0.45	J	0.5	J
Benzene	0.14	U	0.14	U	0.14	U	0.25	J	0.25	J
Chlorobenzene	0.092	U	0.092	U	0.092	U	0.28	J	0.27	J
Chloroethane	0.64	U	0.64	U	0.64	U	0.64	U	0.64	U
Chloroform	0.36	U	0.36	U	0.36	U	0.47	J	0.51	J
cis-1,2-Dichloroethene	23		6.6		17		20		21	
Dichlorodifluoromethane	0.34	J	0.76	J	0.3	U	0.3	U	0.3	U
Ethylbenzene	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U
m,p-Xylene	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U
o-xylene	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U
Tetrachloroethene	2.7		1.6		12		5.3		5.1	
trans-1,2-Dichloroethene	0.37	U	0.37	U	0.37	U	0.37	U	0.37	U
Trichloroethene	73		14		100		79		77	
Trichlorofluoromethane	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Vinyl chloride	5.8		5.8		4.2		3.8		3.9	
Xylenes, total	0.11	U	0.11	U	0.11	U	0.11	U	0.11	U

Table 3.2
Cell 1 Monitoring Well Field Parameter and VOC Results

Analyte	RW-3	
	RW-3-20240906	
	2024-09-06	
	Result	Qualifier
Field and Redox Parameters		
Dissolved Oxygen	3.46	
Ethane		
Ethene		
Ferrous Iron		
Manganese		
Methane		
Oxidation-Reduction Potential	120.8	
pH	6.62	
Propane		
Specific Conductance	2140	
Temperature	17.34	
Total Organic Carbon		
Turbidity	15.16	
VOCs		
1,1-Dichloroethane	0.22	U
1,1-Dichloroethene	0.23	U
1,2-Dibromo-3-Chloropropane	0.42	U
1,2-Dichlorobenzene	0.14	U
1,2-Dichloroethane	0.28	U
1,2-Dichloropropane	0.24	U
1,4-Dichlorobenzene	0.39	U
Benzene	0.14	U
Chlorobenzene	0.45	J
Chloroethane	0.64	U
Chloroform	0.36	U
cis-1,2-Dichloroethene	0.32	U
Dichlorodifluoromethane	0.43	J
Ethylbenzene	0.14	U
m,p-Xylene	0.36	U
o-xylene	0.11	U
Tetrachloroethene	2.3	
trans-1,2-Dichloroethene	0.37	U
Trichloroethene	2	
Trichlorofluoromethane	0.2	U
Vinyl chloride	0.23	U
Xylenes, total	0.11	U

Table 3.3
Remediation System Extraction Well Field Parameter, and VOC Results

Analyte	EPA MCL	ID GW - PRIMARY	ID GW - SECONDARY	Well ID	RW-4		RW-5	
				Sample Name	RW-4-20240910		RW-5-20240910	
				Sample Date	2024-09-10		2024-09-10	
				Unit	Result	Qualifier	Result	Qualifier
Field Parameters								
Dissolved Oxygen				mg/L	4.93		6.57	
Oxidation-Reduction Potential				mV	186.2		192.8	
pH			6.5 - 8.5	su	6.48		6.64	
Specific Conductance				µS/cm	1415		1075	
Temperature				Celsius	14.82		12.54	
Turbidity				ntu	0.55		0.02	
VOCs								
1,1-Dichloroethane				µg/L	0.22	U	0.22	U
1,2-Dichlorobenzene	600	600		µg/L	0.14	U	0.14	U
1,4-Dichlorobenzene	75	75		µg/L	0.39	U	0.39	U
Acrylonitrile				µg/L	1.7	U	1.7	U
cis-1,2-Dichloroethene	70	70		µg/L	8.7		0.32	U
Tetrachloroethene	5	5		µg/L	17		12	
Trichloroethene	5	5		µg/L	96		36	
Vinyl chloride	2	2		µg/L	0.75	J	0.23	U

Table 3.3
Remediation System Extraction Well Field Parameter, and VOC Results

Analyte	RW-9R		RW-10		RW-15		RW-17	
	RW-9R-20240910		RW-10-20240910		RW-15-20240910		RW-17-20240910	
	2024-09-10		2024-09-10		2024-09-10		2024-09-10	
	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
Field Parameters								
Dissolved Oxygen	1.43		5.45		3.05		2.94	
Oxidation-Reduction Potential	102.7		197.3		69.7		107.4	
pH	6.38		6.66		6.65		6.65	
Specific Conductance	1781		1108		1381		1139	
Temperature	14.45		12.29		13.47		13.11	
Turbidity	0.14		0.02		0		0	
VOCs								
1,1-Dichloroethane	0.4	J	0.22	U	0.22	U	0.22	U
1,2-Dichlorobenzene	2.6		0.14	U	1.2		0.14	U
1,4-Dichlorobenzene	0.54	J	0.39	U	0.39	U	0.39	U
Acrylonitrile	2.1	J	1.7	U	1.7	U	1.7	U
cis-1,2-Dichloroethene	19		0.34	J	10		2.9	
Tetrachloroethene	8.5		14		15		17	
Trichloroethene	86		45		80		61	
Vinyl chloride	5.5		0.23	U	2.8		0.23	U

**Table 3.4
Offsite Monitoring Well Field Parameter and VOC Results**

Analyte	EPA MCL	ID GW - PRIMARY	ID GW - SECONDARY	Well ID	MW-103S		MW-115S		MW-116S	
				Sample Name	MW-103S-20240909		MW-115S-20240908		MW-116S-20240908	
				Sample Date	2024-09-09		2024-09-08		2024-09-08	
				Unit	Result	Qualifier	Result	Qualifier	Result	Qualifier
Field Parameters										
Dissolved Oxygen				mg/L	6.72		9.3		7.99	
Oxidation-Reduction Potential				mV	57.6		5.8		31.8	
pH			6.5 - 8.5	su	7.32		7.06		6.98	
Specific Conductance				µS/cm	489		663		719	
Temperature				Celsius	12.96		15.72		12.13	
Turbidity				ntu			1.62		0.3	
VOCs										
cis-1,2-Dichloroethene	70	70		µg/L	0.32	U	0.32	U	0.73	J
Tetrachloroethene	5	5		µg/L	0.4	U	0.4	U	1.9	
Trichloroethene	5	5		µg/L	0.3	U	0.94	J	10	

**Table 3.5
Cell 1 Monitoring Well Inorganic Results**

Analyte	EPA MCL	ID GW - PRIMARY	ID GW - SECONDARY	Well ID			
				MW-121			
				Sample Name			
				MW-121-20240906			
Sample Date		2024-09-06		Unit	Result	Qualifier	
Inorganics							
Arsenic	10	50		µg/L	8		
Barium	2000	2000		µg/L	630		
Calcium				µg/L	280000		
Chromium	100	100		µg/L	1.6	J	
Cobalt				µg/L	9.6	J	
Copper	1300	1300		µg/L	3.2		
Iron			300	µg/L	1700		
Lead	15	15		µg/L	1.3	J	
Magnesium				µg/L	83000		
Manganese			0.05	mg/L	1.1	J	
Nickel				µg/L	42		
Potassium				µg/L	6300		
Sodium				µg/L	190000		
Vanadium				µg/L	4.2	J	
Zinc			5000	µg/L	3.7	J	

**Table 3.6
Remediation Well Status and Groundwater Production Summary**

Well ID	Total Depth (ft bgs)	Screened Interval (ft bgs)	Status (as of 11/23/24)	Cumulative Groundwater Removed (gal) 06/17/24 - 11/23/24	Average Flow Rate (gpm) 06/17/24 - 11/23/24
RW-4	100'	50' to 100'	Operating	286,123	1.4
RW-5	100'	60' to 100'	Operating	1,243,755	5.6
RW-9R	78'	51' to 76'	Operating	355,528	1.6
RW-10	85'	50' to 85'	Operating	1,924,846	8.8
RW-15	105'	42' to 105'	Operating	1,964,479	8.9
RW-17	103.5'	43.5' to 103.5'	Operating	1,245,194	7.7
Air Stripper Influent			Operating	7,534,235	34.4

Notes:

1. The system was off from approximately 16:00 8/17/24 until approximately 09:00 8/21/24. Bannock County indicated that Idaho Power had bumped the landfill power during this timeframe, which likely caused the system to trip.
2. The system was shutdown from 10/17/24 until 10/28/24 for annual blower maintenance.
3. The flow meter at RW-17 was replaced twice during the reporting period. The system was turned off for short periods when these replacements were made.

Abbreviations:

ft bgs = feet below ground surface

gal = gallons

gpm = gallons per minute

**Table 3.7
Remediation System Injection Well Results**

Analyte	EPA MCL	ID GW - PRIMARY	ID GW - SECONDARY	Area	Remediation System			
				Well ID	INJ-1R		INJ-1R	
				Sample Name	INJ-1R-20240910		INJ-1R-20241029	
				Sample Date	9/10/2024 ¹		10/29/2024 ²	
				Unit	Result	Q	Result	Q
Field and Redox Parameters								
Dissolved Oxygen				mg/L	10.39			
Manganese			0.05	mg/L	0.33			
Oxidation-Reduction Potential				mV	98.2			
pH			6.5-8.5	SU	7.76			
Specific Conductance				uS/cm	1200			
Sulfide				mg/L	0.022	U		
Temperature				Celsius	14.69			
Turbidity				NTU	0.59			
Volatile Organic Compounds (VOCs)								
1,1,1,2-Tetrachloroethane				µg/L	0.16	U	0.38	U
1,1,1-Trichloroethane	200	200		µg/L	0.39	U	0.46	U
1,1,2,2-Tetrachloroethane				µg/L	0.21	U	0.4	U
1,1,2-Trichloroethane	5	5		µg/L	0.27	U	0.46	U
1,1-Dichloroethane				µg/L	0.22	U	0.44	U
1,1-Dichloroethene	7	7		µg/L	0.23	U	0.4	U
1,1-Dichloropropene				µg/L	0.19	U	0.37	U
1,2,3-Trichloropropane				µg/L	0.005	U	0.4	U
1,2,4-Trichlorobenzene	70	70		µg/L	0.58	U	0.94	U
1,2-Dibromo-3-Chloropropane	0.2	0.2		µg/L	0.0068	U	0.43	U
1,2-Dibromoethane	0.05	0.05		µg/L	0.0037	U	0.41	U
1,2-Dichlorobenzene	600	600		µg/L	0.14	U	0.32	U
1,2-Dichloroethane	5	5		µg/L	0.28	U	0.44	U
1,2-Dichloropropane	5	5		µg/L	0.24	U	0.48	U
1,3-Dichlorobenzene		600		µg/L	0.33	U	0.33	U
1,3-Dichloropropane				µg/L	0.17	U	0.4	U
1,4-Dichlorobenzene	75	75		µg/L	0.39	U	0.35	U
2,2-Dichloropropane				µg/L	0.17	U	0.52	U
2-Butanone (MEK)				µg/L	4.6	U	2.4	U
2-Hexanone				µg/L	0.81	U	0.59	U
4-Methyl-2-pentanone (MIBK)				µg/L	0.98	U	0.52	U
Acetone				µg/L	6.6	U	4.5	U
Acetonitrile; methyl cyanide				µg/L	14	U	0.6	U
Acrolein				µg/L	4.9	U	7.3	U
Acrylonitrile				µg/L	1.7	U	0.5	U
Allyl chloride				µg/L	0.46	U	0.62	U
Benzene	5	5		µg/L	0.14	U	0.46	U
Bromochloromethane				µg/L	0.4	U	0.45	U
Bromodichloromethane	80	100		µg/L	0.19	U	0.49	U
Bromoform	80	100		µg/L	0.25	U	0.56	U
Bromomethane				µg/L	2.4	U	0.9	U
Carbon disulfide				µg/L	0.26	U	0.49	U
Carbon tetrachloride	5	5		µg/L	0.23	U	0.4	U
Chlorobenzene	100	100		µg/L	0.092	U	0.4	U
Chlorodibromomethane	80	100		µg/L	0.28	U	0.4	U
Chloroethane				µg/L	0.64	U	0.68	U
Chloroform	80	2		µg/L	0.36	U	0.46	U
Chloromethane				µg/L	0.23	U	0.83	U
Chloroprene				µg/L	0.79	U	0.46	U
cis-1,2-Dichloroethene	70	70		µg/L	0.32	U	0.42	U
cis-1,3-Dichloropropene				µg/L	0.16	U	0.57	U
Dibromomethane				µg/L	0.34	U	0.65	U
Dichlorodifluoromethane				µg/L	0.3	U	0.68	U

**Table 3.7
Remediation System Injection Well Results**

Analyte	EPA MCL	ID GW - PRIMARY	ID GW - SECONDARY	Area	Remediation System			
				Well ID	INJ-1R		INJ-1R	
				Sample Name	INJ-1R-20240910		INJ-1R-20241029	
				Sample Date	9/10/2024 ¹		10/29/2024 ²	
				Unit	Result	Q	Result	Q
Ethyl methacrylate				µg/L	0.19	U	0.28	U
Ethylbenzene	700	700		µg/L	0.14	U	0.34	U
Iodomethane				µg/L	2.6	U	2	U
Isobutanol; Isobutyl alcohol				µg/L	37	U	0.88	U
m,p-Xylene	10000			µg/L	0.36	U		
Methacrylonitrile				µg/L	5.3	U	0.59	U
Methyl methacrylate				µg/L	1.1	U	0.55	U
Methylene Chloride	5	5		µg/L	0.94	U	0.86	U
o-xylene	10000			µg/L	0.11	U		
Propionitrile; ethyl cyanide				µg/L	3.7	U	5.7	U
Styrene	100	100		µg/L	0.13	U	0.33	U
Tetrachloroethene	5	5		µg/L	0.4	U	0.39	U
Toluene	1000	1000		µg/L	0.32	U	0.45	U
trans-1,2-Dichloroethene	100	100		µg/L	0.37	U	0.48	U
trans-1,3-Dichloropropene				µg/L	0.14	U	0.38	U
trans-1,4-Dichloro-2-butene				µg/L	0.51	U	0.58	U
Trichloroethene	5	5		µg/L	0.3	U	0.43	U
Trichlorofluoromethane				µg/L	0.2	U	0.52	U
Vinyl acetate				µg/L	0.36	U	2.4	U
Vinyl chloride	2	2		µg/L	0.23	U	0.53	U
Xylenes, total	10000	10000		µg/L	0.11	U	0.81	U
Chlorinated Herbicides								
2,4,5-TP (Silvex)	50	50		µg/L	0.33	U		
2,4,5-Trichlorophenoxyacetic acid				µg/L	0.33	U		
2,4-Dichlorophenoxyacetic acid	70	70		µg/L	0.21	U		
Dinoseb; 2-sec-Butyl-4,6-dinitrophenol	7	7		µg/L	0.23	U		
Dioxins/Furans								
2,3,7,8-TCDD	30	30		pg/L	0.41	U		
Inorganics								
Antimony	0.006	0.006		mg/L	0.0004	U		
Arsenic	0.01	0.05		mg/L	0.00087	J		
Barium	2	2		mg/L	0.18			
Beryllium	0.004	0.004		mg/L	0.0003	U		
Cadmium	0.005	0.005		mg/L	0.00019	U		
Calcium				mg/L	110			
Chromium	0.1	0.1		mg/L	0.0005	U		
Cobalt				mg/L	0.00033	U		
Copper	1.3	1.3		mg/L	0.0015	J		
Cyanide	0.2	0.2		mg/L	0.005	U		
Iron			0.3	mg/L	0.0087	U		
Lead	0.015	0.015		mg/L	0.00023	U		
Magnesium				mg/L	48			
Manganese			0.05	mg/L	0.33			
Mercury	0.002	0.002		mg/L	6.10E-05	U		
Nickel				mg/L	0.0047			
Potassium				mg/L	5.2			
Selenium	0.05	0.05		mg/L	0.001	U		
Silver			0.1	mg/L				
Silver			0.1	mg/L	6.30E-05	J		
Sodium				mg/L	72			
Sulfide				mg/L	0.022	U		
Sulfide				mg/L				
Thallium	0.002	0.002		mg/L	0.00021	U		

**Table 3.7
Remediation System Injection Well Results**

Analyte	EPA MCL	ID GW - PRIMARY	ID GW - SECONDARY	Area	Remediation System			
				Well ID	INJ-1R		INJ-1R	
				Sample Name	INJ-1R-20240910		INJ-1R-20241029	
				Sample Date	9/10/2024 ¹		10/29/2024 ²	
				Unit	Result	Q	Result	Q
Tin				mg/L	0.00058	U		
Vanadium				mg/L	0.0011	J		
Zinc			5	mg/L	0.002	U		
Zinc			5	mg/L				
Organochlorine Pesticides								
4,4'-DDD				µg/L	0.0041	U		
4,4'-DDE				µg/L	0.0041	U		
4,4'-DDT				µg/L	0.023	U		
Aldrin				µg/L	0.006	U		
alpha-BHC				µg/L	0.0094	U		
beta-BHC				µg/L	0.0089	U		
Chlordane - constituents	2	2		µg/L	0.12	U		
delta-BHC				µg/L	0.0076	U		
Dieldrin				µg/L	0.0045	U		
Endosulfan I				µg/L	0.0057	U		
Endosulfan II				µg/L	0.0064	U		
Endosulfan sulfate				µg/L	0.0048	U		
Endrin	2	2		µg/L	0.0084	U		
Endrin aldehyde				µg/L	0.0084	U		
gamma-BHC (lindane)	0.2	0.2		µg/L	0.01	U		
Heptachlor	0.4	0.4		µg/L	0.0098	U		
Heptachlor epoxide	0.2	0.2		µg/L	0.0031	U		
Methoxychlor	40	40		µg/L	0.014	U		
Toxaphene	3	3		µg/L	1.5	U		
Organophosphorous Pesticides								
Dimethoate				µg/L	0.44	U		
Disulfoton				µg/L	0.32	U		
Methyl parathion				µg/L	0.14	U		
Parathion				µg/L	0.14	U		
Polychlorinated Biphenyls (PCBs)								
PCB 1016	0.5			µg/L	0.17	U		
PCB 1221	0.5			µg/L	0.18	U		
PCB 1232	0.5			µg/L	0.13	U		
PCB 1242	0.5			µg/L	0.1	U		
PCB 1248	0.5			µg/L	0.17	U		
PCB 1254	0.5			µg/L	0.14	U		
PCB 1260	0.5			µg/L	0.087	U		
Polychlorinated Biphenyl (PCBs)	0.5	0.5		µg/L	0.071	U		
Semivolatile Organic Compounds (SVOCs)								
1,2,4,5-Tetrachlorobenzene				µg/L	1.7	U		
1,3,5-Trinitrobenzene				µg/L	5	U		
1,3-Dinitrobenzene				µg/L	5	U		
1,4-Naphthoquinone				µg/L	5.3	U		
1-Naphthylamine				µg/L	3.6	U		
2,3,4,6-Tetrachlorophenol				µg/L	6.8	U		
2,4,5-Trichlorophenol				µg/L	2.5	U		
2,4,6-Trichlorophenol				µg/L	2.2	U		
2,4-Dichlorophenol				µg/L	2.9	U		
2,4-Dimethylphenol; m-Xylenol				µg/L	1.3	U		
2,4-Dinitrophenol				µg/L	12	U		
2,4-Dinitrotoluene				µg/L	1.4	U		
2,6-Dichlorophenol				µg/L	2	U		
2,6-Dinitrotoluene				µg/L	1.4	U		

**Table 3.7
Remediation System Injection Well Results**

Analyte	EPA MCL	ID GW - PRIMARY	ID GW - SECONDARY	Area	Remediation System			
				Well ID	INJ-1R		INJ-1R	
				Sample Name	INJ-1R-20240910		INJ-1R-20241029	
				Sample Date	9/10/2024 ¹		10/29/2024 ²	
				Unit	Result	Q	Result	Q
2-Acetylaminofluorene				µg/L	7.8	U		
2-Chloronaphthalene				µg/L	1.2	U		
2-Chlorophenol				µg/L	2.5	U		
2-Methylnaphthalene				µg/L	1.2	U		
2-Methylphenol; o-Cresol				µg/L	0.75	U		
2-Naphthylamine				µg/L	1.3	U		
2-Nitroaniline; o-Nitroaniline				µg/L	2.5	U		
2-Nitrophenol; o-Nitrophenol				µg/L	3.4	U		
3&4-Methylphenol				µg/L	2.1	U		
3,3'-Dichlorobenzidine				µg/L	3.3	U		
3,3'-Dimethylbenzidine				µg/L	4.4	U		
3-Methylcholanthrene				µg/L	3.7	U		
3-Nitroaniline; m-Nitroaniline				µg/L	3.2	U		
4,6-Dinitro-2-methylphenol				µg/L	3.9	U		
4-Aminobiphenyl				µg/L	7.6	U		
4-Bromophenyl phenyl ether				µg/L	0.98	U		
4-Chloro-3-methylphenol				µg/L	1.6	U		
4-Chloroaniline; p-Chloroaniline				µg/L	6.1	U		
4-Chlorophenyl phenyl ether				µg/L	1.2	U		
4-Nitroaniline; p-Nitroaniline				µg/L	2.5	U		
4-Nitrophenol; p-Nitrophenol				µg/L	8.8	U		
5-Nitro-o-toluidine				µg/L	4.1	U		
7,12-Dimethylbenz[a]anthracene				µg/L	3.1	U		
a,a-Dimethylphenethylamine				µg/L	77	U		
Acenaphthene				µg/L	0.93	U		
Acenaphthylene				µg/L	0.72	U		
Acetophenone				µg/L	2.2	U		
Anthracene				µg/L	0.56	U		
Benzo[a]anthracene				µg/L	0.93	U		
Benzo[a]pyrene	0.2	0.2		µg/L	0.023	U		
Benzo[b]fluoranthene				µg/L	2.1	U		
Benzo[ghi]perylene				µg/L	2.8	U		
Benzo[k]fluoranthene				µg/L	1	U		
Benzyl alcohol				µg/L	2.4	U		
Bis(2-chloroethoxy)methane				µg/L	2.3	U		
Bis(2-chloroethyl)ether				µg/L	2	U		
Bis(2-chloroisopropyl)ether				µg/L	1.3	U		
Bis(2-ethylhexyl) phthalate	6	6		µg/L	3.2	U		
Butyl benzyl phthalate				µg/L	1.5	U		
Chlorobenzilate				µg/L	4.4	U		
Chrysene				µg/L	0.94	U		
Diallate				µg/L	3.8	U		
Dibenz[a,h]anthracene				µg/L	4.6	U		
Dibenzofuran				µg/L	0.92	U		
Diethyl phthalate				µg/L	1.3	U		
Dimethyl phthalate				µg/L	0.73	U		
Di-n-butyl phthalate				µg/L	2	U		
Di-n-octyl phthalate				µg/L	3.5	U		
Diphenylamine				µg/L	1.5	U		
Ethyl methanesulfonate				µg/L	1.9	U		
Famphur				µg/L	0.18	U		
Fluoranthene				µg/L	1.1	U		
Fluorene				µg/L	0.76	U		

**Table 3.7
Remediation System Injection Well Results**

Analyte	EPA MCL	ID GW - PRIMARY	ID GW - SECONDARY	Area	Remediation System			
				Well ID	INJ-1R		INJ-1R	
				Sample Name	INJ-1R-20240910		INJ-1R-20241029	
				Sample Date	9/10/2024 ¹		10/29/2024 ²	
				Unit	Result	Q	Result	Q
Hexachloro-1,3-butadiene				µg/L	2.8	U		
Hexachlorobenzene	1	1		µg/L	2.2	U		
Hexachlorocyclopentadiene	50	50		µg/L	15	U		
Hexachloroethane				µg/L	4.3	U		
Hexachloropropene				µg/L	8.6	U		
Indeno(1,2,3-cd)pyrene				µg/L	3.3	U		
Isodrin				µg/L	0.012	U		
Isophorone				µg/L	1.9	U		
Isosafrole				µg/L	3.3	U		
Kepone				µg/L	0.87	U		
Methapyrilene				µg/L	9.2	U		
Methyl methanesulfonate				µg/L	3.6	U		
Naphthalene				µg/L	1.5	U		
Nitrobenzene				µg/L	1.2	U		
N-Nitrosodiethylamine				µg/L	3	U		
N-Nitrosodimethylamine				µg/L	3.2	U		
N-Nitrosodi-n-butylamine				µg/L	1.2	U		
N-Nitrosodi-n-propylamine				µg/L	1.9	U		
N-Nitrosodiphenylamine				µg/L	1.8	U		
N-Nitrosomethylethylamine				µg/L	5.6	U		
N-Nitrosopiperidine				µg/L	5.1	U		
N-Nitrosopyrrolidine				µg/L	4.7	U		
O,O,O-Triethyl phosphorothioate				µg/L	4.7	U		
o-Toluidine				µg/L	1.9	U		
p-(Dimethylamino)azobenzene				µg/L	0.85	U		
Pentachlorobenzene				µg/L	4.6	U		
Pentachloronitrobenzene				µg/L	8	U		
Pentachlorophenol	1	1		µg/L	0.075	U		
Phenacetin				µg/L	4.4	U		
Phenanthrene				µg/L	1.5	U		
Phenol				µg/L	0.89	U		
Phorate				µg/L	0.15	U		
p-Phenylenediamine				µg/L	77	U		
Pronamide				µg/L	1.2	U		
Pyrene				µg/L	2.3	U		
Safrole, Total				µg/L	3.9	U		
Thionazin				µg/L	4	U		

¹Quarter 3 compliance sampling

²Quarter 4 compliance sampling

Table 3.8
Cell 2 Monitoring Well Field Parameter, Inorganic, SVOC, and VOC Results

Analyte	EPA MCL	ID GW - PRIMARY	ID GW - SECONDARY	Well ID	MW-8		MW-9	
				Sample Name	MW-8-20240906		MW-9-20240909	
				Sample Date	2024-09-06		2024-09-09	
				Unit	Result	Qualifier	Result	Qualifier
Field Parameters								
Dissolved Oxygen				mg/L	7.82		1.04	
Oxidation-Reduction Potential				mV	25		-149.9	
pH			6.5 - 8.5	su	7.26		6.79	
Specific Conductance				µS/cm	632		3938	
Temperature				Celsius	15.71		16.11	
Turbidity				ntu	0.62		6.62	
Inorganics								
Arsenic	10	50		µg/L	2.8	J	1.2	J
Barium	2000	2000		µg/L	34		43	
Calcium				µg/L	56000		200000	
Cobalt				µg/L	0.33	U	0.33	U
Copper	1300	1300		µg/L	0.71	U	1.3	J
Iron			300	µg/L	8.7	U	740	
Lead	15	15		µg/L	0.23	U	0.37	J
Magnesium				µg/L	21000		180000	
Manganese			0.05	mg/L	0.00051	U	1.4	
Nickel				µg/L	0.83	U	1.9	J
Potassium				µg/L	1000	U	3800	
Selenium	50	50		µg/L	1	U	2.4	J
Sodium				µg/L	46000		390000	
Sulfide				mg/L	0.022	U	0.022	UJ
Zinc			5000	µg/L	2	U	17	
SVOCs								
Benzo[a]pyrene	0.2	0.2		µg/L	0.025	U	0.024	U
VOCs								
1,1-Dichloroethane				µg/L	0.22	U	0.22	U
cis-1,2-Dichloroethene	70	70		µg/L	0.32	U	0.32	U
Dichlorodifluoromethane				µg/L	0.3	U	0.3	U
Trichloroethene	5	5		µg/L	0.3	U	0.3	U
Vinyl chloride	2	2		µg/L	0.23	U	0.72	J

Table 3.8
Cell 2 Monitoring Well Field Parameter, Inorganic, SVOC, and VOC Results

Analyte	MW-12		MW-13		MW-13	
	MW-12-20240904		MW-13-20240908		MW-13Q-20240908	
	2024-09-04		2024-09-08		2024-09-08	
	Result	Qualifier	Result	Qualifier	Result	Qualifier
Field Parameters						
Dissolved Oxygen	9.34		7.01			
Oxidation-Reduction Potential	35		156.5			
pH	7.35		7.44			
Specific Conductance	598		738			
Temperature	12.81		20.25			
Turbidity	0.38		3.04			
Inorganics						
Arsenic	0.5	J	3.7	J	3.7	J
Barium	53		120		120	
Calcium	61000		44000		44000	
Cobalt	2.8		0.33	U	0.33	U
Copper	0.71	U	0.71	U	0.71	U
Iron	8.7	U	27	J	39	J
Lead	0.23	U	0.23	U	0.23	U
Magnesium	16000		40000		40000	
Manganese	0.00051	U	0.00051	U	0.00068	J
Nickel	0.83	U	0.83	U	0.83	U
Potassium	920	J	2800		2800	
Selenium	1	U	1	U	1	U
Sodium	33000		37000		36000	
Sulfide	0.041	J	0.022	U	0.025	J
Zinc	2	U	2	U	2	U
SVOCs						
Benzo[a]pyrene	0.025	U	0.023	U	0.051	J
VOCs						
1,1-Dichloroethane	0.22	U	0.22	U	0.26	J
cis-1,2-Dichloroethene	0.32	U	1.3		1.3	
Dichlorodifluoromethane	0.3	U	0.96	J	0.97	J
Trichloroethene	0.3	U	0.3	U	0.31	J
Vinyl chloride	0.23	U	0.23	U	0.23	U

Table 3.9
Cell 4 Monitoring Well Field Parameter, Inorganic, and VOC Results

Analyte	EPA MCL	ID GW - PRIMARY	ID GW - SECONDARY	Well ID	MW-3A		MW-4	
				Sample Name	MW-3A-20240906		MW-4-20240905	
				Sample Date	2024-09-06		2024-09-05	
				Unit	Result	Qualifier	Result	Qualifier
Field Parameters								
Dissolved Oxygen				mg/L	6.07		0.47	
Oxidation-Reduction Potential				mV	28.8		-66.9	
pH			6.5 - 8.5	su	7.39		6.61	
Specific Conductance				µS/cm	665		1464	
Temperature				Celsius	14.08		10.77	
Turbidity				ntu	8.32		3.12	
Inorganics								
Arsenic	10	50		µg/L	0.5	U	1.1	J
Barium	2000	2000		µg/L	150		180	
Calcium				µg/L	52000		80000	
Cobalt				µg/L	0.33	UJ	0.33	UJ
Iron			300	µg/L	56	J	8.7	U
Magnesium				µg/L	28000		19000	
Manganese			0.05	mg/L	0.00082	J	0.00051	UJ
Nickel				µg/L	0.83	U	0.83	U
Potassium				µg/L	2400		3400	
Selenium	50	50		µg/L	1	U	1.1	J
Sodium				µg/L	44000		61000	
Vanadium				µg/L	1.1	U	1.1	U
Zinc			5000	µg/L	7.3	J	2	U
VOCs								
1,1-Dichloroethane				µg/L	0.22	U	0.36	J
1,2-Dichloroethane	5	5		µg/L	0.28	U	1.3	
cis-1,2-Dichloroethene	70	70		µg/L	0.32	U	1.9	
Trichloroethene	5	5		µg/L	0.3	U	1.8	
Vinyl chloride	2	2		µg/L	0.23	U	1.6	

Table 3.9
Cell 4 Monitoring Well Field Parameter, Inorganic, and VOC Results

Analyte	MW-4A		MW-5AR		MW-6A	
	MW-4A-20240905		MW-5AR-20240905		MW-6A-20240904	
	2024-09-05		2024-09-05		2024-09-04	
	Result	Qualifier	Result	Qualifier	Result	Qualifier
Field Parameters						
Dissolved Oxygen	9.77		5.21		8.16	
Oxidation-Reduction Potential	120.8		19.1		53.8	
pH	7.31		7.33		7.35	
Specific Conductance	909		1858		963	
Temperature	9.75		12.94		13.88	
Turbidity	0.76		4.81		0.55	
Inorganics						
Arsenic	1.4	J	0.5	U	0.5	U
Barium	210		94		200	
Calcium	170000		83000		69000	
Cobalt	0.82	J	0.33	UJ	0.33	UJ
Iron	720		13	J	8.7	U
Magnesium	67000		27000		43000	
Manganese	0.14	J	0.00093	J	0.00051	UJ
Nickel	1.3	J	0.83	U	0.83	U
Potassium	3700		2900		2000	
Selenium	1	U	1	J	1	U
Sodium	55000		280000		50000	
Vanadium	1.1	J	1.1	U	1.1	U
Zinc	2	U	2	U	2	U
VOCs						
1,1-Dichloroethane	0.22	U	0.22	U	0.22	U
1,2-Dichloroethane	0.28	U	0.28	U	0.28	U
cis-1,2-Dichloroethene	0.32	U	0.32	U	0.32	U
Trichloroethene	0.3	U	0.3	U	0.3	U
Vinyl chloride	0.23	U	0.23	U	0.23	U

**Section 4 Tables
Statistical Definitions
Fort Hall Mine Landfill**

Abbreviation/Expression	Definition
Confidence Level	confidence level of the Mann-Kendall Trend Test
Direction	Mann-Kendall trend result
J	estimated result
Last Q	laboratory qualifier for the most recent result (if any)
Latest Result	most recent result
LCL	lower confidence limit of the data set mean
Max Date	most recent date in the analyzed dataset
mg/L	milligram per liter
µg/L	microgram per liter
Min Date	earliest date in the analyzed dataset
NA	not applicable
NC	not calculated
Q	qualifier
RCRA	Resource Conservation and Recovery Act
RCRA regulated chemical	Whether the chemical is RCRA regulated
S	Mann-Kendall S Statistic
U	nondetect result
UCL	upper confidence limit of the data set mean
UJ	result estimated to be nondetect
UPL	upper prediction limit
UPL of background	UPL of the background well (Cell 2 and Cell 4 Monitoring Well only)
Decreasing (green highlight)	Mann Kendall trend test result is that the dataset has a statistically decreasing trend.
Increasing or Yes (red highlight)	Mann Kendall trend test result is that the dataset has a statistically increasing trend or the test parameter exceeds the comparison criteria (e.g., standard or UPL).

Table 4.1
Cell 1 Statistical Summary - VOCs

Well ID	Analyte	Unit	Min Date	Max Date	Latest Result	Last Q	Latest Result > Standard	UCL > Standard	Confidence Level %	GSI Toolkit Trend
MP-1	Tetrachloroethene	µg/L	09/13/2020	09/06/2024	15		Yes	Yes	81.6	No trend
MP-1	Trichloroethene	µg/L	09/13/2020	09/06/2024	97		Yes	Yes	50	Stable
MP-1	Vinyl chloride	µg/L	09/13/2020	09/06/2024	3.4		Yes	Yes	50	No trend
MP-2	Tetrachloroethene	µg/L	09/13/2020	09/04/2024	6.4		Yes	Yes	99.2	Decreasing
MP-2	Trichloroethene	µg/L	09/13/2020	09/04/2024	87		Yes	Yes	99.3	Decreasing
MP-2	Vinyl chloride	µg/L	09/13/2020	09/04/2024	4.2		Yes	Yes	76	Stable
MP-3	Tetrachloroethene	µg/L	09/13/2020	09/06/2024	13		Yes	Yes	50	Stable
MP-3	Trichloroethene	µg/L	09/13/2020	09/06/2024	40		Yes	Yes	76.7	Stable
MP-4	Tetrachloroethene	µg/L	09/13/2020	09/06/2024	14		Yes	Yes	54.2	No trend
MP-4	Trichloroethene	µg/L	09/13/2020	09/06/2024	66		Yes	Yes	70.1	Stable
MW-101S	Tetrachloroethene	µg/L	10/05/2018	09/06/2024	8.2		Yes	Yes	98.4	Increasing
MW-101S	Trichloroethene	µg/L	10/05/2018	09/06/2024	20		Yes	Yes	95.1	Increasing
MW-102S	Trichloroethene	µg/L	01/24/2018	09/09/2024	4.3		No	Yes	94.6	Probably Increasing
MW-105D	Chloroform	µg/L	01/23/2018	09/05/2024	2		No	Yes	96.4	Increasing
MW-105D	Tetrachloroethene	µg/L	01/23/2018	09/05/2024	34		Yes	Yes	92.7	Probably Increasing
MW-105D	Trichloroethene	µg/L	01/23/2018	09/05/2024	170		Yes	Yes	72.7	Stable
MW-105S	Tetrachloroethene	µg/L	01/23/2018	09/05/2024	5.5		Yes	Yes	82.8	Stable
MW-105S	Trichloroethene	µg/L	01/23/2018	09/05/2024	12		Yes	Yes	100	Decreasing
MW-109D	Tetrachloroethene	µg/L	10/06/2018	09/06/2024	18		Yes	Yes	97.3	Increasing
MW-109D	Trichloroethene	µg/L	10/06/2018	09/06/2024	55		Yes	Yes	52.4	Stable
MW-109S	Tetrachloroethene	µg/L	10/06/2018	09/06/2024	20		Yes	Yes	60.8	No trend
MW-109S	Trichloroethene	µg/L	10/06/2018	09/06/2024	46		Yes	Yes	54.4	Stable
MW-110D	Trichloroethene	µg/L	10/07/2018	09/06/2024	14		Yes	Yes	50	No trend
MW-110S	Tetrachloroethene	µg/L	10/06/2018	09/08/2024	2.2		No	Yes	50	Stable
MW-110S	Trichloroethene	µg/L	10/06/2018	09/08/2024	21		Yes	Yes	50	No trend
MW-110S	Vinyl chloride	µg/L	10/06/2018	09/08/2024	3.6		Yes	Yes	86.4	Stable
MW-111D	Benzene	µg/L	01/24/2018	09/05/2024	13	J	Yes	Yes	99.4	Decreasing
MW-111D	Trichloroethene	µg/L	01/24/2018	09/05/2024	5.1	J	Yes	Yes	52	No trend
MW-111D	Vinyl chloride	µg/L	01/24/2018	09/05/2024	0.62	J	No	Yes	81.1	No trend
MW-111S	Benzene	µg/L	10/04/2018	09/08/2024	9.8		Yes	Yes	97.7	Decreasing
MW-112D	Tetrachloroethene	µg/L	01/24/2018	09/05/2024	12		Yes	Yes	60.2	Stable
MW-112D	Trichloroethene	µg/L	01/24/2018	09/05/2024	180		Yes	Yes	87.9	Stable
MW-112M	Tetrachloroethene	µg/L	10/05/2018	09/08/2024	7.1		Yes	Yes	56.5	No trend
MW-112M	Trichloroethene	µg/L	10/05/2018	09/08/2024	94		Yes	Yes	78.2	Stable
MW-113D	Tetrachloroethene	µg/L	10/04/2018	09/06/2024	13		Yes	Yes	85.2	Stable
MW-113D	Trichloroethene	µg/L	10/04/2018	09/06/2024	7.2		Yes	Yes	96.9	Decreasing
MW-113D	Vinyl chloride	µg/L	10/04/2018	09/06/2024	22		Yes	Yes	94.6	Probably Decreasing
MW-113S	Benzene	µg/L	01/24/2018	09/04/2024	6.2		Yes	Yes	99.2	Decreasing
MW-113S	Chloroform	µg/L	01/24/2018	09/04/2024	1.1		No	Yes	100	Decreasing
MW-113S	Tetrachloroethene	µg/L	01/24/2018	09/04/2024	17		Yes	Yes	100	Decreasing

Table 4.1
Cell 1 Statistical Summary - VOCs

Well ID	Analyte	Unit	Min Date	Max Date	Latest Result	Last Q	Latest Result > Standard	UCL > Standard	Confidence Level %	GSI Toolkit Trend
MW-113S	Trichloroethene	µg/L	01/24/2018	09/04/2024	12		Yes	Yes	100	Decreasing
MW-113S	Vinyl chloride	µg/L	01/24/2018	09/04/2024	67		Yes	Yes	98.7	Decreasing
MW-117R	Tetrachloroethene	µg/L	01/26/2018	09/10/2024	7.5		Yes	Yes	50	No trend
MW-117R	Trichloroethene	µg/L	01/26/2018	09/10/2024	37		Yes	Yes	96.4	Decreasing
MW-118D	Tetrachloroethene	µg/L	01/23/2018	09/05/2024	4.6		No	Yes	100	Decreasing
MW-118D	Trichloroethene	µg/L	01/23/2018	09/05/2024	34		Yes	Yes	100	Decreasing
MW-119D	Tetrachloroethene	µg/L	01/25/2018	09/04/2024	14		Yes	Yes	98.4	Increasing
MW-119D	Trichloroethene	µg/L	01/25/2018	09/04/2024	62		Yes	Yes	61.7	No trend
MW-119S	Tetrachloroethene	µg/L	01/25/2018	09/04/2024	12		Yes	Yes	93.2	Probably Increasing
MW-119S	Trichloroethene	µg/L	01/25/2018	09/04/2024	49		Yes	Yes	92.5	Probably Increasing
MW-120D	Tetrachloroethene	µg/L	01/25/2018	09/04/2024	11		Yes	Yes	99	Decreasing
MW-120D	Trichloroethene	µg/L	01/25/2018	09/04/2024	150		Yes	Yes	94.9	Probably Increasing
MW-120D	Vinyl chloride	µg/L	01/25/2018	09/04/2024	1.8		No	Yes	85	Stable
MW-120S	Tetrachloroethene	µg/L	01/25/2018	09/05/2024	10		Yes	Yes	100	Decreasing
MW-120S	Trichloroethene	µg/L	01/25/2018	09/05/2024	99		Yes	Yes	99.7	Decreasing
MW-121	Trichloroethene	µg/L	10/07/2018	09/06/2024	2.8		No	Yes	NC	NC
MW-123	Tetrachloroethene	µg/L	04/25/2021	09/08/2024	3.4		No	Yes	77.3	No trend
MW-123	Trichloroethene	µg/L	04/25/2021	09/08/2024	47		Yes	Yes	80.7	Stable
MW-124	Tetrachloroethene	µg/L	04/12/2023	09/09/2024	2.7		No	Yes	87	Stable
MW-124	Trichloroethene	µg/L	04/12/2023	09/09/2024	73		Yes	Yes	71.7	Stable
MW-124	Vinyl chloride	µg/L	04/12/2023	09/09/2024	5.8		Yes	Yes	64.6	Stable
MW-125	Tetrachloroethene	µg/L	04/12/2023	09/09/2024	1.6		No	Yes	98.8	Decreasing
MW-125	Trichloroethene	µg/L	04/12/2023	09/09/2024	14		Yes	Yes	98.8	Decreasing
MW-125	Vinyl chloride	µg/L	04/12/2023	09/09/2024	5.8		Yes	Yes	96.5	Increasing
RW-1	Tetrachloroethene	µg/L	01/26/2018	09/06/2024	12		Yes	Yes	85.6	Stable
RW-1	Trichloroethene	µg/L	01/26/2018	09/06/2024	100		Yes	Yes	88.5	Stable
RW-1	Vinyl chloride	µg/L	01/26/2018	09/06/2024	4.2		Yes	Yes	72.6	No trend
RW-2	Tetrachloroethene	µg/L	01/26/2018	09/06/2024	5.3		Yes	Yes	99.4	Decreasing
RW-2	Trichloroethene	µg/L	01/26/2018	09/06/2024	79		Yes	Yes	96.2	Decreasing
RW-2	Vinyl chloride	µg/L	01/26/2018	09/06/2024	3.9		Yes	Yes	96.2	Increasing
RW-3	Tetrachloroethene	µg/L	01/26/2018	09/06/2024	2.3		No	Yes	97.6	Decreasing
RW-3	Trichloroethene	µg/L	01/26/2018	09/06/2024	2		No	Yes	98.6	Decreasing

See Section 4 Table Notes

Table 4.2
Offsite Statistical Summary - VOCs

Well ID	Analyte	Unit	Min Date	Max Date	Latest Result	Last Q	UCL > Standard	Confidence Level %	GSI Toolkit Trend
MW-103S	Trichloroethene	µg/L	08/09/2017	09/09/2024	0.3	U	Yes	69	Stable
MW-116S	Trichloroethene	µg/L	08/11/2017	09/08/2024	10		Yes	99.8	Decreasing

See Section 4 Table Notes

Table 4.3
Remediation System Extraction Well Statistical Summary - PCE and TCE

Well ID	Analyte	Unit	Min Date	Max Date	Latest Result	Last Q	Latest Result > Standard	UCL > Standard	Confidence Level %	GSI Toolkit Trend
RW-10	Tetrachloroethene	µg/L	01/26/2018	09/10/2024	14		Yes	Yes	86.1	No trend
RW-10	Trichloroethene	µg/L	01/26/2018	09/10/2024	45		Yes	Yes	79.1	No trend
RW-15	Tetrachloroethene	µg/L	01/26/2018	09/10/2024	15		Yes	Yes	74.7	Stable
RW-15	Trichloroethene	µg/L	01/26/2018	09/10/2024	80		Yes	Yes	82.5	Stable
RW-17	Tetrachloroethene	µg/L	01/26/2018	09/10/2024	17		Yes	Yes	81	No trend
RW-17	Trichloroethene	µg/L	01/26/2018	09/10/2024	61		Yes	Yes	54.4	No trend
RW-4	Tetrachloroethene	µg/L	01/26/2018	09/10/2024	17		Yes	Yes	64.6	Stable
RW-4	Trichloroethene	µg/L	01/26/2018	09/10/2024	96		Yes	Yes	95.2	Decreasing
RW-5	Tetrachloroethene	µg/L	01/26/2018	09/10/2024	12		Yes	Yes	59.3	Stable
RW-5	Trichloroethene	µg/L	01/26/2018	09/10/2024	36		Yes	Yes	68	Stable
RW-9R	Tetrachloroethene	µg/L	01/26/2018	09/10/2024	8.5		Yes	Yes	85.1	Stable
RW-9R	Trichloroethene	µg/L	01/26/2018	09/10/2024	86		Yes	Yes	90.1	Probably Decreasing

See Section 4 Table Notes

Table 4.4
Cell 1 Recent PCE and TCE Trends Comparison

Well ID	Analyte	Spring 2023 Trend	Fall 2023 Trend	Spring 2024 Trend	Fall 2024 Trend
MP-1	Tetrachloroethene	NC	Stable	No trend	No trend
MP-2	Tetrachloroethene	Stable	Decreasing	Decreasing	Decreasing
MP-3	Tetrachloroethene	Probably Increasing	No trend	No trend	Stable
MP-4	Tetrachloroethene	Probably Increasing	No trend	No trend	No trend
MW-101S	Tetrachloroethene	Increasing	Increasing	Increasing	Increasing
MW-102S	Tetrachloroethene	NC	NC	No trend	Stable
MW-105D	Tetrachloroethene	No trend	Increasing	Increasing	Probably Increasing
MW-105S	Tetrachloroethene	No trend	No trend	Stable	Stable
MW-109D	Tetrachloroethene	Probably Increasing	No trend	Probably Increasing	Increasing
MW-109S	Tetrachloroethene	No trend	No trend	No trend	No trend
MW-110D	Tetrachloroethene	NC	NC	No trend	Stable
MW-110S	Tetrachloroethene	Increasing	No trend	No trend	Stable
MW-112D	Tetrachloroethene	No trend	Stable	Stable	Stable
MW-112M	Tetrachloroethene	Increasing	No trend	No trend	No trend
MW-113D	Tetrachloroethene	Probably Decreasing	Decreasing	Decreasing	Stable
MW-113S	Tetrachloroethene	Decreasing	Decreasing	Decreasing	Decreasing
MW-117R	Tetrachloroethene	NC	NC	No trend	No trend
MW-118D	Tetrachloroethene	Decreasing	Decreasing	Decreasing	Decreasing
MW-119D	Tetrachloroethene	Increasing	Increasing	Increasing	Increasing
MW-119S	Tetrachloroethene	Increasing	Increasing	Increasing	Probably Increasing
MW-120D	Tetrachloroethene	Stable	Probably Decreasing	Decreasing	Decreasing
MW-120S	Tetrachloroethene	Decreasing	Decreasing	Decreasing	Decreasing
MW-123	Tetrachloroethene	NC	No trend	Probably Increasing	No trend
MW-124	Tetrachloroethene	NC	NC	NC	Stable
MW-125	Tetrachloroethene	NC	NC	NC	Decreasing
RW-1	Tetrachloroethene	NC	NC	Stable	Stable
RW-2	Tetrachloroethene	NC	Decreasing	Decreasing	Decreasing
RW-3	Tetrachloroethene	Stable	Stable	Probably Decreasing	Decreasing
RW-16	Tetrachloroethene	NC	NC	Stable	Stable
MP-1	Trichloroethene	NC	No trend	No trend	Stable
MP-2	Trichloroethene	Stable	Decreasing	Decreasing	Decreasing
MP-3	Trichloroethene	No trend	No trend	Stable	Stable
MP-4	Trichloroethene	No trend	Stable	No trend	Stable
MW-101S	Trichloroethene	Increasing	Increasing	Increasing	Increasing
MW-102S	Trichloroethene	No Trend	No trend	Probably Increasing	Probably Increasing
MW-105D	Trichloroethene	Stable	No trend	No trend	Stable
MW-105S	Trichloroethene	Decreasing	Decreasing	Decreasing	Decreasing
MW-109D	Trichloroethene	Stable	Stable	No trend	Stable
MW-109S	Trichloroethene	No trend	No trend	Stable	Stable
MW-110D	Trichloroethene	Stable	Stable	No trend	No trend
MW-110S	Trichloroethene	Increasing	Increasing	No trend	No trend
MW-111D	Trichloroethene	Probably Increasing	No trend	No trend	No trend
MW-112D	Trichloroethene	Stable	Stable	Stable	Stable
MW-112M	Trichloroethene	Probably Increasing	No trend	Stable	Stable
MW-113D	Trichloroethene	Decreasing	Decreasing	Decreasing	Decreasing
MW-113S	Trichloroethene	Decreasing	Decreasing	Decreasing	Decreasing
MW-117R	Trichloroethene	NC	NC	Probably Decreasing	Decreasing
MW-118D	Trichloroethene	Decreasing	Decreasing	Decreasing	Decreasing
MW-119D	Trichloroethene	Increasing	Probably Increasing	No trend	No trend
MW-119S	Trichloroethene	Increasing	Increasing	Increasing	Probably Increasing
MW-120D	Trichloroethene	Increasing	Increasing	No trend	Probably Increasing
MW-120S	Trichloroethene	Probably Decreasing	Decreasing	Decreasing	Decreasing
MW-123	Trichloroethene	Stable	Stable	Stable	Stable
MW-124	Trichloroethene	NC	NC	NC	Stable
MW-125	Trichloroethene	NC	NC	NC	Decreasing
RW-1	Trichloroethene	NC	NC	Stable	Stable
RW-2	Trichloroethene	NC	Stable	Probably Decreasing	Decreasing
RW-3	Trichloroethene	Stable	Stable	Probably Decreasing	Decreasing
RW-16	Trichloroethene	NC	NC	Stable	Stable

See Section 4 Table Notes

Table 4.5
Cell 1 Statistical Summary - Inorganics

Well ID	RCRA regulated chemical	Analyte	Unit	Min Date	Max Date	Latest Result	Last Q	Latest Result > Standard	UCL > Standard
MW-121	Yes	Arsenic	µg/L	10/07/2018	09/06/2024	8		No	Yes
MW-121	No	Iron	µg/L	10/07/2018	09/06/2024	1700		Yes	Yes
MW-121	No	Manganese	mg/L	10/07/2018	09/06/2024	1.1	J	Yes	Yes

See Section 4 Table Notes

Table 4.6
Cell 2 Statistical Summary - VOCs

Well ID	RCRA regulated chemical	Analyte	Unit	Min Date	Max Date	Latest Result	Last Q	Latest Result > Standard	UCL > Standard	LCL > Standard	Confidence Level %	S	sd(S)	Z	Direction
MW-12	Yes	1,2,4-Trichlorobenzene	µg/L	04/13/2018	09/04/2024	0.58	U	No	NC	NC	NC	NC	NC	NC	NC
MW-12	Yes	1,2-Dichloroethane	µg/L	04/13/2018	09/04/2024	0.28	U	No	NC	NC	NC	NC	NC	NC	NC
MW-12	Yes	Iodomethane	µg/L	04/13/2018	09/04/2024	2.6	U	NC	NC	NC	NC	NC	NC	NC	NC
MW-13	Yes	1,1-Dichloroethane	µg/L	04/12/2018	09/08/2024	0.26	J	NC	NC	NC	NC	NC	NC	NC	NC
MW-13	Yes	1,2-Dichloroethane	µg/L	04/12/2018	09/08/2024	0.28	U	No	NC	NC	NC	NC	NC	NC	NC
MW-13	Yes	Dichlorodifluoromethane	µg/L	04/12/2018	09/08/2024	0.97	J	NC	NC	NC	98.2	39	18	2.11	Increasing
MW-13	Yes	Iodomethane	µg/L	04/12/2018	09/08/2024	2.6	U	NC	NC	NC	NC	NC	NC	NC	NC
MW-13	Yes	Tetrachloroethene	µg/L	04/12/2018	09/08/2024	0.4	U	No	No	No	99.5	47	17.8	2.58	Increasing
MW-13	Yes	Trichloroethene	µg/L	04/12/2018	09/08/2024	0.31	J	No	No	No	NC	NC	NC	NC	NC
MW-13	Yes	Trichlorofluoromethane	µg/L	04/12/2018	09/08/2024	0.2	U	NC	NC	NC	NC	NC	NC	NC	NC
MW-13	Yes	cis-1,2-Dichloroethene	µg/L	04/12/2018	09/08/2024	1.3		No	No	No	100	80	18.2	4.34	Increasing
MW-8	Yes	Acetone	µg/L	04/12/2018	09/06/2024	6.6	U	NC	NC	NC	NC	NC	NC	NC	NC
MW-8	Yes	Trichloroethene	µg/L	04/12/2018	09/06/2024	0.3	U	No	NC	NC	NC	NC	NC	NC	NC
MW-9	Yes	1,2-Dichloroethane	µg/L	04/12/2018	09/09/2024	0.28	U	No	No	No	NC	NC	NC	NC	NC
MW-9	Yes	Acetone	µg/L	04/12/2018	09/09/2024	6.6	U	NC	NC	NC	NC	NC	NC	NC	NC
MW-9	Yes	Benzene	µg/L	04/12/2018	09/09/2024	0.14	U	No	No	No	NC	NC	NC	NC	NC
MW-9	Yes	Dichlorodifluoromethane	µg/L	04/12/2018	09/09/2024	0.3	U	NC	NC	NC	NC	NC	NC	NC	NC
MW-9	Yes	Vinyl chloride	µg/L	04/12/2018	09/09/2024	0.72	J	No	No	No	52.2	2	18.1	0.0552	No Trend

See Section 4 Table Notes

Table 4.7
Cell 2 Statistical Summary - Other Organics

Well ID	RCRA regulated chemical	Analyte	Unit	Min Date	Max Date	Latest Result	Last Q	Latest Result > Standard	UCL > Standard	LCL > Standard
MW-12	Yes	4,4'-DDE	µg/L	10/08/2018	09/04/2024	0.0041	U	NC	NC	NC
MW-12	Yes	Bis(2-ethylhexyl) phthalate	µg/L	10/08/2018	09/04/2024	3.2	U	No	NC	NC
MW-12	Yes	Isodrin	µg/L	10/08/2018	09/04/2024	0.012	U	NC	NC	NC
MW-13	Yes	4,4'-DDD	µg/L	10/06/2018	09/08/2024	0.0041	U	NC	NC	NC
MW-13	Yes	4,4'-DDE	µg/L	10/06/2018	09/08/2024	0.0041	U	NC	NC	NC
MW-13	Yes	4,4'-DDT	µg/L	10/06/2018	09/08/2024	0.023	U	NC	NC	NC
MW-13	Yes	Aldrin	µg/L	10/06/2018	09/08/2024	0.006	U	NC	NC	NC
MW-13	Yes	Benzo[a]pyrene	µg/L	04/12/2018	09/08/2024	0.051	J	No	NC	NC
MW-13	Yes	Di-n-butyl phthalate	µg/L	10/06/2018	09/08/2024	2	U	NC	NC	NC
MW-13	Yes	Dieldrin	µg/L	10/06/2018	09/08/2024	0.0045	U	NC	NC	NC
MW-13	Yes	Endosulfan I	µg/L	10/06/2018	09/08/2024	0.0057	U	NC	NC	NC
MW-13	Yes	Endosulfan II	µg/L	10/06/2018	09/08/2024	0.0064	U	NC	NC	NC
MW-13	Yes	Endosulfan sulfate	µg/L	10/06/2018	09/08/2024	0.0048	U	NC	NC	NC
MW-13	Yes	Endrin	µg/L	10/06/2018	09/08/2024	0.0084	U	No	NC	NC
MW-13	Yes	Heptachlor	µg/L	10/06/2018	09/08/2024	0.049	U	No	NC	NC
MW-13	Yes	Heptachlor epoxide	µg/L	10/06/2018	09/08/2024	0.0031	U	No	NC	NC
MW-13	Yes	Methoxychlor	µg/L	10/06/2018	09/08/2024	0.014	U	No	NC	NC
MW-13	Yes	alpha-BHC	µg/L	10/06/2018	09/08/2024	0.0094	U	NC	NC	NC
MW-13	Yes	beta-BHC	µg/L	10/06/2018	09/08/2024	0.0089	U	NC	NC	NC
MW-13	Yes	delta-BHC	µg/L	10/06/2018	09/08/2024	0.0076	U	NC	NC	NC
MW-8	Yes	Bis(2-ethylhexyl) phthalate	µg/L	10/07/2018	09/06/2024	3.2	U	No	NC	NC
MW-8	Yes	Methoxychlor	µg/L	10/07/2018	09/06/2024	0.013	U	No	NC	NC
MW-8	Yes	N-Nitrosodiphenylamine	µg/L	10/07/2018	09/06/2024	1.8	U	NC	NC	NC
MW-9	Yes	2,3,7,8-TCDD	pg/L	10/07/2018	09/09/2024	0.51	U	No	NC	NC
MW-9	Yes	Benzo[a]pyrene	µg/L	04/12/2018	09/09/2024	0.024	U	No	No	No

See Section 4 Table Notes

Table 4.8
Cell 2 Statistical Summary - Inorganics

Well ID	RCRA regulated chemical	Analyte	Unit	Min Date	Max Date	Latest Result	Last Q	Latest Result > Standard	LCL > Standard	Latest Result > UPL of background	Confidence Level %	Direction
MW-12	Yes	Arsenic	µg/L	04/13/2018	09/04/2024	0.5	J	No	No	No	50	No Trend
MW-12	Yes	Barium	µg/L	04/13/2018	09/04/2024	53		No	No	No	88.9	No Trend
MW-12	Yes	Beryllium	µg/L	04/13/2018	09/04/2024	0.3	U	No	No	No	NC	NC
MW-12	No	Calcium	µg/L	04/13/2018	09/04/2024	61000		NC	NC	No	71.1	No Trend
MW-12	Yes	Chromium	µg/L	04/13/2018	09/04/2024	0.5	U	No	No	No	91.6	No Trend
MW-12	Yes	Cobalt	µg/L	04/13/2018	09/04/2024	2.8		NC	NC	No	100	Decreasing
MW-12	Yes	Copper	µg/L	04/13/2018	09/04/2024	0.71	U	No	No	No	NC	NC
MW-12	No	Iron	µg/L	04/13/2018	09/04/2024	8.7	U	No	No	No	NC	NC
MW-12	Yes	Lead	µg/L	04/13/2018	09/04/2024	0.23	U	No	No	No	NC	NC
MW-12	No	Magnesium	µg/L	04/13/2018	09/04/2024	16000		NC	NC	No	73.8	No Trend
MW-12	No	Manganese	mg/L	04/13/2018	09/04/2024	0.00051	U	No	No	No	NC	NC
MW-12	Yes	Nickel	µg/L	04/13/2018	09/04/2024	0.83	U	NC	NC	No	NC	NC
MW-12	No	Potassium	µg/L	04/13/2018	09/04/2024	920	J	NC	NC	No	95.8	Decreasing
MW-12	Yes	Selenium	µg/L	04/13/2018	09/04/2024	1	U	No	No	No	91.8	No Trend
MW-12	No	Sodium	µg/L	04/13/2018	09/04/2024	33000		NC	NC	No	58.8	No Trend
MW-12	Yes	Sulfide	mg/L	04/13/2018	09/04/2024	0.041	J	NC	NC	No	NC	NC
MW-12	Yes	Thallium	µg/L	04/13/2018	09/04/2024	0.21	U	No	No	No	NC	NC
MW-12	Yes	Vanadium	µg/L	04/13/2018	09/04/2024	1.1	U	NC	NC	No	NC	NC
MW-12	Yes	Zinc	µg/L	04/13/2018	09/04/2024	2	U	No	No	No	NC	NC
MW-13	Yes	Arsenic	µg/L	04/12/2018	09/08/2024	3.7	J	No	No	Yes	86.8	No Trend
MW-13	Yes	Barium	µg/L	04/12/2018	09/08/2024	120		No	No	Yes	50	No Trend
MW-13	Yes	Beryllium	µg/L	04/12/2018	09/08/2024	0.3	U	No	NC	No	NC	NC
MW-13	No	Calcium	µg/L	04/12/2018	09/08/2024	44000		NC	NC	No	84.2	No Trend
MW-13	Yes	Chromium	µg/L	04/12/2018	09/08/2024	0.5	U	No	No	No	99.6	Decreasing
MW-13	Yes	Cobalt	µg/L	04/12/2018	09/08/2024	0.33	U	NC	NC	No	74.4	No Trend
MW-13	Yes	Copper	µg/L	04/12/2018	09/08/2024	0.71	U	No	No	No	NC	NC
MW-13	No	Iron	µg/L	04/12/2018	09/08/2024	39	J	No	No	No	82.5	No Trend
MW-13	Yes	Lead	µg/L	04/12/2018	09/08/2024	0.23	U	No	No	No	NC	NC
MW-13	No	Magnesium	µg/L	04/12/2018	09/08/2024	40000		NC	NC	Yes	65.5	No Trend
MW-13	No	Manganese	mg/L	04/12/2018	09/08/2024	0.00068	J	No	No	No	95	Decreasing
MW-13	Yes	Nickel	µg/L	04/12/2018	09/08/2024	0.83	U	NC	NC	No	NC	NC
MW-13	No	Potassium	µg/L	04/12/2018	09/08/2024	2800		NC	NC	No	90.8	No Trend
MW-13	Yes	Selenium	µg/L	04/12/2018	09/08/2024	1	U	No	No	No	97.1	Increasing
MW-13	No	Sodium	µg/L	04/12/2018	09/08/2024	37000		NC	NC	No	87	No Trend
MW-13	Yes	Sulfide	mg/L	04/12/2018	09/08/2024	0.025	J	NC	NC	No	NC	NC
MW-13	Yes	Thallium	µg/L	04/12/2018	09/08/2024	0.21	U	No	NC	No	NC	NC
MW-13	Yes	Vanadium	µg/L	04/12/2018	09/08/2024	1.1	U	NC	NC	No	NC	NC
MW-13	Yes	Zinc	µg/L	04/12/2018	09/08/2024	2	U	No	No	No	NC	NC
MW-8	Yes	Arsenic	µg/L	04/12/2018	09/06/2024	2.8	J	No	No	Yes	99.9	Decreasing
MW-8	Yes	Barium	µg/L	04/12/2018	09/06/2024	34		No	No	No	91.3	No Trend
MW-8	Yes	Beryllium	µg/L	04/12/2018	09/06/2024	0.3	U	No	NC	No	NC	NC
MW-8	No	Calcium	µg/L	04/12/2018	09/06/2024	56000		NC	NC	No	58.7	No Trend

Table 4.8
Cell 2 Statistical Summary - Inorganics

Well ID	RCRA regulated chemical	Analyte	Unit	Min Date	Max Date	Latest Result	Last Q	Latest Result > Standard	LCL > Standard	Latest Result > UPL of background	Confidence Level %	Direction
MW-8	Yes	Chromium	µg/L	04/12/2018	09/06/2024	0.5	U	No	No	No	NC	NC
MW-8	Yes	Cobalt	µg/L	04/12/2018	09/06/2024	0.33	U	NC	NC	No	NC	NC
MW-8	Yes	Copper	µg/L	04/12/2018	09/06/2024	0.71	U	No	No	No	NC	NC
MW-8	No	Iron	µg/L	04/12/2018	09/06/2024	8.7	U	No	No	No	NC	NC
MW-8	No	Magnesium	µg/L	04/12/2018	09/06/2024	21000		NC	NC	Yes	61.1	No Trend
MW-8	No	Manganese	mg/L	04/12/2018	09/06/2024	0.00051	U	No	No	No	95.2	Decreasing
MW-8	Yes	Nickel	µg/L	04/12/2018	09/06/2024	0.83	U	NC	NC	No	NC	NC
MW-8	No	Potassium	µg/L	04/12/2018	09/06/2024	1000	U	NC	NC	No	72.7	No Trend
MW-8	Yes	Selenium	µg/L	04/12/2018	09/06/2024	1	U	No	No	No	81.3	No Trend
MW-8	No	Sodium	µg/L	04/12/2018	09/06/2024	46000		NC	NC	Yes	99.3	Decreasing
MW-8	Yes	Sulfide	mg/L	04/12/2018	09/06/2024	0.022	U	NC	NC	No	NC	NC
MW-8	Yes	Vanadium	µg/L	04/12/2018	09/06/2024	1.1	U	NC	NC	No	NC	NC
MW-8	Yes	Zinc	µg/L	04/12/2018	09/06/2024	2	U	No	No	No	NC	NC
MW-9	Yes	Arsenic	µg/L	04/12/2018	09/09/2024	1.2	J	No	No	No	76.5	No Trend
MW-9	Yes	Barium	µg/L	04/12/2018	09/09/2024	43		No	No	No	96.5	Increasing
MW-9	Yes	Beryllium	µg/L	04/12/2018	09/09/2024	0.3	U	No	NC	No	NC	NC
MW-9	No	Calcium	µg/L	04/12/2018	09/09/2024	200000		NC	NC	Yes	89.6	No Trend
MW-9	Yes	Chromium	µg/L	04/12/2018	09/09/2024	0.5	U	No	No	No	NC	NC
MW-9	Yes	Cobalt	µg/L	04/12/2018	09/09/2024	0.33	U	NC	NC	No	99.4	Decreasing
MW-9	Yes	Copper	µg/L	04/12/2018	09/09/2024	1.3	J	No	No	No	74.7	No Trend
MW-9	No	Iron	µg/L	04/12/2018	09/09/2024	740		Yes	Yes	Yes	99.6	Increasing
MW-9	Yes	Lead	µg/L	04/12/2018	09/09/2024	0.37	J	No	No	Yes	52.3	No Trend
MW-9	No	Magnesium	µg/L	04/12/2018	09/09/2024	180000		NC	NC	Yes	79.5	No Trend
MW-9	No	Manganese	mg/L	04/12/2018	09/09/2024	1.4		Yes	Yes	Yes	83.9	No Trend
MW-9	Yes	Nickel	µg/L	04/12/2018	09/09/2024	1.9	J	NC	NC	Yes	100	Decreasing
MW-9	No	Potassium	µg/L	04/12/2018	09/09/2024	3800		NC	NC	Yes	96	Decreasing
MW-9	Yes	Selenium	µg/L	04/12/2018	09/09/2024	2.4	J	No	No	Yes	NC	NC
MW-9	No	Sodium	µg/L	04/12/2018	09/09/2024	390000		NC	NC	Yes	85.1	No Trend
MW-9	Yes	Sulfide	mg/L	04/12/2018	09/09/2024	0.022	UJ	NC	NC	No	NC	NC
MW-9	Yes	Vanadium	µg/L	04/12/2018	09/09/2024	1.1	U	NC	NC	No	NC	NC
MW-9	Yes	Zinc	µg/L	04/12/2018	09/09/2024	17		No	No	Yes	99.8	Decreasing

See Section 4 Table Notes

Table 4.9
Cell 4 Statistical Summary - VOCs

Well ID	RCRA regulated chemical	Analyte	Unit	Min Date	Max Date	Latest Result	Last Q	Latest Result > Standard	LCL > Standard	Confidence Level %	Direction
MW-3A	Yes	1,2,4-Trichlorobenzene	µg/L	10/08/2018	09/06/2024	0.58	U	No	NC	NC	NC
MW-3A	Yes	1,4-Dichlorobenzene	µg/L	04/11/2018	09/06/2024	0.39	U	No	NC	NC	NC
MW-3A	Yes	Acrylonitrile	µg/L	04/11/2018	09/06/2024	1.7	U	NC	NC	NC	NC
MW-3A	Yes	Iodomethane	µg/L	04/11/2018	09/06/2024	2.6	U	NC	NC	NC	NC
MW-3A	Yes	Trichloroethene	µg/L	04/11/2018	09/06/2024	0.3	U	No	NC	NC	NC
MW-4	Yes	1,1,1-Trichloroethane	µg/L	04/11/2018	09/05/2024	0.39	U	No	No	NC	NC
MW-4	Yes	1,1-Dichloroethane	µg/L	04/11/2018	09/05/2024	0.36	J	NC	NC	99.7	Increasing
MW-4	Yes	1,2-Dichloroethane	µg/L	04/11/2018	09/05/2024	1.3		No	No	100	Increasing
MW-4	Yes	Benzene	µg/L	04/11/2018	09/05/2024	0.14	U	No	No	98.4	Increasing
MW-4	Yes	Chlorobenzene	µg/L	04/11/2018	09/05/2024	0.092	U	No	NC	NC	NC
MW-4	Yes	Dichlorodifluoromethane	µg/L	10/05/2018	09/05/2024	0.3	U	NC	NC	NC	NC
MW-4	Yes	Iodomethane	µg/L	04/11/2018	09/05/2024	2.6	U	NC	NC	NC	NC
MW-4	Yes	Tetrachloroethene	µg/L	04/11/2018	09/05/2024	0.4	U	No	No	100	Decreasing
MW-4	Yes	Trichloroethene	µg/L	04/11/2018	09/05/2024	1.8		No	No	99.9	Increasing
MW-4	Yes	Vinyl chloride	µg/L	04/11/2018	09/05/2024	1.6		No	No	99.6	Increasing
MW-4	Yes	Xylenes, total	µg/L	04/11/2018	09/05/2024	0.11	U	No	No	NC	NC
MW-4	Yes	cis-1,2-Dichloroethene	µg/L	04/11/2018	09/05/2024	1.9		No	No	98.6	Increasing
MW-4	No	o-xylene	µg/L	05/01/2019	09/05/2024	0.11	U	No	NC	NC	NC
MW-4	Yes	trans-1,2-Dichloroethene	µg/L	04/11/2018	09/05/2024	0.37	U	No	No	99.3	Increasing
MW-4A	Yes	Trichloroethene	µg/L	04/11/2018	09/05/2024	0.3	U	No	NC	NC	NC
MW-5AR	Yes	Carbon disulfide	µg/L	07/21/2021	09/05/2024	0.26	U	NC	NC	NC	NC
MW-5AR	Yes	Toluene	µg/L	07/21/2021	09/05/2024	0.32	U	No	No	NC	NC

See Section 4 Table Notes

Table 4.10
Cell 4 Statistical Summary - Inorganics

Well ID	RCRA regulated chemical	Analyte	Unit	Min Date	Max Date	Latest Result	Last Q	Latest Result > Standard	LCL > Standard	Latest Result > UPL of background	Confidence Level %
MW-3A	Yes	Arsenic	µg/L	04/11/2018	09/06/2024	0.5	U	No	NC	No	NC
MW-3A	Yes	Barium	µg/L	04/11/2018	09/06/2024	150		No	No	No	85.9
MW-3A	Yes	Beryllium	µg/L	04/11/2018	09/06/2024	0.3	U	No	No	NC	NC
MW-3A	Yes	Cadmium	µg/L	04/11/2018	09/06/2024	0.19	U	No	NC	NC	NC
MW-3A	No	Calcium	µg/L	04/11/2018	09/06/2024	52000		NC	NC	No	82.7
MW-3A	Yes	Chromium	µg/L	04/11/2018	09/06/2024	0.5	U	No	No	No	NC
MW-3A	Yes	Cobalt	µg/L	04/11/2018	09/06/2024	0.33	UJ	NC	NC	No	NC
MW-3A	Yes	Copper	µg/L	04/11/2018	09/06/2024	0.71	U	No	No	No	NC
MW-3A	No	Iron	µg/L	04/11/2018	09/06/2024	56	J	No	No	No	76.3
MW-3A	Yes	Lead	µg/L	04/11/2018	09/06/2024	0.23	UJ	No	No	NC	NC
MW-3A	No	Magnesium	µg/L	04/11/2018	09/06/2024	28000		NC	NC	No	97.2
MW-3A	No	Manganese	mg/L	04/11/2018	09/06/2024	0.00082	J	No	No	No	66.9
MW-3A	Yes	Nickel	µg/L	04/11/2018	09/06/2024	0.83	U	NC	NC	No	NC
MW-3A	No	Potassium	µg/L	04/11/2018	09/06/2024	2400		NC	NC	No	79.8
MW-3A	Yes	Selenium	µg/L	04/11/2018	09/06/2024	1	U	No	No	No	98.2
MW-3A	No	Sodium	µg/L	04/11/2018	09/06/2024	44000		NC	NC	No	52.2
MW-3A	Yes	Thallium	µg/L	04/11/2018	09/06/2024	0.21	UJ	No	NC	NC	NC
MW-3A	Yes	Tin	µg/L	04/11/2018	09/06/2024	0.58	U	NC	NC	NC	NC
MW-3A	Yes	Vanadium	µg/L	04/11/2018	09/06/2024	1.1	U	NC	NC	No	NC
MW-3A	Yes	Zinc	µg/L	04/11/2018	09/06/2024	7.3	J	No	No	No	99.9
MW-4	Yes	Arsenic	µg/L	04/11/2018	09/05/2024	1.1	J	No	No	No	97.7
MW-4	Yes	Barium	µg/L	04/11/2018	09/05/2024	180		No	No	No	96.7
MW-4	Yes	Beryllium	µg/L	04/11/2018	09/05/2024	0.3	U	No	NC	NC	NC
MW-4	Yes	Cadmium	µg/L	04/11/2018	09/05/2024	0.19	U	No	NC	NC	NC
MW-4	No	Calcium	µg/L	04/11/2018	09/05/2024	80000		NC	NC	No	95.3
MW-4	Yes	Chromium	µg/L	04/11/2018	09/05/2024	0.5	U	No	No	No	NC
MW-4	Yes	Cobalt	µg/L	04/11/2018	09/05/2024	0.33	UJ	NC	NC	No	99.9
MW-4	Yes	Copper	µg/L	04/11/2018	09/05/2024	0.71	U	No	No	No	NC
MW-4	No	Iron	µg/L	04/11/2018	09/05/2024	8.7	U	No	Yes	No	86.3
MW-4	Yes	Lead	µg/L	04/11/2018	09/05/2024	0.23	UJ	No	No	NC	NC
MW-4	No	Magnesium	µg/L	04/11/2018	09/05/2024	19000		NC	NC	No	62.9
MW-4	No	Manganese	mg/L	04/11/2018	09/05/2024	0.00051	UJ	No	Yes	No	100
MW-4	Yes	Nickel	µg/L	04/11/2018	09/05/2024	0.83	U	NC	NC	No	98
MW-4	No	Potassium	µg/L	04/11/2018	09/05/2024	3400		NC	NC	No	94.1
MW-4	Yes	Selenium	µg/L	04/11/2018	09/05/2024	1.1	J	No	NC	No	NC
MW-4	No	Sodium	µg/L	04/11/2018	09/05/2024	61000		NC	NC	No	58.7
MW-4	Yes	Tin	µg/L	04/11/2018	09/05/2024	0.58	U	NC	NC	NC	NC

Table 4.10
Cell 4 Statistical Summary - Inorganics

Well ID	RCRA regulated chemical	Analyte	Unit	Direction
MW-3A	Yes	Arsenic	µg/L	NC
MW-3A	Yes	Barium	µg/L	No Trend
MW-3A	Yes	Beryllium	µg/L	NC
MW-3A	Yes	Cadmium	µg/L	NC
MW-3A	No	Calcium	µg/L	No Trend
MW-3A	Yes	Chromium	µg/L	NC
MW-3A	Yes	Cobalt	µg/L	NC
MW-3A	Yes	Copper	µg/L	NC
MW-3A	No	Iron	µg/L	No Trend
MW-3A	Yes	Lead	µg/L	NC
MW-3A	No	Magnesium	µg/L	Decreasing
MW-3A	No	Manganese	mg/L	No Trend
MW-3A	Yes	Nickel	µg/L	NC
MW-3A	No	Potassium	µg/L	No Trend
MW-3A	Yes	Selenium	µg/L	Increasing
MW-3A	No	Sodium	µg/L	No Trend
MW-3A	Yes	Thallium	µg/L	NC
MW-3A	Yes	Tin	µg/L	NC
MW-3A	Yes	Vanadium	µg/L	NC
MW-3A	Yes	Zinc	µg/L	Decreasing
MW-4	Yes	Arsenic	µg/L	Decreasing
MW-4	Yes	Barium	µg/L	Increasing
MW-4	Yes	Beryllium	µg/L	NC
MW-4	Yes	Cadmium	µg/L	NC
MW-4	No	Calcium	µg/L	Increasing
MW-4	Yes	Chromium	µg/L	NC
MW-4	Yes	Cobalt	µg/L	Decreasing
MW-4	Yes	Copper	µg/L	NC
MW-4	No	Iron	µg/L	No Trend
MW-4	Yes	Lead	µg/L	NC
MW-4	No	Magnesium	µg/L	No Trend
MW-4	No	Manganese	mg/L	Decreasing
MW-4	Yes	Nickel	µg/L	Decreasing
MW-4	No	Potassium	µg/L	No Trend
MW-4	Yes	Selenium	µg/L	NC
MW-4	No	Sodium	µg/L	No Trend
MW-4	Yes	Tin	µg/L	NC

Table 4.10
Cell 4 Statistical Summary - Inorganics

Well ID	RCRA regulated chemical	Analyte	Unit	Min Date	Max Date	Latest Result	Last Q	Latest Result > Standard	LCL > Standard	Latest Result > UPL of background	Confidence Level %
MW-4	Yes	Vanadium	µg/L	04/11/2018	09/05/2024	1.1	U	NC	NC	No	97
MW-4	Yes	Zinc	µg/L	04/11/2018	09/05/2024	2	U	No	No	No	NC
MW-4A	Yes	Antimony	µg/L	04/11/2018	09/05/2024	0.4	U	No	NC	NC	NC
MW-4A	Yes	Arsenic	µg/L	04/11/2018	09/05/2024	1.4	J	No	No	No	63.9
MW-4A	Yes	Barium	µg/L	04/11/2018	09/05/2024	210		No	No	No	80.2
MW-4A	Yes	Beryllium	µg/L	04/11/2018	09/05/2024	0.3	U	No	NC	NC	NC
MW-4A	Yes	Cadmium	µg/L	04/11/2018	09/05/2024	0.19	U	No	NC	NC	NC
MW-4A	No	Calcium	µg/L	04/11/2018	09/05/2024	170000		NC	NC	No	78
MW-4A	Yes	Chromium	µg/L	04/11/2018	09/05/2024	0.5	U	No	No	No	NC
MW-4A	Yes	Cobalt	µg/L	04/11/2018	09/05/2024	0.82	J	NC	NC	No	NC
MW-4A	Yes	Copper	µg/L	04/11/2018	09/05/2024	0.71	U	No	No	No	NC
MW-4A	No	Iron	µg/L	04/11/2018	09/05/2024	720		Yes	No	No	NC
MW-4A	Yes	Lead	µg/L	04/11/2018	09/05/2024	0.23	UJ	No	NC	NC	NC
MW-4A	No	Magnesium	µg/L	04/11/2018	09/05/2024	67000		NC	NC	No	90
MW-4A	No	Manganese	mg/L	04/11/2018	09/05/2024	0.14	J	Yes	No	No	58.7
MW-4A	Yes	Nickel	µg/L	04/11/2018	09/05/2024	1.3	J	NC	NC	No	NC
MW-4A	No	Potassium	µg/L	04/11/2018	09/05/2024	3700		NC	NC	No	96.9
MW-4A	Yes	Selenium	µg/L	04/11/2018	09/05/2024	1	U	No	No	No	92.8
MW-4A	Yes	Silver	µg/L	04/11/2018	09/05/2024	0.045	U	No	NC	NC	NC
MW-4A	No	Sodium	µg/L	04/11/2018	09/05/2024	55000		NC	NC	No	97.4
MW-4A	Yes	Thallium	µg/L	04/11/2018	09/05/2024	0.21	UJ	No	NC	NC	NC
MW-4A	Yes	Tin	µg/L	04/11/2018	09/05/2024	0.58	U	NC	NC	NC	NC
MW-4A	Yes	Vanadium	µg/L	04/11/2018	09/05/2024	1.1	J	NC	NC	No	78.9
MW-4A	Yes	Zinc	µg/L	04/11/2018	09/05/2024	2	U	No	No	No	NC
MW-5AR	Yes	Antimony	µg/L	07/21/2021	09/05/2024	0.4	U	No	NC	NC	NC
MW-5AR	Yes	Barium	µg/L	07/21/2021	09/05/2024	94		No	No	No	55
MW-5AR	No	Calcium	µg/L	07/21/2021	09/05/2024	83000		NC	NC	No	98.4
MW-5AR	Yes	Chromium	µg/L	07/21/2021	09/05/2024	0.5	U	No	NC	No	NC
MW-5AR	Yes	Cobalt	µg/L	07/21/2021	09/05/2024	0.33	UJ	NC	NC	No	99.7
MW-5AR	Yes	Copper	µg/L	07/21/2021	09/05/2024	0.71	U	No	NC	No	NC
MW-5AR	No	Iron	µg/L	07/21/2021	09/05/2024	13	J	No	No	No	97.7
MW-5AR	No	Magnesium	µg/L	07/21/2021	09/05/2024	27000		NC	NC	No	99.4
MW-5AR	No	Manganese	mg/L	07/21/2021	09/05/2024	0.00093	J	No	No	No	100
MW-5AR	Yes	Nickel	µg/L	07/21/2021	09/05/2024	0.83	U	NC	NC	No	NC
MW-5AR	No	Potassium	µg/L	07/21/2021	09/05/2024	2900		NC	NC	No	99.6
MW-5AR	Yes	Selenium	µg/L	07/21/2021	09/05/2024	1	J	No	No	No	NC
MW-5AR	No	Sodium	µg/L	07/21/2021	09/05/2024	280000		NC	NC	Yes	93.3

Table 4.10
Cell 4 Statistical Summary - Inorganics

Well ID	RCRA regulated chemical	Analyte	Unit	Direction
MW-4	Yes	Vanadium	µg/L	Increasing
MW-4	Yes	Zinc	µg/L	NC
MW-4A	Yes	Antimony	µg/L	NC
MW-4A	Yes	Arsenic	µg/L	No Trend
MW-4A	Yes	Barium	µg/L	No Trend
MW-4A	Yes	Beryllium	µg/L	NC
MW-4A	Yes	Cadmium	µg/L	NC
MW-4A	No	Calcium	µg/L	No Trend
MW-4A	Yes	Chromium	µg/L	NC
MW-4A	Yes	Cobalt	µg/L	NC
MW-4A	Yes	Copper	µg/L	NC
MW-4A	No	Iron	µg/L	NC
MW-4A	Yes	Lead	µg/L	NC
MW-4A	No	Magnesium	µg/L	No Trend
MW-4A	No	Manganese	mg/L	No Trend
MW-4A	Yes	Nickel	µg/L	NC
MW-4A	No	Potassium	µg/L	Decreasing
MW-4A	Yes	Selenium	µg/L	No Trend
MW-4A	Yes	Silver	µg/L	NC
MW-4A	No	Sodium	µg/L	Decreasing
MW-4A	Yes	Thallium	µg/L	NC
MW-4A	Yes	Tin	µg/L	NC
MW-4A	Yes	Vanadium	µg/L	No Trend
MW-4A	Yes	Zinc	µg/L	NC
MW-5AR	Yes	Antimony	µg/L	NC
MW-5AR	Yes	Barium	µg/L	No Trend
MW-5AR	No	Calcium	µg/L	Increasing
MW-5AR	Yes	Chromium	µg/L	NC
MW-5AR	Yes	Cobalt	µg/L	Decreasing
MW-5AR	Yes	Copper	µg/L	NC
MW-5AR	No	Iron	µg/L	Decreasing
MW-5AR	No	Magnesium	µg/L	Increasing
MW-5AR	No	Manganese	mg/L	Decreasing
MW-5AR	Yes	Nickel	µg/L	NC
MW-5AR	No	Potassium	µg/L	Decreasing
MW-5AR	Yes	Selenium	µg/L	NC
MW-5AR	No	Sodium	µg/L	No Trend

Table 4.10
Cell 4 Statistical Summary - Inorganics

Well ID	RCRA regulated chemical	Analyte	Unit	Min Date	Max Date	Latest Result	Last Q	Latest Result > Standard	LCL > Standard	Latest Result > UPL of background	Confidence Level %
MW-5AR	Yes	Tin	µg/L	07/21/2021	09/05/2024	0.58	U	NC	NC	NC	NC
MW-6A	Yes	Antimony	µg/L	04/11/2018	09/04/2024	0.4	U	No	NC	NC	NC
MW-6A	Yes	Arsenic	µg/L	04/11/2018	09/04/2024	0.5	U	No	No	No	77.8
MW-6A	Yes	Barium	µg/L	04/11/2018	09/04/2024	200		No	No	No	93.1
MW-6A	Yes	Beryllium	µg/L	04/11/2018	09/04/2024	0.3	U	No	NC	NC	NC
MW-6A	Yes	Cadmium	µg/L	04/11/2018	09/04/2024	0.19	U	No	NC	NC	NC
MW-6A	No	Calcium	µg/L	04/11/2018	09/04/2024	69000		NC	NC	No	97.6
MW-6A	Yes	Chromium	µg/L	04/11/2018	09/04/2024	0.5	U	No	No	No	NC
MW-6A	Yes	Cobalt	µg/L	04/11/2018	09/04/2024	0.33	UJ	NC	NC	No	NC
MW-6A	Yes	Copper	µg/L	04/11/2018	09/04/2024	0.71	U	No	No	No	NC
MW-6A	No	Iron	µg/L	04/11/2018	09/04/2024	8.7	U	No	No	No	NC
MW-6A	Yes	Lead	µg/L	04/11/2018	09/04/2024	0.23	UJ	No	NC	NC	NC
MW-6A	No	Magnesium	µg/L	04/11/2018	09/04/2024	43000		NC	NC	No	99
MW-6A	No	Manganese	mg/L	04/11/2018	09/04/2024	0.00051	UJ	No	No	No	85.2
MW-6A	Yes	Nickel	µg/L	04/11/2018	09/04/2024	0.83	U	NC	NC	No	NC
MW-6A	No	Potassium	µg/L	04/11/2018	09/04/2024	2000		NC	NC	No	99.1
MW-6A	Yes	Selenium	µg/L	04/11/2018	09/04/2024	1	U	No	No	No	94.6
MW-6A	No	Sodium	µg/L	04/11/2018	09/04/2024	50000		NC	NC	No	98.6
MW-6A	Yes	Tin	µg/L	04/11/2018	09/04/2024	0.58	U	NC	NC	NC	NC
MW-6A	Yes	Vanadium	µg/L	04/11/2018	09/04/2024	1.1	U	NC	NC	No	NC
MW-6A	Yes	Zinc	µg/L	04/11/2018	09/04/2024	2	U	No	No	No	NC

See Section 4 Table Notes

Table 4.10
Cell 4 Statistical Summary - Inorganics

Well ID	RCRA regulated chemical	Analyte	Unit	Direction
MW-5AR	Yes	Tin	µg/L	NC
MW-6A	Yes	Antimony	µg/L	NC
MW-6A	Yes	Arsenic	µg/L	No Trend
MW-6A	Yes	Barium	µg/L	No Trend
MW-6A	Yes	Beryllium	µg/L	NC
MW-6A	Yes	Cadmium	µg/L	NC
MW-6A	No	Calcium	µg/L	Decreasing
MW-6A	Yes	Chromium	µg/L	NC
MW-6A	Yes	Cobalt	µg/L	NC
MW-6A	Yes	Copper	µg/L	NC
MW-6A	No	Iron	µg/L	NC
MW-6A	Yes	Lead	µg/L	NC
MW-6A	No	Magnesium	µg/L	Decreasing
MW-6A	No	Manganese	mg/L	No Trend
MW-6A	Yes	Nickel	µg/L	NC
MW-6A	No	Potassium	µg/L	Decreasing
MW-6A	Yes	Selenium	µg/L	No Trend
MW-6A	No	Sodium	µg/L	Decreasing
MW-6A	Yes	Tin	µg/L	NC
MW-6A	Yes	Vanadium	µg/L	NC
MW-6A	Yes	Zinc	µg/L	NC

See Section 4 Table Notes

**Table 5.1
Recommendations for Spring 2025 Sampling**

Location Group	Location	Sampling Approach	Water Levels	Field parameters ¹ water quality meter	Appendix II RCRA Subtitle D Parameters													
					Appendix I				Additional Appendix II									
					VOCs			Total metals	SVOCs		O/C Pest ²	O/P Pest	Chlor Herb	PCBs ²	Dioxin/ Furan	Mercury	Cyanide	Total Sulfide
8260D	8260D unpreserved	8011	6020B/ 6010C	8270E	8270E SIM	8081B	8141B	8321B	8082A	8290	7470A	SM4500-CN-E	SM 4500S-2					
Cell 1	MP-1	Passive	X	X	X													
Cell 1	MP-2	Passive	X	X	X													
Cell 1	MP-3	Passive	X	X	X													
Cell 1	MP-4	Passive	X	X	X													
Cell 1	MP-9	NA	X															
Cell 1	MW-1	NA	X															
Cell 1	MW-101S	Passive	X	X	X													
Cell 1	MW-102S	Dedicated	X	X	X													
Cell 1	MW-104D	NA	X															
Cell 1	MW-104S	NA	X															
Cell 1	MW-105D	Dedicated	X	X	X	X												
Cell 1	MW-105S	Dedicated	X	X	X	X												
Cell 1	MW-109D	Passive	X	X	X													
Cell 1	MW-109S	Passive	X	X	X													
Cell 1	MW-110D	Passive	X	X	X													
Cell 1	MW-110S	Passive	X	X	X													
Cell 1	MW-111D	Dedicated	X	X	X	X												
Cell 1	MW-111S	Passive (If Not Dry) ³	X	X	X													
Cell 1	MW-112D	Dedicated	X	X	X													
Cell 1	MW-112M	Passive	X	X	X													
Cell 1	MW-112S	NA	X															
Cell 1	MW-113D	Passive	X	X	X													
Cell 1	MW-113S	Dedicated	X	X	X													
Cell 1	MW-117R	Passive (If Not Dry) ³	X	X	X													
Cell 1	MW-118D	Dedicated	X	X	X													
Cell 1	MW-119D	Dedicated	X	X	X													
Cell 1	MW-119S	Dedicated	X	X	X													
Cell 1	MW-120D	Dedicated	X	X	X													
Cell 1	MW-120S	Dedicated	X	X	X													
Cell 1	MW-121	Portable Pump	X	X	X													
Cell 1	MW-122	Passive (If Not Dry) ³	X	X	X													
Cell 1	MW-123	Passive	X	X	X													
Cell 1	MW-124	Passive	X	X	X													
Cell 1	MW-125	Passive	X	X	X													
Cell 1	RW-1	Passive	X	X	X													
Cell 1	RW-16	Passive	X															
Cell 1	RW-2	Passive	X	X	X													
Cell 1	RW-3	Passive	X	X	X													
Cell 2	MW-12	Dedicated	X	X	X		X	X	X	X								
Cell 2	MW-13	Dedicated	X	X	X		X	X	X	X								
Cell 2	MW-7	NA	X															
Cell 2	MW-8	Dedicated	X	X	X		X	X	X	X								
Cell 2	MW-9	Dedicated	X	X	X		X	X	X	X								
Cell 4	MW-3A	Dedicated	X	X	X		X	X										
Cell 4	MW-4	Dedicated	X	X	X		X	X										
Cell 4	MW-4A	Dedicated	X	X	X		X	X										
Cell 4	MW-5AR	Dedicated	X	X	X		X	X										
Cell 4	MW-6A	Dedicated	X	X	X		X	X										

**Table 5.1
Recommendations for Spring 2025 Sampling**

Location Group	Location	Sampling Approach	Water Levels	Field parameters ¹	Appendix II RCRA Subtitle D Parameters												
					Appendix I				Additional Appendix II								
					VOCs			Total metals	SVOCs		O/C Pest ²	O/P Pest	Chlor Herb	PCBs ²	Dioxin/Furan	Mercury	Cyanide
water quality meter	8260D	8260D unpreserved	8011	6020B/6010C	8270E	8270E SIM	8081B	8141B	8321B	8082A	8290	7470A	SM4500-CN-E	SM 4500S-2			
Offsite	MW-103D	NA	X														
Offsite	MW-103S	Dedicated	X	X	X												
Offsite	MW-106D	NA	X														
Offsite	MW-106S	NA	X														
Offsite	MW-115D	NA	X														
Offsite	MW-115S	Passive	X	X	X												
Offsite	MW-116D	NA															
Offsite	MW-116S	Portable Pump		X	X												
RSE	RW-10	Tap		X	X												
RSE	RW-15	Tap		X	X												
RSE	RW-17	Tap		X	X												
RSE	RW-4	Tap		X	X												
RSE	RW-5	Tap		X	X												
RSE	RW-9R	Tap		X	X												
System Effluent*	INJ-1R	Tap			X		X	X	X	X	X	X	X	X	X	X	X

Notes
Parameters specified for analysis are for routine monitoring and may not include those analyzed for pilot or tracer study monitoring.
* INJ-1R will also be sampled for VOCs (8260B) in the winter and summer
¹ Field parameters include pH, oxidation reduction potential, turbidity, dissolved oxygen, specific conductivity, and temperature
² PCBs and O/C Pest are collected in the same bottle
³ Hydrasleeve passive sampler will be deployed if there are 4 inches of water above the screen

Acronyms and Abbreviations
Chlor Herb = chlorinated herbicides
Herb = herbicide
O/C = organochlorine
O/P = organophosphate
PCBs = polychlorinated biphenyls
Pest = pesticide
RCRA = Resource Conservation and Recovery Act
RSE = remediation system extraction
SVOCs = semivolatle organic compounds
VOCs = volatile organic compounds

**Table 5.2
Recommendations for Fall 2025 Sampling**

Location Group	Location	Sampling Approach	Water Levels	Field parameters ¹	Appendix II RCRA Subtitle D Parameters														
					Appendix I				Additional Appendix II										
					water quality meter	VOCs			Total metals	SVOCs		O/C Pest ²	O/P Pest	Chlor Herb	PCBs ²	Dioxin/Furan	Mercury	Cyanide	Total Sulfide
						8260D	8260D unpreserved	8011	6020B/6010C	8270E	8270E SIM	8081B	8141B	8321B	8082A	8290	7470A	SM4500-CN-E	SM 4500S-2
Cell 1	MP-1	Passive	X	X	X														
Cell 1	MP-2	Passive	X	X	X														
Cell 1	MP-3	Passive	X	X	X														
Cell 1	MP-4	Passive	X	X	X														
Cell 1	MP-9	NA	X																
Cell 1	MW-1	NA	X																
Cell 1	MW-101S	Passive	X	X	X														
Cell 1	MW-102S	Dedicated	X	X	X														
Cell 1	MW-104D	NA	X																
Cell 1	MW-104S	NA	X																
Cell 1	MW-105D	Dedicated	X	X	X	X													
Cell 1	MW-105S	Dedicated	X	X	X	X													
Cell 1	MW-109D	Passive	X	X	X														
Cell 1	MW-109S	Passive	X	X	X														
Cell 1	MW-110D	Passive	X	X	X														
Cell 1	MW-110S	Passive	X	X	X														
Cell 1	MW-111D	Dedicated	X	X	X	X													
Cell 1	MW-111S	Passive (If Not Dry) ³	X	X	X														
Cell 1	MW-112D	Dedicated Pump	X	X	X														
Cell 1	MW-112M	Passive	X	X	X														
Cell 1	MW-112S	NA	X																
Cell 1	MW-113D	Passive	X	X	X														
Cell 1	MW-113S	Dedicated	X	X	X														
Cell 1	MW-117R	Passive (If Not Dry) ³	X	X	X														
Cell 1	MW-118D	Dedicated	X	X	X														
Cell 1	MW-119D	Dedicated	X	X	X														
Cell 1	MW-119S	Dedicated	X	X	X														
Cell 1	MW-120D	Dedicated	X	X	X														
Cell 1	MW-120S	Dedicated	X	X	X														
Cell 1	MW-121	NA	X																
Cell 1	MW-122	Passive (If Not Dry) ³	X	X	X														
Cell 1	MW-123	Passive	X	X	X														
Cell 1	MW-124	Passive	X	X	X														
Cell 1	MW-125	Passive	X	X	X														
Cell 1	RW-1	Passive	X	X	X														
Cell 1	RW-16	Passive	X																
Cell 1	RW-2	Passive	X	X	X														
Cell 1	RW-3	Passive	X	X	X														
Cell 2	MW-12	Dedicated	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Cell 2	MW-13	Dedicated	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Cell 2	MW-7	NA	X																
Cell 2	MW-8	Dedicated	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Cell 2	MW-9	Dedicated	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Cell 4	MW-3A	Dedicated	X	X	X		X	X											
Cell 4	MW-4	Dedicated	X	X	X		X	X											
Cell 4	MW-4A	Dedicated	X	X	X		X	X											
Cell 4	MW-5AR	Dedicated	X	X	X		X	X											
Cell 4	MW-6A	Dedicated	X	X	X		X	X											

**Table 5.2
Recommendations for Fall 2025 Sampling**

Location Group	Location	Sampling Approach	Water Levels	Field parameters ¹	Appendix II RCRA Subtitle D Parameters														
					Appendix I				Additional Appendix II										
					water quality meter	VOCs			Total metals	SVOCs		O/C Pest ²	O/P Pest	Chlor Herb	PCBs ²	Dioxin/Furan	Mercury	Cyanide	Total Sulfide
						8260D	8260D unpreserved	8011	6020B/6010C	8270E	8270E SIM	8081B	8141B	8321B	8082A	8290	7470A	SM4500-CN-E	SM 4500S-2
Offsite	MW-103D	NA	X																
Offsite	MW-103S	Dedicated	X	X	X														
Offsite	MW-106D	NA	X																
Offsite	MW-106S	NA	X																
Offsite	MW-115D	NA	X																
Offsite	MW-115S	Passive	X	X	X														
Offsite	MW-116D	NA																	
Offsite	MW-116S	Portable Pump		X	X														
RSE	RW-10	Tap		X	X														
RSE	RW-15	Tap		X	X														
RSE	RW-17	Tap		X	X														
RSE	RW-4	Tap		X	X														
RSE	RW-5	Tap		X	X														
RSE	RW-9R	Tap		X	X														
System Effluent*	INJ-1R	Tap			X		X	X	X	X	X	X	X	X	X	X	X	X	

Notes

Parameters specified for analysis are for routine monitoring and may not include those analyzed for pilot or tracer study monitoring.

* INJ-1R will also be sampled for VOCs (8260B) in the winter and summer

¹ Field parameters include pH, oxidation reduction potential, turbidity, dissolved oxygen, specific conductivity, and temperature

² PCBs and O/C Pest are collected in the same bottle

³ Hydrasleeve passive sampler will be deployed if there are 4 inches of water above the screen

Acronyms and Abbreviations

Chlor Herb = chlorinated herbicides
 Herb = herbicide
 O/C = organochlorine
 O/P = organophosphate
 PCBs = polychlorinated biphenyls
 Pest = pesticide
 RCRA = Resource Conservation and Recovery Act
 RSE = remediation system extraction
 SVOCs = semivolatle organic compounds
 VOCs = volatile organic compounds