



Umatilla County–Central Area Artificial Recharge Project

# Artificial Recharge (AR) Limited License Application

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# Index for Limited License Application Information

The index below identifies the location in this document of information required by the Oregon Administrative Rules (OAR) for Artificial Recharge (AR). The index was prepared to assist the Oregon Water Resources Department (OWRD) and the Oregon Department of Environmental Quality (DEQ) in reviewing Umatilla County’s Central Area AR Project Limited License application.

OAR Requirement	Location in Document
690-350-0120 (2) <b>Pre-Application Conference</b>	Section 2 – Project Description
690-350-0120 (3)(a) <b>Minimum Perennial Stream Flow or Instream Water Right</b>	Section 2 – Project Description
690-350-0120 (3)(b) <b>DEQ Water Quality Permit</b>	Not Applicable – Source water does not require a water quality permit from DEQ
690-350-0120 (3)(c) <b>Purpose of Recharge</b>	Section 1 – Introduction
690-350-0120 (3)(d) <b>Volume of Water Stored and Water Losses</b>	Section 2 – Project Description Section 4 – Local Response to AR Section 6 – Project Design
690-350-0120 (3)(e) <b>Financial Capability</b>	Section 2 – Project Description
690-350-0120 (3)(f) <b>Hydrogeologic Feasibility Report</b>	Section 2 – Hydrogeologic Site Characterization
690-350-0120 (3)(g) <b>Project Description Report</b>	Section 2 – Project Description Section 7 – AR Monitoring Plan
690-350-0120 (3)(h) <b>Additional Information</b>	Not Applicable—Not requested at this time
690-350-0120 (4) <b>Recharge Permit Processing</b>	Not Applicable – Not a required element of an AR LL application
690-350-0120 (5)(a) <b>Maximum Rate and Volume</b>	Section 2 – Project Description Section 6 – Project Design

OAR Requirement	Location in Document
690-350-0120 (5)(b) <b>Meters</b>	Section 6 – Project Design Section 7 – AR Monitoring Plan
690-350-0120 (5)(c) <b>Recordkeeping</b>	Section 7 – AR Monitoring Plan
690-350-0120 (5)(d) <b>Estimated Data</b>	Not Applicable – Not a required element of an AR LL application
690-350-0120 (5)(e)(A) <b>Monitoring Program</b>	Section 7 – AR Monitoring Plan
690-350-0120 (5)(e)(B) <b>Key Wells and Target Levels</b>	Section 7 – AR Monitoring Plan
690-350-0120 (5)(f) <b>Determination of Stored Recharge Water</b>	Section 6 – Project Design
690-350-0120 (5)(g) <b>Storage Account</b>	Not Applicable – Not a required element of an AR LL application
690-350-0120 (5)(h) <b>Annual Report</b>	Section 8 – Reporting
690-350-0120 (5)(i) <b>Allowable Use of Stored Recharge Water</b>	Section 6 – Project Design Section 7 – AR Monitoring Plan
690-350-0120 (5)(j) through (5)(m) <b>Permit Assignment</b> <b>Condition Changes</b> <b>Technical Oversight</b> <b>Other Conditions</b>	Not Applicable – Not a required element of an AR LL application
340-040 <b>Conformance with the Oregon Groundwater Protection Rules</b>	Section 5 – Groundwater Quality Protection Section 7 – AR Monitoring Plan
690-310-0040(1)(a) <b>Application Form</b>	Attachment A

## SECTION 1: Introduction

This document presents supporting information for an Artificial Recharge (AR) Limited License application that is being submitted by Umatilla County (County) for recharge of the Ordnance Gravel Aquifer at the former Umatilla Army Depot (Depot) property in Umatilla County, Oregon (Figure 1). The Ordnance Gravel Aquifer has been designated as a Critical Groundwater Area (CGWA) by the Oregon Water Resources Department (OWRD), and the area surrounding the project has been designated as a Groundwater Management Area (GWMA) for nitrate by the Department of Environmental Quality (DEQ). The County's project will help to improve the groundwater quantity limitations and groundwater quality impairment in the Ordnance Gravel Aquifer that the CGWA and GWMA were established to address.

This section is organized as follows:

- Section 1.1: Background
- Section 1.2: Project Overview
- Section 1.3: Project Objectives
- Section 1.4: Document Objectives

### 1.1 Background

The Ordnance Gravel Aquifer, denoted by the purple polygon in Figure 1, is an approximately 82 square mile accumulation of coarse gravels that overlie basalt bedrock. Groundwater development of the Ordnance Gravel Aquifer began in the 1950s and increased through 1970. In 1972, the state of Oregon designated the Ordnance Gravel Aquifer as a CGWA due to excessive groundwater level declines [e.g., in irrigation well MORR 960, water levels declined from about 60 feet below ground surface (bgs) in 1961 to about 90 feet bgs in 1979] (OWRD, 2023a). Permitted groundwater uses were curtailed and the aquifer was closed to further appropriation (OWRD, 2018).

In conjunction with the establishment of the CGWA, an artificial recharge project (the "Ordnance Gravel Aquifer Recharge Project") was initiated in 1980 to recover and stabilize groundwater levels in the aquifer (OWRD, 2023b). While the Ordnance Gravel artificial recharge project resulted in some recovery and stabilization of water levels (OWRD, 2018), groundwater levels in the aquifer continue to be below historic levels (e.g., in MORR 960, water levels were historically at 60 to 65 feet bgs and are currently at 70 to 75 feet bgs) (OWRD, 2023a). This suggests that the Ordnance Gravel Aquifer still has capacity for recovery of water levels by implementation of additional artificial recharge projects.

### 1.2 Project Overview

The Central Area AR Project described in this document will be operated by Umatilla County. Source water for the County's delivery to the AR project will be from the Columbia River. The application requests diversion of Columbia River water for AR at rates up to 45 cubic feet per second (cfs). For reference, the Ordnance Gravel Aquifer Recharge Project generally operated at average daily rates of between 20 cfs and 56 cfs during 2023<sup>1</sup>. The total maximum volume requested for the Central Area AR Project is 18,000 acre-feet (AF) per year. Initially, the project will infiltrate 5,000 AF per year and increase the annual recharge volume if the

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<sup>1</sup> The 10<sup>th</sup> percentile (56 cfs) and 90<sup>th</sup> percentile (20 cfs) of measured average daily discharge in 2023 (OWRD, 2023b)

response of the Ordinance Gravel Aquifer and performance of the recharge basins indicate additional capacity for recharge.

Recharge is planned to occur at six recharge basins located within the “Recharge Basin Area” shown in Figure 2. The project has been designed to infiltrate the target volume with two basins offline to facilitate basin maintenance activities (HDR, 2023).

### 1.3 Project Objectives

The objective of the County’s Central Area AR Project is to realize the benefits of AR for the Ordinance Gravel Aquifer. According to OWRD (2003) and OWRD (2021a), benefits of AR include:

- Augment groundwater supply without adverse impacts to threatened and endangered species or senior water right holders.
- Improve groundwater quality by diluting concentrations of groundwater contaminants. This benefit is especially important to the County because DEQ has designated the Lower Umatilla Basin, where the project is located, as a GWMA because of the elevated nitrate concentrations in groundwater. The County and DEQ have a shared goal of working collaboratively to reduce the nitrate concentrations in groundwater.

In addition to these benefits of AR, the County would like to create drought and climate resiliency, build environmental wealth in the region, and contribute to the long-term recovery of the Ordinance Gravel Aquifer.

### 1.4 Document Objectives

In Oregon, AR projects are regulated under Oregon Administrative Rules (OAR) 690-350, and recharge activities are authorized by OWRD with a limited license<sup>2</sup>. This document includes all information required by the Oregon Administrative Rules to apply for a limited license, including the elements of the Project Description Report and Hydrogeologic Feasibility Report<sup>3</sup>. The limited license application form is provided in Attachment A. This document characterizes the local hydrogeology at the proposed recharge site, summarizes an evaluation of the feasibility of the County’s Central Area AR Project, and develops required plans and procedures for implementing the project.

It should be noted that portions of the Depot property to the west of the Central Area AR Project area have been identified by the U.S. Environmental Protection Agency (EPA) as an operable unit in a superfund site (see “OU3” in Figure 2). An evaluation of potential impacts of recharge on this operable unit (i.e., groundwater contamination associated with former explosives washout lagoons) has been conducted previously in 2016 (GSI, 2016). The County is currently conducting a more detailed evaluation using a numerical groundwater model, and plans to submit the results of the evaluation to OWRD, DEQ, and EPA during fall 2023 in a separate report. The scope of this modeling evaluation was presented by GSI during a meeting between OWRD, DEQ, EPA, the United States Army Corps of Engineers (USACE), and the Air National Guard (ANG) on December 13, 2023.

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<sup>2</sup> Beneficial use of artificially recharged groundwater requires a secondary groundwater permit. See OAR 690-350-0120(1).

<sup>3</sup> Requirements for AR applications are set forth in OAR 690-350-0120, OAR 690-310-0040, and OAR 340-040. The required elements of the Project Description Report are listed in OAR 690-350-0120(3)(g), and the required elements of the Hydrogeologic Feasibility Report are listed in OAR 690-350-0120(3)(f).

## SECTION 2: Project Description

This section provides a description of the County’s Central Area AR Project, and is organized as follows:

- Section 2.1: Project Overview
- Section 2.2: Minimum Perennial Stream Flow or Instream Water Right
- Section 2.3: Recharge Site
- Section 2.4: Project Schedule
- Section 2.5: Financial Capability

### 2.1 Project Overview

The County’s Central Area AR Project proposes to divert Columbia River water during the winter months when water is available between October 1 and April 14, as determined by the OWRD and the local Watermaster District 5, and subject to the limitations provided in Division 33 rules and Oregon Department of Fish and Wildlife (ODFW) minimum flow targets. The application requests diversion of Columbia River water for AR at rates up to 45 cfs. The total maximum volume requested for the Central Area AR Project is 18,000 AF per year. Initially, the proposed recharge basin area will infiltrate 5,000 AF per year and increase the annual recharge volume if the response of the Ordinance Gravel Aquifer and performance of the infiltration basins indicate additional capacity for recharge.

Columbia River water will be diverted at the existing Columbia River Pump Station, which is shared by the County and other water users (see Figure 2). The water will then be conveyed to the recharge basin area by a new, 42-inch diameter conveyance pipe, and will be artificially recharged to the Ordinance Gravel Aquifer (see “Proposed Conveyance Line” and “Recharge Basin Area” in Figure 2). Further information and discussion of the Columbia River Pump Station (i.e., point of diversion), conveyance piping, and design specifications for the recharge basins are presented in Section 6.

### 2.2 Minimum Perennial Stream Flow or Instream Water Right

There is currently no minimum perennial stream flow or instream water right for the protection of aquatic and fish life established for the source stream (Columbia River). However, the County recognizes that the proposed use is subject to public interest standards for new appropriations from the Columbia River, and understands that ODFW typically recommends conditions regarding the use of water from the Columbia River during October and November.

### 2.3 Recharge Site

Columbia River water will be infiltrated at the recharge basin area as shown in Figure 2. The recharge basin area is located in Section 14, Township 4N, Range 27E of the Willamette Meridian, approximately 0.5 miles west of Interstate 82. Six individual infiltration basins are proposed to be located in this area, and were designed and sited based on infiltration rates measured at test pits that were excavated in June 2022 and April 2023, modeling of groundwater mounding under various recharge scenarios, land ownership and accessibility, and site hydrogeology. The recharge basins are rectangular-shaped and 54,000 square feet (1.24 acres), for a total area of approximately 7.44 acres.

## 2.4 Project Schedule

An anticipated schedule for project development is provided in Table 1.

**Table 1. Anticipated Schedule for Project Development.**

Activity	Date
Pre-Application Conference	February 23, 2023
Submit Limited License Application for AR to OWRD	September 9, 2023
Submit Groundwater Modeling Evaluation to OWRD	October 31, 2023
AR Limited License Issued by OWRD (12 month turn around time)	September 9, 2024
Recharge Basin Design Completed	December 31, 2023
Recharge Basin Bidding and Construction	January 2024 – September 2024
Year 1 Recharge and Monitoring	October 1, 2024 – April 14, 2025
Project Update Letter to OWRD (covers the 2024 WY, 7/19/24 to 9/30/24)	February 15, 2025
Year 1 Annual Report (covers the 2025 WY, 10/1/2024 to 9/30/2025)	February 15, 2026

**NOTES:**

WY = water year

OWRD = Oregon Water Resources Department

## 2.5 Financial Capability

Capital construction and all permitting costs are paid for by a combination of private and public dollars. In addition to private construction funding the County has received 1.2 million dollars during the 2023 legislative session for recharge testing post construction.

## SECTION 3: Hydrogeologic Site Characterization

This hydrogeologic site characterization represents a compilation of previous work in the Umatilla Basin completed by GSI and others, and evaluation of new site-specific data collected in 2022 and 2023. It is anticipated that data developed during the limited license period will be used to update and supplement the hydrogeologic information presented in this document as a part of annual report submittals. Ultimately, the information collected during the limited license period will be used to develop and submit an AR permit application that meets the requirements of OAR 690-350-120 if the project achieves the intended objectives of improving water quality and quantity in the Ordinance Gravel Aquifer.

This section is organized as follows:

- Section 3.1: Regional Geology and Hydrogeology
- Section 3.2: Central Area AR Project Geology and Hydrogeology

### 3.1 Regional Geology and Hydrogeology

The Central Area AR Project area is located in the Umatilla Basin, which is a structural and topographic depression situated between the Blue Mountains of Oregon and the Columbia Hills of Washington. An in-depth discussion of the geology and hydrogeology of the Umatilla Basin is provided in Attachment B.

### 3.2 Central Area AR Project Geology and Hydrogeology

This section summarizes an overview of the geology and hydrogeology of the Central Area AR Project area based on existing technical reports, well driller logs, data maintained by OWRD, and field work conducted in 2022 and 2023 to evaluate project feasibility. The results of the field work are documented in technical memoranda that are provided in the following attachments to this document:

- Attachment C: June 2022 Shallow Soil Investigation and Infiltration Testing
- Attachment D: April 2023 Shallow Soil Investigation and Infiltration Testing
- Attachment E: Deep Soil and Groundwater Investigation

The field investigation involved excavating 16 test pits to classify shallow soils and/or measure soil infiltration rates, advancing three temporary borings to the water table to characterize deep soils, and constructing three monitoring wells to perform an aquifer test to measure aquifer permeability. In addition, soil and groundwater quality samples were collected to confirm that the project would meet DEQ's groundwater protection rules.

#### 3.2.1 Geology

##### Geologic Units

The geologic deposits present in the Central Area, from shallowest to deepest, include:

- Unconsolidated Sedimentary Deposits, and
- Basalts of the Columbia River Basalt Group (CRBG)

These units are briefly described in the following sections. A map showing surficial geology in the vicinity of the study area is provided in Figure 3. Cross sections showing the occurrence and estimated thickness and depths of geologic units are provided in Figure 4A (cross section A – A') and Figure 4B (cross section B – B').

### Unconsolidated Sedimentary Deposits

The Unconsolidated Sedimentary Deposits overly the basalts and consist of two primary stratigraphic units: the Catastrophic Flood deposits and the Alkali Canyon Formation. Eolian deposits are also present in the Central Area (see Figure 3) but are not discussed further because they are a surficial deposit ranging from 2 to 4 feet thick (see Attachment C).

- **Catastrophic Flood Deposits:** The Catastrophic Flood deposits were deposited in the late Pleistocene Epoch<sup>4</sup> and, at the proposed recharge site, consist primarily of unconsolidated, poorly-sorted sand and gravel. Thickness of the flood deposits is variable, reaching 140 feet thick at the proposed recharge site based on observations from monitoring well RMW-3 (see Attachment E). The Catastrophic Flood Deposits are highly permeable (Hogenson 1964).
- **Alkali Canyon Formation.** The Alkali Canyon Formation is an older sedimentary deposit that underlies the Catastrophic Flood Deposits and consist of indurated gravels and tuffaceous silts and sands that were eroded from the Blue Mountains during the Miocene Epoch and the Pliocene Epoch<sup>5</sup> (Wozniak, 1995; Farooqui et al., 1981). The Alkali Canyon Formation reaches thicknesses of up to 250 feet but has been scoured by flood deposits in the project area and is only a few feet thick based on observations from monitoring well RMW-3 (see Attachment E). The Alkali Canyon Formation is generally not highly permeable and acts as a confining unit where present (Wozniak, 1995).

The Catastrophic Flood Deposits are equivalent to the Ordnance Gravel Aquifer, which is the target water bearing zone for recharge. In the project area, the Catastrophic Flood Deposits range from gravels with few fines (i.e., silt and clay) to gravels with a significant fines content (see Attachment C, Attachment D, and Attachment E). The gravels do not appear to follow a layer-cake geology. Specifically, the gravels with few fines occur at different depths or may not be encountered at all, which suggests that they are comprised of discontinuous gravel lenses nested within the gravels that contain significant amounts of fines. This is consistent with the fact that, regionally, the Catastrophic Flood Deposits were deposited by about 25 individual flood events.

Vertical saturated hydraulic conductivity in the shallow gravel units measured during infiltration testing ranged from about 2.0 feet per day to about 450 feet per day, indicating that shallow gravels at the site are highly permeable. Based on test pit excavations in the recharge basin area, a cemented gravel layer was observed to occur in the Catastrophic Flood Deposits between 5 and 8 feet bgs. The layer ranged from 0.5 to 1.0 feet thick. Because this layer will likely act as a barrier to infiltrating water, the infiltration basins will be designed to infiltrate below the cemented gravel layer. Deeper cemented layers were encountered in temporary borings and monitoring wells. However, the layers exhibited a large range of thicknesses (from a few inches to a few feet thick) and did not occur at a consistent elevation or depth, suggesting that the deeper cemented layers are not continuous across the project area. Additional evidence that cemented gravels are not continuous in the Ordnance Gravel Aquifer includes the ability of residual concentrations of explosives to migrate downwards from the Explosives Washout Lagoons into the Ordnance Gravel Aquifer.

Based on logging of soil core from temporary borings and monitoring wells, the deeper Catastrophic Flood Deposits underlying the proposed recharge basin study area have a relatively course grained texture. Grain

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<sup>4</sup> The Pleistocene Epoch lasted from 2.58 million to 11,700 years ago

<sup>5</sup> The Miocene Epoch lasted from about 23 million years ago to 5 million years ago; the Pliocene Epoch lasted from about 5 million years ago to 2.58 million years ago.

size analysis from soil samples collected in the temporary borings and monitoring wells indicate that the gravels have few fines, which is consistent with the high permeability of the unit. The unsaturated zone underlying the recharge basin area ranges from about 55 to 60 feet thick.

### Columbia River Basalt Group

The CRBG consists of a thick sequence of more than 300 continental tholeiitic flood-basalt lava flows. The CRBG covers more than 63,000 square miles in Washington, Oregon, and Western Idaho, has a total estimated volume of more than 41,700 cubic miles, and has a maximum thickness of more than 2 miles near Pasco, Washington (Tolan and others, 1989). The uppermost CRBG unit that underlies the study area is the Elephant Mountain Member of the Saddle Mountains Basalt Formation. The Elephant Mountain Member is represented by a single basalt flow underlying the entire Central Area AR Project area and, based on a geologic log for UMAT 5820, located about 5 miles north of the proposed recharge site, is up to 50 feet thick in the area (USGS, 1993).

### Structural Geology

As shown on Figures 4A and 4B, the study area is characterized by an east-west trending erosional and/or structural trough. The Catastrophic Flood Deposits are thickest in this trough and become thinner and unsaturated to the north and south. The trough appears to have eroded into the Elephant Mountain Member of the CRBG, potentially cutting down into the underlying Pomona Member of the CRBG.

## 3.2.2 Hydrogeology

### Hydrogeologic Units

There are two aquifer systems in the Central Area. The uppermost aquifer is present in the Unconsolidated Sedimentary Deposits that overlie the basalt. This aquifer, called the “alluvial aquifer” in this document, is comprised of the Catastrophic Flood Deposits and Alkali Canyon Formation<sup>6</sup>. The alluvial aquifer is unconfined, meaning that it is in hydraulic communication with the surface. In the CRBG, aquifers occur in thin zones that comprise the boundaries between individual basalt flows (specifically, the flow top of an older flow and the flow bottom of a younger flow). These zones, called interflow zones, are typically confined. Interflow zones are highly productive if they are associated with pillow complexes or rubbly flow tops and bottoms, but may not be productive if they are associated with paleosols.

Regionally, the water-bearing interflow zones within the CRBG are hydraulically isolated from the alluvial aquifer and, therefore, comprise separate aquifers. However, the CRBG and alluvial aquifers may be locally hydraulically connected where sediments abut against the interflow zones. Despite the fact that the alluvial aquifer abuts against the CRBG in the trough that runs through the Central Area, hydraulic communication between the alluvial aquifer and CRBG is likely limited because water levels in the alluvial aquifer and CRBG are significantly different<sup>7</sup>. The lack of hydraulic communication could be related to the low-permeability

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<sup>6</sup> The Ordinance Gravel Aquifer corresponds with the Catastrophic Flood Deposits. However, because wells are commonly completed in both the Catastrophic Flood Deposits and Alkali Canyon Formation, we use the more general term “alluvial aquifer” to refer to water-bearing sediments above the basalt when describing groundwater elevations, flow directions, etc., in this document.

<sup>7</sup> See UMAT 57531, shown on cross section A-A'. When the well was drilled in 2015, a hydraulic head of 55 feet bgs was measured in the alluvium, while a hydraulic head of 88 feet bgs was measured in the CRBG. This approximately 30-foot difference in hydraulic head suggests that the trough depicted in cross section A to A' does not hydraulically connect the Alluvium and deeper interflow zones of the CRBG.

Alkali Canyon Formation, or the basalt interflow zone locally not being permeable<sup>8</sup>. Additional water level data collected during recharge operations will provide more information about the potential for hydraulic connection between the CRBG and the alluvial aquifer.

### Groundwater Gradient and Flow Directions

Figure 5 shows the locations of water wells and monitoring wells in the vicinity of the Central Area AR Project. Wells completed in the alluvial aquifer are represented by yellow-fill, and wells completed in the CRBG are represented by gray fill.

Groundwater elevations in the alluvial aquifer are shown in Figure 6. Groundwater elevation measurements are from synoptic water level monitoring events conducted by OWRD in February 2016 (OWRD, 2023a) and USACE in April 2016 (USACE, 2016). As shown in Figure 6, the regional groundwater flow direction during the spring is towards the northeast, with localized flow reversals related to the Depot's groundwater pump and treat system. Based on groundwater elevation measurements in the alluvial aquifer, the hydraulic gradient is relatively flat (0.0015 ft/ft). The flat gradient is consistent with the high permeability of the alluvial aquifer.

Hydrographs from OWRD observation wells that are completed in the alluvial aquifer are shown in Figure 7. Water levels fluctuate seasonally by up to about 10 feet. Typically, water levels are lowest from September to November, and highest from March to June. Interpretation of groundwater flow directions in the Ordnance Gravel Aquifer is complicated due to seasonably variable stresses, including agricultural water application, recharge projects, groundwater pumping, and interaction of groundwater with surface water including canal leakage. Groundwater flow directions in the Ordnance Gravel Aquifer vary seasonally; and have been inferred to flow principally towards the southwest during the fall and winter and towards the northeast during the summer. These flow directions are illustrated in Figure 7, which shows five alluvial water supply wells in the Ordnance Gravel Aquifer with available water level data between July 2019 and July 2022.

- During the fall and early winter months, groundwater elevations in MORR 51990 (located in the southwest corner of Figure 5) are lower than UMAT 57007 (located in the eastern part of Figure 5). Therefore, groundwater flows predominantly towards the southwest during this time.
- Conversely, the water levels in MORR 51990 are higher than in UMAT 57007 during the spring and summer months. Therefore, groundwater flows towards the northeast during these months.

### Recharge Sources

The Ordnance Gravel Aquifer is recharged by limited precipitation in combination with the irrigated agricultural practices in the basin (irrigation return flow and canal leakage) and the Ordnance Gravel Artificial Recharge project. Natural recharge to the alluvial aquifer system is thought to be minor in comparison to the other recharge sources.

### Hydrogeologic Properties

The Ordnance Gravel Aquifer is highly permeable. In February 2023, the County completed a 48-hour constant rate pumping test (e.g., aquifer test) in the vicinity of the proposed recharge basin area using monitoring well RMW-3 (UMAT 59025) as the pumping well and adjacent monitoring well RMW-2 (UMAT 59024) as the observation well. RMW-3 and RMW-2 are separated by 25 feet. The objective of the aquifer

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<sup>8</sup> According to UMAT 57531, shown on Cross Section A-A', the basalt interflow zone produces 15 gallons per minute (gpm).

test was to estimate the hydraulic conductivity of the Ordnance Gravel Aquifer to facilitate estimation of recharge volumes. The locations of the pumping and observation wells are shown in Figure 2.

Based on the aquifer test, the hydraulic conductivity of the Ordnance Gravel Aquifer was estimated to be between 5,330 feet/day (ft/day) and 7,020 ft/day, depending on the test analysis method and the well being analyzed (see Table 2). The resultant hydraulic conductivity is consistent with the high hydraulic conductivities observed in the Catastrophic Flood Deposits in this region (Wozniak 1995) (i.e., 1,000 ft/day to 4,000 ft/day). Based on a saturated aquifer thickness of 80 feet (the depth between top of static water level and the bottom of the well), the transmissivity of the alluvial aquifer was calculated to range between approximately 3,200,000 gallons per day per foot (gpd/ft) to 4,200,000 gpd/ft.

**Table 2. Hydraulic Properties of the Ordnance Gravel Aquifer.**

Test	Transmissivity (gpd/ft)	Horizontal Hydraulic Conductivity (ft/d)	Horizontal Hydraulic Gradient (ft/ft)	Specific Yield (dimensionless)
RMW-3 Aquifer Test Feb 2023	3,200,000 - 4,200,000	6,780 - 7,020 (RMW-2) 5,330 (RMW-3)	0.0015	0.19 <sup>1</sup>

**NOTES:**

(1) Specific yield of a “gravel” from Heath (1983)

gpd/ft = gallons per day per foot

ft/d = feet per day

ft/ft = feet per foot

## SECTION 4: Predicted Hydraulic Response of the Ordnance Gravel Aquifer to Artificial Recharge

This section summarizes an evaluation of the response of the Ordnance Gravel Aquifer to artificial recharge. This section is organized as follows:

- Section 4.1: Estimates of Maximum Groundwater Mounding and Recharge Volume
- Section 4.2: Potential Impacts to Nearby Groundwater Users

### 4.1 Estimates of Maximum Groundwater Mounding and Recharge Volume

During artificial recharge, groundwater mounding occurs in the aquifer beneath the recharge basin. The groundwater mound stabilizes when the rate of recharge is equivalent to the rate that water moves laterally away from the recharge basin through the aquifer. The height of the mound depends on the recharge rate, infiltration basin geometry, aquifer hydraulic conductivity, aquifer saturated thickness, and specific yield of soils. The height of the water level mound is important to understand because recharge rate is at a maximum when the groundwater level intersects the recharge basin floor. Therefore, an initial estimate for the infiltration capacity of an AR project is determined by modeling the height of the groundwater mound over a range of potential infiltration rates, and confirming that shallow soils are sufficiently permeable to infiltrate at the infiltration rates.

The groundwater mounding analysis presented herein utilizes the aquifer and vadose zone hydraulic parameters measured during the subsurface field investigations (summarized in the technical memoranda in Attachment C, Attachment D, and Attachment E). Predictive mound height simulations were determined by GeoSystems Analysis, Inc. using MOUNDSOLV (Hydrosolve, 2023) to estimate groundwater mound growth and decay beneath the study area. The Zlotnik (2017) analytical solution for groundwater mounding was used in MOUNDSOLV. The Zlotnik analytical solution considers both horizontal and dipping aquifers that are assumed to be of infinite areal extent, assumes that the vadose zone and aquifer properties are homogeneous, and assumes that groundwater flow away from the basin symmetrical (i.e., isotropic). The analysis does not take into account other potential influences on water levels, such as low permeability layers, percolation of precipitation, or pumping of wells.

A detailed summary of the groundwater modeling analysis is presented in Attachment F. For the purpose of this analysis, two potential recharge scenarios were evaluated: (1) 5,000 AF over 120 days of continuous recharge and (2) 18,000 AF over 120 days of continuous recharge. These rates are assumed to be achievable based on the saturated hydraulic conductivities of gravels below the cemented gravel layer at the site, which were measured at 44 feet per day or greater during the April 2023 infiltration testing (Attachment D).

The initial water level (prior to recharge) is about 60 feet bgs. The maximum predicted groundwater mound for the 5,000 AF scenario ranged from 3 ft above the initial water level (assuming a hydraulic conductivity of 5,330 ft/day) to 2.5 feet above the initial water level (assuming a hydraulic conductivity of 7,020 ft/day). The maximum predicted groundwater mound for the 18,000 AF recharge scenario ranged from 11 ft above the initial water level (assuming a hydraulic conductivity of 5,330 ft/day) to approximately 9 feet above the initial water level (assuming a hydraulic conductivity of 7,020 ft/day). These results provide an initial

estimate that 18,000 AF of recharged water can be recharged to the Ordinance Gravel Aquifer. This estimate may be updated based on observed water level changes during the first year of recharge.

## 4.2 Potential Impacts to Nearby Groundwater Users

Because the County's Central Area AR Project area is located on relatively undeveloped Depot property, there are no anticipated impacts on other groundwater users. The nearest alluvial-supply wells are located approximately  $\frac{3}{4}$ - to 1-mile east of the proposed recharge basin study area. We do not anticipate negative impacts to these wells. Potentially higher water levels caused by mounding around the proposed recharge basin area may be considered a benefit to nearby groundwater users because it will be indicative of continued recovery of the Ordinance Gravel Aquifer to pre-groundwater development conditions.

## SECTION 5: Groundwater Quality Protection

Oregon's groundwater protection rules<sup>9</sup> require that groundwater be protected from pollution that could impair existing or potential beneficial uses. Among the potential beneficial uses of groundwater, Oregon recognizes domestic water supply as the use that requires the highest level of water quality. It should be noted that this project is anticipated to significantly improve groundwater quality in the Ordnance Gravel Aquifer because the source water is characterized by significantly lower nitrate concentrations than the receiving groundwater.

The potential for impairment of the beneficial use of groundwater as drinking water due to artificial recharge was evaluated based on soil and water quality samples that were collected and analyzed during the subsurface field investigations. Detailed discussion of the soil and groundwater quality data are provided in the technical memoranda in Attachment C (shallow soil quality) and Attachment E (deep soil and groundwater quality). Soil quality data were collected in addition to groundwater quality data to address concerns related to the project being located on a Superfund Site (i.e., to confirm that contamination does not extend to the recharge site). This section is organized as follows:

- Section 5.1: Soil Quality Evaluation
- Section 5.2: Source Water and Receiving Water Quality Evaluation

### 5.1 Soil Quality Evaluation

Because the County's AR project is located on a property that is designated by the Environmental Protection Agency as a Superfund site [although the AR project is not located near any of the Operable Units of the Superfund Site, which indicate areas of contamination (see Figure 2)], soil quality samples were collected to confirm that soil contamination that would cause Oregon's groundwater protection rules to be violated is not present.

In June 2022, soil samples were collected from three of the test pits within the study area at depths ranging from about 4 to 5 feet below ground surface (bgs). The samples were analyzed for the following soil quality parameters:

- Multi-residue pesticides by Modified EPA Method 8270D and Modified EPA Method 8321B
- Polychlorinated biphenyls (PCB) Aroclors by EPA Method 8082
- Metals by EPA Method 6020 and EPA Method 7471
- Explosives by EPA Method 8330
- Volatile organic compounds (VOCs) by EPA Method 8260
- Synthetic organic compounds (SVOCs) by EPA Method 8270
- Nitrate and nitrite by EPA Method 9056

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<sup>9</sup> OAR 340-040

Because low levels of VOCs and nitrates were detected in the shallow soil samples from test pits, additional soil samples were collected from temporary borings at 10 feet bgs and 20 feet bgs in February 2023 and analyzed for VOCs and nitrates.

Based on the soil quality data collected at the proposed recharge site, the AR project does not appear to impair the beneficial use of groundwater as drinking water; thereby meeting Oregon’s groundwater quality protection rules. The following bullets provide an overview of the soil quality results in the project area:

- **Pesticides, PCBs, Explosives, and Metals.** Pesticides, PCBs, and explosives were not detected in soil, and metals were below background concentrations for soil in the Deschutes-Columbia Plateau Province (DEQ, 2019). Therefore, there is not a potential for leaching of pesticides, PCBs, explosives, and metals from soils during infiltration to violate Oregon’s groundwater protection rules.
- **VOCs and SVOCs.** Low levels of eight VOCs and SVOCs were detected in soil, with detections shown by the bold text in Table 3.

**Table 3. Detected VOCs and SVOCs in Soil.**

Analyte <sup>3</sup>	Regulatory Standard	TP-1	TP-5	TP-8	RB-1	RB-2	RB-3
1,2,4-Trimethylbenzene (ug/kg)	10,000 <sup>2</sup>	<0.059 (5')	<0.054 (4')	<0.054 (4')	<0.20 (10') <b>0.20 J (20')</b>	<0.22 (10') <b>0.22 J (20')</b>	<0.21 (10') <0.26 (20')
Acetone (ug/kg)	3,700 <sup>2</sup>	<b>55 (5')**</b>	<b>25 (4')**</b>	<b>20 (4')**</b>	<b>18 J (10')</b> <b>14 J (20')</b>	<b>17 J (10')</b> <b>26 (20')</b>	<b>5.6 J (10')</b> <b>10 J (20')</b>
2-butanone (MEK) (ug/kg)	1,200 <sup>1</sup>	<b>4.5 J (5')</b>	<b>1.8 J (4')</b>	<b>1.9 J (4')</b>	<0.91 (10') <0.96 (20')	<1.1 (10') <b>3.6 J (20')**</b>	<1.1 (10') <1.3 (20')
Carbon Disulfide (ug/kg)	240 <sup>1</sup>	<b>0.53 J (5')</b>	<b>0.29 J (4')</b>	<b>0.26 J (4')</b>	<0.30 (10') <b>1.7 J (20')**</b>	<0.33 (10') <0.30 (20')	<b>4.3 J (10')</b> <b>4.7 J (20')</b>
Methylene Chloride (ug/kg)	2.9 <sup>1</sup>	<b>0.92 J (5')</b>	<b>0.74 J (4')</b>	<b>0.76 J (4')</b>	<b>1.3 J (10')**</b> <b>1.2 J (20')**</b>	<b>0.57 J (10')</b> <b>0.76 J (20')</b>	<0.54 (10') <0.65 (20')
4-isopropyltoluene (ug/kg)	NA	<0.07 (5')	<b>0.33 J (4')</b>	<0.064 (4')	<0.20 (10') <0.21 (20')	<0.22 (10') <0.20 (20')	<0.21 (10') <0.26 (20')
Toluene (ug/kg)	460 <sup>2</sup>	<0.17 (5')	<b>0.60 J (4')</b>	<0.15 (4')	<0.55 (10') <b>0.49 J (20')**</b>	<0.55 (10') <b>0.68 J (20')</b>	<0.54 (10') <b>0.50 J (20')</b>
Xylenes (total) (ug/kg)	23,000 <sup>2</sup>	<0.11 (5')	<0.10 (4')	<0.10 (4')	<0.40 (10') <b>0.31 J (20')</b>	<0.089 (10') <b>0.49 J (20')</b>	<0.43 (10') <0.39 (20')

**Notes**

“–” = no sample collected

ug/kg = micrograms per kilogram

“\*\*” indicates that a constituent was detected in the method blank accompanying the sample run, which suggests laboratory contamination

(1) EPA RSL for residential soil to groundwater

(2) DEQ RBC for leaching for soil to groundwater under the residential scenario

(3) Bromomethane, diethyl phthalate, and naphthalene were detected in soil. However, the detections are not shown in Table 2 because all detections in samples were also detected in the method blank accompanying the sample run, suggesting that the all detections were due to laboratory contamination.

Note that all detections are either related to laboratory contamination because the contaminant was detected in the method blank accompanying the sample run (denoted by the “\*\*”) or are extremely

low (denoted by the “J,” which indicates that the concentration had to be estimated because it is below the accuracy of the lab equipment (i.e., the method reporting limit) but above the accuracy of EPA’s analysis method (i.e., the method detection limit). The remaining constituent concentrations would not impair the beneficial use of groundwater as drinking water because: (1) concentrations are generally one or more orders of magnitude below their respective regulatory standards for leaching to groundwater, (2) the concentrations are extremely low and will be diluted to nondetectable levels during recharge, and (3) the detections of many of the constituents are of fuel-related compounds that may be related to cross contamination due to vehicle exhaust from the backhoe or drilling rig during sampling. Therefore, there does not appear to be the potential for leaching of VOCs and SVOCs from soils during infiltration to violate Oregon’s groundwater protection rules.

- **Nitrate.** Nitrate was detected in soil at low concentrations ranging from 0.09 milligrams per kilogram (mg/kg) to 1.08 mg/kg. These concentrations are not expected to degrade groundwater quality, which is characterized by elevated nitrate concentrations ranging from 5.75 milligrams per liter (mg/L) to 12.0 mg/L at the Depot (see discussion of groundwater quality results at RMW-1, RMW-2 and RMW-3 in Section 5.2). Therefore, there does not appear to be the potential for leaching of nitrate from soils during infiltration to violate Oregon’s groundwater protection rules.

As discussed in the bullets above, there does not appear to be soil contamination at the recharge site that would result in a violation of Oregon’s groundwater protection rules.

## 5.2 Source Water and Receiving Water Quality Evaluation

This section summarizes an evaluation of source water quality (Columbia River quality) and receiving water quality (groundwater quality) in the context of Oregon’s groundwater protection rules. In March 2023, a source water quality sample was collected from the Columbia River Pump Station to characterize Columbia River water quality during the period of recharge. Groundwater quality samples were collected from monitoring wells RMW-1, RMW-2, and 4-166 to characterize background (i.e., pre-recharge) groundwater quality. Water quality samples were analyzed for geochemical parameters, metals, synthetic organic compounds, volatile organic compounds, radionuclides, and explosives as shown in Table 4.

### 5.2.1 Columbia River Source Water

Water quality data for the Columbia River is provided on Table 4. Source water quality data indicate that:

- VOCs, SOCs, and explosives were not detected in source water.
- All detections are naturally-occurring geochemical and inorganic constituents and are below pollutant limits in the Safe Drinking Water Act (SDWA) (which are used by the groundwater protection rules to evaluate the significance of a particular contaminant concentration).

### 5.2.2 Groundwater Quality

Water quality data from monitoring wells RMW-1, RMW-2, and 4-166 are provided in Table 4. Groundwater quality data indicate that:

- SOCs and VOCs were not detected in groundwater (note that the herbicide 2,4-DB was detected in all groundwater samples at a low level, but the detection appears to be caused by laboratory

**Table 4**  
Source Water (Columbia River) and Receiving Water (Groundwater) Quality  
Central Area Artificial Recharge Project - Umatilla County

Sample Location Sampling Date	Criteria	Unit	Source Water (Columbia River)	Receiving Water (Groundwater)			
			Columbia River PS 3/29/2023	RMW-1 4/5/2023	RMW-2 4/6/2023	4-166 4/6/2023	
<b>Geochemical and Inorganic Constituents</b>							
Alkalinity as CaCO <sub>3</sub>	--	--	mg/L	90.4 (1)	174 (1)	169 (1)	227 (1)
Antimony (Total)	0.006	MCL	mg/L	0.000118 (1)	0.000146 (1)	0.000091 (1)	0.000085 (1)
Aluminum (Total)	0.05 - 0.2	SMCL	mg/L	0.0402 (1)	0.0042 (1)	0.0062 (1)	0.0031 J (1)
Arsenic (Total)	0.01	MCL	mg/L	0.00138 (1)	0.00678 (1)	0.00483 (1)	0.00326 (1)
Barium (Total)	2	MCL	mg/L	0.0301 (1)	0.0337 (1)	0.0333 (1)	0.0511 (1)
Beryllium (Total)	0.004	MCL	mg/L	0.00002 U (1)	0.00002 U (1)	0.00002 U (1)	0.00002 U (1)
Cadmium (Total)	0.005	MCL	mg/L	0.00001 J (1)	0.00002 U (1)	0.00002 U (1)	0.00002 U (1)
Calcium	--	--	mg/L	27.9 (1)	50.0 (1)	54.2 (1)	82.2 (1)
Carbonate as CaCO <sub>3</sub>	--	--	mg/L	2.0 U (1)	2.0 U (1)	2.0 U (1)	2.0 U (1)
Chloride	250	SMCL	mg/L	6.81 (1)	11.8 (1)	14.2 (1)	23.6 (1)
Chromium (Total)	0.1	MCL	mg/L	0.00027 (1)	0.00117 (1)	0.00144 (1)	0.00172 (1)
Copper (Total)	1.3	MCL	mg/L	0.0019 (1)	0.00028 (1)	0.00019 J (1)	0.00036 (1)
Cyanide (Total)	0.2	MCL	mg/L	0.02 U (1)	0.02 U (1)	0.02 U (1)	0.02 U (1)
Fluoride (Total)	2	MCL, MML, SMCL	mg/L	0.17 J (1)	0.30 (1)	0.28 (1)	0.24 (1)
Hardness (as CaCO <sub>3</sub> )	250	--	mg/L	103 (1)	189 (1)	198 (1)	297 (1)
Iron (Total)	0.3	SMCL	mg/L	0.0582 (1)	0.0059 (1)	0.0025 (1)	0.0138 (1)
Lead (Total)	0.015	MCL	mg/L	0.000151 (1)	0.000011 J (1)	0.00002 U (1)	0.000009 J (1)
Magnesium (Total)	--	--	mg/L	8.1 (1)	15.5 (1)	15.2 (1)	22.4 (1)
Manganese (Total)	0.05	SMCL	mg/L	0.00988 (1)	0.0034 (1)	0.00107 (1)	0.0006 (1)
Mercury (Total)	0.002	MCL	mg/L	0.0002 U (1)	0.0002 U (1)	0.0002 U (1)	0.00002 J (1)
Total Nitrate-Nitrite	10	MCL	mg/L	0.824 (1)	5.75 (1)	6.71 (1)	12.9 (1)
Nickel (Total)	--	--	mg/L	0.00041 (1)	0.00025 (1)	0.00007 J (1)	0.00094 (1)
Potassium	--	--	mg/L	1.91 (1)	4.61 (1)	4.45 (1)	5.45 (1)
Selenium (Total)	0.01	MML	mg/L	0.0003 J (1)	0.0006 J (1)	0.0007 J (1)	0.0004 J (1)
Silver (Total)	0.05	MML	mg/L	0.00002 U (1)	0.00002 U (1)	0.00002 U (1)	0.00002 U (1)
Sodium	--	--	mg/L	11.6 (1)	23.4 (1)	22.7 (1)	29.6 (1)
Sulfate	250	SMCL	mg/L	20.0 (1)	19.7 (1)	22.6 (1)	34.4 (1)
Thallium (Total)	0.002	MCL	mg/L	0.00003 (1)	0.00002 U (1)	0.00002 U (1)	0.000021 (1)
Total Dissolved Solids	500	SMCL	mg/L	136 (1)	279 (1)	291 (1)	421 (1)
Total Organic Carbon	--	--	mg/L	1.60 (1)	0.5 J (1)	0.46 J (1)	1.10 (1)
Total Suspended Solids	--	--	mg/L	5.0 U (1)	5.0 U (1)	5.0 U (1)	5.0 U (1)
Zinc (Total)	5	SMCL	mg/L	0.0028 (1)	0.0005 J (1)	0.002 U (1)	0.002 U (1)
<b>Synthetic Organic Compounds (SOCs)</b>							
2, 4-D	70	MCL, MML	ug/L	0.10 U (1)	0.20 U (1)	0.20 U (1)	0.20 U (1)
2, 4-DB	--	--	ug/L	0.20 U (1)	0.18** J (1)	0.12** J (1)	0.15** J (1)
2, 4, 5-T	--	--	ug/L	0.10 U (1)	0.20 U (1)	0.20 U (1)	0.20 U (1)
2, 4, 5-TP (Silvex)	10	MCL, MML	ug/L	0.10 U (1)	0.20 U (1)	0.20 U (1)	0.20 U (1)
Alachlor (Alanex)	2	MCL	ug/L	0.060 U (2)	0.060 U (2)	0.060 U (2)	0.060 U (2)
Aldicarb (temik)	--	--	ug/L	0.060 U (2)	0.060 U (2)	0.060 U (2)	0.060 U (2)
Aldrin	--	--	ug/L	0.060 U (2)	0.060 U (2)	0.060 U (2)	0.060 U (2)
Atrazine	3	MCL	ug/L	0.060 U (2)	0.060 U (2)	0.060 U (2)	0.060 U (2)
Benzo(a)Pyrene	0.2	MCL	ug/L	0.75 U (1)	10 U (1)	10 U (1)	13 U (1)
BHC-gamma (Lindane)	0.2	MCL, MML	ug/L	0.010 U (1)	0.010 U (1)	0.010 U (1)	0.010 U (1)
Carbaryl	--	--	ug/L	0.060 U (2)	0.060 U (2)	0.060 U (2)	0.060 U (2)
Carbofuran	40	MCL	ug/L	0.060 U (2)	0.060 U (2)	0.060 U (2)	0.060 U (2)
Chlordane	2	MCL	ug/L	0.060 U (2)	0.060 U (2)	0.060 U (2)	0.060 U (2)
Dalapon	200	MCL	ug/L	0.28 U (1)	0.40 U (1)	0.40 U (1)	0.40 U (1)
Di(2-ethylhexyl)adipate (adipates)	400	MCL	ug/L	0.200 U (3)	0.210 U (3)	0.209 U (3)	0.215 U (3)
Di(2-ethylhexyl)phthalate (phthalates)	6	MCL	ug/L	0.75 U (1)	10 U (1)	10 U (1)	13 U (1)
Dicamba	--	--	ug/L	0.10 U (1)	0.20 U (1)	0.20 U (1)	0.20 U (1)
Dichlorprop	--	--	ug/L	0.10 U (1)	0.40 U (1)	0.40 U (1)	0.40 U (1)
Dieldrin	--	--	ug/L	0.060 U (2)	0.060 U (2)	0.060 U (2)	0.060 U (2)
Dinoseb	7	MCL	ug/L	0.06 U (1)	0.20 U (1)	0.20 U (1)	0.20 U (1)
Endothall	100	MCL	ug/L	9.00 U (3)	9.00 U (3)	9.00 U (3)	9.00 U (3)
Endrin	0.2	MCL, MML	ug/L	0.010 U (1)	0.010 U (1)	0.010 U (1)	0.010 U (1)
Glyphosate	700	MCL	ug/L	10 U (2)	10 U (2)	10 U (2)	10 U (2)
Heptachlor	0.4	MCL	ug/L	0.010 U (1)	0.010 U (1)	0.010 U (1)	0.010 U (1)
Heptachlor Epoxide	0.2	MCL	ug/L	0.010 U (1)	0.010 U (1)	0.010 U (1)	0.010 U (1)
Hexachlorobenzene (HCB)	1	MCL	ug/L	0.010 U (1)	0.010 U (1)	0.010 U (1)	13 U (1)
Hexachlorocyclopentadiene	50	MCL	ug/L	0.75 U (1)	51 U (1)	51 U (1)	64 U (1)
Methoxychlor	40	MCL, MML	ug/L	0.025 U (1)	0.010 U (1)	0.010 U (1)	0.010 U (1)
Pentachlorophenol	1	MCL	ug/L	10 U (1)	26 U (1)	26 U (1)	32 U (1)
Picloram	500	MCL	ug/L	0.080 U (2)	0.086 U (2)	0.086 U (2)	0.086 U (2)
Simazine	4	MCL	ug/L	0.060 U (2)	0.060 U (2)	0.060 U (2)	0.060 U (2)
Total Polychlorinated Biphenyls (PCBs)	0.5	MCL	ug/L	0.04 U (1)	0.04 U (1)	0.04 U (1)	0.04 U (1)
Toxaphene	3	MCL, MML	ug/L	0.60 U (1)	0.60 U (1)	0.60 U (1)	0.60 U (1)
<b>Volatile Organic Compounds (VOCs)</b>							
1, 1-Dichloroethylene	7	MCL, MML	ug/L	0.50 U (1)	0.50 U (1)	0.50 U (1)	0.50 U (1)
1, 2-Dichloroethane (EDC)	5	MCL, MML	ug/L	0.50 U (1)	0.50 U (1)	0.50 U (1)	0.50 U (1)
1, 2-Dichloropropane	5	MCL	ug/L	0.50 U (1)	0.50 U (1)	0.50 U (1)	0.50 U (1)
1, 2, 4-Trichlorobenzene	70	MCL	ug/L	2.0 U (1)	2.0 U (1)	2.0 U (1)	2.0 U (1)
1, 1, 1-Trichloroethane	200	MCL, MML	ug/L	0.50 U (1)	0.50 U (1)	0.50 U (1)	0.50 U (1)
1, 1, 2-Trichloroethane	5	MCL	ug/L	0.50 U (1)	0.50 U (1)	0.50 U (1)	0.50 U (1)

Sample Location Sampling Date		Criteria	Unit	Source Water (Columbia River)		Receiving Water (Groundwater)					
				Columbia River PS 3/29/2023		RMW-1 4/5/2023		RMW-2 4/6/2023		4-166 4/6/2023	
Benzene	5	MCL, MML	ug/L	0.50	U (1)	0.50	U (1)	0.50	U (1)	0.50	U (1)
Chlorobenzene (monochlorobenzene)	100	MCL	ug/L	0.50	U (1)	0.50	U (1)	0.50	U (1)	0.50	U (1)
cis-1,2-Dichloroethylene	70	MCL	ug/L	0.50	U (1)	0.50	U (1)	0.50	U (1)	0.50	U (1)
Ethylbenzene	700	MCL	ug/L	0.50	U (1)	0.50	U (1)	0.50	U (1)	0.50	U (1)
Methylene Chloride	0.005	MCL	ug/l	2.0	U (1)	2.0	U (1)	2.0	U (1)	2.0	U (1)
Styrene	100	MCL	ug/L	0.50	U (1)	0.50	U (1)	0.50	U (1)	0.50	U (1)
Tetrachloroethylene (PCE)	5	MCL	ug/L	0.50	U (1)	0.50	U (1)	0.50	U (1)	0.50	U (1)
Toluene	1000	MCL	ug/L	0.50	U (1)	0.50	U (1)	0.50	U (1)	0.50	U (1)
Total Xylenes	10000	MCL	ug/L	0.50	U (1)	0.50	U (1)	0.50	U (1)	0.50	U (1)
trans-1,2-Dichloroethylene	100	MCL	ug/L	0.50	U (1)	0.50	U (1)	0.50	U (1)	0.50	U (1)
Trichloroethylene (TCE)	5	MCL, MML	ug/L	0.50	U (1)	0.50	U (1)	0.50	U (1)	0.50	U (1)
Vinyl chloride	2	MCL, MML	ug/L	0.50	U (1)	0.50	U (1)	0.50	U (1)	0.50	U (1)
<b>Radionuclides</b>											
Alpha, Gross	15	MML	pCi/L	1.52	U (1)	<b>4.34</b>	(1)	1.79	U (1)	<b>3.51</b>	(1)
Beta, Gross	50	MML	pCi/L	1.08	U (1)	<b>4.42</b>	(1)	2.45	U (1)	<b>4.15</b>	(1)
<b>Radium 226, 228 Combined</b>	5	MML	pCi/L	<b>0.627</b>	(1)	<b>2.95</b>	(1)	<b>2.00</b>	(1)	<b>4.16</b>	(1)
<b>Uranium</b>	30	MCL	ug/L	<b>1.51</b>	(1)	<b>3.01</b>	(1)	<b>2.22</b>	(1)	<b>3.95</b>	(1)
<b>Explosives</b>											
1,3,5-Trinitrobenzene	--	--	ug/L	0.29	U (1)	0.31	U (1)	0.30	U (1)	0.30	U (1)
1,3-Dinitrobenzene	--	--	ug/L	0.29	U (1)	0.31	U (1)	0.30	U (1)	0.30	U (1)
2,4,6-Trinitrotoluene	--	--	ug/L	0.29	U (1)	0.31	U (1)	0.30	U (1)	0.30	U (1)
2,4-Dinitrotoluene	--	--	ug/L	0.29	U (1)	0.31	U (1)	0.30	U (1)	0.30	U (1)
HMX	--	--	ug/L	0.29	U (1)	0.31	U (1)	0.30	U (1)	0.30	U (1)
Nitrobenzene	--	--	ug/L	0.29	U (1)	0.31	U (1)	0.30	U (1)	0.30	U (1)
RDX	--	--	ug/L	0.29	U (1)	0.31	U (1)	<b>0.97</b>	(1)	0.30	U (1)
Tetryl	--	--	ug/L	0.29	U (1)	0.31	U (1)	0.30	U (1)	0.30	U (1)

**Notes:**

(1) Data from ALS Laboratories

(2) Data from Matrix Laboratories

(3) Data from Anatek Laboratories

MCL = Maximum Contaminant Level

SMCL = Secondary Maximum Contaminant Level

PS = Pump Station

U = Analyte not detected above the method reporting limit

J = Estimated concentration (concentration between detection limit and reporting limit)

mg/L = milligrams per liter

ug/L = micrograms per liter

pCi/L = picoCuries per liter

\*\* = Constituent also detected in the method blank; therefore, detection is likely due to laboratory contamination

**Black Bold** indicates constituent was detected

**Blue Bold** indicates constituent concentration in source water is lower than groundwater (i.e., groundwater quality improvement)

contamination because 2,4-DB was also detected in the method blank accompanying the sample run).

- A single explosive (RDX) was detected in monitoring well RMW-2 at a concentration of 0.97 micrograms per liter (ug/L), below the remedial level of 2.1 ug/L. This remedial level is used to delineate the RDX plume for cleanup purposes (USACE, 2016). The AR project will improve the groundwater quality by diluting this low-level concentration of RDX.

### 5.2.3 Water Quality Comparison

A comparison of source water quality data and groundwater quality data indicates that:

- The blue-bold constituents in Table 4 have lower concentrations in source water than receiving water. The County’s Central Area AR Project will improve groundwater quality for these constituents [nitrate, radionuclides, certain geochemical and inorganic parameters, and various metals (arsenic, barium, chromium, copper, magnesium, and selenium)]. The reduction in nitrate concentrations is notable given that the project is located within the DEQ-delineated GWMA for nitrate.
- The constituents in Table 5 have higher concentrations in source water than in receiving water. Constituent concentrations in source water range from slightly higher (i.e., antimony, cadmium, thallium) to moderately higher (aluminum, iron, lead, manganese, total organic carbon, and zinc). All constituents that are higher in source water are naturally-occurring geochemical and inorganic constituents and are below pollutant limits in the Safe Drinking Water Act (SDWA) (which are used by the groundwater protection rules to evaluate the significance of a particular contaminant concentration).

**Table 5. Constituents With Source Water Concentrations Exceeding Receiving Water Concentrations<sup>1</sup>.**

Constituent	Surface Water Concentration	Average Receiving Water Concentration
Antimony	0.118 ug/L	0.107 ug/L
Aluminum	40.2 ug/L	4.5 ug/L
Cadmium	0.01 J ug/L	ND
Iron	58.2 ug/L	7.4 ug/L
Lead	0.151 ug/L	0.010 ug/L
Manganese	9.88 ug/L	1.69 ug/L
Thallium	0.03 ug/L	0.02 ug/L
Total Organic Carbon	1,600 ug/L	687 ug/L
Zinc	2.8 ug/L	0.833 ug/L

**NOTES:**

- (1) Note that bacteriological parameters were not analyzed in source water. We assume that bacteriological parameters will be higher in source water than receiving water, and the monitoring plan in Section 7 includes analysis of bacteriological parameters to confirm that Oregon’s groundwater protection rules are met.  
ug/L = micrograms per liter

The sampling plan for the project will focus on these pollutants (certain geochemical and inorganic parameters) to ensure that the project meets Oregon’s groundwater protection rules. Specifically, the

County will monitor concentrations of these constituents to determine if they remain below background at downgradient monitoring wells RMW-1 and RMW-2. If concentrations exceed background, then the significance of the exceedance will be assessed by comparison to SDWA standards, and the appropriate action will be taken to address the exceedance.

Currently, background is calculated as the average concentration at monitoring wells RMW-1, RWM-2 and 4-161. Following pre-recharge groundwater quality sampling at these wells prior to Year 1 of recharge (see the AR monitoring plan in Section 7), background will be re-calculated using the new data. Background concentrations will be calculated using statistical methods to indicate when an exceedance of a background concentration at a monitoring well is statistically significant (e.g., upper tolerance levels).

Overall, the source water quality is good and will improve the quality of native groundwater. It should be noted that the constituents with source water concentrations that are higher than receiving water concentrations are naturally-occurring, below limits in the SDWA (based on the groundwater protection rules, concentrations that exceed SDWA limits may be considered to be “significant”), and will be incorporated in the AR monitoring plan (Section 7) to confirm that the project meets Oregon’s groundwater protection rules.

## SECTION 6: Project Design and Operation

This section provides an overview of the recharge basin and conveyance piping designs and project operation. This section is organized as follows:

- Section 6.1: Recharge Source, Recharge Period, and Recharge Rates/Volumes
- Section 6.2: Recharge Basins
- Section 6.3: Recovery of Recharged Water

### 6.1 Recharge Source, Recharge Period, and Recharge Rates/Volumes

The County proposes to divert Columbia River water when water is available between October 1 and April 14, or as determined by OWRD, and subject to interpretations provided in Division 33 rules and ODFW's minimum flow targets. The application requests diversion of Columbia River water for AR, up to 45 cfs and maximum volume of 18,000 AF annually for the Central Area AR Project. It is anticipated that the first year of recharge will target a recharge volume of 5,000 AF, with the potential to increase the recharge volume based on aquifer response and infiltration basin performance. The locations of the existing point of diversion, proposed conveyance piping and proposed recharge basin area are shown on Figure 1 and Figure 2.

### 6.2 Recharge Basins

Figure 1 and Figure 2 show the proposed recharge basin area for the County's Central Area AR Project. Recharge water will be conveyed from the Columbia River Pump Station to the recharge basin area through a single 42-inch diameter pipeline. The entire recharge facility is designed to infiltrate up to 45 cfs. The preliminary design assumptions for the recharge basin area were developed by IRZ Engineering & Consulting (IRZ) and HDR, Inc. (HDR), the design drawings for which are included in Attachment H.

- Six rectangular-shaped infiltration basins, each with bottom infiltration areas of 54,000 square feet and a designed receiving capacity of 11.25 cfs infiltration (infiltration rate of 18 feet per day).
- Operating four of the infiltration basins will provide the 45 cfs design total capacity while two additional basins are provided for redundancy.
- Maximum side slope of 3 to 1.
- Basins shall be equipped with overflow culverts in the event of high water levels are exceeded. Overflow piping will be used to prevent basin overtopping and erosion if flow control and level monitoring and alarm malfunction or are not attended.

Note that the recharge basins are currently based on preliminary engineering designs, and may change as designs are finalized.

### 6.3 Recovery of Recharged Water

Per the Oregon Administrative Rules, the availability of stored water for recovery will be based on: (1) a formula which relies primarily on water levels in wells, metered quantities of recharge, hydrogeologic conditions, and secondary permit withdrawals, (2) geochemical parameters in groundwater, and/or (3) a definitive groundwater investigation. Storage water may be credited at up to 85% of water metered to the place of recharge. Recovery will occur under a secondary permit for use of artificially recharged water.

# SECTION 7: Artificial Recharge Monitoring Plan

This section summarizes a plan for monitoring flows, water levels, and groundwater quality for the County’s Central Area AR Project. The purpose of the monitoring plan is to collect data that can be used to evaluate the effect of the project on the Ordinance Gravel Aquifer and apply for a secondary permit for the use of artificially recharged water. The objectives of the monitoring plan are to: (1) track the volume of water that is recharged by the project, (2) evaluate impacts of recharge on the aquifer, and (3) confirm that the project meets the requirements of Oregon’s groundwater protection rules.

This section is organized as follows:

- Section 7.1: Flow Monitoring
- Section 7.2: Groundwater Level Monitoring
- Section 7.3: Water Quality Monitoring

## 7.1 Flow Monitoring

Flow (both instantaneous rate and total volume) will be metered at the following locations during recharge to track the volume of water recharged to the Ordinance Gravel Aquifer.

- **Source of Recharge.** Points of diversion from: (1) the Columbia River Pump Station and (2) Umatilla River Pump Station. Note that recharge authorized by this limited license shall only be from the Columbia River Pump Station; however, the monitoring plan for this limited license will also track flows at the Umatilla River Pump Station for accounting purposes because Umatilla River water may be used for recharge, under a separate limited license, at the same infiltration basins and using some shared segments of conveyance piping.
- **Place of Recharge.** Conveyance pipe prior to discharge at the proposed recharge basin area.

While no loss of recharge water is anticipated between the point of diversion and the place of recharge, this flow monitoring program can confirm that no water is lost by comparing data from the Columbia River Pump Station and Entry to the Project Site. Planned detail for the flowmeters is shown in Sheet 001 (Overall Site Plan) and Sheet 00Y-002 (Instrumentation & Controls Piping & Instrumentation Diagram) of Attachment H. Table 6 summarizes the frequency and locations for flow monitoring.

**Table 6. Flow Monitoring Plan.**

Monitoring Location	Manual Measurement Frequency	Automated Measurement Frequency
Columbia River Pump Station <sup>1</sup>	Weekly During Recharge	Hourly
Umatilla River Pump Station <sup>1</sup>	Weekly During Recharge	Hourly
Entry to Project Site <sup>2</sup>	Weekly During Recharge	Hourly

**Notes**

(1) See Sheet 00Y-002 in Attachment H

(2) See Sheet 001 in Attachment H for the currently-planned location of the flowmeter at the entry to the project site (labeled “External GE Panametrics Flowmeter FM-1007)

Quantities of water pumped under secondary permits will be recorded by the secondary permit holders and reported to OWRD on an annual basis.

## 7.2 Groundwater Level Monitoring

Groundwater levels will be monitored at 17 observation wells to evaluate the effectiveness of recharge, determine the availability of stored recharge water for recovery under secondary permits, evaluate the potential for hydraulic connection between the basalt aquifer and Ordnance Gravel Aquifer, and evaluate the volume of water that can be recharged to the Ordnance Gravel Aquifer. We anticipate that this groundwater level monitoring network will be used to select the key wells and target levels upon which recovery volumes will be in part based. Table 7 summarizes the frequency and locations for groundwater level monitoring; monitoring locations are shown in Figure 8.

**Table 7. Groundwater Level Monitoring Plan.**

Monitoring Location	Aquifer	Manual Measurement Frequency	Automated Measurement Frequency
<b>County-Owned Wells</b>			
RMW-1	Ordnance Gravel	Quarterly	Hourly
RMW-2	Ordnance Gravel	Quarterly	Hourly
RMW-3	Ordnance Gravel	Quarterly	Hourly
<b>USACE Monitoring Wells <sup>1</sup></b>			
4-115	Ordnance Gravel	Annually	Daily
4-116	Ordnance Gravel	Annually	Daily
4-122	Ordnance Gravel	Annually	Daily
4-131	Ordnance Gravel	Annually	Daily
<b>OWRD Monitoring Wells <sup>2</sup></b>			
4-166 (U58259) <sup>3</sup>	Ordnance Gravel	Quarterly (Approximate)	Daily
U57006	Ordnance Gravel	Quarterly (Approximate)	Daily
U57007	Ordnance Gravel	Quarterly (Approximate)	Daily
U57115	Ordnance Gravel	Quarterly (Approximate)	Daily
U57114	Ordnance Gravel	Quarterly (Approximate)	Daily
U57546	Basalt	Quarterly (Approximate)	Daily
U5857	Basalt	Quarterly (Approximate)	Daily
M955	Ordnance Gravel	Quarterly (Approximate)	Daily
M50489	Ordnance Gravel	Quarterly (Approximate)	Daily
M51990	Ordnance Gravel	Quarterly (Approximate)	Daily

**Notes**

- (1) USACE downloads data from transducers twice annually and measures groundwater levels
- (2) Data are available from OWRD through the OWRD Groundwater Information System
- (3) Well is also monitored by the USACE

**Table 8**

## Water Quality Monitoring Analyte List

## Central Area Artificial Recharge Project - Umatilla County

	General Geochemical and Groundwater Protection List	Full Suite
	Group A	Group B
<b>Microorganisms/Microparticulate</b>		
Total Coliforms (including fecal coliform and E. Coli)	X	X
Coliform Bacteria	X	X
Turbidity	X	X
<b>Geochemical</b>		
Bicarbonate as CaCO <sub>3</sub>	X	X
Calcium	X	X
Carbonate as CaCO <sub>3</sub>	X	X
Chloride	X	X
Cyanide (Total)	X	X
Fluoride (Total)	X	X
Hardness (as CaCO <sub>3</sub> )	X	X
Magnesium (Total)	X	X
Nitrite as N	X	X
Nitrate as N	X	X
Total Nitrate-Nitrite	X	X
Potassium	X	X
Silica	X	X
Sodium	X	X
Sulfate	X	X
Total Alkalinity	X	X
Total Organic Carbon	X **	X
<b>Metals</b>		
Aluminum (Total)	X **	X
Antimony (Total)	X **	X
Arsenic (Total)	X	X
Barium (Total)	X	X
Beryllium (Total)	X	X
Cadmium (Total)	X **	X
Chromium (Total)	X	X
Copper (Total)	X	X
Iron (Total)	X **	X
Lead (Total)	X **	X
Manganese (Total)	X **	X
Mercury (Total)	X	X
Nickel (Total)	X **	X
Selenium (Total)	X	X
Silver (Total)	X	X
Thallium (Total)	X **	X
Zinc (Total)	X **	X
<b>Miscellaneous</b>		
Total Dissolved Solids (TDS)		X
Total Suspended Solids (TSS)		X
<b>Synthetic Organic Compounds (SOCs)</b>		
2, 4-D		X
2, 4, 5-TP (Silvex)		X
Alachlor (Alanex)		X
Atrazine		X
Benzo(a)Pyrene		X
BHC-gamma (Lindane)		X
Carbofuran		X
Chlordane		X
Dalapon		X
Di(2-ethylhexyl)adipate ( <i>adipates</i> )		X
Di(2-ethylhexyl)phthalate ( <i>phthalates</i> )		X
Dibromochloropropane (DBCP)		X
Dinoseb		X
Diquat		X
Ethylene Dibromide (EDB)		X
Endothall		X
Endrin		X
Glyphosate		X
Heptachlor		X
Heptachlor Epoxide		X
Hexachlorobenzene (HCB)		X
Hexachlorocyclopentadiene		X
Methoxychlor		X
Pentachlorophenol		X

**Table 8**

## Water Quality Monitoring Analyte List

## Central Area Artificial Recharge Project - Umatilla County

	General Geochemical and Groundwater Protection List	Full Suite
	Group A	Group B
Picloram		X
Simazine		X
Total Polychlorinated Biphenyls (PCBs)		X
Toxaphene		X
Vydate (Oxamyl)		X
<b>Volatile Organic Compounds (VOCs)</b>		
1, 1-Dichloroethylene		X
1, 2-Dichloroethane (EDC)		X
1, 2-Dichloropropane		X
1, 2, 4-Trichlorobenzene		X
1, 1, 1-Trichloroethane		X
1, 1, 2-Trichloroethane		X
Benzene		X
Chlorobenzene (monochlorobenzene)		X
cis-1,2-Dichloroethylene		X
Dichloromethane		X
Ethylbenzene		X
Styrene		X
Tetrachloroethylene (PCE)		X
Toluene		X
Total Xylenes		X
trans-1,2-Dichloroethylene		X
Trichloroethylene (TCE)		X
Vinyl chloride		X
<b>Radionuclides</b>		
Alpha, Gross		X
Beta, Gross		X
Radium 226, 228 Combined		X
Uranium		X

Notes:

X = Constituent will be monitored

"\*\*\*" = Concentration of constituent in source water exceeds concentration of constituent in groundwater

After the first year of recharge testing and monitoring, additional observation wells may be identified, if necessary. In addition, observation wells may be removed from the network if data from the wells do not meet the objectives of groundwater level monitoring.

Note that observation wells will be monitored by several monitoring parties, including the County (County-Owned Wells), U.S. Army Corps of Engineers (USACE Monitoring Wells), and/or the Oregon Water Resources Department (OWRD Monitoring Wells). Inclusion of the non-County-owned wells under the monitoring plan in this limited license is contingent on the future existence of the wells, continued monitoring by the monitoring parties, and/or data sharing by monitoring the parties.

### 7.3 Water Quality Monitoring

Source and receiving water quality will be monitored to determine if water quality standards are being met, evaluate the response of the Ordinance Gravel Aquifer to recharge, and to demonstrate the availability of stored water for recovery. The water quality monitoring consists of two analyte groups, which are listed in Table 8:

- **Group A** includes general geochemical parameters to evaluate aquifer response to recharge and water availability for recovery, and facilitate frequent evaluation of whether the project meets Oregon’s groundwater protection rules (denoted by “X\*\*” in Table 8).
- **Group B** is a comprehensive analytical list to provide confirmation that Oregon’s groundwater protection rules are being met and includes most contaminants regulated under OAR 340-040 and OAR 333-061. Disinfection by-products are not included in Group B because source water will not be chlorinated prior to recharge.

Note that additional water quality analytes may be added to Group A based on Group B analytical results from baseline water quality monitoring (i.e., if Group B analyte concentrations exceed background). Water quality monitoring will be conducted at monitoring wells RMW-1, RMW-2, 4-166, and from the pipe where source water enters the recharge site. The schedule for water quality monitoring during the first year of water quality monitoring is provided in Table 9.

**Table 9. Groundwater Quality Monitoring Plan During Year 1 of Recharge.**

Monitoring Location <sup>1</sup>	Monitoring			
	Baseline Monitoring	Monthly During Recharge		
Source Water	Group B	Group A	Group A	Group A
RMW-1	Group A	Group A	Group A	Group A
RMW-2	Group A	Group A	Group A	Group A
4-166	Group A	Group A	Group A	Group A

**Notes**

(1) Additional wells may be added to the water quality monitoring network based on well owner agreement and the results of groundwater quality sampling.

The analyte list, schedule, and monitored wells during subsequent years' water quality monitoring may be changed based on the results of the first year's water quality monitoring. Updates will be developed and submitted to OWRD following evaluation of the first year analytical results.

## SECTION 8: Reporting

An annual report summarizing the first year of artificial recharge will be submitted on February 15 following each year of AR in accordance with OAR 690-350. The report will present the system design and modifications, operation, water volumes, estimated storage account volumes, water quality data, and water level response in the aquifer. The report will present modifications to the monitoring (if any) and operation schedule for the following year.

## SECTION 9: References

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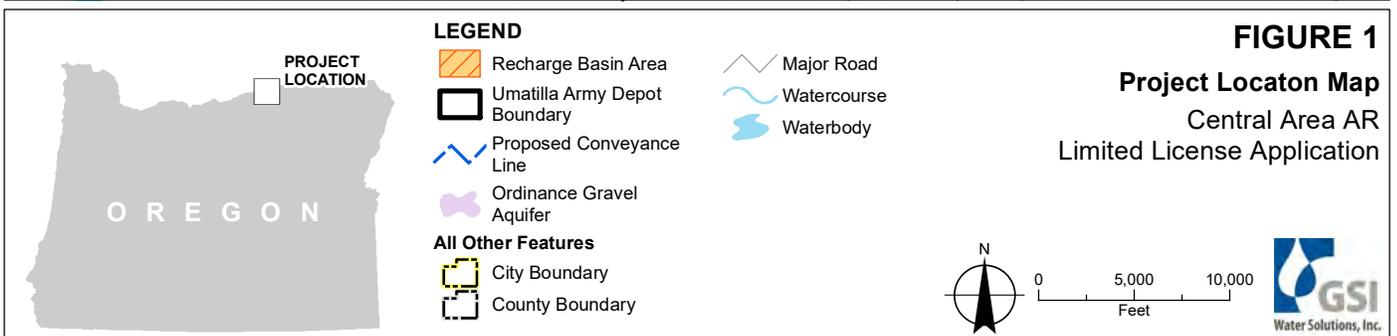
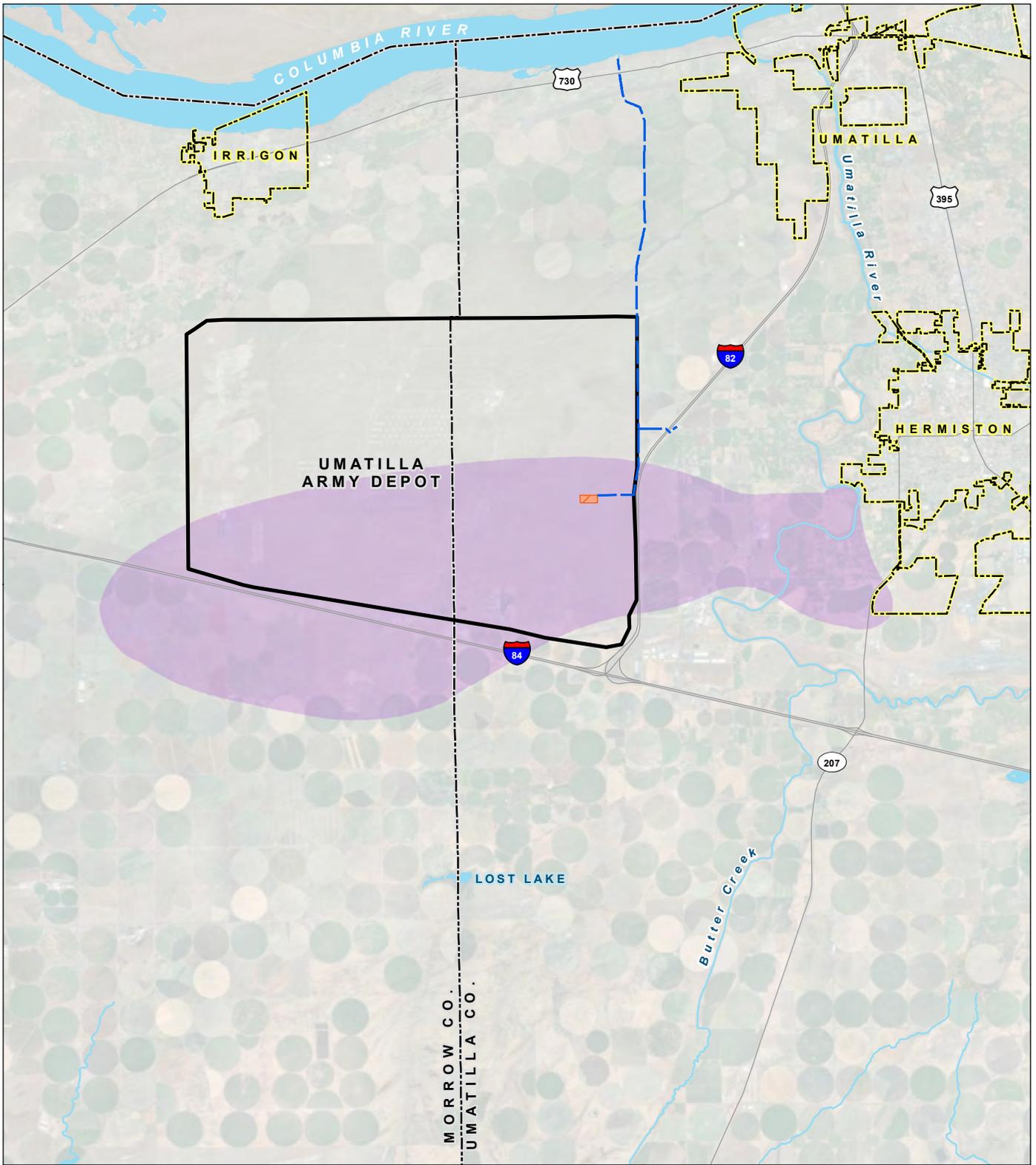
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[https://apps.wrd.state.or.us/apps/sw/hydro\\_near\\_real\\_time/display\\_hydro\\_graph.aspx?station\\_nbr=14030820](https://apps.wrd.state.or.us/apps/sw/hydro_near_real_time/display_hydro_graph.aspx?station_nbr=14030820).

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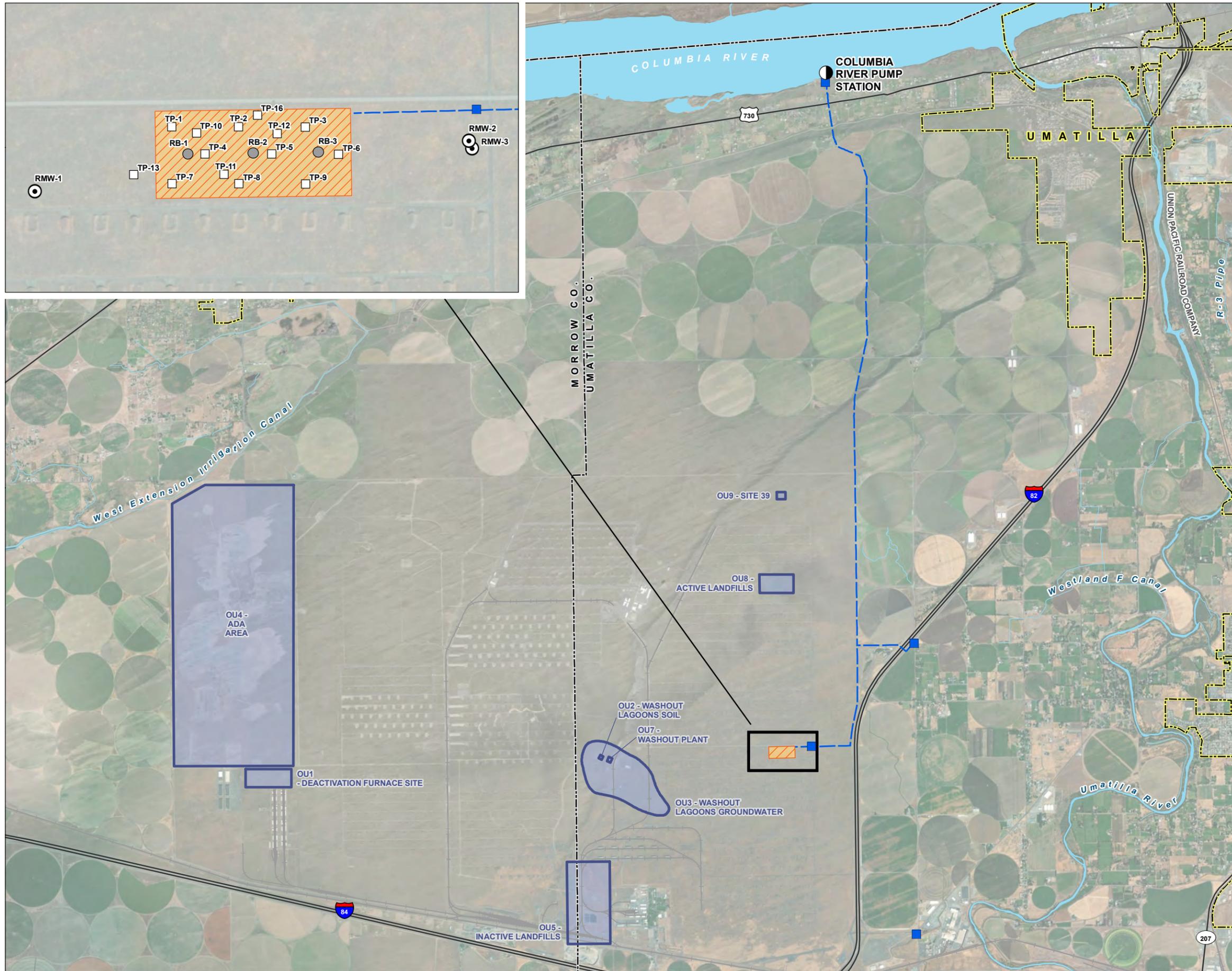
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[https://or.water.usgs.gov/projs\\_dir/crbg/data/wells/umat\\_5820/umat\\_5820\\_geol.pdf](https://or.water.usgs.gov/projs_dir/crbg/data/wells/umat_5820/umat_5820_geol.pdf).

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**FIGURE 2**  
**Central Area Site Map**  
 Central Area AR  
 Limited License Application

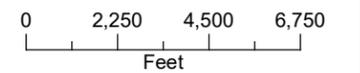


**LEGEND**

- Monitoring Well
  - Test Pit
  - Temporary Geotechnical Boring
  - Point of Diversion
  - Proposed Flowmeter
  - Proposed Conveyance Line
  - Operable Unit
  - Recharge Basin Area
- All Other Features**
- City Boundary
  - County Boundary
  - Major Road
  - Railroad
  - Watercourse
  - Waterbody

**NOTE**

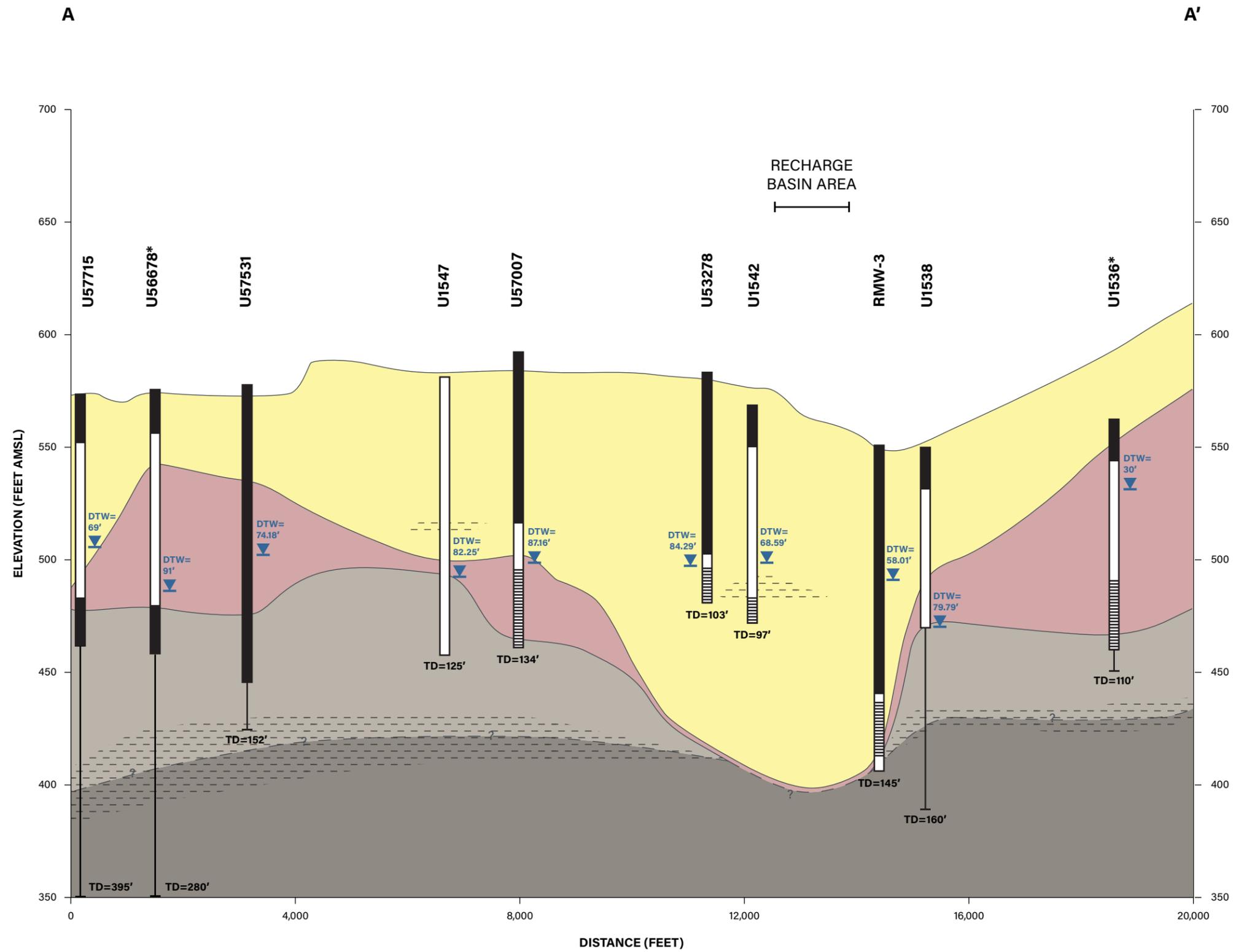
Operational Unit 6 (Miscellaneous Sites) is not shown. None of the miscellaneous sites are located near the proposed recharge basin.



Date: July 20, 2023  
 Data Sources: BLM, ESRI, ODOT, USGS, Maxar imagery (2018)



**FIGURE 4A**  
**Cross Section A-A'**  
 Central Area AR  
 Limited License Application



**LEGEND**

Static Water Level (February 2016)

Interflow Zone

**Unconsolidated Deposits**

Catastrophic Flood Deposits

Alkali Canyon Formation

**Columbia River Basalt Group**

Elephant Mountain Member

Pomona Member

**WELL LEGEND**

Seal

Casing

Perforations

Open Borehole

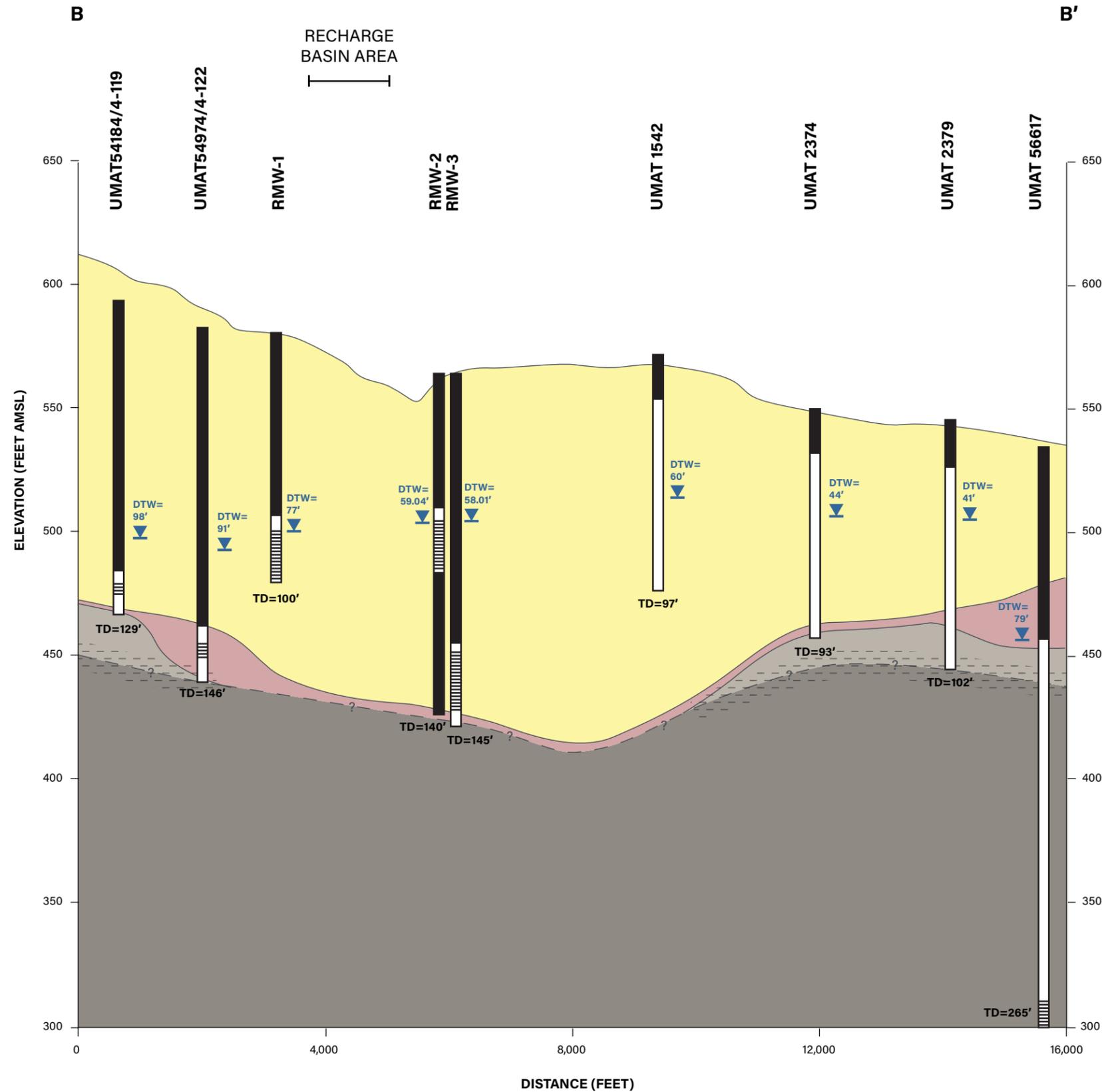
**NOTES**

1. Water levels from sitewide OWRD event from 2/10/2016-2/11/2016. U57715 measured 11/28/2016.
  2. Vertical exaggeration = 40x.
- \*Depth to Water from drilling log.

AMSL: Above mean sea level  
 DTW: Depth to water



**FIGURE 4B**  
**Cross Section B-B'**  
 Central Area AR  
 Limited License Application



**LEGEND**

Static Water Level (February 2016)

Interflow Zone

**Unconsolidated Deposits**

Catastrophic Flood Deposits

Alkali Canyon Formation

**Columbia River Basalt Group**

Elephant Mountain Member

Pomona Member

**WELL LEGEND**

Seal

Casing

Perforations

Open Borehole

**NOTES**

Vertical exaggeration = 40x.

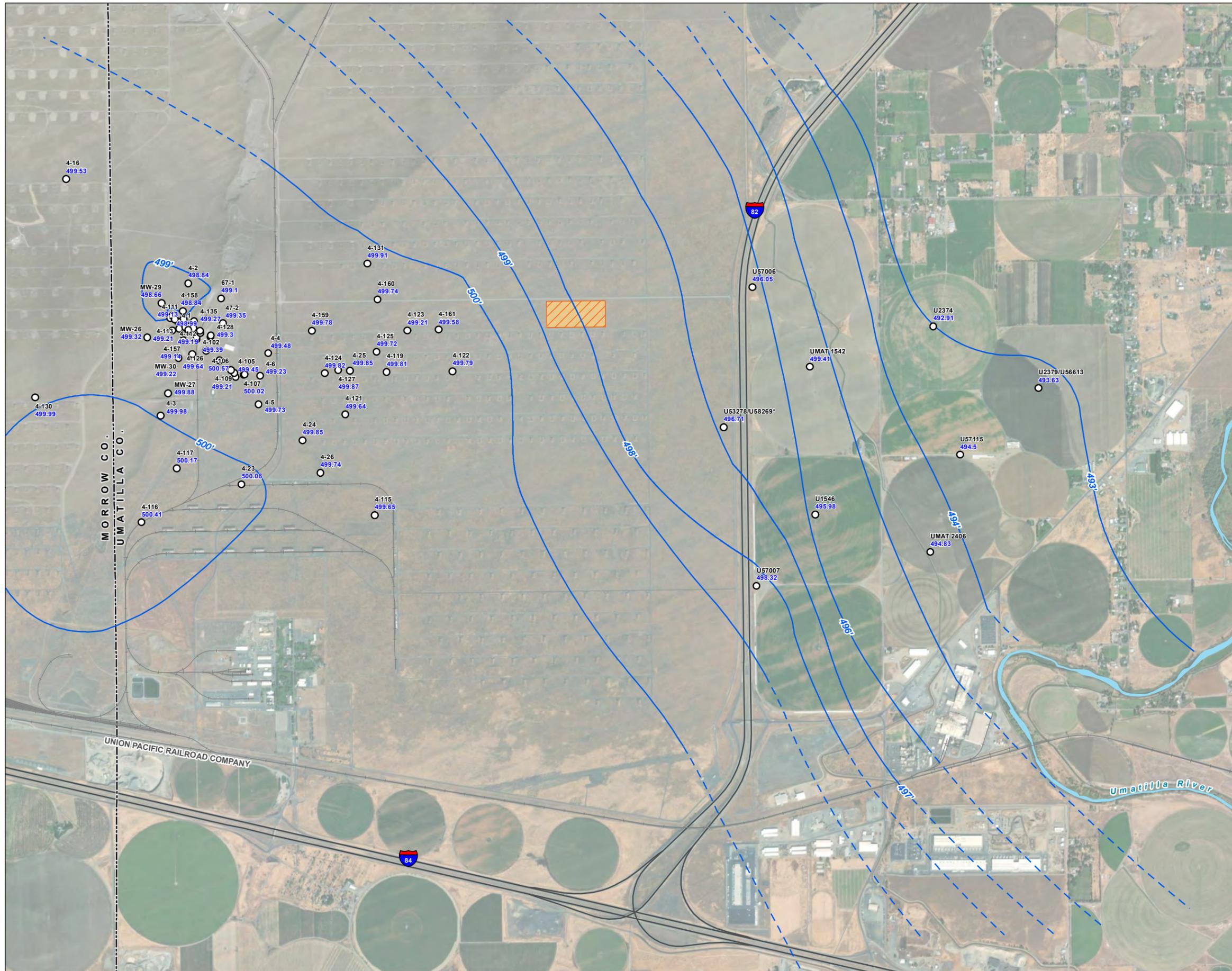
AMSL: Above mean sea level

DTW: Depth to water





**FIGURE 6**  
**Groundwater Elevation**  
**Contour Map**  
 Central Area AR  
 Limited License Application

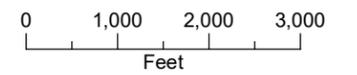


**LEGEND**

- Well Used for Contour
- 1' Contour
- - - 1' Contour Inferred
- ▨ Recharge Basin Area
- All Other Features**
- ▭ County Boundary
- Major Road
- Railroad
- Watercourse
- Waterbody

**NOTE**

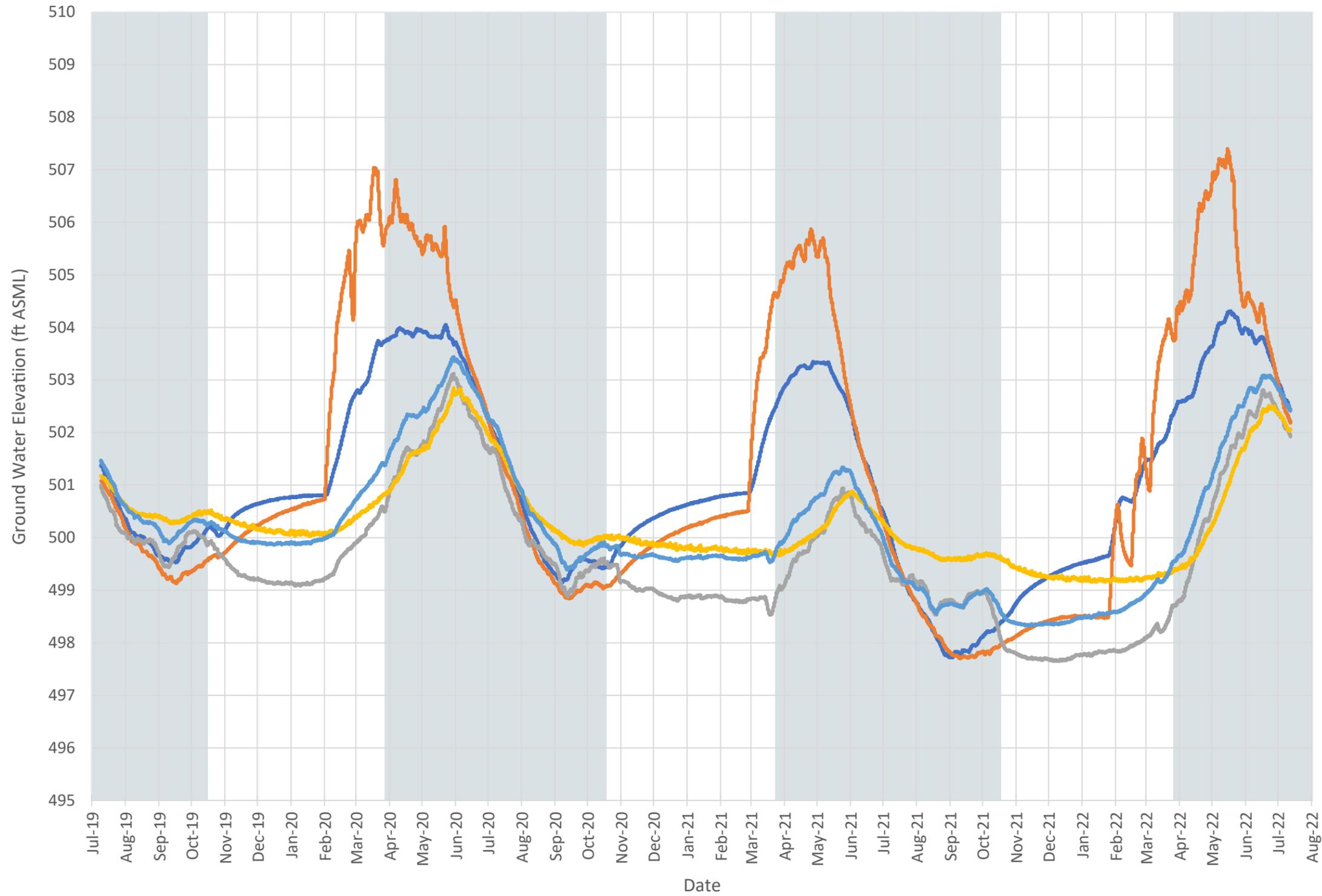
\*Represents an abandoned well.



Date: July 20, 2023  
 Data Sources: BLM, ESRI, ODOT, USGS,  
 Aerial Photo 2018



**FIGURE 7**  
**Ordnance Gravel Aquifer**  
**Hydrographs**  
**Central Area AR**  
**Limited License Application**



**LEGEND**

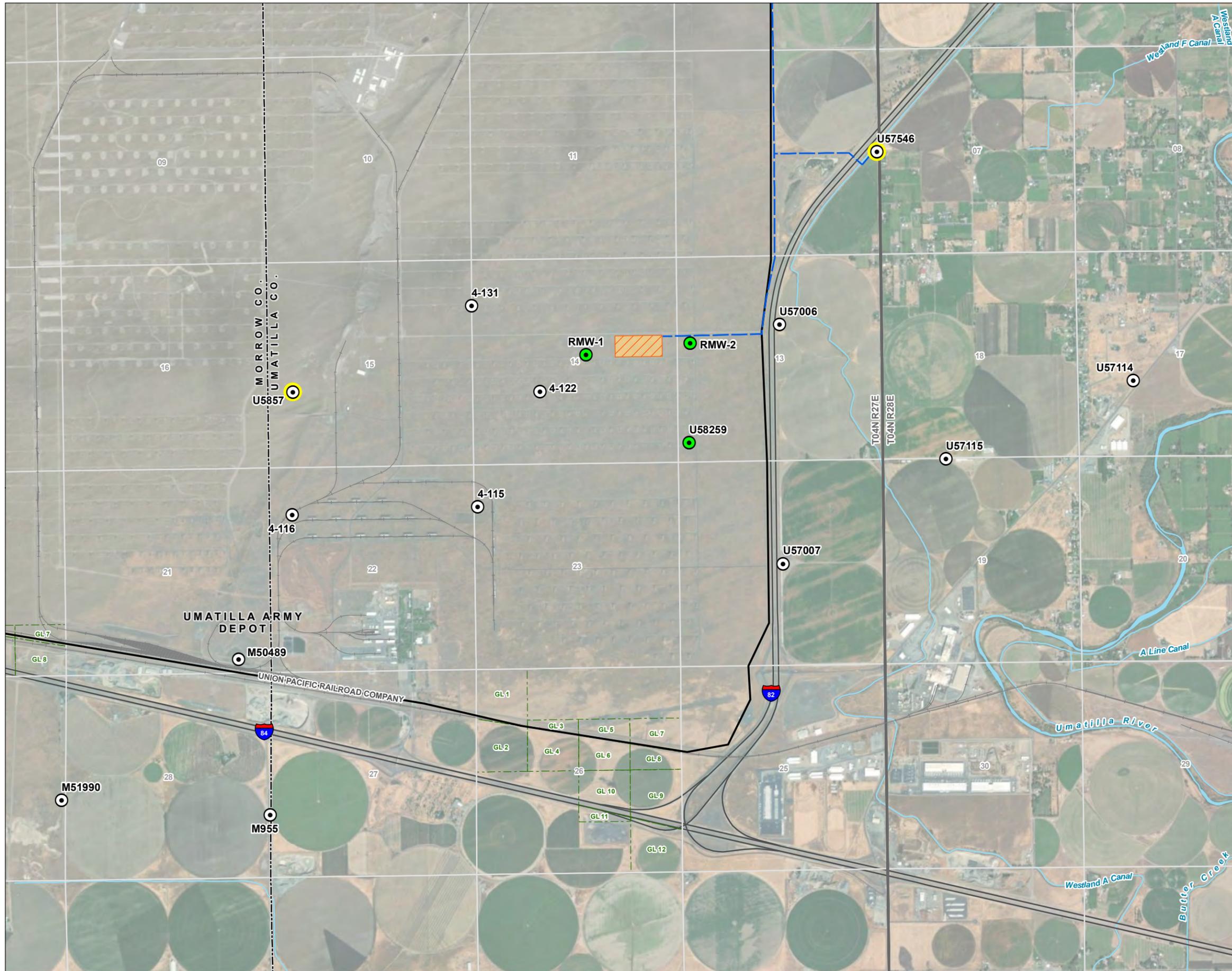
- MORR 955
- MORR 51990
- UMAT 57006
- UMAT 57007
- UMAT 58259
- Irrigation Season  
(April 15 - October 31)

**NOTES**

See Figure 5 for well locations.  
 AMSL: above mean sea level



**FIGURE 8**  
**Groundwater Well**  
**Monitoring Network**  
 Central Area AR  
 Limited License Application



**LEGEND**

**Well Monitoring Network**

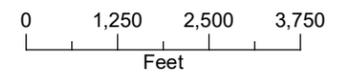
- Water Level
- Water Level and Water Quality
- Basalt Well

**All Other Features**

- Umatilla Army Depot Boundary
- Recharge Basin Area
- Proposed Conveyance Line
- County Boundary
- Government Lot (GL)
- Major Road
- Railroad
- Watercourse
- Waterbody

**NOTE**

\*Represents an abandoned well.



Date: July 20, 2023  
 Data Sources: BLM, ESRI, ODOT, USGS,  
 Aerial Photo 2018



**ATTACHMENT A**

Application for a Limited Water Use License



Oregon Water Resources Department  
 725 Summer Street NE, Suite A  
 Salem Oregon 97301-1271  
 (503) 986-0900  
 www.wrd.state.or.us

# Application for Limited Water Use License

License No.: \_\_\_\_\_

### Applicant Information

NAME John Shafer		PHONE (HM) 541-278-6203	
PHONE (WK) 541-278-6203	CELL None	FAX None	
ADDRESS 216 SE 4th Street			
CITY Pendleton	STATE OR	ZIP 97801	E-MAIL * john.shafer@umatillacounty.net

### Agent Information

NAME Matt Kohlbecker		PHONE 971-200-8531	FAX None
ADDRESS 650 NE Holladay Street, Suite 900			CELL 503-877-8086
CITY Portland	STATE OR	ZIP 97232	E-MAIL * mkohlbecker@gsiws.com

I (We) make application for a Limited License to use or store the following described surface waters or groundwater – not otherwise exempt, or to use stored water of for a use of a short-term or fixed-duration:

- SOURCE(S) OF WATER:** Columbia River \_\_\_\_\_ a tributary of None
- AMOUNT OF WATER** to be diverted;  
 Maximum and instantaneous rate (cubic feet or gallons per minute): 45 cfs  
 Total volume (gallons or acre-feet): 90,000 AF . If water is to be used from more than one source, give the quantity from each: NA

**3. INTENDED USE(S) OF WATER:** (check all that apply)

- Road construction or maintenance
- General construction
- Forestland and rangeland management; or
- Other: Artificial Recharge

**4. DESCRIPTION OF PROPOSED PROJECT:** Include a description of the place of use as shown on the accompanying site map, the method of water diversion, the type of equipment to be used (including pump horsepower, if applicable), length and dimensions of supply ditches and pipelines:

Water will be diverted from the Columbia River Pump Station as shown in the attached map, conveyed to the recharge site through a new, 42-inch diameter pipe, and recharged at six infiltration basins. See report for additional details.

**5. PROJECT SCHEDULE:** (List day, month, and year)

Date water use will begin: Date of LL issuance  
 Date water use will be completed: 5 years from data of LL issuance  
 Months of the year water would be diverted and used: Months permitted from LL issuance

If for other than irrigation from stored water, how and where will water be discharged after use:

NA

  
 Applicant Signature



7-10-23  
 Date

**PLEASE READ CAREFULLY**

**NOTE:** A completed water availability statement from the local watermaster, Land Use Information Form completed by the local Planning Department, fees and site map meeting the requirements of OAR 690-340-030 must accompany this request. The fee for this request is **\$280** for the first point of diversion plus **\$30** for each additional point of diversion. Please review the Department’s fee schedule to view fees required to request a limited license for Aquifer Storage and Recovery testing purposes or for Artificial Groundwater Recharge testing purposes.

**Failure to provide any of the required information will result in return of your application.** The license, if granted, will not be issued or replaced by a new license for a period of more than five consecutive years. The license, if granted, will be subordinate to all other authorized uses that rely upon the same source, or water affected by the source, and may be revoked at any time it is determined the use causes injury to any other water right or minimum perennial streamflow.

If water source is well, well logs or adequate information for the Department to determine aquifer, well depth, well seal and open interval, etc. are required. The licensee shall indicate the intended aquifer. If for multiple wells, each map location shall be clearly tied to a well log.

If a limited license is approved, the licensee shall give notice to the Department (Watermaster) at least 15 days in advance of using the water under the Limited License and shall maintain a record of use. The record of use shall include, but need not be limited to, an estimate of the amount of water used, the period of use and the categories of beneficial use to which the water is applied. During the period of the Limited License, the record of use shall be available for review by the Department upon request.

*\*A summary of review criteria and procedures that are generally applicable to these applications is available at: <http://www.oregon.gov/owrd/pages/pubs/forms.aspx>*

---

**Mapping Requirements (OAR 690-340-0030):**

- (1) A request for a limited license shall be submitted on a form provided by the Water Resources Department, and shall be accompanied by the following:
  - a. A site map of reproducible quality, drawn to a standard, even scale of not less than 2 inches = 1 mile, showing:
    - i. The locations of all proposed points of diversion referenced by coordinates or by bearing and distance to the nearest established or projected public land survey corner;
    - ii. The general course of the source for the proposed use, if applicable;
    - iii. Other topographical features such as roads, streams, railroads, etc., which may be helpful in locating the diversion points in the field.

---

**REMARKS:**

<b>For WRD Use Only</b>
-------------------------

Application reviewed by Watermaster via email. Application reviewed was attached to Matt Kohlbeckers email dated 9/20/2023 at 3:31PM.

***This page to be completed by the local Watermaster.***

### WATER AVAILABILITY STATEMENT

Name of Applicant: Umatilla County Limited License Number: \_\_\_\_\_

1. To your knowledge, has the stream or basin that is the source for this application ever been regulated for prior rights?

Yes  No

If yes, please explain: The Columbia River water us is limited under OAR 690 - Division 33 - Above Bonneville rules. The applicant has not identified a season in which diversion will take place. Therefore, it shall be within Division 33 rules unless a shorter season is requested. Allowable diversion dates are October 1st-April 14th.

2. Based on your observations, would there be water available in the quantity and at the times needed to supply the use proposed by this application?

Yes  No

For clarity, applicant proposed a quantity of 90K Acre-Feet. This is a total for the 5 year project.

3. Do you observe this stream system during regular fieldwork?

Yes  No

If yes, what are your observations for the stream?

**Staff have not witnessed the Columbia River go dry and believe there is water available.**

4. If the source is a well and if WRD were to determine that there is the potential for substantial interference with nearby surface water sources, would there still be ground water and surface water available during the time requested and in the amount requested without injury to existing water rights?

Yes  No  N/A

What would you recommend for conditions on a limited license that may be issued approving this application?

**Telemetered metering is required at the Columbia River Pump Station and at the Recharge facility due to multiple sources of water in pipeline and security of properties involved. Watermaster will be provided access to instantaneous rate and historical daily totalized metering data via online portal during entirety of limited license.**

5. Any other recommendations you would like to make?

**Annual report due to Watermaster and Groundwater staff. Defer to groundwater section on monitoring and reporting requirements.**

Signature



WM District #: 5

Date: 9/20/2023

# Land Use Information Form



Oregon Water Resources Department  
 725 Summer Street NE, Suite A  
 Salem, Oregon 97301-1266  
 (503) 986-0900  
 www.wrd.state.or.us

Applicant: John Shafer  
First Last

Mailing Address: 216 SE 4th Street

Pendleton OR 97801 Daytime Phone: 541-278-6203  
City State Zip

## A. Land and Location

Please include the following information for all tax lots where water will be diverted (taken from its source), conveyed (transported), and/or used or developed. Applicants for municipal use, or irrigation uses within irrigation districts may substitute existing and proposed service-area boundaries for the tax-lot information requested below.

Township	Range	Section	¼ ¼	Tax Lot #	Plan Designation (e.g., Rural Residential/RR-5)	Water to be:	Proposed Land Use:
See attached Table						<input type="checkbox"/> Diverted <input type="checkbox"/> Conveyed <input type="checkbox"/> Used	
						<input type="checkbox"/> Diverted <input type="checkbox"/> Conveyed <input type="checkbox"/> Used	
						<input type="checkbox"/> Diverted <input type="checkbox"/> Conveyed <input type="checkbox"/> Used	
						<input type="checkbox"/> Diverted <input type="checkbox"/> Conveyed <input type="checkbox"/> Used	

List all counties and cities where water is proposed to be diverted, conveyed, and/or used or developed:

Umatilla County

## B. Description of Proposed Use

Type of application to be filed with the Water Resources Department:

- Permit to Use or Store Water   
  Water Right Transfer   
  Permit Amendment or Ground Water Registration Modification  
 Limited Water Use License   
  Allocation of Conserved Water   
  Exchange of Water

Source of water:  Reservoir/Pond   
 Ground Water   
 Surface Water (name) Columbia River

Estimated quantity of water needed: 45  cubic feet per second   
 gallons per minute   
 acre-feet

Intended use of water:  Irrigation   
 Commercial   
 Industrial   
 Domestic for \_\_\_\_\_ household(s)  
 Municipal   
 Quasi-Municipal   
 Instream   
 Other Artificial Groundwater Recharge

Briefly describe:

An application for a limited water use license is being submitted to the Oregon Water Resources Department requesting to use water from the Columbia River for artificial groundwater use.

**Note to applicant:** If the Land Use Information Form cannot be completed while you wait, please have a local government representative sign the receipt at the bottom of the next page and include it with the application filed with the Water Resources Department.

See bottom of Page 3. →

# For Local Government Use Only

The following section must be completed by a planning official from each county and city listed unless the project will be located entirely within the city limits. In that case, only the city planning agency must complete this form. This deals only with the local land-use plan. Do not include approval for activities such as building or grading permits.

**Please check the appropriate box below and provide the requested information**

- Land uses to be served by the proposed water uses (including proposed construction) are allowed outright or are not regulated by your comprehensive plan. Cite applicable ordinance section(s): UCDC 152.056, 152.131
- Land uses to be served by the proposed water uses (including proposed construction) <sup>(EFU) (RR)</sup> involve discretionary land-use approvals as listed in the table below. (Please attach documentation of applicable land-use approvals which have already been obtained. Record of Action/land-use decision and accompanying findings are sufficient.) **If approvals have been obtained but all appeal periods have not ended, check "Being pursued."**

Type of Land-Use Approval Needed (e.g., plan amendments, rezones, conditional-use permits, etc.)	Cite Most Significant, Applicable Plan Policies & Ordinance Section References	Land-Use Approval:	
<u>Zoning Permit</u>	<u>152.538 Uses permitted with a Zoning Permit in Depot Refuge Zone</u>	<input type="checkbox"/> Obtained <input type="checkbox"/> Denied	<input type="checkbox"/> Being Pursued <input type="checkbox"/> Not Being Pursued
		<input type="checkbox"/> Obtained <input type="checkbox"/> Denied	<input type="checkbox"/> Being Pursued <input type="checkbox"/> Not Being Pursued
		<input type="checkbox"/> Obtained <input type="checkbox"/> Denied	<input type="checkbox"/> Being Pursued <input type="checkbox"/> Not Being Pursued
		<input type="checkbox"/> Obtained <input type="checkbox"/> Denied	<input type="checkbox"/> Being Pursued <input type="checkbox"/> Not Being Pursued
		<input type="checkbox"/> Obtained <input type="checkbox"/> Denied	<input type="checkbox"/> Being Pursued <input type="checkbox"/> Not Being Pursued

Local governments are invited to express special land-use concerns or make recommendations to the Water Resources Department regarding this proposed use of water below, or on a separate sheet.

Name: Robert T Waldher Title: Director  
 Signature: Robert T Waldher Phone: 541-278-6251 Date: 04/13/23  
 Government Entity: Umatilla County Community Development

**Note to local government representative:** Please complete this form or sign the receipt below and return it to the applicant. If you sign the receipt, you will have 30 days from the Water Resources Department's notice date to return the completed Land Use Information Form or WRD may presume the land use associated with the proposed use of water is compatible with local comprehensive plans.



**Receipt for Request for Land Use Information**

Applicant name: \_\_\_\_\_  
 City or County: \_\_\_\_\_ Staff contact: \_\_\_\_\_  
 Signature: \_\_\_\_\_ Phone: \_\_\_\_\_ Date: \_\_\_\_\_



# UMATILLA COUNTY ZONING PERMIT

## DEPARTMENT OF LAND USE PLANNING

216 SE 4<sup>th</sup> ST. Pendleton, OR 97801

Phone: 541-278-6252 • Fax 541-278-5480

Email completed applications to:

[planning@umatillacounty.gov](mailto:planning@umatillacounty.gov)

Website: [www.co.umatilla.or.us/departments/planning](http://www.co.umatilla.or.us/departments/planning)

Permit No.	
ZP - 23 - 066	
<input type="checkbox"/> Zoning Permit	\$100
<input type="checkbox"/> Code Violation	\$100
<input type="checkbox"/> Design Review	\$350
<input type="checkbox"/> Floodplain Dev. Permit	\$250
<input type="checkbox"/> Replace Dwelling Verify	\$75
<input type="checkbox"/> Rural Address	\$50
<input type="checkbox"/> Towers (Cell, Met, etc.)	\$200

EMAIL: john.shafer@umatillacounty.gov

Home or Cell (541) 278-6203

APPLICANT NAME Umatilla County - John Shafer PHONE \_\_\_\_\_ Work ( ) \_\_\_\_\_

MAILING ADDRESS 216 SE 4th Street, Courthouse Pendleton, OR 97801  
STREET CITY STATE ZIP

PROPERTY OWNER(S) Columbia Development Authority PHONE (541) 481-3693

MAILING ADDRESS PO Box 200 Boardman, OR 97818  
STREET CITY STATE ZIP

TWP <sup>4N & 5N</sup> 27 RING SEC \_\_\_\_\_ ACCT # 135555 & 135557 Map # 4N27;200 & 5N27;900 Tax Lot # 200 & 900

LAND USE ZONE UDR PARCEL SQ FT/ACRES \_\_\_\_\_ SITE ADDRESS \_\_\_\_\_

REQUIRED SETBACKS (Stream Setback 100-ft) FRONT N/A ft. SIDE N/A ft. SIDE N/A ft. REAR N/A ft.

Is the property in a FLOODPLAIN?  No  Yes. FLOOD ZONE \_\_\_\_\_ Is a Flood Development Permit required?  No  Yes

If the permit is for an accessory building located within the EFUGF Zones, how will it be used?  Personal Use  Farm Use  Not Applicable

ACCESS PERMIT: Has an access permit been issued from the County or ODOT?  No  Yes  In Process  Not Applicable

MANUFACTURED HOME (placement/removal) - Has the County Assessor's Office been contacted?  No  Yes  Not Applicable

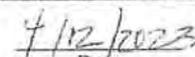
PROPOSED USE or STRUCTURES: 1) Umatilla County Groundwater Recharge YEAR - SIZE 45 cfs  
 Briefly describe the use 2) Pipeline Project YEAR - SIZE \_\_\_\_\_

These conditions apply to various uses authorized via a zoning permit. Planning Staff will check those that apply, if any.

- Manufactured Home Placement**, pursuant to UCDC 152.013 the mobile home unit shall be manufactured after January 1, 1972, and bear the "Insignia of Compliance" if prior to 1976.
- Replacement of a dwelling in a resource zone**. The dwelling to be replaced MUST be removed, demolished or converted to an approved nonresidential use within **one year** of the date of certification of occupancy of the new dwelling. **A Replacement Covenant and the Covenant Not to Sue must be recorded.**
- Met Towers**. Temporary met towers must be removed within two years from the date of a zoning permit; an extension of one year may be requested prior to the permit expiration.
- Temporary Mobile Home/Temporary Hardship Dwelling**. The home MUST be removed within 90 days from the date the hardship ends. **(Contact County Planning as soon as the hardship ends.)**

I hereby certify that the above information is correct and understand that issuance of a permit based on this application will not excuse me from complying with effective Ordinances and Resolutions of the County of Umatilla and Statutes of Oregon, despite any errors on the part of the issuing authority in checking this application. The applicant must notify the Planning Department if there are ANY changes in the details of this Zoning Permit. This Zoning Permit may be REVOKED if the information provided is found to be false.

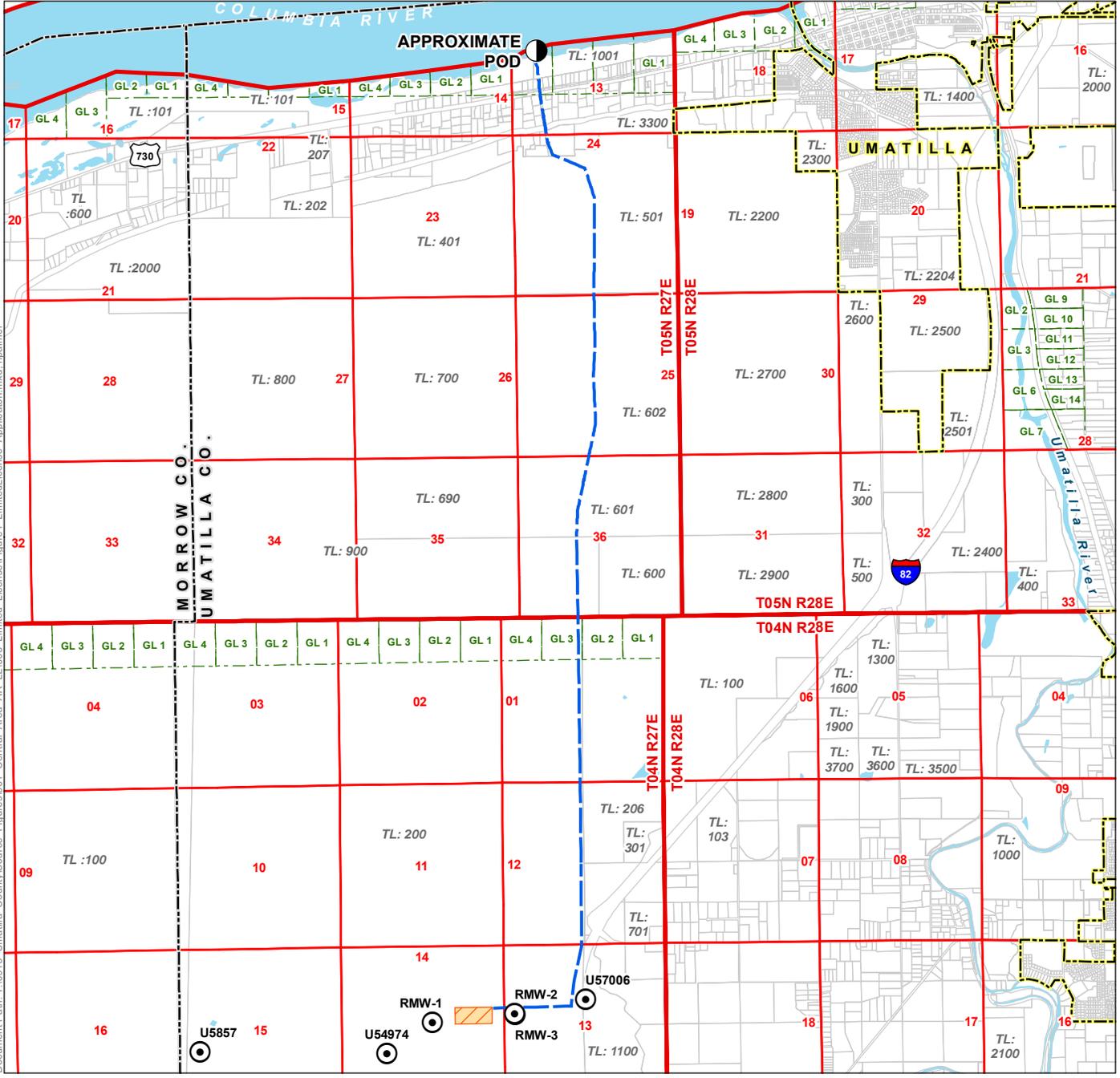
\* SIGNATURE OF ALL PROPERTY OWNERS REQUIRED (additional signature pages are available upon request)

<input checked="" type="checkbox"/> 	<input checked="" type="checkbox"/> 
Signature of Property Owner, Title	Signature of Property Owner, Title
Greg Smith - CDA Executive Director	
Printed Name of Property Owner	Printed Name of Property Owner
Date: <u>7/12/2023</u>	Date: _____

DATE APPROVED 04/13/23 APPROVED BY Robert T. Walden PERMIT NO ZP - 23 - 066

RELATED: LUD, CUP and/or VARIANCE NO \_\_\_\_\_ APPROVED BY \_\_\_\_\_  
EXTENDED or AMENDED, DATE APPROVED \_\_\_\_\_

VALID FOR ONE YEAR ONLY UNLESS OTHERWISE NOTED. This is NOT a Building or Subsurface Disposal Permit Revision Date: April 19, 2022



- LEGEND**
- Monitoring Well
  - Approximate Point of Diversion (POD)
  - Proposed Conveyance Line
  - Proposed Recharge Basin
- All Other Features**
- Tax Lot
  - Government Lot (GL)
  - City Boundary
  - County Boundary
  - Major Road
  - Watercourse
  - Waterbody

**LOCATION DESCRIPTION**  
**Approximate Point of Diversion (POD)**  
 Located 550 feet South and 4,490 feet West from the NE corner of Section 13, Township 5 North, Range 27 East (W.M.)

**FIGURE 1**  
**Limited License Application**  
**for Artificial Recharge**  
 Umatilla County  
 Township 4 and 5 North, Range 27 East (W.M.)

**DISCLAIMER**  
 This map was prepared for the purpose of identifying the location of a water right only and it is not intended to provide legal dimensions or location of property ownership lines.

Date: September 20, 2023  
 Data Sources: BLM, ESRI, OWRD, USGS

Table A - Umatilla County Land Use

Township	Range	Section	1/4 1/4	Tax Lot #	Plan Designation	Water To Be:	Proposed Land Use:
4N	27E	1	NENW SESW	200	Depot Refuge	Conveyed	Artificial groundwater recharge
4N	27E	12	NENW SESW	200	Depot Refuge	Conveyed	Artificial groundwater recharge
4N	27E	13	NENW SESW	200	Depot Refuge	Conveyed	Artificial groundwater recharge
4N	27E	14	SENE SWNE	200	Depot Refuge	Conveyed/Used	Artificial groundwater recharge
5N	27E	13	SWSW	3301	Exclusive Farm Use	Conveyed	Artificial groundwater recharge
5N	27E	13	SWSW	200	Exclusive Farm Use	Conveyed	Artificial groundwater recharge
5N	27E	24	NWNW	200	Rural Residential	Conveyed	Artificial groundwater recharge
5N	27E	24	NENW SESW	501	Exclusive Farm Use	Conveyed	Artificial groundwater recharge
5N	27E	25	NENW SESW	602	Exclusive Farm Use	Conveyed	Artificial groundwater recharge
5N	27E	36	NENW SESW	601	Exclusive Farm Use	Conveyed	Artificial groundwater recharge
5N	27E	36	NESW SESW	900	Depot Refuge	Conveyed	Artificial groundwater recharge



# UMATILLA COUNTY ZONING PERMIT

## DEPARTMENT OF LAND USE PLANNING

216 SE 4<sup>TH</sup> ST, Pendleton, OR 97801

Phone: 541-278-6252 • Fax 541-278-5480

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ZP -	-
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<input type="checkbox"/> Replace Dwelling Verify	\$75
<input type="checkbox"/> Rural Address	\$50
<input type="checkbox"/> Towers (Cell, Met, etc.)	\$200

EMAIL: john.shafer@umatillacounty.gov

Home or Cell (541) 278-6203

APPLICANT NAME Umatilla County - John Shafer PHONE Work ( )

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STREET CITY STATE ZIP

PROPERTY OWNER(S) Columbia Development Authority PHONE (541) 481-3693

MAILING ADDRESS PO Box 200 Boardman, OR 97818  
STREET CITY STATE ZIP

TWP 4N & 5N RNG 27 SEC        ACCT # 135555 & 135557 Map # 4N27;200 & 5N27:900 Tax Lot # 200 & 900

LAND USE ZONE UDR PARCEL SQ FT/ACRES        SITE ADDRESS       

REQUIRED SETBACKS (Stream Setback 100-ft) FRONT N/A ft. SIDE N/A ft. SIDE N/A ft. REAR N/A ft.

Is the property in a FLOODPLAIN?  No  Yes. FLOOD ZONE        Is a Flood Development Permit required?  No  Yes

If the permit is for an accessory building located within the EFU/GF Zones, how will it be used?  Personal Use  Farm Use  Not Applicable

ACCESS PERMIT: Has an access permit been issued from the County or ODOT?  No  Yes  In Process  Not Applicable

MANUFACTURED HOME (placement/removal) – Has the County Assessor’s Office been contacted?  No  Yes  Not Applicable

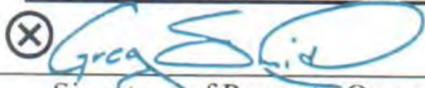
PROPOSED USE or STRUCTURES: Briefly describe the use  
1) Umatilla County Groundwater Recharge YEAR - SIZE 45 cfs  
2) Pipeline Project YEAR - SIZE

These conditions apply to various uses authorized via a zoning permit. Planning Staff will check those that apply, if any.

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\* SIGNATURE OF ALL PROPERTY OWNERS REQUIRED (additional signature pages are available upon request)

<input checked="" type="checkbox"/> 	<u>4/12/2023</u>	<input checked="" type="checkbox"/>	
Signature of Property Owner, Title	Date	Signature of Property Owner, Title	Date
Greg Smith - CDA Executive Director			
Printed Name of Property Owner		Printed Name of Property Owner	

DATE APPROVED \_\_\_\_\_ APPROVED BY \_\_\_\_\_ PERMIT NO. ZP - -

RELATED: LUD, CUP and/or VARIANCE NO. \_\_\_\_\_

EXTENDED or AMENDED, DATE APPROVED: \_\_\_\_\_ APPROVED BY: \_\_\_\_\_

**VALID FOR ONE YEAR ONLY UNLESS OTHERWISE NOTED.** This is NOT a Building or Subsurface Disposal Permit. Revision Date: April 19, 2022

**ATTACHMENT B**

Umatilla Basin Geology and Hydrogeology

# Umatilla Basin Geology and Hydrogeology

## 1.1 Physiography

The Umatilla Basin is bordered by the Columbia Hills on the north and the Blue Mountains to the east and south. The Umatilla Basin varies in elevation from 5,000 feet in the upland areas of the Blue Mountains to approximately 300 feet near the Columbia River.

The Umatilla Basin uplands receive an average of approximately 35 inches of precipitation per year, while the lowlands and CGWAs receive approximately 8 to 10 inches a year (Wozniak, 1995). Precipitation falls mostly in the winter months as rain in the lowlands, and as snow and rain in the upland areas to the south. The regional climate can be described as mild and semi-arid, consisting of hot, dry summers and cool, moist winters.

The Columbia River and Umatilla River are the primary surface water features in the Umatilla Basin. The Umatilla River collects surface water runoff and groundwater discharge from springs within the Umatilla Basin before it flows into the Columbia River. Creeks that are significant tributaries to the Umatilla River include Birch, Butter Creek, and Cold Springs Canyon. Springs are numerous in the area and help to maintain summer flow in the Umatilla River and its tributaries. Ephemeral and intermittent streams drain the hills in the southern portion of the basin. The Umatilla River supports resurging salmon and lamprey populations as a result of programs to enhance stream water quality and fish habitat. The Umatilla River (and some associated tributaries) is listed as a water quality impaired 303 (d) stream for flow modifications, temperature, pH, iron, manganese, and nitrate (DEQ, 2008).

## 1.2 Umatilla Basin Geology

A relatively limited number of geologic mapping studies have been conducted in the Umatilla Basin (Wagner, 1949; Hogenson, 1964; Robison, 1971; Shannon and Wilson, Inc., 1972, 1973a, 1973b, 1975; Walker, 1973; Bechtel, Inc., 1973a, 1973b; Farooqui and others, 1981a, 1981b; Swanson and others, 1981; U.S. ACE, 1982, 1984; State of Oregon, 1987; Miklancic, 1989; Wozniak, 1995). Recently, Oregon Department of Geology and Mineral Industries (DOGAMI) released an updated, preliminary geologic map (Madin and Geitgey, 2007). From these studies, a basic stratigraphic (Figure B.1) and structural geology framework for this area has been developed and is briefly reviewed in the following sections.

### 1.2.1 Suprabasalt Sediments

The sediments that overlie the Columbia River Basalt Group (CRBG) in the Umatilla Basin area are informally called the “suprabasalt sediments.” Depending upon location within the Umatilla Basin, the suprabasalt sediments can consist of several different mappable stratigraphic units. The Central Area AR project is being conducted within portions of these suprabasalt sediments. It is anticipated that these and other shallow artificial recharge sites within suprabasalt sediments may provide storage for irrigation users and recharge source water for Aquifer Storage and Recovery in the deeper CRBG units. Additional discussion of the CRBG units with respect to alluvial AR and natural treatment feasibility was presented in separate reports prepared by GSI (2009) and HDR (2009).

The major suprabasalt sedimentary units that occur within the Umatilla Basin are described in the following sections.

#### **1.2.1.1 Holocene Eolian Sand**

The Holocene eolian sand (Figure B.1) predominantly consists of stratified to massive, unconsolidated, friable fine sand to silty fine sand (Kennedy/Jenks, 2001; Madin and Geitgey, 2007). These strata are typically felsic to moderately mafic and display little or no induration (cementation). Colors range from light tan to brown. This unit typically ranges from a few feet thick to more than 50 feet thick. Based on mineralogy and grain size, these eolian strata are inferred to have been derived from wind reworking older Cataclysmic Flood deposits, and post-flood Columbia River floodplain deposits (Kennedy/Jenks, 2001). This unit can overlie all older suprabasalt sediment units.

#### **1.2.1.2 Holocene to Pleistocene Alluvium**

This unit (Figure B.1) consists of sand, gravel, and silt deposited along local perennial (and intermittent) stream channels and floodplains (e.g., Butter Creek, Willow Creek, and Umatilla River). These deposits typically are stratified and exhibit little to poor induration. Deposits of this unit often are found unconformably overlying older suprabasalt sediment units and the CRBG within the Umatilla Basin.

#### **1.2.1.3 Pleistocene Cataclysmic (Missoula) Flood Deposits**

Largely uncemented, typically poorly indurated (loose), well-stratified interbedded silt and sand, sand, gravelly sand, and pebble to boulder gravel is present within the Umatilla Basin (Wozniak, 1995; Madin and Geitgey, 2007). These strata (Figure B.1) have been interpreted as having been deposited by the Pleistocene Cataclysmic Floods that were released from glacial Lake Missoula periodically between approximately 1,000,000 and 13,000 years ago (Bretz and others, 1956; Baker and Nummedal, 1978; Waitt, 1980, 1985; Baker and Bunker, 1985; Kiver and others, 1989; McDonald and Busacca, 1989; Baker and others, 1991). It is estimated that the maximum level of Cataclysmic floodwaters within the Umatilla Basin reached an elevation of 1,000 feet above mean sea level (Allen and others, 1986; Waitt and others, 1994).

Where present, Pleistocene Cataclysmic Flood deposits range from a few feet thick to more than 100 feet thick, with the thickest deposits being found in the lee of topographic barriers (e.g., Service Anticline), proximal to the Columbia River, and in local stream valleys (e.g., Butter Creek Valley; Wozniak, 1995; Madin and Geitgey, 2007). Cataclysmic floodwaters also scoured and removed much of the older suprabasalt sediment deposits from some areas within the Umatilla Basin and, in some cases, left the older CRBG exposed.

#### **1.2.1.4 Pleistocene Loess**

A sequence of wind-deposited, massive to poorly stratified, light colored, silt and very fine sand underlies the younger units and commonly is found overlying the older Alkali Canyon Formation in the upland areas (Figure B.1). These strata, commonly referred to as loess (or Palouse Formation or “Palouse loess”), typically display evidence of pedogenic alteration (i.e., soil forming processes, including animal burrow and root casts). In some areas this unit contains air-fall ash, and displays

evidence of multiple, stacked, and superimposed soil horizons reflecting subtle changes in climate and erosion conditions in the region during the Quaternary. Minor (less than 0.5 inch wide) stringers of caliche (discussed below) are occasionally observed transecting these strata.

The fine-grained material comprising the Pleistocene loess generally is thought to consist of glacial “rock flour.” The source of this rock flour is thought to be the Pleistocene Cordilleran and Continental ice sheets. This rock flour was transported and deposited in the Columbia Plateau region by glacial melt waters (possibly including Cataclysmic Floods). Following deposition, the rock flour was reworked (transported) and deposited by wind across much of the region (Rigby and others, 1979; Baker and others, 1991; Busacca and McDonald, 1994). Air-fall ash found intermittently within the loess came from volcanic eruptions in the Cascade Range. Caliche, where found in the loess, suggests semi-arid conditions periodically occurred throughout this area during the Quaternary. Where they occur, Pleistocene loess deposits are generally less than 50 feet thick (Madin and Geitgey, 2007).

#### **1.2.1.5 Pliocene-Pleistocene Calcrete (“Caliche”)**

The Pliocene-Pleistocene calcrete (commonly referred to as “caliche”) is a pedogenic calcium carbonate deposit that typically is developed on older suprabasalt sediment units and CRBG. This calcrete is present throughout much of the Umatilla Basin, except in areas where it has been removed by Pleistocene Cataclysmic Floods or recent stream erosion. Calcrete in the Umatilla Basin area usually consists of multiple, thin (less than 1 foot thick), individual layers of discontinuous platy, hard, cemented calcrete typical of Machette’s (1985) stage IV and V carbonate (Kennedy/Jenks, 2001). Carbonate calcrete coatings on sediments (stage I), calcrete filaments (stage II), and nodules (stage III) of calcrete are also present but are laterally discontinuous. The calcrete layers and material range in color from white, to light gray, to pinkish white/gray. Typically the individual calcrete layers are highly fractured with poor to moderate cementation (Kennedy/Jenks, 2001). The total thickness of caliche is highly variable, ranging from less than 1 foot to more than 15 feet thick.

When present, the Pliocene-Pleistocene calcrete forms a generally easily recognized horizon both in outcrop and in the subsurface. However given the fact that the Pliocene-Pleistocene calcrete may be present on different stratigraphic units, it is generally not mapped as a separate unit by most investigators (e.g., Wozniak, 1995; Madin and Geitgey, 2007).

#### **1.2.1.6 Miocene-Pliocene Alkali Canyon Formation**

The Alkali Canyon Formation (Figure B.1) consists of interbedded fluvial (conglomerate, sandstone, siltstone, and claystone), lacustrine (claystone, siltstone, and diatomite), and minor pyroclastic (volcanic air-fall tuffs) deposits and represents the oldest suprabasalt sediment unit in the Umatilla Basin (Hodge, 1938; Piper, 1932; Newcomb, 1966; Farooqui and others, 1981a and 1981b; Lindsey and other, 1993; Lindsey and Tolan, 1996; Tolan and others, 1996). The fluvial Miocene to Pliocene-age sediments were deposited in the Umatilla Basin as it subsided, by both local and regional (i.e., ancestral Snake River) tributaries to the ancestral Columbia River (Lindsey and others, 1993; Lindsey and Tolan, 1996; Tolan and others, 1996) and later (after 6 million years ago) by the ancestral Columbia River (Fecht and others, 1987). Alkali Canyon sediments can display a wide range of induration (cementation), from very little to very well indurated (Kennedy/Jenks, 2001). In outcrop, Alkali Canyon fluvial and lacustrine sediments typically exhibit light brown, light reddish

brown, light tan, or light grayish-tan colors. Because of Pliocene-Pleistocene erosion (e.g., Cataclysmic Floods, local stream/river incision), the thickness of the Alkali Canyon Formation is highly variable, ranging from absent to more than 300 feet thick (Farooqui and others, 1981a, and 1981b; Wozniak, 1995; Madin and Geitgey, 2007).

As noted above, the base of the Alkali Canyon Formation is defined as the top of the CRBG. However, the CRBG unit upon which these Miocene-Pliocene sediments were deposited is not always the same CRBG unit. In the Umatilla Basin, both Saddle Mountains and Wanapum flows within the CRBG terminate as one travels south from the Columbia River onto the flanks of the Blue Mountains. This means as one moves south from the Columbia River (and the axis of the Umatilla Syncline), the Alkali Canyon Formation progressively lies atop older CRBG units. Thus the age of the base of the “Alkali Canyon Formation” can vary from 10.5 Ma, where it overlies the Elephant Mountain Member of the Saddle Mountains Basalt, to 15.3 Ma where it overlies the Frenchman Springs Member of the Wanapum Basalt (Figure B.1). The termination of CRBG flows also results in the “merging” of some Ellensburg Formation members (i.e., Mabton, Selah, and Rattlesnake Ridge sedimentary interbeds within the CRBG) with the Alkali Canyon Formation.

### **1.2.2 Columbia River Basalt Group (CRBG)**

The oldest exposed unit within the central portion of the Umatilla Basin is the CRBG (Figures B.1 and B.2). Early geologic studies within the Umatilla Basin mapped the CRBG as simply an undifferentiated unit (Wagner, 1949; Hogenson, 1964; Robison, 1971; Walker, 1973). Subsequent investigations did differentiate and map individual CRBG units, however most were for small areas (site-specific) within the Umatilla Basin (Shannon and Wilson, Inc., 1972, 1973a, 1973b, 1975; Bechtel, Inc., 1973a, 1973b; U.S. ACE, 1982, 1984; Sweet, Edwards & Associates, Inc., 1987; Bentley, 1989; Miklancic, 1989). The first reconnaissance geologic map of the CRBG units in the Umatilla Basin area was produced by Swanson and others (1981). Subsequent investigations by the State of Oregon (1987) and Wozniak (1995) have provided additional refinement and details of the CRBG unit stratigraphy and distribution within selected portions of the Umatilla Basin. Recently an updated, preliminary geologic map of the Umatilla Basin (Madin and Geitgey, 2007) was published by DOGAMI and serves as the primary geologic map for the Umatilla Basin.

The CRBG consists of a thick sequence of more than 300 continental tholeiitic flood-basalt lava flows (Tolan and others, 1989). The CRBG covers more than 63,000 square miles in Washington, Oregon, and western Idaho, has a total estimated volume of more than 41,700 cubic miles (Tolan and others, 1989), and has a maximum thickness of more than 2 miles near Pasco, Washington, based on data from geophysical surveys and deep hydrocarbon exploration wells (Reidel and others, 1982, 1989a). Each CRBG flow typically represents the product of a single eruptive event (Reidel and others, 1989b; Reidel and Tolan, 1992; Reidel and others, 1994; Reidel, 1998, 2005). CRBG flows were erupted during an 11 million year period, from approximately 17 to 6 million years ago (Tolan and others, 1989; Swanson and others, 1979a).

## **1.3 Umatilla Basin Structural Geology**

The present-day Umatilla Basin lies within the Columbia Basin and the eastern portion of the Columbia Trans-Arc Lowland. The Columbia Basin and Columbia Trans-Arc Lowland have

experienced considerable regional-scale subsidence (5,000 to 10,000+ feet) since the onset of CRBG volcanism approximately 17 million years ago (Myers and Price, 1979; Reidel and others, 1982, 1989b; Caggiano and Duncan, 1983; U.S. DOE, 1988; Watters, 1989). In addition to regional subsidence, this region has been under a general north-south compression/east-west extension stress regime from the beginning of CRBG time (Davis, 1981; Myers and Price, 1979, 1981; Reidel and others, 1982, 1989a; Caggiano and Duncan, 1983; U.S. DOE, 1988; Watters, 1989) to the present-day (U.S. DOE, 1988; Geomatrix, 1988, 1990). This stress regime has led to the formation of folds and faults in the Columbia Basin. These folds and faults play a role in the thickness and distribution of the overlying sediments and also the occurrence and direction of groundwater movement within the sediments.

A map of structural features in the Umatilla Basin is shown on Figure B.3. The Umatilla structural basin often is described as lying within the Dalles-Umatilla Syncline, which is a major, regional-scale Yakima Fold Belt feature. However, the actual extent of this structural basin is delineated and controlled by a number of structural features:

- The northern edge of the Umatilla structural basin is delineated by the east-northeast-trending Columbia Hills (Yakima Fold Belt anticlinal ridge).
- The southern boundary is less well defined, but lies along the flanks of the Blue Mountains. West of the Service Anticline (or Service Fold Belt of Madin and Geitgey [2007]), the southern edge of this structural basin lies in the area between the Willow Creek monocline (Hogenson, 1964; Oberlander and Miller, 1981; Davies-Smith and others, 1988) and the Milk Canyon Fold Belt of Madin and Geitgey (2007).
- The eastern boundary of the structural basin is not the Service Anticline as stated by Farooqui and others (1981a,b), but is defined by the area where the Columbia Hills and the uplands formed by the Horse Heaven Hills/Wallula Fault Zone come together (Newcomb 1969; Oberlander and Miller, 1981; Davies-Smith and others, 1988; Wozniak, 1995).
- The western boundary of the Umatilla structural basin was defined by Farooqui and others (1981a,b) as the upland area (immediately east of the John Day River) created by uplift along the northwest-trending Luna Butte-Arlington Shutler Butte fault zone.

The principal structures in the Umatilla Basin are the Dalles–Umatilla Syncline, Willow Creek Monocline and Service Anticline (Figure B.3). The Service Anticline is a generally north-south-trending structural zone that has a mapped extent of more than 50 miles and consists of multiple faults and associated doubly plunging, faulted, anticlinal folds (Kienle, 1980; Swanson and others, 1981; U.S. ACE, 1982, 1984; State of Oregon, 1987; U.S. DOE, 1988; Tolan and Reidel, 1989; Madin and Geitgey, 2007). This structural feature dies out immediately north of its intersection with the Columbia Hills (Figure B.3), appearing to merge into a northeast-trending, faulted anticline (Yakima Fold). To the south, this feature turns to the southwest and becomes part of the Milk Canyon Fold Belt (Figure B.3) of Madin and Geitgey (2007). The axes of the anticlinal folds associated with the Service Anticline structural zone are aligned roughly parallel to the overall north-south-trend of this zone (Kienle, 1980; Swanson and others, 1981). The amount of vertical structural relief developed on some of the anticlinal folds is estimated to be more than 500 feet. The

Willow Creek Monocline (Shannon and Wilson, 1973; Bela, 1982; Davies-Smith and others, 1988; Madin and Geitgey, 2007) is a sinuous, southwest-trending structural feature that extends from near the Service Anticline, west to at least the Arlington-Shutler Butte trend (Figure B.3). The sinuosity in the trace of the axis of this monocline appears to be the result of a series of right-hand “steps.” These steps in the trace of the Willow Creek Monocline appear to coincide with the intersection with several of the major northwest-trending, dextral wrench faults (Figure B.3).

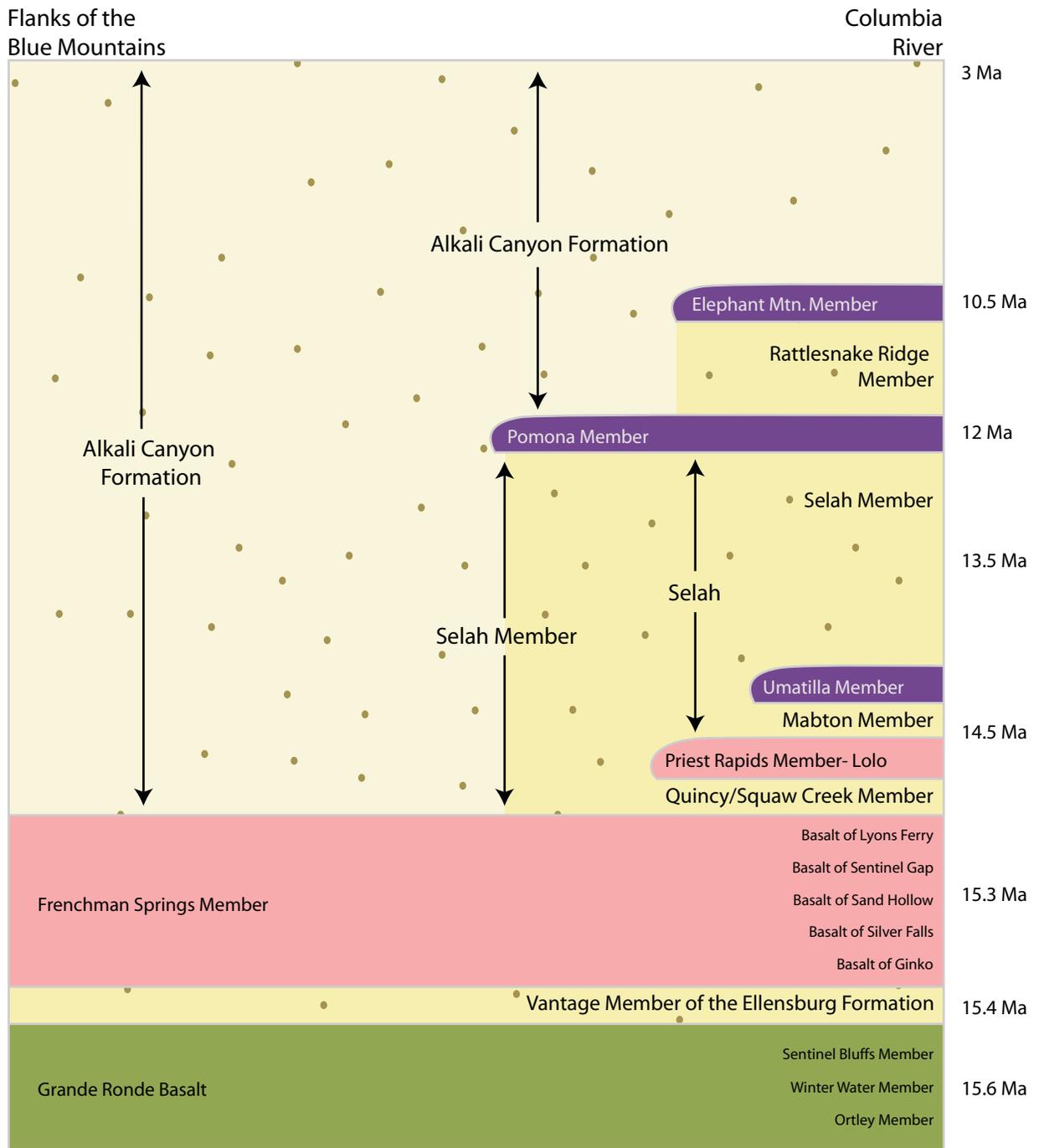
AGE (ML)	SYSTEM	SERIES	UNIT	DESCRIPTION
0.01	QUATERNARY	HOLOCENE	ALLUVIAL & EOLIAN DEPOSITS	STREAM DEPOSITS AND SAND DUNES
		PLEISTOCENE	CATAclysmic FLOOD DEPOSITS	GRAVEL, SAND, AND SILT DEPOSITS PRODUCED BY THE "MISSOULA FLOODS"
			LOESS	WIND-DEPOSITED SILT
1.6				PERIOD OF NON-DEPOSITION
5.3	TERTIARY	PLIOCENE	ALKALI CANYON FORMATION	RIVER/LAKE DEPOSITS
		MIOCENE	ELEPHANT MTN. MEMBER	CONTINENTAL FLOOD-BASALT FLOWS OF THE COLUMBIA RIVER BASALT GROUP INTERBEDDED WITH ELLENSBURG FORMATION SEDIMENTS
RATTLESNAKE RIDGE INTERBED				
POMONA MEMBER				
SELAH INTERBED				
UMATILLA MEMBER				
MABTON INTERBED				
PRIEST RAPIDS MEMBER				
QUINCY/SQUAW CREEK INTERBED				
FRENCHMAN SPRINGS MEMBER				
14.5				
15.3				

**FIGURE B.1**

Stratigraphic Chart Showing the Relationship Between Geologic Units within the Umatilla Basin  
Umatilla Basin Aquifer Recharge Project

From Kennedy/Jenks (2001).

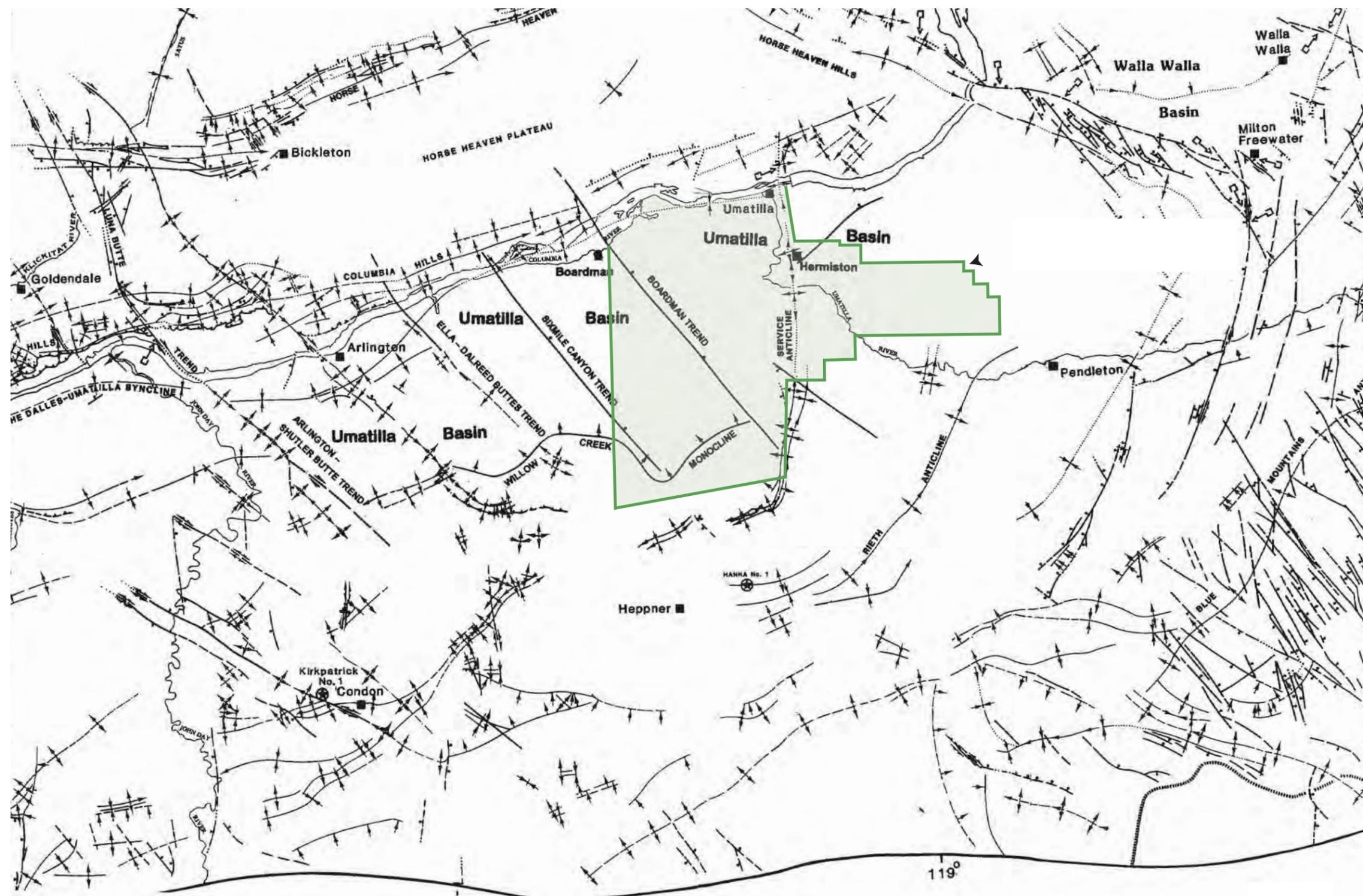




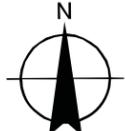
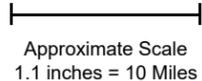
**FIGURE B.2**  
 Umatilla Basin Stratigraphic Relationship of Geologic Units  
 Umatilla Basin Aquifer Recharge Project



**FIGURE B.3**  
 Map of Structural Features  
 in the Umatilla Basin  
 Umatilla Basin Aquifer Recharge Project



Modified from Tolan and Reidel (1989) and  
 Madin and Geitgey (2008)


**ATTACHMENT C**

June 2022 Shallow Soil Investigation and Infiltration Testing



## TECHNICAL MEMORANDUM

### Phase I Subsurface Characterization Results, Umatilla Army Depot Artificial Recharge Project, Umatilla County, Oregon

**To:** Gibb Evans / IRZ Consulting, Inc.  
JR Cook / Northeast Oregon Water Association

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Michele Lanigan / U.S. Army Environmental Division  
Kelly Toynton / Oregon ARNG  
Kristin Addis / U.S. Army  
Rebecca Rule / U.S. Army

**Attachments:** Attachment A. Infiltration Testing Methods and Results Memorandum.  
Attachment B. Test Pit Logs.  
Attachment C. Test Pit Photolog.  
Attachment D. Soil Quality and Physical Parameters.  
Attachment E. Laboratory Analytical Reports.

**Date:** March 13, 2023

This Technical Memorandum (TM), prepared by GSI Water Solutions, Inc. (GSI) and GeoSystems Analysis, Inc. (GSA), summarizes the first phase of a subsurface characterization at the Umatilla Army Depot in Umatilla County, Oregon, to evaluate site suitability for artificial recharge (AR). The first phase of the subsurface characterization consisted of excavating test pits to log soils, conducting infiltration tests, and collecting soil samples.

#### 1. Introduction

Umatilla County (the County) and Westland Irrigation District (WID) are planning to artificially recharge the shallow groundwater system at the Umatilla Army Depot (the Depot) in Umatilla County, Oregon, using infiltration basins. Figure 1 shows the study area encompassing the potential infiltration basins. Source water for the County's delivery to the AR project will be from the Columbia River and source water for WID's delivery to the AR project will be from the Umatilla River; therefore, recharge will be authorized by two separate AR limited licenses from the Oregon Water Resources Department (OWRD).

Permitting and design of an AR basin requires characterization of subsurface soils at the recharge site. Specifically, it is necessary to characterize soil lithology, soil infiltration rates, soil quality, and soil properties. In June 2022, GSI and its teaming partner GSA conducted the first phase of subsurface soil characterization (called the “Phase I Subsurface Characterization” in this TM) in general accordance with the *Umatilla Army Depot AR Project Subsurface Characterization Work Plan* (the Work Plan) (GSI, 2022). Specifically, GSI and GSA oversaw excavation of test pits to measure soil infiltration rates, log soils, and collect samples for analysis of soil quality and soil properties. This TM summarizes the methods (Section 2) and results (Section 3) of the Phase I Subsurface Characterization, and provides conclusions and recommendations based on the data that were collected (Section 4).

## 2. Methods

This section describes the methods that were used during the Phase I Subsurface Characterization to: (1) locate utilities (Subsection 2.1), (2) excavate test pits, log soils, and collect soil samples (Subsection 2.2), and (3) conduct infiltration tests (Subsection 2.3).

### 2.1 Utility Locating

A total of 18 potential test pit locations were located and cleared for utilities in the study area by Geophysical Survey, LLC, on June 14, 2022. No utilities were found near the test pits, although buried metal debris were found near TP-5 and TP-17<sup>1</sup>. Additionally, two communications lines were found to run east-west just south of the road bordering the northern edge of the study area (Figure 1).

### 2.2 Test Pit Excavation, Soil Logging, and Soil Quality Sampling

Test pits were excavated by Columbia River Services, LLC (CRS) using a Case 160 excavator outfitted with a 36-inch bucket. Excavation of nine test pits (TP-1 through TP-9, shown in Figure 1) occurred from June 15 through June 17, 2022. Table 1 shows test pit depths. Each pit was excavated to a depth necessary to identify the wetting front from the infiltration test, with total depths ranging from about 4 feet below ground surface (bgs) to 14 feet bgs. GSI continuously logged soils excavated from each pit in general accordance with the visual-manual method of the Unified Soil Classification System (USCS), and tested soils for effervescence with 3.0 molar hydrochloric acid where there was potential evidence of cementation.

Table 1 shows the soil samples that were collected from each test pit. Samples were collected from the approximate depth infiltration tests were conducted (prior to the infiltration test) and were submitted to Pacific Agricultural Laboratories (PAL) or ALS Laboratories (ALS) for the following analyses:

- Multi-residue pesticides by Modified EPA Method 8270D and Modified EPA Method 8321B
- Volatile organic compounds (VOCs) by EPA Method 8260C
- Synthetic volatile organic compounds (SVOCs) by EPA Method 8270D
- Polychlorinated biphenyl (PCB) Aroclors by EPA Method 8082
- Metals<sup>2</sup> by EPA Method 6020 and EPA Method 7471
- Nitrate and nitrite by EPA Method 9056
- Explosives<sup>3</sup> by EPA Method 8330
- Particle size by ASTM Method D422M (by sieves and hydrometer)
- Specific gravity by ASTM Method D854

<sup>1</sup> Due to time constraints, only 9 of the 18 test pits were excavated. The figures that accompany this TM only show the test pits that were excavated (test pits TP-1 through TP-9). Figure 2 of the Work Plan shows locations of all 18 test pits.

<sup>2</sup> Antimony, aluminum, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, nickel, manganese, mercury, potassium, selenium, silver, thallium, zinc.

<sup>3</sup> 2,4,6-trinitrotoluene (TNT); hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX); octahydro-1,3,4,7-tetranitro-1,3,5,7-tetrazocine (HMX); 2,4,6-trinitrophenyl-n-methylnitramine (tertyl); 2,4-dinitrotoluene (DNT); 1,3,5-trinitrobenzene (2,6-DNT); 1,3-dinitrobenzene (DNB); nitrobenzene (NB).

**Table 1. Inventory of Collected Soil Samples.**

Test Pit ID	Test Pit Depth (feet)	Depth Sample Collected (ft bgs)	Soil Horizon <sup>1</sup>	Soil Quality <sup>2</sup>	Soil Physical Properties <sup>3</sup>
TP-1	12.0	5.0-5.5	Gravel w/ Fines	X	X
TP-2	9.4	9.0-9.4	Clean Gravel	--	X
TP-3	11.8	8.0-8.3	Gravel w/ Fines	--	X
TP-4	11.5	4.5-4.6	Gravel w/ Fines	--	X
TP-5	5.8	3.8-4.0	Gravel w/ Fines	X	X
TP-6	12.2	2.1-2.2	Fine Sand	--	X
		9.5-10.0	Gravel w/ Fines	--	X
TP-7	14.0	6.7-7.0	Clean Gravel	--	X
TP-8	4.1	1.5-2.0	Fine Sand	--	X
		3.5-4.0	Gravel w/ Fines	X	X
TP-9	12.0	8.0-8.5	Gravel w/ Fines	--	X

**Notes**

"--" = no sample collected

(1) See section 3.1

(2) Multi-residue pesticide analysis, VOCs, SVOCs, PCB Aroclors, metals, nitrate and nitrite, and explosives (see test for details)

(3) Soil physical properties include grain size and specific gravity

## 2.3 Infiltration Testing

GSA conducted one or more infiltration tests at each test pit. A total of 13 infiltration tests were conducted and targeted the different soil units that were observed in the test pits. Infiltration tests in sandy soil were conducted using the single ring infiltrometer method with lateral divergence correction (Bouwer et al., 1999), while infiltration tests in gravels were conducted using a modified test pit infiltration method with lateral divergence correction due to the inability to create an adequate seal between the coarse gravel clasts and the ring infiltrometer. For both methods, the lateral and vertical extent of the wetting front and ponding height were measured in order to calculate the effective saturated hydraulic conductivity (K) of the soil. Effective K values provide a good estimate of the potential infiltration rate in the absence of surface clogging and/or restricting or compacted layers present deeper in the profile (Bouwer et al., 1999; Rice et al., 2014). A technical memorandum prepared by GSA to document the methods and results of the infiltration testing is provided in Attachment A.

Following infiltration testing, the test pits were backfilled with excavated soils and compacted by tamping down the pit with the bucket of the excavator and driving the excavator over the pit.

## 3. Results

This section presents the results of the subsurface characterization, including the subsurface geology (Subsection 3.1), measured effective saturated hydraulic conductivity (Subsection 3.2), and soil sampling results (Subsection 3.3).

### 3.1 Subsurface Geology

Shallow subsurface geology within the project area was generally consistent between test pits. Test pit logs showing soil classifications are provided in Attachment B, and photologs of each test pit are provided in Attachment C. The following soil units were encountered in the study area, from shallowest to deepest:

- **Fine Sand.** This unit is comprised primarily of poorly graded fine SAND (SP) to a poorly graded fine SAND with SILT (SP-SM), ranging from about 2 to 4 feet thick with a median thickness of 2.8 feet.
- **Gravel with Fines.** This gravel has a relatively high fines content (silt and clay fraction was estimated in the field at between 5% and 20%). The unit grades from a silty SAND with gravel (SM), to an interlayered silty GRAVEL (GM) and well graded GRAVEL with sand (GW), to a well graded GRAVEL (GW) with increasing depth. The total thickness of this unit ranged from about 2 to over 10 feet thick, and was thinnest in the west part of the study area.
- **Clean Gravel.** This gravel is characterized by a low fines content (<1%) and is classified as a well graded GRAVEL (GW) with a matrix of coarse to very coarse sand. The depth to the top of this unit ranged from about 5 feet bgs to 9 feet bgs, with a median depth of 7.4 feet bgs. Depth to the top of the Clean Gravel and contours showing the depth to the top of the gravel are provided in Figure 2. This unit was only found in the western part of the study area, but may be present in the eastern part of the study area at greater depths than were excavated.

A cross section showing the Fine Sand, Gravel with Fines, and Clean Gravel in the study area is provided in Figure 3.

### 3.2 Infiltration Tests

A statistical summary of the effective saturated hydraulic conductivity values measured during the infiltration testing are shown in Table 2. Note that these effective K rates are raw measurements that do not include a safety factor to account to clogging over time or uncertainties related to spatial variability in soil properties.

**Table 2. Effective Saturated Hydraulic Conductivity (feet per day)**

Geology	# of Infiltration Tests	Minimum	Maximum	Geometric Mean
Fine Sand	5	0.5	3.7	1.6
Gravel with Fines	5	2.3	8.2	4.2
Clean Gravel	3	2.4	449.9	36.9

The geometric mean soil effective K increased with decreasing fines content, ranging from 1.6 ft/day for Fine Sand to 36.9 ft/day for Clean Gravel. Individual infiltration testing results at each pit for each unit are shown in Figure 4 as well as in Attachment A.

### 3.3 Soil Quality and Soil Physical Parameters

Laboratory results are tabulated and presented in Attachment D, and laboratory reports are provided in Attachment E.

### 3.3.1 Soil Quality Results

Because the Depot is a superfund site, soil quality samples were collected from a subset of the test pits to characterize soil quality. Soil quality samples were collected at 5 feet bgs (TP-1), 3.8 feet bgs (TP-5), and 3.5 feet bgs (TP-8), as shown in Table 1. Soil quality results are presented in Table D.1 of Attachment D.

The soil quality results indicate that infiltration through the surficial soils in the study area is not likely to violate DEQ's groundwater protection rules, which require that groundwater is protected to its highest beneficial use (which is usually drinking water). AR projects are required to meet these rules, which, in practice, require that infiltration projects do not degrade background groundwater quality at a receptor point (i.e., a water well).

- PCB Aroclors, explosives, and pesticides were not detected in soil.
- Metals were below background concentrations in soil for the Deschutes-Columbia Plateau Province (DEQ, 2019).
- Most VOCs and SVOCs were not detected in soils. The following VOCs and SVOCs, which were detected in soils at very low concentrations, are not anticipated to degrade groundwater quality because:
  - Detections are the result of laboratory contamination and, therefore, not representative of native soil conditions:
    - Diethyl phthalate. Diethyl phthalate was detected in all soil samples that were tested at estimated concentrations ranging from 0.014 mg/kg to 0.017 mg/kg ("J-Flag"). We note that diethyl phthalate was detected in the laboratory method blank at an estimated concentration of 0.034 mg/kg ("J-Flag"), which indicates a laboratory source for the detection.
    - Acetone. Acetone was detected in all soil samples that were tested at concentrations ranging from 20 ug/kg to 55 ug/kg. We note that acetone was detected in the laboratory method blank at an estimated concentration of 6.4 ug/kg ("J-Flag"), which indicates a laboratory source for the detection.
  - The detected pollutants are unlikely to degrade groundwater quality at a receptor (i.e., water well) because concentrations are very low (specifically, concentrations are likely to be diluted and will not be detected at downgradient compliance monitoring points) and are below regulatory standards for leaching from soil to groundwater (if established). The bullets below summarize the detected concentrations and regulatory standards for leaching of the pollutant from soil to groundwater. The regulatory standards include both EPA Regional Screening Levels (EPA, 2022) and DEQ Risk-Based Concentrations (RBCs) (DEQ, 2018) because DEQ RBCs have not been developed for most of the detected pollutants.
    - Carbon disulfide. Carbon disulfide was detected in all soil samples that were tested at estimated concentrations ranging from 0.26 ug/kg to 0.53 ug/kg ("J-Flag"), which is well below the regulatory standard of 240 ug/kg for leaching from soil to groundwater<sup>4</sup>.
    - Methylene Chloride. Methylene chloride was detected in all soil samples that were tested at estimated concentrations ranging from 0.74 ug/kg to 0.92 ug/kg

<sup>4</sup> EPA Regional Screening Level for Residential Soil to Groundwater (EPA, 2022).

("J-Flag"), which is below the regulatory standard of 2.9 ug/kg for leaching from soil to groundwater<sup>5</sup>.

- **4-isopropyltoluene.** 4-isopropyltoluene was detected in a single soil sample at an estimated concentration of 0.33 ug/kg ("J-Flag"). No regulatory standard has been established for 4-isopropyltoluene.
- **2-Butanone (MEK) and Toluene.** MEK was detected in all soil samples that were tested at estimated concentrations ranging from 1.8 ug/kg to 4.5 ug/kg ("J-Flag") (well below the regulatory standard of 1,200 ug/kg<sup>6</sup>), and toluene was detected in a single sample at a concentration of 0.60 ug/kg ("J-Flag") (well below the regulatory standards of 760 ug/kg<sup>7</sup> and 84,000 ug/kg<sup>8</sup>). MEK and Toluene are found in exhaust from internal combustion engines, and these low concentrations may be related to cross-contamination from vehicle engines during the field work. We also note that MEK is common lab contaminant.
- Nitrate was detected at low concentrations of 0.09 mg/kg (estimated, "J-Flag") to 0.66 mg/kg. These concentrations are not expected to degrade background groundwater quality, which is characterized by elevated nitrate concentrations (IRZ, 2021).

### 3.3.2 Soil Physical Parameters

The sample depths for soil physical parameters are provided in Table 1. Specific gravity of the Fine Sand, Gravel with Fines, and Clean Gravel is summarized in Table 3.

**Table 3. Specific Gravity (dimensionless)**

Geology	# of Samples	Minimum	Maximum	Geometric Mean
Fine Sand	1	--	--	1.84
Gravel with Fines	6	1.66	2.13	1.94
Clean Gravel	3	1.65	2.19	1.95

Results of soil grain size analyses are provided in Table D.2 of Attachment D. For the Fine Sand, USCS visual-manual classifications on the test pit logs (Attachment B) were updated based on the lab results. For the gravel units, USCS visual-manual classifications on test pit logs were not updated because the lab results were not necessarily representative of soil conditions in the field (i.e., because boulder-sized sediment was not included in the laboratory analyses).

## 4. Conclusions and Recommendations

GSI and GSA make the following conclusions based on the Phase I Subsurface Investigation:

- No impermeable clay or caliche layers that would limit infiltration were encountered in the shallow soils (i.e., less than 12 feet bgs) at the test pits excavated within the study area.
- The infiltration test results indicate that the Clean Gravel has the highest effective K (geometric mean infiltration rate of 36.9 feet per day). However, the Clean Gravel occurs at significant depths

<sup>5</sup> EPA Regional Screening Level for Residential Soil to Groundwater (EPA, 2022).

<sup>6</sup> EPA Regional Screening Level for Residential Soil to Groundwater (EPA, 2022).

<sup>7</sup> EPA Regional Screening Level for Residential Soil to Groundwater (EPA, 2022).

<sup>8</sup> DEQ Risk Based Concentration for Leaching from Soil to Groundwater under the Residential Scenario (DEQ, 2018).

(about nine feet bgs) in some areas, and may not be present in the eastern part of the study area<sup>9</sup> (see Figure 2). The Gravel with Fines also has relatively high effective K (geometric mean effective K of 4.2 feet per day), and may be targeted for infiltration depending on the desired size of the infiltration basin, limitations on infiltration basin depth, and the target infiltration volume.

- Low concentrations of MEK, toluene, carbon disulfide, methylene chloride, 4-isopropyl toluene, and nitrate were detected in shallow soil. Infiltration through the surficial soils in the study area is not likely to violate DEQ's groundwater protection rules because the concentrations are likely to be diluted/attenuated and will not be detected at downgradient compliance monitoring points (i.e., MEK, toluene, carbon disulfide, methylene chloride, 4-isopropyl toluene) and/or will not degrade groundwater quality which is already characterized by elevated contaminant concentrations (i.e., nitrate).

GSI and GSA make the following recommendations based on the Phase I Subsurface Investigation:

- The effective K rates presented in this TM do not account for uncertainties related to the spatial variability of soil properties and clogging of the basin over time. We recommend applying a safety factor to these effective K rates to account for these uncertainties.
- Infiltration basin designs based on the results of the Phase I Subsurface Investigation, which focused on shallow soils (less than 12 feet bgs) should be considered preliminary because we have not yet evaluated the potential for less permeable soil horizons deeper in the soil profile. In addition, we have not yet evaluated the aquifer potential to dissipate the groundwater mound that will occur during recharge, which depends on aquifer properties. The deep soils were evaluated as part of the Phase II Subsurface Investigation, which is anticipated to be finished in February 2023.
- We recommend that the project team consider basin designs that include a single recharge basin as well as multiple recharge basins. Use of multiple basins provides benefits including being able to continue recharge while conducting maintenance activities (e.g., clogging layer removal) and cycling of recharge between basins should groundwater or perched water mounding beneath a basin reduce infiltration rates.
- The Work Plan (GSI, 2022) originally proposed two temporary soil borings to characterize deep soils. In order to better characterize the extent of the Clean Gravel, which was not encountered in the test pits in the eastern half of the study area, we recommend increasing the number of temporary soil borings from two to three. Soil borings should be advanced along an east-west transect through the center of the study area (i.e., through TP-4, TP-5 and TP-6), with an approximately even spacing.
- Recall that soil quality samples were collected at depths shallower than 5 feet bgs. We recommend collecting additional soil quality samples to further characterize concentrations of the detected VOCs and SVOCs (specifically, MEK, toluene, carbon disulfide, methylene chloride, and 4-isopropyl toluene), and nitrate with depth. Specifically, we recommend collecting soil samples at each of the temporary borings B-1, B-2 and B-3 at depths of 10 feet bgs and 20 feet bgs (two samples at each boring for a total of six samples).

---

<sup>9</sup> The Clean Gravel was encountered at about 9 feet bgs in test pits TP-1 and TP-2, and was not encountered in test pits TP-5 and TP-8 (excavated to about 6 and 4 feet bgs, respectively) and TP-3, TP-6 and TP-9 (excavated to about 12 feet bgs).

## 5. References

Bouwer, H., Back, J.T., Oliver, J.M. 1999. Predicting Infiltration and Groundwater Mounds for Artificial Recharge, J Hydro Eng, ASCE, (4) pp. 350-357.

Bouwer, H. 2002. Artificial recharge of groundwater: hydrogeology and engineering. Hydrogeology Journal.

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DEQ. 2019. Clean Fill Determinations. Available online at:  
<https://www.oregon.gov/deq/Filtered%20Library/IMDcleanfill.pdf>.

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IRZ. 2021. Westland Irrigation District Limited License No. 1447: WY2020 Annual Report. February 15.

Rice, R.C., M. Milczarek, J. Keller. 2014. A Critical Review of Single Ring Cylinder Infiltrometers with Lateral Flow Compensation. Proceedings 14th Biennial Symposium on Managed Aquifer Recharge, July 31-August 1, 2014 – Orange, CA.

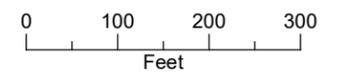
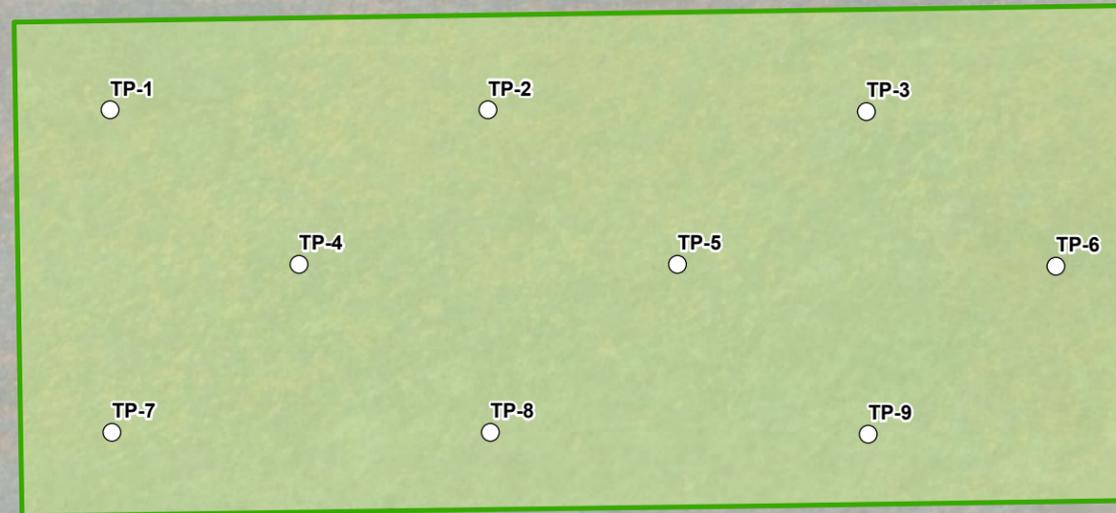
**FIGURE 1**  
**Site Map and**  
**Test Pit Locations**  
 Phase I Subsurface  
 Characterization Results  
 Umatilla Army Depot  
 Artificial Recharge Project

**LEGEND**

○ Test Pit Location

**All Other Features**

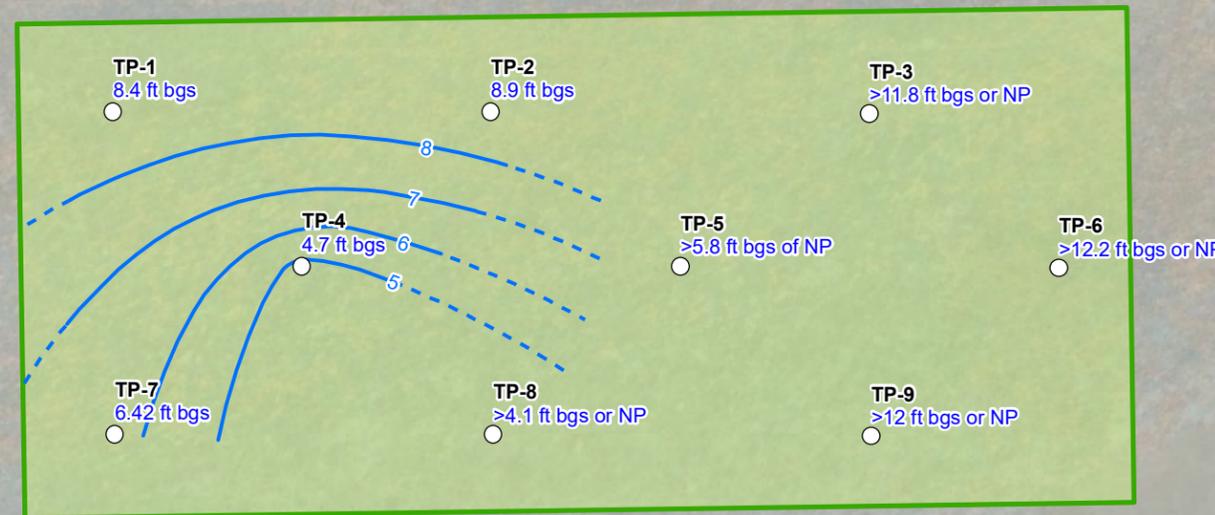
■ Study Area (15-acres)



Date: January 26, 2023  
 Data Sources: BLM, ESRI, ODOT, USGS,  
 Maxar Imagery (2020), OWRD



**FIGURE 2**  
**Depth to Clean Gravel Unit**  
 Phase I Subsurface  
 Characterization Results  
 Umatilla Army Depot  
 Artificial Recharge Project

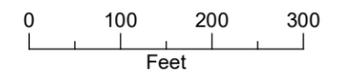


**LEGEND**

- Test Pit Location
- Depth to Clean Gravel Unit (feet bgs)
- Depth to Clean Gravel Contour (feet), dashed where inferred
- All Other Features
- Study Area (15-acres)

**NOTES**

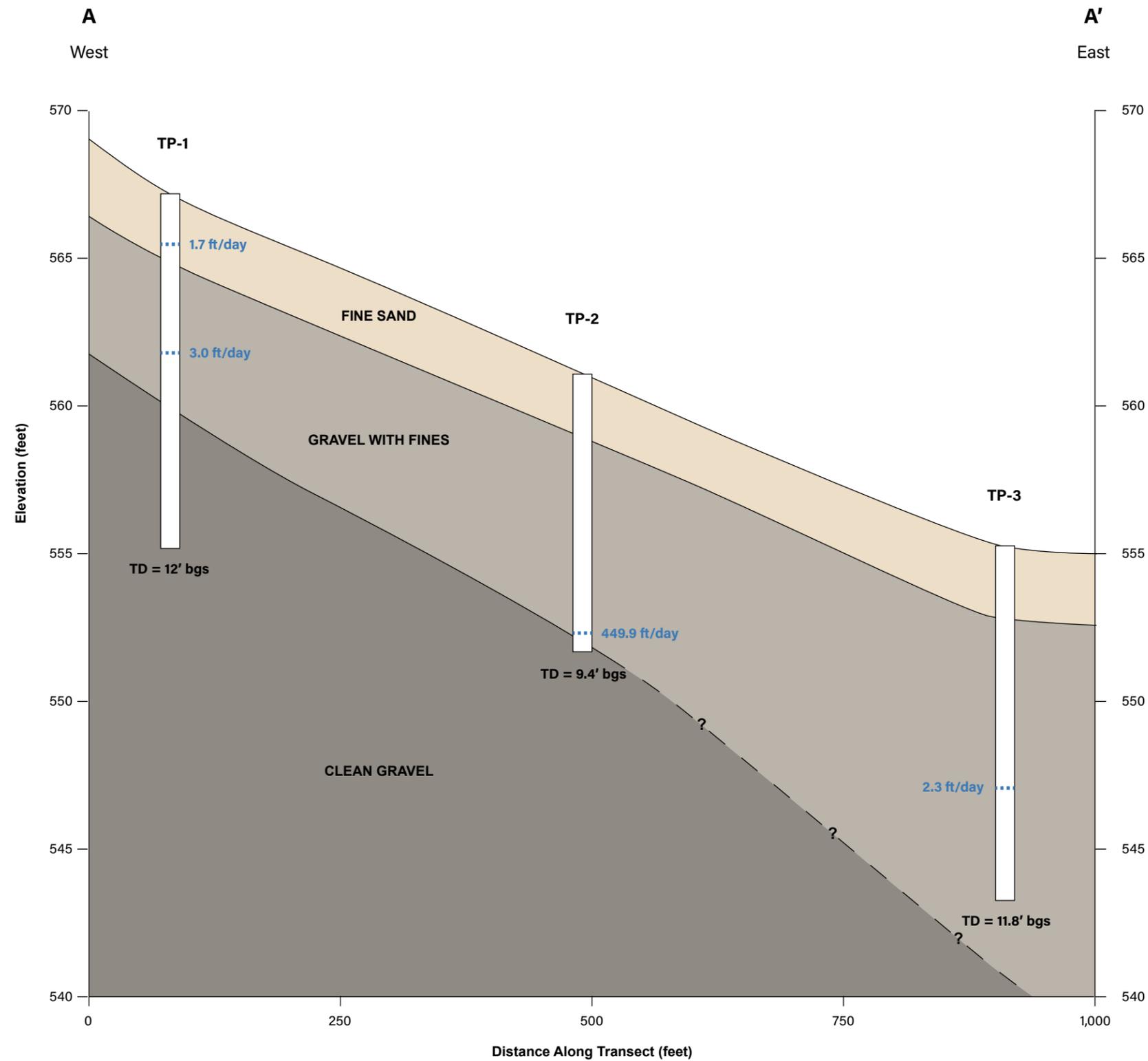
bgs: below ground surface  
 NP: not present  
 TP: test pit



Date: June 27, 2022  
 Data Sources: BLM, ESRI, ODOT, USGS,  
 Maxar Imagery (2020), OWRD



**FIGURE 3**  
**Cross Section A**  
 Phase I Subsurface  
 Characterization Results  
 Umatilla Army Depot  
 Artificial Recharge Project



**CROSS SECTION LEGEND**

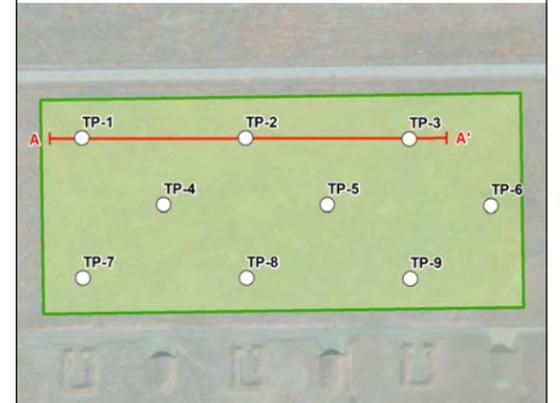
- ? - Inferred Contact
- Fine Sand
- Gravel with Fines
- Clean Gravel

**WELL LEGEND**

- Infiltration Test
- Effective Saturated Hydraulic Conductivity

**MAP LEGEND**

- Test Pit Location
- Cross Section Line
- Study Area (15-acres)

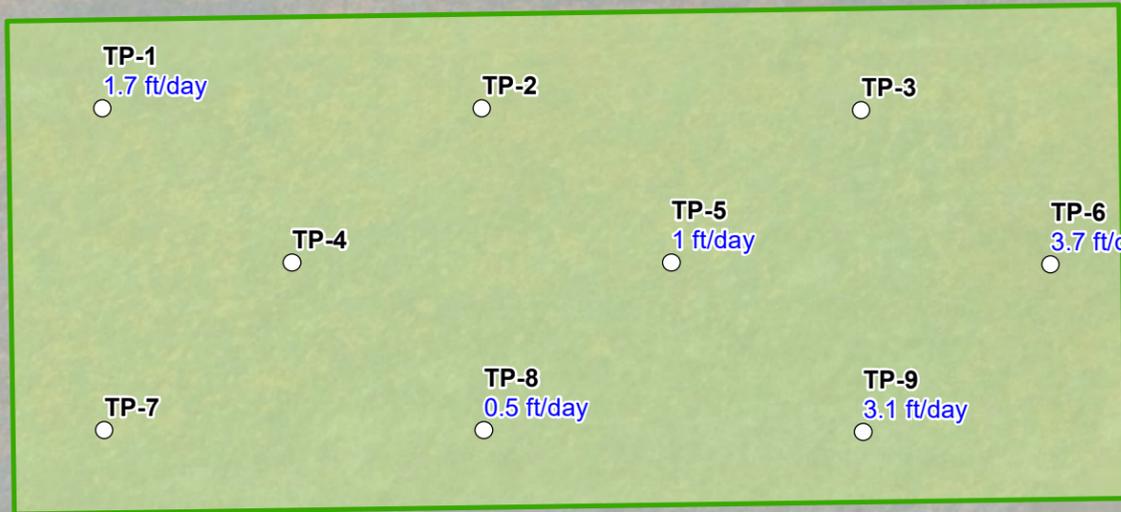


**NOTES**

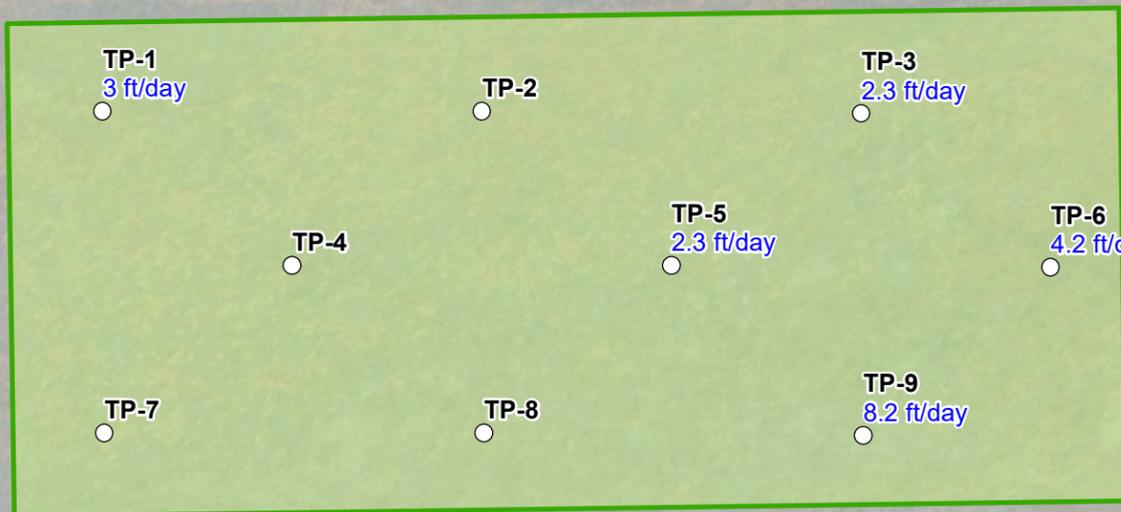
- 30x vertical exaggeration
- bgs: below ground surface
- ft: feet
- TD: total depth



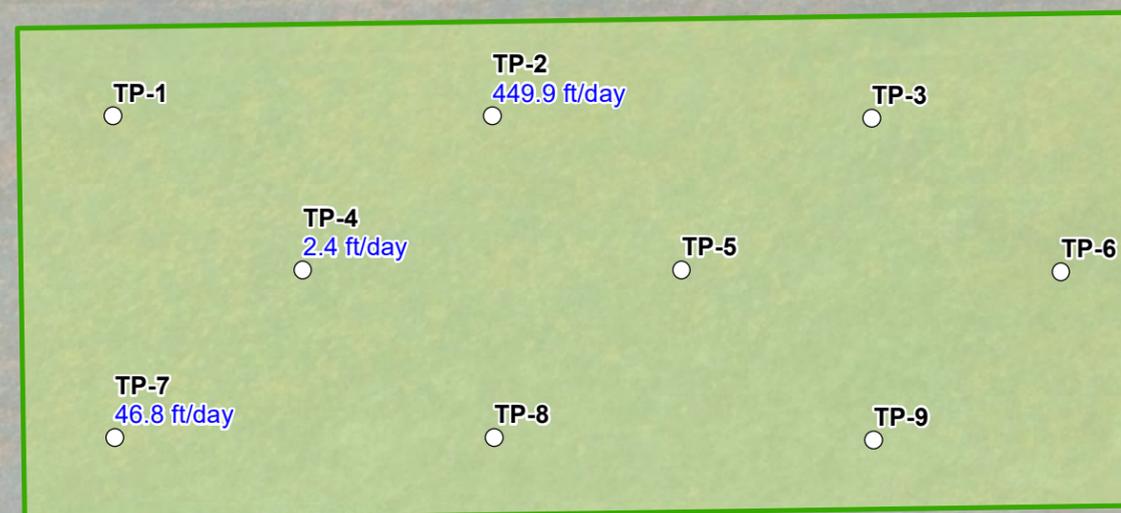
**FINE SAND**



**GRAVEL WITH FINES**



**CLEAN GRAVEL**



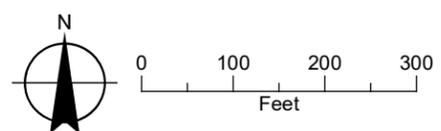
**LEGEND**

- Test Pit Location
- Effective Saturated Hydraulic Conductivity (feet/day)
- Study Area (15-acres)

**NOTE**

TP: Test Pit  
 Date: June 27, 2022  
 Data Sources: BLM, ESRI, ODOT, USGS,  
 Maxar Imagery (2020), OWRD

**FIGURE 4**  
**Effective Saturated Hydraulic Conductivity**  
 Phase I Subsurface  
 Characterization Results  
 Umatilla Army Depot  
 Artificial Recharge Project



**ATTACHMENT A**

Infiltration Testing Methods and Results Memorandum

## MEMORANDUM

June 27, 2022

TO: Matt Kohlbecker, RG, GSI Water Solutions, Inc.

FROM: Jason Keller, GeoSystems Analysis, Inc.

CC: Matt Thomas, GSI Water Solutions, Inc.  
Scott Waibel, GeoSystems Analysis, Inc.

RE: Umatilla Army Depot Artificial Recharge Project Infiltration Testing

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### 1.0 INTRODUCTION

GeoSystems Analysis Inc. (GSA) was contracted to conduct an infiltration assessment to support test pit characterization performed by GSI Water Solutions, Inc (GSI) at a proposed artificial groundwater recharge site at the Umatilla Army Depot in Umatilla County, OR. This technical memorandum presents the results of cylinder infiltrometer (CI) testing and test pit infiltration testing to measure the field effective saturated hydraulic conductivity (K) of predominant materials identified by test pit soil logging performed by GSI.

### 2.0 METHODS

The single-ring CI method with lateral divergence correction (Bouwer et al., 1999) provides an intermediate-scale measurement of the effective K in the tested material. Effective K values provide a good estimate of the potential infiltration rate in the absence of surface clogging and/or restricting or compacted layers present deeper in the profile (Bouwer et al., 1999, Rice et al., 2014). The CI method employs a cylinder measuring 20 inches in diameter and 12 inches in length which provides a more accurate in-situ measurement of the effective K of the soil than smaller-scale laboratory measurements (Figure 1).

Infiltration tests in gravel soils were conducted using a modified test pit infiltration with lateral divergence method (Figure 2) due to the inability to create an adequate seal between the coarse gravel clasts and the ring infiltrometer. Test pit infiltration tests are similar to the CI method

except that water is added to an open test pit as opposed to a CI ring. The modified test pit infiltration method may overestimate effective K due to flow through the sidewall of the pit, however, final infiltration measurements were made with pit water heights of approximately 8 inches or less, resulting in flow being predominately vertical flow through the bottom of the test pit and reducing the potential error introduced by sidewall flow. Standard Operating Procedure (SOP) for the CI test method is provided in Appendix A. Modifications to the CI test calculations for the test pit infiltration tests are provided in Appendix B.

Based on GSI's geologic logging results, locations were selected for infiltration testing to measure the effective K of the range of materials encountered from 1.5 ft to 10 ft below ground surface (bgs). A total of 14 infiltration tests were conducted at the test pit locations in Figure 3.

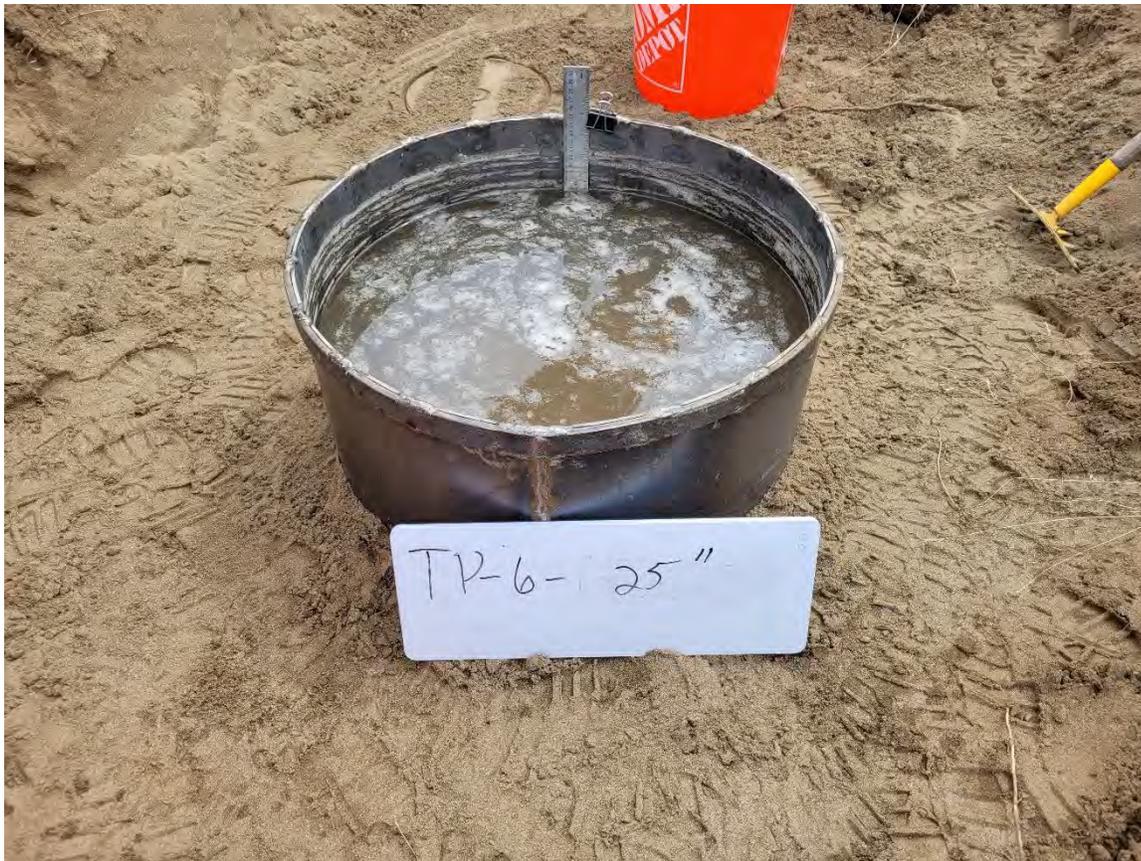


Figure 1. Example CI measurement (TP-6 at 2.1 ft bgs)



Figure 2. Example modified test pit infiltration measurement (TP-1 at 5.3 ft bgs)



Figure 3. Test pit and infiltration test locations

**GeoSystems Analysis, Inc.**

### 3.0 RESULTS

Table 1 presents the results for the infiltration testing. Five tests were completed in the Fine Sand material, five tests in the Gravel with Fines material, and three tests in the Clean Gravel material. A sixth test performed in the Gravel with Fines material (TP-8 at 3.5 ft bgs) was not successful because of test pit wall cave in.

Effective K values generally increased with decreasing fines. Effective K values in the Fine Sand material ranged from 0.5 to 3.7 ft/day with a geometric mean effective K of 1.6 ft/day. Effective K values in the Gravel with Fines material ranged from 2.3 to 8.2 ft/day with a geometric mean effective K of 4.2 ft/day. Effective K values in the Clean Gravel material ranged from 449.9 ft/day to 2.4 ft/day with a geometric mean effective K of 36.9 ft/day.

Table 1. Infiltration test results

Test Pit	Test Method (feet)	Depth of Infiltration Test (feet)	Lithology of Tested Interval <sup>a</sup>	Infiltration Rate (feet/day)
TP-1	CI	1.5	Fine Sand	1.7
	Modified Test Pit	5.3	Gravel with Fines	3.0
TP-2	Modified Test Pit	8.9	Clean Gravel	449.9
TP-3	Modified Test Pit	8.0	Gravel with Fines	2.3
TP-4	Modified Test Pit	4.6	Clean Gravel	2.4
TP-5	CI	2.0	Fine Sand	1.0
	Modified Test Pit	5.8	Gravel with Fines	5.3
TP-6	CI	2.1	Fine Sand	3.7
	Modified Test Pit	10.0	Gravel with Fines	4.2
TP-7	Modified Test Pit	6.7	Clean Gravel	46.8
TP-8	CI	2.0	Fine Sand	0.5
	Modified Test Pit	3.5	Gravel with Fines	Wall Cave In
TP-9	CI	1.7	Fine Sand	3.1
	Modified Test Pit	9.7	Gravel with Fines	8.2

a – From GSI test pit logs

## 4.0 CONCLUSIONS

The infiltration test results indicate that the Clean Gravel has the highest infiltration rates (geometric mean infiltration rate of 36.9 feet per day), followed by the Gravel with Fines (4.2 ft/day) and Fine Sand (1.6 ft/day). The effective K rates presented do not account for surface clogging and/or restricting or compacted layers present deeper in the profile.

## 5.0 REFERENCES

- Bouwer, H., Back, J.T., Oliver, J.M., 1999. Predicting Infiltration and Groundwater Mounds for Artificial Recharge, *J Hydro Eng, ASCE*, (4) pp. 350-357.
- Bower, H. 2002. Artificial recharge of groundwater: hydrogeology and engineering. *Hydrogeology Journal*. 10:121-142.
- Rice, R.C., M. Milczarek, J. Keller, 2014. A Critical Review of Single Ring Cylinder Infiltrimeters with Lateral Flow Compensation. *Proceedings 14th Biennial Symposium on Managed Aquifer Recharge*, July 31-August 1, 2014 – Orange, CA.

**Appendix A**  
**Cylinder Infiltrometer Standard Operating Procedure**



## **STANDARD OPERATING PROCEDURE 4.4**

### **Single Ring Infiltrometer with Lateral Divergence Correction**

Version 1.0

Prepared by:	RR	Date:	08/06/2015
Reviewed by:	JB	Date:	10/09/2020
Approved by:		Date:	

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## 1.0 GENERAL STATEMENT

The single-ring cylinder infiltrometer (CI) method is described by Bouwer et al. (1999). The method is a short-term infiltration test, which provides an in-situ measurement of the effective saturated hydraulic conductivity ( $K$ ) of soil material.

## 2.0 OBJECTIVE

The CI is driven into the material to be tested and then filled with water to the top of the ring. The decline of water in the ring is then monitored (Figure 1). After the water falls about 5 cm, the time and exact decrease in water level is recorded and the cylinder is refilled. This process is continued until about 40 cm of water have infiltrated or four hours have expired. A shovel is then used to dig outside of the cylinder to determine the distance of lateral divergence (Figure 1). The depth of the wetting front is also determined by augering in the center of the wetted surface to dryness or the wetting front, if evident. The final infiltration rate, wetting depth and divergence are then used to calculate  $K$ .



Figure 1. Cylinder infiltrometer testing (1a); measurement of lateral divergence (1b)

### **3.0 EQUIPMENT AND/OR INSTRUMENTATION**

The following field equipment shall be used to run a CI test:

- Cylinder infiltrometer, minimum diameter of 50 cm, depth of 30 cm.
- 20 to 60-liter water-filled containers to supply water.
- Bubble wrap to place inside the ring while filling with water.
- Stopwatch or watch.
- Thermometer.
- Ruler or tape measure.
- Sledge hammer or equivalent driver and three foot 2x4's for driving the CI into the soil.
- Shovel.
- Pick or breaking bar.
- Hand auger
- Knee pads and/or chair (optional).

### **4.0 PREPARATION**

The following procedures shall be used to prepare the site and the equipment for running the CI test:

- The measuring surface should be relatively level.
- Large rocks or stones should be removed from the cylinder perimeter.
- The method is not recommended for use on rocky soil that prevents the insertion of the cylinder.
- When measurements are not taken at the ground surface, the site should be leveled after excavation. Care is to be taken to remove loose, disturbed soil.
- The area leveled should be at least one meter larger than the cylinder diameter.

## 5.0 PROCEDURES

The following procedures shall be used to run the CI test in the field. Data collected shall be recorded in Table 1.

- Drive the CI approximately 4 to 7 cm into the ground using a sledge hammer or driver and 2x4's placed across the CI top.
- In cases where the soil is too compacted to drive the CI to the required depth, the soil may be loosened around the outside perimeter of the cylinder with a pick or breaking bar and then driven in.
- Lightly compact the soil against the inside and outside of the CI ring to minimize preferential flow at the ring-soil contact.
- Place bubble wrap on the soil surface inside the CI ring to prevent soil disturbance during filling with water.
- Fill the CI ring with water to the top, remove bubble wrap and measure water temperature
- Monitor the decline in water level ( $y$ ). After the water has fallen about 5 cm, record the elapsed time ( $\Delta t$ ) and exact decrease in water level ( $y_n$ ) before the CI is refilled.
- This process is repeated until about 40 cm of water has infiltrated or four hours have expired.
- When the CI has been filled for the last time, water level measurements should be taken more frequently to obtain an accurate infiltration rate.
- At the conclusion of the test, a shovel is used to dig outside of the cylinder to determine the distance ( $x$ ) of lateral divergence. In moist soils where the lateral wetting cannot be determined by change of color, the lateral wetting can be determined with a portable moisture probe.
- After removing the cylinder, determine the depth of wetting ( $L$ ) by augering to dryness or the wetting front, when possible.

## 6.0 SAMPLE CONTAINERS, PRESERVATION, AND TRANSMITTAL

Not applicable.

## 7.0 EQUIPMENT DECONTAMINATION AND DISPOSAL

Not applicable.

## 8.0 DOCUMENTATION

In order to calculate  $K$ , the downward flow rate,  $i_w$ , must first be corrected for the effect of lateral divergence, based on the radius of the observed wetting front:

$$1) \quad i_w = \frac{i_n \pi r^2}{\pi(r+x)^2}$$

Where,

$i_n$  = infiltration rate during the last water drop ( $y_n/\Delta t_n$ ),

$r$  = radius of the CI ring,

$x$  = lateral divergence from the ring, and

$\Delta t_n$  = elapsed time during last water drop

When the depth of the wetting front at the end of the test,  $L$ , is difficult to measure, such as in soil that is already moist, it can be calculated from the cumulative infiltration ( $y_i$ ) as follows:

$$2) \quad L = \frac{y_i \pi r^2}{n \pi (r+x)^2}$$

Where,  $n$  is the estimated fillable porosity of the soil, based on the field description of soil texture and initial moisture content. When the depth of the wetting front was directly measured in the field, Equation 2 may be used to estimate fillable porosity.

Applying Darcy's equation to the downward flow  $i_w$  (Equation 1) and assuming vertical flow in the wetted zone yields:

$$3) \quad i_w = K \frac{z+L-h_{we}}{L}$$

where:

$K$  = effective saturated hydraulic conductivity of the wetted zone,

$z$  = average depth of water in the cylinder during the last water drop  $y_n$ ,

$h_{we}$  = water entry value of the soil (estimate of soil suction, from Bouwer et al., 1999).

Soil texture estimates made in the field (Table 1) are used to assign the water entry value for each sample.

Equation 3 is rearranged to solve for K:

$$4) \quad K = \frac{i_w L}{(z + L - h_{we})}$$

This calculated  $K$  is an estimate of the effective field saturated hydraulic conductivity. The effective field saturated hydraulic conductivity, may be less than the true hydraulic conductivity due to air entrapment within the pores. Nonetheless, because of scale effects, cylinder infiltrometers provide a more accurate estimation of saturated hydraulic conductivity than smaller-scale laboratory measurements.

Table 1. Water entry values for different soil types

Soil Type	Water-entry Value (cm of water) <sup>1</sup>
Coarse sands	-5
Medium sands	-10
Fine sands	-15
Loamy sands	-20
Sandy loams	-25
Loams	-35
Structured clay soils	-30
Nonstructured clay soils	-100 or less (more negative)

<sup>1</sup>Water entry values taken from Bouwer, 1999

### 8.1 Spreadsheet

Enter the data into the Standard Field Form Single Ring Cylinder Infiltrometer spreadsheet (see below) to calculate the final K value. The data to be entered is highlighted in yellow. Several tests can be recorded in the same spreadsheet and summarized on the first page.

### 9.0 QUALITY ASSURANCE

Quality assurance (QA) for running the CI shall be accomplished by following the procedures contained in this SOP. It is especially important that the sites chosen remain as undisturbed and are as level as possible. In addition, soils with a large percentage of gravel material, or soils that are loosely compacted increase the probability that the  $K$  will not be representative of the undisturbed soil matrix.

### 10.0 REFERENCES

Bouwer, H., Back, J.T., Oliver, J.M., 1999. Predicting Infiltration and Ground Water Mounds for Artificial Recharge, J Hydro Eng, ASCE, (4) pp. 350-357

**Standard Field Form  
Single Ring Cylinder Infiltrometer**

Project: \_\_\_\_\_

Location: \_\_\_\_\_

Date: \_\_\_\_\_ Operators: \_\_\_\_\_

Soil Type: \_\_\_\_\_

Cover and moisture conditions: \_\_\_\_\_

Diameter of cylinder: 50.4 cm      Height of cylinder: 30 cm

Depth of penetration: \_\_\_\_\_

Time	Filled level	Water level drop	Infiltration	Accumulated infiltration
_____	_____	<u>Filled</u>	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Lateral wetting outside cylinder: \_\_\_\_\_

Wetting depth: \_\_\_\_\_

Water entry value: \_\_\_\_\_

Fillable porosity: \_\_\_\_\_

Final infiltration rate for large area: \_\_\_\_\_

## **Appendix B**

### **Test Pit Infiltration Test Lateral Divergence Correction for an Assumed Rectangular Prism**

## Test Pit Infiltration Test Lateral Divergence Correction for an Assumed Rectangular Prism)

In order to calculate  $K$ , the downward flow rate,  $i_w$ , must first be corrected for the effect of lateral divergence, based on the change in width and length of the observed wetting front in the rectangular plan view:

$$1) \quad i_w = \frac{i_n l w}{(l+2x)(w+2x)}$$

where:

$i_n$  = infiltration rate during the last water drop ( $y_n/\Delta t_n$ )

$l$  = length of rectangular prism plan view face

$w$  = width of rectangular prism plan view face

$x$  = observed lateral divergence distance

$\Delta t_n$  = elapsed time during last water drop

When the depth of the wetting front at the end of the test,  $L$ , is difficult to measure, such as in soil that is already moist, it can be calculated from the cumulative infiltration ( $y_t$ ) as follows:

$$2) \quad L = \frac{y_t l w}{n(l+2x)(w+2x)}$$

where  $n$  is the estimated fillable porosity of the soil, based on the field description of soil texture and initial moisture content. When the depth of the wetting front was directly measured in the field, Equation 2 may be used to estimate fillable porosity.

Applying Darcy's equation to the downward flow  $i_w$  (Equation 1) and assuming vertical flow in the wetted zone yields:

$$3) \quad i_w = K \left( \frac{z+L-h_{we}}{L} \right)$$

where:

$K$  = effective saturated hydraulic conductivity of the wetted zone

$z$  = average depth of water in the test pit during the last water drop  $y_n$ ,

$h_{we}$  = water entry value of the soil

Soil texture estimates made in the field are used to assign the water entry value for each sample.

Equation 3 is rearranged to solve for  $K$ :

$$4) \quad K = \frac{i_w L}{(z+L-h_{we})}$$

This calculated  $K$  is an estimate of the effective field saturated hydraulic conductivity.

**ATTACHMENT B**

Test Pit Logs



<b>CLIENT/PROJECT:</b>	Umatilla Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 567 feet WGS84	
<b>TEST PIT LOCATION:</b>	OMD Camp Umatilla	<b>TOTAL DEPTH (ft):</b> 12	<b>DATE STARTED:</b> 6/15/2022
<b>EXCAVATION CONTRACTOR:</b>	Columbia River Services	<b>LOGGED BY:</b> M. Thomas	<b>DATE FINISHED:</b> 6/16/2022
<b>SAMPLING METHOD:</b>	Grab		
<b>EXCAVATION METHOD:</b>	36-inch bucket		

DEPTH (feet)	Soil Description Soil Name, USCS Group Symbol, Color, Moisture, Relative Density/Consistency, Soil Structure, Mineralogy	% GRAVEL	% SAND	% SILT	Comments
0	(0 - 2.25'): Loose, moist, dark brown, poorly graded SAND (SP), trace gravel (<1-in), poorly graded fine sand, fine to coarse gravel subround to round	5	85	10	
2.25	(2.25-2.5'): Loose, moist, dark brown, silty SAND with gravel (SM), fine sand, well graded fine to coarse subround to round gravel	30	40	30	
2.5	(2.5-3.8'): Loose, moist, dark brown, silty GRAVEL (GM), well graded, fine gravels to cobbles (< 6-in) subround to round, larger cobbles near bottom	70	10	20	
3.8	(3.8-4.62'): Loose, moist, dark brown to dark gray, well graded GRAVEL with sand (GW), very fine to medium well graded sand, coarse subround to round gravel to cobbles (< 9-in), some boulders (< 15-in)	80	15	5	
4.62	(4.62-5.3'): Loose, dry, gray to light brown, well graded GRAVEL (GW), very fine to fine sand, well graded subround to round gravel	90	<5	5	
5.3	(5.3-7.2'): NO RECOVERY	-	-	-	5.3': infiltration test. Moisture below impacted by test. 5.0-5.5': Collect sample TP-1-061622-05.0-05.5 at 08:25
7.2	(7.2-8.4'): Loose, moist, light gray to gray, well graded GRAVEL (GW), medium to coarse poorly graded sand, well graded subround to round gravel, subround to round cobbles (< 12-in)	90	10	<1	
8.4	(8.4-12.0'): Loose, moist, light gray-light brown, well graded GRAVEL with sand (GW), medium to coarse poorly graded sand, well graded subround to round gravel, little subround to round cobbles (< 6-in)	85	15	<1	
12					



<b>CLIENT/PROJECT:</b>	Umatilla Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 561 feet WGS84	
<b>TEST PIT LOCATION:</b>	OMD Camp Umatilla	<b>TOTAL DEPTH (ft):</b> 9.4	<b>DATE STARTED:</b> 6/16/2022
<b>EXCAVATION CONTRACTOR:</b>	Columbia River Services	<b>LOGGED BY:</b> M. Thomas	<b>DATE FINISHED:</b> 6/16/2022
<b>SAMPLING METHOD:</b>	Grab		
<b>EXCAVATION METHOD:</b>	36-inch bucket		

DEPTH (feet)	Soil Description Soil Name, USCS Group Symbol, Color, Moisture, Relative Density/Consistency, Soil Structure, Mineralogy	% GRAVEL	% SAND	% SILT	Comments
0	(0 - 1.9'): Loose, moist, dark brown, poorly graded SAND (SP), trace subround to round gravel (<1-in), poorly graded fine sand	<1	95	5	
1					
2	(1.9'-2.8'): Loose, dark brown, moist, well graded GRAVEL (GW-GM), very fine to fine poorly graded sand, well graded gravel subround to round	75	15	10	
3	(2.8-4.92'): Loose, dark brown to gray, moist, well graded GRAVEL with sand (GW), very fine to coarse sand, well graded subround to round gravel, some cobbles (< 7-in)	80	15	<5	
4					
5	(4.92'-5.3'): Loose, gray to light brown, dry, well graded GRAVEL (GW), very fine to fine poorly graded sand, well graded subround to round gravel	90	<5	5	
6	(5.3-8.9'): Loose, dark brown to gray, dry, well graded GRAVEL with sand (GW), very fine to coarse sand, well graded subround to round gravel, some cobbles (< 9-in)	80	15	<5	
7					
8	(8.9-9.4'): Loose moist, light gray to gray, well graded GRAVEL (GW), coarse to very coarse sand, well graded subround to round gravel	90	10	<1	8.9': Infiltration test. Moisture content below impacted by test.
9					9.0-9.4': Collect sample TP-2-061622-09.0-09.4 at 11:45
10					9.4': Cave-ins prevent further digging
11					
12					
13					
14					
15					



CLIENT/PROJECT:	Umatilla Depot	GROUND SURFACE ELEVATION AND DATUM: 555 feet WGS84	
TEST PIT LOCATION:	OMD Camp Umatilla	TOTAL DEPTH (ft): 11.8	DATE STARTED: 6/17/2022
EXCAVATION CONTRACTOR:	Columbia River Services	LOGGED BY: M. Thomas	DATE FINISHED: 6/17/2022
SAMPLING METHOD:	Grab		
EXCAVATION METHOD:	36-inch bucket		

DEPTH (feet)	Soil Description Soil Name, USCS Group Symbol, Color, Moisture, Relative Density/Consistency, Soil Structure, Mineralogy	% GRAVEL	% SAND	% SILT	Comments
0	(0-2.4'): Loose, dark brown, moist, poorly graded SAND (SP), trace gravel subround to round (< 2-in), very fine to fine sand	<1	95	5	8.0': Infiltration test. Moisture content below impacted by test. 8.0-8.3': Collect TP-3-061722-08.0-08.3 at 09:40
1					
2	(2.4-2.92'): Loose, dark brown, moist, well graded GRAVEL with silt and sand (GW-GM), very fine to fine poorly graded sand, well graded subround to round gravel, trace cobbles (< 5-in)	70	20	10	
3					
4	(2.92-4.3'): Loose, dark brown to grey, dry, well graded GRAVEL with sand (GW), fine to coarse sand, well graded subround to round gravel, some subround to round cobbles (< 5-in), reacts with 3.0 M hydrochloric acid	80	15	<5	
5					
6	(4.3-6.2'): Loose to medium dense, dry, gray to light brown, well graded GRAVEL (GW), very fine to fine poorly graded sand, well graded subround to round gravel, weak cementation, reacts with 3.0 M hydrochloric acid	90	<5	5	
7					
8	(6.2-6.7'): Loose, dry, dark brown to gray, well graded GRAVEL (GW), fine to coarse poorly graded sand, well graded subround to round gravel, subround to round cobbles (< 7-in), reacts with 3.0 M hydrochloric acid	90	10	<1	
9					
10	(6.7-11.8'): Loose, dry, gray to light brown, well graded GRAVEL (GW), very fine to fine poorly graded sand, subround to round gravel, little subround to round cobbles (< 8-in), reacts with 3.0 M hydrochloric acid	90	<5	5	
11					
12					
13					
14					
15					



CLIENT/PROJECT:	Umatilla Depot	GROUND SURFACE ELEVATION AND DATUM: 562 feet WGS84	
TEST PIT LOCATION:	OMD Camp Umatilla	TOTAL DEPTH (ft): 11.5	DATE STARTED: 6/16/2022
EXCAVATION CONTRACTOR:	Columbia River Services	LOGGED BY: M. Thomas	DATE FINISHED: 6/16/2022
SAMPLING METHOD:	Grab		
EXCAVATION METHOD:	36-inch bucket		

DEPTH (feet)	Soil Description Soil Name, USCS Group Symbol, Color, Moisture, Relative Density/Consistency, Soil Structure, Mineralogy	% GRAVEL	% SAND	% SILT	Comments
0					
1	(0-2.83'): Loose, dark brown, moist, poorly graded SAND (SP), trace subround to round gravel	<1	95	5	
2					
3	(2.83-3.3'): Loose, dark brown, moist, silty SAND with gravel (SM), poorly graded subround to round gravel (< 2-in), poorly graded fine to very fine sand	30	40	30	
4	(3.3-3.83'): Loose, dark brown, moist, well graded GRAVEL with silt and sand (GW-GM), well graded gravels to little cobbles (< 10-in) subround to round, very fine to fine poorly graded sand	75	15	10	
5	(3.83-4.58'): Loose, moist, light brown to gray, well graded GRAVEL with sand, very fine to coarse well graded sand, well graded subround to round gravel, little cobbles (< 5-in)	80	15	<5	
6	(4.58-4.7'): Loose, gray to light brown, well graded GRAVEL (GW), very fine to fine poorly graded sand, well graded subround to round gravel, well graded subround to round cobbles	90	<5	5	4.5-4.6': Collect sample TP-4-061622-04.5-04.6 at 10:55
7	(4.7-11.5'): Loose, moist, light grey to gray well graded GRAVEL (GW), coarse to very coarse sand, well graded subround to round gravel, well sorted cobbles, trace boulders (< 27-in)	90	10	1	4.63': Infiltration test. Moisture content below impacted by test
8					
9					
10					
11					
12					
13					
14					
15					



<b>CLIENT/PROJECT:</b>	Umatilla Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 557 feet WGS84	
<b>TEST PIT LOCATION:</b>	OMD Camp Umatilla	<b>TOTAL DEPTH (ft):</b> 5.8	<b>DATE STARTED:</b> 6/15/2022
<b>EXCAVATION CONTRACTOR:</b>	Columbia River Services	<b>LOGGED BY:</b> M. Thomas	<b>DATE FINISHED:</b> 6/15/2022
<b>SAMPLING METHOD:</b>	Grab		
<b>EXCAVATION METHOD:</b>	36-inch bucket		

DEPTH (feet)	Soil Description Soil Name, USCS Group Symbol, Color, Moisture, Relative Density/Consistency, Soil Structure, Mineralogy	% GRAVEL	% SAND	% SILT	Comments
0					
1					
2	(0-3.6'): Loose, dark brown, moist, poorly graded SAND (SP), trace gravel, poorly graded fine sand, coarse subangular gravel	5	90	5	2.0': Infiltration test. Moisture content below impacted.
3					
4	(3.6-3.8'): Loose, moist, dark brown, silty GRAVEL with sand (GM), well graded subround to round gravel	60	20	20	3.8-4.0': Collect sample TP-5-061522-03.8-04.0 at 13:00
5	(3.8-5.3'): Loose moist, dark brown, well graded GRAVEL with sand (GW), subround to round gravels, well graded fine to medium sand	75	24	1	
6	(5.3-5.8'): Loose moist, dark gray, well graded GRAVEL with sand, subround to round gravels, little boulders, poorly graded coarse sand	80	20	<1	5.8': Infiltration test. Moisture content below impacted.
7					
8					
9					
10					
11					
12					
13					
14					
15					



<b>CLIENT/PROJECT:</b>	Umatilla Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 555 feet WGS84	
<b>TEST PIT LOCATION:</b>	OMD Camp Umatilla	<b>TOTAL DEPTH (ft):</b> 12.2	<b>DATE STARTED:</b> 6/17/2022
<b>EXCAVATION CONTRACTOR:</b>	Columbia River Services	<b>LOGGED BY:</b> M. Thomas	<b>DATE FINISHED:</b> 6/17/2022
<b>SAMPLING METHOD:</b>	Grab		
<b>EXCAVATION METHOD:</b>	36-inch bucket		

DEPTH (feet)	Soil Description Soil Name, USCS Group Symbol, Color, Moisture, Relative Density/Consistency, Soil Structure, Mineralogy	% GRAVEL	% SAND	% SILT	Comments
0	(0.0-3.7'): Loose, dark brown, moist, poorly graded SAND (SP), trace gravel subround to round (< 2-in), very fine to fine sand	1.5	91.1	7.4	2.1': Infiltration test 2.1-2.2': Collect sample TP-6-061722-02.1-02.2 at 10:45
1					
2	(3.7-5.0'): Loose, dark brown, moist, silty GRAVEL with sand (GM), poorly graded very fine to fine sand, well graded gravel, little cobbles (< 5-in)	45	40	15	
3					
4	(5.0-8.8'): Loose, light brown to gray, moist, well graded GRAVEL with sand (GW), very fine to coarse well graded sand, well graded subround to round gravel, some cobbles (< 6-in), trace fine boulders	80	15	<5	
5					
6	(8.8-12.2'): Loose, gray to light brown, moist, well graded GRAVEL (GW), fine to medium poorly graded sand, well graded subround to round gravel, little subround to round cobbles (< 8-in) , trace boulders (< 18-in)	85	10	5	9.5-10.0': Collect sample TP-6-061722-09.5-10.0 at 15:30 10.0': Infiltration test. Moisture content beneath impacted.
7					
8					
9					
10					
11					
12					
13					
14					
15					



<b>CLIENT/PROJECT:</b>	Umatilla Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 564 feet WGS84	
<b>TEST PIT LOCATION:</b>	OMD Camp Umatilla	<b>TOTAL DEPTH (ft):</b> 14	<b>DATE STARTED:</b> 6/16/2022
<b>EXCAVATION CONTRACTOR:</b>	Columbia River Services	<b>LOGGED BY:</b> M. Thomas	<b>DATE FINISHED:</b> 6/16/2022
<b>SAMPLING METHOD:</b>	Grab		
<b>EXCAVATION METHOD:</b>	36-inch bucket		

DEPTH (feet)	Soil Description Soil Name, USCS Group Symbol, Color, Moisture, Relative Density/Consistency, Soil Structure, Mineralogy	% GRAVEL	% SAND	% SILT	Comments
0	(0.0-2.2'): Loose, dark brown, moist, poorly graded SAND (SP), trace gravel subround to round (< 2-in), poorly graded fine sand	<1	95	5	6.7': Infiltration test. Moisture content below impacted. Collect TP-7-061622-06.7-07.0 at 14:00
1					
2	(2.2-2.8'): Loose, dark brown, moist, silty SAND with gravel (SM), poorly graded very fine to fine sand, well graded gravel subround to round	30	40	30	
3	(2.8-3.75'): Loose, dark brown, moist, well graded GRAVEL with silt and sand (GW-GM), very fine to fine poorly graded sand, well graded gravels to cobbles (< 10-in)	75	15	10	
4	(3.75-5.08'): Loose dark brown to gray, moist, well graded GRAVEL with sand (GW), very fine to coarse sand, well graded subround to round gravel, some cobbles (< 8-in)	80	15	<5	
5	(5.08-6.42'): Loose, gray to light brown, well graded GRAVEL (GW), very fine to fine poorly graded sand, well graded subround to round gravel, well graded subround to round cobbles, little boulders (< 20-in)	90	<5	5	
6	(6.42-14.0'): Loose, moist, light gray to gray, well graded GRAVEL (GW), coarse to very coarse sand, well graded subround to round gravel, little well graded subround to round cobbles, trace boulders (< 30-in)	90	10	<1	
7					
8					
9					
10					
11					
12					
13					
14					
15					



<b>CLIENT/PROJECT:</b>	Umatilla Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 560 feet WGS84	
<b>TEST PIT LOCATION:</b>	OMD Camp Umatilla	<b>TOTAL DEPTH (ft):</b> 4.1	<b>DATE STARTED:</b> 6/15/2022
<b>EXCAVATION CONTRACTOR:</b>	Columbia River Services	<b>LOGGED BY:</b> M. Thomas	<b>DATE FINISHED:</b> 6/15/2022
<b>SAMPLING METHOD:</b>	Grab		
<b>EXCAVATION METHOD:</b>	36-inch bucket		

DEPTH (feet)	Soil Description Soil Name, USCS Group Symbol, Color, Moisture, Relative Density/Consistency, Soil Structure, Mineralogy	% GRAVEL	% SAND	% SILT	Comments
0					
1	(0.0-3.0'): Loose, dark brown, moist, poorly graded SAND with SILT (SP-SM), trace gravel, poorly graded fine sand, trace roots	8.7	78.2	13.1	1.5-2.0': Collect TP-8-061522-01.5-02.0 at 09:30
2					
3	(3.0-3.5'): Loose, moist, dark brown, silty GRAVEL with sand (GM), well graded subround to round gravel (< 5-in)	60	20	20	2.0': Infiltration test. Moisture content below impacted.
4	(3.5-4.1'): Loose moist, dark brown, well graded GRAVEL with silt and sand (GW-GM), well graded subrounded to rounded gravel (< 5-in)	75	15	10	3.5': Infiltration test. Moisture content below impacted.
5					3.5-4.0': Collect TP-8-061522-03.5-04.0 at 09:30
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					



<b>CLIENT/PROJECT:</b>	Umatilla Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 554 feet WGS84	
<b>TEST PIT LOCATION:</b>	OMD Camp Umatilla	<b>TOTAL DEPTH (ft):</b> 12	<b>DATE STARTED:</b> 6/17/2022
<b>EXCAVATION CONTRACTOR:</b>	Columbia River Services	<b>LOGGED BY:</b> M. Thomas	<b>DATE FINISHED:</b> 6/17/2022
<b>SAMPLING METHOD:</b>	Grab		
<b>EXCAVATION METHOD:</b>	36-inch bucket		

DEPTH (feet)	Soil Description Soil Name, USCS Group Symbol, Color, Moisture, Relative Density/Consistency, Soil Structure, Mineralogy	% GRAVEL	% SAND	% SILT	Comments
0					
1	(0.0-3.2'): Loose, dark brown, moist, poorly graded SAND (SP), trace gravel subround to round (< 3-in), poorly graded fine sand	<1	95	5	1.7': Infiltration test
2					
3					
4	(3.2-3.9'): Loose, dark brown, moist, silty SAND with gravel (SM), poorly graded very fine to fine sand, poorly graded coarse gravel	30	50	20	
5					
6	Loose, dark brown to gray, moist, well graded GRAVEL with sand (GW), very fine to coarse well graded sand, well graded subround to round gravel, some cobbles (< 5-in), trace cobbles (< 16-in)	80	15	<5	
7					
8					8.0-8.5': Collect TP-9-061722-08.0-08.5 at 14:00
9					
10	(7.75-12.0'): Loose, gray to light brown, well graded GRAVEL (GW), very fine to fine poorly graded sand, well graded subround to round gravel, well graded cobbles (< 9-in)	90	<5	5	9.7': Infiltration test. Moisture content below impacted.
11					
12					
13					
14					
15					

**ATTACHMENT C**

Test Pit Photolog

# Test Pit Soil Photologs

Umatilla Army Depot AR Project,  
Phase I Subsurface  
Characterization



# TP-1 0.0-2.25 ft bgs



# TP-1 2.25-2.5 ft bgs



# TP-1 2.5-3.8 ft bgs



# TP-1 3.8-4.6 ft bgs



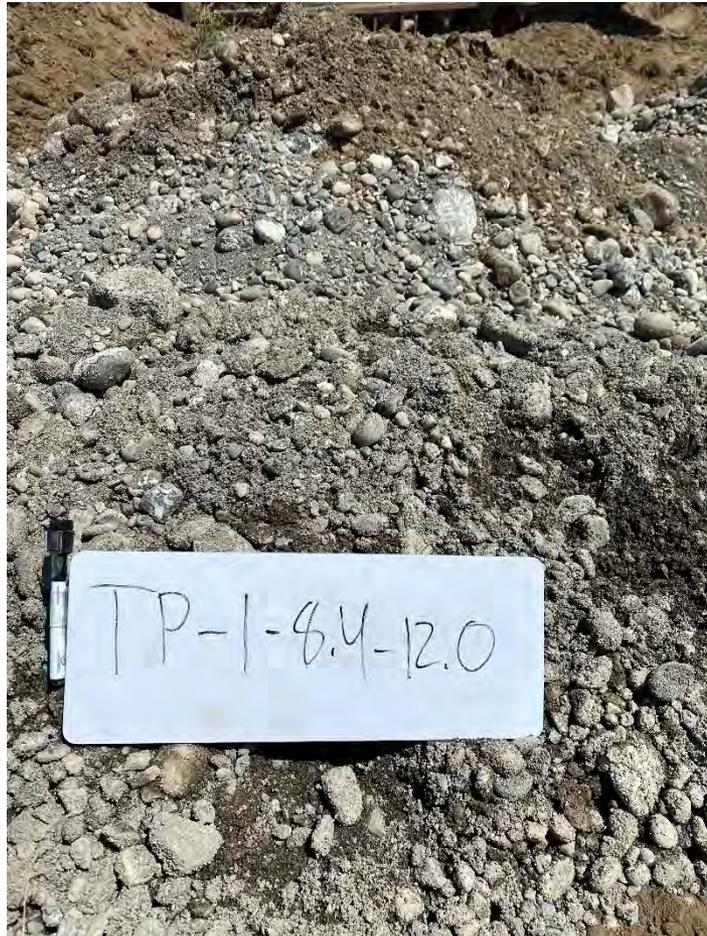
# TP-1 4.6-7.0 ft bgs

- No recovery

# TP-1 7.0-8.4 ft bgs



# TP-1 8.4-12.0 ft bgs



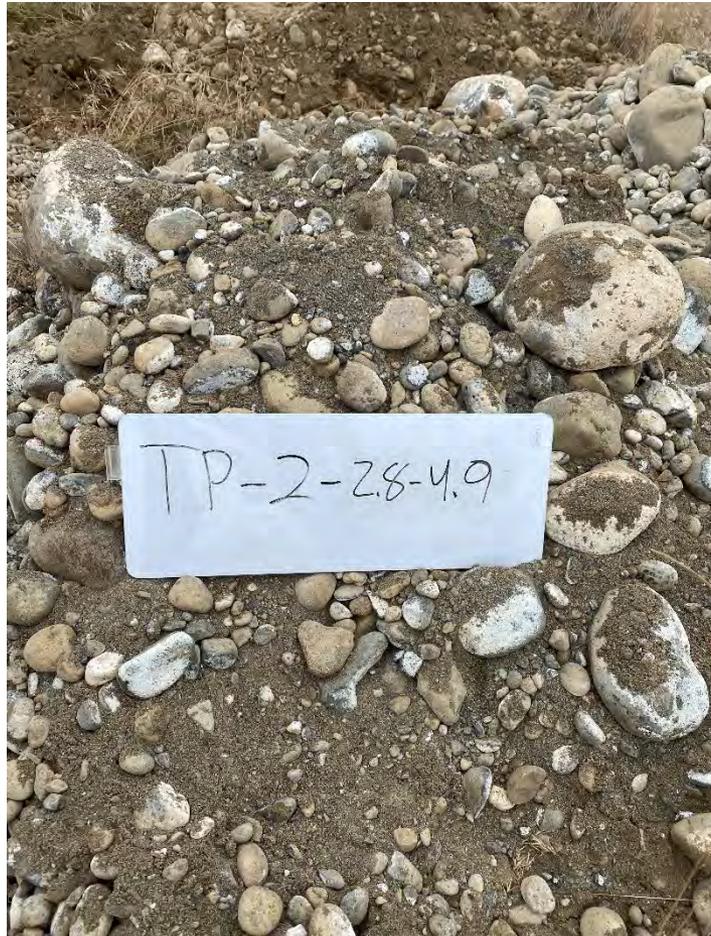
# TP-2 0.0-1.9 ft bgs



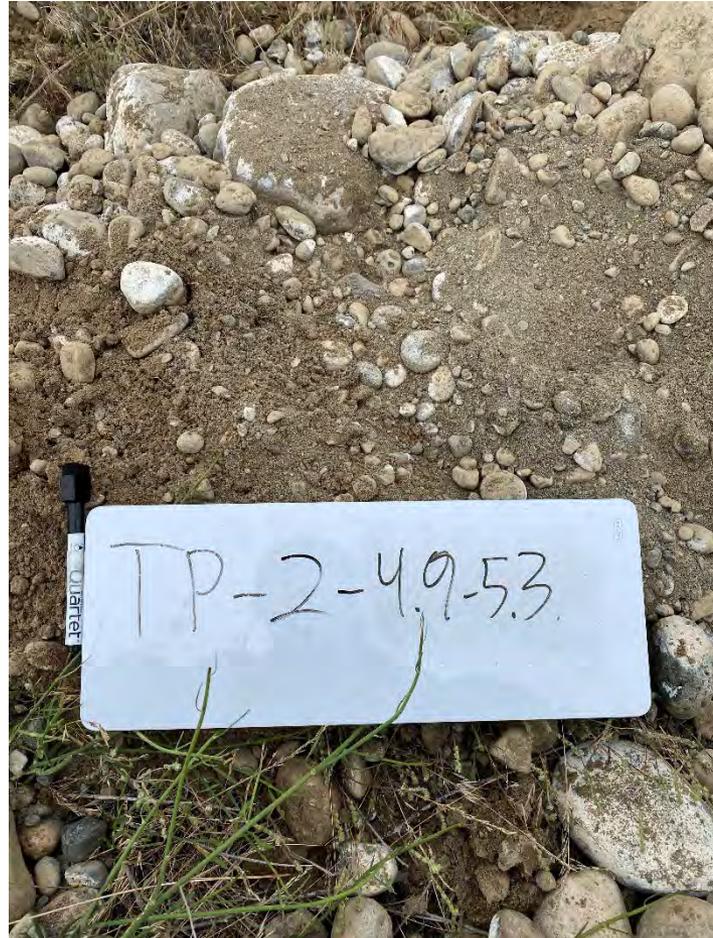
# TP-2 1.9-2.8 ft bgs



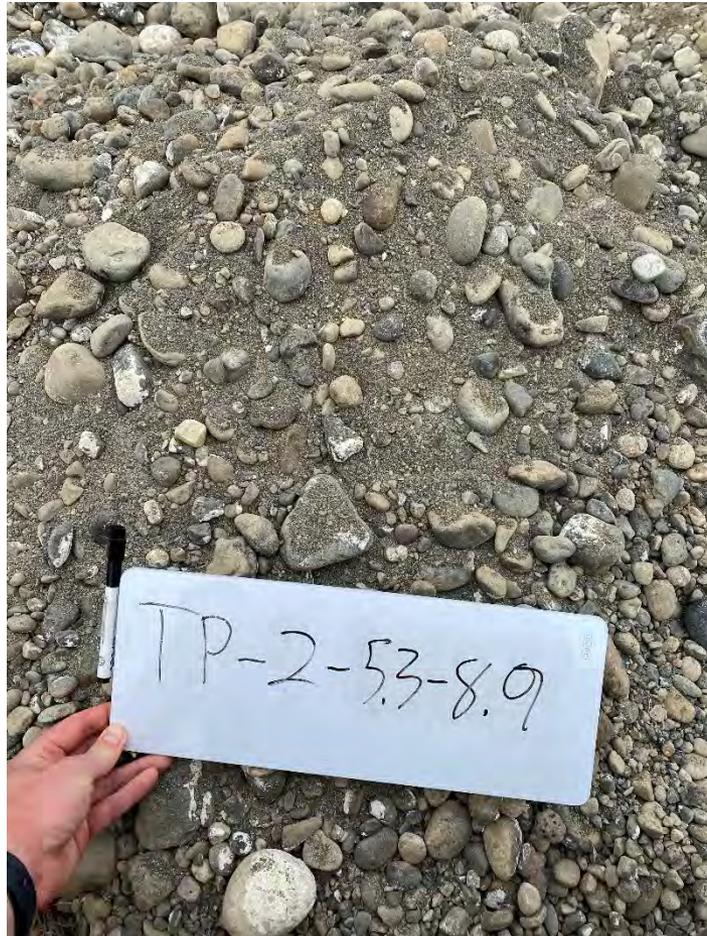
# TP-2 2.8-4.9 ft bgs



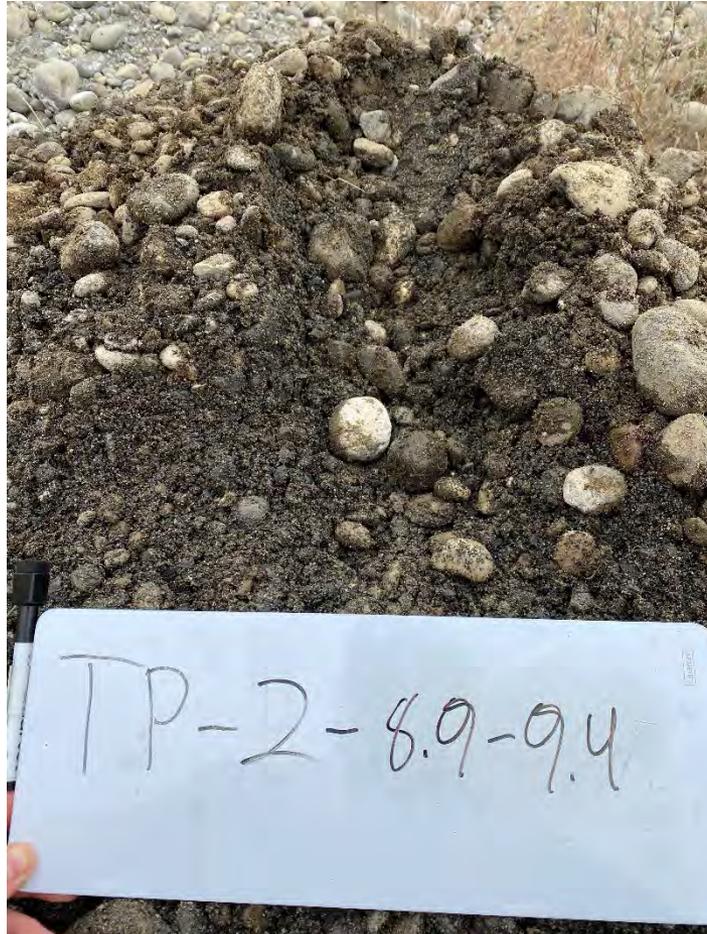
# TP-2 4.9-5.3 ft bgs



# TP-2 5.3-8.9 ft bgs



# TP-2 8.9-9.4 ft bgs



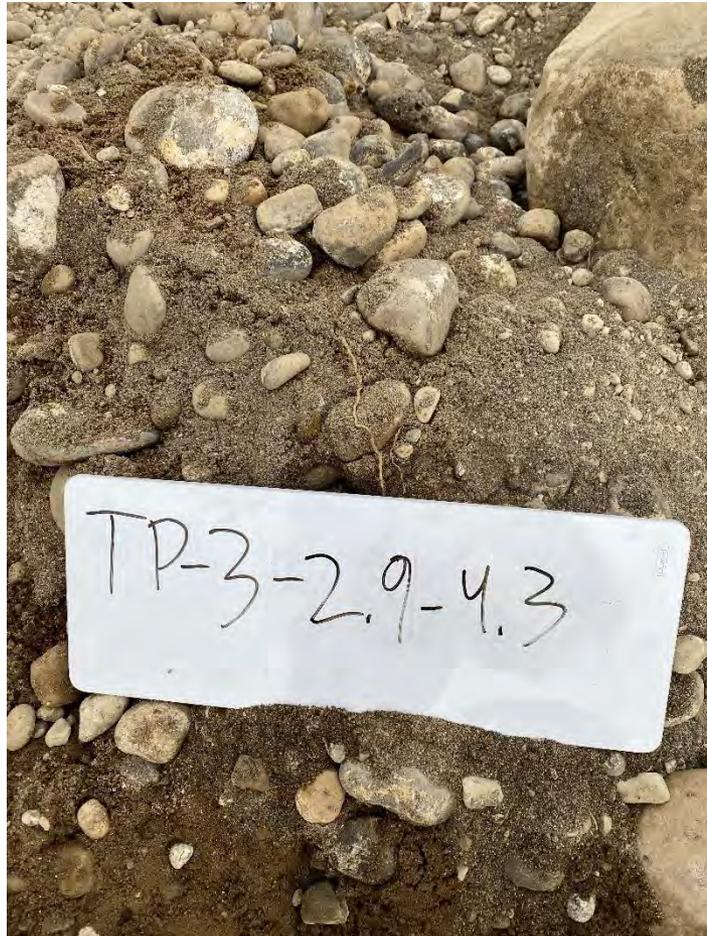
# TP-3 0.0-2.4 ft bgs



# TP-3 2.4-2.9 ft bgs



# TP-3 2.9-4.3 ft bgs



# TP-3 4.3-6.2 ft bgs



# TP-3 6.2-6.7 ft bgs



# TP-3 6.7-8.0 ft bgs



# TP-4 0.0-2.8 ft bgs



# TP-4 2.8-3.3 ft bgs



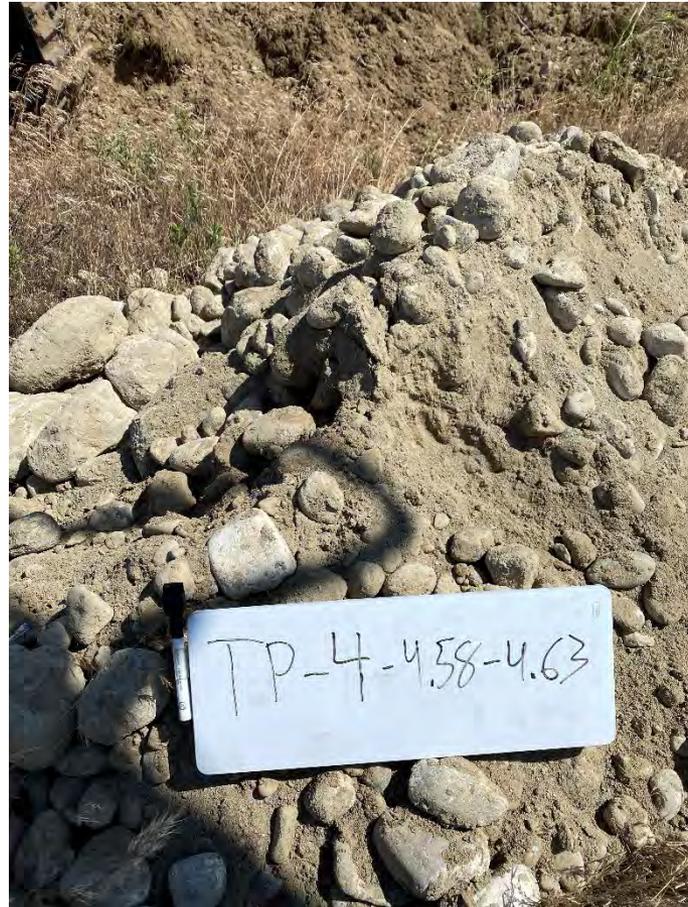
# TP-4 3.3-3.8 ft bgs



# TP-4 3.8-4.6 ft bgs



# TP-4 4.58-4.63 ft bgs



# TP-4 4.47-11.5 ft bgs



# TP-5 0.0-3.6 ft bgs



# TP-5 3.6-3.8 ft bgs



# TP-5 3.8-5.3 ft bgs



# TP-5 3.8-5.3 ft bgs



# TP-6 0.0-3.7 ft bgs



# TP-6 3.7-5.0 ft bgs



# TP-6 5.0-8.8 ft bgs



# TP-6 8.8-12.2 ft bgs



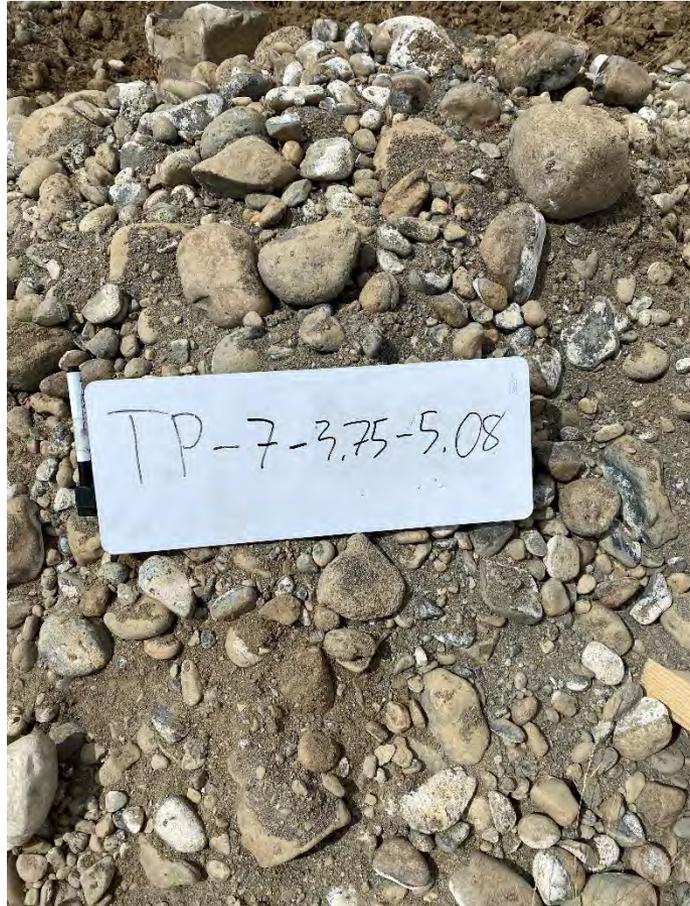
# TP-7 0.0-2.2 ft bgs



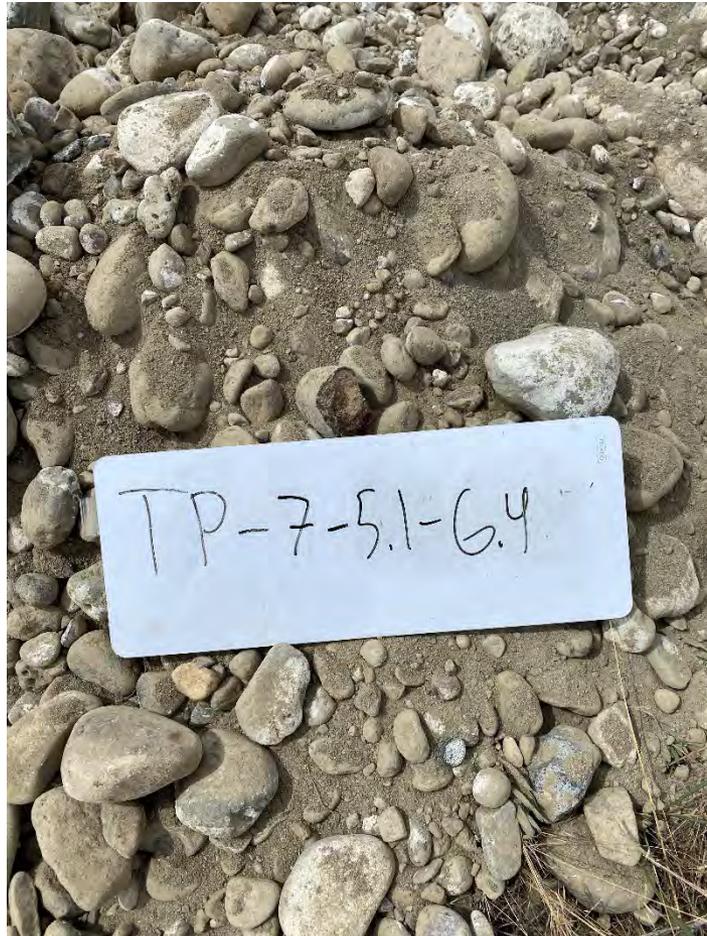
# TP-7 2.2-3.8 ft bgs



# TP-7 3.75-5.08 ft bgs



# TP-7 5.1-6.4 ft bgs



# TP-7 6.42-14.0 ft bgs



# TP-8 0.0-2.0 ft bgs



# TP-8 3.0-3.5 ft bgs



# TP-8 3.5-4.0 ft bgs



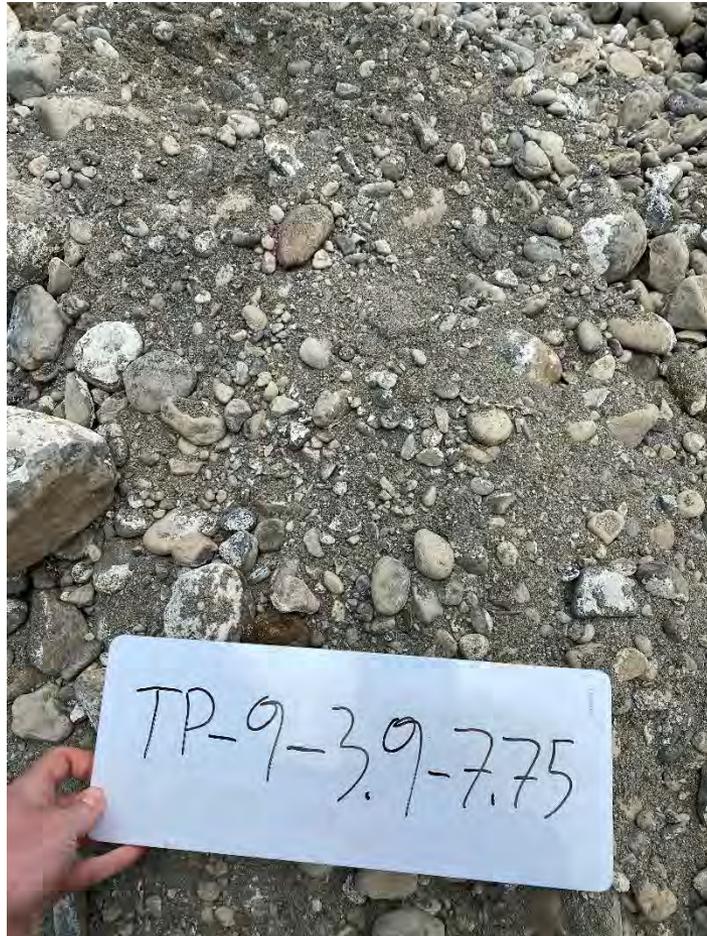
# TP-9 0.0-3.2 ft bgs



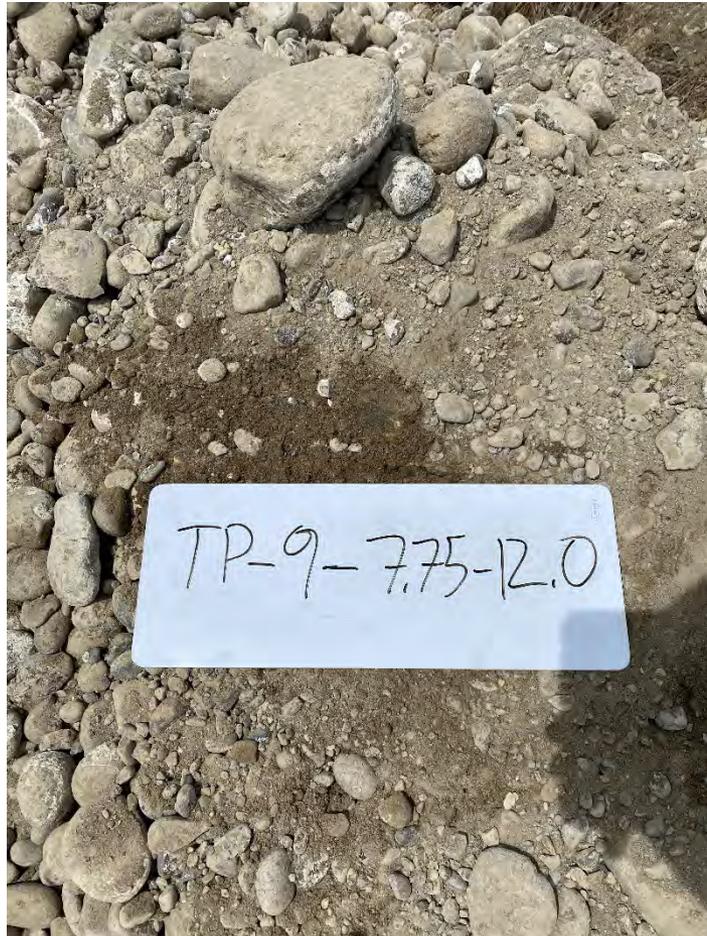
# TP-9 3.2-3.9 ft bgs



# TP-9 3.9-7.75 ft bgs



# TP-9 7.75-12.0 ft bgs



## ATTACHMENT D

Soil Quality and Physical Parameters

**Table D.1.**  
**Soil Quality**  
 Umatilla Army Depot

Sample Name Date Sample Point	Background Concentration	Unit	TP-1-061622-	TP-5-061522-	TP-8-061522-
			5.0-5.5	3.8-4	3.5-4
			6/16/2022	6/15/2022	6/15/2022
			TP-1	TP-5	TP-8
			Result		
<b>General Chemistry</b>					
Nitrate + Nitrite as N	-	ppm	<b>0.66</b>	<b>0.09 J</b>	<0.08
<b>Metals</b>					
Aluminum	-	ppm	<b>6640</b>	<b>7340</b>	<b>6760</b>
Antimony	1.3	ppm	<b>0.134</b>	<b>0.19</b>	<b>0.113</b>
Arsenic	6.8	ppm	<b>4.26</b>	<b>3.82</b>	<b>3.13</b>
Barium	700	ppm	<b>82</b>	<b>91.6</b>	<b>88.6</b>
Beryllium	2.6	ppm	<b>0.347</b>	<b>0.39</b>	<b>0.37</b>
Cadmium	0.4	ppm	<b>0.103</b>	<b>0.103</b>	<b>0.09</b>
Chromium	170	ppm	<b>7.69</b>	<b>9.01</b>	<b>7.41</b>
Cobalt	43	ppm	<b>9.58</b>	<b>9.87</b>	<b>9.29</b>
Copper	29	ppm	<b>18.3</b>	<b>16.4</b>	<b>16.5</b>
Lead	18	ppm	<b>5.62</b>	<b>6.56</b>	<b>5.34</b>
Manganese	1,300	ppm	<b>373</b>	<b>411</b>	<b>404</b>
Mercury	0.04	ppm	<b>0.005 J</b>	<b>0.011 J</b>	<b>0.004 J</b>
Nickel	78	ppm	<b>10.6</b>	<b>10.5</b>	<b>9.25</b>
Potassium	-	ppm	<b>1100</b>	<b>1460</b>	<b>1120</b>
Selenium	0.46	ppm	<b>0.2 J</b>	<b>0.2 J</b>	<b>0.18 J</b>
Silver	0.82	ppm	<b>0.051</b>	<b>0.053</b>	<b>0.048</b>
Thallium	4.6	ppm	<b>0.099</b>	<b>0.124</b>	<b>0.095</b>
Zinc	130	ppm	<b>47.4</b>	<b>48.5</b>	<b>46.6</b>
<b>Polychlorinated Biphenyls (PCBs)</b>					
Aroclor 1016	NA	ppb	<0.52	<0.56	<0.55
Aroclor 1221	NA	ppb	<0.52	<0.56	<0.55
Aroclor 1232	NA	ppb	<0.52	<0.56	<0.55
Aroclor 1242	NA	ppb	<0.52	<0.56	<0.55
Aroclor 1248	NA	ppb	<0.52	<0.56	<0.55
Aroclor 1254	NA	ppb	<0.52	<0.56	<0.55
Aroclor 1260	NA	ppb	<0.52	<0.56	<0.55
<b>Volatile Organic Compounds (VOCs)</b>					
Acetone	NA	ppb	<b>55</b>	<b>25</b>	<b>20</b>
Benzene	NA	ppb	<0.059	<0.054	<0.054
Bromobenzene	NA	ppb	<0.095	<0.088	<0.088
Bromochloromethane	NA	ppb	<0.26	<0.24	<0.24
Bromodichloromethane	NA	ppb	<0.18	<0.16	<0.16
Bromoform	NA	ppb	<0.16	<0.14	<0.14
Bromomethane	NA	ppb	<0.22	<0.2	<0.2
2-Butanone (MEK)	NA	ppb	<b>4.5 J</b>	<b>1.8 J</b>	<b>1.9 J</b>
n-Butylbenzene	NA	ppb	<0.075	<0.069	<0.069
sec-Butylbenzene	NA	ppb	<0.08	<0.074	<0.074
tert-Butylbenzene	NA	ppb	<0.16	<0.14	<0.14
Carbon Disulfide	NA	ppb	<b>0.53 J</b>	<b>0.29 J</b>	<b>0.26 J</b>
Carbon Tetrachloride	NA	ppb	<0.11	<0.094	<0.094
Chlorobenzene	NA	ppb	<0.071	<0.065	<0.065
Chloroethane	NA	ppb	<0.8	<0.74	<0.74
Chloroform	NA	ppb	<0.12	<0.11	<0.11
Chloromethane	NA	ppb	<0.2	<0.18	<0.18
2-Chlorotoluene	NA	ppb	<0.13	<0.12	<0.12
4-Chlorotoluene	NA	ppb	<0.095	<0.088	<0.088
1,2-Dibromo-3-chloropropane	NA	ppb	<0.44	<0.4	<0.4
Dibromochloromethane	NA	ppb	<0.2	<0.18	<0.18
1,2-Dibromoethane (EDB)	NA	ppb	<0.11	<0.094	<0.094
Dibromomethane	NA	ppb	<0.31	<0.28	<0.28
1,2-Dichlorobenzene	NA	ppb	<0.084	<0.077	<0.077
1,3-Dichlorobenzene	NA	ppb	<0.11	<0.094	<0.094
1,4-Dichlorobenzene	NA	ppb	<0.093	<0.086	<0.086
Dichlorodifluoromethane	NA	ppb	<0.13	<0.12	<0.12
1,1-Dichloroethane	NA	ppb	<0.13	<0.12	<0.12
1,2-Dichloroethane (EDC)	NA	ppb	<0.076	<0.07	<0.07
1,1-Dichloroethene	NA	ppb	<0.27	<0.25	<0.25
cis-1,2-Dichloroethene	NA	ppb	<0.13	<0.12	<0.12
trans-1,2-Dichloroethene	NA	ppb	<0.13	<0.12	<0.12
1,2-Dichloropropane	NA	ppb	<0.15	<0.13	<0.13
1,3-Dichloropropane	NA	ppb	<0.13	<0.12	<0.12
2,2-Dichloropropane	NA	ppb	<0.11	<0.098	<0.098
1,1-Dichloropropene	NA	ppb	<0.15	<0.13	<0.13
cis-1,3-Dichloropropene	NA	ppb	<0.15	<0.13	<0.13
trans-1,3-Dichloropropene	NA	ppb	<0.12	<0.11	<0.11
Ethylbenzene	NA	ppb	<0.11	<0.094	<0.094
Hexachlorobutadiene	NA	ppb	<0.44	<0.4	<0.4
2-Hexanone	NA	ppb	<1.1	<0.93	<0.93
Isopropylbenzene	NA	ppb	<0.088	<0.081	<0.081
4-Isopropyltoluene	NA	ppb	<0.07	<b>0.33 J</b>	<0.064
4-Methyl-2-pentanone (MIBK)	NA	ppb	<2	<1.8	<1.8
Methylene Chloride	NA	ppb	<b>0.92 J</b>	<b>0.74 J</b>	<b>0.76 J</b>
Naphthalene	NA	ppb	<0.15	<0.13	<0.13
n-Propylbenzene	NA	ppb	<0.15	<0.13	<0.13
Styrene	NA	ppb	<0.16	<0.14	<0.14
1,1,1,2-Tetrachloroethane	NA	ppb	<0.12	<0.11	<0.11
1,1,2,2-Tetrachloroethane	NA	ppb	<0.15	<0.13	<0.13
Tetrachloroethene (PCE)	NA	ppb	<0.18	<0.16	<0.16

**Table D.1.**  
**Soil Quality**  
Umatilla Army Depot

Sample Name Date Sample Point	Background Concentration	Unit	TP-1-061622-	TP-5-061522-	TP-8-061522-
			5.0-5.5	3.8-4	3.5-4
			6/16/2022	6/15/2022	6/15/2022
			TP-1	TP-5	TP-8
			Result		
Toluene	NA	ppb	<0.17	<b>0.60 J</b>	<0.15
1,2,3-Trichlorobenzene	NA	ppb	<0.21	<0.19	<0.19
1,2,4-Trichlorobenzene	NA	ppb	<0.15	<0.13	<0.13
1,1,2-Trichloroethane	NA	ppb	<0.17	<0.15	<0.15
1,1,1-Trichloroethane (TCA)	NA	ppb	<0.12	<0.11	<0.11
Trichloroethene (TCE)	NA	ppb	<0.17	<0.15	<0.15
Trichlorofluoromethane (CFC 11)	NA	ppb	<0.092	<0.085	<0.085
1,2,3-Trichloropropane	NA	ppb	<0.49	<0.45	<0.45
1,2,4-Trimethylbenzene	NA	ppb	<0.059	<0.054	<0.054
1,3,5-Trimethylbenzene	NA	ppb	<0.1	<0.092	<0.092
Vinyl Chloride	NA	ppb	<0.2	<0.18	<0.18
o-Xylene	NA	ppb	<0.088	<0.081	<0.081
m,p-Xylenes	NA	ppb	<0.11	<0.1	<0.1
<b>Semi-Volatile Organic Compounds (SVOCs)</b>					
Acenaphthene	NA	ppm	<0.0097	<0.011	<0.011
Acenaphthylene	NA	ppm	<0.0074	<0.0079	<0.0078
Aniline	NA	ppm	<0.013	<0.014	<0.014
Anthracene	NA	ppm	<0.009	<0.0095	<0.0095
Benz(a)anthracene	NA	ppm	<0.0095	<0.011	<0.01
Benzo(b)fluoranthene	NA	ppm	<0.013	<0.014	<0.014
Benzo(k)fluoranthene	NA	ppm	<0.015	<0.016	<0.016
Benzoic Acid	NA	ppm	<0.15	<0.16	<0.16
Benzo(g,h,i)perylene	NA	ppm	<0.012	<0.013	<0.013
Benzo(a)pyrene	NA	ppm	<0.017	<0.018	<0.018
Benzyl Alcohol	NA	ppm	<0.0077	<0.0081	<0.0081
Bis(2-chloroethyl) Ether	NA	ppm	<0.0086	<0.0091	<0.0091
Bis(2-ethylhexyl) Phthalate	NA	ppm	<0.0074	<0.0079	<0.0078
Bis(2-chloroethoxy)methane	NA	ppm	<0.0098	<0.011	<0.011
4-Bromophenyl Phenyl Ether	NA	ppm	<0.014	<0.015	<0.015
Butyl Benzyl Phthalate	NA	ppm	<0.016	<0.017	<0.017
4-Chloro-3-methylphenol	NA	ppm	<0.17	<0.18	<0.18
4-Chloroaniline	NA	ppm	<0.0073	<0.0078	<0.0077
2-Chloronaphthalene	NA	ppm	<0.011	<0.012	<0.011
2-Chlorophenol	NA	ppm	<0.009	<0.0095	<0.0095
4-Chlorophenyl Phenyl Ether	NA	ppm	<0.0089	<0.0094	<0.0094
Chrysene	NA	ppm	<0.015	<0.016	<0.016
Di-n-butyl Phthalate	NA	ppm	<0.016	<0.017	<0.017
Di-n-octyl Phthalate	NA	ppm	<0.011	<0.012	<0.011
Dibenz(a,h)anthracene	NA	ppm	<0.015	<0.016	<0.016
Dibenzofuran	NA	ppm	<0.011	<0.011	<0.011
1,2-Dichlorobenzene	NA	ppm	<0.0082	<0.0087	<0.0086
1,3-Dichlorobenzene	NA	ppm	<0.0088	<0.0093	<0.0093
1,4-Dichlorobenzene	NA	ppm	<0.0087	<0.0092	<0.0092
3,3'-Dichlorobenzidine	NA	ppm	<0.029	<0.03	<0.03
2,4-Dichlorophenol	NA	ppm	<0.0081	<0.0085	<0.0085
Diethyl Phthalate	NA	ppm	<b>0.015 J</b>	<b>0.017 J</b>	<b>0.014 J</b>
Dimethyl Phthalate	NA	ppm	<0.008	<0.0084	<0.0084
2,4-Dimethylphenol	NA	ppm	<0.038	<0.04	<0.04
2,4-Dinitrophenol	NA	ppm	<0.15	<0.16	<0.16
2,4-Dinitrotoluene	NA	ppm	<0.016	<0.017	<0.017
2,6-Dinitrotoluene	NA	ppm	<0.0077	<0.0081	<0.0081
Fluoranthene	NA	ppm	<0.013	<0.014	<0.014
Fluorene	NA	ppm	<0.014	<0.015	<0.015
Hexachlorobenzene	NA	ppm	<0.017	<0.018	<0.018
Hexachlorobutadiene	NA	ppm	<0.012	<0.013	<0.013
Hexachlorocyclopentadiene	NA	ppm	<0.025	<0.027	<0.027
Hexachloroethane	NA	ppm	<0.0083	<0.0088	<0.0087
Indeno(1,2,3-cd)pyrene	NA	ppm	<0.012	<0.013	<0.013
Isophorone	NA	ppm	<0.012	<0.013	<0.013
2-Methyl-4,6-dinitrophenol	NA	ppm	<0.034	<0.036	<0.036
2-Methylnaphthalene	NA	ppm	<0.012	<0.013	<0.013
2-Methylphenol	NA	ppm	<0.016	<0.017	<0.017
4-Methylphenol	NA	ppm	<0.011	<0.012	<0.011
Naphthalene	NA	ppm	<0.012	<0.013	<0.013
2-Nitroaniline	NA	ppm	<0.044	<0.047	<0.047
3-Nitroaniline	NA	ppm	<0.0083	<0.0088	<0.0087
4-Nitroaniline	NA	ppm	<0.011	<0.011	<0.011
Nitrobenzene	NA	ppm	<0.012	<0.013	<0.013
2-Nitrophenol	NA	ppm	<0.015	<0.016	<0.016
4-Nitrophenol	NA	ppm	<0.052	<0.055	<0.054
N-Nitrosodi-n-propylamine	NA	ppm	<0.012	<0.013	<0.013
N-Nitrosodimethylamine	NA	ppm	<0.32	<0.34	<0.33
N-Nitrosodiphenylamine	NA	ppm	<0.0079	<0.0083	<0.0083
2,2'-Oxybis(1-chloropropane)	NA	ppm	<0.0083	<0.0088	<0.0087
Pentachlorophenol	NA	ppm	<0.066	<0.07	<0.07
Phenanthrene	NA	ppm	<0.012	<0.013	<0.013
Phenol	NA	ppm	<0.02	<0.021	<0.021
Pyrene	NA	ppm	<0.01	<0.011	<0.011
1,2,4-Trichlorobenzene	NA	ppm	<0.012	<0.013	<0.013
2,4,5-Trichlorophenol	NA	ppm	<0.0087	<0.0092	<0.0092
2,4,6-Trichlorophenol	NA	ppm	<0.015	<0.016	<0.016

**Table D.1.**  
**Soil Quality**  
 Umatilla Army Depot

Sample Name Date Sample Point	Background Concentration	Unit	TP-1-061622-	TP-5-061522-	TP-8-061522-
			5.0-5.5	3.8-4	3.5-4
			6/16/2022	6/15/2022	6/15/2022
			TP-1	TP-5	TP-8
	Background Concentration	Unit	Result		
<b>Explosives</b>					
1,3,5-Trinitrobenzene	NA	ppm	<0.20	<0.20	<0.20
1,3-Dinitrobenzene	NA	ppm	<0.15	<0.15	<0.15
2,4,6-Trinitrotoluene	NA	ppm	<0.15	<0.15	<0.15
2,4-Dinitrotoluene	NA	ppm	<0.15	<0.15	<0.15
2,6-Dinitrotoluene	NA	ppm	<0.15	<0.15	<0.15
HMX	NA	ppm	<0.15	<0.15	<0.15
Nitrobenzene	NA	ppm	<0.15	<0.15	<0.15
RDX	NA	ppm	<0.15	<0.15	<0.15
Tetryl	NA	ppm	<0.15	<0.15	<0.15
<b>Pesticides</b>					
2,6-Dichlorobenzamide	NA	ppm	<0.0067	<0.0067	<0.0067
3-Hydroxycarbofuran	NA	ppm	<0.0067	<0.0067	<0.0067
Abamectin	NA	ppm	<0.0067	<0.0067	<0.0067
a-BHC	NA	ppm	<0.0067	<0.0067	<0.0067
Acephate	NA	ppm	<0.0067	<0.0067	<0.0067
Acetamiprid	NA	ppm	<0.0067	<0.0067	<0.0067
Acetochlor	NA	ppm	<0.0067	<0.0067	<0.0067
Acibenzolar-S-methyl	NA	ppm	<0.013	<0.013	<0.013
Afidopyropen	NA	ppm	<0.0067	<0.0067	<0.0067
Alachlor	NA	ppm	<0.0067	<0.0067	<0.0067
Aldicarb	NA	ppm	<0.0067	<0.0067	<0.0067
Aldicarb Sulfone	NA	ppm	<0.0067	<0.0067	<0.0067
Aldicarb Sulfoxide	NA	ppm	<0.0067	<0.0067	<0.0067
Aldrin	NA	ppm	<0.0067	<0.0067	<0.0067
Allethrin	NA	ppm	<0.0067	<0.0067	<0.0067
Ametoctradin	NA	ppm	<0.0067	<0.0067	<0.0067
Ametryn	NA	ppm	<0.0067	<0.0067	<0.0067
Aspon	NA	ppm	<0.0067	<0.0067	<0.0067
Atrazine	NA	ppm	<0.0067	<0.0067	<0.0067
Azinphos-ethyl	NA	ppm	<0.0067	<0.0067	<0.0067
Azinphos-methyl	NA	ppm	<0.013	<0.013	<0.013
Azoxystrobin	NA	ppm	<0.0067	<0.0067	<0.0067
b-BHC	NA	ppm	<0.0067	<0.0067	<0.0067
Bendiocarb	NA	ppm	<0.0067	<0.0067	<0.0067
Benfluralin	NA	ppm	<0.0067	<0.0067	<0.0067
Bensulide	NA	ppm	<0.0067	<0.0067	<0.0067
Bifenthrin	NA	ppm	<0.0067	<0.0067	<0.0067
Bitertanol	NA	ppm	<0.0067	<0.0067	<0.0067
Bolstar	NA	ppm	<0.0067	<0.0067	<0.0067
Boscalid	NA	ppm	<0.0067	<0.0067	<0.0067
Bromacil	NA	ppm	<0.0067	<0.0067	<0.0067
Bromopropylate	NA	ppm	<0.0067	<0.0067	<0.0067
Buprofezin	NA	ppm	<0.0067	<0.0067	<0.0067
Captan	NA	ppm	<0.067	<0.067	<0.067
Carbaryl	NA	ppm	<0.0067	<0.0067	<0.0067
Carbendazim	NA	ppm	<0.0067	<0.0067	<0.0067
Carbofuran	NA	ppm	<0.0067	<0.0067	<0.0067
Carfentrazone-ethyl	NA	ppm	<0.0067	<0.0067	<0.0067
Chlorantraniliprole	NA	ppm	<0.0067	<0.0067	<0.0067
Chlordane	NA	ppm	<0.0067	<0.0067	<0.0067
Chlorfenapyr	NA	ppm	<0.0067	<0.0067	<0.0067
Chlorfenvinphos	NA	ppm	<0.0067	<0.0067	<0.0067
Chlorobenzilate	NA	ppm	<0.0067	<0.0067	<0.0067
Chloroneb	NA	ppm	<0.0067	<0.0067	<0.0067
Chlorpropham	NA	ppm	<0.0067	<0.0067	<0.0067
Chlorpyrifos	NA	ppm	<0.0067	<0.0067	<0.0067
Chlorpyrifos-methyl	NA	ppm	<0.0067	<0.0067	<0.0067
cis-Nonachlor	NA	ppm	<0.0067	<0.0067	<0.0067
Clethodim	NA	ppm	<0.013	<0.013	<0.013
Clomazone	NA	ppm	<0.0067	<0.0067	<0.0067
Clothianidin	NA	ppm	<0.0067	<0.0067	<0.0067
Cyanazine	NA	ppm	<0.0067	<0.0067	<0.0067
Cyantraniliprole	NA	ppm	<0.0067	<0.0067	<0.0067
Cyazofamid	NA	ppm	<0.0067	<0.0067	<0.0067
Cyclaniliprole	NA	ppm	<0.0067	<0.0067	<0.0067
Cycloate	NA	ppm	<0.013	<0.013	<0.013
Cyflufenamid	NA	ppm	<0.0067	<0.0067	<0.0067
Cyflumetofen	NA	ppm	<0.0067	<0.0067	<0.0067
Cyfluthrin	NA	ppm	<0.034	<0.034	<0.034
Cyhalofop-butyl	NA	ppm	<0.013	<0.013	<0.013
Cypermethrin	NA	ppm	<0.034	<0.034	<0.034
Cyprodinil	NA	ppm	<0.0067	<0.0067	<0.0067
Cyprosulfamide	NA	ppm	<0.0067	<0.0067	<0.0067
Dacthal	NA	ppm	<0.0067	<0.0067	<0.0067
d-BHC	NA	ppm	<0.0067	<0.0067	<0.0067
DCPMU	NA	ppm	<0.0067	<0.0067	<0.0067
Deltamethrin	NA	ppm	<0.034	<0.034	<0.034
Demeton	NA	ppm	<0.0067	<0.0067	<0.0067
Diazinon	NA	ppm	<0.0067	<0.0067	<0.0067
Diazoxon	NA	ppm	<0.0067	<0.0067	<0.0067

**Table D.1.**  
**Soil Quality**  
*Umatilla Army Depot*

Sample Name Date Sample Point	Background Concentration	Unit	TP-1-061622-	TP-5-061522-	TP-8-061522-
			5.0-5.5	3.8-4	3.5-4
			6/16/2022	6/15/2022	6/15/2022
			TP-1	TP-5	TP-8
			Result		
Dichlobenil	NA	ppm	<0.0067	<0.0067	<0.0067
Dichlorofenthion	NA	ppm	<0.0067	<0.0067	<0.0067
Dichlorvos	NA	ppm	<0.0067	<0.0067	<0.0067
Diclofop-methyl	NA	ppm	<0.0067	<0.0067	<0.0067
Dicloran	NA	ppm	<0.034	<0.034	<0.034
Dicofol	NA	ppm	<0.0067	<0.0067	<0.0067
Dieldrin	NA	ppm	<0.0067	<0.0067	<0.0067
Difenoconazole	NA	ppm	<0.0067	<0.0067	<0.0067
Diflubenzuron	NA	ppm	<0.0067	<0.0067	<0.0067
Diflufenican	NA	ppm	<0.0067	<0.0067	<0.0067
Dimethenamid	NA	ppm	<0.0067	<0.0067	<0.0067
Dimethoate	NA	ppm	<0.0067	<0.0067	<0.0067
Dimethomorph	NA	ppm	<0.0067	<0.0067	<0.0067
Dinotefuran	NA	ppm	<0.0067	<0.0067	<0.0067
Diphenamid	NA	ppm	<0.0067	<0.0067	<0.0067
Diphenylamine	NA	ppm	<0.0067	<0.0067	<0.0067
Disulfoton	NA	ppm	<0.0067	<0.0067	<0.0067
Disulfoton sulfone	NA	ppm	<0.0067	<0.0067	<0.0067
Dithiopyr	NA	ppm	<0.0067	<0.0067	<0.0067
Diuron	NA	ppm	<0.0067	<0.0067	<0.0067
d-Phenothrin	NA	ppm	<0.0067	<0.0067	<0.0067
Emamectin Benzoate	NA	ppm	<0.0067	<0.0067	<0.0067
Endosulfan I	NA	ppm	<0.013	<0.013	<0.013
Endosulfan II	NA	ppm	<0.013	<0.013	<0.013
Endosulfan sulfate	NA	ppm	<0.013	<0.013	<0.013
Endrin	NA	ppm	<0.0067	<0.0067	<0.0067
Endrin ketone	NA	ppm	<0.0067	<0.0067	<0.0067
EPN	NA	ppm	<0.0067	<0.0067	<0.0067
Esfenvalerate	NA	ppm	<0.0067	<0.0067	<0.0067
Ethalfuralin	NA	ppm	<0.0067	<0.0067	<0.0067
Ethion	NA	ppm	<0.0067	<0.0067	<0.0067
Ethofumesate	NA	ppm	<0.0067	<0.0067	<0.0067
Ethoprop	NA	ppm	<0.0067	<0.0067	<0.0067
Etofenprox	NA	ppm	<0.0067	<0.0067	<0.0067
Etoxazole	NA	ppm	<0.0067	<0.0067	<0.0067
Etridiazole	NA	ppm	<0.0067	<0.0067	<0.0067
Famoxadone	NA	ppm	<0.0067	<0.0067	<0.0067
Famphur	NA	ppm	<0.0067	<0.0067	<0.0067
Fenamidone	NA	ppm	<0.0067	<0.0067	<0.0067
Fenamiphos sulfone	NA	ppm	<0.0067	<0.0067	<0.0067
Fenamiphos sulfoxide	NA	ppm	<0.0067	<0.0067	<0.0067
Fenarimol	NA	ppm	<0.0067	<0.0067	<0.0067
Fenazaquin	NA	ppm	<0.0067	<0.0067	<0.0067
Fenbuconazole	NA	ppm	<0.0067	<0.0067	<0.0067
Fenbutatin oxide	NA	ppm	<0.0067	<0.0067	<0.0067
Fenhexamid	NA	ppm	<0.0067	<0.0067	<0.0067
Fenitrothion	NA	ppm	<0.0067	<0.0067	<0.0067
Fenobucarb	NA	ppm	<0.0067	<0.0067	<0.0067
Fenoxaprop-ethyl	NA	ppm	<0.013	<0.013	<0.013
Fenoxycarb	NA	ppm	<0.0067	<0.0067	<0.0067
Fenpropathrin	NA	ppm	<0.0067	<0.0067	<0.0067
Fenpyroximate	NA	ppm	<0.0067	<0.0067	<0.0067
Fenthion	NA	ppm	<0.0067	<0.0067	<0.0067
Fenuron	NA	ppm	<0.0067	<0.0067	<0.0067
Fenvalerate	NA	ppm	<0.0067	<0.0067	<0.0067
Fipronil	NA	ppm	<0.0067	<0.0067	<0.0067
Flonicamid	NA	ppm	<0.0067	<0.0067	<0.0067
Fluazifop-p-butyl	NA	ppm	<0.013	<0.013	<0.013
Fluazinam	NA	ppm	<0.0067	<0.0067	<0.0067
Flubendiamide	NA	ppm	<0.013	<0.013	<0.013
Fludioxonil	NA	ppm	<0.0067	<0.0067	<0.0067
Flufenacet	NA	ppm	<0.0067	<0.0067	<0.0067
Flumetsulam	NA	ppm	<0.0067	<0.0067	<0.0067
Flumioxazin	NA	ppm	<0.0067	<0.0067	<0.0067
Fluometuron	NA	ppm	<0.0067	<0.0067	<0.0067
Fluopicolide	NA	ppm	<0.0067	<0.0067	<0.0067
Fluopyram	NA	ppm	<0.0067	<0.0067	<0.0067
Fluoxastrobin	NA	ppm	<0.0067	<0.0067	<0.0067
Flupyradifurone	NA	ppm	<0.0067	<0.0067	<0.0067
Fluridone	NA	ppm	<0.0067	<0.0067	<0.0067
Fluroxypyr-meptyl	NA	ppm	<0.013	<0.013	<0.013
Flutianil	NA	ppm	<0.0067	<0.0067	<0.0067
Flutolanil	NA	ppm	<0.0067	<0.0067	<0.0067
Flutriafol	NA	ppm	<0.0067	<0.0067	<0.0067
Fluvalinate	NA	ppm	<0.0067	<0.0067	<0.0067
Fluxapyroxad	NA	ppm	<0.0067	<0.0067	<0.0067
Fonofos	NA	ppm	<0.0067	<0.0067	<0.0067
Fonofos	NA	ppm	<0.013	<0.013	<0.013
g-BHC	NA	ppm	<0.0067	<0.0067	<0.0067
Heptachlor	NA	ppm	<0.0067	<0.0067	<0.0067
Heptachlor epoxide	NA	ppm	<0.0067	<0.0067	<0.0067

**Table D.1.**  
**Soil Quality**  
*Umatilla Army Depot*

Sample Name Date Sample Point	Background Concentration	Unit	TP-1-061622-	TP-5-061522-	TP-8-061522-
			5.0-5.5	3.8-4	3.5-4
			6/16/2022	6/15/2022	6/15/2022
			TP-1	TP-5	TP-8
			Result		
Hexachlorobenzene	NA	ppm	<0.0067	<0.0067	<0.0067
Hexaconazole	NA	ppm	<0.0067	<0.0067	<0.0067
Hexazinone	NA	ppm	<0.0067	<0.0067	<0.0067
Hexythiazox	NA	ppm	<0.0067	<0.0067	<0.0067
Imazalil	NA	ppm	<0.0067	<0.0067	<0.0067
Imidacloprid	NA	ppm	<0.0067	<0.0067	<0.0067
Indaziflam	NA	ppm	<0.0067	<0.0067	<0.0067
Indoxacarb	NA	ppm	<0.0067	<0.0067	<0.0067
Ipconazole	NA	ppm	<0.0067	<0.0067	<0.0067
Iprodione	NA	ppm	<0.034	<0.034	<0.034
Isofetamid	NA	ppm	<0.0067	<0.0067	<0.0067
Isoxaben	NA	ppm	<0.0067	<0.0067	<0.0067
Isoxadifen-ethyl	NA	ppm	<0.0067	<0.0067	<0.0067
Kresoxim-methyl	NA	ppm	<0.0067	<0.0067	<0.0067
Lactofen	NA	ppm	<0.0067	<0.0067	<0.0067
lambda-Cyhalothrin	NA	ppm	<0.013	<0.013	<0.013
Leptophos	NA	ppm	<0.0067	<0.0067	<0.0067
Linuron	NA	ppm	<0.0067	<0.0067	<0.0067
Malaoxon	NA	ppm	<0.0067	<0.0067	<0.0067
Malathion	NA	ppm	<0.0067	<0.0067	<0.0067
Mandipropamid	NA	ppm	<0.0067	<0.0067	<0.0067
Mefenoxam	NA	ppm	<0.0067	<0.0067	<0.0067
Metconazole	NA	ppm	<0.0067	<0.0067	<0.0067
Methamidophos	NA	ppm	<0.034	<0.034	<0.034
Methidathion	NA	ppm	<0.0067	<0.0067	<0.0067
Methiocarb	NA	ppm	<0.0067	<0.0067	<0.0067
Methomyl	NA	ppm	<0.0067	<0.0067	<0.0067
Methoxychlor	NA	ppm	<0.0067	<0.0067	<0.0067
Methoxyfenozide	NA	ppm	<0.0067	<0.0067	<0.0067
Metolachlor	NA	ppm	<0.0067	<0.0067	<0.0067
Metrafenone	NA	ppm	<0.0067	<0.0067	<0.0067
Metribuzin	NA	ppm	<0.0067	<0.0067	<0.0067
Mevinphos	NA	ppm	<0.0067	<0.0067	<0.0067
MGK-264	NA	ppm	<0.0067	<0.0067	<0.0067
Monuron	NA	ppm	<0.0067	<0.0067	<0.0067
Myclobutanil	NA	ppm	<0.0067	<0.0067	<0.0067
Napropamide	NA	ppm	<0.0067	<0.0067	<0.0067
Neburon	NA	ppm	<0.0067	<0.0067	<0.0067
Norflurazon	NA	ppm	<0.0067	<0.0067	<0.0067
Novaluron	NA	ppm	<0.0067	<0.0067	<0.0067
Omethoate	NA	ppm	<0.0067	<0.0067	<0.0067
Oryzalin	NA	ppm	<0.0067	<0.0067	<0.0067
Ovex	NA	ppm	<0.0067	<0.0067	<0.0067
Oxadiazon	NA	ppm	<0.0067	<0.0067	<0.0067
Oxadixyl	NA	ppm	<0.0067	<0.0067	<0.0067
Oxamyl	NA	ppm	<0.0067	<0.0067	<0.0067
Oxydemeton-Methyl	NA	ppm	<0.0067	<0.0067	<0.0067
Oxyfluorfen	NA	ppm	<0.0067	<0.0067	<0.0067
p,p'-DDD	NA	ppm	<0.0067	<0.0067	<0.0067
p,p'-DDE	NA	ppm	<0.0067	<0.0067	<0.0067
p,p'-DDT	NA	ppm	<0.0067	<0.0067	<0.0067
Pacllobutrazol	NA	ppm	<0.0067	<0.0067	<0.0067
Parathion	NA	ppm	<0.0067	<0.0067	<0.0067
Parathion-methyl	NA	ppm	<0.0067	<0.0067	<0.0067
PCA	NA	ppm	<0.0067	<0.0067	<0.0067
PCB	NA	ppm	<0.0067	<0.0067	<0.0067
PCNB	NA	ppm	<0.0067	<0.0067	<0.0067
Pendimethalin	NA	ppm	<0.0067	<0.0067	<0.0067
Penoxsulam	NA	ppm	<0.0067	<0.0067	<0.0067
Pentachlorothioanisole	NA	ppm	<0.0067	<0.0067	<0.0067
Penthiopyrad	NA	ppm	<0.0067	<0.0067	<0.0067
Permethrin	NA	ppm	<0.034	<0.034	<0.034
Phorate	NA	ppm	<0.0067	<0.0067	<0.0067
Phorate Sulfone	NA	ppm	<0.0067	<0.0067	<0.0067
Phorate Sulfoxide	NA	ppm	<0.0067	<0.0067	<0.0067
Phosalone	NA	ppm	<0.0067	<0.0067	<0.0067
Phosmet	NA	ppm	<0.0067	<0.0067	<0.0067
Phosphamidon	NA	ppm	<0.0067	<0.0067	<0.0067
Picoxystrobin	NA	ppm	<0.0067	<0.0067	<0.0067
Piperonyl Butoxide	NA	ppm	<0.0067	<0.0067	<0.0067
Pirimicarb	NA	ppm	<0.0067	<0.0067	<0.0067
Pirimiphos-methyl	NA	ppm	<0.0067	<0.0067	<0.0067
Prallethrin	NA	ppm	<0.0067	<0.0067	<0.0067
Procymidone	NA	ppm	<0.0067	<0.0067	<0.0067
Prodiamine	NA	ppm	<0.0067	<0.0067	<0.0067
Prometon	NA	ppm	<0.0067	<0.0067	<0.0067
Prometryn	NA	ppm	<0.0067	<0.0067	<0.0067
Pronamide	NA	ppm	<0.0067	<0.0067	<0.0067
Propachlor	NA	ppm	<0.0067	<0.0067	<0.0067
Propamocarb	NA	ppm	<0.0067	<0.0067	<0.0067
Propanil	NA	ppm	<0.0067	<0.0067	<0.0067

**Table D.1.**  
**Soil Quality**  
 Umatilla Army Depot

Sample Name Date Sample Point	Background Concentration	Unit	TP-1-061622-	TP-5-061522-	TP-8-061522-
			5.0-5.5	3.8-4	3.5-4
			6/16/2022	6/15/2022	6/15/2022
			TP-1	TP-5	TP-8
			Result		
Propargite	NA	ppm	<0.0067	<0.0067	<0.0067
Propazine	NA	ppm	<0.0067	<0.0067	<0.0067
Propiconazole	NA	ppm	<0.013	<0.013	<0.013
Pyraclostrobin	NA	ppm	<0.0067	<0.0067	<0.0067
Pyraflufen-ethyl	NA	ppm	<0.0067	<0.0067	<0.0067
Pyrethrin	NA	ppm	<0.034	<0.034	<0.034
Pyridaben	NA	ppm	<0.0067	<0.0067	<0.0067
Pyridalyl	NA	ppm	<0.0067	<0.0067	<0.0067
Pyrimethanil	NA	ppm	<0.0067	<0.0067	<0.0067
Pyriproxyfen	NA	ppm	<0.0067	<0.0067	<0.0067
Pyroxasulfone	NA	ppm	<0.0067	<0.0067	<0.0067
Quinoxifen	NA	ppm	<0.0067	<0.0067	<0.0067
Quizalofop-p-ethyl	NA	ppm	<0.0067	<0.0067	<0.0067
Ronnel	NA	ppm	<0.0067	<0.0067	<0.0067
Rotenone	NA	ppm	<0.0067	<0.0067	<0.0067
Saflufenacil	NA	ppm	<0.0067	<0.0067	<0.0067
Sethoxydim	NA	ppm	<0.013	<0.013	<0.013
Siduron	NA	ppm	<0.0067	<0.0067	<0.0067
Simazine	NA	ppm	<0.0067	<0.0067	<0.0067
Simetryn	NA	ppm	<0.0067	<0.0067	<0.0067
Spinetoram	NA	ppm	<0.0067	<0.0067	<0.0067
Spinosad	NA	ppm	<0.0067	<0.0067	<0.0067
Spirodiclofen	NA	ppm	<0.0067	<0.0067	<0.0067
Spiromesifen	NA	ppm	<0.013	<0.013	<0.013
Spirotetramat	NA	ppm	<0.0067	<0.0067	<0.0067
Spiroxamine	NA	ppm	<0.0067	<0.0067	<0.0067
Sulfentrazone	NA	ppm	<0.0067	<0.0067	<0.0067
Sulfotep	NA	ppm	<0.0067	<0.0067	<0.0067
Sulfoxaflor	NA	ppm	<0.0067	<0.0067	<0.0067
Tebuconazole	NA	ppm	<0.0067	<0.0067	<0.0067
Tebufenozide	NA	ppm	<0.0067	<0.0067	<0.0067
Tebuthiuron	NA	ppm	<0.0067	<0.0067	<0.0067
Tefluthrin	NA	ppm	<0.0067	<0.0067	<0.0067
Terbacil	NA	ppm	<0.0067	<0.0067	<0.0067
Terbufos	NA	ppm	<0.0067	<0.0067	<0.0067
Terbuthylazine	NA	ppm	<0.0067	<0.0067	<0.0067
Terbutryn	NA	ppm	<0.0067	<0.0067	<0.0067
Tetraconazole	NA	ppm	<0.0067	<0.0067	<0.0067
Tetradifon	NA	ppm	<0.0067	<0.0067	<0.0067
Thiabendazole	NA	ppm	<0.0067	<0.0067	<0.0067
Thiacloprid	NA	ppm	<0.0067	<0.0067	<0.0067
Thiamethoxam	NA	ppm	<0.0067	<0.0067	<0.0067
Thiobencarb	NA	ppm	<0.0067	<0.0067	<0.0067
Thiodicarb	NA	ppm	<0.0067	<0.0067	<0.0067
Thionazin	NA	ppm	<0.0067	<0.0067	<0.0067
Tokuthion	NA	ppm	<0.0067	<0.0067	<0.0067
Tolfenpyrad	NA	ppm	<0.0067	<0.0067	<0.0067
trans-Nonachlor	NA	ppm	<0.0067	<0.0067	<0.0067
Triadimefon	NA	ppm	<0.0067	<0.0067	<0.0067
Triadimenol	NA	ppm	<0.013	<0.013	<0.013
Triallate	NA	ppm	<0.0067	<0.0067	<0.0067
Trichloronate	NA	ppm	<0.0067	<0.0067	<0.0067
Trifloxystrobin	NA	ppm	<0.0067	<0.0067	<0.0067
Triflumizole	NA	ppm	<0.0067	<0.0067	<0.0067
Trifluralin	NA	ppm	<0.0067	<0.0067	<0.0067
Triticonazole	NA	ppm	<0.0067	<0.0067	<0.0067
Vinclozalin	NA	ppm	<0.0067	<0.0067	<0.0067

**Notes**

Background concentrations for metals are from Table 1 of DEQ (2019), Deschutes-Columbia Plateau Province.

J = estimated value

**BOLD** = detected

**RED** = criteria exceedance

ppm = parts per million

ppb = parts per billion

**Table D.2.**  
**Soil Physical Parameters**  
 Umatilla Army Depot

Sample Name Soil Unit Date Sample Point	Unit	Particle Diameter (mm)	TP-1-061622-05.0-05.5		TP-2-061622-09.0-09.4		TP-3-061722-08.0-08.3		TP-4-061622-04.5-04.6		TP-5-061522-3.8-4		TP-6-061722-02.1-02.2		TP-6-061722-09.5-10.0		TP-7-061622-06.7-07.0		TP-8-061522-1.5-2.0		TP-8-061522-3.5-4		TP-9-061722-08.0-08.5	
			Gravel with Fines		Clean Gravel		Gravel with Fines		Clean Gravel		Gravel with Fines		Fine Sand		Gravel with Fines		Clean Gravel		Fine Sand		Gravel with Fines		Gravel with Fines	
			6/16/2022		6/16/2022		6/17/2022		6/16/2022		6/15/2022		6/17/2022		6/17/2022		6/16/2022		6/15/2022		6/15/2022		6/17/2022	
			TP-1		TP-2		TP-3		TP-4		TP-5		TP-6		TP-6		TP-7		TP-8		TP-8		TP-9	
Description	Unit	Particle Diameter (mm)	Weight	% Passing	Weight	% Passing	Weight	% Passing	Weight	% Passing	Weight	% Passing	Weight	% Passing	Weight	% Passing	Weight	% Passing						
Gravel	-	19.0	0.0000	99.91	0.0000	99.9	12.3547	70.47	23.8747	40.29	14.7629	69.97	0.0000	99.97	0.0000	99.8	0.0000	99.84	0.0000	99.98	23.7491	42.64	0.0000	99.77
Gravel	-	9.50	25.0036	43.94	21.9312	54.16	21.5326	19.32	2.3821	34.34	22.6311	24.29	0.0000	99.97	20.2863	51.65	15.4629	65.84	4.1299	91.37	6.2184	27.68	21.4025	54.04
Gravel, Medium	-	4.75	10.3890	20.68	11.3094	30.59	3.8039	10.29	0.6302	32.77	4.5823	15.04	0.6904	98.56	14.3455	17.59	9.1596	45.70	0.0000	91.37	4.1274	17.75	11.2799	29.94
Gravel, Fine	-	2.00	1.3181	17.73	2.7956	24.77	0.9984	7.92	0.8330	30.69	0.3588	14.31	0.0196	98.52	3.7248	8.75	3.2359	38.59	0.0372	91.30	1.6624	13.75	5.0688	19.11
Sand, Very Coarse	-	0.850	1.1476	15.17	3.7644	16.95	0.3769	7.04	1.2925	27.47	0.4244	13.47	0.3110	97.89	1.0402	6.31	4.6312	28.37	0.4393	90.38	1.0207	11.33	1.8575	15.17
Sand, Coarse	-	0.425	1.5666	11.66	5.9417	4.62	0.3904	6.12	2.6386	20.89	1.1842	11.11	9.2793	78.97	0.5811	4.94	7.6102	11.59	5.0362	79.88	1.5852	7.56	1.5785	11.82
Sand, Medium	-	0.250	1.4067	8.52	1.2536	2.02	0.1205	5.84	1.9181	16.11	1.6918	7.74	18.7909	40.66	0.1920	4.49	2.0938	6.97	14.3167	50.01	1.3868	4.27	1.0370	9.62
Sand, Fine	-	0.106	0.8659	6.59	0.2722	1.45	0.1894	5.40	1.2470	13.00	1.2416	5.26	13.4359	13.27	0.2377	3.93	0.6203	5.60	14.7021	19.35	0.4464	3.21	1.0979	7.30
Sand, Very Fine	-	0.0750	0.2735	5.97	0.0328	1.39	0.1147	5.13	0.4741	11.82	0.3470	4.57	2.8731	7.41	0.1084	3.68	0.1396	5.30	3.0109	13.07	0.0563	3.07	0.3269	6.60
Silt and Clay	-	0.074	-	5.87	-	2.39	-	5.41	-	12.06	-	4.62	-	7.99	-	4.48	-	5.66	-	12.44	-	3.94	-	6.87
Silt and Clay	-	0.005	-	4.47	-	2.96	-	6.45	-	9.18	-	3.86	-	0.00	-	6.21	-	3.53	-	0.00	-	4.37	-	5.88
Silt and Clay	-	0.001	-	2.33	-	1.68	-	6.65	-	5.50	-	1.96	-	0.00	-	6.73	-	0.00	-	0.00	-	3.54	-	4.06
<b>Physical Properties</b>																								
Total Solids	%	-	95.6	92.0	94.6	95.4	89.4	95.1	95.0	97.8	94.1	89.7	95.6											
Specific Gravity	-	-	2.00	1.65	2.01	2.04	1.86	1.84	2.13	2.19	-	1.66	2.04											

**ATTACHMENT E**

Laboratory Analytical Reports



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July 20, 2022

**Analytical Report for Service Request No: K2206845**

Matt Thomas  
GSI Water Solutions, Inc  
55 SW Yamhill, Suite 300  
Portland, OR 97204

**RE: Umatilla Army Depot / 913.001.002.001**

Dear Matt,

Enclosed are the results of the sample(s) submitted to our laboratory June 20, 2022  
For your reference, these analyses have been assigned our service request number **K2206845**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at [www.alsglobal.com](http://www.alsglobal.com). All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at [Mark.Harris@alsglobal.com](mailto:Mark.Harris@alsglobal.com).

Respectfully submitted,

**ALS Group USA, Corp. dba ALS Environmental**

for Mark Harris  
Project Manager



---

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## Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

### **Inorganic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

### **Metals Data Qualifiers**

- # The control limit criteria is not applicable.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.  
  
i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Organic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Additional Petroleum Hydrocarbon Specific Qualifiers**

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso  
State Certifications, Accreditations, and Licenses**

<b>Agency</b>	<b>Web Site</b>	<b>Number</b>
Alaska DEH	<a href="http://dec.alaska.gov/eh/lab/cs/csapproval.htm">http://dec.alaska.gov/eh/lab/cs/csapproval.htm</a>	UST-040
Arizona DHS	<a href="http://www.azdhs.gov/lab/license/env.htm">http://www.azdhs.gov/lab/license/env.htm</a>	AZ0339
Arkansas - DEQ	<a href="http://www.adeq.state.ar.us/techsvs/labcert.htm">http://www.adeq.state.ar.us/techsvs/labcert.htm</a>	88-0637
California DHS (ELAP)	<a href="http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx">http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx</a>	2795
DOD ELAP	<a href="http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm">http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm</a>	L16-58-R4
Florida DOH	<a href="http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm">http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm</a>	E87412
Hawaii DOH	<a href="http://health.hawaii.gov/">http://health.hawaii.gov/</a>	-
ISO 17025	<a href="http://www.pjllabs.com/">http://www.pjllabs.com/</a>	L16-57
Louisiana DEQ	<a href="http://www.deq.louisiana.gov/page/la-lab-accreditation">http://www.deq.louisiana.gov/page/la-lab-accreditation</a>	03016
Maine DHS	<a href="http://www.maine.gov/dhhs/">http://www.maine.gov/dhhs/</a>	WA01276
Minnesota DOH	<a href="http://www.health.state.mn.us/accreditation">http://www.health.state.mn.us/accreditation</a>	053-999-457
Nevada DEP	<a href="http://ndep.nv.gov/bsdw/labservice.htm">http://ndep.nv.gov/bsdw/labservice.htm</a>	WA01276
New Jersey DEP	<a href="http://www.nj.gov/dep/enforcement/oqa.html">http://www.nj.gov/dep/enforcement/oqa.html</a>	WA005
New York - DOH	<a href="https://www.wadsworth.org/regulatory/elap">https://www.wadsworth.org/regulatory/elap</a>	12060
North Carolina DEQ	<a href="https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification">https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification</a>	605
Oklahoma DEQ	<a href="http://www.deq.state.ok.us/CSDnew/labcert.htm">http://www.deq.state.ok.us/CSDnew/labcert.htm</a>	9801
Oregon – DEQ (NELAP)	<a href="http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx">http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx</a>	WA100010
South Carolina DHEC	<a href="http://www.scdhec.gov/environment/EnvironmentalLabCertification/">http://www.scdhec.gov/environment/EnvironmentalLabCertification/</a>	61002
Texas CEQ	<a href="http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html">http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html</a>	T104704427
Washington DOE	<a href="http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html">http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html</a>	C544
Wyoming (EPA Region 8)	<a href="https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water">https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water</a>	-
Kelso Laboratory Website	<a href="http://www.alsglobal.com">www.alsglobal.com</a>	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at [www.ALSGlobal.com](http://www.ALSGlobal.com) or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.



## Case Narrative

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot  
**Sample Matrix:** Soil

**Service Request:** K2206845  
**Date Received:** 06/20/2022

### CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

#### Sample Receipt:

Eleven soil samples were received for analysis at ALS Environmental on 06/20/2022. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

#### Semivolatiles by GC/MS:

Method 8270D: The recovery for Acenaphthylene and N-Nitrosodiphenylamine was above the upper control limit in the Initial Calibration Verification (ICV). These analytes were not detected in the associated field samples. The data quality was not affected. No further corrective action was necessary.

Method 8270D, 07/13/2022: The upper control criterion was exceeded for Acenaphthylene, N-Nitrosodi-n-propylamine, and N-Nitrosodiphenylamine in Continuing Calibration Verification (CCV) KQ2211389-02. The field samples analyzed in this sequence did not contain the analytes in question. Since the apparent problem indicated a potential high bias, the data quality was not affected. No further corrective action was required.

#### Semivolatile GC:

Method 8082A: The analysis of 8082A requires the use of dual column confirmation. For the Initial Calibration Verification (ICV) at least one of the analytical systems in a dual column or dual detector system must meet the criteria. This criteria was met on one column for Aroclor 1260. The data quality was not affected. No further corrective action was necessary.

Method 8082A: The analysis of 8082A requires the use of dual column confirmation. The primary evaluation criteria were not met on the confirmation column for Decachlorobiphenyl. The results were reported from the column with an acceptable CCV. The data quality was not affected. No further corrective action was necessary.

#### Metals:

No significant anomalies were noted with this analysis.

#### General Chemistry:

Method 353.2M, 07/14/2022: The analysis of samples in this delivery group was initially performed past the recommended holding time due to a sample login error. Efforts were made to analyze the sample as soon as the error was identified. The data was flagged to indicate the holding time violation.

#### Subcontracted Analytical Parameters:

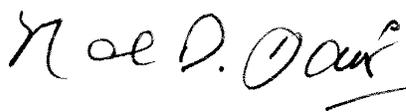
8330

This analysis was performed at ALS Environmental, Middletown, PA. The data for this analysis is included in the corresponding section of this report.

#### Volatiles by GC/MS:

Method 8260C, 06/28/2022: The DOD QSM lower control criterion was exceeded for the surrogate 4-Bromofluorobenzene in the Method Blank (MB) KQ2210667-05. The error associated with reduced recoveries equates to a potential slight bias. The recoveries of the surrogate in question were within ALS control Charted limits.

Method 8260C, 06/28/2022: The RPD control criterion was exceeded for 2-Hexanone, Chloromethane, cis-1,2-Dichloroethene, and Vinyl Chloride for Laboratory Control Sample (LCS) KQ2210667-03 and Duplicate Laboratory Control Sample (DLCS) KQ2210667-04. All recoveries are acceptable. The analytes in question were not detected in the associated field samples.

Approved by 

Date 07/20/2022



# Chain of Custody

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)



# CHAIN OF CUSTODY 124376

001

SR# K2206845  
COC Set \_\_\_\_\_ of \_\_\_\_\_  
COC# \_\_\_\_\_

1317 South 13th Ave, Kelso, WA 98626 Phone (360) 577-7222 / 800-695-7222 FAX (360) 636-1068  
www.alsglobal.com

Project Name <u>Onnetilla Army Post</u>		Project Number <u>913.001.002.001</u>		NUMBER OF CONTAINERS	14D	28D	180D	365D	999D	Special IC Grav			Remarks			
Project Manager <u>Matt Kohlbecker</u>		Company <u>BSI Water Solutions</u>			3260C / VOC FP	3270D / SVO	3330A / NitroAro Amin	7471A / Hg	3056A / NO2 NO3	5020A / Metals T	ASTM D422M / Part Size	ASTM D864 / Sp Grav		3082A / PCB LL	160.3 Modified / TS	Grind / Grind
Address <u>55 SW Yamhill St, Se 200, Portland OR 97204</u>		Phone # <u>971.200.8531</u>			email <u>m.kohlbecker@gsiws.com</u>											
Sampler Signature <u>[Signature]</u>		Sampler Printed Name <u>Renée Fowler</u>														
CLIENT SAMPLE ID	LABID	SAMPLING Date	Time	Matrix												
1.TP-3-061722-08.0-08.3		6/17/22	940	Soil	2								X	X		
2.TP-6-061722-09.5-10.0		6/17/22	1530	Soil	2								X	X		
3.TP-9-061722-08.0-08.5		6/17/22	1400	Soil	2								X	X		
4.TP-6-061722-02.1-02.2		6/17/22	1045	Soil	1								X	X		
5.TP-4-061622-04.5-04.6		6/16/22	1055	Soil	2								X	X		
6.TP-7-061622-06.7-07.0		6/16/22	1400	Soil	2								X	X		
7.TP-2-061622-09.0-09.4		6/16/22	1145	Soil	2								X	X		
8.																
9.																
10.																

- Report Requirements**
- I. Routine Report, Method Blank, Surrogate, as required
  - II. Report Dup., MS, MSD as required
  - III. CLP Like Summary (no raw data)
  - IV. Data Validation Report
  - V. EDD

**Invoice Information**

P.O.# \_\_\_\_\_

Bill To: John Schafer  
216 SE 4th St, Pendleton OR  
97801

**Turnaround Requirements**

Requested Report Date \_\_\_\_\_

24 hr. \_\_\_\_\_ 48 hr.

5 Day Standard

Circle which metals are to be analyzed

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg

Special Instructions/Comments: \*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other \_\_\_\_\_ (Circle One)

Address invoice to John Schafer: 216 SE 4th St, Pendleton, OR 97801. Email invoice to Matt Kohlbecker (m.kohlbecker@gsiws.com) for payment.

Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature <u>[Signature]</u>	Signature <u>[Signature]</u>	Signature <u>[Signature]</u>	Signature <u>M. Mullen</u>	Signature <u>[Signature]</u>	Signature <u>[Signature]</u>
Printed Name <u>Renée Fowler</u>	Printed Name <u>[Name]</u>	Printed Name <u>[Name]</u>	Printed Name <u>M. Mullen</u>	Printed Name <u>[Name]</u>	Printed Name <u>[Name]</u>
Firm <u>BSI</u>	Firm <u>6/20/22 1050</u>	Firm <u>6/20/22 010</u>	Firm <u>6/20/22 1210</u>	Firm <u>[Firm]</u>	Firm <u>[Firm]</u>
Date/Time <u>6/20/22 1050</u>	Date/Time <u>[Date/Time]</u>	Date/Time <u>[Date/Time]</u>	Date/Time <u>[Date/Time]</u>	Date/Time <u>[Date/Time]</u>	Date/Time <u>[Date/Time]</u>



CHAIN OF CUSTODY  
**124376**

001

SR# 12206845  
COC Set \_\_\_\_\_ of \_\_\_\_\_  
COC# \_\_\_\_\_

1317 South 13th Ave, Kelso, WA 98626 Phone (360) 577-7222 / 800-695-7222 / FAX (360) 636-1068  
www.alsglobal.com

Project Name: <u>Umatilla Army Post</u>		Project Number: <u>913.001.002.001</u>		NUMBER OF CONTAINERS	14D	28D	180D	365D	999D	Remarks
Project Manager: <u>Matt Kohlbecker</u>										
Company: <u>BSI Water Solutions</u>										
Address: <u>55 SW Yamhill St, Se 200, Portland OR 97204</u>										
Phone #: <u>971.200.8531</u>	email: <u>m.kohlbecker@gsiws.com</u>									
Sampler Signature: <u>Renee Fowler</u>		Sampler Printed Name: <u>Renee Fowler</u>								
CLIENT SAMPLE ID	LABID	SAMPLING Date Time	Matrix							
1. TP-1-061622-05-0-05.5		6/16/22 825	soil	5						X
2. TP-5-061522-3.8-4		6/15/22 1300	soil	5						X
3. TP-8-061522-3.5-84		6/15/22 930	soil	5						X
4. TP-8-061522-1.5-2.0		6/15/22 930	soil	1						X
5.										
6.										
7.										
8.										
9.										
10.										

**Report Requirements**

I. Routine Report. Method Blank, Surrogate, as required.

II. Report Dup., MS, MSD as required

III. CLP Like Summary (no raw data)

IV. Data Validation Report

V. EDD

**Invoice Information**

P.O.# \_\_\_\_\_

Bill To: John Schafer  
216 SE 4th St, Pendleton OR  
97801

**Turnaround Requirements**

Requested Report Date \_\_\_\_\_

24 hr.  48 hr.

5 Day  Standard

Circle which metals are to be analyzed

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg

Special Instructions/Comments: \*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other \_\_\_\_\_ (Circle One)

Address invoice to John Schafer: 216 SE 4th St, Pendleton, OR 97801. Email invoice to Matt Kohlbecker (m.kohlbecker@gsiws.com) for payment.

Relinquished By: <u>[Signature]</u>	Received By: <u>[Signature]</u>	Relinquished By: <u>[Signature]</u>	Received By: <u>[Signature]</u>	Relinquished By: _____	Received By: _____
Signature: <u>Renee Fowler</u>	Signature: <u>[Signature]</u>	Signature: <u>[Signature]</u>	Signature: <u>[Signature]</u>	Signature: _____	Signature: _____
Printed Name: <u>Renee Fowler</u>	Printed Name: <u>[Name]</u>	Printed Name: <u>[Name]</u>	Printed Name: <u>[Name]</u>	Printed Name: _____	Printed Name: _____
Firm: <u>GSI</u>	Firm: <u>[Firm]</u>	Firm: <u>[Firm]</u>	Firm: <u>[Firm]</u>	Firm: _____	Firm: _____
Date/Time: <u>6/16/22 1050</u>	Date/Time: <u>6/20/22 1050</u>	Date/Time: <u>6/20/22 1210</u>	Date/Time: <u>6/20/22 1210</u>	Date/Time: _____	Date/Time: _____

PM MH

### Cooler Receipt and Preservation Form

Client 651 Water Solutions Service Request K22 060845  
Received: 6/20/22 Opened: 6/20/22 By: [Signature] Unloaded: 6/20/22 By: [Signature]

- 1. Samples were received via? **USPS** **Fed Ex** **UPS** **DHL** **PDX** Courier **Hand Delivered**
- 2. Samples were received in: (circle) Cooler **Box** **Envelope** **Other** NA
- 3. Were custody seals on coolers? **NA** **Y** N If yes, how many and where? \_\_\_\_\_  
If present, were custody seals intact? **Y** **N** If present, were they signed and dated? **Y** **N**

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp Indicate with 'X'	PM Notified If out of temp	Tracking Number NA	Filed
<u>2.8</u>		<u>TR01</u>					
<u>20.0</u>	<u>21.5</u>	<u>TR01</u>	<u>Not Temp.</u>	<u>Sensitive</u>			

- 4. Was a Temperature Blank present in cooler? **NA** Y **N** If yes, note the temperature in the appropriate column above:  
If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
- 5. Were samples received within the method specified temperature ranges? **NA** Y **N**  
If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. **NA** Y **N**

If applicable, tissue samples were received: ~~Frozen~~ Partially Thawed ~~Thawed~~

- 6. Packing material: **Inserts** Baggies Bubble Wrap **Gel Packs** Wet Ice **Dry Ice** **Sleeves**
- 7. Were custody papers properly filled out (ink, signed, etc.)? **NA** Y **N**
- 8. Were samples received in good condition (unbroken) **NA** Y **N**
- 9. Were all sample labels complete (ie, analysis, preservation, etc.)? **NA** Y **N**
- 10. Did all sample labels and tags agree with custody papers? **NA** Y **N**
- 11. Were appropriate bottles/containers and volumes received for the tests indicated? **NA** Y **N**
- 12. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below **NA** Y **N**
- 13. Were VOA vials received without headspace? Indicate in the table below. **NA** Y **N**
- 14. Was C12/Res negative? **NA** Y **N**
- 15. Were 100ml sterile microbiology bottles filled exactly to the 100ml mark? NA **Y** **N** Under filled Overfilled

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, Resolutions: 2nd Cooler, matrix = Rocks and Soil.  
Sample TP-2-061622-09.0-09.4 / Sample time on Bags 16:45. Time on COC=11:45.



# Total Solids

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

**ALS Group USA, Corp.**  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil  
**Analysis Method:** 160.3 Modified  
**Prep Method:** None

**Service Request:** K2206845  
**Date Collected:** 06/15/22 - 06/17/22  
**Date Received:** 06/20/22  
**Units:** Percent  
**Basis:** As Received

**Solids, Total**

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
TP-3-061722-08.0-08.3	K2206845-001	94.6	-	-	1	06/30/22 15:59	
TP-6-061722-09.5-10.0	K2206845-002	95.0	-	-	1	06/30/22 15:59	
TP-9-061722-08.0-08.5	K2206845-003	95.6	-	-	1	06/30/22 15:59	
TP-6-061722-02.1-02.2	K2206845-004	95.1	-	-	1	06/30/22 15:59	
TP-4-061622-04.5-04.6	K2206845-005	95.4	-	-	1	06/30/22 15:59	
TP-7-061622-06.7-07.0	K2206845-006	97.8	-	-	1	06/30/22 15:59	
TP-2-061622-09.0-09.4	K2206845-007	92.0	-	-	1	06/30/22 15:59	
TP-1-061622-05.0-05.5	K2206845-008	95.6	-	-	1	06/30/22 15:59	
TP-5-061522-3.8-4	K2206845-009	89.4	-	-	1	06/30/22 15:59	
TP-8-061522-3.5-4	K2206845-010	89.7	-	-	1	06/30/22 15:59	
TP-8-061522-1.5-2.0	K2206845-011	94.1	-	-	1	06/30/22 15:59	

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil  
**Analysis Method:** 160.3 Modified  
**Prep Method:** None

**Service Request:** K2206845  
**Date Collected:** 06/15/22 - 06/17/22  
**Date Received:** 06/20/22

**Units:** Percent  
**Basis:** As Received

Replicate Sample Summary

Inorganic Parameters

Sample Name:	Lab Code:	MRL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
TP-3-061722-08.0-08.3	K2206845-001DUP	-	94.6	98.7	96.7	4	20	06/30/22
TP-8-061522-1.5-2.0	K2206845-011DUP	-	94.1	93.9	94.0	<1	20	06/30/22

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.



# General Chemistry

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

**ALS Group USA, Corp.**  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil  
**Analysis Method:** 353.2M  
**Prep Method:** ALS SOP

**Service Request:** K2206845  
**Date Collected:** 06/15/22 - 06/16/22  
**Date Received:** 06/20/22  
**Units:** mg/Kg  
**Basis:** Dry

**Nitrate+Nitrite as Nitrogen**

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
TP-1-061622-05.0-05.5	K2206845-008	<b>0.66</b>	0.50	-	0.08	1	07/14/22	7/13/22	*
TP-5-061522-3.8-4	K2206845-009	<b>0.09 J</b>	0.55	-	0.08	1	07/14/22	7/13/22	*
TP-8-061522-3.5-4	K2206845-010	ND U	0.55	-	0.08	1	07/14/22	7/13/22	*
Method Blank	K2206845-MB	ND U	0.50	-	0.07	1	07/14/22	7/13/22	

ALS Group USA, Corp.  
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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845  
**Date Analyzed:** 07/14/22  
**Date Extracted:** 07/13/22

**Lab Control Sample Summary**  
**Nitrate+Nitrite as Nitrogen**

**Analysis Method:** 353.2M  
**Prep Method:** ALS SOP

**Units:** mg/Kg  
**Basis:** Dry  
**Analysis Lot:** 770529

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2206845-LCS	9.49	9.11	104	87-113

ALS Group USA, Corp.  
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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil  
**Analysis Method:** ASTM D854  
**Prep Method:** None

**Service Request:** K2206845  
**Date Collected:** 06/15/22 - 06/17/22  
**Date Received:** 06/20/22  
**Units:** NONE  
**Basis:** As Received

Specific Gravity

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
TP-3-061722-08.0-08.3	K2206845-001	2.01	-	-	-	1	07/20/22 02:30	
TP-6-061722-09.5-10.0	K2206845-002	2.13	-	-	-	1	07/20/22 02:30	
TP-9-061722-08.0-08.5	K2206845-003	2.04	-	-	-	1	07/20/22 02:30	
TP-6-061722-02.1-02.2	K2206845-004	1.84	-	-	-	1	07/20/22 02:30	
TP-4-061622-04.5-04.6	K2206845-005	2.04	-	-	-	1	07/20/22 02:30	
TP-7-061622-06.7-07.0	K2206845-006	2.19	-	-	-	1	07/20/22 02:30	
TP-2-061622-09.0-09.4	K2206845-007	1.65	-	-	-	1	07/20/22 02:30	
TP-1-061622-05.0-05.5	K2206845-008	2.00	-	-	-	1	07/20/22 02:30	
TP-5-061522-3.8-4	K2206845-009	1.86	-	-	-	1	07/20/22 02:30	
TP-8-061522-3.5-4	K2206845-010	1.66	-	-	-	1	07/20/22 02:30	

ALS Group USA, Corp.

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QA/QC Report

Client: GSI Water Solutions, Inc
Project: Umatilla Army Depot/913.001.002.001
Sample Matrix: Soil

Service Request: K2206845
Date Collected: 06/17/22
Date Received: 06/20/22
Date Analyzed: 07/20/22

Replicate Sample Summary
General Chemistry Parameters

Sample Name: TP-3-061722-08.0-08.3
Lab Code: K2206845-001

Units: NONE
Basis: As Received

Table with 10 columns: Analyte Name, Analysis Method, LOQ, LOD, MDL, Sample Result, Duplicate Sample Result (K2206845-001DUP), Average, RPD, RPD Limit. Row 1: Specific Gravity, ASTM D854, -, -, -, 2.01, 2.08, 2.04, 3, 20.

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**ALS Group USA, Corp.**  
dba ALS Environmental  
**Analytical Report**

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845  
**Date Collected:** 06/17/22  
**Date Received:** 06/20/22  
**Date Analyzed:** 06/29/22

**Particle Size Determination**  
**ASTM D422**

**Sample Name:** TP-3-061722-08.0-08.3  
**Lab Code:** K2206845-001

**Gravel and Sand**  
**(Sieve Analysis)**

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	12.3547	70.47
Gravel (9.50 mm)	No.3/8"(9.50 mm)	21.5326	19.32
Gravel, Medium	No.4 (4.75 mm)	3.8039	10.29
Gravel, Fine	No.10 (2.00 mm)	0.9984	7.92
Sand, Very Coarse	No.20 (0.850 mm)	0.3769	7.04
Sand, Coarse	No.40 (0.425 mm)	0.3904	6.12
Sand, Medium	No.60 (0.250 mm)	0.1205	5.84
Sand, Fine	No.140 (0.106 mm)	0.1894	5.40
Sand, Very Fine	No.200 (0.0750 mm)	0.1147	5.13

**Silt and Clay**  
**(Hydrometer Analysis)**

Particle Diameter	Percent Passing
0.074 mm	5.41
0.005 mm	6.45
0.001 mm	6.65

**ALS Group USA, Corp.**  
dba ALS Environmental  
**Analytical Report**

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845  
**Date Collected:** 06/17/22  
**Date Received:** 06/20/22  
**Date Analyzed:** 06/29/22

**Particle Size Determination**  
**ASTM D422**

**Sample Name:** TP-6-061722-09.5-10.0  
**Lab Code:** K2206845-002

**Gravel and Sand**  
**(Sieve Analysis)**

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	99.82
Gravel (9.50 mm)	No.3/8"(9.50 mm)	20.2863	51.65
Gravel, Medium	No.4 (4.75 mm)	14.3455	17.59
Gravel, Fine	No.10 (2.00 mm)	3.7248	8.75
Sand, Very Coarse	No.20 (0.850 mm)	1.0402	6.31
Sand, Coarse	No.40 (0.425 mm)	0.5811	4.94
Sand, Medium	No.60 (0.250 mm)	0.1920	4.49
Sand, Fine	No.140 (0.106 mm)	0.2377	3.93
Sand, Very Fine	No.200 (0.0750 mm)	0.1084	3.68

**Silt and Clay**  
**(Hydrometer Analysis)**

Particle Diameter	Percent Passing
0.074 mm	4.48
0.005 mm	6.21
0.001 mm	6.73

**ALS Group USA, Corp.**  
dba ALS Environmental  
**Analytical Report**

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845  
**Date Collected:** 06/17/22  
**Date Received:** 06/20/22  
**Date Analyzed:** 06/29/22

**Particle Size Determination**  
**ASTM D422**

**Sample Name:** TP-9-061722-08.0-08.5  
**Lab Code:** K2206845-003

**Gravel and Sand**  
**(Sieve Analysis)**

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	99.77
Gravel (9.50 mm)	No.3/8"(9.50 mm)	21.4025	54.04
Gravel, Medium	No.4 (4.75 mm)	11.2799	29.94
Gravel, Fine	No.10 (2.00 mm)	5.0688	19.11
Sand, Very Coarse	No.20 (0.850 mm)	1.8575	15.17
Sand, Coarse	No.40 (0.425 mm)	1.5785	11.82
Sand, Medium	No.60 (0.250 mm)	1.0370	9.62
Sand, Fine	No.140 (0.106 mm)	1.0979	7.30
Sand, Very Fine	No.200 (0.0750 mm)	0.3269	6.60

**Silt and Clay**  
**(Hydrometer Analysis)**

Particle Diameter	Percent Passing
0.074 mm	6.87
0.005 mm	5.88
0.001 mm	4.06

**ALS Group USA, Corp.**  
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**Analytical Report**

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845  
**Date Collected:** 06/17/22  
**Date Received:** 06/20/22  
**Date Analyzed:** 06/29/22

**Particle Size Determination**  
**ASTM D422**

**Sample Name:** TP-6-061722-02.1-02.2  
**Lab Code:** K2206845-004

**Gravel and Sand**  
**(Sieve Analysis)**

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	99.97
Gravel (9.50 mm)	No.3/8"(9.50 mm)	0.0000	99.97
Gravel, Medium	No.4 (4.75 mm)	0.6904	98.56
Gravel, Fine	No.10 (2.00 mm)	0.0196	98.52
Sand, Very Coarse	No.20 (0.850 mm)	0.3110	97.89
Sand, Coarse	No.40 (0.425 mm)	9.2793	78.97
Sand, Medium	No.60 (0.250 mm)	18.7909	40.66
Sand, Fine	No.140 (0.106 mm)	13.4359	13.27
Sand, Very Fine	No.200 (0.0750 mm)	2.8731	7.41

**Silt and Clay**  
**(Hydrometer Analysis)**

Particle Diameter	Percent Passing
0.074 mm	7.99
0.005 mm	0.00
0.001 mm	0.00

**ALS Group USA, Corp.**  
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**Analytical Report**

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845  
**Date Collected:** 06/17/22  
**Date Received:** 06/20/22  
**Date Analyzed:** 06/29/22

**Particle Size Determination**  
**ASTM D422**

**Sample Name:** TP-6-061722-02.1-02.2  
**Lab Code:** K2206845-004DUP

**Gravel and Sand**  
**(Sieve Analysis)**

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	99.98
Gravel (9.50 mm)	No.3/8"(9.50 mm)	0.0000	99.98
Gravel, Medium	No.4 (4.75 mm)	0.0000	99.98
Gravel, Fine	No.10 (2.00 mm)	0.0499	99.88
Sand, Very Coarse	No.20 (0.850 mm)	0.3395	99.18
Sand, Coarse	No.40 (0.425 mm)	8.6757	81.36
Sand, Medium	No.60 (0.250 mm)	18.2533	43.86
Sand, Fine	No.140 (0.106 mm)	14.4777	14.12
Sand, Very Fine	No.200 (0.0750 mm)	2.9673	8.02

**Silt and Clay**  
**(Hydrometer Analysis)**

Particle Diameter	Percent Passing
0.074 mm	9.05
0.005 mm	0.00
0.001 mm	0.00

**ALS Group USA, Corp.**  
dba ALS Environmental  
**Analytical Report**

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845  
**Date Collected:** 06/16/22  
**Date Received:** 06/20/22  
**Date Analyzed:** 06/29/22

**Particle Size Determination**  
**ASTM D422**

**Sample Name:** TP-4-061622-04.5-04.6  
**Lab Code:** K2206845-005

**Gravel and Sand**  
**(Sieve Analysis)**

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	23.8747	40.29
Gravel (9.50 mm)	No.3/8"(9.50 mm)	2.3821	34.34
Gravel, Medium	No.4 (4.75 mm)	0.6302	32.77
Gravel, Fine	No.10 (2.00 mm)	0.8330	30.69
Sand, Very Coarse	No.20 (0.850 mm)	1.2925	27.47
Sand, Coarse	No.40 (0.425 mm)	2.6386	20.89
Sand, Medium	No.60 (0.250 mm)	1.9181	16.11
Sand, Fine	No.140 (0.106 mm)	1.2470	13.00
Sand, Very Fine	No.200 (0.0750 mm)	0.4741	11.82

**Silt and Clay**  
**(Hydrometer Analysis)**

Particle Diameter	Percent Passing
0.074 mm	12.06
0.005 mm	9.18
0.001 mm	5.50

**ALS Group USA, Corp.**  
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**Analytical Report**

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845  
**Date Collected:** 06/16/22  
**Date Received:** 06/20/22  
**Date Analyzed:** 06/29/22

**Particle Size Determination**  
**ASTM D422**

**Sample Name:** TP-7-061622-06.7-07.0  
**Lab Code:** K2206845-006

**Gravel and Sand**  
**(Sieve Analysis)**

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	99.84
Gravel (9.50 mm)	No.3/8"(9.50 mm)	15.4629	65.84
Gravel, Medium	No.4 (4.75 mm)	9.1596	45.70
Gravel, Fine	No.10 (2.00 mm)	3.2359	38.59
Sand, Very Coarse	No.20 (0.850 mm)	4.6312	28.37
Sand, Coarse	No.40 (0.425 mm)	7.6102	11.59
Sand, Medium	No.60 (0.250 mm)	2.0938	6.97
Sand, Fine	No.140 (0.106 mm)	0.6203	5.60
Sand, Very Fine	No.200 (0.0750 mm)	0.1396	5.30

**Silt and Clay**  
**(Hydrometer Analysis)**

Particle Diameter	Percent Passing
0.074 mm	5.66
0.005 mm	3.53
0.001 mm	0.00

**ALS Group USA, Corp.**  
dba ALS Environmental  
**Analytical Report**

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845  
**Date Collected:** 06/16/22  
**Date Received:** 06/20/22  
**Date Analyzed:** 06/29/22

**Particle Size Determination**  
**ASTM D422**

**Sample Name:** TP-2-061622-09.0-09.4  
**Lab Code:** K2206845-007

**Gravel and Sand**  
**(Sieve Analysis)**

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	99.86
Gravel (9.50 mm)	No.3/8"(9.50 mm)	21.9312	54.16
Gravel, Medium	No.4 (4.75 mm)	11.3094	30.59
Gravel, Fine	No.10 (2.00 mm)	2.7956	24.77
Sand, Very Coarse	No.20 (0.850 mm)	3.7644	16.95
Sand, Coarse	No.40 (0.425 mm)	5.9417	4.62
Sand, Medium	No.60 (0.250 mm)	1.2536	2.02
Sand, Fine	No.140 (0.106 mm)	0.2722	1.45
Sand, Very Fine	No.200 (0.0750 mm)	0.0328	1.39

**Silt and Clay**  
**(Hydrometer Analysis)**

Particle Diameter	Percent Passing
0.074 mm	2.39
0.005 mm	2.96
0.001 mm	1.68

**ALS Group USA, Corp.**  
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**Analytical Report**

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845  
**Date Collected:** 06/16/22  
**Date Received:** 06/20/22  
**Date Analyzed:** 06/29/22

**Particle Size Determination**  
**ASTM D422**

**Sample Name:** TP-1-061622-05.0-05.5  
**Lab Code:** K2206845-008

**Gravel and Sand**  
**(Sieve Analysis)**

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	99.91
Gravel (9.50 mm)	No.3/8"(9.50 mm)	25.0036	43.94
Gravel, Medium	No.4 (4.75 mm)	10.3890	20.68
Gravel, Fine	No.10 (2.00 mm)	1.3181	17.73
Sand, Very Coarse	No.20 (0.850 mm)	1.1476	15.17
Sand, Coarse	No.40 (0.425 mm)	1.5666	11.66
Sand, Medium	No.60 (0.250 mm)	1.4067	8.52
Sand, Fine	No.140 (0.106 mm)	0.8659	6.59
Sand, Very Fine	No.200 (0.0750 mm)	0.2735	5.97

**Silt and Clay**  
**(Hydrometer Analysis)**

Particle Diameter	Percent Passing
0.074 mm	5.87
0.005 mm	4.47
0.001 mm	2.33

**ALS Group USA, Corp.**  
dba ALS Environmental  
**Analytical Report**

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845  
**Date Collected:** 06/15/22  
**Date Received:** 06/20/22  
**Date Analyzed:** 06/29/22

**Particle Size Determination**  
**ASTM D422**

**Sample Name:** TP-5-061522-3.8-4  
**Lab Code:** K2206845-009

**Gravel and Sand**  
**(Sieve Analysis)**

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	14.7629	69.97
Gravel (9.50 mm)	No.3/8"(9.50 mm)	22.6311	24.29
Gravel, Medium	No.4 (4.75 mm)	4.5823	15.04
Gravel, Fine	No.10 (2.00 mm)	0.3588	14.31
Sand, Very Coarse	No.20 (0.850 mm)	0.4244	13.47
Sand, Coarse	No.40 (0.425 mm)	1.1842	11.11
Sand, Medium	No.60 (0.250 mm)	1.6918	7.74
Sand, Fine	No.140 (0.106 mm)	1.2416	5.26
Sand, Very Fine	No.200 (0.0750 mm)	0.3470	4.57

**Silt and Clay**  
**(Hydrometer Analysis)**

Particle Diameter	Percent Passing
0.074 mm	4.62
0.005 mm	3.86
0.001 mm	1.96

**ALS Group USA, Corp.**  
dba ALS Environmental  
**Analytical Report**

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845  
**Date Collected:** 06/15/22  
**Date Received:** 06/20/22  
**Date Analyzed:** 06/29/22

**Particle Size Determination**  
**ASTM D422**

**Sample Name:** TP-8-061522-3.5-4  
**Lab Code:** K2206845-010

**Gravel and Sand**  
**(Sieve Analysis)**

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	23.7491	42.64
Gravel (9.50 mm)	No.3/8"(9.50 mm)	6.2184	27.68
Gravel, Medium	No.4 (4.75 mm)	4.1274	17.75
Gravel, Fine	No.10 (2.00 mm)	1.6624	13.75
Sand, Very Coarse	No.20 (0.850 mm)	1.0207	11.33
Sand, Coarse	No.40 (0.425 mm)	1.5852	7.56
Sand, Medium	No.60 (0.250 mm)	1.3868	4.27
Sand, Fine	No.140 (0.106 mm)	0.4464	3.21
Sand, Very Fine	No.200 (0.0750 mm)	0.0563	3.07

**Silt and Clay**  
**(Hydrometer Analysis)**

Particle Diameter	Percent Passing
0.074 mm	3.94
0.005 mm	4.37
0.001 mm	3.54

**ALS Group USA, Corp.**  
dba ALS Environmental  
**Analytical Report**

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845  
**Date Collected:** 06/15/22  
**Date Received:** 06/20/22  
**Date Analyzed:** 06/29/22

**Particle Size Determination**  
**ASTM D422**

**Sample Name:** TP-8-061522-1.5-2.0  
**Lab Code:** K2206845-011

**Gravel and Sand**  
**(Sieve Analysis)**

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	99.98
Gravel (9.50 mm)	No.3/8"(9.50 mm)	4.1299	91.37
Gravel, Medium	No.4 (4.75 mm)	0.0000	91.37
Gravel, Fine	No.10 (2.00 mm)	0.0372	91.30
Sand, Very Coarse	No.20 (0.850 mm)	0.4393	90.38
Sand, Coarse	No.40 (0.425 mm)	5.0362	79.88
Sand, Medium	No.60 (0.250 mm)	14.3167	50.01
Sand, Fine	No.140 (0.106 mm)	14.7021	19.35
Sand, Very Fine	No.200 (0.0750 mm)	3.0109	13.07

**Silt and Clay**  
**(Hydrometer Analysis)**

Particle Diameter	Percent Passing
0.074 mm	12.44
0.005 mm	0.00
0.001 mm	0.00



# Metals

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
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**ALS Group USA, Corp.**  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil  
**Sample Name:** TP-1-061622-05.0-05.5  
**Lab Code:** K2206845-008

**Service Request:** K2206845  
**Date Collected:** 06/16/22 08:25  
**Date Received:** 06/20/22 12:10

**Basis:** Dry

**Total Metals**

Analyte Name	Analysis		Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Date	
	Method	Result							Extracted	Q
Aluminum	6020A	<b>6640</b>	mg/Kg	2.1	1.8	0.6	5	07/07/22 15:29	07/01/22	
Antimony	6020A	<b>0.134</b>	mg/Kg	0.051	0.046	0.021	5	07/07/22 15:29	07/01/22	
Arsenic	6020A	<b>4.26</b>	mg/Kg	0.51	0.13	0.06	5	07/07/22 15:29	07/01/22	
Barium	6020A	<b>82.0</b>	mg/Kg	0.051	0.046	0.021	5	07/07/22 15:29	07/01/22	
Beryllium	6020A	<b>0.347</b>	mg/Kg	0.021	0.018	0.006	5	07/07/22 15:29	07/01/22	
Cadmium	6020A	<b>0.103</b>	mg/Kg	0.021	0.018	0.007	5	07/07/22 15:29	07/01/22	
Chromium	6020A	<b>7.69</b>	mg/Kg	0.21	0.18	0.06	5	07/07/22 15:29	07/01/22	
Cobalt	6020A	<b>9.58</b>	mg/Kg	0.021	0.018	0.006	5	07/07/22 15:29	07/01/22	
Copper	6020A	<b>18.3</b>	mg/Kg	0.10	0.09	0.04	5	07/07/22 15:29	07/01/22	
Lead	6020A	<b>5.62</b>	mg/Kg	0.051	0.046	0.021	5	07/07/22 15:29	07/01/22	
Manganese	6020A	<b>373</b>	mg/Kg	0.051	0.046	0.021	5	07/07/22 15:29	07/01/22	
Mercury	7471A	<b>0.005 J</b>	mg/Kg	0.020	0.005	0.002	1	07/06/22 13:49	07/05/22	
Nickel	6020A	<b>10.6</b>	mg/Kg	0.21	0.10	0.03	5	07/08/22 10:35	07/01/22	
Potassium	6010C	<b>1100</b>	mg/Kg	41	37	10	2	07/08/22 13:31	07/01/22	
Selenium	6020A	<b>0.2 J</b>	mg/Kg	1.0	0.3	0.09	5	07/07/22 15:29	07/01/22	
Silver	6020A	<b>0.051</b>	mg/Kg	0.021	0.010	0.004	5	07/07/22 15:29	07/01/22	
Thallium	6020A	<b>0.099</b>	mg/Kg	0.021	0.010	0.004	5	07/07/22 15:29	07/01/22	
Zinc	6020A	<b>47.4</b>	mg/Kg	0.51	0.46	0.21	5	07/07/22 15:29	07/01/22	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil  
**Sample Name:** TP-5-061522-3.8-4  
**Lab Code:** K2206845-009

**Service Request:** K2206845  
**Date Collected:** 06/15/22 13:00  
**Date Received:** 06/20/22 12:10

**Basis:** Dry

**Total Metals**

Analyte Name	Analysis		Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Date	
	Method	Result							Extracted	Q
Aluminum	6020A	<b>7340</b>	mg/Kg	2.0	1.8	0.6	5	07/07/22 15:37	07/01/22	
Antimony	6020A	<b>0.190</b>	mg/Kg	0.050	0.045	0.020	5	07/07/22 15:37	07/01/22	
Arsenic	6020A	<b>3.82</b>	mg/Kg	0.50	0.12	0.06	5	07/07/22 15:37	07/01/22	
Barium	6020A	<b>91.6</b>	mg/Kg	0.050	0.045	0.020	5	07/07/22 15:37	07/01/22	
Beryllium	6020A	<b>0.390</b>	mg/Kg	0.020	0.018	0.006	5	07/07/22 15:37	07/01/22	
Cadmium	6020A	<b>0.103</b>	mg/Kg	0.020	0.018	0.007	5	07/07/22 15:37	07/01/22	
Chromium	6020A	<b>9.01</b>	mg/Kg	0.20	0.18	0.06	5	07/07/22 15:37	07/01/22	
Cobalt	6020A	<b>9.87</b>	mg/Kg	0.020	0.018	0.006	5	07/07/22 15:37	07/01/22	
Copper	6020A	<b>16.4</b>	mg/Kg	0.10	0.09	0.04	5	07/07/22 15:37	07/01/22	
Lead	6020A	<b>6.56</b>	mg/Kg	0.050	0.045	0.020	5	07/07/22 15:37	07/01/22	
Manganese	6020A	<b>411</b>	mg/Kg	0.050	0.045	0.020	5	07/07/22 15:37	07/01/22	
Mercury	7471A	<b>0.011 J</b>	mg/Kg	0.021	0.005	0.002	1	07/06/22 13:51	07/05/22	
Nickel	6020A	<b>10.5</b>	mg/Kg	0.20	0.10	0.03	5	07/08/22 10:40	07/01/22	
Potassium	6010C	<b>1460</b>	mg/Kg	40	36	10	2	07/08/22 13:34	07/01/22	
Selenium	6020A	<b>0.2 J</b>	mg/Kg	1.0	0.2	0.09	5	07/07/22 15:37	07/01/22	
Silver	6020A	<b>0.053</b>	mg/Kg	0.020	0.010	0.004	5	07/07/22 15:37	07/01/22	
Thallium	6020A	<b>0.124</b>	mg/Kg	0.020	0.010	0.004	5	07/07/22 15:37	07/01/22	
Zinc	6020A	<b>48.5</b>	mg/Kg	0.50	0.45	0.20	5	07/07/22 15:37	07/01/22	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil  
**Sample Name:** TP-8-061522-3.5-4  
**Lab Code:** K2206845-010

**Service Request:** K2206845  
**Date Collected:** 06/15/22 09:30  
**Date Received:** 06/20/22 12:10

**Basis:** Dry

**Total Metals**

Analyte Name	Analysis		Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Date	
	Method	Result							Extracted	Q
Aluminum	6020A	<b>6760</b>	mg/Kg	1.5	1.4	0.5	5	07/07/22 15:40	07/01/22	
Antimony	6020A	<b>0.113</b>	mg/Kg	0.038	0.034	0.015	5	07/07/22 15:40	07/01/22	
Arsenic	6020A	<b>3.13</b>	mg/Kg	0.38	0.09	0.05	5	07/07/22 15:40	07/01/22	
Barium	6020A	<b>88.6</b>	mg/Kg	0.038	0.034	0.015	5	07/07/22 15:40	07/01/22	
Beryllium	6020A	<b>0.370</b>	mg/Kg	0.015	0.014	0.005	5	07/07/22 15:40	07/01/22	
Cadmium	6020A	<b>0.090</b>	mg/Kg	0.015	0.014	0.005	5	07/07/22 15:40	07/01/22	
Chromium	6020A	<b>7.41</b>	mg/Kg	0.15	0.14	0.05	5	07/07/22 15:40	07/01/22	
Cobalt	6020A	<b>9.29</b>	mg/Kg	0.015	0.014	0.005	5	07/07/22 15:40	07/01/22	
Copper	6020A	<b>16.5</b>	mg/Kg	0.075	0.068	0.030	5	07/07/22 15:40	07/01/22	
Lead	6020A	<b>5.34</b>	mg/Kg	0.038	0.034	0.015	5	07/07/22 15:40	07/01/22	
Manganese	6020A	<b>404</b>	mg/Kg	0.038	0.034	0.015	5	07/07/22 15:40	07/01/22	
Mercury	7471A	<b>0.004 J</b>	mg/Kg	0.020	0.005	0.002	1	07/06/22 13:52	07/05/22	
Nickel	6020A	<b>9.25</b>	mg/Kg	0.15	0.08	0.02	5	07/08/22 10:42	07/01/22	
Potassium	6010C	<b>1120</b>	mg/Kg	30	27	8	2	07/08/22 13:37	07/01/22	
Selenium	6020A	<b>0.18 J</b>	mg/Kg	0.75	0.19	0.07	5	07/07/22 15:40	07/01/22	
Silver	6020A	<b>0.048</b>	mg/Kg	0.015	0.008	0.003	5	07/07/22 15:40	07/01/22	
Thallium	6020A	<b>0.095</b>	mg/Kg	0.015	0.008	0.003	5	07/07/22 15:40	07/01/22	
Zinc	6020A	<b>46.6</b>	mg/Kg	0.38	0.34	0.15	5	07/07/22 15:40	07/01/22	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil  
**Sample Name:** Method Blank  
**Lab Code:** KQ2210830-01

**Service Request:** K2206845  
**Date Collected:** NA  
**Date Received:** NA  
**Basis:** Dry

**Total Metals**

Analyte Name	Analysis		Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Date		Q
	Method	Result							Extracted		
Aluminum	6020A	<b>1.3 J</b>	mg/Kg	2.0	1.8	0.6	5	07/07/22 15:20	07/01/22		
Antimony	6020A	ND U	mg/Kg	0.05	0.045	0.020	5	07/07/22 15:20	07/01/22		
Arsenic	6020A	ND U	mg/Kg	0.5	0.13	0.06	5	07/07/22 15:20	07/01/22		
Barium	6020A	ND U	mg/Kg	0.05	0.045	0.020	5	07/07/22 15:20	07/01/22		
Beryllium	6020A	ND U	mg/Kg	0.020	0.018	0.006	5	07/07/22 15:20	07/01/22		
Cadmium	6020A	ND U	mg/Kg	0.020	0.018	0.007	5	07/07/22 15:20	07/01/22		
Chromium	6020A	ND U	mg/Kg	0.20	0.18	0.06	5	07/07/22 15:20	07/01/22		
Cobalt	6020A	ND U	mg/Kg	0.020	0.018	0.006	5	07/07/22 15:20	07/01/22		
Copper	6020A	ND U	mg/Kg	0.10	0.09	0.04	5	07/07/22 15:20	07/01/22		
Lead	6020A	ND U	mg/Kg	0.05	0.045	0.020	5	07/07/22 15:20	07/01/22		
Manganese	6020A	ND U	mg/Kg	0.05	0.045	0.020	5	07/07/22 15:20	07/01/22		
Nickel	6020A	ND U	mg/Kg	0.20	0.10	0.03	5	07/08/22 10:29	07/01/22		
Potassium	6010C	ND U	mg/Kg	40	36	10	2	07/08/22 13:24	07/01/22		
Selenium	6020A	ND U	mg/Kg	1.0	0.3	0.09	5	07/07/22 15:20	07/01/22		
Silver	6020A	ND U	mg/Kg	0.020	0.010	0.004	5	07/07/22 15:20	07/01/22		
Thallium	6020A	ND U	mg/Kg	0.020	0.010	0.004	5	07/07/22 15:20	07/01/22		
Zinc	6020A	ND U	mg/Kg	0.5	0.45	0.20	5	07/07/22 15:20	07/01/22		

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil  
**Sample Name:** Method Blank  
**Lab Code:** KQ2210944-01

**Service Request:** K2206845  
**Date Collected:** NA  
**Date Received:** NA  
**Basis:** Dry

Total Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>LOQ</u>	<u>LOD</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Mercury	7471A	ND U	mg/Kg	0.02	0.005	0.002	1	07/06/22 13:44	07/05/22	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845  
**Date Analyzed:** 07/07/22 - 07/08/22

**Duplicate Lab Control Sample Summary**  
**Total Metals**

**Units:**mg/Kg  
**Basis:**Dry

**Lab Control Sample**  
KQ2210830-02

**Duplicate Lab Control Sample**  
KQ2210830-03

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec	% Rec Limits	RPD	RPD Limit
Aluminum	6020A	403	400	101	406	400	101	78-124	<1	20
Antimony	6020A	94.6	100	95	93.7	100	94	72-124	<1	20
Arsenic	6020A	103	100	103	104	100	104	82-118	<1	20
Barium	6020A	197	200	98	193	200	96	86-116	2	20
Beryllium	6020A	10.1	10.0	101	10.0	10.0	100	80-120	<1	20
Cadmium	6020A	9.94	10.0	99	9.87	10.0	99	84-116	<1	20
Chromium	6020A	38.5	40.0	96	39.3	40.0	98	83-119	2	20
Cobalt	6020A	96.5	100	97	97.3	100	97	84-115	<1	20
Copper	6020A	47.2	50.0	94	47.6	50.0	95	84-119	<1	20
Lead	6020A	96.1	100	96	95.7	100	96	84-118	<1	20
Manganese	6020A	98.2	100	98	99.2	100	99	85-116	1	20
Nickel	6020A	95.0	100	95	96.2	100	96	84-119	1	20
Potassium	6010C	1000	1000	100	992	1000	99	81-116	<1	20
Selenium	6020A	113	100	113	103	100	103	80-119	9	20
Silver	6020A	9.63	10.0	96	9.57	10.0	96	83-118	<1	20
Thallium	6020A	19.5	20.0	97	19.4	20.0	97	83-118	<1	20
Zinc	6020A	106	100	106	106	100	106	82-119	<1	20

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845  
**Date Analyzed:** 07/06/22

**Duplicate Lab Control Sample Summary**  
**Total Metals**

**Units:**mg/Kg  
**Basis:**Dry

Analyte Name	Analytical Method	Result	Lab Control Sample		Duplicate Lab Control Sample		% Rec Limits	RPD	RPD Limit	
			Spike Amount	% Rec	Result	Spike Amount				% Rec
Mercury	7471A	0.498	0.500	100	0.498	0.500	100	80-120	<1	20



# Polychlorinated Biphenyls (PCBs)

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

Analytical Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845  
**Date Collected:** 06/16/2022  
**Date Received:** 06/20/2022

Polychlorinated Biphenyls (PCBs)

**Sample Name:** TP-1-061622-05.0-05.5  
**Lab Code:** K2206845-008  
**Extraction Method:** EPA 3546  
**Analysis Method:** 8082A

**Units:** ug/Kg  
**Basis:** Dry  
**Level:** Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	2.1	1.3	0.52	1	07/07/22	07/08/22	KWG2201319	
Aroclor 1221	ND	U	2.1	1.3	0.52	1	07/07/22	07/08/22	KWG2201319	
Aroclor 1232	ND	U	2.1	1.3	0.52	1	07/07/22	07/08/22	KWG2201319	
Aroclor 1242	ND	U	2.1	1.3	0.52	1	07/07/22	07/08/22	KWG2201319	
Aroclor 1248	ND	U	2.1	1.3	0.52	1	07/07/22	07/08/22	KWG2201319	
Aroclor 1254	ND	U	2.1	1.3	0.52	1	07/07/22	07/08/22	KWG2201319	
Aroclor 1260	ND	U	2.1	1.3	0.52	1	07/07/22	07/08/22	KWG2201319	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	65	20-155	07/08/22	Acceptable

**Comments:** \_\_\_\_\_

Analytical Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845  
**Date Collected:** 06/15/2022  
**Date Received:** 06/20/2022

Polychlorinated Biphenyls (PCBs)

**Sample Name:** TP-5-061522-3.8-4  
**Lab Code:** K2206845-009  
**Extraction Method:** EPA 3546  
**Analysis Method:** 8082A

**Units:** ug/Kg  
**Basis:** Dry  
**Level:** Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	2.3	1.4	0.56	1	07/07/22	07/08/22	KWG2201319	
Aroclor 1221	ND	U	2.3	1.4	0.56	1	07/07/22	07/08/22	KWG2201319	
Aroclor 1232	ND	U	2.3	1.4	0.56	1	07/07/22	07/08/22	KWG2201319	
Aroclor 1242	ND	U	2.3	1.4	0.56	1	07/07/22	07/08/22	KWG2201319	
Aroclor 1248	ND	U	2.3	1.4	0.56	1	07/07/22	07/08/22	KWG2201319	
Aroclor 1254	ND	U	2.3	1.4	0.56	1	07/07/22	07/08/22	KWG2201319	
Aroclor 1260	ND	U	2.3	1.4	0.56	1	07/07/22	07/08/22	KWG2201319	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	64	20-155	07/08/22	Acceptable

**Comments:** \_\_\_\_\_

Analytical Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845  
**Date Collected:** 06/15/2022  
**Date Received:** 06/20/2022

Polychlorinated Biphenyls (PCBs)

**Sample Name:** TP-8-061522-3.5-4  
**Lab Code:** K2206845-010  
**Extraction Method:** EPA 3546  
**Analysis Method:** 8082A

**Units:** ug/Kg  
**Basis:** Dry  
**Level:** Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	2.2	1.4	0.55	1	07/07/22	07/08/22	KWG2201319	
Aroclor 1221	ND	U	2.2	1.4	0.55	1	07/07/22	07/08/22	KWG2201319	
Aroclor 1232	ND	U	2.2	1.4	0.55	1	07/07/22	07/08/22	KWG2201319	
Aroclor 1242	ND	U	2.2	1.4	0.55	1	07/07/22	07/08/22	KWG2201319	
Aroclor 1248	ND	U	2.2	1.4	0.55	1	07/07/22	07/08/22	KWG2201319	
Aroclor 1254	ND	U	2.2	1.4	0.55	1	07/07/22	07/08/22	KWG2201319	
Aroclor 1260	ND	U	2.2	1.4	0.55	1	07/07/22	07/08/22	KWG2201319	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	70	20-155	07/08/22	Acceptable

**Comments:** \_\_\_\_\_

Analytical Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845  
**Date Collected:** NA  
**Date Received:** NA

Polychlorinated Biphenyls (PCBs)

**Sample Name:** Method Blank  
**Lab Code:** KWG2201319-3  
**Extraction Method:** EPA 3546  
**Analysis Method:** 8082A

**Units:** ug/Kg  
**Basis:** Dry  
**Level:** Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	2.0	1.3	0.50	1	07/07/22	07/08/22	KWG2201319	
Aroclor 1221	ND	U	2.0	1.3	0.50	1	07/07/22	07/08/22	KWG2201319	
Aroclor 1232	ND	U	2.0	1.3	0.50	1	07/07/22	07/08/22	KWG2201319	
Aroclor 1242	ND	U	2.0	1.3	0.50	1	07/07/22	07/08/22	KWG2201319	
Aroclor 1248	ND	U	2.0	1.3	0.50	1	07/07/22	07/08/22	KWG2201319	
Aroclor 1254	ND	U	2.0	1.3	0.50	1	07/07/22	07/08/22	KWG2201319	
Aroclor 1260	ND	U	2.0	1.3	0.50	1	07/07/22	07/08/22	KWG2201319	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	58	20-155	07/08/22	Acceptable

**Comments:** \_\_\_\_\_

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845

**Surrogate Recovery Summary  
 Polychlorinated Biphenyls (PCBs)**

**Extraction Method:** EPA 3546  
**Analysis Method:** 8082A

**Units:** Percent  
**Level:** Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
TP-1-061622-05.0-05.5	K2206845-008	65
TP-5-061522-3.8-4	K2206845-009	64
TP-8-061522-3.5-4	K2206845-010	70
Method Blank	KWG2201319-3	58
Lab Control Sample	KWG2201319-1	63
Duplicate Lab Control Sample	KWG2201319-2	64

**Surrogate Recovery Control Limits (%)**

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Sur1 = Decachlorobiphenyl 20-155

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Results flagged with an asterisk (\*) indicate values outside control criteria.  
 Results flagged with a pound (#) indicate the control criteria is not applicable.

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845  
**Date Extracted:** 07/07/2022  
**Date Analyzed:** 07/08/2022

**Lab Control Spike/Duplicate Lab Control Spike Summary**  
**Polychlorinated Biphenyls (PCBs)**

**Extraction Method:** EPA 3546  
**Analysis Method:** 8082A

**Units:** ug/Kg  
**Basis:** Dry  
**Level:** Low  
**Extraction Lot:** KWG2201319

Analyte Name	Lab Control Sample KWG2201319-1 Lab Control Spike			Duplicate Lab Control Sample KWG2201319-2 Duplicate Lab Control Spike			%Rec Limits	RPD	RPD Limit
	Result	Spike Amount	%Rec	Result	Spike Amount	%Rec			
Aroclor 1016	11.5	20.0	57	11.6	20.0	58	44-119	0	40
Aroclor 1260	12.9	20.0	65	13.1	20.0	66	56-130	2	40

Results flagged with an asterisk (\*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.



# Volatile Organic Compounds

**ALS Environmental—Kelso Laboratory**  
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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil  
**Sample Name:** TP-1-061622-05.0-05.5  
**Lab Code:** K2206845-008

**Service Request:** K2206845  
**Date Collected:** 06/16/22 08:25  
**Date Received:** 06/20/22 12:10

**Units:** ug/Kg  
**Basis:** Dry

Volatile Organic Compounds by GC/MS

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Acetone	55	22	4.3	3.2	1	06/28/22 17:06	
Benzene	ND U	5.4	0.22	0.059	1	06/28/22 17:06	
Bromobenzene	ND U	5.4	0.32	0.095	1	06/28/22 17:06	
Bromochloromethane	ND U	5.4	0.54	0.26	1	06/28/22 17:06	
Bromodichloromethane	ND U	5.4	0.54	0.18	1	06/28/22 17:06	
Bromoform	ND U	5.4	0.54	0.16	1	06/28/22 17:06	
Bromomethane	ND U	5.4	0.54	0.22	1	06/28/22 17:06	
2-Butanone (MEK)	4.5 J	22	1.1	0.98	1	06/28/22 17:06	
n-Butylbenzene	ND U	22	0.22	0.075	1	06/28/22 17:06	
sec-Butylbenzene	ND U	22	0.22	0.080	1	06/28/22 17:06	
tert-Butylbenzene	ND U	22	0.54	0.16	1	06/28/22 17:06	
Carbon Disulfide	0.53 J	5.4	0.32	0.10	1	06/28/22 17:06	
Carbon Tetrachloride	ND U	5.4	0.32	0.11	1	06/28/22 17:06	
Chlorobenzene	ND U	5.4	0.22	0.071	1	06/28/22 17:06	
Chloroethane	ND U	5.4	1.1	0.80	1	06/28/22 17:06	
Chloroform	ND U	5.4	0.43	0.12	1	06/28/22 17:06	
Chloromethane	ND U	5.4	0.54	0.20	1	06/28/22 17:06	
2-Chlorotoluene	ND U	22	0.43	0.13	1	06/28/22 17:06	
4-Chlorotoluene	ND U	22	0.43	0.095	1	06/28/22 17:06	
1,2-Dibromo-3-chloropropane	ND U	22	1.5	0.44	1	06/28/22 17:06	
Dibromochloromethane	ND U	5.4	0.54	0.20	1	06/28/22 17:06	
1,2-Dibromoethane (EDB)	ND U	22	0.32	0.11	1	06/28/22 17:06	
Dibromomethane	ND U	5.4	0.54	0.31	1	06/28/22 17:06	
1,2-Dichlorobenzene	ND U	5.4	0.32	0.084	1	06/28/22 17:06	
1,3-Dichlorobenzene	ND U	6.5	0.32	0.11	1	06/28/22 17:06	
1,4-Dichlorobenzene	ND U	2.2	0.32	0.093	1	06/28/22 17:06	
Dichlorodifluoromethane	ND U	5.4	0.43	0.13	1	06/28/22 17:06	
1,1-Dichloroethane	ND U	5.4	0.43	0.13	1	06/28/22 17:06	
1,2-Dichloroethane (EDC)	ND U	5.4	0.22	0.076	1	06/28/22 17:06	
1,1-Dichloroethene	ND U	5.4	0.54	0.27	1	06/28/22 17:06	
cis-1,2-Dichloroethene	ND U	5.4	0.43	0.13	1	06/28/22 17:06	
trans-1,2-Dichloroethene	ND U	5.4	0.43	0.13	1	06/28/22 17:06	
1,2-Dichloropropane	ND U	5.4	0.54	0.15	1	06/28/22 17:06	
1,3-Dichloropropane	ND U	2.2	0.43	0.13	1	06/28/22 17:06	
2,2-Dichloropropane	ND U	5.4	0.32	0.11	1	06/28/22 17:06	
1,1-Dichloropropene	ND U	5.4	0.54	0.15	1	06/28/22 17:06	
cis-1,3-Dichloropropene	ND U	5.4	0.54	0.15	1	06/28/22 17:06	
trans-1,3-Dichloropropene	ND U	5.4	0.43	0.12	1	06/28/22 17:06	
Ethylbenzene	ND U	5.4	0.32	0.11	1	06/28/22 17:06	
Hexachlorobutadiene	ND U	22	0.86	0.44	1	06/28/22 17:06	
2-Hexanone	ND U	22	2.2	1.1	1	06/28/22 17:06	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil  
**Sample Name:** TP-1-061622-05.0-05.5  
**Lab Code:** K2206845-008

**Service Request:** K2206845  
**Date Collected:** 06/16/22 08:25  
**Date Received:** 06/20/22 12:10

**Units:** ug/Kg  
**Basis:** Dry

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Isopropylbenzene	ND U	22	0.32	0.088	1	06/28/22 17:06	
4-Isopropyltoluene	ND U	22	0.22	0.070	1	06/28/22 17:06	
4-Methyl-2-pentanone (MIBK)	ND U	22	2.0	2.0	1	06/28/22 17:06	
Methylene Chloride	<b>0.92 J</b>	11	0.54	0.18	1	06/28/22 17:06	
Naphthalene	ND U	22	0.54	0.15	1	06/28/22 17:06	
n-Propylbenzene	ND U	22	0.54	0.15	1	06/28/22 17:06	
Styrene	ND U	5.4	0.54	0.16	1	06/28/22 17:06	
1,1,1,2-Tetrachloroethane	ND U	5.4	0.43	0.12	1	06/28/22 17:06	
1,1,2,2-Tetrachloroethane	ND U	5.4	0.54	0.15	1	06/28/22 17:06	
Tetrachloroethene (PCE)	ND U	5.4	0.54	0.18	1	06/28/22 17:06	
Toluene	ND U	5.4	0.54	0.17	1	06/28/22 17:06	
1,2,3-Trichlorobenzene	ND U	22	0.54	0.21	1	06/28/22 17:06	
1,2,4-Trichlorobenzene	ND U	22	0.54	0.15	1	06/28/22 17:06	
1,1,2-Trichloroethane	ND U	5.4	0.54	0.17	1	06/28/22 17:06	
1,1,1-Trichloroethane (TCA)	ND U	5.4	0.43	0.12	1	06/28/22 17:06	
Trichloroethene (TCE)	ND U	5.4	0.54	0.17	1	06/28/22 17:06	
Trichlorofluoromethane (CFC 11)	ND U	5.4	0.32	0.092	1	06/28/22 17:06	
1,2,3-Trichloropropane	ND U	5.4	1.5	0.49	1	06/28/22 17:06	
1,2,4-Trimethylbenzene	ND U	22	0.22	0.059	1	06/28/22 17:06	
1,3,5-Trimethylbenzene	ND U	22	0.32	0.10	1	06/28/22 17:06	
Vinyl Chloride	ND U	5.4	0.54	0.20	1	06/28/22 17:06	
o-Xylene	ND U	5.4	0.32	0.088	1	06/28/22 17:06	
m,p-Xylenes	ND U	22	0.43	0.11	1	06/28/22 17:06	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	86	79 - 119	06/28/22 17:06	
Dibromofluoromethane	108	78 - 119	06/28/22 17:06	
1,2-Dichloroethane-d4	110	71 - 136	06/28/22 17:06	
Toluene-d8	106	85 - 116	06/28/22 17:06	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845  
**Date Collected:** 06/15/22 13:00  
**Date Received:** 06/20/22 12:10

**Sample Name:** TP-5-061522-3.8-4  
**Lab Code:** K2206845-009

**Units:** ug/Kg  
**Basis:** Dry

Volatile Organic Compounds by GC/MS

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Acetone	25	18	4.0	2.9	1	06/28/22 17:27	
Benzene	ND U	4.4	0.20	0.054	1	06/28/22 17:27	
Bromobenzene	ND U	4.4	0.30	0.088	1	06/28/22 17:27	
Bromochloromethane	ND U	4.4	0.50	0.24	1	06/28/22 17:27	
Bromodichloromethane	ND U	4.4	0.50	0.16	1	06/28/22 17:27	
Bromoform	ND U	4.4	0.50	0.14	1	06/28/22 17:27	
Bromomethane	ND U	4.4	0.50	0.20	1	06/28/22 17:27	
2-Butanone (MEK)	1.8 J	18	1.0	0.90	1	06/28/22 17:27	
n-Butylbenzene	ND U	18	0.20	0.069	1	06/28/22 17:27	
sec-Butylbenzene	ND U	18	0.20	0.074	1	06/28/22 17:27	
tert-Butylbenzene	ND U	18	0.50	0.14	1	06/28/22 17:27	
Carbon Disulfide	0.29 J	4.4	0.30	0.092	1	06/28/22 17:27	
Carbon Tetrachloride	ND U	4.4	0.30	0.094	1	06/28/22 17:27	
Chlorobenzene	ND U	4.4	0.20	0.065	1	06/28/22 17:27	
Chloroethane	ND U	4.4	1.0	0.74	1	06/28/22 17:27	
Chloroform	ND U	4.4	0.40	0.11	1	06/28/22 17:27	
Chloromethane	ND U	4.4	0.50	0.18	1	06/28/22 17:27	
2-Chlorotoluene	ND U	18	0.40	0.12	1	06/28/22 17:27	
4-Chlorotoluene	ND U	18	0.40	0.088	1	06/28/22 17:27	
1,2-Dibromo-3-chloropropane	ND U	18	1.4	0.40	1	06/28/22 17:27	
Dibromochloromethane	ND U	4.4	0.50	0.18	1	06/28/22 17:27	
1,2-Dibromoethane (EDB)	ND U	18	0.30	0.094	1	06/28/22 17:27	
Dibromomethane	ND U	4.4	0.50	0.28	1	06/28/22 17:27	
1,2-Dichlorobenzene	ND U	4.4	0.30	0.077	1	06/28/22 17:27	
1,3-Dichlorobenzene	ND U	5.3	0.30	0.094	1	06/28/22 17:27	
1,4-Dichlorobenzene	ND U	1.8	0.30	0.086	1	06/28/22 17:27	
Dichlorodifluoromethane	ND U	4.4	0.40	0.12	1	06/28/22 17:27	
1,1-Dichloroethane	ND U	4.4	0.40	0.12	1	06/28/22 17:27	
1,2-Dichloroethane (EDC)	ND U	4.4	0.20	0.070	1	06/28/22 17:27	
1,1-Dichloroethene	ND U	4.4	0.50	0.25	1	06/28/22 17:27	
cis-1,2-Dichloroethene	ND U	4.4	0.40	0.12	1	06/28/22 17:27	
trans-1,2-Dichloroethene	ND U	4.4	0.40	0.12	1	06/28/22 17:27	
1,2-Dichloropropane	ND U	4.4	0.50	0.13	1	06/28/22 17:27	
1,3-Dichloropropane	ND U	1.8	0.40	0.12	1	06/28/22 17:27	
2,2-Dichloropropane	ND U	4.4	0.30	0.098	1	06/28/22 17:27	
1,1-Dichloropropene	ND U	4.4	0.50	0.13	1	06/28/22 17:27	
cis-1,3-Dichloropropene	ND U	4.4	0.50	0.13	1	06/28/22 17:27	
trans-1,3-Dichloropropene	ND U	4.4	0.40	0.11	1	06/28/22 17:27	
Ethylbenzene	ND U	4.4	0.30	0.094	1	06/28/22 17:27	
Hexachlorobutadiene	ND U	18	0.80	0.40	1	06/28/22 17:27	
2-Hexanone	ND U	18	2.0	0.93	1	06/28/22 17:27	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil  
**Sample Name:** TP-5-061522-3.8-4  
**Lab Code:** K2206845-009

**Service Request:** K2206845  
**Date Collected:** 06/15/22 13:00  
**Date Received:** 06/20/22 12:10

**Units:** ug/Kg  
**Basis:** Dry

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Isopropylbenzene	ND U	18	0.30	0.081	1	06/28/22 17:27	
4-Isopropyltoluene	<b>0.33 J</b>	18	0.20	0.064	1	06/28/22 17:27	
4-Methyl-2-pentanone (MIBK)	ND U	18	1.8	1.8	1	06/28/22 17:27	
Methylene Chloride	<b>0.74 J</b>	8.8	0.50	0.16	1	06/28/22 17:27	
Naphthalene	ND U	18	0.50	0.13	1	06/28/22 17:27	
n-Propylbenzene	ND U	18	0.50	0.13	1	06/28/22 17:27	
Styrene	ND U	4.4	0.50	0.14	1	06/28/22 17:27	
1,1,1,2-Tetrachloroethane	ND U	4.4	0.40	0.11	1	06/28/22 17:27	
1,1,2,2-Tetrachloroethane	ND U	4.4	0.50	0.13	1	06/28/22 17:27	
Tetrachloroethene (PCE)	ND U	4.4	0.50	0.16	1	06/28/22 17:27	
Toluene	<b>0.60 J</b>	4.4	0.50	0.15	1	06/28/22 17:27	
1,2,3-Trichlorobenzene	ND U	18	0.50	0.19	1	06/28/22 17:27	
1,2,4-Trichlorobenzene	ND U	18	0.50	0.13	1	06/28/22 17:27	
1,1,2-Trichloroethane	ND U	4.4	0.50	0.15	1	06/28/22 17:27	
1,1,1-Trichloroethane (TCA)	ND U	4.4	0.40	0.11	1	06/28/22 17:27	
Trichloroethene (TCE)	ND U	4.4	0.50	0.15	1	06/28/22 17:27	
Trichlorofluoromethane (CFC 11)	ND U	4.4	0.30	0.085	1	06/28/22 17:27	
1,2,3-Trichloropropane	ND U	4.4	1.4	0.45	1	06/28/22 17:27	
1,2,4-Trimethylbenzene	ND U	18	0.20	0.054	1	06/28/22 17:27	
1,3,5-Trimethylbenzene	ND U	18	0.30	0.092	1	06/28/22 17:27	
Vinyl Chloride	ND U	4.4	0.50	0.18	1	06/28/22 17:27	
o-Xylene	ND U	4.4	0.30	0.081	1	06/28/22 17:27	
m,p-Xylenes	ND U	18	0.40	0.10	1	06/28/22 17:27	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	88	79 - 119	06/28/22 17:27	
Dibromofluoromethane	109	78 - 119	06/28/22 17:27	
1,2-Dichloroethane-d4	113	71 - 136	06/28/22 17:27	
Toluene-d8	111	85 - 116	06/28/22 17:27	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil  
**Sample Name:** TP-8-061522-3.5-4  
**Lab Code:** K2206845-010

**Service Request:** K2206845  
**Date Collected:** 06/15/22 09:30  
**Date Received:** 06/20/22 12:10

**Units:** ug/Kg  
**Basis:** Dry

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Acetone	<b>20</b>	17	4.0	2.9	1	06/28/22 17:48	
Benzene	ND U	4.2	0.20	0.054	1	06/28/22 17:48	
Bromobenzene	ND U	4.2	0.30	0.088	1	06/28/22 17:48	
Bromochloromethane	ND U	4.2	0.50	0.24	1	06/28/22 17:48	
Bromodichloromethane	ND U	4.2	0.50	0.16	1	06/28/22 17:48	
Bromoform	ND U	4.2	0.50	0.14	1	06/28/22 17:48	
Bromomethane	ND U	4.2	0.50	0.20	1	06/28/22 17:48	
2-Butanone (MEK)	<b>1.9 J</b>	17	1.0	0.90	1	06/28/22 17:48	
n-Butylbenzene	ND U	17	0.20	0.069	1	06/28/22 17:48	
sec-Butylbenzene	ND U	17	0.20	0.074	1	06/28/22 17:48	
tert-Butylbenzene	ND U	17	0.50	0.14	1	06/28/22 17:48	
Carbon Disulfide	<b>0.26 J</b>	4.2	0.30	0.092	1	06/28/22 17:48	
Carbon Tetrachloride	ND U	4.2	0.30	0.094	1	06/28/22 17:48	
Chlorobenzene	ND U	4.2	0.20	0.065	1	06/28/22 17:48	
Chloroethane	ND U	4.2	1.0	0.74	1	06/28/22 17:48	
Chloroform	ND U	4.2	0.40	0.11	1	06/28/22 17:48	
Chloromethane	ND U	4.2	0.50	0.18	1	06/28/22 17:48	
2-Chlorotoluene	ND U	17	0.40	0.12	1	06/28/22 17:48	
4-Chlorotoluene	ND U	17	0.40	0.088	1	06/28/22 17:48	
1,2-Dibromo-3-chloropropane	ND U	17	1.4	0.40	1	06/28/22 17:48	
Dibromochloromethane	ND U	4.2	0.50	0.18	1	06/28/22 17:48	
1,2-Dibromoethane (EDB)	ND U	17	0.30	0.094	1	06/28/22 17:48	
Dibromomethane	ND U	4.2	0.50	0.28	1	06/28/22 17:48	
1,2-Dichlorobenzene	ND U	4.2	0.30	0.077	1	06/28/22 17:48	
1,3-Dichlorobenzene	ND U	5.0	0.30	0.094	1	06/28/22 17:48	
1,4-Dichlorobenzene	ND U	1.7	0.30	0.086	1	06/28/22 17:48	
Dichlorodifluoromethane	ND U	4.2	0.40	0.12	1	06/28/22 17:48	
1,1-Dichloroethane	ND U	4.2	0.40	0.12	1	06/28/22 17:48	
1,2-Dichloroethane (EDC)	ND U	4.2	0.20	0.070	1	06/28/22 17:48	
1,1-Dichloroethene	ND U	4.2	0.50	0.25	1	06/28/22 17:48	
cis-1,2-Dichloroethene	ND U	4.2	0.40	0.12	1	06/28/22 17:48	
trans-1,2-Dichloroethene	ND U	4.2	0.40	0.12	1	06/28/22 17:48	
1,2-Dichloropropane	ND U	4.2	0.50	0.13	1	06/28/22 17:48	
1,3-Dichloropropane	ND U	1.7	0.40	0.12	1	06/28/22 17:48	
2,2-Dichloropropane	ND U	4.2	0.30	0.098	1	06/28/22 17:48	
1,1-Dichloropropene	ND U	4.2	0.50	0.13	1	06/28/22 17:48	
cis-1,3-Dichloropropene	ND U	4.2	0.50	0.13	1	06/28/22 17:48	
trans-1,3-Dichloropropene	ND U	4.2	0.40	0.11	1	06/28/22 17:48	
Ethylbenzene	ND U	4.2	0.30	0.094	1	06/28/22 17:48	
Hexachlorobutadiene	ND U	17	0.80	0.40	1	06/28/22 17:48	
2-Hexanone	ND U	17	2.0	0.93	1	06/28/22 17:48	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845  
**Date Collected:** 06/15/22 09:30  
**Date Received:** 06/20/22 12:10

**Sample Name:** TP-8-061522-3.5-4  
**Lab Code:** K2206845-010

**Units:** ug/Kg  
**Basis:** Dry

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Isopropylbenzene	ND U	17	0.30	0.081	1	06/28/22 17:48	
4-Isopropyltoluene	ND U	17	0.20	0.064	1	06/28/22 17:48	
4-Methyl-2-pentanone (MIBK)	ND U	17	1.8	1.8	1	06/28/22 17:48	
Methylene Chloride	<b>0.76 J</b>	8.4	0.50	0.16	1	06/28/22 17:48	
Naphthalene	ND U	17	0.50	0.13	1	06/28/22 17:48	
n-Propylbenzene	ND U	17	0.50	0.13	1	06/28/22 17:48	
Styrene	ND U	4.2	0.50	0.14	1	06/28/22 17:48	
1,1,1,2-Tetrachloroethane	ND U	4.2	0.40	0.11	1	06/28/22 17:48	
1,1,2,2-Tetrachloroethane	ND U	4.2	0.50	0.13	1	06/28/22 17:48	
Tetrachloroethene (PCE)	ND U	4.2	0.50	0.16	1	06/28/22 17:48	
Toluene	ND U	4.2	0.50	0.15	1	06/28/22 17:48	
1,2,3-Trichlorobenzene	ND U	17	0.50	0.19	1	06/28/22 17:48	
1,2,4-Trichlorobenzene	ND U	17	0.50	0.13	1	06/28/22 17:48	
1,1,2-Trichloroethane	ND U	4.2	0.50	0.15	1	06/28/22 17:48	
1,1,1-Trichloroethane (TCA)	ND U	4.2	0.40	0.11	1	06/28/22 17:48	
Trichloroethene (TCE)	ND U	4.2	0.50	0.15	1	06/28/22 17:48	
Trichlorofluoromethane (CFC 11)	ND U	4.2	0.30	0.085	1	06/28/22 17:48	
1,2,3-Trichloropropane	ND U	4.2	1.4	0.45	1	06/28/22 17:48	
1,2,4-Trimethylbenzene	ND U	17	0.20	0.054	1	06/28/22 17:48	
1,3,5-Trimethylbenzene	ND U	17	0.30	0.092	1	06/28/22 17:48	
Vinyl Chloride	ND U	4.2	0.50	0.18	1	06/28/22 17:48	
o-Xylene	ND U	4.2	0.30	0.081	1	06/28/22 17:48	
m,p-Xylenes	ND U	17	0.40	0.10	1	06/28/22 17:48	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	79	79 - 119	06/28/22 17:48	
Dibromofluoromethane	110	78 - 119	06/28/22 17:48	
1,2-Dichloroethane-d4	112	71 - 136	06/28/22 17:48	
Toluene-d8	110	85 - 116	06/28/22 17:48	

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845

**SURROGATE RECOVERY SUMMARY**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Extraction Method:** None

Sample Name	Lab Code	4-Bromofluorobenzene	Dibromofluoromethane	1,2-Dichloroethane-d4
		79-119	78-119	71-136
TP-1-061622-05.0-05.5	K2206845-008	86	108	110
TP-5-061522-3.8-4	K2206845-009	88	109	113
TP-8-061522-3.5-4	K2206845-010	79	110	112
Method Blank	KQ2210667-05	74*	110	95
Lab Control Sample	KQ2210667-03	90	110	108
Duplicate Lab Control Sample	KQ2210667-04	90	101	101

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845

**SURROGATE RECOVERY SUMMARY**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Extraction Method:** None

<b>Sample Name</b>	<b>Lab Code</b>	<b>Toluene-d8</b>
		<b>85-116</b>
TP-1-061622-05.0-05.5	K2206845-008	106
TP-5-061522-3.8-4	K2206845-009	111
TP-8-061522-3.5-4	K2206845-010	110
Method Blank	KQ2210667-05	112
Lab Control Sample	KQ2210667-03	115
Duplicate Lab Control Sample	KQ2210667-04	95

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil  
**Sample Name:** Method Blank  
**Lab Code:** KQ2210667-05

**Service Request:** K2206845  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/Kg  
**Basis:** Dry

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Acetone	6.4 J	20	4.0	2.9	1	06/28/22 16:45	
Benzene	ND U	5.0	0.20	0.054	1	06/28/22 16:45	
Bromobenzene	ND U	5.0	0.30	0.088	1	06/28/22 16:45	
Bromochloromethane	ND U	5.0	0.50	0.24	1	06/28/22 16:45	
Bromodichloromethane	ND U	5.0	0.50	0.16	1	06/28/22 16:45	
Bromoform	ND U	5.0	0.50	0.14	1	06/28/22 16:45	
Bromomethane	ND U	5.0	0.50	0.20	1	06/28/22 16:45	
2-Butanone (MEK)	ND U	20	1.0	0.90	1	06/28/22 16:45	
n-Butylbenzene	ND U	20	0.20	0.069	1	06/28/22 16:45	
sec-Butylbenzene	ND U	20	0.20	0.074	1	06/28/22 16:45	
tert-Butylbenzene	ND U	20	0.50	0.14	1	06/28/22 16:45	
Carbon Disulfide	ND U	5.0	0.30	0.092	1	06/28/22 16:45	
Carbon Tetrachloride	ND U	5.0	0.30	0.094	1	06/28/22 16:45	
Chlorobenzene	ND U	5.0	0.20	0.065	1	06/28/22 16:45	
Chloroethane	ND U	5.0	1.0	0.74	1	06/28/22 16:45	
Chloroform	ND U	5.0	0.40	0.11	1	06/28/22 16:45	
Chloromethane	ND U	5.0	0.50	0.18	1	06/28/22 16:45	
2-Chlorotoluene	ND U	20	0.40	0.12	1	06/28/22 16:45	
4-Chlorotoluene	ND U	20	0.40	0.088	1	06/28/22 16:45	
1,2-Dibromo-3-chloropropane	ND U	20	1.4	0.40	1	06/28/22 16:45	
Dibromochloromethane	ND U	5.0	0.50	0.18	1	06/28/22 16:45	
1,2-Dibromoethane (EDB)	ND U	20	0.30	0.094	1	06/28/22 16:45	
Dibromomethane	ND U	5.0	0.50	0.28	1	06/28/22 16:45	
1,2-Dichlorobenzene	ND U	5.0	0.30	0.077	1	06/28/22 16:45	
1,3-Dichlorobenzene	ND U	6.0	0.30	0.094	1	06/28/22 16:45	
1,4-Dichlorobenzene	ND U	2.0	0.30	0.086	1	06/28/22 16:45	
Dichlorodifluoromethane	ND U	5.0	0.40	0.12	1	06/28/22 16:45	
1,1-Dichloroethane	ND U	5.0	0.40	0.12	1	06/28/22 16:45	
1,2-Dichloroethane (EDC)	ND U	5.0	0.20	0.070	1	06/28/22 16:45	
1,1-Dichloroethene	ND U	5.0	0.50	0.25	1	06/28/22 16:45	
cis-1,2-Dichloroethene	ND U	5.0	0.40	0.12	1	06/28/22 16:45	
trans-1,2-Dichloroethene	ND U	5.0	0.40	0.12	1	06/28/22 16:45	
1,2-Dichloropropane	ND U	5.0	0.50	0.13	1	06/28/22 16:45	
1,3-Dichloropropane	ND U	2.0	0.40	0.12	1	06/28/22 16:45	
2,2-Dichloropropane	ND U	5.0	0.30	0.098	1	06/28/22 16:45	
1,1-Dichloropropene	ND U	5.0	0.50	0.13	1	06/28/22 16:45	
cis-1,3-Dichloropropene	ND U	5.0	0.50	0.13	1	06/28/22 16:45	
trans-1,3-Dichloropropene	ND U	5.0	0.40	0.11	1	06/28/22 16:45	
Ethylbenzene	ND U	5.0	0.30	0.094	1	06/28/22 16:45	
Hexachlorobutadiene	ND U	20	0.80	0.40	1	06/28/22 16:45	
2-Hexanone	ND U	20	2.0	0.93	1	06/28/22 16:45	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil  
**Sample Name:** Method Blank  
**Lab Code:** KQ2210667-05

**Service Request:** K2206845  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/Kg  
**Basis:** Dry

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Isopropylbenzene	ND U	20	0.30	0.081	1	06/28/22 16:45	
4-Isopropyltoluene	ND U	20	0.20	0.064	1	06/28/22 16:45	
4-Methyl-2-pentanone (MIBK)	ND U	20	1.8	1.8	1	06/28/22 16:45	
Methylene Chloride	<b>0.79 J</b>	10	0.50	0.16	1	06/28/22 16:45	
Naphthalene	ND U	20	0.50	0.13	1	06/28/22 16:45	
n-Propylbenzene	ND U	20	0.50	0.13	1	06/28/22 16:45	
Styrene	ND U	5.0	0.50	0.14	1	06/28/22 16:45	
1,1,1,2-Tetrachloroethane	ND U	5.0	0.40	0.11	1	06/28/22 16:45	
1,1,2,2-Tetrachloroethane	ND U	5.0	0.50	0.13	1	06/28/22 16:45	
Tetrachloroethene (PCE)	ND U	5.0	0.50	0.16	1	06/28/22 16:45	
Toluene	ND U	5.0	0.50	0.15	1	06/28/22 16:45	
1,2,3-Trichlorobenzene	ND U	20	0.50	0.19	1	06/28/22 16:45	
1,2,4-Trichlorobenzene	ND U	20	0.50	0.13	1	06/28/22 16:45	
1,1,2-Trichloroethane	ND U	5.0	0.50	0.15	1	06/28/22 16:45	
1,1,1-Trichloroethane (TCA)	ND U	5.0	0.40	0.11	1	06/28/22 16:45	
Trichloroethene (TCE)	ND U	5.0	0.50	0.15	1	06/28/22 16:45	
Trichlorofluoromethane (CFC 11)	ND U	5.0	0.30	0.085	1	06/28/22 16:45	
1,2,3-Trichloropropane	ND U	5.0	1.4	0.45	1	06/28/22 16:45	
1,2,4-Trimethylbenzene	ND U	20	0.20	0.054	1	06/28/22 16:45	
1,3,5-Trimethylbenzene	ND U	20	0.30	0.092	1	06/28/22 16:45	
Vinyl Chloride	ND U	5.0	0.50	0.18	1	06/28/22 16:45	
o-Xylene	ND U	5.0	0.30	0.081	1	06/28/22 16:45	
m,p-Xylenes	ND U	20	0.40	0.10	1	06/28/22 16:45	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	74	79 - 119	06/28/22 16:45	*
Dibromofluoromethane	110	78 - 119	06/28/22 16:45	
1,2-Dichloroethane-d4	95	71 - 136	06/28/22 16:45	
Toluene-d8	112	85 - 116	06/28/22 16:45	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845  
**Date Analyzed:** 06/28/22  
**Date Extracted:** NA

**Duplicate Lab Control Sample Summary**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

**Units:** ug/Kg  
**Basis:** Dry  
**Analysis Lot:** 769041

Analyte Name	Lab Control Sample KQ2210667-03			Duplicate Lab Control Sample KQ2210667-04			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1,2-Tetrachloroethane	48.4	50.0	97	49.4	50.0	99	78-125	2	20
1,1,1-Trichloroethane (TCA)	50.0	50.0	100	43.0	50.0	86	73-130	15	20
1,1,2,2-Tetrachloroethane	43.7	50.0	87	47.2	50.0	94	70-124	8	20
1,1,2-Trichloroethane	43.3	50.0	87	50.3	50.0	101	78-121	15	20
1,1-Dichloroethane	50.4	50.0	101	43.4	50.0	87	76-125	15	20
1,1-Dichloroethene	54.6	50.0	109	48.7	50.0	97	70-131	11	20
1,1-Dichloropropene	46.5	50.0	93	44.1	50.0	88	76-125	5	20
1,2,3-Trichlorobenzene	51.8	50.0	104	52.3	50.0	105	66-130	1	20
1,2,3-Trichloropropane	46.7	50.0	93	48.8	50.0	98	73-125	4	20
1,2,4-Trichlorobenzene	51.8	50.0	104	53.5	50.0	107	67-129	3	20
1,2,4-Trimethylbenzene	51.9	50.0	104	45.5	50.0	91	75-123	13	20
1,2-Dibromo-3-chloropropane	38.6	50.0	77	41.7	50.0	83	61-132	8	20
1,2-Dibromoethane (EDB)	48.1	50.0	96	52.3	50.0	105	78-122	8	20
1,2-Dichlorobenzene	48.5	50.0	97	46.6	50.0	93	78-121	4	20
1,2-Dichloroethane (EDC)	45.3	50.0	91	40.8	50.0	82	73-128	10	20
1,2-Dichloropropane	42.1	50.0	84	42.9	50.0	86	76-123	2	20
1,3,5-Trimethylbenzene	51.1	50.0	102	50.3	50.0	101	73-124	2	20
1,3-Dichlorobenzene	50.2	50.0	100	51.2	50.0	102	77-121	2	20
1,3-Dichloropropane	47.3	50.0	95	49.0	50.0	98	77-121	4	20
1,4-Dichlorobenzene	50.4	50.0	101	50.4	50.0	101	75-120	<1	20
2,2-Dichloropropane	48.8	50.0	98	42.9	50.0	86	67-133	13	20
2-Butanone (MEK)	79.7	100	80	85.3	100	85	51-148	7	20
2-Chlorotoluene	48.5	50.0	97	48.4	50.0	97	75-122	<1	20
2-Hexanone	83.1	100	83	104	100	104	53-145	23 *	20
4-Chlorotoluene	48.4	50.0	97	51.7	50.0	103	72-124	6	20
4-Isopropyltoluene	51.2	50.0	102	49.8	50.0	100	73-127	3	20
4-Methyl-2-pentanone (MIBK)	81.0	100	81	85.0	100	85	65-135	5	20
Acetone	84.7	100	85	88.6	100	89	36-164	4	20
Benzene	46.1	50.0	92	45.2	50.0	90	77-121	2	20
Bromobenzene	48.3	50.0	97	47.3	50.0	95	78-121	2	20
Bromochloromethane	43.3	50.0	87	42.6	50.0	85	78-125	2	20
Bromodichloromethane	49.4	50.0	99	44.0	50.0	88	75-127	11	20
Bromoform	41.2	50.0	82	46.7	50.0	93	67-132	13	20
Bromomethane	49.7	50.0	99	44.5	50.0	89	53-143	11	20
Carbon Disulfide	55.1	50.0	110	47.3	50.0	95	63-132	15	20
Carbon Tetrachloride	47.3	50.0	95	44.6	50.0	89	70-135	6	20
Chlorobenzene	47.5	50.0	95	52.3	50.0	105	79-120	10	20
Chloroethane	44.4	50.0	89	43.0	50.0	86	59-139	3	20
Chloroform	48.1	50.0	96	43.7	50.0	87	78-123	10	20
Chloromethane	47.8	50.0	96	37.2	50.0	74	50-136	25 *	20
cis-1,2-Dichloroethene	51.5	50.0	103	40.1	50.0	80	77-123	25 *	20

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845  
**Date Analyzed:** 06/28/22  
**Date Extracted:** NA

**Duplicate Lab Control Sample Summary**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

**Units:** ug/Kg  
**Basis:** Dry  
**Analysis Lot:** 769041

Analyte Name	Lab Control Sample KQ2210667-03			Duplicate Lab Control Sample KQ2210667-04			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
cis-1,3-Dichloropropene	51.8	50.0	104	43.2	50.0	86	74-126	18	20
Dibromochloromethane	45.2	50.0	90	49.3	50.0	99	74-126	9	20
Dibromomethane	42.9	50.0	86	43.3	50.0	87	78-125	<1	20
Dichlorodifluoromethane	49.1	50.0	98	43.0	50.0	86	29-149	13	20
Ethylbenzene	51.7	50.0	103	53.1	50.0	106	76-122	3	20
Hexachlorobutadiene	51.5	50.0	103	50.4	50.0	101	61-135	2	20
Isopropylbenzene	50.0	50.0	100	51.8	50.0	104	68-134	4	20
m,p-Xylenes	106	100	106	99.7	100	100	77-124	6	20
Methylene Chloride	44.4	50.0	89	42.0	50.0	84	70-128	6	20
Naphthalene	42.7	50.0	85	47.1	50.0	94	62-129	10	20
n-Butylbenzene	53.7	50.0	107	49.8	50.0	100	70-128	8	20
n-Propylbenzene	50.1	50.0	100	49.5	50.0	99	73-125	1	20
o-Xylene	53.0	50.0	106	46.8	50.0	94	77-123	12	20
sec-Butylbenzene	49.2	50.0	98	49.2	50.0	98	73-126	<1	20
Styrene	54.3	50.0	109	49.2	50.0	98	76-124	10	20
tert-Butylbenzene	50.6	50.0	101	48.2	50.0	96	73-125	5	20
Tetrachloroethene (PCE)	51.8	50.0	104	50.6	50.0	101	73-128	3	20
Toluene	48.2	50.0	96	45.0	50.0	90	77-121	7	20
trans-1,2-Dichloroethene	50.0	50.0	100	45.7	50.0	91	74-125	9	20
trans-1,3-Dichloropropene	46.5	50.0	93	52.0	50.0	104	71-130	11	20
Trichloroethene (TCE)	47.9	50.0	96	43.7	50.0	87	77-123	9	20
Trichlorofluoromethane (CFC 11)	50.6	50.0	101	41.6	50.0	83	62-140	20	20
Vinyl Chloride	53.1	50.0	106	43.2	50.0	86	56-135	21 *	20



# Semi-Volatile Organic Compounds by GC/MS

**ALS Environmental—Kelso Laboratory**  
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ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845  
**Date Collected:** 06/16/22 08:25  
**Date Received:** 06/20/22 12:10

**Sample Name:** TP-1-061622-05.0-05.5  
**Lab Code:** K2206845-008

**Units:** mg/Kg  
**Basis:** Dry

Semivolatile Organic Compounds by GC/MS

**Analysis Method:** 8270D  
**Prep Method:** EPA 3541

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Acenaphthene	ND U	0.35	0.024	0.0097	1	07/13/22 15:16	6/29/22	
Acenaphthylene	ND U	0.35	0.017	0.0074	1	07/13/22 15:16	6/29/22	*
Aniline	ND U	1.7	0.024	0.013	1	07/13/22 15:16	6/29/22	
Anthracene	ND U	0.35	0.024	0.0090	1	07/13/22 15:16	6/29/22	
Benz(a)anthracene	ND U	0.35	0.024	0.0095	1	07/13/22 15:16	6/29/22	
Benzo(b)fluoranthene	ND U	0.35	0.024	0.013	1	07/13/22 15:16	6/29/22	
Benzo(k)fluoranthene	ND U	0.35	0.035	0.015	1	07/13/22 15:16	6/29/22	
Benzoic Acid	ND U	3.5	0.69	0.15	1	07/13/22 15:16	6/29/22	
Benzo(g,h,i)perylene	ND U	0.35	0.024	0.012	1	07/13/22 15:16	6/29/22	
Benzo(a)pyrene	ND U	0.35	0.035	0.017	1	07/13/22 15:16	6/29/22	
Benzyl Alcohol	ND U	0.35	0.017	0.0077	1	07/13/22 15:16	6/29/22	
Bis(2-chloroethyl) Ether	ND U	0.35	0.024	0.0086	1	07/13/22 15:16	6/29/22	
Bis(2-ethylhexyl) Phthalate	ND U	0.35	0.017	0.0074	1	07/13/22 15:16	6/29/22	
Bis(2-chloroethoxy)methane	ND U	0.35	0.069	0.0098	1	07/13/22 15:16	6/29/22	
4-Bromophenyl Phenyl Ether	ND U	0.35	0.035	0.014	1	07/13/22 15:16	6/29/22	
Butyl Benzyl Phthalate	ND U	0.35	0.035	0.016	1	07/13/22 15:16	6/29/22	
4-Chloro-3-methylphenol	ND U	0.69	0.35	0.17	1	07/13/22 15:16	6/29/22	
4-Chloroaniline	ND U	0.35	0.017	0.0073	1	07/13/22 15:16	6/29/22	
2-Chloronaphthalene	ND U	0.35	0.024	0.011	1	07/13/22 15:16	6/29/22	
2-Chlorophenol	ND U	0.35	0.024	0.0090	1	07/13/22 15:16	6/29/22	
4-Chlorophenyl Phenyl Ether	ND U	0.35	0.024	0.0089	1	07/13/22 15:16	6/29/22	
Chrysene	ND U	0.35	0.035	0.015	1	07/13/22 15:16	6/29/22	
Di-n-butyl Phthalate	ND U	0.35	0.035	0.016	1	07/13/22 15:16	6/29/22	
Di-n-octyl Phthalate	ND U	0.35	0.024	0.011	1	07/13/22 15:16	6/29/22	
Dibenz(a,h)anthracene	ND U	0.35	0.035	0.015	1	07/13/22 15:16	6/29/22	
Dibenzofuran	ND U	0.35	0.024	0.011	1	07/13/22 15:16	6/29/22	
1,2-Dichlorobenzene	ND U	0.35	0.017	0.0082	1	07/13/22 15:16	6/29/22	
1,3-Dichlorobenzene	ND U	0.35	0.024	0.0088	1	07/13/22 15:16	6/29/22	
1,4-Dichlorobenzene	ND U	0.35	0.017	0.0087	1	07/13/22 15:16	6/29/22	
3,3'-Dichlorobenzidine	ND U	0.35	0.069	0.029	1	07/13/22 15:16	6/29/22	
2,4-Dichlorophenol	ND U	0.35	0.024	0.0081	1	07/13/22 15:16	6/29/22	
Diethyl Phthalate	<b>0.015 J</b>	0.35	0.017	0.0083	1	07/13/22 15:16	6/29/22	
Dimethyl Phthalate	ND U	0.35	0.017	0.0080	1	07/13/22 15:16	6/29/22	
2,4-Dimethylphenol	ND U	0.35	0.14	0.038	1	07/13/22 15:16	6/29/22	
2,4-Dinitrophenol	ND U	3.5	0.69	0.15	1	07/13/22 15:16	6/29/22	
2,4-Dinitrotoluene	ND U	0.35	0.069	0.016	1	07/13/22 15:16	6/29/22	
2,6-Dinitrotoluene	ND U	0.35	0.069	0.0077	1	07/13/22 15:16	6/29/22	
Fluoranthene	ND U	0.35	0.035	0.013	1	07/13/22 15:16	6/29/22	
Fluorene	ND U	0.35	0.035	0.014	1	07/13/22 15:16	6/29/22	
Hexachlorobenzene	ND U	0.35	0.035	0.017	1	07/13/22 15:16	6/29/22	
Hexachlorobutadiene	ND U	0.35	0.024	0.012	1	07/13/22 15:16	6/29/22	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil  
**Sample Name:** TP-1-061622-05.0-05.5  
**Lab Code:** K2206845-008

**Service Request:** K2206845  
**Date Collected:** 06/16/22 08:25  
**Date Received:** 06/20/22 12:10

**Units:** mg/Kg  
**Basis:** Dry

**Semivolatile Organic Compounds by GC/MS**

**Analysis Method:** 8270D  
**Prep Method:** EPA 3541

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Hexachlorocyclopentadiene	ND U	0.35	0.17	0.025	1	07/13/22 15:16	6/29/22	
Hexachloroethane	ND U	0.35	0.069	0.0083	1	07/13/22 15:16	6/29/22	
Indeno(1,2,3-cd)pyrene	ND U	0.35	0.024	0.012	1	07/13/22 15:16	6/29/22	
Isophorone	ND U	0.35	0.024	0.012	1	07/13/22 15:16	6/29/22	
2-Methyl-4,6-dinitrophenol	ND U	3.5	0.29	0.034	1	07/13/22 15:16	6/29/22	
2-Methylnaphthalene	ND U	0.35	0.024	0.012	1	07/13/22 15:16	6/29/22	
2-Methylphenol	ND U	0.35	0.069	0.016	1	07/13/22 15:16	6/29/22	
4-Methylphenol	ND U	0.35	0.024	0.011	1	07/13/22 15:16	6/29/22	
Naphthalene	ND U	0.35	0.024	0.012	1	07/13/22 15:16	6/29/22	
2-Nitroaniline	ND U	0.35	0.14	0.044	1	07/13/22 15:16	6/29/22	
3-Nitroaniline	ND U	0.35	0.069	0.0083	1	07/13/22 15:16	6/29/22	
4-Nitroaniline	ND U	3.5	0.069	0.011	1	07/13/22 15:16	6/29/22	
Nitrobenzene	ND U	0.35	0.024	0.012	1	07/13/22 15:16	6/29/22	
2-Nitrophenol	ND U	0.35	0.069	0.015	1	07/13/22 15:16	6/29/22	
4-Nitrophenol	ND U	3.5	0.14	0.052	1	07/13/22 15:16	6/29/22	
N-Nitrosodi-n-propylamine	ND U	0.35	0.024	0.012	1	07/13/22 15:16	6/29/22	*
N-Nitrosodimethylamine	ND U	3.5	0.69	0.32	1	07/13/22 15:16	6/29/22	
N-Nitrosodiphenylamine	ND U	0.35	0.017	0.0079	1	07/13/22 15:16	6/29/22	*
2,2'-Oxybis(1-chloropropane)	ND U	0.35	0.024	0.0083	1	07/13/22 15:16	6/29/22	
Pentachlorophenol	ND U	3.5	0.14	0.066	1	07/13/22 15:16	6/29/22	
Phenanthrene	ND U	0.35	0.024	0.012	1	07/13/22 15:16	6/29/22	
Phenol	ND U	0.35	0.069	0.020	1	07/13/22 15:16	6/29/22	
Pyrene	ND U	0.35	0.024	0.010	1	07/13/22 15:16	6/29/22	
1,2,4-Trichlorobenzene	ND U	0.35	0.024	0.012	1	07/13/22 15:16	6/29/22	
2,4,5-Trichlorophenol	ND U	0.35	0.069	0.0087	1	07/13/22 15:16	6/29/22	
2,4,6-Trichlorophenol	ND U	0.35	0.069	0.015	1	07/13/22 15:16	6/29/22	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2-Fluorobiphenyl	47	44 - 115	07/13/22 15:16	
2-Fluorophenol	43	35 - 115	07/13/22 15:16	
Nitrobenzene-d5	49	37 - 122	07/13/22 15:16	
Phenol-d6	48	33 - 122	07/13/22 15:16	
Terphenyl-d14	57	54 - 127	07/13/22 15:16	
2,4,6-Tribromophenol	49	39 - 132	07/13/22 15:16	

**Analyte Comments:**

Benzo(b)fluoranthene This analyte cannot be separated from Benzo(j)fluoranthene.

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845  
**Date Collected:** 06/15/22 13:00  
**Date Received:** 06/20/22 12:10

**Sample Name:** TP-5-061522-3.8-4  
**Lab Code:** K2206845-009

**Units:** mg/Kg  
**Basis:** Dry

Semivolatile Organic Compounds by GC/MS

**Analysis Method:** 8270D  
**Prep Method:** EPA 3541

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Acenaphthene	ND U	0.37	0.026	0.011	1	07/13/22 15:37	6/29/22	
Acenaphthylene	ND U	0.37	0.018	0.0079	1	07/13/22 15:37	6/29/22	*
Aniline	ND U	1.8	0.026	0.014	1	07/13/22 15:37	6/29/22	
Anthracene	ND U	0.37	0.026	0.0095	1	07/13/22 15:37	6/29/22	
Benz(a)anthracene	ND U	0.37	0.026	0.011	1	07/13/22 15:37	6/29/22	
Benzo(b)fluoranthene	ND U	0.37	0.026	0.014	1	07/13/22 15:37	6/29/22	
Benzo(k)fluoranthene	ND U	0.37	0.037	0.016	1	07/13/22 15:37	6/29/22	
Benzoic Acid	ND U	3.7	0.74	0.16	1	07/13/22 15:37	6/29/22	
Benzo(g,h,i)perylene	ND U	0.37	0.026	0.013	1	07/13/22 15:37	6/29/22	
Benzo(a)pyrene	ND U	0.37	0.037	0.018	1	07/13/22 15:37	6/29/22	
Benzyl Alcohol	ND U	0.37	0.018	0.0081	1	07/13/22 15:37	6/29/22	
Bis(2-chloroethyl) Ether	ND U	0.37	0.026	0.0091	1	07/13/22 15:37	6/29/22	
Bis(2-ethylhexyl) Phthalate	ND U	0.37	0.018	0.0079	1	07/13/22 15:37	6/29/22	
Bis(2-chloroethoxy)methane	ND U	0.37	0.074	0.011	1	07/13/22 15:37	6/29/22	
4-Bromophenyl Phenyl Ether	ND U	0.37	0.037	0.015	1	07/13/22 15:37	6/29/22	
Butyl Benzyl Phthalate	ND U	0.37	0.037	0.017	1	07/13/22 15:37	6/29/22	
4-Chloro-3-methylphenol	ND U	0.74	0.37	0.18	1	07/13/22 15:37	6/29/22	
4-Chloroaniline	ND U	0.37	0.018	0.0078	1	07/13/22 15:37	6/29/22	
2-Chloronaphthalene	ND U	0.37	0.026	0.012	1	07/13/22 15:37	6/29/22	
2-Chlorophenol	ND U	0.37	0.026	0.0095	1	07/13/22 15:37	6/29/22	
4-Chlorophenyl Phenyl Ether	ND U	0.37	0.026	0.0094	1	07/13/22 15:37	6/29/22	
Chrysene	ND U	0.37	0.037	0.016	1	07/13/22 15:37	6/29/22	
Di-n-butyl Phthalate	ND U	0.37	0.037	0.017	1	07/13/22 15:37	6/29/22	
Di-n-octyl Phthalate	ND U	0.37	0.026	0.012	1	07/13/22 15:37	6/29/22	
Dibenz(a,h)anthracene	ND U	0.37	0.037	0.016	1	07/13/22 15:37	6/29/22	
Dibenzofuran	ND U	0.37	0.026	0.011	1	07/13/22 15:37	6/29/22	
1,2-Dichlorobenzene	ND U	0.37	0.018	0.0087	1	07/13/22 15:37	6/29/22	
1,3-Dichlorobenzene	ND U	0.37	0.026	0.0093	1	07/13/22 15:37	6/29/22	
1,4-Dichlorobenzene	ND U	0.37	0.018	0.0092	1	07/13/22 15:37	6/29/22	
3,3'-Dichlorobenzidine	ND U	0.37	0.074	0.030	1	07/13/22 15:37	6/29/22	
2,4-Dichlorophenol	ND U	0.37	0.026	0.0085	1	07/13/22 15:37	6/29/22	
Diethyl Phthalate	<b>0.017 J</b>	0.37	0.018	0.0088	1	07/13/22 15:37	6/29/22	
Dimethyl Phthalate	ND U	0.37	0.018	0.0084	1	07/13/22 15:37	6/29/22	
2,4-Dimethylphenol	ND U	0.37	0.15	0.040	1	07/13/22 15:37	6/29/22	
2,4-Dinitrophenol	ND U	3.7	0.74	0.16	1	07/13/22 15:37	6/29/22	
2,4-Dinitrotoluene	ND U	0.37	0.074	0.017	1	07/13/22 15:37	6/29/22	
2,6-Dinitrotoluene	ND U	0.37	0.074	0.0081	1	07/13/22 15:37	6/29/22	
Fluoranthene	ND U	0.37	0.037	0.014	1	07/13/22 15:37	6/29/22	
Fluorene	ND U	0.37	0.037	0.015	1	07/13/22 15:37	6/29/22	
Hexachlorobenzene	ND U	0.37	0.037	0.018	1	07/13/22 15:37	6/29/22	
Hexachlorobutadiene	ND U	0.37	0.026	0.013	1	07/13/22 15:37	6/29/22	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil  
**Sample Name:** TP-5-061522-3.8-4  
**Lab Code:** K2206845-009

**Service Request:** K2206845  
**Date Collected:** 06/15/22 13:00  
**Date Received:** 06/20/22 12:10

**Units:** mg/Kg  
**Basis:** Dry

Semivolatile Organic Compounds by GC/MS

**Analysis Method:** 8270D  
**Prep Method:** EPA 3541

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Hexachlorocyclopentadiene	ND U	0.37	0.18	0.027	1	07/13/22 15:37	6/29/22	
Hexachloroethane	ND U	0.37	0.074	0.0088	1	07/13/22 15:37	6/29/22	
Indeno(1,2,3-cd)pyrene	ND U	0.37	0.026	0.013	1	07/13/22 15:37	6/29/22	
Isophorone	ND U	0.37	0.026	0.013	1	07/13/22 15:37	6/29/22	
2-Methyl-4,6-dinitrophenol	ND U	3.7	0.31	0.036	1	07/13/22 15:37	6/29/22	
2-Methylnaphthalene	ND U	0.37	0.026	0.013	1	07/13/22 15:37	6/29/22	
2-Methylphenol	ND U	0.37	0.074	0.017	1	07/13/22 15:37	6/29/22	
4-Methylphenol	ND U	0.37	0.026	0.012	1	07/13/22 15:37	6/29/22	
Naphthalene	ND U	0.37	0.026	0.013	1	07/13/22 15:37	6/29/22	
2-Nitroaniline	ND U	0.37	0.15	0.047	1	07/13/22 15:37	6/29/22	
3-Nitroaniline	ND U	0.37	0.074	0.0088	1	07/13/22 15:37	6/29/22	
4-Nitroaniline	ND U	3.7	0.074	0.011	1	07/13/22 15:37	6/29/22	
Nitrobenzene	ND U	0.37	0.026	0.013	1	07/13/22 15:37	6/29/22	
2-Nitrophenol	ND U	0.37	0.074	0.016	1	07/13/22 15:37	6/29/22	
4-Nitrophenol	ND U	3.7	0.15	0.055	1	07/13/22 15:37	6/29/22	
N-Nitrosodi-n-propylamine	ND U	0.37	0.026	0.013	1	07/13/22 15:37	6/29/22	*
N-Nitrosodimethylamine	ND U	3.7	0.74	0.34	1	07/13/22 15:37	6/29/22	
N-Nitrosodiphenylamine	ND U	0.37	0.018	0.0083	1	07/13/22 15:37	6/29/22	*
2,2'-Oxybis(1-chloropropane)	ND U	0.37	0.026	0.0088	1	07/13/22 15:37	6/29/22	
Pentachlorophenol	ND U	3.7	0.15	0.070	1	07/13/22 15:37	6/29/22	
Phenanthrene	ND U	0.37	0.026	0.013	1	07/13/22 15:37	6/29/22	
Phenol	ND U	0.37	0.074	0.021	1	07/13/22 15:37	6/29/22	
Pyrene	ND U	0.37	0.026	0.011	1	07/13/22 15:37	6/29/22	
1,2,4-Trichlorobenzene	ND U	0.37	0.026	0.013	1	07/13/22 15:37	6/29/22	
2,4,5-Trichlorophenol	ND U	0.37	0.074	0.0092	1	07/13/22 15:37	6/29/22	
2,4,6-Trichlorophenol	ND U	0.37	0.074	0.016	1	07/13/22 15:37	6/29/22	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2-Fluorobiphenyl	50	44 - 115	07/13/22 15:37	
2-Fluorophenol	46	35 - 115	07/13/22 15:37	
Nitrobenzene-d5	53	37 - 122	07/13/22 15:37	
Phenol-d6	51	33 - 122	07/13/22 15:37	
Terphenyl-d14	56	54 - 127	07/13/22 15:37	
2,4,6-Tribromophenol	46	39 - 132	07/13/22 15:37	

**Analyte Comments:**

Benzo(b)fluoranthene This analyte cannot be separated from Benzo(j)fluoranthene.

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845  
**Date Collected:** 06/15/22 09:30  
**Date Received:** 06/20/22 12:10

**Sample Name:** TP-8-061522-3.5-4  
**Lab Code:** K2206845-010

**Units:** mg/Kg  
**Basis:** Dry

Semivolatile Organic Compounds by GC/MS

**Analysis Method:** 8270D  
**Prep Method:** EPA 3541

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Acenaphthene	ND U	0.37	0.026	0.011	1	07/13/22 15:59	6/29/22	
Acenaphthylene	ND U	0.37	0.018	0.0078	1	07/13/22 15:59	6/29/22	*
Aniline	ND U	1.8	0.026	0.014	1	07/13/22 15:59	6/29/22	
Anthracene	ND U	0.37	0.026	0.0095	1	07/13/22 15:59	6/29/22	
Benz(a)anthracene	ND U	0.37	0.026	0.010	1	07/13/22 15:59	6/29/22	
Benzo(b)fluoranthene	ND U	0.37	0.026	0.014	1	07/13/22 15:59	6/29/22	
Benzo(k)fluoranthene	ND U	0.37	0.037	0.016	1	07/13/22 15:59	6/29/22	
Benzoic Acid	ND U	3.7	0.73	0.16	1	07/13/22 15:59	6/29/22	
Benzo(g,h,i)perylene	ND U	0.37	0.026	0.013	1	07/13/22 15:59	6/29/22	
Benzo(a)pyrene	ND U	0.37	0.037	0.018	1	07/13/22 15:59	6/29/22	
Benzyl Alcohol	ND U	0.37	0.018	0.0081	1	07/13/22 15:59	6/29/22	
Bis(2-chloroethyl) Ether	ND U	0.37	0.026	0.0091	1	07/13/22 15:59	6/29/22	
Bis(2-ethylhexyl) Phthalate	ND U	0.37	0.018	0.0078	1	07/13/22 15:59	6/29/22	
Bis(2-chloroethoxy)methane	ND U	0.37	0.073	0.011	1	07/13/22 15:59	6/29/22	
4-Bromophenyl Phenyl Ether	ND U	0.37	0.037	0.015	1	07/13/22 15:59	6/29/22	
Butyl Benzyl Phthalate	ND U	0.37	0.037	0.017	1	07/13/22 15:59	6/29/22	
4-Chloro-3-methylphenol	ND U	0.73	0.37	0.18	1	07/13/22 15:59	6/29/22	
4-Chloroaniline	ND U	0.37	0.018	0.0077	1	07/13/22 15:59	6/29/22	
2-Chloronaphthalene	ND U	0.37	0.026	0.011	1	07/13/22 15:59	6/29/22	
2-Chlorophenol	ND U	0.37	0.026	0.0095	1	07/13/22 15:59	6/29/22	
4-Chlorophenyl Phenyl Ether	ND U	0.37	0.026	0.0094	1	07/13/22 15:59	6/29/22	
Chrysene	ND U	0.37	0.037	0.016	1	07/13/22 15:59	6/29/22	
Di-n-butyl Phthalate	ND U	0.37	0.037	0.017	1	07/13/22 15:59	6/29/22	
Di-n-octyl Phthalate	ND U	0.37	0.026	0.011	1	07/13/22 15:59	6/29/22	
Dibenz(a,h)anthracene	ND U	0.37	0.037	0.016	1	07/13/22 15:59	6/29/22	
Dibenzofuran	ND U	0.37	0.026	0.011	1	07/13/22 15:59	6/29/22	
1,2-Dichlorobenzene	ND U	0.37	0.018	0.0086	1	07/13/22 15:59	6/29/22	
1,3-Dichlorobenzene	ND U	0.37	0.026	0.0093	1	07/13/22 15:59	6/29/22	
1,4-Dichlorobenzene	ND U	0.37	0.018	0.0092	1	07/13/22 15:59	6/29/22	
3,3'-Dichlorobenzidine	ND U	0.37	0.073	0.030	1	07/13/22 15:59	6/29/22	
2,4-Dichlorophenol	ND U	0.37	0.026	0.0085	1	07/13/22 15:59	6/29/22	
Diethyl Phthalate	<b>0.014 J</b>	0.37	0.018	0.0087	1	07/13/22 15:59	6/29/22	
Dimethyl Phthalate	ND U	0.37	0.018	0.0084	1	07/13/22 15:59	6/29/22	
2,4-Dimethylphenol	ND U	0.37	0.15	0.040	1	07/13/22 15:59	6/29/22	
2,4-Dinitrophenol	ND U	3.7	0.73	0.16	1	07/13/22 15:59	6/29/22	
2,4-Dinitrotoluene	ND U	0.37	0.073	0.017	1	07/13/22 15:59	6/29/22	
2,6-Dinitrotoluene	ND U	0.37	0.073	0.0081	1	07/13/22 15:59	6/29/22	
Fluoranthene	ND U	0.37	0.037	0.014	1	07/13/22 15:59	6/29/22	
Fluorene	ND U	0.37	0.037	0.015	1	07/13/22 15:59	6/29/22	
Hexachlorobenzene	ND U	0.37	0.037	0.018	1	07/13/22 15:59	6/29/22	
Hexachlorobutadiene	ND U	0.37	0.026	0.013	1	07/13/22 15:59	6/29/22	

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dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil  
**Sample Name:** TP-8-061522-3.5-4  
**Lab Code:** K2206845-010

**Service Request:** K2206845  
**Date Collected:** 06/15/22 09:30  
**Date Received:** 06/20/22 12:10

**Units:** mg/Kg  
**Basis:** Dry

**Semivolatile Organic Compounds by GC/MS**

**Analysis Method:** 8270D  
**Prep Method:** EPA 3541

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Hexachlorocyclopentadiene	ND U	0.37	0.18	0.027	1	07/13/22 15:59	6/29/22	
Hexachloroethane	ND U	0.37	0.073	0.0087	1	07/13/22 15:59	6/29/22	
Indeno(1,2,3-cd)pyrene	ND U	0.37	0.026	0.013	1	07/13/22 15:59	6/29/22	
Isophorone	ND U	0.37	0.026	0.013	1	07/13/22 15:59	6/29/22	
2-Methyl-4,6-dinitrophenol	ND U	3.7	0.31	0.036	1	07/13/22 15:59	6/29/22	
2-Methylnaphthalene	ND U	0.37	0.026	0.013	1	07/13/22 15:59	6/29/22	
2-Methylphenol	ND U	0.37	0.073	0.017	1	07/13/22 15:59	6/29/22	
4-Methylphenol	ND U	0.37	0.026	0.011	1	07/13/22 15:59	6/29/22	
Naphthalene	ND U	0.37	0.026	0.013	1	07/13/22 15:59	6/29/22	
2-Nitroaniline	ND U	0.37	0.15	0.047	1	07/13/22 15:59	6/29/22	
3-Nitroaniline	ND U	0.37	0.073	0.0087	1	07/13/22 15:59	6/29/22	
4-Nitroaniline	ND U	3.7	0.073	0.011	1	07/13/22 15:59	6/29/22	
Nitrobenzene	ND U	0.37	0.026	0.013	1	07/13/22 15:59	6/29/22	
2-Nitrophenol	ND U	0.37	0.073	0.016	1	07/13/22 15:59	6/29/22	
4-Nitrophenol	ND U	3.7	0.15	0.054	1	07/13/22 15:59	6/29/22	
N-Nitrosodi-n-propylamine	ND U	0.37	0.026	0.013	1	07/13/22 15:59	6/29/22	*
N-Nitrosodimethylamine	ND U	3.7	0.73	0.33	1	07/13/22 15:59	6/29/22	
N-Nitrosodiphenylamine	ND U	0.37	0.018	0.0083	1	07/13/22 15:59	6/29/22	*
2,2'-Oxybis(1-chloropropane)	ND U	0.37	0.026	0.0087	1	07/13/22 15:59	6/29/22	
Pentachlorophenol	ND U	3.7	0.15	0.070	1	07/13/22 15:59	6/29/22	
Phenanthrene	ND U	0.37	0.026	0.013	1	07/13/22 15:59	6/29/22	
Phenol	ND U	0.37	0.073	0.021	1	07/13/22 15:59	6/29/22	
Pyrene	ND U	0.37	0.026	0.011	1	07/13/22 15:59	6/29/22	
1,2,4-Trichlorobenzene	ND U	0.37	0.026	0.013	1	07/13/22 15:59	6/29/22	
2,4,5-Trichlorophenol	ND U	0.37	0.073	0.0092	1	07/13/22 15:59	6/29/22	
2,4,6-Trichlorophenol	ND U	0.37	0.073	0.016	1	07/13/22 15:59	6/29/22	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2-Fluorobiphenyl	62	44 - 115	07/13/22 15:59	
2-Fluorophenol	56	35 - 115	07/13/22 15:59	
Nitrobenzene-d5	68	37 - 122	07/13/22 15:59	
Phenol-d6	64	33 - 122	07/13/22 15:59	
Terphenyl-d14	64	54 - 127	07/13/22 15:59	
2,4,6-Tribromophenol	59	39 - 132	07/13/22 15:59	

**Analyte Comments:**

Benzo(b)fluoranthene This analyte cannot be separated from Benzo(j)fluoranthene.

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845

**SURROGATE RECOVERY SUMMARY**  
**Semivolatile Organic Compounds by GC/MS**

**Analysis Method:** 8270D  
**Extraction Method:** EPA 3541

Sample Name	Lab Code	2-Fluorobiphenyl	2-Fluorophenol	Nitrobenzene-d5
		44-115	35-115	37-122
TP-1-061622-05.0-05.5	K2206845-008	47	43	49
TP-5-061522-3.8-4	K2206845-009	50	46	53
TP-8-061522-3.5-4	K2206845-010	62	56	68
Method Blank	KQ2210638-04	56	52	59
Lab Control Sample	KQ2210638-03	64	64	74

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845

**SURROGATE RECOVERY SUMMARY**  
**Semivolatile Organic Compounds by GC/MS**

**Analysis Method:** 8270D  
**Extraction Method:** EPA 3541

Sample Name	Lab Code	Phenol-d6	Terphenyl-d14	2,4,6-Tribromophenol
		33-122	54-127	39-132
TP-1-061622-05.0-05.5	K2206845-008	48	57	49
TP-5-061522-3.8-4	K2206845-009	51	56	46
TP-8-061522-3.5-4	K2206845-010	64	64	59
Method Blank	KQ2210638-04	56	62	49
Lab Control Sample	KQ2210638-03	70	68	71

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dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845  
**Date Collected:** NA  
**Date Received:** NA

**Sample Name:** Method Blank  
**Lab Code:** KQ2210638-04

**Units:** mg/Kg  
**Basis:** Dry

Semivolatile Organic Compounds by GC/MS

**Analysis Method:** 8270D  
**Prep Method:** EPA 3541

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Acenaphthene	ND U	0.33	0.023	0.0093	1	07/13/22 14:33	6/29/22	
Acenaphthylene	ND U	0.33	0.017	0.0071	1	07/13/22 14:33	6/29/22	
Aniline	ND U	1.6	0.023	0.012	1	07/13/22 14:33	6/29/22	
Anthracene	ND U	0.33	0.023	0.0086	1	07/13/22 14:33	6/29/22	
Benz(a)anthracene	ND U	0.33	0.023	0.0091	1	07/13/22 14:33	6/29/22	
Benzo(b)fluoranthene	ND U	0.33	0.023	0.012	1	07/13/22 14:33	6/29/22	
Benzo(k)fluoranthene	ND U	0.33	0.033	0.014	1	07/13/22 14:33	6/29/22	
Benzoic Acid	ND U	3.3	0.67	0.14	1	07/13/22 14:33	6/29/22	
Benzo(g,h,i)perylene	ND U	0.33	0.023	0.011	1	07/13/22 14:33	6/29/22	
Benzo(a)pyrene	ND U	0.33	0.033	0.016	1	07/13/22 14:33	6/29/22	
Benzyl Alcohol	ND U	0.33	0.017	0.0073	1	07/13/22 14:33	6/29/22	
Bis(2-chloroethyl) Ether	ND U	0.33	0.023	0.0082	1	07/13/22 14:33	6/29/22	
Bis(2-ethylhexyl) Phthalate	ND U	0.33	0.017	0.0071	1	07/13/22 14:33	6/29/22	
Bis(2-chloroethoxy)methane	ND U	0.33	0.067	0.0094	1	07/13/22 14:33	6/29/22	
4-Bromophenyl Phenyl Ether	ND U	0.33	0.033	0.013	1	07/13/22 14:33	6/29/22	
Butyl Benzyl Phthalate	ND U	0.33	0.033	0.015	1	07/13/22 14:33	6/29/22	
4-Chloro-3-methylphenol	ND U	0.66	0.33	0.16	1	07/13/22 14:33	6/29/22	
4-Chloroaniline	ND U	0.33	0.017	0.0070	1	07/13/22 14:33	6/29/22	
2-Chloronaphthalene	ND U	0.33	0.023	0.010	1	07/13/22 14:33	6/29/22	
2-Chlorophenol	ND U	0.33	0.023	0.0086	1	07/13/22 14:33	6/29/22	
4-Chlorophenyl Phenyl Ether	ND U	0.33	0.023	0.0085	1	07/13/22 14:33	6/29/22	
Chrysene	ND U	0.33	0.033	0.014	1	07/13/22 14:33	6/29/22	
Di-n-butyl Phthalate	ND U	0.33	0.033	0.015	1	07/13/22 14:33	6/29/22	
Di-n-octyl Phthalate	ND U	0.33	0.023	0.010	1	07/13/22 14:33	6/29/22	
Dibenz(a,h)anthracene	ND U	0.33	0.033	0.014	1	07/13/22 14:33	6/29/22	
Dibenzofuran	ND U	0.33	0.023	0.0098	1	07/13/22 14:33	6/29/22	
1,2-Dichlorobenzene	ND U	0.33	0.017	0.0078	1	07/13/22 14:33	6/29/22	
1,3-Dichlorobenzene	ND U	0.33	0.023	0.0084	1	07/13/22 14:33	6/29/22	
1,4-Dichlorobenzene	ND U	0.33	0.017	0.0083	1	07/13/22 14:33	6/29/22	
3,3'-Dichlorobenzidine	ND U	0.33	0.067	0.027	1	07/13/22 14:33	6/29/22	
2,4-Dichlorophenol	ND U	0.33	0.023	0.0077	1	07/13/22 14:33	6/29/22	
Diethyl Phthalate	<b>0.034 J</b>	0.33	0.017	0.0079	1	07/13/22 14:33	6/29/22	
Dimethyl Phthalate	ND U	0.33	0.017	0.0076	1	07/13/22 14:33	6/29/22	
2,4-Dimethylphenol	ND U	0.33	0.13	0.036	1	07/13/22 14:33	6/29/22	
2,4-Dinitrophenol	ND U	3.3	0.67	0.14	1	07/13/22 14:33	6/29/22	
2,4-Dinitrotoluene	ND U	0.33	0.067	0.015	1	07/13/22 14:33	6/29/22	
2,6-Dinitrotoluene	ND U	0.33	0.067	0.0073	1	07/13/22 14:33	6/29/22	
Fluoranthene	ND U	0.33	0.033	0.012	1	07/13/22 14:33	6/29/22	
Fluorene	ND U	0.33	0.033	0.013	1	07/13/22 14:33	6/29/22	
Hexachlorobenzene	ND U	0.33	0.033	0.016	1	07/13/22 14:33	6/29/22	
Hexachlorobutadiene	ND U	0.33	0.023	0.011	1	07/13/22 14:33	6/29/22	

**ALS Group USA, Corp.**  
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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil  
**Sample Name:** Method Blank  
**Lab Code:** KQ2210638-04

**Service Request:** K2206845  
**Date Collected:** NA  
**Date Received:** NA

**Units:** mg/Kg  
**Basis:** Dry

**Semivolatile Organic Compounds by GC/MS**

**Analysis Method:** 8270D  
**Prep Method:** EPA 3541

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Hexachlorocyclopentadiene	ND U	0.33	0.17	0.024	1	07/13/22 14:33	6/29/22	
Hexachloroethane	ND U	0.33	0.067	0.0079	1	07/13/22 14:33	6/29/22	
Indeno(1,2,3-cd)pyrene	ND U	0.33	0.023	0.011	1	07/13/22 14:33	6/29/22	
Isophorone	ND U	0.33	0.023	0.011	1	07/13/22 14:33	6/29/22	
2-Methyl-4,6-dinitrophenol	ND U	3.3	0.28	0.032	1	07/13/22 14:33	6/29/22	
2-Methylnaphthalene	ND U	0.33	0.023	0.011	1	07/13/22 14:33	6/29/22	
2-Methylphenol	ND U	0.33	0.067	0.015	1	07/13/22 14:33	6/29/22	
4-Methylphenol	ND U	0.33	0.023	0.010	1	07/13/22 14:33	6/29/22	
Naphthalene	ND U	0.33	0.023	0.011	1	07/13/22 14:33	6/29/22	
2-Nitroaniline	ND U	0.33	0.13	0.042	1	07/13/22 14:33	6/29/22	
3-Nitroaniline	ND U	0.33	0.067	0.0079	1	07/13/22 14:33	6/29/22	
4-Nitroaniline	ND U	3.3	0.067	0.0099	1	07/13/22 14:33	6/29/22	
Nitrobenzene	ND U	0.33	0.023	0.011	1	07/13/22 14:33	6/29/22	
2-Nitrophenol	ND U	0.33	0.067	0.014	1	07/13/22 14:33	6/29/22	
4-Nitrophenol	ND U	3.3	0.13	0.049	1	07/13/22 14:33	6/29/22	
N-Nitrosodi-n-propylamine	ND U	0.33	0.023	0.011	1	07/13/22 14:33	6/29/22	
N-Nitrosodimethylamine	ND U	3.3	0.67	0.30	1	07/13/22 14:33	6/29/22	
N-Nitrosodiphenylamine	ND U	0.33	0.017	0.0075	1	07/13/22 14:33	6/29/22	
2,2'-Oxybis(1-chloropropane)	ND U	0.33	0.023	0.0079	1	07/13/22 14:33	6/29/22	
Pentachlorophenol	ND U	3.3	0.13	0.063	1	07/13/22 14:33	6/29/22	
Phenanthrene	ND U	0.33	0.023	0.011	1	07/13/22 14:33	6/29/22	
Phenol	ND U	0.33	0.067	0.019	1	07/13/22 14:33	6/29/22	
Pyrene	ND U	0.33	0.023	0.0096	1	07/13/22 14:33	6/29/22	
1,2,4-Trichlorobenzene	ND U	0.33	0.023	0.011	1	07/13/22 14:33	6/29/22	
2,4,5-Trichlorophenol	ND U	0.33	0.067	0.0083	1	07/13/22 14:33	6/29/22	
2,4,6-Trichlorophenol	ND U	0.33	0.067	0.014	1	07/13/22 14:33	6/29/22	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2-Fluorobiphenyl	56	44 - 115	07/13/22 14:33	
2-Fluorophenol	52	35 - 115	07/13/22 14:33	
Nitrobenzene-d5	59	37 - 122	07/13/22 14:33	
Phenol-d6	56	33 - 122	07/13/22 14:33	
Terphenyl-d14	62	54 - 127	07/13/22 14:33	
2,4,6-Tribromophenol	49	39 - 132	07/13/22 14:33	

**Analyte Comments:**

Benzo(b)fluoranthene This analyte cannot be separated from Benzo(j)fluoranthene.

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845  
**Date Analyzed:** 07/13/22  
**Date Extracted:** 06/29/22

**Lab Control Sample Summary**  
**Semivolatile Organic Compounds by GC/MS**

**Analysis Method:** 8270D  
**Prep Method:** EPA 3541

**Units:** mg/Kg  
**Basis:** Dry  
**Analysis Lot:** 770379

**Lab Control Sample**  
**KQ2210638-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1,2,4-Trichlorobenzene	2.09	3.33	63	34-118
1,2-Dichlorobenzene	2.18	3.33	65	33-117
1,3-Dichlorobenzene	2.18	3.33	65	30-115
1,4-Dichlorobenzene	2.18	3.33	65	31-115
2,2'-Oxybis(1-chloropropane)	2.39	3.33	72	33-121
2,4,5-Trichlorophenol	2.28	3.33	68	41-124
2,4,6-Trichlorophenol	2.26	3.33	68	39-126
2,4-Dichlorophenol	2.28	3.33	68	40-122
2,4-Dimethylphenol	2.04	3.33	61	30-127
2,4-Dinitrophenol	2.25 J	3.33	67	28-116
2,4-Dinitrotoluene	2.29	3.33	69	48-126
2,6-Dinitrotoluene	2.29	3.33	69	46-124
2-Chloronaphthalene	2.19	3.33	66	41-114
2-Chlorophenol	2.30	3.33	69	34-121
2-Methyl-4,6-dinitrophenol	2.40 J	3.33	72	29-132
2-Methylnaphthalene	2.22	3.33	67	38-122
2-Methylphenol	2.36	3.33	71	32-122
2-Nitroaniline	2.54	3.33	76	44-127
2-Nitrophenol	2.28	3.33	68	36-123
3,3'-Dichlorobenzidine	2.31	3.33	69	22-121
3-Nitroaniline	2.40	3.33	72	33-119
4-Bromophenyl Phenyl Ether	2.26	3.33	68	46-124
4-Chloro-3-methylphenol	2.45	3.33	74	45-122
4-Chloroaniline	2.17	3.33	65	17-106
4-Chlorophenyl Phenyl Ether	2.17	3.33	65	45-121
4-Methylphenol	2.44	3.33	73	42-126
4-Nitroaniline	2.47 J	3.33	74	39-120
4-Nitrophenol	2.24 J	3.33	67	30-132
Acenaphthene	2.23	3.33	67	40-123
Acenaphthylene	2.33	3.33	70	32-132
Aniline	1.94	3.33	58	35-98
Anthracene	2.29	3.33	69	47-123
Benz(a)anthracene	2.34	3.33	70	49-126
Benzo(a)pyrene	2.34	3.33	70	45-129
Benzo(b)fluoranthene	2.26	3.33	68	45-132
Benzo(g,h,i)perylene	1.84	3.33	55	43-134
Benzo(k)fluoranthene	2.27	3.33	68	47-132
Benzoic Acid	1.87 J	3.33	56	10-104
Benzyl Alcohol	2.43	3.33	73	29-122
Bis(2-chloroethoxy)methane	2.30	3.33	69	36-121
Bis(2-chloroethyl) Ether	2.29	3.33	69	31-120

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Army Depot/913.001.002.001  
**Sample Matrix:** Soil

**Service Request:** K2206845  
**Date Analyzed:** 07/13/22  
**Date Extracted:** 06/29/22

**Lab Control Sample Summary**  
**Semivolatile Organic Compounds by GC/MS**

**Analysis Method:** 8270D  
**Prep Method:** EPA 3541

**Units:** mg/Kg  
**Basis:** Dry  
**Analysis Lot:** 770379

**Lab Control Sample**  
**KQ2210638-03**

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Bis(2-ethylhexyl) Phthalate	2.37	3.33	71	51-133
Butyl Benzyl Phthalate	2.48	3.33	74	48-132
Chrysene	2.27	3.33	68	50-124
Dibenz(a,h)anthracene	2.29	3.33	69	45-134
Dibenzofuran	2.28	3.33	68	44-120
Diethyl Phthalate	2.33	3.33	70	50-124
Dimethyl Phthalate	2.30	3.33	69	48-124
Di-n-butyl Phthalate	2.48	3.33	74	51-128
Di-n-octyl Phthalate	2.48	3.33	74	45-140
Fluoranthene	2.40	3.33	72	50-127
Fluorene	2.26	3.33	68	43-125
Hexachlorobenzene	2.20	3.33	66	45-122
Hexachlorobutadiene	2.02	3.33	61	32-123
Hexachlorocyclopentadiene	1.77	3.33	53	10-68
Hexachloroethane	2.26	3.33	68	28-117
Indeno(1,2,3-cd)pyrene	2.29	3.33	69	45-133
Isophorone	2.18	3.33	65	30-122
Naphthalene	2.21	3.33	66	35-123
Nitrobenzene	2.45	3.33	73	34-122
N-Nitrosodimethylamine	2.38 J	3.33	71	23-120
N-Nitrosodi-n-propylamine	2.36	3.33	71	36-120
N-Nitrosodiphenylamine	2.27	3.33	68	38-127
Pentachlorophenol	2.31 J	3.33	69	25-133
Phenanthrene	2.31	3.33	69	50-121
Phenol	2.41	3.33	72	34-121
Pyrene	2.23	3.33	67	47-127



# Subcontract Lab Results

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
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NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618  
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

Analytical Results Report For

**ALS Environmental-Kelso**

Project [ALK037|DOD Umatilla Army Depot](#)  
Workorder [3249559](#)  
Report ID [180686 on 7/11/2022](#)

**Certificate of Analysis**

Enclosed are the analytical results for samples received by the laboratory on Jun 23, 2022.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Sarah Leung (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at [www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads](http://www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads).

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ALS Middletown: 301 Fulling Mill Road, Middletown, PA 17057 : 717-944-5541.

Recipient(s):

ALKLS Data - ALS Environmental-Kelso  
Mark Harris - ALS Environmental-Kelso

*Sarah Leung*

**Sarah Leung**  
Project Coordinator

(ALS Digital Signature)

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*



### Sample Summary

<u>Lab ID</u>	<u>Sample ID</u>	<u>Matrix</u>	<u>Date Collected</u>	<u>Date Received</u>	<u>Collector</u>	<u>Collection Company</u>
3249559001	TP-1-061622-05.0-05.5	Oil/Other	06/16/2022 08:25	06/23/2022 08:43	CBC	Collected By Client
3249559002	TP-5-061522-3.8-4	Oil/Other	06/15/2022 13:00	06/23/2022 08:43	CBC	Collected By Client
3249559003	TP-8-061522-3.5-4	Oil/Other	06/15/2022 09:30	06/23/2022 08:43	CBC	Collected By Client



## Reference

### Notes

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- Except as qualified, Clean Water Act sample analyses are consistent with methodology requirements in 40 CFR Part 136.
- Except as qualified, Safe Drinking Water Act sample analyses are consistent with methodology requirements in 40 CFR Part 141.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are performed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.

### Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND) above the MDL
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits
#	Please reference the result in the Results Section for analyte-level flags.



**Project Notations**

**Sample Notations**

**Lab ID**      **Sample ID**

**Result Notations**

**Notation Ref.**

- |   |  |
|---|--|
| 1 | The QC sample type MS for method SW846 8330B was outside the control limits for the analyte 1,3-Dinitrobenzene. The % Recovery was reported as 161 and the control limits were 73 to 119.      |
| 2 | The QC sample type MSD for method SW846 8330B was outside the control limits for the analyte 1,3-Dinitrobenzene. The % Recovery was reported as 134 and the control limits were 73 to 119.     |
| 3 | The QC sample type MSD for method SW846 8330B was outside the control limits for the analyte Tetryl. The RPD was reported as 200 and the upper control limit is 20.                            |
| 4 | The QC sample type MS for method SW846 8330B was outside the control limits for the analyte Tetryl. The % Recovery was reported as 0 and the control limits were 68 to 135.                    |
| 5 | The QC sample type LCS for method SW846 8330B was outside the control limits for the analyte Tetryl. The % Recovery was reported as 13.9 and the control limits were 68 to 135.                |
| 6 | The QC sample type MSD for method SW846 8330B was outside the control limits for the analyte Tetryl. The % Recovery was reported as 33.9 and the control limits were 68 to 135.                |
| 7 | The QC sample type LCS for method SW846 8330B was outside the control limits for the analyte 1,3,5-Trinitrobenzene. The % Recovery was reported as 57.9 and the control limits were 80 to 116. |



**Detected Results Summary**

Not applicable for this WO.



## Results

Client Sample ID	TP-1-061622-05.0-05.5	Collected	06/16/2022 08:25
Lab Sample ID	3249559001	Lab Receipt	06/23/2022 08:43

### ENERGETICS

Compound	Result	Flag	Units	LOQ	LOD	DL	Method	Dilution	Analysis Date/Time	By	Cntr
1,3,5-Trinitrobenzene	0.20U	U,7	mg/kg	0.25	0.20	0.024	SW846 8330B	1	07/08/2022 18:16	CGS	A11
1,3-Dinitrobenzene	0.15U	U,1,2	mg/kg	0.20	0.15	0.033	SW846 8330B	1	07/08/2022 18:16	CGS	A11
2,4,6-Trinitrotoluene	0.15U	U	mg/kg	0.20	0.15	0.027	SW846 8330B	1	07/08/2022 18:16	CGS	A11
2,4-Dinitrotoluene	0.15U	U	mg/kg	0.20	0.15	0.033	SW846 8330B	1	07/08/2022 18:16	CGS	A11
2,6-Dinitrotoluene	0.15U	U	mg/kg	0.20	0.15	0.045	SW846 8330B	1	07/08/2022 18:16	CGS	A11
HMX	0.15U	U	mg/kg	0.20	0.15	0.031	SW846 8330B	1	07/08/2022 18:16	CGS	A11
Nitrobenzene	0.15U	U	mg/kg	0.20	0.15	0.077	SW846 8330B	1	07/08/2022 18:16	CGS	A11
RDX	0.15U	U	mg/kg	0.20	0.15	0.011	SW846 8330B	1	07/08/2022 18:16	CGS	A11
Tetryl	0.15U	U,3,4,5,6	mg/kg	0.20	0.15	0.048	SW846 8330B	1	07/08/2022 18:16	CGS	A11

### SURROGATES

Compound	CAS No	Recovery	Limits(%)	Analysis Date/Time	Qualifiers
1,4-Dinitrobenzene	100-25-4	99.2%	50 – 150	07/08/2022 18:16	



## Results

Client Sample ID	TP-5-061522-3.8-4	Collected	06/15/2022 13:00
Lab Sample ID	3249559002	Lab Receipt	06/23/2022 08:43

### ENERGETICS

Compound	Result	Flag	Units	LOQ	LOD	DL	Method	Dilution	Analysis Date/Time	By	Cntr
1,3,5-Trinitrobenzene	0.20U	U,7	mg/kg	0.25	0.20	0.024	SW846 8330B	1	07/08/2022 20:34	CGS	A11
1,3-Dinitrobenzene	0.15U	U	mg/kg	0.20	0.15	0.033	SW846 8330B	1	07/08/2022 20:34	CGS	A11
2,4,6-Trinitrotoluene	0.15U	U	mg/kg	0.20	0.15	0.027	SW846 8330B	1	07/08/2022 20:34	CGS	A11
2,4-Dinitrotoluene	0.15U	U	mg/kg	0.20	0.15	0.033	SW846 8330B	1	07/08/2022 20:34	CGS	A11
2,6-Dinitrotoluene	0.15U	U	mg/kg	0.20	0.15	0.045	SW846 8330B	1	07/08/2022 20:34	CGS	A11
HMX	0.15U	U	mg/kg	0.20	0.15	0.031	SW846 8330B	1	07/08/2022 20:34	CGS	A11
Nitrobenzene	0.15U	U	mg/kg	0.20	0.15	0.078	SW846 8330B	1	07/08/2022 20:34	CGS	A11
RDX	0.15U	U	mg/kg	0.20	0.15	0.011	SW846 8330B	1	07/08/2022 20:34	CGS	A11
Tetryl	0.15U	U,5	mg/kg	0.20	0.15	0.048	SW846 8330B	1	07/08/2022 20:34	CGS	A11

### SURROGATES

Compound	CAS No	Recovery	Limits(%)	Analysis Date/Time	Qualifiers
1,4-Dinitrobenzene	100-25-4	100%	50 - 150	07/08/2022 20:34	



## Results

Client Sample ID	TP-8-061522-3.5-4	Collected	06/15/2022 09:30
Lab Sample ID	3249559003	Lab Receipt	06/23/2022 08:43

### ENERGETICS

Compound	Result	Flag	Units	LOQ	LOD	DL	Method	Dilution	Analysis Date/Time	By	Cntr
1,3,5-Trinitrobenzene	0.20U	U,7	mg/kg	0.25	0.20	0.024	SW846 8330B	1	07/08/2022 21:20	CGS	A11
1,3-Dinitrobenzene	0.15U	U	mg/kg	0.20	0.15	0.033	SW846 8330B	1	07/08/2022 21:20	CGS	A11
2,4,6-Trinitrotoluene	0.15U	U	mg/kg	0.20	0.15	0.027	SW846 8330B	1	07/08/2022 21:20	CGS	A11
2,4-Dinitrotoluene	0.15U	U	mg/kg	0.20	0.15	0.033	SW846 8330B	1	07/08/2022 21:20	CGS	A11
2,6-Dinitrotoluene	0.15U	U	mg/kg	0.20	0.15	0.045	SW846 8330B	1	07/08/2022 21:20	CGS	A11
HMX	0.15U	U	mg/kg	0.20	0.15	0.031	SW846 8330B	1	07/08/2022 21:20	CGS	A11
Nitrobenzene	0.15U	U	mg/kg	0.20	0.15	0.077	SW846 8330B	1	07/08/2022 21:20	CGS	A11
RDX	0.15U	U	mg/kg	0.20	0.15	0.011	SW846 8330B	1	07/08/2022 21:20	CGS	A11
Tetryl	0.15U	U,5	mg/kg	0.20	0.15	0.048	SW846 8330B	1	07/08/2022 21:20	CGS	A11

### SURROGATES

Compound	CAS No	Recovery	Limits(%)	Analysis Date/Time	Qualifiers
1,4-Dinitrobenzene	100-25-4	100%	50 - 150	07/08/2022 21:20	



### Sample - Method Cross Reference Table

Lab ID	Sample ID	Analysis Method	Preparation Method	Leachate Method
3249559001	TP-1-061622-05.0-05.5	SW846 8330B	SW846 8330B	
3249559002	TP-5-061522-3.8-4	SW846 8330B	SW846 8330B	
3249559003	TP-8-061522-3.5-4	SW846 8330B	SW846 8330B	



### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Lab ID	Sample ID	Preparation Method	Prep Batch	Prep Date/Time	By	Analysis Method	Anly Batch
3249559001	TP-1-061622-05.0-05.5	SW846 8330B	859616	06/28/2022 19:25	JEK	SW846 8330B	860501
3249559002	TP-5-061522-3.8-4	SW846 8330B	859616	06/28/2022 19:25	JEK	SW846 8330B	860501
3249559003	TP-8-061522-3.5-4	SW846 8330B	859616	06/28/2022 19:25	JEK	SW846 8330B	860501



3249559  
pg 2

K2206845

✓ Ship To: Middletown ALS  
ALS Environmental - Middletown  
301 Fulling Mill Rd.  
Middletown, PA 17057

PC 104 Date 6/21/22  
SMO SM Date 6/22/22

Instructions:

Ice   
Dry Ice \_\_\_\_\_  
No Ice \_\_\_\_\_

Shipping:

Overnight   
2nd Day \_\_\_\_\_  
Ground \_\_\_\_\_

Bill to Client Account

Comments:

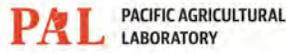
ALS Group USA, Corp.  
www.alsglobal.com  
An ALS Limited Company

Exhibit A

3249559  
pg 3

Table C1. Bid Tab for Laboratory Services (Soil)  
Umatilla Army Depot Artificial Recharge

			ALS	
Soil Sampler	Method	No. Samples	Unit Price	Total Price
Volatile Organic Compounds	EPA 8260	6	\$75.00	\$450
Synthetic Volatile Organic Comp	EPA 8270	6	\$155.00	\$930
PCB Aroclors 8082	EPA 8082	6	\$60.00	\$360
<b>Metals</b>				
Antimony		6	\$15.00	\$90
Aluminum		6	\$5.00	\$30
Arsenic		6	\$5.00	\$30
Barium		6	\$5.00	\$30
Beryllium		6	\$5.00	\$30
Cadmium		6	\$5.00	\$30
Chromium		6	\$5.00	\$30
Cobalt		6	\$5.00	\$30
Copper		6	\$5.00	\$30
Lead		6	\$5.00	\$30
Nickel		6	\$5.00	\$30
Manganese		6	\$5.00	\$30
Mercury		6	\$25.00	\$150
Potassium		6	\$5.00	\$30
Selenium		6	\$5.00	\$30
Silver		6	\$5.00	\$30
Thallium		6	\$5.00	\$30
Zinc		6	\$5.00	\$30
Nitrate/Nitrite		6	\$28.00	\$168
<b>Explosives</b>				
2,4,6-trinitrotoluene (TNT)		6	\$115.00	\$690
hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)		6		
octahydro-1,3,4,7-tetranitro-1,3,5,7-tetrazo		6		
2,4,6-trinitrophenyl-n-methylnitramine (tein		6		
2,4-dinitrotoluene (2,4-DNT)		6		
1,3,5-trinitrobenzene (2,6-DNT)		6		
1,3-dinitrobenzene (DNB)		6		
nitrobenzene (NB)		6		
<b>Total</b>				<b>\$3,318</b>



GSI Water Solutions, Inc.  
55 SW Yamhill Street, Suite 300  
Portland, OR 97204

Report Number: P220890  
Report Date: July 07, 2022  
Client Project ID: 913.001.002.001

## Analytical Report

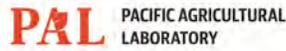
Client Sample ID: TP-1-061622-05.0-05.5  
Matrix: soil

PAL Sample ID: P220890-01  
Sample Date: 6/16/22  
Received Date: 6/21/22

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
<b>Method:</b> Modified EPA 8270D (GC-MS/MS)					
6/29/22	7/5/22	2,6-Dichlorobenzamide	ND	0.0067 mg/kg	
6/29/22	7/5/22	a-BHC	ND	0.0067 mg/kg	
6/29/22	7/5/22	Acetochlor	ND	0.0067 mg/kg	
6/29/22	7/5/22	Alachlor	ND	0.0067 mg/kg	
6/29/22	7/5/22	Aldrin	ND	0.0067 mg/kg	
6/29/22	7/5/22	Ametryn	ND	0.0067 mg/kg	
6/29/22	7/5/22	Aspon	ND	0.0067 mg/kg	
6/29/22	7/5/22	b-BHC	ND	0.0067 mg/kg	
6/29/22	7/5/22	Benfluralin	ND	0.0067 mg/kg	
6/29/22	7/5/22	Bifenthrin	ND	0.0067 mg/kg	
6/29/22	7/5/22	Bolstar	ND	0.0067 mg/kg	
6/29/22	7/5/22	Bromopropylate	ND	0.0067 mg/kg	
6/29/22	7/5/22	Buprofezin	ND	0.0067 mg/kg	
6/29/22	7/5/22	Captan	ND	0.067 mg/kg	
6/29/22	7/5/22	Chlordane	ND	0.0067 mg/kg	
6/29/22	7/5/22	Chlorfenapyr	ND	0.0067 mg/kg	
6/29/22	7/5/22	Chlorfenvinphos	ND	0.0067 mg/kg	
6/29/22	7/5/22	Chlorobenzilate	ND	0.0067 mg/kg	
6/29/22	7/5/22	Chloroneb	ND	0.0067 mg/kg	
6/29/22	7/5/22	Chlorpropham	ND	0.0067 mg/kg	
6/29/22	7/5/22	Chlorpyrifos	ND	0.0067 mg/kg	
6/29/22	7/5/22	Chlorpyrifos-methyl	ND	0.0067 mg/kg	
6/29/22	7/5/22	cis-Nonachlor	ND	0.0067 mg/kg	
6/29/22	7/5/22	Cyfluthrin	ND	0.034 mg/kg	
6/29/22	7/5/22	Cypermethrin	ND	0.034 mg/kg	
6/29/22	7/5/22	Dacthal	ND	0.0067 mg/kg	
6/29/22	7/5/22	d-BHC	ND	0.0067 mg/kg	
6/29/22	7/5/22	Deltamethrin	ND	0.034 mg/kg	
6/29/22	7/5/22	Demeton	ND	0.0067 mg/kg	
6/29/22	7/5/22	Diazinon	ND	0.0067 mg/kg	
6/29/22	7/5/22	Dichlobenil	ND	0.0067 mg/kg	

Rick Jordan, Laboratory Director

This analytical report complies with the ISO/IEC 17025:2017  
Quality Standard.



GSI Water Solutions, Inc.  
55 SW Yamhill Street, Suite 300  
Portland, OR 97204

Report Number: P220890  
Report Date: July 07, 2022  
Client Project ID: 913.001.002.001

## Analytical Report

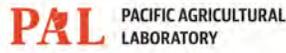
Client Sample ID: TP-1-061622-05.0-05.5  
Matrix: soil

PAL Sample ID: P220890-01  
Sample Date: 6/16/22  
Received Date: 6/21/22

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
6/29/22	7/5/22	Dichlorofenthion	ND	0.0067 mg/kg	
6/29/22	7/5/22	Dichlorvos	ND	0.0067 mg/kg	
6/29/22	7/5/22	Diclofop-methyl	ND	0.0067 mg/kg	
6/29/22	7/5/22	Dicloran	ND	0.034 mg/kg	
6/29/22	7/5/22	Dicofol	ND	0.0067 mg/kg	
6/29/22	7/5/22	Dieldrin	ND	0.0067 mg/kg	
6/29/22	7/5/22	Dimethenamid	ND	0.0067 mg/kg	
6/29/22	7/5/22	Diphenamid	ND	0.0067 mg/kg	
6/29/22	7/5/22	Diphenylamine	ND	0.0067 mg/kg	
6/29/22	7/5/22	Disulfoton	ND	0.0067 mg/kg	
6/29/22	7/5/22	Dithiopyr	ND	0.0067 mg/kg	
6/29/22	7/5/22	Endosulfan I	ND	0.013 mg/kg	
6/29/22	7/5/22	Endosulfan II	ND	0.013 mg/kg	
6/29/22	7/5/22	Endosulfan sulfate	ND	0.013 mg/kg	
6/29/22	7/5/22	Endrin	ND	0.0067 mg/kg	
6/29/22	7/5/22	Endrin ketone	ND	0.0067 mg/kg	
6/29/22	7/5/22	EPN	ND	0.0067 mg/kg	
6/29/22	7/5/22	Esfenvalerate	ND	0.0067 mg/kg	
6/29/22	7/5/22	Ethalfuralin	ND	0.0067 mg/kg	
6/29/22	7/5/22	Ethofumesate	ND	0.0067 mg/kg	
6/29/22	7/5/22	Ethoprop	ND	0.0067 mg/kg	
6/29/22	7/5/22	Etoxazole	ND	0.0067 mg/kg	
6/29/22	7/5/22	Etridiazole	ND	0.0067 mg/kg	
6/29/22	7/5/22	Fenarimol	ND	0.0067 mg/kg	
6/29/22	7/5/22	Fenitrothion	ND	0.0067 mg/kg	
6/29/22	7/5/22	Fenoxaprop-ethyl	ND	0.013 mg/kg	
6/29/22	7/5/22	Fenthion	ND	0.0067 mg/kg	
6/29/22	7/5/22	Fenvalerate	ND	0.0067 mg/kg	
6/29/22	7/5/22	Fipronil	ND	0.0067 mg/kg	
6/29/22	7/5/22	Fluazifop-p-butyl	ND	0.013 mg/kg	
6/29/22	7/5/22	Fludioxonil	ND	0.0067 mg/kg	
6/29/22	7/5/22	Fluroxypyr-meptyl	ND	0.013 mg/kg	
6/29/22	7/5/22	Flutolanil	ND	0.0067 mg/kg	

Rick Jordan, Laboratory Director

This analytical report complies with the ISO/IEC 17025:2017  
Quality Standard.



GSI Water Solutions, Inc.  
55 SW Yamhill Street, Suite 300  
Portland, OR 97204

Report Number: P220890  
Report Date: July 07, 2022  
Client Project ID: 913.001.002.001

## Analytical Report

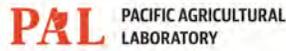
Client Sample ID: TP-1-061622-05.0-05.5  
Matrix: soil

PAL Sample ID: P220890-01  
Sample Date: 6/16/22  
Received Date: 6/21/22

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
6/29/22	7/5/22	Fonofos	ND	0.0067 mg/kg	
6/29/22	7/5/22	g-BHC	ND	0.0067 mg/kg	
6/29/22	7/5/22	Heptachlor	ND	0.0067 mg/kg	
6/29/22	7/5/22	Heptachlor epoxide	ND	0.0067 mg/kg	
6/29/22	7/5/22	Hexachlorobenzene	ND	0.0067 mg/kg	
6/29/22	7/5/22	Kresoxim-methyl	ND	0.0067 mg/kg	
6/29/22	7/5/22	lambda-Cyhalothrin	ND	0.013 mg/kg	
6/29/22	7/5/22	Leptophos	ND	0.0067 mg/kg	
6/29/22	7/5/22	Malathion	ND	0.0067 mg/kg	
6/29/22	7/5/22	Mefenoxam	ND	0.0067 mg/kg	
6/29/22	7/5/22	Methoxychlor	ND	0.0067 mg/kg	
6/29/22	7/5/22	Metolachlor	ND	0.0067 mg/kg	
6/29/22	7/5/22	MGK-264	ND	0.0067 mg/kg	
6/29/22	7/5/22	Myclobutanil	ND	0.0067 mg/kg	
6/29/22	7/5/22	Napropamide	ND	0.0067 mg/kg	
6/29/22	7/5/22	Ovex	ND	0.0067 mg/kg	
6/29/22	7/5/22	Oxadiazon	ND	0.0067 mg/kg	
6/29/22	7/5/22	Oxyfluorfen	ND	0.0067 mg/kg	
6/29/22	7/5/22	p,p'-DDD	ND	0.0067 mg/kg	
6/29/22	7/5/22	p,p'-DDE	ND	0.0067 mg/kg	
6/29/22	7/5/22	p,p'-DDT	ND	0.0067 mg/kg	
6/29/22	7/5/22	Paclobutrazol	ND	0.0067 mg/kg	
6/29/22	7/5/22	Parathion	ND	0.0067 mg/kg	
6/29/22	7/5/22	Parathion-methyl	ND	0.0067 mg/kg	
6/29/22	7/5/22	PCA	ND	0.0067 mg/kg	
6/29/22	7/5/22	PCB	ND	0.0067 mg/kg	
6/29/22	7/5/22	PCNB	ND	0.0067 mg/kg	
6/29/22	7/5/22	Pendimethalin	ND	0.0067 mg/kg	
6/29/22	7/5/22	Pentachlorothioanisole	ND	0.0067 mg/kg	
6/29/22	7/5/22	Permethrin	ND	0.034 mg/kg	
6/29/22	7/5/22	Phorate	ND	0.0067 mg/kg	
6/29/22	7/5/22	Procymidone	ND	0.0067 mg/kg	
6/29/22	7/5/22	Prodiamine	ND	0.0067 mg/kg	

Rick Jordan, Laboratory Director

This analytical report complies with the ISO/IEC 17025:2017  
Quality Standard.



GSI Water Solutions, Inc.  
55 SW Yamhill Street, Suite 300  
Portland, OR 97204

Report Number: P220890  
Report Date: July 07, 2022  
Client Project ID: 913.001.002.001

## Analytical Report

Client Sample ID: TP-1-061622-05.0-05.5  
Matrix: soil

PAL Sample ID: P220890-01  
Sample Date: 6/16/22  
Received Date: 6/21/22

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
6/29/22	7/5/22	Pronamide	ND	0.0067 mg/kg	
6/29/22	7/5/22	Propachlor	ND	0.0067 mg/kg	
6/29/22	7/5/22	Pyriproxyfen	ND	0.0067 mg/kg	
6/29/22	7/5/22	Quinoxifen	ND	0.0067 mg/kg	
6/29/22	7/5/22	Ronnel	ND	0.0067 mg/kg	
6/29/22	7/5/22	Spirodiclofen	ND	0.0067 mg/kg	
6/29/22	7/5/22	Sulfotep	ND	0.0067 mg/kg	
6/29/22	7/5/22	Tefluthrin	ND	0.0067 mg/kg	
6/29/22	7/5/22	Terbufos	ND	0.0067 mg/kg	
6/29/22	7/5/22	Tetraconazole	ND	0.0067 mg/kg	
6/29/22	7/5/22	Tetradifon	ND	0.0067 mg/kg	
6/29/22	7/5/22	Thionazin	ND	0.0067 mg/kg	
6/29/22	7/5/22	Tokuthion	ND	0.0067 mg/kg	
6/29/22	7/5/22	trans-Nonachlor	ND	0.0067 mg/kg	
6/29/22	7/5/22	Trichloronate	ND	0.0067 mg/kg	
6/29/22	7/5/22	Trifluralin	ND	0.0067 mg/kg	
6/29/22	7/5/22	Vinclozalin	ND	0.0067 mg/kg	

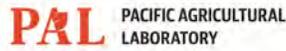
Surrogate Recovery: 63 %  
Surrogate Recovery Range: 34-134  
(TPP-d15 used as Surrogate)

Method: Modified EPA 8321B (LC-MS/MS)

6/29/22	7/1/22	3-Hydroxycarbofuran	ND	0.0067 mg/kg	
6/29/22	7/1/22	Abamectin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Acephate	ND	0.0067 mg/kg	
6/29/22	7/1/22	Acetamiprid	ND	0.0067 mg/kg	
6/29/22	7/1/22	Acibenzolar-S-methyl	ND	0.013 mg/kg	
6/29/22	7/1/22	Afidopyropen	ND	0.0067 mg/kg	
6/29/22	7/1/22	Aldicarb	ND	0.0067 mg/kg	
6/29/22	7/1/22	Aldicarb Sulfone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Aldicarb Sulfoxide	ND	0.0067 mg/kg	
6/29/22	7/1/22	Allethrin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Ametoctradin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Atrazine	ND	0.0067 mg/kg	

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### Analytical Report

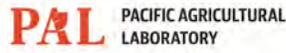
Client Sample ID: TP-1-061622-05.0-05.5  
Matrix: soil

PAL Sample ID: P220890-01  
Sample Date: 6/16/22  
Received Date: 6/21/22

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
6/29/22	7/1/22	Azinphos-ethyl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Azinphos-methyl	ND	0.013 mg/kg	
6/29/22	7/1/22	Azoxystrobin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Bendiocarb	ND	0.0067 mg/kg	
6/29/22	7/1/22	Bensulide	ND	0.0067 mg/kg	
6/29/22	7/1/22	Bitertanol	ND	0.0067 mg/kg	
6/29/22	7/1/22	Boscalid	ND	0.0067 mg/kg	
6/29/22	7/1/22	Bromacil	ND	0.0067 mg/kg	
6/29/22	7/1/22	Carbaryl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Carbendazim	ND	0.0067 mg/kg	
6/29/22	7/1/22	Carbofuran	ND	0.0067 mg/kg	
6/29/22	7/1/22	Carfentrazone-ethyl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Chlorantraniliprole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Clethodim	ND	0.013 mg/kg	
6/29/22	7/1/22	Clomazone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Clothianidin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Cyanazine	ND	0.0067 mg/kg	
6/29/22	7/1/22	Cyantraniliprole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Cyazofamid	ND	0.0067 mg/kg	
6/29/22	7/1/22	Cyclaniliprole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Cycloate	ND	0.013 mg/kg	
6/29/22	7/1/22	Cyflufenamid	ND	0.0067 mg/kg	
6/29/22	7/1/22	Cyflumetofen	ND	0.0067 mg/kg	
6/29/22	7/1/22	Cyhalofop-butyl	ND	0.013 mg/kg	
6/29/22	7/1/22	Cyprodinil	ND	0.0067 mg/kg	
6/29/22	7/1/22	Cyprosulfamide	ND	0.0067 mg/kg	
6/29/22	7/1/22	DCPMU	ND	0.0067 mg/kg	
6/29/22	7/1/22	Diazoxon	ND	0.0067 mg/kg	
6/29/22	7/1/22	Difenoconazole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Diflubenzuron	ND	0.0067 mg/kg	
6/29/22	7/1/22	Diflufenican	ND	0.0067 mg/kg	
6/29/22	7/1/22	Dimethoate	ND	0.0067 mg/kg	
6/29/22	7/1/22	Dimethomorph	ND	0.0067 mg/kg	

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55 SW Yamhill Street, Suite 300  
Portland, OR 97204

Report Number: P220890  
Report Date: July 07, 2022  
Client Project ID: 913.001.002.001

## Analytical Report

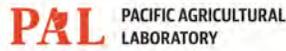
Client Sample ID: TP-1-061622-05.0-05.5  
Matrix: soil

PAL Sample ID: P220890-01  
Sample Date: 6/16/22  
Received Date: 6/21/22

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
6/29/22	7/1/22	Dinotefuran	ND	0.0067 mg/kg	
6/29/22	7/1/22	Disulfoton sulfone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Diuron	ND	0.0067 mg/kg	
6/29/22	7/1/22	d-Phenothrin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Emamectin Benzoate	ND	0.0067 mg/kg	
6/29/22	7/1/22	Ethion	ND	0.0067 mg/kg	
6/29/22	7/1/22	Etofenprox	ND	0.0067 mg/kg	
6/29/22	7/1/22	Famoxadone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Famphur	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenamidone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenamiphos sulfone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenamiphos sulfoxide	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenazaquin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenbuconazole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenbutatin oxide	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenhexamid	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenobucarb	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenoxycarb	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenpropathrin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenpyroximate	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenuron	ND	0.0067 mg/kg	
6/29/22	7/1/22	Flonicamid	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fluazinam	ND	0.0067 mg/kg	
6/29/22	7/1/22	Flubendiamide	ND	0.013 mg/kg	
6/29/22	7/1/22	Flufenacet	ND	0.0067 mg/kg	
6/29/22	7/1/22	Flumetsulam	ND	0.0067 mg/kg	
6/29/22	7/1/22	Flumioxazin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fluometuron	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fluopicolide	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fluopyram	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fluoxastrobin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Flupyradifurone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fluridone	ND	0.0067 mg/kg	

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### Analytical Report

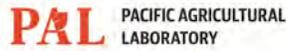
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Matrix: soil

PAL Sample ID: P220890-01  
Sample Date: 6/16/22  
Received Date: 6/21/22

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
6/29/22	7/1/22	Flutianil	ND	0.0067 mg/kg	
6/29/22	7/1/22	Flutriafol	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fluvalinate	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fluxapyroxad	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fonofos	ND	0.013 mg/kg	
6/29/22	7/1/22	Hexaconazole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Hexazinone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Hexythiazox	ND	0.0067 mg/kg	
6/29/22	7/1/22	Imazalil	ND	0.0067 mg/kg	
6/29/22	7/1/22	Imidacloprid	ND	0.0067 mg/kg	
6/29/22	7/1/22	Indaziflam	ND	0.0067 mg/kg	
6/29/22	7/1/22	Indoxacarb	ND	0.0067 mg/kg	
6/29/22	7/1/22	Ipconazole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Iprodione	ND	0.034 mg/kg	
6/29/22	7/1/22	Isofetamid	ND	0.0067 mg/kg	
6/29/22	7/1/22	Isoxaben	ND	0.0067 mg/kg	
6/29/22	7/1/22	Isoxadifen-ethyl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Lactofen	ND	0.0067 mg/kg	
6/29/22	7/1/22	Linuron	ND	0.0067 mg/kg	
6/29/22	7/1/22	Malaoxon	ND	0.0067 mg/kg	
6/29/22	7/1/22	Mandipropamid	ND	0.0067 mg/kg	
6/29/22	7/1/22	Metconazole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Methamidophos	ND	0.034 mg/kg	
6/29/22	7/1/22	Methidathion	ND	0.0067 mg/kg	
6/29/22	7/1/22	Methiocarb	ND	0.0067 mg/kg	
6/29/22	7/1/22	Methomyl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Methoxyfenozide	ND	0.0067 mg/kg	
6/29/22	7/1/22	Metrafenone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Metribuzin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Mevinphos	ND	0.0067 mg/kg	
6/29/22	7/1/22	Monuron	ND	0.0067 mg/kg	
6/29/22	7/1/22	Neburon	ND	0.0067 mg/kg	
6/29/22	7/1/22	Norflurazon	ND	0.0067 mg/kg	

Rick Jordan, Laboratory Director

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### Analytical Report

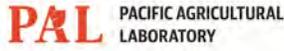
Client Sample ID: TP-1-061622-05.0-05.5  
Matrix: soil

PAL Sample ID: P220890-01  
Sample Date: 6/16/22  
Received Date: 6/21/22

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
6/29/22	7/1/22	Novaluron	ND	0.0067 mg/kg	
6/29/22	7/1/22	Omethoate	ND	0.0067 mg/kg	
6/29/22	7/1/22	Oryzalin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Oxadixyl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Oxamyl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Oxydemeton-Methyl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Penoxsulam	ND	0.0067 mg/kg	
6/29/22	7/1/22	Penthiopyrad	ND	0.0067 mg/kg	
6/29/22	7/1/22	Phorate Sulfone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Phorate Sulfoxide	ND	0.0067 mg/kg	
6/29/22	7/1/22	Phosalone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Phosmet	ND	0.0067 mg/kg	
6/29/22	7/1/22	Phosphamidon	ND	0.0067 mg/kg	
6/29/22	7/1/22	Picoxystrobin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Piperonyl Butoxide	ND	0.0067 mg/kg	
6/29/22	7/1/22	Pirimicarb	ND	0.0067 mg/kg	
6/29/22	7/1/22	Pirimiphos-methyl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Prallethrin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Prometon	ND	0.0067 mg/kg	
6/29/22	7/1/22	Prometryn	ND	0.0067 mg/kg	
6/29/22	7/1/22	Propamocarb	ND	0.0067 mg/kg	
6/29/22	7/1/22	Propanil	ND	0.0067 mg/kg	
6/29/22	7/1/22	Propargite	ND	0.0067 mg/kg	
6/29/22	7/1/22	Propazine	ND	0.0067 mg/kg	
6/29/22	7/1/22	Propiconazole	ND	0.013 mg/kg	
6/29/22	7/1/22	Pyraclostrobin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Pyraflufen-ethyl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Pyrethrin	ND	0.034 mg/kg	
6/29/22	7/1/22	Pyridaben	ND	0.0067 mg/kg	
6/29/22	7/1/22	Pyridalyl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Pyrimethanil	ND	0.0067 mg/kg	
6/29/22	7/1/22	Pyroxasulfone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Quizalofop-p-ethyl	ND	0.0067 mg/kg	

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55 SW Yamhill Street, Suite 300  
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Report Date: July 07, 2022  
Client Project ID: 913.001.002.001

### Analytical Report

Client Sample ID: TP-1-061622-05.0-05.5  
Matrix: soil

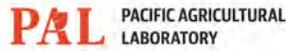
PAL Sample ID: P220890-01  
Sample Date: 6/16/22  
Received Date: 6/21/22

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
6/29/22	7/1/22	Rotenone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Saflufenacil	ND	0.0067 mg/kg	
6/29/22	7/1/22	Sethoxydim	ND	0.013 mg/kg	
6/29/22	7/1/22	Siduron	ND	0.0067 mg/kg	
6/29/22	7/1/22	Simazine	ND	0.0067 mg/kg	
6/29/22	7/1/22	Simetryn	ND	0.0067 mg/kg	
6/29/22	7/1/22	Spinetoram	ND	0.0067 mg/kg	
6/29/22	7/1/22	Spinosad	ND	0.0067 mg/kg	
6/29/22	7/1/22	Spiromesifen	ND	0.013 mg/kg	
6/29/22	7/1/22	Spirotetramat	ND	0.0067 mg/kg	
6/29/22	7/1/22	Spiroxamine	ND	0.0067 mg/kg	
6/29/22	7/1/22	Sulfentrazone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Sulfoxaflor	ND	0.0067 mg/kg	
6/29/22	7/1/22	Tebuconazole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Tebufenozide	ND	0.0067 mg/kg	
6/29/22	7/1/22	Tebuthiuron	ND	0.0067 mg/kg	
6/29/22	7/1/22	Terbacil	ND	0.0067 mg/kg	
6/29/22	7/1/22	Terbuthylazine	ND	0.0067 mg/kg	
6/29/22	7/1/22	Terbutryn	ND	0.0067 mg/kg	
6/29/22	7/1/22	Thiabendazole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Thiacloprid	ND	0.0067 mg/kg	
6/29/22	7/1/22	Thiamethoxam	ND	0.0067 mg/kg	
6/29/22	7/1/22	Thiobencarb	ND	0.0067 mg/kg	
6/29/22	7/1/22	Thiodicarb	ND	0.0067 mg/kg	
6/29/22	7/1/22	Tolfenpyrad	ND	0.0067 mg/kg	
6/29/22	7/1/22	Triadimefon	ND	0.0067 mg/kg	
6/29/22	7/1/22	Triadimenol	ND	0.013 mg/kg	
6/29/22	7/1/22	Triallate	ND	0.0067 mg/kg	
6/29/22	7/1/22	Trifloxystrobin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Triflumizole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Triticonazole	ND	0.0067 mg/kg	

Surrogate Recovery: 55 %  
Surrogate Recovery Range: 36-117  
(TPP-d15 used as Surrogate)

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### Analytical Report

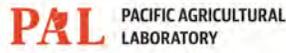
Client Sample ID: TP-5-061522-3.8-4  
Matrix: soil

PAL Sample ID: P220890-02  
Sample Date: 6/15/22  
Received Date: 6/21/22

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
<b>Method:</b> Modified EPA 8270D (GC-MS/MS)					
6/29/22	7/6/22	2,6-Dichlorobenzamide	ND	0.0067 mg/kg	
6/29/22	7/6/22	a-BHC	ND	0.0067 mg/kg	
6/29/22	7/6/22	Acetochlor	ND	0.0067 mg/kg	
6/29/22	7/6/22	Alachlor	ND	0.0067 mg/kg	
6/29/22	7/6/22	Aldrin	ND	0.0067 mg/kg	
6/29/22	7/6/22	Ametryn	ND	0.0067 mg/kg	
6/29/22	7/6/22	Aspon	ND	0.0067 mg/kg	
6/29/22	7/6/22	b-BHC	ND	0.0067 mg/kg	
6/29/22	7/6/22	Benfluralin	ND	0.0067 mg/kg	
6/29/22	7/6/22	Bifenthrin	ND	0.0067 mg/kg	
6/29/22	7/6/22	Bolstar	ND	0.0067 mg/kg	
6/29/22	7/6/22	Bromopropylate	ND	0.0067 mg/kg	
6/29/22	7/6/22	Buprofezin	ND	0.0067 mg/kg	
6/29/22	7/6/22	Captan	ND	0.067 mg/kg	
6/29/22	7/6/22	Chlordane	ND	0.0067 mg/kg	
6/29/22	7/6/22	Chlorfenapyr	ND	0.0067 mg/kg	
6/29/22	7/6/22	Chlorfenvinphos	ND	0.0067 mg/kg	
6/29/22	7/6/22	Chlorobenzilate	ND	0.0067 mg/kg	
6/29/22	7/6/22	Chloroneb	ND	0.0067 mg/kg	
6/29/22	7/6/22	Chlorpropham	ND	0.0067 mg/kg	
6/29/22	7/6/22	Chlorpyrifos	ND	0.0067 mg/kg	
6/29/22	7/6/22	Chlorpyrifos-methyl	ND	0.0067 mg/kg	
6/29/22	7/6/22	cis-Nonachlor	ND	0.0067 mg/kg	
6/29/22	7/6/22	Cyfluthrin	ND	0.034 mg/kg	
6/29/22	7/6/22	Cypermethrin	ND	0.034 mg/kg	
6/29/22	7/6/22	Dacthal	ND	0.0067 mg/kg	
6/29/22	7/6/22	d-BHC	ND	0.0067 mg/kg	
6/29/22	7/6/22	Deltamethrin	ND	0.034 mg/kg	
6/29/22	7/6/22	Demeton	ND	0.0067 mg/kg	
6/29/22	7/6/22	Diazinon	ND	0.0067 mg/kg	
6/29/22	7/6/22	Dichlobenil	ND	0.0067 mg/kg	

Rick Jordan, Laboratory Director

This analytical report complies with the ISO/IEC 17025:2017  
Quality Standard.



GSI Water Solutions, Inc.  
55 SW Yamhill Street, Suite 300  
Portland, OR 97204

Report Number: P220890  
Report Date: July 07, 2022  
Client Project ID: 913.001.002.001

### Analytical Report

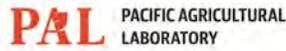
Client Sample ID: TP-5-061522-3.8-4  
Matrix: soil

PAL Sample ID: P220890-02  
Sample Date: 6/15/22  
Received Date: 6/21/22

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
6/29/22	7/6/22	Dichlorofenthion	ND	0.0067 mg/kg	
6/29/22	7/6/22	Dichlorvos	ND	0.0067 mg/kg	
6/29/22	7/6/22	Diclofop-methyl	ND	0.0067 mg/kg	
6/29/22	7/6/22	Dicloran	ND	0.034 mg/kg	
6/29/22	7/6/22	Dicofol	ND	0.0067 mg/kg	
6/29/22	7/6/22	Dieldrin	ND	0.0067 mg/kg	
6/29/22	7/6/22	Dimethenamid	ND	0.0067 mg/kg	
6/29/22	7/6/22	Diphenamid	ND	0.0067 mg/kg	
6/29/22	7/6/22	Diphenylamine	ND	0.0067 mg/kg	
6/29/22	7/6/22	Disulfoton	ND	0.0067 mg/kg	
6/29/22	7/6/22	Dithiopyr	ND	0.0067 mg/kg	
6/29/22	7/6/22	Endosulfan I	ND	0.013 mg/kg	
6/29/22	7/6/22	Endosulfan II	ND	0.013 mg/kg	
6/29/22	7/6/22	Endosulfan sulfate	ND	0.013 mg/kg	
6/29/22	7/6/22	Endrin	ND	0.0067 mg/kg	
6/29/22	7/6/22	Endrin ketone	ND	0.0067 mg/kg	
6/29/22	7/6/22	EPN	ND	0.0067 mg/kg	
6/29/22	7/6/22	Esfenvalerate	ND	0.0067 mg/kg	
6/29/22	7/6/22	Ethalfuralin	ND	0.0067 mg/kg	
6/29/22	7/6/22	Ethofumesate	ND	0.0067 mg/kg	
6/29/22	7/6/22	Ethoprop	ND	0.0067 mg/kg	
6/29/22	7/6/22	Etoxazole	ND	0.0067 mg/kg	
6/29/22	7/6/22	Etridiazole	ND	0.0067 mg/kg	
6/29/22	7/6/22	Fenarimol	ND	0.0067 mg/kg	
6/29/22	7/6/22	Fenitrothion	ND	0.0067 mg/kg	
6/29/22	7/6/22	Fenoxaprop-ethyl	ND	0.013 mg/kg	
6/29/22	7/6/22	Fenthion	ND	0.0067 mg/kg	
6/29/22	7/6/22	Fenvalerate	ND	0.0067 mg/kg	
6/29/22	7/6/22	Fipronil	ND	0.0067 mg/kg	
6/29/22	7/6/22	Fluazifop-p-butyl	ND	0.013 mg/kg	
6/29/22	7/6/22	Fludioxonil	ND	0.0067 mg/kg	
6/29/22	7/6/22	Fluroxypyr-meptyl	ND	0.013 mg/kg	
6/29/22	7/6/22	Flutolanil	ND	0.0067 mg/kg	

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### Analytical Report

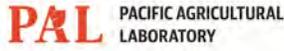
Client Sample ID: TP-5-061522-3.8-4  
Matrix: soil

PAL Sample ID: P220890-02  
Sample Date: 6/15/22  
Received Date: 6/21/22

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
6/29/22	7/6/22	Fonofos	ND	0.0067 mg/kg	
6/29/22	7/6/22	g-BHC	ND	0.0067 mg/kg	
6/29/22	7/6/22	Heptachlor	ND	0.0067 mg/kg	
6/29/22	7/6/22	Heptachlor epoxide	ND	0.0067 mg/kg	
6/29/22	7/6/22	Hexachlorobenzene	ND	0.0067 mg/kg	
6/29/22	7/6/22	Kresoxim-methyl	ND	0.0067 mg/kg	
6/29/22	7/6/22	lambda-Cyhalothrin	ND	0.013 mg/kg	
6/29/22	7/6/22	Leptophos	ND	0.0067 mg/kg	
6/29/22	7/6/22	Malathion	ND	0.0067 mg/kg	
6/29/22	7/6/22	Mefenoxam	ND	0.0067 mg/kg	
6/29/22	7/6/22	Methoxychlor	ND	0.0067 mg/kg	
6/29/22	7/6/22	Metolachlor	ND	0.0067 mg/kg	
6/29/22	7/6/22	MGK-264	ND	0.0067 mg/kg	
6/29/22	7/6/22	Myclobutanil	ND	0.0067 mg/kg	
6/29/22	7/6/22	Napropamide	ND	0.0067 mg/kg	
6/29/22	7/6/22	Ovex	ND	0.0067 mg/kg	
6/29/22	7/6/22	Oxadiazon	ND	0.0067 mg/kg	
6/29/22	7/6/22	Oxyfluorfen	ND	0.0067 mg/kg	
6/29/22	7/6/22	p,p'-DDD	ND	0.0067 mg/kg	
6/29/22	7/6/22	p,p'-DDE	ND	0.0067 mg/kg	
6/29/22	7/6/22	p,p'-DDT	ND	0.0067 mg/kg	
6/29/22	7/6/22	Paclobutrazol	ND	0.0067 mg/kg	
6/29/22	7/6/22	Parathion	ND	0.0067 mg/kg	
6/29/22	7/6/22	Parathion-methyl	ND	0.0067 mg/kg	
6/29/22	7/6/22	PCA	ND	0.0067 mg/kg	
6/29/22	7/6/22	PCB	ND	0.0067 mg/kg	
6/29/22	7/6/22	PCNB	ND	0.0067 mg/kg	
6/29/22	7/6/22	Pendimethalin	ND	0.0067 mg/kg	
6/29/22	7/6/22	Pentachlorothioanisole	ND	0.0067 mg/kg	
6/29/22	7/6/22	Permethrin	ND	0.034 mg/kg	
6/29/22	7/6/22	Phorate	ND	0.0067 mg/kg	
6/29/22	7/6/22	Procymidone	ND	0.0067 mg/kg	
6/29/22	7/6/22	Prodiamine	ND	0.0067 mg/kg	

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## Analytical Report

Client Sample ID: TP-5-061522-3.8-4  
Matrix: soil

PAL Sample ID: P220890-02  
Sample Date: 6/15/22  
Received Date: 6/21/22

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
6/29/22	7/6/22	Pronamide	ND	0.0067 mg/kg	
6/29/22	7/6/22	Propachlor	ND	0.0067 mg/kg	
6/29/22	7/6/22	Pyriproxyfen	ND	0.0067 mg/kg	
6/29/22	7/6/22	Quinoxifen	ND	0.0067 mg/kg	
6/29/22	7/6/22	Ronnel	ND	0.0067 mg/kg	
6/29/22	7/6/22	Spirodiclofen	ND	0.0067 mg/kg	
6/29/22	7/6/22	Sulfotep	ND	0.0067 mg/kg	
6/29/22	7/6/22	Tefluthrin	ND	0.0067 mg/kg	
6/29/22	7/6/22	Terbufos	ND	0.0067 mg/kg	
6/29/22	7/6/22	Tetraconazole	ND	0.0067 mg/kg	
6/29/22	7/6/22	Tetradifon	ND	0.0067 mg/kg	
6/29/22	7/6/22	Thionazin	ND	0.0067 mg/kg	
6/29/22	7/6/22	Tokuthion	ND	0.0067 mg/kg	
6/29/22	7/6/22	trans-Nonachlor	ND	0.0067 mg/kg	
6/29/22	7/6/22	Trichloronate	ND	0.0067 mg/kg	
6/29/22	7/6/22	Trifluralin	ND	0.0067 mg/kg	
6/29/22	7/6/22	Vinclozalin	ND	0.0067 mg/kg	

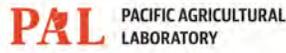
Surrogate Recovery: 64 %  
Surrogate Recovery Range: 34-134  
(TPP-d15 used as Surrogate)

Method: Modified EPA 8321B (LC-MS/MS)

6/29/22	7/1/22	3-Hydroxycarbofuran	ND	0.0067 mg/kg	
6/29/22	7/1/22	Abamectin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Acephate	ND	0.0067 mg/kg	
6/29/22	7/1/22	Acetamiprid	ND	0.0067 mg/kg	
6/29/22	7/1/22	Acibenzolar-S-methyl	ND	0.013 mg/kg	
6/29/22	7/1/22	Afidopyropen	ND	0.0067 mg/kg	
6/29/22	7/1/22	Aldicarb	ND	0.0067 mg/kg	
6/29/22	7/1/22	Aldicarb Sulfone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Aldicarb Sulfoxide	ND	0.0067 mg/kg	
6/29/22	7/1/22	Allethrin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Ametoctradin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Atrazine	ND	0.0067 mg/kg	

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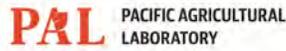
Client Sample ID: TP-5-061522-3.8-4  
Matrix: soil

PAL Sample ID: P220890-02  
Sample Date: 6/15/22  
Received Date: 6/21/22

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
6/29/22	7/1/22	Azinphos-ethyl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Azinphos-methyl	ND	0.013 mg/kg	
6/29/22	7/1/22	Azoxystrobin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Bendiocarb	ND	0.0067 mg/kg	
6/29/22	7/1/22	Bensulide	ND	0.0067 mg/kg	
6/29/22	7/1/22	Bitertanol	ND	0.0067 mg/kg	
6/29/22	7/1/22	Boscalid	ND	0.0067 mg/kg	
6/29/22	7/1/22	Bromacil	ND	0.0067 mg/kg	
6/29/22	7/1/22	Carbaryl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Carbendazim	ND	0.0067 mg/kg	
6/29/22	7/1/22	Carbofuran	ND	0.0067 mg/kg	
6/29/22	7/1/22	Carfentrazone-ethyl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Chlorantraniliprole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Clethodim	ND	0.013 mg/kg	
6/29/22	7/1/22	Clomazone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Clothianidin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Cyanazine	ND	0.0067 mg/kg	
6/29/22	7/1/22	Cyantraniliprole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Cyazofamid	ND	0.0067 mg/kg	
6/29/22	7/1/22	Cyclaniliprole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Cycloate	ND	0.013 mg/kg	
6/29/22	7/1/22	Cyflufenamid	ND	0.0067 mg/kg	
6/29/22	7/1/22	Cyflumetofen	ND	0.0067 mg/kg	
6/29/22	7/1/22	Cyhalofop-butyl	ND	0.013 mg/kg	
6/29/22	7/1/22	Cyprodinil	ND	0.0067 mg/kg	
6/29/22	7/1/22	Cyprosulfamide	ND	0.0067 mg/kg	
6/29/22	7/1/22	DCPMU	ND	0.0067 mg/kg	
6/29/22	7/1/22	Diazoxon	ND	0.0067 mg/kg	
6/29/22	7/1/22	Difenoconazole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Diflubenzuron	ND	0.0067 mg/kg	
6/29/22	7/1/22	Diflufenican	ND	0.0067 mg/kg	
6/29/22	7/1/22	Dimethoate	ND	0.0067 mg/kg	
6/29/22	7/1/22	Dimethomorph	ND	0.0067 mg/kg	

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Client Sample ID: TP-5-061522-3.8-4  
Matrix: soil

PAL Sample ID: P220890-02  
Sample Date: 6/15/22  
Received Date: 6/21/22

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
6/29/22	7/1/22	Dinotefuran	ND	0.0067 mg/kg	
6/29/22	7/1/22	Disulfoton sulfone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Diuron	ND	0.0067 mg/kg	
6/29/22	7/1/22	d-Phenothrin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Emamectin Benzoate	ND	0.0067 mg/kg	
6/29/22	7/1/22	Ethion	ND	0.0067 mg/kg	
6/29/22	7/1/22	Etofenprox	ND	0.0067 mg/kg	
6/29/22	7/1/22	Famoxadone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Famphur	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenamidone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenamiphos sulfone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenamiphos sulfoxide	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenazaquin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenbuconazole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenbutatin oxide	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenhexamid	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenobucarb	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenoxycarb	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenpropathrin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenpyroximate	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenuron	ND	0.0067 mg/kg	
6/29/22	7/1/22	Flonicamid	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fluazinam	ND	0.0067 mg/kg	
6/29/22	7/1/22	Flubendiamide	ND	0.013 mg/kg	
6/29/22	7/1/22	Flufenacet	ND	0.0067 mg/kg	
6/29/22	7/1/22	Flumetsulam	ND	0.0067 mg/kg	
6/29/22	7/1/22	Flumioxazin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fluometuron	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fluopicolide	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fluopyram	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fluoxastrobin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Flupyradifurone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fluridone	ND	0.0067 mg/kg	

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Client Sample ID: TP-5-061522-3.8-4  
Matrix: soil

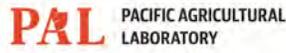
PAL Sample ID: P220890-02  
Sample Date: 6/15/22  
Received Date: 6/21/22

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
6/29/22	7/1/22	Flutianil	ND	0.0067 mg/kg	
6/29/22	7/1/22	Flutriafol	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fluvalinate	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fluxapyroxad	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fonofos	ND	0.013 mg/kg	
6/29/22	7/1/22	Hexaconazole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Hexazinone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Hexythiazox	ND	0.0067 mg/kg	
6/29/22	7/1/22	Imazalil	ND	0.0067 mg/kg	
6/29/22	7/1/22	Imidacloprid	ND	0.0067 mg/kg	
6/29/22	7/1/22	Indaziflam	ND	0.0067 mg/kg	
6/29/22	7/1/22	Indoxacarb	ND	0.0067 mg/kg	
6/29/22	7/1/22	Ipconazole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Iprodione	ND	0.034 mg/kg	
6/29/22	7/1/22	Isofetamid	ND	0.0067 mg/kg	
6/29/22	7/1/22	Isoxaben	ND	0.0067 mg/kg	
6/29/22	7/1/22	Isoxadifen-ethyl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Lactofen	ND	0.0067 mg/kg	
6/29/22	7/1/22	Linuron	ND	0.0067 mg/kg	
6/29/22	7/1/22	Malaoxon	ND	0.0067 mg/kg	
6/29/22	7/1/22	Mandipropamid	ND	0.0067 mg/kg	
6/29/22	7/1/22	Metconazole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Methamidophos	ND	0.034 mg/kg	
6/29/22	7/1/22	Methidathion	ND	0.0067 mg/kg	
6/29/22	7/1/22	Methiocarb	ND	0.0067 mg/kg	
6/29/22	7/1/22	Methomyl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Methoxyfenozide	ND	0.0067 mg/kg	
6/29/22	7/1/22	Metrafenone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Metribuzin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Mevinphos	ND	0.0067 mg/kg	
6/29/22	7/1/22	Monuron	ND	0.0067 mg/kg	
6/29/22	7/1/22	Neburon	ND	0.0067 mg/kg	
6/29/22	7/1/22	Norflurazon	ND	0.0067 mg/kg	



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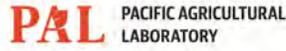
Client Sample ID: TP-5-061522-3.8-4  
Matrix: soil

PAL Sample ID: P220890-02  
Sample Date: 6/15/22  
Received Date: 6/21/22

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
6/29/22	7/1/22	Novaluron	ND	0.0067 mg/kg	
6/29/22	7/1/22	Omethoate	ND	0.0067 mg/kg	
6/29/22	7/1/22	Oryzalin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Oxadixyl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Oxamyl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Oxydemeton-Methyl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Penoxsulam	ND	0.0067 mg/kg	
6/29/22	7/1/22	Penthiopyrad	ND	0.0067 mg/kg	
6/29/22	7/1/22	Phorate Sulfone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Phorate Sulfoxide	ND	0.0067 mg/kg	
6/29/22	7/1/22	Phosalone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Phosmet	ND	0.0067 mg/kg	
6/29/22	7/1/22	Phosphamidon	ND	0.0067 mg/kg	
6/29/22	7/1/22	Picoxystrobin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Piperonyl Butoxide	ND	0.0067 mg/kg	
6/29/22	7/1/22	Pirimicarb	ND	0.0067 mg/kg	
6/29/22	7/1/22	Pirimiphos-methyl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Prallethrin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Prometon	ND	0.0067 mg/kg	
6/29/22	7/1/22	Prometryn	ND	0.0067 mg/kg	
6/29/22	7/1/22	Propamocarb	ND	0.0067 mg/kg	
6/29/22	7/1/22	Propanil	ND	0.0067 mg/kg	
6/29/22	7/1/22	Propargite	ND	0.0067 mg/kg	
6/29/22	7/1/22	Propazine	ND	0.0067 mg/kg	
6/29/22	7/1/22	Propiconazole	ND	0.013 mg/kg	
6/29/22	7/1/22	Pyraclostrobin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Pyraflufen-ethyl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Pyrethrin	ND	0.034 mg/kg	
6/29/22	7/1/22	Pyridaben	ND	0.0067 mg/kg	
6/29/22	7/1/22	Pyridalyl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Pyrimethanil	ND	0.0067 mg/kg	
6/29/22	7/1/22	Pyroxasulfone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Quizalofop-p-ethyl	ND	0.0067 mg/kg	

Rick Jordan, Laboratory Director

This analytical report complies with the ISO/IEC 17025:2017  
Quality Standard.



GSI Water Solutions, Inc.  
55 SW Yamhill Street, Suite 300  
Portland, OR 97204

Report Number: P220890  
Report Date: July 07, 2022  
Client Project ID: 913.001.002.001

### Analytical Report

Client Sample ID: TP-5-061522-3.8-4  
Matrix: soil

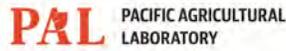
PAL Sample ID: P220890-02  
Sample Date: 6/15/22  
Received Date: 6/21/22

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
6/29/22	7/1/22	Rotenone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Saflufenacil	ND	0.0067 mg/kg	
6/29/22	7/1/22	Sethoxydim	ND	0.013 mg/kg	
6/29/22	7/1/22	Siduron	ND	0.0067 mg/kg	
6/29/22	7/1/22	Simazine	ND	0.0067 mg/kg	
6/29/22	7/1/22	Simetryn	ND	0.0067 mg/kg	
6/29/22	7/1/22	Spinetoram	ND	0.0067 mg/kg	
6/29/22	7/1/22	Spinosad	ND	0.0067 mg/kg	
6/29/22	7/1/22	Spiromesifen	ND	0.013 mg/kg	
6/29/22	7/1/22	Spirotetramat	ND	0.0067 mg/kg	
6/29/22	7/1/22	Spiroxamine	ND	0.0067 mg/kg	
6/29/22	7/1/22	Sulfentrazone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Sulfoxaflor	ND	0.0067 mg/kg	
6/29/22	7/1/22	Tebuconazole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Tebufenozide	ND	0.0067 mg/kg	
6/29/22	7/1/22	Tebuthiuron	ND	0.0067 mg/kg	
6/29/22	7/1/22	Terbacil	ND	0.0067 mg/kg	
6/29/22	7/1/22	Terbuthylazine	ND	0.0067 mg/kg	
6/29/22	7/1/22	Terbutryn	ND	0.0067 mg/kg	
6/29/22	7/1/22	Thiabendazole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Thiacloprid	ND	0.0067 mg/kg	
6/29/22	7/1/22	Thiamethoxam	ND	0.0067 mg/kg	
6/29/22	7/1/22	Thiobencarb	ND	0.0067 mg/kg	
6/29/22	7/1/22	Thiodicarb	ND	0.0067 mg/kg	
6/29/22	7/1/22	Tolfenpyrad	ND	0.0067 mg/kg	
6/29/22	7/1/22	Triadimefon	ND	0.0067 mg/kg	
6/29/22	7/1/22	Triadimenol	ND	0.013 mg/kg	
6/29/22	7/1/22	Triallate	ND	0.0067 mg/kg	
6/29/22	7/1/22	Trifloxystrobin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Triflumizole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Triticonazole	ND	0.0067 mg/kg	

Surrogate Recovery: 55 %  
Surrogate Recovery Range: 36-117  
(TPP-d15 used as Surrogate)

Rick Jordan, Laboratory Director

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Portland, OR 97204

Report Number: P220890  
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### Analytical Report

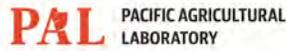
Client Sample ID: TP-8-061522-3.5-4  
Matrix: soil

PAL Sample ID: P220890-03  
Sample Date: 6/15/22  
Received Date: 6/21/22

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
<b>Method:</b> Modified EPA 8270D (GC-MS/MS)					
6/29/22	7/6/22	2,6-Dichlorobenzamide	ND	0.0067 mg/kg	
6/29/22	7/6/22	a-BHC	ND	0.0067 mg/kg	
6/29/22	7/6/22	Acetochlor	ND	0.0067 mg/kg	
6/29/22	7/6/22	Alachlor	ND	0.0067 mg/kg	
6/29/22	7/6/22	Aldrin	ND	0.0067 mg/kg	
6/29/22	7/6/22	Ametryn	ND	0.0067 mg/kg	
6/29/22	7/6/22	Aspon	ND	0.0067 mg/kg	
6/29/22	7/6/22	b-BHC	ND	0.0067 mg/kg	
6/29/22	7/6/22	Benfluralin	ND	0.0067 mg/kg	
6/29/22	7/6/22	Bifenthrin	ND	0.0067 mg/kg	
6/29/22	7/6/22	Bolstar	ND	0.0067 mg/kg	
6/29/22	7/6/22	Bromopropylate	ND	0.0067 mg/kg	
6/29/22	7/6/22	Buprofezin	ND	0.0067 mg/kg	
6/29/22	7/6/22	Captan	ND	0.067 mg/kg	
6/29/22	7/6/22	Chlordane	ND	0.0067 mg/kg	
6/29/22	7/6/22	Chlorfenapyr	ND	0.0067 mg/kg	
6/29/22	7/6/22	Chlorfenvinphos	ND	0.0067 mg/kg	
6/29/22	7/6/22	Chlorobenzilate	ND	0.0067 mg/kg	
6/29/22	7/6/22	Chloroneb	ND	0.0067 mg/kg	
6/29/22	7/6/22	Chlorpropham	ND	0.0067 mg/kg	
6/29/22	7/6/22	Chlorpyrifos	ND	0.0067 mg/kg	
6/29/22	7/6/22	Chlorpyrifos-methyl	ND	0.0067 mg/kg	
6/29/22	7/6/22	cis-Nonachlor	ND	0.0067 mg/kg	
6/29/22	7/6/22	Cyfluthrin	ND	0.034 mg/kg	
6/29/22	7/6/22	Cypermethrin	ND	0.034 mg/kg	
6/29/22	7/6/22	Dacthal	ND	0.0067 mg/kg	
6/29/22	7/6/22	d-BHC	ND	0.0067 mg/kg	
6/29/22	7/6/22	Deltamethrin	ND	0.034 mg/kg	
6/29/22	7/6/22	Demeton	ND	0.0067 mg/kg	
6/29/22	7/6/22	Diazinon	ND	0.0067 mg/kg	
6/29/22	7/6/22	Dichlobenil	ND	0.0067 mg/kg	

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Report Date: July 07, 2022  
Client Project ID: 913.001.002.001

### Analytical Report

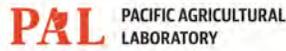
Client Sample ID: TP-8-061522-3.5-4  
Matrix: soil

PAL Sample ID: P220890-03  
Sample Date: 6/15/22  
Received Date: 6/21/22

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
6/29/22	7/6/22	Dichlorofenthion	ND	0.0067 mg/kg	
6/29/22	7/6/22	Dichlorvos	ND	0.0067 mg/kg	
6/29/22	7/6/22	Diclofop-methyl	ND	0.0067 mg/kg	
6/29/22	7/6/22	Dicloran	ND	0.034 mg/kg	
6/29/22	7/6/22	Dicofol	ND	0.0067 mg/kg	
6/29/22	7/6/22	Dieldrin	ND	0.0067 mg/kg	
6/29/22	7/6/22	Dimethenamid	ND	0.0067 mg/kg	
6/29/22	7/6/22	Diphenamid	ND	0.0067 mg/kg	
6/29/22	7/6/22	Diphenylamine	ND	0.0067 mg/kg	
6/29/22	7/6/22	Disulfoton	ND	0.0067 mg/kg	
6/29/22	7/6/22	Dithiopyr	ND	0.0067 mg/kg	
6/29/22	7/6/22	Endosulfan I	ND	0.013 mg/kg	
6/29/22	7/6/22	Endosulfan II	ND	0.013 mg/kg	
6/29/22	7/6/22	Endosulfan sulfate	ND	0.013 mg/kg	
6/29/22	7/6/22	Endrin	ND	0.0067 mg/kg	
6/29/22	7/6/22	Endrin ketone	ND	0.0067 mg/kg	
6/29/22	7/6/22	EPN	ND	0.0067 mg/kg	
6/29/22	7/6/22	Esfenvalerate	ND	0.0067 mg/kg	
6/29/22	7/6/22	Ethalfuralin	ND	0.0067 mg/kg	
6/29/22	7/6/22	Ethofumesate	ND	0.0067 mg/kg	
6/29/22	7/6/22	Ethoprop	ND	0.0067 mg/kg	
6/29/22	7/6/22	Etoxazole	ND	0.0067 mg/kg	
6/29/22	7/6/22	Etridiazole	ND	0.0067 mg/kg	
6/29/22	7/6/22	Fenarimol	ND	0.0067 mg/kg	
6/29/22	7/6/22	Fenitrothion	ND	0.0067 mg/kg	
6/29/22	7/6/22	Fenoxaprop-ethyl	ND	0.013 mg/kg	
6/29/22	7/6/22	Fenthion	ND	0.0067 mg/kg	
6/29/22	7/6/22	Fenvalerate	ND	0.0067 mg/kg	
6/29/22	7/6/22	Fipronil	ND	0.0067 mg/kg	
6/29/22	7/6/22	Fluazifop-p-butyl	ND	0.013 mg/kg	
6/29/22	7/6/22	Fludioxonil	ND	0.0067 mg/kg	
6/29/22	7/6/22	Fluroxypyr-meptyl	ND	0.013 mg/kg	
6/29/22	7/6/22	Flutolanil	ND	0.0067 mg/kg	

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### Analytical Report

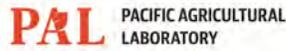
Client Sample ID: TP-8-061522-3.5-4  
Matrix: soil

PAL Sample ID: P220890-03  
Sample Date: 6/15/22  
Received Date: 6/21/22

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
6/29/22	7/6/22	Fonofos	ND	0.0067 mg/kg	
6/29/22	7/6/22	g-BHC	ND	0.0067 mg/kg	
6/29/22	7/6/22	Heptachlor	ND	0.0067 mg/kg	
6/29/22	7/6/22	Heptachlor epoxide	ND	0.0067 mg/kg	
6/29/22	7/6/22	Hexachlorobenzene	ND	0.0067 mg/kg	
6/29/22	7/6/22	Kresoxim-methyl	ND	0.0067 mg/kg	
6/29/22	7/6/22	lambda-Cyhalothrin	ND	0.013 mg/kg	
6/29/22	7/6/22	Leptophos	ND	0.0067 mg/kg	
6/29/22	7/6/22	Malathion	ND	0.0067 mg/kg	
6/29/22	7/6/22	Mefenoxam	ND	0.0067 mg/kg	
6/29/22	7/6/22	Methoxychlor	ND	0.0067 mg/kg	
6/29/22	7/6/22	Metolachlor	ND	0.0067 mg/kg	
6/29/22	7/6/22	MGK-264	ND	0.0067 mg/kg	
6/29/22	7/6/22	Myclobutanil	ND	0.0067 mg/kg	
6/29/22	7/6/22	Napropamide	ND	0.0067 mg/kg	
6/29/22	7/6/22	Ovex	ND	0.0067 mg/kg	
6/29/22	7/6/22	Oxadiazon	ND	0.0067 mg/kg	
6/29/22	7/6/22	Oxyfluorfen	ND	0.0067 mg/kg	
6/29/22	7/6/22	p,p'-DDD	ND	0.0067 mg/kg	
6/29/22	7/6/22	p,p'-DDE	ND	0.0067 mg/kg	
6/29/22	7/6/22	p,p'-DDT	ND	0.0067 mg/kg	
6/29/22	7/6/22	Paclobutrazol	ND	0.0067 mg/kg	
6/29/22	7/6/22	Parathion	ND	0.0067 mg/kg	
6/29/22	7/6/22	Parathion-methyl	ND	0.0067 mg/kg	
6/29/22	7/6/22	PCA	ND	0.0067 mg/kg	
6/29/22	7/6/22	PCB	ND	0.0067 mg/kg	
6/29/22	7/6/22	PCNB	ND	0.0067 mg/kg	
6/29/22	7/6/22	Pendimethalin	ND	0.0067 mg/kg	
6/29/22	7/6/22	Pentachlorothioanisole	ND	0.0067 mg/kg	
6/29/22	7/6/22	Permethrin	ND	0.034 mg/kg	
6/29/22	7/6/22	Phorate	ND	0.0067 mg/kg	
6/29/22	7/6/22	Procymidone	ND	0.0067 mg/kg	
6/29/22	7/6/22	Prodiamine	ND	0.0067 mg/kg	

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Report Number: P220890  
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Client Project ID: 913.001.002.001

### Analytical Report

Client Sample ID: TP-8-061522-3.5-4  
Matrix: soil

PAL Sample ID: P220890-03  
Sample Date: 6/15/22  
Received Date: 6/21/22

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
6/29/22	7/6/22	Pronamide	ND	0.0067 mg/kg	
6/29/22	7/6/22	Propachlor	ND	0.0067 mg/kg	
6/29/22	7/6/22	Pyriproxyfen	ND	0.0067 mg/kg	
6/29/22	7/6/22	Quinoxifen	ND	0.0067 mg/kg	
6/29/22	7/6/22	Ronnel	ND	0.0067 mg/kg	
6/29/22	7/6/22	Spirodiclofen	ND	0.0067 mg/kg	
6/29/22	7/6/22	Sulfotep	ND	0.0067 mg/kg	
6/29/22	7/6/22	Tefluthrin	ND	0.0067 mg/kg	
6/29/22	7/6/22	Terbufos	ND	0.0067 mg/kg	
6/29/22	7/6/22	Tetraconazole	ND	0.0067 mg/kg	
6/29/22	7/6/22	Tetradifon	ND	0.0067 mg/kg	
6/29/22	7/6/22	Thionazin	ND	0.0067 mg/kg	
6/29/22	7/6/22	Tokuthion	ND	0.0067 mg/kg	
6/29/22	7/6/22	trans-Nonachlor	ND	0.0067 mg/kg	
6/29/22	7/6/22	Trichloronate	ND	0.0067 mg/kg	
6/29/22	7/6/22	Trifluralin	ND	0.0067 mg/kg	
6/29/22	7/6/22	Vinclozalin	ND	0.0067 mg/kg	

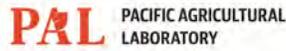
Surrogate Recovery: 62 %  
Surrogate Recovery Range: 34-134  
(TPP-d15 used as Surrogate)

Method: Modified EPA 8321B (LC-MS/MS)

6/29/22	7/1/22	3-Hydroxycarbofuran	ND	0.0067 mg/kg	
6/29/22	7/1/22	Abamectin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Acephate	ND	0.0067 mg/kg	
6/29/22	7/1/22	Acetamiprid	ND	0.0067 mg/kg	
6/29/22	7/1/22	Acibenzolar-S-methyl	ND	0.013 mg/kg	
6/29/22	7/1/22	Afidopyropen	ND	0.0067 mg/kg	
6/29/22	7/1/22	Aldicarb	ND	0.0067 mg/kg	
6/29/22	7/1/22	Aldicarb Sulfone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Aldicarb Sulfoxide	ND	0.0067 mg/kg	
6/29/22	7/1/22	Allethrin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Ametoctradin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Atrazine	ND	0.0067 mg/kg	

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### Analytical Report

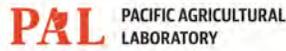
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Matrix: soil

PAL Sample ID: P220890-03  
Sample Date: 6/15/22  
Received Date: 6/21/22

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
6/29/22	7/1/22	Azinphos-ethyl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Azinphos-methyl	ND	0.013 mg/kg	
6/29/22	7/1/22	Azoxystrobin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Bendiocarb	ND	0.0067 mg/kg	
6/29/22	7/1/22	Bensulide	ND	0.0067 mg/kg	
6/29/22	7/1/22	Bitertanol	ND	0.0067 mg/kg	
6/29/22	7/1/22	Boscalid	ND	0.0067 mg/kg	
6/29/22	7/1/22	Bromacil	ND	0.0067 mg/kg	
6/29/22	7/1/22	Carbaryl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Carbendazim	ND	0.0067 mg/kg	
6/29/22	7/1/22	Carbofuran	ND	0.0067 mg/kg	
6/29/22	7/1/22	Carfentrazone-ethyl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Chlorantraniliprole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Clethodim	ND	0.013 mg/kg	
6/29/22	7/1/22	Clomazone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Clothianidin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Cyanazine	ND	0.0067 mg/kg	
6/29/22	7/1/22	Cyantraniliprole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Cyazofamid	ND	0.0067 mg/kg	
6/29/22	7/1/22	Cyclaniliprole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Cycloate	ND	0.013 mg/kg	
6/29/22	7/1/22	Cyflufenamid	ND	0.0067 mg/kg	
6/29/22	7/1/22	Cyflumetofen	ND	0.0067 mg/kg	
6/29/22	7/1/22	Cyhalofop-butyl	ND	0.013 mg/kg	
6/29/22	7/1/22	Cyprodinil	ND	0.0067 mg/kg	
6/29/22	7/1/22	Cyprosulfamide	ND	0.0067 mg/kg	
6/29/22	7/1/22	DCPMU	ND	0.0067 mg/kg	
6/29/22	7/1/22	Diazoxon	ND	0.0067 mg/kg	
6/29/22	7/1/22	Difenoconazole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Diflubenzuron	ND	0.0067 mg/kg	
6/29/22	7/1/22	Diflufenican	ND	0.0067 mg/kg	
6/29/22	7/1/22	Dimethoate	ND	0.0067 mg/kg	
6/29/22	7/1/22	Dimethomorph	ND	0.0067 mg/kg	

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GSI Water Solutions, Inc.  
55 SW Yamhill Street, Suite 300  
Portland, OR 97204

Report Number: P220890  
Report Date: July 07, 2022  
Client Project ID: 913.001.002.001

## Analytical Report

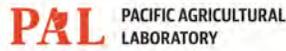
Client Sample ID: TP-8-061522-3.5-4  
Matrix: soil

PAL Sample ID: P220890-03  
Sample Date: 6/15/22  
Received Date: 6/21/22

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
6/29/22	7/1/22	Dinotefuran	ND	0.0067 mg/kg	
6/29/22	7/1/22	Disulfoton sulfone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Diuron	ND	0.0067 mg/kg	
6/29/22	7/1/22	d-Phenothrin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Emamectin Benzoate	ND	0.0067 mg/kg	
6/29/22	7/1/22	Ethion	ND	0.0067 mg/kg	
6/29/22	7/1/22	Etofenprox	ND	0.0067 mg/kg	
6/29/22	7/1/22	Famoxadone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Famphur	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenamidone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenamiphos sulfone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenamiphos sulfoxide	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenazaquin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenbuconazole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenbutatin oxide	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenhexamid	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenobucarb	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenoxycarb	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenpropathrin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenpyroximate	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fenuron	ND	0.0067 mg/kg	
6/29/22	7/1/22	Flonicamid	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fluazinam	ND	0.0067 mg/kg	
6/29/22	7/1/22	Flubendiamide	ND	0.013 mg/kg	
6/29/22	7/1/22	Flufenacet	ND	0.0067 mg/kg	
6/29/22	7/1/22	Flumetsulam	ND	0.0067 mg/kg	
6/29/22	7/1/22	Flumioxazin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fluometuron	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fluopicolide	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fluopyram	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fluoxastrobin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Flupyradifurone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fluridone	ND	0.0067 mg/kg	

Rick Jordan, Laboratory Director

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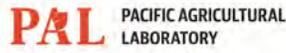
Client Sample ID: TP-8-061522-3.5-4  
Matrix: soil

PAL Sample ID: P220890-03  
Sample Date: 6/15/22  
Received Date: 6/21/22

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
6/29/22	7/1/22	Flutianil	ND	0.0067 mg/kg	
6/29/22	7/1/22	Flutriafol	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fluvalinate	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fluxapyroxad	ND	0.0067 mg/kg	
6/29/22	7/1/22	Fonofos	ND	0.013 mg/kg	
6/29/22	7/1/22	Hexaconazole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Hexazinone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Hexythiazox	ND	0.0067 mg/kg	
6/29/22	7/1/22	Imazalil	ND	0.0067 mg/kg	
6/29/22	7/1/22	Imidacloprid	ND	0.0067 mg/kg	
6/29/22	7/1/22	Indaziflam	ND	0.0067 mg/kg	
6/29/22	7/1/22	Indoxacarb	ND	0.0067 mg/kg	
6/29/22	7/1/22	Ipconazole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Iprodione	ND	0.034 mg/kg	
6/29/22	7/1/22	Isofetamid	ND	0.0067 mg/kg	
6/29/22	7/1/22	Isoxaben	ND	0.0067 mg/kg	
6/29/22	7/1/22	Isoxadifen-ethyl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Lactofen	ND	0.0067 mg/kg	
6/29/22	7/1/22	Linuron	ND	0.0067 mg/kg	
6/29/22	7/1/22	Malaoxon	ND	0.0067 mg/kg	
6/29/22	7/1/22	Mandipropamid	ND	0.0067 mg/kg	
6/29/22	7/1/22	Metconazole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Methamidophos	ND	0.034 mg/kg	
6/29/22	7/1/22	Methidathion	ND	0.0067 mg/kg	
6/29/22	7/1/22	Methiocarb	ND	0.0067 mg/kg	
6/29/22	7/1/22	Methomyl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Methoxyfenozide	ND	0.0067 mg/kg	
6/29/22	7/1/22	Metrafenone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Metribuzin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Mevinphos	ND	0.0067 mg/kg	
6/29/22	7/1/22	Monuron	ND	0.0067 mg/kg	
6/29/22	7/1/22	Neburon	ND	0.0067 mg/kg	
6/29/22	7/1/22	Norflurazon	ND	0.0067 mg/kg	

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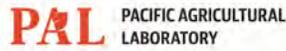
Client Sample ID: TP-8-061522-3.5-4  
Matrix: soil

PAL Sample ID: P220890-03  
Sample Date: 6/15/22  
Received Date: 6/21/22

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
6/29/22	7/1/22	Novaluron	ND	0.0067 mg/kg	
6/29/22	7/1/22	Omethoate	ND	0.0067 mg/kg	
6/29/22	7/1/22	Oryzalin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Oxadixyl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Oxamyl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Oxydemeton-Methyl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Penoxsulam	ND	0.0067 mg/kg	
6/29/22	7/1/22	Penthiopyrad	ND	0.0067 mg/kg	
6/29/22	7/1/22	Phorate Sulfone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Phorate Sulfoxide	ND	0.0067 mg/kg	
6/29/22	7/1/22	Phosalone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Phosmet	ND	0.0067 mg/kg	
6/29/22	7/1/22	Phosphamidon	ND	0.0067 mg/kg	
6/29/22	7/1/22	Picoxystrobin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Piperonyl Butoxide	ND	0.0067 mg/kg	
6/29/22	7/1/22	Pirimicarb	ND	0.0067 mg/kg	
6/29/22	7/1/22	Pirimiphos-methyl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Prallethrin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Prometon	ND	0.0067 mg/kg	
6/29/22	7/1/22	Prometryn	ND	0.0067 mg/kg	
6/29/22	7/1/22	Propamocarb	ND	0.0067 mg/kg	
6/29/22	7/1/22	Propanil	ND	0.0067 mg/kg	
6/29/22	7/1/22	Propargite	ND	0.0067 mg/kg	
6/29/22	7/1/22	Propazine	ND	0.0067 mg/kg	
6/29/22	7/1/22	Propiconazole	ND	0.013 mg/kg	
6/29/22	7/1/22	Pyraclostrobin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Pyraflufen-ethyl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Pyrethrin	ND	0.034 mg/kg	
6/29/22	7/1/22	Pyridaben	ND	0.0067 mg/kg	
6/29/22	7/1/22	Pyridalyl	ND	0.0067 mg/kg	
6/29/22	7/1/22	Pyrimethanil	ND	0.0067 mg/kg	
6/29/22	7/1/22	Pyroxasulfone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Quizalofop-p-ethyl	ND	0.0067 mg/kg	

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Client Sample ID: TP-8-061522-3.5-4  
Matrix: soil

PAL Sample ID: P220890-03  
Sample Date: 6/15/22  
Received Date: 6/21/22

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
6/29/22	7/1/22	Rotenone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Saflufenacil	ND	0.0067 mg/kg	
6/29/22	7/1/22	Sethoxydim	ND	0.013 mg/kg	
6/29/22	7/1/22	Siduron	ND	0.0067 mg/kg	
6/29/22	7/1/22	Simazine	ND	0.0067 mg/kg	
6/29/22	7/1/22	Simetryn	ND	0.0067 mg/kg	
6/29/22	7/1/22	Spinetoram	ND	0.0067 mg/kg	
6/29/22	7/1/22	Spinosad	ND	0.0067 mg/kg	
6/29/22	7/1/22	Spiromesifen	ND	0.013 mg/kg	
6/29/22	7/1/22	Spirotetramat	ND	0.0067 mg/kg	
6/29/22	7/1/22	Spiroxamine	ND	0.0067 mg/kg	
6/29/22	7/1/22	Sulfentrazone	ND	0.0067 mg/kg	
6/29/22	7/1/22	Sulfoxaflor	ND	0.0067 mg/kg	
6/29/22	7/1/22	Tebuconazole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Tebufenozide	ND	0.0067 mg/kg	
6/29/22	7/1/22	Tebuthiuron	ND	0.0067 mg/kg	
6/29/22	7/1/22	Terbacil	ND	0.0067 mg/kg	
6/29/22	7/1/22	Terbuthylazine	ND	0.0067 mg/kg	
6/29/22	7/1/22	Terbutryn	ND	0.0067 mg/kg	
6/29/22	7/1/22	Thiabendazole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Thiacloprid	ND	0.0067 mg/kg	
6/29/22	7/1/22	Thiamethoxam	ND	0.0067 mg/kg	
6/29/22	7/1/22	Thiobencarb	ND	0.0067 mg/kg	
6/29/22	7/1/22	Thiodicarb	ND	0.0067 mg/kg	
6/29/22	7/1/22	Tolfenpyrad	ND	0.0067 mg/kg	
6/29/22	7/1/22	Triadimefon	ND	0.0067 mg/kg	
6/29/22	7/1/22	Triadimenol	ND	0.013 mg/kg	
6/29/22	7/1/22	Triallate	ND	0.0067 mg/kg	
6/29/22	7/1/22	Trifloxystrobin	ND	0.0067 mg/kg	
6/29/22	7/1/22	Triflumizole	ND	0.0067 mg/kg	
6/29/22	7/1/22	Triticonazole	ND	0.0067 mg/kg	

Surrogate Recovery: 56 %  
Surrogate Recovery Range: 36-117  
(TPP-d15 used as Surrogate)

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## Quality Assurance

Method Blank Data Matrix: soil

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
6/29/22	7/5/22	22F2906-BLK1	2,6-Dichlorobenzamide	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	3-Hydroxycarbofuran	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Abamectin	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	a-BHC	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Acephate	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Acetamiprid	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Acetochlor	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Acibenzolar-S-methyl	Not Detected	< 0.013 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Afidopyropen	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Alachlor	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Aldicarb	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Aldicarb Sulfone	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Aldicarb Sulfoxide	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Aldrin	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Allethrin	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Ametoctradin	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Ametryn	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Aspon	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Atrazine	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Azinphos-ethyl	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Azinphos-methyl	Not Detected	< 0.013 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Azoxystrobin	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	b-BHC	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Bendiocarb	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Benfluralin	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Bensulide	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Bifenthrin	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Bitertanol	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Bolstar	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Boscalid	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Bromacil	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Bromopropylate	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Buprofezin	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Captan	Not Detected	< 0.067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Carbaryl	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Carbendazim	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Carbofuran	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Carfentrazone-ethyl	Not Detected	< 0.0067 mg/kg	



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Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
6/29/22	7/1/22	22F2906-BLK1	Chlorantranilprole	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Chlordane	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Chlorfenapyr	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Chlorfenvinphos	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Chlorobenzilate	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Chloroneb	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Chlorpropham	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Chlorpyrifos	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Chlorpyrifos-methyl	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	cis-Nonachlor	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Clethodim	Not Detected	< 0.013 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Clomazone	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Clothianidin	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Cyanazine	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Cyantranilprole	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Cyazofamid	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Cyclanilprole	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Cycloate	Not Detected	< 0.013 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Cyflufenamid	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Cyflumetofen	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Cyfluthrin	Not Detected	< 0.034 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Cyhalofop-butyl	Not Detected	< 0.013 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Cypermethrin	Not Detected	< 0.034 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Cyprodinil	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Cyprosulfamide	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Dacthal	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	d-BHC	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	DCPMU	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Deltamethrin	Not Detected	< 0.034 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Demeton	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Diazinon	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Diazoxon	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Dichlobenil	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Dichlorofenthion	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Dichlorvos	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Diclofop-methyl	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Dicloran	Not Detected	< 0.034 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Dicofol	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Dieldrin	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Difenoconazole	Not Detected	< 0.0067 mg/kg	



Rick Jordan, Laboratory Director

This analytical report complies with the ISO/IEC 17025:2017  
Quality Standard.

**GSI Water Solutions, Inc.**  
55 SW Yamhill Street, Suite 300  
Portland, OR 97204

**Report Number:** P220890  
**Report Date:** July 07, 2022  
**Client Project ID:** 913.001.002.001

**Method Blank Data**      **Matrix:** soil

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
6/29/22	7/1/22	22F2906-BLK1	Diflubenzuron	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Diflufenican	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Dimethenamid	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Dimethoate	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Dimethomorph	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Dinotefuran	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Diphenamid	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Diphenylamine	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Disulfoton	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Disulfoton sulfone	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Dithiopyr	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Diuron	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	d-Phenothrin	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Emamectin Benzoate	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Endosulfan I	Not Detected	< 0.013 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Endosulfan II	Not Detected	< 0.013 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Endosulfan sulfate	Not Detected	< 0.013 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Endrin	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Endrin ketone	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	EPN	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Esfenvalerate	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Ethalfuralin	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Ethion	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Ethofumesate	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Ethoprop	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Etofenprox	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Etoxazole	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Etridiazole	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Famoxadone	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Famphur	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Fenamidone	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Fenamiphos sulfone	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Fenamiphos sulfoxide	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Fenarimol	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Fenazaquin	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Fenbuconazole	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Fenbutatin oxide	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Fenhexamid	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Fenitrothion	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Fenobucarb	Not Detected	< 0.0067 mg/kg	



Rick Jordan, Laboratory Director

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GSI Water Solutions, Inc.  
55 SW Yamhill Street, Suite 300  
Portland, OR 97204

Report Number: P220890  
Report Date: July 07, 2022  
Client Project ID: 913.001.002.001

Method Blank Data Matrix: soil

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
6/29/22	7/5/22	22F2906-BLK1	Fenoxaprop-ethyl	Not Detected	< 0.013 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Fenoxycarb	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Fenpropathrin	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Fenpyroximate	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Fenthion	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Fenuron	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Fenvalerate	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Fipronil	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Flonicamid	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Fluazifop-p-butyl	Not Detected	< 0.013 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Fluazinam	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Flubendiamide	Not Detected	< 0.013 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Fludioxonil	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Flufenacet	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Flumetsulam	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Flumioxazin	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Fluometuron	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Fluopicolide	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Fluopyram	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Fluoxastrobin	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Flupyradifurone	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Fluridone	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Fluroxypyr-meptyl	Not Detected	< 0.013 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Flutianil	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Flutolanil	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Flutriafol	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Fluvalinate	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Fluxapyroxad	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Fonofos	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Fonofos	Not Detected	< 0.013 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	g-BHC	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Heptachlor	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Heptachlor epoxide	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Hexachlorobenzene	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Hexaconazole	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Hexazinone	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Hexythiazox	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Imazalil	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Imidacloprid	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Indaziflam	Not Detected	< 0.0067 mg/kg	



Rick Jordan, Laboratory Director

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Quality Standard.

**GSI Water Solutions, Inc.**  
55 SW Yamhill Street, Suite 300  
Portland, OR 97204

**Report Number:** P220890  
**Report Date:** July 07, 2022  
**Client Project ID:** 913.001.002.001

**Method Blank Data**      **Matrix:** soil

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
6/29/22	7/1/22	22F2906-BLK1	Indoxacarb	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Ipconazole	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Iprodione	Not Detected	< 0.034 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Isofetamid	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Isoxaben	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Isoxadifen-ethyl	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Kresoxim-methyl	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Lactofen	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	lambda-Cyhalothrin	Not Detected	< 0.013 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Leptophos	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Linuron	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Malaoxon	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Malathion	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Mandipropamid	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Mefenoxam	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Metconazole	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Methamidophos	Not Detected	< 0.034 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Methidathion	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Methiocarb	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Methomyl	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Methoxychlor	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Methoxyfenozide	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Metolachlor	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Metrafenone	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Metribuzin	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Mevinphos	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	MGK-264	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Monuron	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Myclobutanil	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Napropamide	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Neburon	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Norflurazon	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Novaluron	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Omethoate	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Oryzalin	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Ovex	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Oxadiazon	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Oxadixyl	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Oxamyl	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Oxydemeton-Methyl	Not Detected	< 0.0067 mg/kg	



Rick Jordan, Laboratory Director

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**GSI Water Solutions, Inc.**  
55 SW Yamhill Street, Suite 300  
Portland, OR 97204

**Report Number:** P220890  
**Report Date:** July 07, 2022  
**Client Project ID:** 913.001.002.001

**Method Blank Data**      **Matrix:** soil

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
6/29/22	7/5/22	22F2906-BLK1	Oxyfluorfen	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	p,p'-DDD	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	p,p'-DDE	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	p,p'-DDT	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Paclobutrazol	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Parathion	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Parathion-methyl	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	PCA	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	PCB	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	PCNB	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Pendimethalin	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Penoxsulam	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Pentachloroethioanisole	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Penthiopyrad	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Permethrin	Not Detected	< 0.034 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Phorate	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Phorate Sulfone	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Phorate Sulfoxide	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Phosalone	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Phosmet	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Phosphamidon	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Picoxystrobin	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Piperonyl Butoxide	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Pirimicarb	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Pirimiphos-methyl	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Prallethrin	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Procymidone	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Prodiamine	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Prometon	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Prometryn	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Pronamide	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Propachlor	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Propamocarb	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Propanil	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Propargite	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Propazine	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Propiconazole	Not Detected	< 0.013 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Pyraclostrobin	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Pyraflufen-ethyl	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Pyrethrin	Not Detected	< 0.034 mg/kg	



Rick Jordan, Laboratory Director

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**GSI Water Solutions, Inc.**  
55 SW Yamhill Street, Suite 300  
Portland, OR 97204

**Report Number:** P220890  
**Report Date:** July 07, 2022  
**Client Project ID:** 913.001.002.001

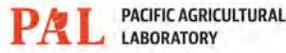
**Method Blank Data**      **Matrix:** soil

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
6/29/22	7/1/22	22F2906-BLK1	Pyridaben	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Pyridalyl	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Pyrimethanil	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Pyriproxyfen	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Pyroxasulfone	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Quinoxifen	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Quizalofop-p-ethyl	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Ronnel	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Rotenone	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Saflufenacil	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Sethoxydim	Not Detected	< 0.013 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Siduron	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Simazine	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Simetryn	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Spinetoram	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Spinosad	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Spirodiclofen	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Spiromesifen	Not Detected	< 0.013 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Spirotetramat	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Spiroxamine	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Sulfentrazone	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Sulfotep	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Sulfoxaflo	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Tebuconazole	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Tebufenozide	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Tebuthiuron	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Tefluthrin	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Terbacil	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Terbufos	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Terbutylazine	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Terbutryn	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Tetraconazole	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Tetradifon	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Thiabendazole	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Thiacloprid	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Thiamethoxam	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Thiobencarb	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Thiodicarb	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Thionazin	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Tokuthion	Not Detected	< 0.0067 mg/kg	



Rick Jordan, Laboratory Director

*This analytical report complies with the ISO/IEC 17025:2017 Quality Standard.*



GSI Water Solutions, Inc.  
55 SW Yamhill Street, Suite 300  
Portland, OR 97204

Report Number: P220890  
Report Date: July 07, 2022  
Client Project ID: 913.001.002.001

Method Blank Data Matrix: soil

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
6/29/22	7/1/22	22F2906-BLK1	Tolfenpyrad	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	trans-Nonachlor	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Triadimefon	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Triadimenol	Not Detected	< 0.013 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Triallate	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Trichloronate	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Trifloxystrobin	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Triflumizole	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Trifluralin	Not Detected	< 0.0067 mg/kg	
6/29/22	7/1/22	22F2906-BLK1	Triticonazole	Not Detected	< 0.0067 mg/kg	
6/29/22	7/5/22	22F2906-BLK1	Vinclozalin	Not Detected	< 0.0067 mg/kg	

Rick Jordan, Laboratory Director

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GSI Water Solutions, Inc.  
55 SW Yamhill Street, Suite 300  
Portland, OR 97204

Report Number: P220890  
Report Date: July 07, 2022  
Client Project ID: 913.001.002.001

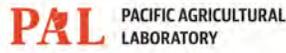
Matrix Spike Data Matrix: soil

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
6/29/22	7/1/22	22F2906-MS1	Azoxystrobin	99	53-103	
6/29/22	7/1/22	22F2906-MSD1	Azoxystrobin	94	53-103	
6/29/22	7/5/22	22F2906-MS1	Bifenthrin	97	50-151	
6/29/22	7/5/22	22F2906-MSD1	Bifenthrin	95	50-151	
6/29/22	7/1/22	22F2906-MS1	Boscalid	92	52-120	
6/29/22	7/1/22	22F2906-MSD1	Boscalid	84	52-120	
6/29/22	7/1/22	22F2906-MS1	Bromacil	106	64-106	
6/29/22	7/1/22	22F2906-MSD1	Bromacil	98	64-106	
6/29/22	7/5/22	22F2906-MS1	Chlorpyrifos	76	45-145	
6/29/22	7/5/22	22F2906-MSD1	Chlorpyrifos	74	45-145	
6/29/22	7/5/22	22F2906-MS1	Dimethenamid	94	46-142	
6/29/22	7/5/22	22F2906-MSD1	Dimethenamid	93	46-142	
6/29/22	7/5/22	22F2906-MS1	Dithiopyr	96	53-139	
6/29/22	7/5/22	22F2906-MSD1	Dithiopyr	92	53-139	
6/29/22	7/1/22	22F2906-MS1	Diuron	88	59-98	
6/29/22	7/1/22	22F2906-MSD1	Diuron	86	59-98	
6/29/22	7/5/22	22F2906-MS1	Endosulfan I	89	58-126	
6/29/22	7/5/22	22F2906-MSD1	Endosulfan I	84	58-126	
6/29/22	7/1/22	22F2906-MS1	Flumioxazin	97	44-121	
6/29/22	7/1/22	22F2906-MSD1	Flumioxazin	90	44-121	
6/29/22	7/1/22	22F2906-MS1	Imidacloprid	93	56-109	
6/29/22	7/1/22	22F2906-MSD1	Imidacloprid	87	56-109	
6/29/22	7/1/22	22F2906-MS1	Indaziflam	92	49-105	
6/29/22	7/1/22	22F2906-MSD1	Indaziflam	88	49-105	
6/29/22	7/1/22	22F2906-MS1	Iprodione	99	60-116	
6/29/22	7/1/22	22F2906-MSD1	Iprodione	98	60-116	
6/29/22	7/1/22	22F2906-MS1	Isoxaben	95	58-108	
6/29/22	7/1/22	22F2906-MSD1	Isoxaben	89	58-108	
6/29/22	7/5/22	22F2906-MS1	Metolachlor	95	60-140	
6/29/22	7/5/22	22F2906-MSD1	Metolachlor	94	60-140	
6/29/22	7/5/22	22F2906-MS1	Myclobutanil	97	42-149	
6/29/22	7/5/22	22F2906-MSD1	Myclobutanil	93	42-149	
6/29/22	7/1/22	22F2906-MS1	Oryzalin	79	34-135	
6/29/22	7/1/22	22F2906-MSD1	Oryzalin	74	34-135	
6/29/22	7/5/22	22F2906-MS1	Pendimethalin	109	45-157	
6/29/22	7/5/22	22F2906-MSD1	Pendimethalin	105	45-157	
6/29/22	7/5/22	22F2906-MS1	Prodiamine	103	35-150	
6/29/22	7/5/22	22F2906-MSD1	Prodiamine	102	35-150	
6/29/22	7/1/22	22F2906-MS1	Pyraclostrobin	90	60-114	
6/29/22	7/1/22	22F2906-MSD1	Pyraclostrobin	86	60-114	
6/29/22	7/5/22	22F2906-MS1	Pyriproxyfen	103	48-158	
6/29/22	7/5/22	22F2906-MSD1	Pyriproxyfen	100	48-158	
6/29/22	7/1/22	22F2906-MS1	Sulfentrazone	99	60-140	
6/29/22	7/1/22	22F2906-MSD1	Sulfentrazone	91	60-140	



Rick Jordan, Laboratory Director

This analytical report complies with the ISO/IEC 17025:2017  
Quality Standard.



GSI Water Solutions, Inc.  
55 SW Yamhill Street, Suite 300  
Portland, OR 97204

Report Number: P220890  
Report Date: July 07, 2022  
Client Project ID: 913.001.002.001

Matrix Spike Data      Matrix: soil

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
6/29/22	7/1/22	22F2906-MS1	Thiabendazole	82	14-104	
6/29/22	7/1/22	22F2906-MSD1	Thiabendazole	80	14-104	
6/29/22	7/5/22	22F2906-MS1	Trifluralin	92	49-136	
6/29/22	7/5/22	22F2906-MSD1	Trifluralin	98	49-136	

Rick Jordan, Laboratory Director

This analytical report complies with the ISO/IEC 17025:2017 Quality Standard.

**ATTACHMENT D**

April 2023 Shallow Soil Investigation and Infiltration Testing



TECHNICAL MEMORANDUM

Excavation and Infiltration Testing in Support of an Artificial Recharge Project, April 2023, Umatilla Army Depot

To: Ty Lord, PE / IRZ Engineering & Consulting
From: Matt Kohlbecker, RG / GSI Water Solutions, Inc.
Jason Keller, RG / GeoSystems Analysis, Inc.
CC: Justin Leraris, PE / HDR
Date: May 11, 2023



1. Introduction

Additional test pit excavation and infiltration testing was conducted in support of a proposed artificial recharge (AR) project at the Umatilla Army Depot near Hermiston, Oregon. Test pit soils were logged by GSI Water Solutions, Inc. (GSI) and infiltration testing was conducted by GeoSystems Analysis (GSA). The objective of the April 2023 test pit investigation was to conduct a focused evaluation of the deep gravel soils in the project area; previous investigations (i.e., June 2022) included an evaluation of gravel and sand soils.

2. Methods

Field work was conducted from April 24, 2023 through April 26, 2023, and consisted of:

- On April 24, Geophysical Survey, LLC (Kennewick, Washington) located the test pits using a GPS device (test pit coordinates were provided by HDR) and cleared test pit locations of subsurface utilities using ground penetrating radar.
On April 25 and April 26, six test pits were excavated by Columbia River Services using a Case CX160 Excavator. Soils were logged by GSI in general accordance with the Unified Soil Classification System (USCS) Visual-Manual Method. Gravel percentages were measured in the field using a scale and No. 4 sieve. Infiltration tests were conducted at four of the test pits using methods discussed in Attachment A.

Table 1. Test Pit and Infiltration Test Summary.

Table with 5 columns: Test Pit ID, Latitude, Longitude, Soil Logging, Infiltration Testing. Rows include TP-10, TP-11, TP-12, TP-13, TP-14, and TP-16 1.

Note: Coordinates represent the original TP-16 location. TP-16 was moved 25 feet to the south due to a communications line.

### 3. Results

Soil classifications at the test pits are provided in Attachment B. The following observations were made based on the soil classification:

- A communications line was encountered by ground penetrating radar at test pit TP-16. The test pit was moved 25 feet to the south to avoid the communications line.
- The soils in the project area (which are comprised of Catastrophic Missoula Flood Deposits) do not appear to follow a layer-cake geology. Specifically, the “Clean Gravel” appears to occur at different depths or may not be encountered at all, which suggests that the “Clean Gravel” is comprised of discontinuous gravel lenses that occur within the “Gravel with Fines.” This is consistent with the fact that, regionally, the Catastrophic Missoula Flood Deposits are comprised of about 25 individual flood events. Geologic observations are summarized in Table 2.

**Table 2. Test Pit and Infiltration Test Summary.**

Test Pit ID	Total Depth (feet bgs)	Fine Sand (feet bgs)	Gravel With Fines (feet bgs)	Clean Gravel (feet bgs)	Notes
TP-10	15.0	0.0 - 2.5	2.5 - 15.0	--	Cemented Gravel @ 6.0 - 7.0 feet bgs
TP-11	11.0	0.0 - 4.5	4.5 - 10.0	10.0 - 11.0	Cemented Gravel @ 5.5 - 6.0 feet bgs
TP-12	13.0	0.0 - 1.8	1.8 - 13.0	--	Cemented Gravel @ 7.0 - 7.5 feet bgs
TP-13	14.0	0.0 - 2.0	2.0 - 13.0	13.0 - 14.0	Cemented Gravel @ 6.0 - 7.0 feet bgs, may not be continuous
TP-14	8.0	0.0 - 3.5	3.5 - 8.0	--	
TP-16	7.5	0.0 - 3.0	3.0 - 7.5	--	Cemented Gravel @ 5.5 - 6.5 feet bgs

**Note:**

bgs = below ground surface

-- = not encountered

- As shown in Table 2, a cemented gravel layer was encountered in every test pit except for TP-14. The cemented gravel layer generally occurred between 5 and 8 feet below ground surface (bgs) and ranged from 0.5 feet to 1.0 feet thick. The excavator was able to excavate past the cemented gravel layer, although digging was noted to be hard. This layer was also noted to be present in TP-3 during the June 2022 test pit excavations (GSI, 2023) and at borings advanced during the January 2023 drilling investigation (GSI, in press).
- A summary of the effective saturated hydraulic conductivities ( $K_{sat}$ ) measured at the test pits is provided in Table 3. Note that an in-depth discussion of the infiltration test data is provided in Attachment A.

**Table 3. Test Pit and Infiltration Test Summary.**

Test Pit ID	Geologic Unit	Steady State Test $K_{sat}$ (feet per day)	Falling Head Test $K_{sat}$ (feet per day)
TP-10	Gravel with Fines	126.4	93.6
TP-13	Clean Gravel	93.5	59.9
TP-14	Gravel with Fines	48.4	44.4
TP-16	Gravel with Fines	Not Tested	4.0

**Note:**

$K_{sat}$  = saturated hydraulic conductivity

## 4. Conclusions

The cemented gravel layer that was observed between 6 and 8 feet bgs was continuous and will likely act as a barrier to infiltrating water. Note that during the June 2022 infiltration testing, the  $K_{sat}$  measured in the Clean Gravel was significantly higher than the  $K_{sat}$  measured in the Gravel with Fines (36.9 ft/day versus 4.2 ft/day); however, the measured  $K_{sat}$  of Gravel with Fines in the April 2023 test pits were similar to the June 2022 Clean Gravel measurements. The June 2022 Gravel with Fines measurements may have been impacted by unidentified cemented gravel layers, whereas the April 2023 measurements were targeted below the cemented gravel layer. These results indicate that basins located above a cemented gravel layer may have recharge rates of approximately 4 ft/day, whereas basins constructed below the cemented layer may be 44 ft/day or greater. Therefore, infiltration basins should be excavated deeper than the cemented gravel layer.

Given the non-layer cake geology at the site, the value of  $K_{sat}$  that is used to design the basin should be conservative in its assumption of absence of cemented gravel layers below 8 ft bgs. While no continuous cemented gravels were observed in deep borings, it should be recognized that the density of the borings (three within the 5 acre infiltration basin footprint) was relatively low (compared to the 15 test pits that have been excavated at the site).

## 5. References

GSI. 2023. Phase I Subsurface Characterization Results, Umatilla Army Depot, Artificial Recharge Project, Umatilla County, Oregon. March 13.

GSI. In press. Phase II Subsurface Characterization Results, Umatilla Army Depot Artificial Recharge Project, Umatilla County, Oregon.

## ATTACHMENT A

Infiltration Test Methods and Results

## MEMORANDUM

May 12, 2023

TO: Matt Kohlbecker, RG, GSI Water Solutions, Inc.

FROM: Jason Keller, RG, GeoSystems Analysis, Inc.

RE: Umatilla Army Depot Artificial Recharge Project – Supplemental Infiltration Testing

---

### 1.0 INTRODUCTION

GeoSystems Analysis Inc. (GSA) was contracted to complete an infiltration assessment at a proposed artificial groundwater recharge site at the Umatilla Army Depot in Umatilla County, OR. Infiltration tests were conducted to estimate the near surface (15 ft bgs and shallower) in-situ effective saturated hydraulic conductivity ( $K_{sat}$ ), which represents the rate at which water infiltrates into the soil under field saturated conditions. The infiltration testing was performed to augment infiltration tests completed in 2022 (GSA, 2022). This technical memorandum presents the methods and results of the supplementary infiltration testing.

### 2.0 METHODS

Infiltration tests were performed at the trench locations in Table 1. Testing was performed by excavating a trench to the target depth, inserting a 4-foot diameter steel pipe in the trench, and adding water to the inside of the pipe (Figure 1). Two types of tests were performed:

- 1) Steady-state test: Water was added at a measured flow rate until a constant head of water in the cylinder was achieved. Flow rate was measured by timing flow into a bucket, weighting water added to the bucket, and converting the water mass to volume assuming a water density of 8.345 pounds per gallon of water. Effective  $K_{sat}$  was calculated from the measured flow rate and water height in the pipe using the single-ring cylinder infiltrometer method with lateral divergence correction (Bouwer et al., 1999).
- 2) Falling head test: The water source to the pipe was shut off and the rate of water decline in the pipe was monitored. Effective  $K_{sat}$  was calculated from the measured infiltration rates using the Green and Ampt equation with time-varying ponded water depth (Warrick et al., 2005) and lateral divergence correction.

The water level within the pipe was measured using a Rugged TROLL 100 ® datalogger (In-Situ, Ft. Collins, CO). Lateral divergence was measured by excavating laterally away from the pipe after completion of testing and visually identifying the wetted soil.

Table 1. Infiltration test locations

Test Pit ID	Latitude	Longitude
TP-10	N45° 49' 46.68"	W119° 23' 54.27"
TP-13	N45° 49' 44.17"	W119° 23' 59.82"
TP-14	N45° 49' 45.69"	W119° 23' 00.81"
TP-16	N45° 49' 47.71"	W119° 23' 48.91"



Figure 1. TP-16 infiltrometer test

### 3.0 RESULTS

Infiltration test results are provided in Table 2. USCS soil type at the testing depth was provided by GSI Water Solutions, Inc. Apart from TP-16, effective  $K_{sat}$  values were high, ranging from 48.4 ft/day to 126 ft/day for the steady-state tests and 44.4 ft/day to 93.6 ft/day for the falling head tests. Due to potential error of measuring flow rate during the steady-state analysis, the falling head test results represent the best estimate of effective  $K_{sat}$ . Effective  $K_{sat}$  at TP-16 was relatively low, being 4.0 ft/day. While not identified at TP-16, a cemented layer below the testing depth may have contributed to the lower effective  $K_{sat}$  and large lateral wetting distance at this location.

#### **GeoSystems Analysis, Inc.**

Table 2. Infiltration test results

Test Pit	Depth (ft bgs)	USCS Soil Type	Lateral Wetting (ft from cylinder wall)	State-State Flow Rate (gpm)	Effective Saturated Hydraulic Conductivity (ft/day)	
					Steady-State Test	Falling Head Test
TP-10	15	GW	2.5	46.9	126.4	93.6
TP-13	14	GP	4.4	68.7	93.5	59.9
TP-14	8	GW	2.3	17.7	48.4	44.4
TP-16	7.5	GW	4.5	Not Tested	Not Tested	4.0

**4.0 REFERENCES**

Bouwer, H., Back, J.T., Oliver, J.M., 1999. Predicting Infiltration and Groundwater Mounds for Artificial Recharge, *J Hydro Eng, ASCE*, (4) pp. 350-357.

GeoSystems Analysis, Inc., 2022. Umatilla Arby Depot Artificial Recharge Project Infiltration Testing. Memorandum to GSI Water Solutions, Inc., June 27, 2022.

GSA – see GeoSystems Analysis, Inc.

Warrick, A.W., D. Zerihun, C.A. Sanchez, and A. Furman, 2005. Infiltration Under Variable Ponding Depths of Water. *J. Irrigation and Drainage Eng.*, 131(4):358-363.

**ATTACHMENT B**

Test Pit Logs



Test Pit ID

TP-10

Project Number: 290.010

Sheet 1 of 3

**SOIL LOGGING FORM**

**Project:** Umatilla Army Depot Test Pits

**Location:** Umatilla Army Depot, Hermiston, Oregon

**Contractor:** Columbia River Services

**Method:** Case CX160 Excavator

**Start Date:** 4/25/23

**End Date:** 4/25/23

**Field Personnel:** M. Kohlbecker, M. Harrison

**Sampling Method:** Excavator Bucket

**Water Levels:** NOT ENCOUNTERED

Total Depth: ~~7.0~~ 15.0

Depth Below Surface (ft)	Sample	USCS Symbol	Description Consistency, Color, Moisture Content, USCS Name, Soil Structure/Mineralogy, Soil Unit	Grain Sizes		
				% Gravel	% Sand	% Fines
1.0		SP	FIRM, LIGHT BROWN, DRY POORLY GRADED SAND, SAND IS VERY FINE TO FINE, GRAVEL IS FINE, SUB-ROUNDED TO ROUNDED, TRACE ROOTLETS [FINE SAND]	10	85	<5
2.5		GW	FIRM, LIGHT GREY, DRY, WELL GRADED GRAVEL WITH SAND, SAND IS VERY FINE TO FINE, GRAVEL IS FINE TO COARSE, SUBROUNDED [GR. W/ FINES]	68	27	<5
3.0			FIRM, LIGHT GREY, DRY, WELL GRADED GRAVEL WITH SAND, SAND IS FINE TO MEDIUM, GRAVEL IS FINE TO COARSE, SUBROUNDED [GRAVEL W/ FINES]	76	19	<5
4.0		GW	BOULDERS UP TO 3 FEET IN 5-6 FOOT SAMPLE	81	14	<5
5.0		*	CEMENTED GRAVELS FROM 6.0-7.0 FEET BGS. HARD DIGGING	75	20	<5

TOTAL DEPTH: ~~7.0~~ FEET BGS

15.0



Test Pit ID

TP-10

Project Number: 290.010

Sheet 2 of 3

### SOIL LOGGING FORM

**Project:** Umatilla Army Depot Test Pits

**Location:** Umatilla Army Depot, Hermiston, Oregon

**Contractor:** Columbia River Services

**Method:** Case CX160 Excavator

**Start Date:** 4/25/23

**End Date:** 4/25/23

**Field Personnel:** M. Kohlbecker, M. Harrison

**Sampling Method:** Excavator Bucket

**Water Levels:** NOT ENCOUNTERED

**Total Depth:** 15.0

Depth Below Surface (ft)	Sample	USCS Symbol	Description Consistency, Color, Moisture Content, USCS Name, Soil Structure/Mineralogy, Soil Unit	Grain Sizes		
				% Gravel	% Sand	% Fines
				75	20	<5
8.0						
				71	24	<5
9.0						
				75	20	<5
10.0						
	GW		BOULDERS UP TO 4 FEET IN 10'-11' INTERVAL	76	19	<5
11.0						
			SAND BECOMES FINE TO VERY FINE @ 11 FEET	82	13	<5
12.0						
				70	25	<5
13.0						
				67	28	<5
14.0						



Test Pit ID

TP-10

Project Number: 290.010

Sheet 3 of 3

### SOIL LOGGING FORM

**Project:** Umatilla Army Depot Test Pits

**Location:** Umatilla Army Depot, Hermiston, Oregon

**Contractor:** Columbia River Services

**Method:** Case CX160 Excavator

**Start Date:** 4/25/23

**End Date:** 4/25/23

**Field Personnel:** M. Kohlbecker, M. Harrison

**Sampling Method:** Excavator Bucket

**Water Levels:** NOT ENCOUNTERED

**Total Depth:** 15.0

Depth Below Surface (ft)	Sample	USCS Symbol	Description Consistency, Color, Moisture Content, USCS Name, Soil Structure/Mineralogy, Soil Unit	Grain Sizes		
				% Gravel	% Sand	% Fines
15.0 10.0		GW				
2.0			TOTAL DEPTH = 15.0 FEET BGS			
2.0						
4.0						
5.0						
6.0						
7.0						



Test Pit ID  
TP-11

Project Number: 290.010  
Sheet 1 of 2

### SOIL LOGGING FORM

**Project:** Umatilla Army Depot Test Pits      **Location:** Umatilla Army Depot, Hermiston, Oregon  
**Contractor:** Columbia River Services      **Method:** Case CX160 Excavator  
**Start Date:** 4/26/23      **End Date:** 4/26/23      **Field Personnel:** M. Kohlbecker, M. Harrison  
**Sampling Method:** Excavator Bucket      **Water Levels:** NOT ENCOUNTERED

Total Depth: 11.0

Depth Below Surface (ft)	Sample	USCS Symbol	Description Consistency, Color, Moisture Content, USCS Name, Soil Structure/Mineralogy, Soil Unit	Grain Sizes		
				% Gravel	% Sand	% Fines
1.0		SP	FIRM, LIGHT BROWN, DRY, POORLY GRADED SAND, SAND IS VERY FINE TO FINE, GRAVEL IS FINE, SUBROUNDED, TRACE ROOTLETS [FINE SAND]	5	90	<5
2.0						
3.0						
4.0						
4.5		GW	FIRM, LIGHT GRAY, WELL GRADED GRAVEL WITH SAND, SAND IS FINE, GRAVEL IS FINE TO COARSE, SUBROUNDED, COBBLES TO 11-INCHES [GRAVEL W/ FINES]	64	31	<5
5.0			* CEMENTED GRAVELS FROM 5.5-6.0 FEET BGS. HARD DIGGING.			
6.0		GW	FIRM, LIGHT GREY, WELL GRADED GRAVEL, SAND IS FINE TO MEDIUM, GRAVEL IS FINE TO COARSE, SUBROUNDED [GRAVEL W/ FINES]	82	12	<5
7.0						



Test Pit ID

TP-11

Project Number: 290.010

Sheet 2 of 2

**SOIL LOGGING FORM**

**Project:** Umatilla Army Depot Test Pits

**Location:** Umatilla Army Depot, Hermiston, Oregon

**Contractor:** Columbia River Services

**Method:** Case CX160 Excavator

**Start Date:** 4/26/23

**End Date:** 4/26/23

**Field Personnel:** M. Kohlbecker, M. Harrison

**Sampling Method:** Excavator Bucket

**Water Levels:** NOT ENCOUNTERED

**Total Depth:** 11.0

Depth Below Surface (ft)	Sample	USCS Symbol	Description Consistency, Color, Moisture Content, USCS Name, Soil Structure/Mineralogy, Soil Unit	Grain Sizes		
				% Gravel	% Sand	% Fines
8.0			WHITE PRECIPITATE ON GRAVEL CLASTS	82	12	<5
		GW	Boulders to 24-inches @ 8.0 feet BGS.	95	5	<1
9.0			32-INCH BOULDER @ 9.0 FEET.			
			WHITE PRECIPITATE ON GRAVEL CLASTS IN 9'-10' INTERVAL	92	5	<5
10.0						
		GP	FIRM, LIGHT GRAY, DRY, POORLY GRADED GRAVEL, SAND IS FINE TO MEDIUM, GRAVEL IS MEDIUM TO COARSE, SUBROUNDED [CLEAN GRAVEL]	95	5	<1
11.0			TOTAL DEPTH = 11.0 FEET BGS			
12.0						
13.0						
14.0						



Test Pit ID

TP-12

Project Number: 290.010

Sheet 1 of 2

### SOIL LOGGING FORM

**Project:** Umatilla Army Depot Test Pits

**Location:** Umatilla Army Depot, Hermiston, Oregon

**Contractor:** Columbia River Services

**Method:** Case CX160 Excavator

**Start Date:** 4/26/23

**End Date:** 4/26/23

**Field Personnel:** M. Kohlbecker, M. Harrison

**Sampling Method:** Excavator Bucket

**Water Levels:** NOT ENCOUNTERED

**Total Depth:** 13.0'

Depth Below Surface (ft)	Sample	USCS Symbol	Description Consistency, Color, Moisture Content, USCS Name, Soil Structure/Mineralogy, Soil Unit	Grain Sizes		
				% Gravel	% Sand	% Fines
1.0		SP	FIRM, LIGHT BROWN, DRY, POORLY GRADED SAND, SAND IS VERY FINE TO FINE, GRAVEL IS FINE, SUBROUNDED TO ROUNDED, TRACE ROOTLETS [FINE SAND]	8.7	86.3	<5
1.8 2.0		SP	FIRM, LIGHT BROWN, MOIST, POORLY GRADED SAND WITH GRAVEL, SAND IS VERY FINE TO FINE, GRAVEL IS FINE TO COARSE, ROUNDED TO SUBROUNDED [GRAVEL W/ FINES]  - CEMENTED GRAVEL CHUNK IN 3'-4' SAMPLE	37.5	57.5	<5
4.0						
5.0		GW	FIRM, LIGHT GREY, DRY, WELL GRADED GRAVEL, SAND IS FINE TO MEDIUM, GRAVEL IS FINE TO COARSE, ROUNDED TO SUBROUNDED, WITH APPARENT WHITE PRECIPITATE ON GRAVEL CLASTS [GRAVEL W/ FINES] - SAND BECOMES MEDIUM @ 5'  - IN 5'-6' INTERVAL, BOULDERS UP TO 24-INCHES	95	5	<1
				83	12	<5
6.0				76	19	<5
7.0			TRANSITIONS TO GRAVEL W/ SAND (GW) AT 7 FEET, SAND IS FINE TO MEDIUM			



Test Pit ID

TP-12

Project Number: 290.010

Sheet 2 of 2

### SOIL LOGGING FORM

**Project:** Umatilla Army Depot Test Pits

**Location:** Umatilla Army Depot, Hermiston, Oregon

**Contractor:** Columbia River Services

**Method:** Case CX160 Excavator

**Start Date:** 4/26/23

**End Date:** 4/26/23

**Field Personnel:** M. Kohlbecker, M. Harrison

**Sampling Method:** Excavator Bucket

**Water Levels:** NOT ENCOUNTERED

**Total Depth:** 13.0'

Depth Below Surface (ft)	Sample	USCS Symbol	Description Consistency, Color, Moisture Content, USCS Name, Soil Structure/Mineralogy, Soil Unit	Grain Sizes		
				% Gravel	% Sand	% Fines
8.0		*	CEMENTED GRAVEL LAYER FROM 7.0-7.5 FEET BGS	85	10	<5
			TRANSITIONS TO WELL GRADED GRAVEL (GW) @ 7' W/ WHITE PRECIPITATE ON CLASTS	88	7	<5
9.0			TRANSITIONS TO A WELL GRADED GRAVEL W/ SAND (GW) @ 9.0' W/ LESS WHITE PRECIPITATE	66	29	<5
10.0		GW	GRAVEL GRADES TO FINE @ 10'	73	22	<5
11.0				77	18	<5
12.0			GRADES TO A WELL GRADED GRAVEL (GW) AT 12'-13'	86	9	<5
13.0			- 20-INCH BOULDER @ 13.0'			
			TOTAL DEPTH = 13.0'			
14.0						



Test Pit ID  
TP-13

Project Number: 290.010  
290.010

Sheet 1 of 2

### SOIL LOGGING FORM

**Project:** Umatilla Army Depot Test Pits

**Location:** Umatilla Army Depot, Hermiston, Oregon

**Contractor:** Columbia River Services

**Method:** Case CX160 Excavator

**Start Date:** 4/25/23

**End Date:** 4/25/23

**Field Personnel:** M. Kohlbecker, M. Harrison

**Sampling Method:** Excavator Bucket

**Water Levels:** NOT ENCOUNTERED

**Total Depth:** 14.0'

Depth Below Surface (ft)	Sample	USCS Symbol	Description Consistency, Color, Moisture Content, USCS Name, Soil Structure/Mineralogy, Soil Unit	Grain Sizes		
				% Gravel	% Sand	% Fines
1.0		SP	FIRM, LIGHT BROWN, DRY, POORLY GRADED SAND, SAND IS VERY FINE TO FINE, TRACE ROOTLETS, GRAVEL IS FINE, SUBROUNDED TO ROUNDED [FINE SAND]	<5	90	<5
3.0		GW	FIRM, LIGHT BROWN, DRY, WELL GRADED GRAVEL W/ SAND, SAND IS VERY FINE TO FINE, GRAVEL IS FINE TO COARSE, SUBROUNDED TO ROUNDED [GRAVEL W/ FINES]	50	45	<5
4.0			- 10-INCH BOULDER @ 4'	50	45	<5
5.0		GW	FIRM, LIGHT GREY, DRY, WELL GRADED GRAVEL W/ SAND, SAND IS VERY FINE TO FINE, GRAVEL IS FINE TO COARSE, SUBROUNDED TO ROUNDED [GRAVEL W/ FINES]	82	13	<5
6.0		*	- 2' TO 6" OCCASSIONAL CEMENTED GRAVEL CHUNKS, DO NOT APPEAR CONTINUOUS, 6-7' INTERVAL	83	12	<5
7.0			- 24" BOULDER @ 7'	88	7	<5



Test Pit ID

TP-13

Project Number: 290.010

Sheet 2 of 2

### SOIL LOGGING FORM

Project: Umatilla Army Depot Test Pits

Location: Umatilla Army Depot, Hermiston, Oregon

Contractor: Columbia River Services

Method: Case CX160 Excavator

Start Date: 4/25/23

End Date: 4/25/23

Field Personnel: M. Kohlbecker, M. Harrison

Sampling Method: Excavator Bucket

Water Levels: NOT ENCOUNTERED

Total Depth: 14.0'

Depth Below Surface (ft)	Sample	USCS Symbol	Description Consistency, Color, Moisture Content, USCS Name, Soil Structure/Mineralogy, Soil Unit	Grain Sizes		
				% Gravel	% Sand	% Fines
8.0			- SAND BECOMES FINE TO MEDIUM @ 7'	91	8	<1
9.0		GW		89	6	<5
10.0				92	7	<1
11.0			10-13' NO RECOVERY. SIDEWALL APPEARS TO BE GRAVEL W/ FINES AS DO PILES OF SPOILS (CONTRACTOR LAID PILES OF ROCK IN WRONG LOCATION)			
12.0						
13.0						
14.0		GP	FIRM, LIGHT GRAY, DRY, POORLY-GRADED GRAVEL, SAND IS FINE TO MEDIUM, GRAVEL IS MEDIUM TO COARSE, SUBROUNDED [CLEAN GRAVEL]	94	5	<1

TOTAL DEPTH= 14.0 FEET BGS



Test Pit ID

TP - 14

Project Number: 290.010

Sheet 1 of 1

### SOIL LOGGING FORM

**Project:** Umatilla Army Depot Test Pits

**Location:** Umatilla Army Depot, Hermiston, Oregon

**Contractor:** Columbia River Services

**Method:** Case CX160 Excavator

**Start Date:** 4/26/23

**End Date:** 4/26/23

**Field Personnel:** M. Kohlbecker, M. Harrison

**Sampling Method:** Excavator Bucket

**Water Levels:** NOT ENCOUNTERED

**Total Depth:** 8.0'

Depth Below Surface (ft)	Sample	USCS Symbol	Description Consistency, Color, Moisture Content, USCS Name, Soil Structure/Mineralogy, Soil Unit	Grain Sizes		
				% Gravel	% Sand	% Fines
1.0		SP	FIRM, LIGHT BROWN, DRY, POORLY GRADED SAND, SAND IS VERY FINE TO FINE, GRAVEL IS FINE TO COARSE, SUBANGULAR, TRACE ROOTLETS [FINE SAND]	91	8	<1
2.0						
3.0						
3.5		GW	FIRM, LIGHT GRAY, WELL GRADED GRAVEL W/ SAND, DRY, SAND IS FINE TO MEDIUM, GRAVEL IS FINE TO COARSE, SUBANGULAR TO SUB-ROUNDED [GRAVEL W/ FINES]  SAND BECOMES MEDIUM @ 6'-7'  BOULDERS TO 24" @ 7'	70	25	<5
4.0						
5.0				78	17	<5
6.0				76	19	<5
7.0				79	16	<5

TOTAL DEPTH = 8.0' BGS

\* 7'-8' BGS INTERVAL SAME AS ABOVE



Test Pit ID

TP-16

Project Number: 290.010

Sheet 1 of 1

### SOIL LOGGING FORM

**Project:** Umatilla Army Depot Test Pits

**Location:** Umatilla Army Depot, Hermiston, Oregon

**Contractor:** Columbia River Services

**Method:** Case CX160 Excavator

**Start Date:** 4/26/23

**End Date:** 4/26/23

**Field Personnel:** M. Kohlbecker, M. Harrison

**Sampling Method:** Excavator Bucket

**Water Levels:** NOT ENCOUNTERED

**Total Depth:** 7.5'

Depth Below Surface (ft)	Sample	USCS Symbol	Description Consistency, Color, Moisture Content, USCS Name, Soil Structure/Mineralogy, Soil Unit	Grain Sizes		
				% Gravel	% Sand	% Fines
1.0		SP	FIRM, LIGHT BROWN, DRY, POORLY GRADED SAND, SAND IS VERY FINE TO FINE, GRAVEL IS FINE TO COARSE, SUBROUNDED, TRACE ROOTLETS [FINE SAND]	9	86	<5
4.0		GW	FIRM, LIGHT GREY, DRY, WELL GRADED GRAVEL W/ SAND, SAND IS FINE TO MEDIUM, GRAVELS ARE FINE TO COARSE, SUBROUNDED [GRAVEL W/ FINES]	73	22	<5
5.0		GW	FIRM, LIGHT GREY, DRY, WELL GRADED GRAVEL, SAND IS FINE TO MEDIUM, GRAVEL IS FINE TO COARSE, SUBROUNDED, CLASTS ARE BASALT W/ TRACE CHERT [GRAVEL W/ FINES]	86	9	<5
6.0		*	TWO 20-INCH BOULDERS @ 4'-5' CEMENTED GRAVEL AT 5.5' TO 6.5' BGS			

TOTAL DEPTH = 7.5' BGS

## ATTACHMENT E

Deep Soil and Groundwater Investigation



## TECHNICAL MEMORANDUM

### Phase II Subsurface Characterization Results, Umatilla Army Depot Artificial Recharge Project, Umatilla County, Oregon

**To:** Gibb Evans / IRZ Consulting, Inc.  
Ty Lord, PE / IRZ Consulting, Inc.  
Commissioner John Shafer / Umatilla County  
JR Cook / Northeast Oregon Water Association

**From:** Matt Thomas / GSI Water Solutions, Inc.  
Matt Kohlbecker, RG / GSI Water Solutions, Inc.

**Date:** July 10, 2023

This Technical Memorandum (TM), prepared by GSI Water Solutions, Inc. (GSI), summarizes the second phase of a subsurface characterization at the Umatilla Army Depot in Umatilla County, Oregon, to evaluate site suitability for artificial recharge (AR). The second phase of the subsurface characterization consisted of advancing temporary borings to the water table, installing groundwater monitoring wells, and conducting an aquifer test to estimate aquifer permeability.

#### 1. Introduction

Umatilla County (the County) and Westland Irrigation District (WID) are planning to artificially recharge the shallow groundwater system at the Umatilla Army Depot (the Depot) in Umatilla County, Oregon, using infiltration basins. Source water for the County's delivery to the AR project will be from the Columbia River and source water for WID's delivery to the AR project will be from the Umatilla River; therefore, recharge will be authorized by two separate AR limited licenses from the Oregon Water Resources Department (OWRD).

Permitting and design of an AR basin requires characterization of soils and groundwater at the recharge site. In June 2022, GSI developed the *Umatilla Army Depot AR Project Subsurface Characterization Work Plan* (the Work Plan) (GSI, 2022) to guide the soil and groundwater characterization, which was subdivided into Phase I [to evaluate shallow soils (up to about 15 feet below ground)] and Phase II (to evaluate deep soils and groundwater). GSI finalized the Phase I Subsurface Investigation memo on March 13, 2023, to summarize the shallow soil lithology, infiltration rates, quality, and properties in the study area. This TM summarizes the deep soil and aquifer properties in the study area based on temporary borings, monitoring wells, and an aquifer test to estimate aquifer permeability. Section 2 of this TM summarizes the investigation methods, and Section 3 of this TM summarizes the investigation results.

#### 2. Methods

This section describes the methods that were used during the Phase II Subsurface Characterization to: (1) locate utilities (Subsection 2.1), (2) advance temporary borings and construct monitoring wells (Subsection 2.2), (3) log subsurface soils (Subsection 2.3), (4) collect samples for analysis of soil quality (Subsection 2.4), and (5) conduct an aquifer test (Subsection 2.5).

## 2.1 Utility Locating

Monitoring wells and temporary borings were located and cleared for utilities in the study area by Geophysical Survey, LLC, on June 14, 2022 (RMW-1, RMW-2, RMW-3), November 14 (RB-3), and January 3, 2023 (RB-1 and RB-2). No utilities were found near the monitoring wells and borings. Monitoring well and boring locations are shown in Figure 2 of the limited license application for the Central Area AR Project.

## 2.2 Monitoring Well Construction and Temporary Boring Advancement

Monitoring wells and temporary boreholes were drilled with a track-mounted Terra Sonic 150cc Compact Crawler rotosonic drilling rig operated by Holt Services (Vancouver, Washington). Temporary borings were advanced to the water table within the anticipated footprint of future infiltration basins with the objectives of: (1) identifying potential restrictive layers at depth and (2) collecting soil quality samples for analytes that were detected in shallow soils during the Phase I Subsurface Characterization to further delineate their nature and extent. Monitoring wells were constructed with the objectives of: (1) conducting an aquifer test to measure aquifer properties, (2) collecting groundwater quality samples to support an antidegradation analysis as required by Oregon's groundwater protection rules, and (3) developing monitoring points that can be used to evaluate future changes in groundwater quality and groundwater levels during AR. The drilling dates, tooling that was used to drill the monitoring wells and temporary borings, and total depths of the boreholes, are provided in Table 1.

**Table 1. Overview of Monitoring Well and Boring Drilling.**

Well or Boring ID	Drilling Date(s) <sup>1</sup>	Drill Tooling	Total Depth (feet)
RB-1	2/1/23	6-inch casing, 4-inch core barrel	80
RB-2	1/24/23 - 1/25/23	6-inch casing, 4-inch core barrel	80
RB-3	11/23/22	6-inch casing, 4-inch core barrel	60
RMW-1	12/2/22 - 12/8/22	6-inch casing, 4-inch core barrel, 0 to 100 feet	100
RMW-2	11/29/22 - 12/2/22	7-inch casing, 6-inch core barrel, 0 to 50 feet 6-inch casing, 4-inch core barrel, 50 to 140 feet	140
RMW-3	11/15/22 - 11/22/22	12-inch casing, 10-inch core barrel, 0 to 50 feet 10-inch casing, 8-inch core barrel, 50 to 145 feet	145

### Notes

(1) Does not include well completion activities

## 2.3 Soil Logging

GSI continuously logged soils from each boring in general accordance with the visual-manual method of the Unified Soil Classification System (USCS).

## 2.4 Soil Sampling

### 2.4.1 Soil Quality Sampling

Because the Depot is a superfund site, soil quality samples were collected during the subsurface investigation to characterize soil quality. During the Phase I investigation, soils were sampled from test pits and analyzed for an extensive suite of constituents including metals, explosives, pesticides, polychlorinated biphenyls, nitrate, volatile organic compounds (VOCs), and semi-volatile organic compounds (SVOCs). During the Phase II investigation, soils were collected from the temporary borings and analyzed for constituents detected in shallow soil during the Phase I investigation:

- Nitrate + Nitrite by Method 353.2M
- Volatile Organic Compounds (VOCs) by EPA Method 8260C

Table 2 shows the soil quality samples that were collected from each boring. Samples were submitted to ALS Laboratories (ALS) in Kelso, Washington.

**Table 2. Inventory of Soil Quality Samples Collected at Temporary Borings and Monitoring Wells.**

Analyte	RB-1	RB-2	RB-3	RMW-1	RMW-2	RMW-3
Nitrate-Nitrite	10' bgs	10' bgs	10' bgs	--	--	--
	20' bgs	20' bgs	20' bgs	--	--	--
Volatile Organic Compounds	10' bgs	10' bgs	10' bgs	--	--	--
	20' bgs	20' bgs	20' bgs	--	--	--

**Notes**

"--" = no sample collected  
 bgs = below ground surface

**2.4.2 Soil Grain Size Sampling**

Soil grain sizes were analyzed by sieves and hydrometer using ASTM Method D422M. Table 3 shows the soil grain size samples that were collected from each temporary boring. Three samples were collected at each temporary boring (RB-1, RB-2, and RB-3) to evaluate grain size within the footprint of potential infiltration basins. Eleven samples were collected from the monitoring well RMW-3 boring to design the screen (monitoring well RMW-3 was used as the pumping well during the aquifer test).

**Table 3. Inventory of Soil Grain Size Samples Collected at Temporary Borings and Monitoring Wells.**

Analyte	RB-1	RB-2	RB-3	RMW-1	RMW-2	RMW-3
Soil Grain Size						101' bgs
						107' bgs
						112' bgs
						114' bgs
		20' bgs	20' bgs	20' bgs		118' bgs
		40' bgs	41.5' bgs	40' bgs	--	122' bgs
		60' bgs	58' bgs	56' bgs		128' bgs
						132' bgs
						133' bgs
						136' bgs
						139' bgs

**Notes**

"--" = no sample collected  
 bgs = below ground surface

**2.5 Aquifer Testing**

GSI conducted an aquifer test to estimate the hydraulic conductivity of the Ordinance Gravel Aquifer. The test consisted of pumping RMW-3 and observing water level changes in monitoring well RMW-2, which is located about 25 feet north of RMW-3. Two totalizing flowmeters were used to measure discharge rate, and the flow rates were averaged when calculating transmissivity. The aquifer test consisted of two phases:

- A step-drawdown test to determine the flow rate for the constant rate test. The step-drawdown test was performed on January 26, 2023, and consisted of pumping RMW-3 at three steps [50 gallons per minute (gpm) for 60 minutes, 100 gpm for 60 minutes, and 110 gpm for 120 minutes (the maximum achievable rate with the pump)].
- A constant-rate aquifer test was performed by pumping RMW-3 for 48 hours from January 30, 2023, to February 1, 2023, and consisted of pumping RMW-3 at a target rate of 100 gpm.

At the time of the test, monitoring well RMW-2 boring had been advanced to 145 feet bgs and completed with a temporary well screen from 100 to 140 feet bgs; therefore, RMW-2 was completed in the same depth interval as monitoring well RMW-3. Water produced during the test was conveyed to an undeveloped field located approximately 750 feet northeast of RMW-2 and RMW-3. Water levels were measured during the test using a manual water level meter and down-hole pressure transducers and dataloggers (a Solinst M30 non-vented Levelogger 5 Model 3001 in RMW-3 and a vented 15 psi In-Situ Level TROLL 700 at RMW-2). Barometric pressure was measured with a Solinst barologger.

### 3. Results

This section presents the results of the Phase II subsurface characterization, including monitoring well construction (Subsection 3.1), the subsurface geology (Subsection 3.2), soil quality and physical parameters (Subsection 3.3), and aquifer test results (Subsection 3.4).

#### 3.1 Monitoring Well and Temporary Boring Details

Details about the location, depths, and construction of monitoring wells RMW-1, RMW-2, and RMW-3 and temporary borings RB-1, RB-2 and RB-3 are summarized in Table 4. Well construction diagrams are provided in Attachment A.

**Table 4. Monitoring Well Construction.**

Well ID	Latitude	Longitude	Ground Surface Elevation (ft amsl)	Total Depth (ft bgs)	Screened Interval (ft bgs)	Slot Size (inches)	Well Diameter and Material	Filter Pack
RMW-1 <sup>1</sup>	45.828684	-119.402353	580.76	100	80 - 100	0.020	2-inch, Sch. 40 PVC	10-20 Silica Sand
RMW-2 <sup>1</sup>	45.829377	-119.391692	565.32	80	60 - 80	0.020	2-inch, Sch. 40 PVC	10-20 Silica Sand
RMW-3 <sup>1</sup>	45.829307	-119.391700	564.78	140	115 - 140	0.100	6-inch, Sch. 80 PVC	1/4" - 1/8" Pea Gravel
RB-1 <sup>2</sup>	45.829275	-119.398632	564	80	NA	NA	NA	NA
RB-2 <sup>2</sup>	45.829276	-119.397045	558	80	NA	NA	NA	NA
RB-3 <sup>2</sup>	45.829277	-119.395458	555	60	NA	NA	NA	NA

**Notes**

ft amsl = feet above mean sea level

ft bgs = feet below ground surface

Sch. = schedule

(1) Coordinates were professionally surveyed by Geometrix Northwest on April 26, 2023

(2) Latitude and longitude measured in the field with GPS. Elevation estimated from Google Earth.

### 3.2 Subsurface Geology

Boring logs showing subsurface geology and/or well construction are presented in Attachment A. Table 4 summarizes the geologic units that were encountered in each borehole.

**Table 4. Bottom Depths of Geologic Units in Phase II Boreholes.**

Geology	RMW-1	RMW-2	RMW-3	RB-1	RB-2	RB-3
Eolian Sand	3.2 feet	3 feet	3 feet	1.6 feet	3.7 feet	5.0 feet
Catastrophic Flood Deposits	NA	140 feet	140 feet	NA	NA	NA
Alkali Canyon Formation	NA	NA	145 feet	NA	NA	NA
Columbia River Basalt	NA	NA	NA	NA	NA	NA

Cemented gravel layers were encountered in monitoring wells and borings. Cemented gravel layers would have the ability to limit recharge if they are continuous across the recharge area. Table 5 summarizes the location of cemented gravel layers based on feet above mean sea level, and Table 6 summarizes the location of cemented gravel layers based on feet below ground surface. Note that the level of the cemented gravel layers do not appear to occur at the same horizons, neither in terms of elevation (feet above mean sea level, in Table 5) or depth (feet below ground surface, in Table 6). This suggests that the cemented gravel layers are not continuous across the recharge area. Additional evidence that cemented gravels are not continuous in the Ordnance Gravel Aquifer includes: (1) documented flow losses in Westland Irrigation District's A-Line Canal where it crosses the Ordnance Gravel Aquifer, and (2) downward the ability of residual concentrations of explosives to migrate from the Explosives Washout Lagoons into the Ordnance Alluvial Aquifer. Pilot-scale recharge testing would be necessary to further evaluate the continuity of the cemented gravel layers.

**Table 5. Cemented Gravel Layers in the Unsaturated Zone (Feet Above Mean Sea Level).**

Elevation Grouping	RMW-1	RMW-2	RB-1	RB-2
550 to 545	548.8 to 544.8	--	--	--
545 to 540	--	--	--	--
540 to 535	538.6 to 535.8	--	--	538.8 to 538.3
535 to 530	--	--	--	--
530 to 525	--	529.7 to 528.7	529.0 to 524.0	--
525 to 520	523.3 to 522.8	526.7 to 521.7	--	--
520 to 515	--	--	521.4 to 515.6	--
515 to 510	--	515.2 to 512.7	514.0 to 507.0	--
510 to 505	--	507.3 to 506.7	--	508.3 to 508.0
505 to 500	--	--	--	503.0 to 498.0
500 to 495	--	--	497.0 to 494.0	--

**Table 6. Cemented Gravel Layers in the Unsaturated Zone (Feet Below Ground Surface).**

Depth Grouping	RMW-1	RMW-2	RB-1	RB-2
15 to 20	--	--	--	19.2 to 19.7
20 to 25	--	--	--	--
25 to 30	--	--	--	--
30 to 35	32.0 to 36.0	33.0 to 34.0	--	--
35 to 40		36.0 to 41.0	35.0 to 40.0	--
40 to 45	42.2 to 45.0	--	42.6 to 46.5	--
45 to 50	--	47.5 to 50.0	47.1 to 48.4	49.7 to 50.0
50 to 55	--	--	50.0 to 57.0	--
55 to 60	57.5 to 58.0	55.4 to 56.0	--	55.0 to 60.0

### 3.3 Soil Quality and Soil Physical Parameters

Detections of nitrate and volatile organic compounds in soil are presented in Table 7. Lab reports are provided in Attachment B.

**Table 7. Soil Quality Results (mg/kg).**

Analyte	Depth	RB-1	RB-2	RB-3
Nitrate	10' bgs	<b>0.27 J</b>	<b>0.55</b>	<b>0.38 J</b>
	20' bgs	<b>0.36 J</b>	<b>1.08</b>	<b>0.16 J</b>
Acetone	10' bgs	<b>18 J</b>	<b>17 J</b>	<b>5.6 J</b>
	20' bgs	<b>14 J</b>	<b>26</b>	<b>10 J</b>
Bromomethane	10' bgs	<b>0.65 J **</b>	< 0.55	< 0.54
	20' bgs	<b>0.63 J **</b>	< 0.50	< 0.65
2-Butanone (MEK)	10' bgs	< 0.91	< 1.1 **	< 1.1
	20' bgs	< 0.96	<b>3.6 J **</b>	< 1.3
Carbon Disulfide	10' bgs	< 0.30 **	< 0.33	<b>4.3 J</b>
	20' bgs	<b>1.7 J **</b>	< 0.30	<b>4.7 J</b>
Methylene Chloride	10' bgs	<b>1.3 J **</b>	<b>0.57 J</b>	< 0.54
	20' bgs	<b>1.2 J **</b>	<b>0.76 J</b>	< 0.65
Naphthalene	10' bgs	<b>0.23 J **</b>	< 0.55 **	< 0.54 **
	20' bgs	< 0.53 **	< 0.50 **	< 0.65 **
Toluene	10' bgs	< 0.50 **	< 0.55	< 0.54
	20' bgs	<b>0.49 J **</b>	<b>0.68 J</b>	<b>0.50 J</b>
1,2,4-Trimethylbenzene	10' bgs	< 0.20	< 0.22	< 0.21
	20' bgs	<b>0.20 J</b>	<b>0.22 J</b>	< 0.26
m,p-Xylenes	10' bgs	< 0.40	< 0.44	< 0.43
	20' bgs	<b>0.31 J</b>	<b>0.38 J</b>	< 0.52
o-Xylenes	10' bgs	< 0.30	< 0.089	< 0.32
	20' bgs	< 0.32	<b>0.11 J</b>	< 0.39

#### Notes

ug/kg = micrograms per kilogram

mg/kg = milligrams per kilograms

bgs = below ground surface

"J" is an estimated concentration, indicating that the pollutant was detected between the method detection limit and method reporting limit

"\*\*" indicates that a constituent was detected in the method blank accompanying the sample run.

Soil grain size results are summarized in Table 8. The grain size analyses indicate that the Catastrophic Flood Deposits in the Ordnance Gravel Aquifer are clean gravels with few fines, which is consistent with the high permeability of the unit. Note that the samples collected from temporary borings are from above the water table, and samples collected from monitoring well RMW-3 are from below the water table. The grain size samples were not used to update soil classifications on the boring logs because the grain size samples did not include cobble-sized clasts (i.e., fist-sized) that were present in the field.

**Table 8. Inventory of Collected Soil Grain Size Samples at Temporary Borings and Monitoring Wells.**

Boring	Depth	% Gravel	% Sand	% Fines
RB-1	20' bgs	54.8%	32.7%	12.5%
	40' bgs	52.2%	37.5%	10.3%
	60' bgs	47.0%	37.2%	15.8%
RB-2	20' bgs	62.2%	21.6%	16.2%
	41.5' bgs	70.6%	23.3%	6.1%
	58' bgs	71.2%	20.9%	7.9%
RB-3	20' bgs	28.7%	51.7%	19.6%
	40' bgs	54.2%	33.9%	11.9%
	56' bgs	93.9%	4.6%	1.5%
RMW-3 <sup>1</sup>	101' bgs	40.3%	50.1%	9.6%
	107' bgs	54.2%	42.7%	3.1%
	112' bgs	86.2%	13.6%	0.3%
	114' bgs	4.9%	86.2%	8.8%
	118' bgs	64.9%	33.8%	1.3%
	122' bgs	53.3%	44.8%	1.9%
	128' bgs	34.4%	59.6%	6.0%
	132' bgs	46.7%	51.3%	1.9%
	133' bgs	46.0%	50.1%	3.8%
	136' bgs	31.3%	65.8%	3.0%
139' bgs	31.3%	67.1%	1.6%	

NOTES:

- (1) For RMW-3, the %fines and %sands is estimated based on the percent passing the No. 100 sieve. The No. 100 sieve was used by the laboratory conducting the sieve testing (as opposed to the No. 200 sieve, which is the actual criteria used to separate sand from fines)
- (2) Percent gravel is estimated based on the percent retained on the No. 4 (and coarser) sieves

### 3.4 Aquifer Test Results

This section summarizes the results of the aquifer test analysis. The analyses are based on the Cooper Jacob (1946) approximation to the Theis (1935) solution to the groundwater flow equation. Although this assumes that the aquifer thickness remains constant (i.e., as in a confined aquifer), the Cooper Jacob (1946) approximation can be used as long as the saturated thickness of the aquifer does not decline more than 20% (Driscoll, 1986). The saturated thickness of the Ordnance Gravel Aquifer changed by less than 0.2% during the constant rate aquifer test. Note that no recharge effects were observed from discharge of produced water in the field approximately 750 northeast of the pumping well.

- During the step-drawdown test, RMW-3 was pumped at approximate rates of 50 gpm for 60 minutes, 100 gpm for 60 minutes, and 110 gpm for 120 minutes (the maximum achievable rate with the pump). At the end of the third step, a drawdown of 0.17 feet (2 inches) was observed in RMW-3.

Based on the step-drawdown test, the decision was made to conduct the constant rate drawdown test at the maximum rate of 110 gpm.

- A plot of water level vs. time for RMW-2 and RMW-3 is provided in Attachment C.1. Water level data recorded by transducers is generally scattered evenly around the water level data recorded by manual measurements with an electronic water level meter. The scatter in the data ranges from about 0.2 inches of water level fluctuation in RMW-2 to about 5 inches of water level fluctuation in RMW-3. In RMW-2, the data scatter is likely related to the accuracy of the transducer, which is +/- 0.2 inches of water. In RMW-3, the data scatter significantly exceeds the accuracy of the transducer (+/- 0.8 inches of water) and is likely attributable to short-term fluctuations in the pumping rate that affected the water level in the well (note also that the 5-inch data scatter in RMW-3 occurs only when the pump is operating)<sup>1</sup>.
- Based on the manual measurements, a water level drawdown of 1.9 inches was observed in pumping well RMW-3 and a drawdown of 0.36 inches was observed in observation well RMW-2 after 48 hours of pumping at an average rate of 108.7 gpm.
- Estimates of hydraulic conductivity are summarized in Table 9. Calculations are provided in Attachment C.2 through Attachment C.4. The following bullets summarize the analyses that were conducted to develop the estimates.

**Table 9. Hydraulic Conductivity Estimates.**

Well	Hydraulic Conductivity	Analysis Method
RMW-2	6,850 feet/day 6,780 – 7,020 feet/day	Time-Drawdown Cooper Jacob Analysis ( $S_y=0.19$ , $b=80$ ft, $Q=108.7$ gpm)
RMW-3	5,330 feet/day	Time-Drawdown

- At RMW-3, the transducer data cannot be used to develop estimates of transmissivity because the noise in the readings is too large relative to the drawdown. Therefore, an estimated hydraulic conductivity of 5,330 feet per day was developed based on the manual water levels. Calculations for the estimated hydraulic conductivity are shown on the time-drawdown plot in Attachment C.2.
- At RMW-2, the transducer data exhibit a declining trend for approximately the first 100 minutes, followed by a rising trend until the end of the test. Because this trend is not evident in the manual water levels, we consider the transducer data from RMW-2 to be unreliable, potentially due to the transducer being moved during the test. Therefore, an estimated hydraulic conductivity of 6,850 feet per day was developed based on the manual water levels. Calculations for the estimated hydraulic conductivity are shown on the time-drawdown plot in Attachment C.3.
- Because the time drawdown analyses for RMW-3 (Attachment C.2) and RMW-2 (Attachment C.3) were based on manual water level measurements that recorded drawdown as a series of steps (as opposed to a continuous trend), the Cooper Jacob equation was used to provide more certainty about the hydraulic conductivity estimates. The analysis was conducted for observation well RMW-2 (because the Cooper Jacob equation does not include turbulent drawdown caused by pumping, which occurred in pumping well RMW-3). Specifically, the

<sup>1</sup> According to product specification sheets, the non-vented Solinst Levellogger 5 Model 3001 M30 that was installed in RMW-3 has a measurement accuracy of +/- 0.768 inches of water, and the measurement accuracy of the associated barologger is +/- 0.20 inches of water. According to product specification sheets, the vented 15 psi In-Situ Level TROLL has a measurement accuracy of +/- 0.2079 inches of water.

Cooper Jacob equation was used to back-calculate the hydraulic conductivity that corresponds to a drawdown of 0.03 feet (0.36 inches) after 48 hours of pumping assuming an aquifer thickness of 80 feet<sup>2</sup>, pumping rate of 108.7 gpm, and specific yield of 0.19<sup>3</sup>. Calculations for the back-calculated hydraulic conductivity ranged from 6,780 feet per day to 7,020 feet per day, both of which produce an observed drawdown of 0.03 feet. This range is consistent with the 6,850 feet per day calculated with a time-drawdown analysis. Calculations for the Cooper Jacob equation are provided in Attachment C.4.

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<sup>2</sup> The aquifer is the Ordnance Gravel Aquifer. At RMW-3, this unit is present from 2 feet bgs to 140 feet bgs (the top of the Alkali Canyon Formation). The depth to groundwater is about 60 feet bgs. Therefore, the aquifer thickness is 140 feet – 60 feet = 80 feet.

<sup>3</sup> Specific yield of a gravel from Heath (1983).

## 4. References

Cooper, H. H. and C. E. Jacob. 1946. A generalized graphical method for evaluating formation constants and summarizing well field history, Transactions, American Geophysical Union, Vol. 27, No. 4.

Driscoll, F. G. 1986. Groundwater and Wells. 2<sup>nd</sup> Ed. Johnson Screens Press, St. Paul, Minnesota.

Theis, C. V. 1935. The relation between the lowering of the piezometric surface and the rate and duration of discharge of a well using ground water storage, Transactions, American Geophysical Union, Washington, D. C., pp. 518 - 524.

**ATTACHMENT A**

Soil Boring Logs

<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 564 feet amsl		
<b>BORING LOCATION:</b>	45.829261, -119.398626	<b>TOTAL DEPTH (ft bgs):</b> 80	<b>DATE STARTED:</b> 2/1/2023	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 2/1/2023	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 77	<b>COMPLETED:</b> 68.8
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	COMMENTS
0 - 1	0.0 - 1.6 ft: Very loose, moist, dark brown, poorly graded SAND (SP), fine sand is subrounded to subangular, trace roots, trace fine gravel is poorly graded [EOLIAN SAND]	5	95	<1	
2	1.6 - 2.6 ft: Loose, moist, dark brow, well graded GRAVEL with sand (GW), fine sand is subrounded to subangular, trace silt, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	80	15	<5	
3	2.6 - 3.5 ft: Loose, moist, dark brow, well graded GRAVEL (GW), sand is fine to coarse, subrounded to subangular, trace silt, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	90	10	<1	
4	3.5 - 4.3 ft: Very loose, dry, light gray to light brown, well graded GRAVEL (GW), sand is fine to coarse, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	90	10	<1	
7 - 11	4.3 - 11.0 ft: Very loose, dry, light gray to light brown, well graded GRAVEL (GW), trace silt, sand is very fine to coarse, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	80	20	<1	Some cobbles (< 4in) @ 9.0 - 11.0 ft
11 - 13	11.0 - 13.0 ft: Very loose, dry, light gray to light brown, well graded GRAVEL (GW), trace silt, few sand is very fine to coarse, subrounded to subangular, gravel is subrounded to rounded, trace cobbles (< 4in) [MISSOULA FLOOD DEPOSITS]	90	10	<1	
13 - 16	13.0 - 17.6 ft: Very loose, dry, light gray to light brown, well graded GRAVEL with sand (GW), trace silt, little sand is very fine to coarse, subrounded to subangular, gravel is subrounded to rounded, trace cobbles (< 4in) [MISSOULA FLOOD DEPOSITS]	90	10	<1	

<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 564 feet amsl		
<b>BORING LOCATION:</b>	45.829261, -119.398626	<b>TOTAL DEPTH (ft bgs):</b> 80	<b>DATE STARTED:</b> 2/1/2023	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 2/1/2023	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 77	<b>COMPLETED:</b> 68.8
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	COMMENTS
17					
18	17.6 - 18.2 ft: Very loose, dry, light gray to light brown, well graded GRAVEL (GW), trace silt, trace sand is very fine to coarse, subrounded to subangular, mostly very fine gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	95	5	<1	
19	18.2 - 18.8 ft: Very loose, dry, light gray to light brown, well graded GRAVEL with sand (GW), trace silt, little sand is very fine to coarse, subrounded to subangular, gravel is subrounded to rounded, trace cobbles (< 4in) [MISSOULA FLOOD DEPOSITS]	95	5	<1	
20	18.8 - 21.0 ft: Very loose, moist, light gray to brown, well graded GRAVEL (GW), trace silt, trace sand is fine to coarse, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	95	5	<1	
21					
22					
23					
24					
25	21.0 - 30.0 ft: Very loose, dry to moist, light gray to brown, well graded GRAVEL (GW), trace silt, few sand is fine to coarse, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	90	10	<1	signs of cored out cobbles @ 29.0 - 30.0 ft
26					
27					
28					
29					
30					
31	30.0 - 32.0 ft: Very loose, dry, light gray, gravelly SILT with sand (ML), silt, little sand is very fine to fine, subrounded to subangular, little gravel is fine to coarse, rounded to angular, trace cobbles (< 4in) [MISSOULA FLOOD DEPOSITS]	25	15	60	
32					



<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 564 feet amsl		
<b>BORING LOCATION:</b>	45.829261, -119.398626	<b>TOTAL DEPTH (ft bgs):</b> 80	<b>DATE STARTED:</b> 2/1/2023	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 2/1/2023	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 77	<b>COMPLETED:</b> 68.8
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	COMMENTS
33	32.0 - 40.0 ft: Very loose, moist, brown, well graded GRAVEL with sand (GW), trace silt, little sand is fine to coarse, subrounded to subangular, mostly fine gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	85	15	<1	35.0 - 40.0 ft: weak cementation
34					
35					
36					
37					
38	40.0 - 41.5 ft: Very loose, dry, light gray, gravelly SILT with sand (ML), silt, little sand is very fine to fine, subrounded to subangular, little gravel is fine to coarse, rounded to angular [MISSOULA FLOOD DEPOSITS]	25	15	60	
39					
40	41.5 - 42.6 ft: Very loose, dry, light gray to brown, well graded GRAVEL (GW), trace silt, trace sand is fine to coarse, subrounded to subangular, gravel is subrounded to rounded, few cobbles (< 4in) [MISSOULA FLOOD DEPOSITS]	90	10	<1	
41					
42	42.6 - 46.5 ft: Very loose, moist, brown, well graded GRAVEL (GW), trace silt, few sand is fine to coarse, subrounded to subangular, gravel is subrounded to rounded, weak cementation [MISSOULA FLOOD DEPOSITS]	90	10	<1	
43					
44					
45	46.5 - 47.1 ft: Very loose, dry, light gray, gravelly SILT with sand (ML), silt, little sand is very fine to fine, subrounded to subangular, little gravel is fine to coarse, rounded to angular [MISSOULA FLOOD DEPOSITS]	25	15	60	
46					
47	47.1 - 50.0 ft: Very loose, moist, brown, well graded GRAVEL (GW), trace silt, few sand is fine to coarse, subrounded to	90	10	<1	47.1 - 48.4 ft: weak cementation
48					

<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 564 feet amsl		
<b>BORING LOCATION:</b>	45.829261, -119.398626	<b>TOTAL DEPTH (ft bgs):</b> 80	<b>DATE STARTED:</b> 2/1/2023	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 2/1/2023	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 77	<b>COMPLETED:</b> 68.8
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	COMMENTS
49	subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]				
50					
51					
52					
53	50.0 - 57.0 ft: Very loose, dry to moist, well graded GRAVEL with sand (GW), trace silt, little sand is fine to coarse, subrounded to subangular, mostly fine gravel is subrounded to rounded, few cobbles (< 4in) [MISSOULA FLOOD DEPOSITS]	90	10	<1	Core out @ 55.2 - 55.6 ft
54					
55					
56					
57					
58	57.0 - 58.9 ft: Very loose, dry, light gray to light brown, poorly graded SAND with silt (SP-SM), few silt, sand is very fine to fine, subrounded to subangular, few fine gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	5	85	10	
59					
60	58.9 - 60.0 ft: Very loose, moist, light brown to brown, well graded GRAVEL with sand (GW), trace silt, little sand is fine to coarse, subrounded to subangular, gravel is subrounded to subangular [MISSOULA FLOOD DEPOSITS]	80	20	<1	
61	60.0 - 62.0 ft: NO RECOVERY				
62					
63					
64	62.0 - 67.0 ft: Very loose, dry, light brown, well graded GRAVEL (GW), trace silt, little sand is fine to coarse, subrounded to subangular, gravel is subrounded to	75	25	<1	

<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 564 feet amsl		
<b>BORING LOCATION:</b>	45.829261, -119.398626	<b>TOTAL DEPTH (ft bgs):</b> 80	<b>DATE STARTED:</b> 2/1/2023	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 2/1/2023	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 77	<b>COMPLETED:</b> 68.8
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	COMMENTS
65	subangular [MISSOULA FLOOD DEPOSITS]				
66					
67					
68	67.0 - 70.0 ft: Loose, dry, light brown, well graded GRAVEL (GW), trace silt, few sand is fine to coarse, subrounded to subangular, gravel is subrounded to subangular, weak cementation [MISSOULA FLOOD DEPOSITS]	90	10	<1	
69					
70					
71					
72	70.0 - 75.0 ft: Very loose, dry, brown, well graded GRAVEL with sand (GW), trace silt, little sand is fine to coarse, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	85	15	<1	
73					
74					
75					
76	75.0 - 76.8 ft: Loose, moist, brown, well graded GRAVEL with sand (GW), trace silt, little sand is fine to coarse, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	60	40	<1	
77					
78	76.8 - 80.0 ft: Loose, wet, dark brown, poorly graded GRAVEL with sand (GW), trace silt, some sand is fine to very coarse, subrounded to angular, fine gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	60	40	<1	
79					
80					
<b>Total Depth: 80-feet bgs</b>					
81					

<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 558 feet amsl		
<b>BORING LOCATION:</b>	45.829271, -119.396885	<b>TOTAL DEPTH (ft bgs):</b> 80	<b>DATE STARTED:</b> 1/24/2023	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 1/25/2023	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 69.5	<b>COMPLETED:</b> 64.65
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	COMMENTS
0 - 3.7	0.0 - 3.7 ft: Very loose, moist, dark brown, poorly graded SAND (SP), trace silt, fine sand is subrounded to subangular, trace fine gravel is subrounded to rounded, trace organics (roots) [EOLIAN SAND]	<5	95	<5	
3.7 - 4.9	3.7 - 4.9 ft: Very loose, moist, dark brown, well graded GRAVEL with sand (GW), trace silt, fine sand is subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	85	15	<1	
4.9 - 6.0	4.9 - 6.0 ft: Very loose, dry, light gray, poorly graded SAND with gravel (SP), trace silt is medium to coarse, sand is subrounded to subangular, some gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	45	55	<1	
6.0 - 8.9	6.0 - 8.9 ft: Very loose, dry, light gray, well graded GRAVEL (GW), trace silt, few sand is fine to coarse, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	95	5	<1	
8.9 - 9.5	8.9 - 9.5 ft: Very loose, dry, light gray, well graded GRAVEL with sand (GW), trace silt, some sand is fine to coarse, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	60	40	<1	
9.5 - 10.5	9.5 - 10.5 ft: Very loose, dry, light gray, well graded GRAVEL (GW), trace silt, few sand is fine to coarse, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	95	5	<1	
10.5 - 11.5	10.5 - 11.5 ft: Very loose, dry, light gray, well graded GRAVEL with sand (GW), trace silt, some sand is fine to coarse, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	60	40	<1	
11.5 - 13.2	11.5 - 13.2 ft: Very loose, dry, light gray to brown, well graded GRAVEL with sand (GW), trace silt, some sand is fine to coarse, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	60	40	<1	
13.2 - 18.6	13.2 - 18.6 ft: Very loose, dry, light gray to brown, well graded GRAVEL with sand (GW), trace silt, some sand is fine to very coarse, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	60	40	<1	

<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 558 feet amsl		
<b>BORING LOCATION:</b>	45.829271, -119.396885	<b>TOTAL DEPTH (ft bgs):</b> 80	<b>DATE STARTED:</b> 1/24/2023	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 1/25/2023	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 69.5	<b>COMPLETED:</b> 64.65
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	COMMENTS
17	rounded [MISSOULA FLOOD DEPOSITS]				
18					
19	18.6 - 19.2 ft: Very loose, dry, light gray, well graded SAND with gravel (SW), trace silt is very fine to fine, subrounded to subangular, gravel is subrounded to subangular [MISSOULA FLOOD DEPOSITS]	40	50	<1	
20					
21					
22					
23					
24					
25					
26					
27					
28	19.2 - 36.3 ft: Very loose, dry to moist, light gray to brown, well graded GRAVEL with sand (GW), trace silt, sand is fine to very coarse, subrounded to subangular, gravel is subrounded to angular [MISSOULA FLOOD DEPOSITS]	80	20	<1	Weak cementation from 19.2 - 19.7 ft. Moisture content varies: dry to moist from 19.2 to 27.0 ft; moist from 27.0 to 30.0 ft; dry from 30.0 to 30.6 ft; moist to dry from 30.6 to 36.3 ft.
29					
30					
31					
32					



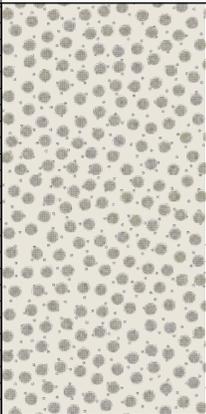
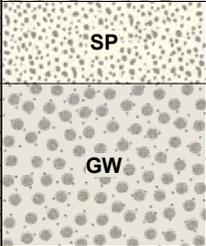
<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 558 feet amsl		
<b>BORING LOCATION:</b>	45.829271, -119.396885	<b>TOTAL DEPTH (ft bgs):</b> 80	<b>DATE STARTED:</b> 1/24/2023	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 1/25/2023	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 69.5	<b>COMPLETED:</b> 64.65
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	COMMENTS
33					
34					
35					
36					
37					
38	<b>GW</b> 36.3 - 40.0 ft: Loose, moist, light brown to brown, well graded GRAVEL (GW), few silt, few sand is fine to coarse, subrounded to subangular, gravel is more coarse than fine, subrounded to rounded [MISSOULA FLOOD DEPOSITS]	85	10	<5	
39					
40	<b>ML</b> 40.0 - 41.0 ft: Loose, dry, light brown, gravelly SILT with sand (ML), silt, little sand is very fine to fine, subrounded to subangular, little gravel is fine to medium, subrounded to rounded	25	15	60	
41					
42	<b>GW</b> 41.0 - 43.0 ft: Very loose, dry to moist, light gray to brown, well graded GRAVEL with sand (GW), trace silt, sand is fine to very coarse, subrounded to subangular, gravel is subrounded to angular [MISSOULA FLOOD DEPOSITS]	80	20	<1	
43					
44					
45					
46	<b>NR</b> 43.0 - 48.0 ft: NO RECOVERY				
47					
48					
	48.0 - 49.7 ft: Loose, moist, light brown to brown, well graded				

<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 558 feet amsl		
<b>BORING LOCATION:</b>	45.829271, -119.396885	<b>TOTAL DEPTH (ft bgs):</b> 80	<b>DATE STARTED:</b> 1/24/2023	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 1/25/2023	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 69.5	<b>COMPLETED:</b> 64.65
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	COMMENTS
49	GRAVEL (GW), few silt, few sand is fine to coarse, subrounded to subangular, gravel is more coarse than fine, subrounded to rounded [MISSOULA FLOOD DEPOSITS]	85	10	<5	
50	49.7 - 50.0 ft: Very loose, dry, light gray to gray, poorly graded GRAVEL with sand (GP), trace silt, some sand is fine to coarse, subrounded to angular, fine gravel is subrounded to rounded, weak cementation [MISSOULA FLOOD DEPOSITS]	70	30	<5	
51					
52	50.0 - 55.0 ft: Loose, moist to dry, light brown to brown, well graded GRAVEL (GW), few silt, few sand is fine to coarse, subrounded to subangular, gravel is more coarse than fine, subrounded to rounded [MISSOULA FLOOD DEPOSITS]	85	10	<5	Dry from 52.0 to 55.0 ft.
53					
54					
55					
56					
57					
58					
59					
60					
61					
62	55.0 - 70.0 ft: Very loose, dry to wet, light gray to brown, well graded GRAVEL with sand (GW), trace silt, sand is fine to very coarse, subrounded to subangular, gravel is subrounded to angular [MISSOULA FLOOD DEPOSITS]	80	20	<1	Weak cementation 55.0 - 60.0 ft. Moisture content varies: dry from 55.0 to 60.0 ft; moist from 60.0 to 69.5 ft; wet from 69.5 to 70.0 ft.
63					
64					

<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 558 feet amsl		
<b>BORING LOCATION:</b>	45.829271, -119.396885	<b>TOTAL DEPTH (ft bgs):</b> 80	<b>DATE STARTED:</b> 1/24/2023	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 1/25/2023	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 69.5	<b>COMPLETED:</b> 64.65
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	COMMENTS
65		0	95	<5	
66					
67					
68					
69					
70		75	25	<5	
71					
72					
73		90	10	<1	
74					
75					
76					
77					
78					
79					
80					
81					

Total Depth: 80-feet bgs



<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 555 feet amsl		
<b>BORING LOCATION:</b>	45.829212, -119.395390	<b>TOTAL DEPTH (ft bgs):</b> 62	<b>DATE STARTED:</b> 11/23/2022	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 11/23/2022	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 53.6	<b>COMPLETED:</b> 60
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	COMMENTS
0 - 3.0	0.0 - 3.0 ft: Very loose, dark brown, moist, poorly graded SAND (SP), few silt, sand is very fine to fine, subrounded to subangular, organics (roots) [EOLIAN SAND]	<1	95	5	
3.0 - 5.0	3.0 - 5.0 ft: Very loose, light brown, dry, poorly graded SAND (SP), few silt, sand is very fine to fine, subrounded to subangular, trace fine gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	<5	90	<5	
5.0 - 8.9	5.0 - 8.9 ft: Very loose, light brown to gray, dry, well graded GRAVEL (GW), few silt, few sand is very fine to fine, subrounded to subangular, gravel is fine to coarse, subrounded to rounded [MISSOULA FLOOD DEPOSITS]	90	<5	<5	
8.9 - 10.0	8.9 - 10.0 ft: Very loose, light brown to gray, dry, well graded GRAVEL with sand (GW), few silt, some sand is very fine to medium, subrounded to subangular, gravel is fine to coarse, subrounded to rounded [MISSOULA FLOOD DEPOSITS]	70	30	<5	
10.0 - 11.4	10.0 - 11.4 ft: Very loose, light brown to gray, dry, well graded GRAVEL (GW), trace silt, few sand is very fine to coarse, subrounded to subangular, gravel is fine to coarse, subrounded to rounded [MISSOULA FLOOD DEPOSITS]	90	5	5	
11.4 - 13.0	11.4 - 13.0 ft: Very loose, light brown to gray, dry, well graded GRAVEL (GW), trace silt, few sand is very fine to coarse, subrounded to subangular, gravel is fine to coarse, subrounded to rounded, some cobbles (less than 4 inches) [MISSOULA FLOOD DEPOSITS]	90	5	5	
13.0 - 14.0	13.0 - 14.0 ft: Very loose, light gray, dry, well graded GRAVEL with silt and sand (GW), few silt, little sand is very fine to coarse, gravel is fine to coarse, subrounded to rounded, cobbles (less than 4 inches) are subrounded to subangular [MISSOULA FLOOD DEPOSITS]	75	15	10	Signs of pulverized cobbles/drilled through
14.0 - 15.0	14.0 - 15.0 ft: Very loose, light brown to gray, dry, well graded GRAVEL (GW), trace silt, few sand is very fine to coarse, subrounded to subangular, gravel is fine to coarse, subrounded to rounded, some cobbles (less than 4 inches) [MISSOULA FLOOD DEPOSITS]	90	5	5	
15.0 - 16.0	No Recovery				Core-out

<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 555 feet amsl		
<b>BORING LOCATION:</b>	45.829212, -119.395390	<b>TOTAL DEPTH (ft bgs):</b> 62	<b>DATE STARTED:</b> 11/23/2022	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 11/23/2022	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 53.6	<b>COMPLETED:</b> 60
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	COMMENTS
17	16.0 - 18.0 ft: Very loose, brown, moist, well graded GRAVEL with sand (GW), trace silt, little sand is very fine to very coarse, subrounded to subangular, gravel is fine to coarse, subrounded to angular [MISSOULA FLOOD DEPOSITS]	80	15	<5	Signs of core-out
18	18.0 - 18.9 ft: Very loose, light gray, dry, SILT with gravel (ML), few sand is very fine to medium, subrounded to subangular, few gravel is fine to coarse, subrounded to angular [MISSOULA FLOOD DEPOSITS]	10	5	85	
21	18.9 - 24.0 ft: Loose, dark brown to brown, moist, well graded GRAVEL with sand (GW), trace silt, little sand is very fine to very coarse, subrounded to angular, gravel is fine to coarse (mostly fine), subrounded to subangular [MISSOULA FLOOD DEPOSITS]	80	20	<5	
24	24.0 - 25.0 ft: Loose, brown to light brown, wet, poorly graded GRAVEL with sand (GP), trace silt, some sand is fine to very coarse, subrounded to angular, fine gravel is subrounded to subangular [MISSOULA FLOOD DEPOSITS]	60	40	<5	
29	25.0 - 33.9 ft: Loose, dark brown to brown, moist, well graded GRAVEL with sand (GW), trace silt, little sand is very fine to very coarse, subrounded to angular, gravel is fine to coarse (mostly fine), subrounded to subangular [MISSOULA FLOOD DEPOSITS]	75	15	10	



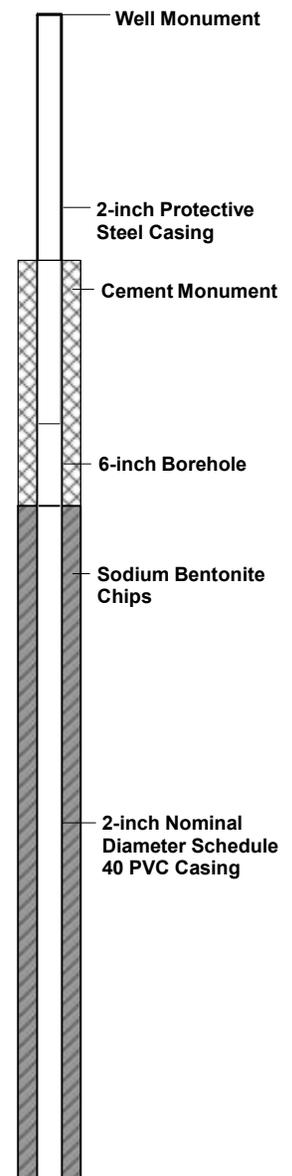
<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 555 feet amsl		
<b>BORING LOCATION:</b>	45.829212, -119.395390	<b>TOTAL DEPTH (ft bgs):</b> 62	<b>DATE STARTED:</b> 11/23/2022	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 11/23/2022	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 53.6	<b>COMPLETED:</b> 60
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	COMMENTS
33					
34					
35	33.9 - 36.5 ft: Very loose, light gray, dry, poorly graded GRAVEL with silt (GP-GM), little silt, trace sand is very fine to fine, coarse gravel is subrounded to angular, angular cobbles (less than 4 inches) [MISSOULA FLOOD DEPOSITS]	90	<1	10	Signs of core out
36					
37					
38					
39	36.5 - 41.4 ft: Loose, dark brown to brown, moist, well graded GRAVEL with sand (GW), trace silt, little sand is very fine to very coarse, subrounded to angular, gravel is fine to coarse (mostly fine), subrounded to subangular [MISSOULA FLOOD DEPOSITS]	75	15	10	
40					
41					
42	41.4 - 42.8 ft: Very loose, light gray, dry, poorly graded GRAVEL with silt (GP-GM), little silt, trace sand is very fine to fine, coarse gravel is subrounded to angular, angular cobbles (less than 4 inches) [MISSOULA FLOOD DEPOSITS]	90	<1	10	
43					
44					
45					
46	43.0 - 49.0 ft: Loose, dark brown to brown, moist, well graded GRAVEL with sand (GW), trace silt, little sand is very fine to very coarse, subrounded to angular, gravel is fine to coarse, subrounded to subangular [MISSOULA FLOOD DEPOSITS]	75	15	10	
47					
48					

<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 555 feet amsl		
<b>BORING LOCATION:</b>	45.829212, -119.395390	<b>TOTAL DEPTH (ft bgs):</b> 62	<b>DATE STARTED:</b> 11/23/2022	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 11/23/2022	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 53.6	<b>COMPLETED:</b> 60
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	COMMENTS
49	49.0 - 51.0 ft: Very loose, brown to light brown, wet, well graded GRAVEL (GW), few silt, few sand is very fine to coarse, subrounded to subangular, gravel is subrounded to subangular [MISSOULA FLOOD DEPOSITS]	90	5	5	
50					
51	51.0 - 52.0 ft: Loose, dark brown to brown, moist, well graded GRAVEL with sand (GW), trace silt, little sand is very fine to very coarse, subrounded to angular, gravel is fine to coarse, subrounded to subangular [MISSOULA FLOOD DEPOSITS]	75	15	10	
52					
53	52.0 - 53.6 ft: Medium dense to loose, brown, moist, well graded GRAVEL with silt (GW-GM), little silt, trace sand is very fine to fine, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	90	<1	10	
54	53.6 - 55.7 ft: Very loose, brown, wet, well graded GRAVEL (GW), trace silt, few sand is very fine to medium, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	90	<5	<5	
55					
56	NR No Recovery				
57					
58					
59					
60	60.0 - 62.0 ft: Very loose, gray to light gray, wet, well graded GRAVEL (GW), trace silt, trace sand, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	95	<5	<5	Clean but was dropped/recovered - disturbed
61					
62	<b>Total Depth: 62-feet bgs</b>				
63					
64					

<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 580.76 feet amsl		
<b>BORING LOCATION:</b>	45.828684, -119.402353	<b>TOTAL DEPTH (ft bgs):</b> 100	<b>DATE STARTED:</b> 12/2/2022	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 12/8/2022	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 82.1	<b>COMPLETED:</b> 76.68
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	AS-BUILT WELL CONSTRUCTION
0					
0 - 1	SP 0 - 2.0 ft: Very loose, moist, dark brown, poorly graded SAND (SP), sand is subrounded to rounded, very fine to fine with trace organics (roots), trace fine gravel is subrounded to rounded [EOLIAN SAND]	<5	95	<5	
1 - 2	SP 2.0 - 3.2 ft: Very loose, dry, brown, poorly graded SAND (SP), sand is subrounded to subangular, trace fine gravel is subrounded to rounded [EOLIAN SAND]	<5	95	<5	
2 - 3.2	GW 3.2 - 4.4 ft: Very loose, dry, brown to light brown, well graded GRAVEL (GW), sand is subrounded to subangular, very fine to medium, gravel is subrounded to rounded with few cobbles (<4 inches) [MISSOULA FLOOD DEPOSITS]	90	5	<1	
3.2 - 4.4	GP 4.4 - 8.4 ft: Very loose, dry, brown to light brown, poorly graded GRAVEL with sand (GP), sand is subrounded to subangular, very fine to medium, gravel is fine, subrounded to rounded, with trace coarse subrounded to rounded gravel [MISSOULA FLOOD DEPOSITS]	80	20	<1	
4.4 - 8.4	NR 8.4 - 10.0 ft: No Recovery				
8.4 - 10.0	GP 10.0 - 10.7 ft: Very loose, dry, brown to light brown, poorly graded GRAVEL with sand (GP), sand is subrounded to subangular, very fine to medium, gravel is fine, subrounded to rounded, with trace coarse subrounded to rounded gravel	80	20	<1	
10.0 - 10.7	GW 10.7 - 11.0 ft: Very loose, dry, brown to light brown, poorly graded GRAVEL with sand (GW), sand is subrounded to subangular, very fine to medium, gravel is fine, subrounded to rounded, with trace coarse subrounded to rounded gravel	90	10	<1	
10.7 - 11.0					
11.0					



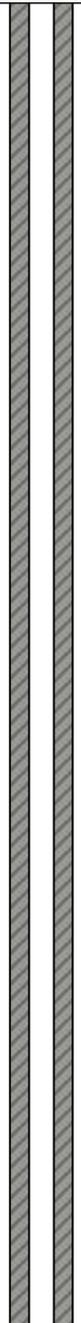
<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 580.76 feet amsl		
<b>BORING LOCATION:</b>	45.828684, -119.402353	<b>TOTAL DEPTH (ft bgs):</b> 100	<b>DATE STARTED:</b> 12/2/2022	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 12/8/2022	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 82.1	<b>COMPLETED:</b> 76.68
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	AS-BUILT WELL CONSTRUCTION
12	[MISSOULA FLOOD DEPOSITS] 10.7 - 11.3 ft: Very loose, dry, brown to light gray, well graded GRAVEL (GW), few fine to medium, subrounded to subangular sand, gravel is subrounded to rounded	85	<5	10	
13	[MISSOULA FLOOD DEPOSITS] 11.3 - 12.2 ft: Very loose, dry, brown to light grey, well graded GRAVEL with silt (GW-SM), some silt, trace very fine to medium, subrounded to subangular sand, gravel is subrounded to angular with few cobbles (<4 inches)	90	10	<1	
14	[MISSOULA FLOOD DEPOSITS] 12.2 - 13.7 ft: Very loose, dry, brown to light gray, well graded GRAVEL (GW), few subrounded to subangular, fine to course sand, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	85	5	10	
15	[MISSOULA FLOOD DEPOSITS] 13.7 - 15.0 ft: Very loose, dry, brown to light grey, well graded GRAVEL with silt (GW-SM), some silt, trace very fine to medium, subrounded to subangular sand, gravel is subrounded to angular with few cobbles (<4 inches)				
16	[MISSOULA FLOOD DEPOSITS]				
17					
18	15.0 - 21.6 ft: Very loose, dry, brown to light gray, well graded GRAVEL with sand (GW), trace silt, little very fine to course, subrounded to subangular sand, gravel is subrounded to angular (broken gravels). [MISSOULA FLOOD DEPOSITS]	80	20	<5	
19					
20					
21					
22	21.6 - 22.1 ft: Very loose, dry, brown to light gray, well graded GRAVEL (GW), trace very fine to course, subrounded to angular sand, gravel is subrounded to angular [MISSOULA FLOOD DEPOSITS]	95	5	<1	
23	22.1 - 24.2 ft: Very loose, dry, brown to light gray, well graded GRAVEL with sand (GW), trace silt, little very fine to course, subrounded to subangular sand, gravel is subrounded to angular (broken gravels). [MISSOULA FLOOD DEPOSITS]	80	20	<5	
24					
25	24.2 - 25.0 ft: Very loose, dry, brown to light brown, poorly graded GRAVEL with sand (GW), some very fine to medium, subrounded to angular sand, gravel is fine and subrounded to rounded [MISSOULA FLOOD DEPOSITS]	60	40	<1	
26	25.0 - 26.3 ft: Very loose, moist, brown, well graded GRAVEL (GW), few very fine to medium, subrounded to subangular sand, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	90	10	<1	
26.3	GP-SM	50	10	40	
27	26.3 - 26.7 ft: Very loose, dry, light gray, poorly graded GRAVEL with silt (GP-SM), some silt, few very fine to fine, subrounded to subangular sand, gravel is course and	90	10	<1	

<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 580.76 feet amsl		
<b>BORING LOCATION:</b>	45.828684, -119.402353	<b>TOTAL DEPTH (ft bgs):</b> 100	<b>DATE STARTED:</b> 12/2/2022	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 12/8/2022	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 82.1	<b>COMPLETED:</b> 76.68
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	AS-BUILT WELL CONSTRUCTION	
28	subrounded to angular [MISSOULA FLOOD DEPOSITS] 26.7 - 27.3 ft: Very loose, dry, brown, well graded, GRAVEL (GW), few subrounded to subangular sand, gravel is mostly fine and subrounded to rounded [MISSOULA FLOOD DEPOSITS]	95	5	<1		
29	27.3 - 29.3 ft: Very loose, moist, dry brown to gray, well graded GRAVEL (GW), trace subrounded to subangular, fine to course sand, gravel is subrounded to angular [MISSOULA FLOOD DEPOSITS]	50	10	40		
30	29.3 - 30.0 ft: Very loose, dry, light gray, poorly graded GRAVEL with silt (GP-SM), some silt, few very fine to fine, subrounded to subangular sand, gravel is course and subrounded to angular [MISSOULA FLOOD DEPOSITS]	80	20	<1		
31	30.0 - 32.0 ft: Very loose, dry, dark brown to gray, well graded GRAVEL with sand (GW), little very fine to course, subrounded to subangular sand, gravel is subrounded to angular with few cobbles (< 4inch) from 30.0 - 31.0 ft [MISSOULA FLOOD DEPOSITS]	50	10	40		
32	32.0 - 32.2 ft: Very loose, dry, light gray, poorly graded GRAVEL with silt (GP-SM), some silt, few very fine to fine, subrounded to subangular sand, gravel is course and subrounded to angular (busted gravel and 'flour' consistency) [MISSOULA FLOOD DEPOSITS]	85	15	<1		
33	32.2 - 37.0 ft: Very loose, moist, dark brown to gray, well graded GRAVEL with sand (GW), little very fine to course, subrounded to subangular sand, gravel is rounded to angular with few cobbles (<4 inches), weak cementation 32.2 - 36.0 ft [MISSOULA FLOOD DEPOSITS]					
34						
35						
36						
37	37.0 - 38.3 ft: Very loose, dry, light gray silty SAND with gravel (SM), sand is very fine to medium, gravel is round to angular, fine to course [MISSOULA FLOOD DEPOSITS]	40	60	<5		
38	38.3 - 40.0 ft: Very loose, moist, dark brown to gray, well graded GRAVEL with sand (GW), little very fine to course, subrounded to subangular sand, gravel is rounded to angular with few cobbles (<4 inches) [MISSOULA FLOOD DEPOSITS]	85	15	<1		
39	40.0 - 42.2 ft: Loose, moist, brown, well graded GRAVEL (GW), trace very fine to medium, subround to subangular sand, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	95	5	<1		
40						
41	42.2 - 45.0 ft: Very loose, moist, dark brown to gray, well graded GRAVEL with sand (GW), little very fine to very					
42						
43						

<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 580.76 feet amsl		
<b>BORING LOCATION:</b>	45.828684, -119.402353	<b>TOTAL DEPTH (ft bgs):</b> 100	<b>DATE STARTED:</b> 12/2/2022	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 12/8/2022	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 82.1	<b>COMPLETED:</b> 76.68
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	AS-BUILT WELL CONSTRUCTION
44	course, subrounded to subangular sand, gravel is rounded to angular with few cobbles (<4 inch), weak cementation [MISSOULA FLOOD DEPOSITS]	85	15	<1	
45	45.0 - 46.0 ft: Very loose, dry, light gray, sandy SILT (S) with gravel, non-plastic, sand is very fine to fine, rounded to angular (busted gravel) [MISSOULA FLOOD DEPOSITS]	10	20	70	
46	46.0 - 47.0 ft: Loose, moist, brown, well graded GRAVEL (GW), trace very fine to medium, subround to subangular sand, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	95	5	<1	
47					
48	47.0 - 50.0 ft: Loose, moist, brown, well graded GRAVEL (GW), trace very fine to medium, subround to subangular sand, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	95	5	<1	
49					
50	50.0 - 51.2 ft: Very loose, moist, dark brown to gray, well graded GRAVEL with sand (GW), little very fine to very course, subrounded to subangular sand, gravel is rounded to angular with few cobbles (<4 inch) [MISSOULA FLOOD DEPOSITS]	85	15	<1	
51					
52	51.2 - 52.1 ft: Very loose, moist, dark brown to gray, well graded GRAVEL with sand (GW), little very fine to very course, subrounded to subangular sand, gravel is rounded to angular with few cobbles (<4 inch), weak cementation [MISSOULA FLOOD DEPOSITS]	85	15	<1	
53	52.1 - 53.0 ft: Very loose, dry, light gray, poorly graded GRAVEL (GP), trace very fine to fine sand, gravel is course, rounded to angular, mostly cobbles (<4 inches) [MISSOULA FLOOD DEPOSITS]	95	5	<1	
54	53.0 - 54.0 ft: Very loose, moist, dark brown to gray, well graded GRAVEL with sand (GW), little very fine to very course, subrounded to subangular sand, gravel is rounded to angular with few cobbles (<4 inch) [MISSOULA FLOOD DEPOSITS]	85	15	<1	
55					
56					
57	54.0 - 60.0 ft: Very loose, dry, brown well graded GRAVEL with sand (GW), little very fine to course sand, gravel is rounded to angular, weak cementation 57.5 - 58.0 ft [MISSOULA FLOOD DEPOSITS]	80	20	<1	
58					
59					

<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 580.76 feet amsl		
<b>BORING LOCATION:</b>	45.828684, -119.402353	<b>TOTAL DEPTH (ft bgs):</b> 100	<b>DATE STARTED:</b> 12/2/2022	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 12/8/2022	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 82.1	<b>COMPLETED:</b> 76.68
<b>DRILLING METHOD:</b>	Sonic			

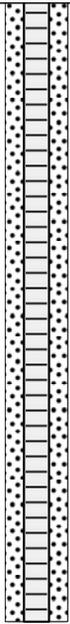
DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	AS-BUILT WELL CONSTRUCTION
60	60.0 - 62.0 ft: Loose, moist, dark brown, well graded GRAVEL (GW), few sand is very fine to course, gravel is rounded to subangular, more fine than course [MISSOULA FLOOD DEPOSITS]	90	10	<1	
61					
62	62.0 - 62.7 ft: Loose, dry, dark brown to dark gray, poorly graded GRAVEL with sand (GP), little sand is very fine to very course, gravel is fine and subrounded to subangular [MISSOULA FLOOD DEPOSITS]	85	15	<1	
63	62.7 - 65.0 ft: Loose, dry, dark brown, well graded GRAVEL with sand (GW), little sand is very fine to very course, subrounded to subangular, gravel is rounded to angular [MISSOULA FLOOD DEPOSITS]	80	20	<1	
64					
65	65.0 - 66.4 ft: Loose, moist, dark brown, well graded GRAVEL (GW), few sand is fine to course, subrounded to subangular, gravel is rounded to angular, chemical odor detected [MISSOULA FLOOD DEPOSITS]	90	10	<1	
66					
67	66.4 - 66.7 ft: Dry, light gray, SILT (S) with gravel (busted cobble) [MISSOULA FLOOD DEPOSITS]	15	5	80	
68	66.7 - 70.0 ft: Loose, moist, dark brown, well graded GRAVEL (GW), few sand is fine to course, subrounded to subangular, gravel is rounded to angular, chemical odor detected [MISSOULA FLOOD DEPOSITS]	90	10	<1	
69					
70	70.0 - 73.1 ft: Loose, moist, dark brown, well graded GRAVEL with sand (GW), some sand is very fine to course, subrounded to subangular, gravel is rounded to angular, trace silt [MISSOULA FLOOD DEPOSITS]	65	35	<1	
71					GW
72					GW
73	73.1 - 74.0 ft: Loose, dry, brown to light gray, well graded GRAVEL with sand (GW), some sand is very fine to coarse, trace silt, gravel is rounded to angular [MISSOULA FLOOD DEPOSITS]	65	35	<1	
74					GW
75	74.0 - 78.9 ft: Loose, moist, dark brown, well graded GRAVEL				
76					GW



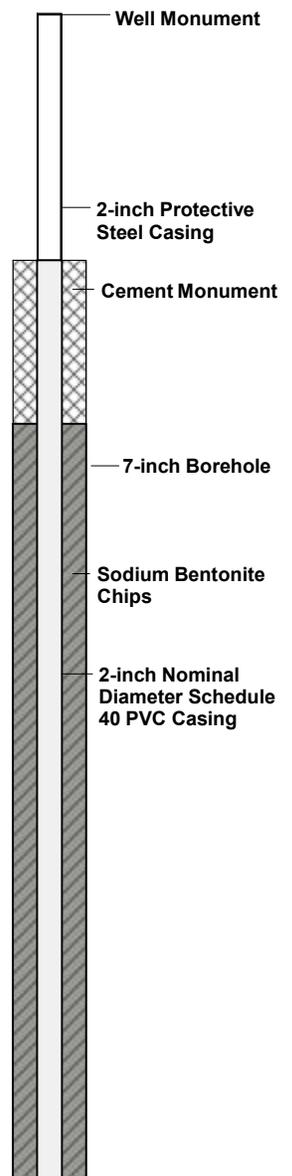
<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 580.76 feet amsl		
<b>BORING LOCATION:</b>	45.828684, -119.402353	<b>TOTAL DEPTH (ft bgs):</b> 100	<b>DATE STARTED:</b> 12/2/2022	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 12/8/2022	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 82.1	<b>COMPLETED:</b> 76.68
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	AS-BUILT WELL CONSTRUCTION
77	with sand (GW), some sand is very fine to coarse, subrounded to subangular, gravel is rounded to angular, trace silt [MISSOULA FLOOD DEPOSITS]	65	35	<1	
78					
79	78.9 - 79.0 ft: Loose, moist, dark brown to gray, well graded GRAVEL (GW), few sand is very fine to medium, gravel is rounded to angular [MISSOULA FLOOD DEPOSITS]	90	10	<1	
80	80.0 - 81.0 ft: Loose, moist, dark brown, well graded GRAVEL with sand (GW), some sand is very fine to coarse, subrounded to subangular, gravel is rounded to angular, trace silt [MISSOULA FLOOD DEPOSITS]	65	35	<1	
81	81.0 - 82.1 ft: Very loose, moist, dark brown to dark gray, well graded GRAVEL (GW), few sand is fine to very coarse, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	90	10	<1	
82	82.1 - 83.2 ft: Very loose, wet, brown, well graded GRAVEL (GW), trace sand is coarse to very coarse, subrounded to subangular, gravel is subrounded to rounded with trace cobbles (<4 inches) [MISSOULA FLOOD DEPOSITS]	90	10	<1	
83	83.2 - 84.3 ft: Very loose, moist, dark brown to dark gray, well graded GRAVEL (GW), few sand is fine to very coarse, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	90	10	<1	
84	84.3 - 85.0 ft: Very loose, wet, brown, well graded GRAVEL (GW), trace sand is coarse to very coarse, subrounded to subangular, gravel is subrounded to rounded with trace cobbles (<4 inches) [MISSOULA FLOOD DEPOSITS]	95	5	<1	
85	85.0 - 87.2 ft: Very loose, wet, dark brown to dark gray, well graded GRAVEL (GW), trace sand is medium to very coarse, subrounded to subangular, gravel is subrounded to rounded, few cobbles (<4 inches) [MISSOULA FLOOD DEPOSITS]	85	15	<1	
86	87.2 - 88.9 ft: Very loose, wet dark brown to dark gray, well graded GRAVEL with sand (GW), little sand is fine to very coarse, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	85	15	<1	
87	88.9 - 89.5 ft: Very loose, wet dark gray, poorly graded GRAVEL with sand (GP), little sand is fine to very coarse, subrounded to subangular, Gravel is fine, subrounded to rounded [MISSOULA FLOOD DEPOSITS]	85	15	<1	
88	89.5 - 91.0 ft: Very loose, wet, brown, well graded GRAVEL with sand (GW), little sand is very fine to very coarse, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	85	15	<1	
89	91.0 - 93.7 ft: Very loose, wet, dark gray, well graded GRAVEL (GW), few sand is fine to very coarse, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	90	10	<1	
90					
91					
92	93.7 - 95.0 ft: Very loose, wet, dark gray, poorly graded SAND (SP), sand is medium to very coarse, subrounded to				

<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 580.76 feet amsl		
<b>BORING LOCATION:</b>	45.828684, -119.402353	<b>TOTAL DEPTH (ft bgs):</b> 100	<b>DATE STARTED:</b> 12/2/2022	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 12/8/2022	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 82.1	<b>COMPLETED:</b> 76.68
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	AS-BUILT WELL CONSTRUCTION	
93	subangular, few gravel is fine, subrounded to rounded [MISSOULA FLOOD DEPOSITS]	10	90	<1		
94	95.0 - 97.0 ft: Very loose, wet, dark gray, poorly graded GRAVEL (GP), trace sand is medium to very coarse, subrounded to subangular, gravel is fine, subrounded to rounded [MISSOULA FLOOD DEPOSITS]	95	5	<1		
95						
96	97.0 - 97.5 ft: Very loose, wet, dark gray, well graded GRAVEL (GW), gravel subrounded to rounded [MISSOULA FLOOD DEPOSITS]	100	0	0		
97						
98	97.5 - 98.8 ft: Very loose, wet, brown, well graded GRAVEL with sand (GW), little sand is very fine to very coarse, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	85	15	<1		
99	98.8 - 99.2 ft: Very loose, wet, dark gray, poorly graded GRAVEL (GP), trace sand is fine to very coarse, Gravel is very fine, subangular to rounded [MISSOULA FLOOD DEPOSITS]	85	15	<1		
100	99.2 - 100.0 ft: Very loose, wet, brown, well graded GRAVEL with sand (GW), little sand is very fine to very coarse, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	85	15	<1		
101	<b>Total Depth: 100-feet bgs</b>					
102						
103						
104						
105						
106						
107						
108						

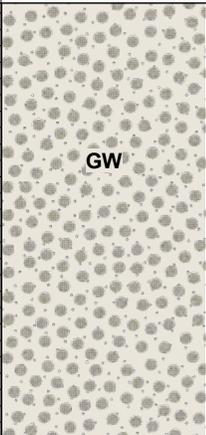
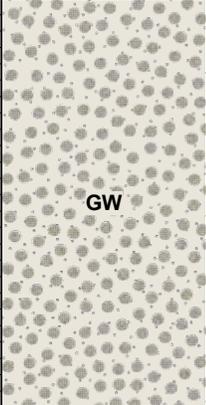
<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 565.32 feet amsl		
<b>BORING LOCATION:</b>	45.829377, -119.391692	<b>TOTAL DEPTH (ft bgs):</b> 140	<b>DATE STARTED:</b> 11/29/2022	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 12/1/2022	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 57.1	<b>COMPLETED:</b> 58.82
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	AS-BUILT WELL CONSTRUCTION
0					
1	0.0 - 2.0 ft: Very loose, dark brown, moist, poorly graded SAND (SP), fine sand, trace organics [EOLIAN SAND]	<1	95	5	
2	2.0 - 3.0 ft: Very loose, dark brown, dry, poorly graded SAND (SP), fine sand, no organics [EOLIAN SAND]	<1	95	5	
3	3.0 - 5.8 ft: Very loose, gray to light brown, well graded GRAVEL with silt and sand (GP-GM), sand is very fine, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	60	30	10	
4	5.8 - 8.0 ft: Very loose, dry, gray to light brown, well graded GRAVEL with sand (GW), sand is fine to medium, subrounded to subangular, trace subrounded to rounded cobbles (< 4in) [MISSOULA FLOOD DEPOSITS]	75	20	<5	
5	8.0 - 10.3 ft: Very loose, dry, gray to light brown, poorly graded GRAVEL with silt and sand (GP-GM), sand is very fine to medium, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	50	40	10	
6					
7					
8					
9					
10					
11					

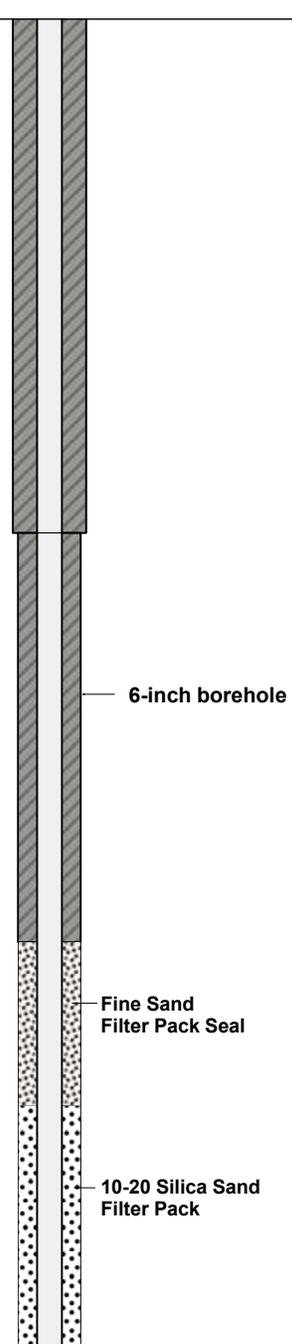
<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 565.32 feet amsl		
<b>BORING LOCATION:</b>	45.829377, -119.391692	<b>TOTAL DEPTH (ft bgs):</b> 140	<b>DATE STARTED:</b> 11/29/2022	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 12/1/2022	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 57.1	<b>COMPLETED:</b> 58.82
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	AS-BUILT WELL CONSTRUCTION	
12 13 14 15	10.3 - 15.5 ft: Very loose, moist, dark gray to gray, poorly graded GRAVEL (GP), sand is fine to medium, subrounded to subangular, gravel is fine, subrounded to rounded [MISSOULA FLOOD DEPOSITS]	95	5	<1		
16 17	15.5 - 17.3 ft: Very loose, gray to dark gray, moist, well graded GRAVEL (GW), sand is very fine to medium, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	90	10	<1		
18 19 20	17.3 - 20.0 ft: Very loose, moist, gray to dark gray, well graded GRAVEL with sand (GW), sand is fine to course, subrounded to subangular, gravel is subrounded to rounded, trace cobbles (<4 in) [MISSOULA FLOOD DEPOSITS]	80	15	<5		
21 22	20.0 - 22.0 ft: Very loose, moist, dark gray to gray, poorly graded GRAVEL (GP), sand is fine to medium, subrounded to subangular, gravel is fine, subrounded to rounded, cored through cobble at 15 ft bgs [MISSOULA FLOOD DEPOSITS]	95	5	<1		
23	22.0 - 23.5 ft: Very loose, moist, gray to dark gray, well graded GRAVEL with sand (GW), sand is fine to course, subrounded to subangular, gravel is subrounded to rounded, trace cobbles (<4 in) [MISSOULA FLOOD DEPOSITS]	80	15	<5		
24	23.5 - 24.4 ft: Very loose, moist, gray, poorly graded GRAVEL (GP), sand is fine to course, subrounded to subangular, gravel is fine, subrounded to rounded [MISSOULA FLOOD DEPOSITS]	95	5	<1		
25	24.4 - 25.5 ft: Very loose, moist, gray, well graded GRAVEL (GP), sand is fine to course, subrounded to subangular, gravel is fine, subrounded to rounded [MISSOULA FLOOD DEPOSITS]	95	5	<1		
26	25.5 - 26.6 ft: NO RECOVERY					
27						

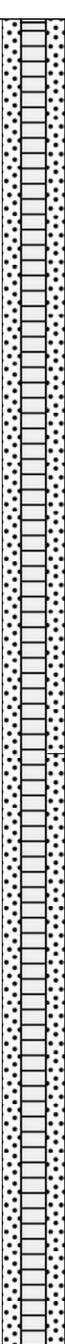
<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 565.32 feet amsl		
<b>BORING LOCATION:</b>	45.829377, -119.391692	<b>TOTAL DEPTH (ft bgs):</b> 140	<b>DATE STARTED:</b> 11/29/2022	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 12/1/2022	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 57.1	<b>COMPLETED:</b> 58.82
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	AS-BUILT WELL CONSTRUCTION	
28	 26.0 - 32.8 ft: Very loose, moist, gray to dark gray, well graded GRAVEL with sand (GW), sand is fine to course, subrounded to subangular, gravel is subrounded to rounded, trace cobbles (<4 in) [MISSOULA FLOOD DEPOSITS]	80	15	<5		
29						
30						
31						
32						
33	 32.8 - 34.0 ft: Very loose, moist, dark brown, well graded GRAVEL (GW), sand is very fine to course, subrounded to subangular, gravel is subrounded to rounded, weak cementation [MISSOULA FLOOD DEPOSITS]	85	10	<5		
34	 34.0 - 36.0 ft: Very loose, dry, light brown to gray, poorly graded GRAVEL with sand and silt (GP-GM), few silt, some sand is very fine to medium, subrounded to subangular, gravel is fine, subrounded to angular, trace cobbles (<4 in) [MISSOULA FLOOD DEPOSITS]	50	40	10		
35	 36.0 - 41.0 ft: Very loose, moist, dark brown, well graded GRAVEL with sand (GW), sand is very fine to medium, subrounded to subangular, gravel is subrounded to angular, trace cored through cobbles (<4 in), weak cementation [MISSOULA FLOOD DEPOSITS]	85	15	<1		
36						
37						
38						
39	 41.0 - 42.5 ft: Very loose, dry, brown to light gray, poorly graded SAND with silt and gravel (SP-SM), few silt, sand is very fine to medium, subrounded to subangular, some fine subrounded to rounded gravel, trace cobbles (<4 in) [MISSOULA FLOOD DEPOSITS]	50	40	10		
40						
41						
42						
43						

<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 565.32 feet amsl		
<b>BORING LOCATION:</b>	45.829377, -119.391692	<b>TOTAL DEPTH (ft bgs):</b> 140	<b>DATE STARTED:</b> 11/29/2022	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 12/1/2022	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 57.1	<b>COMPLETED:</b> 58.82
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	AS-BUILT WELL CONSTRUCTION	
44	42.5 - 47.6 ft: Very loose, moist, dark brown to dark gray, poorly graded GRAVEL (GP), trace silt, few to little sand is very fine to medium, fine gravel is subrounded to rounded, trace cobbles (<4 in) [MISSOULA FLOOD DEPOSITS]	90	10	<1		
45						GP
46						
47	47.6 - 50.0 ft: Very loose, dry, gray, poorly graded GRAVEL with sand (GP), some sand is very fine to medium, subrounded to subangular, fine gravel is subrounded to rounded, weak cementation [MISSOULA FLOOD DEPOSITS]	50	40	<5		
48						GP
49	50.0 - 54.0 ft: Very loose, moist, dark gray to gray, well graded GRAVEL (GW), trace silt, few sand is fine to course, subrounded to subangular, gravel is subrounded to rounded, trace cobbles (<4 in) [MISSOULA FLOOD DEPOSITS]	90	10	<1		
50						GW
51						
52	54.0 - 54.6 ft: Very loose, dry, brown, poorly sorted GRAVEL with sand (GP), trace silt, some sand is fine to course, subrounded to subangular, gravel is course, subrounded to rounded [MISSOULA FLOOD DEPOSITS]	70	30	<1		
53						GP
54	54.6 - 55.4 ft: Very loose, dry, light brown, poorly graded SAND with silt and gravel (SP-SM), few silt, sand is very fine to fine, subrounded to subangular, little gravel is course, subrounded to rounded [MISSOULA FLOOD DEPOSITS]	20	70	10		
55						SP-SM
56	55.4 - 56.0 ft: Very loose, moist, dark brown, poorly graded GRAVEL with sand (GP), little sand is fine to course, subrounded to subangular, gravel is fine, subrounded to rounded, weak cementation [MISSOULA FLOOD DEPOSITS]	70	30	<1		
57						GP
58	56.0 - 57.1 ft: Very loose, dry, dark brown, poorly graded GRAVEL with sand (GP), little sand is fine to course, subrounded to subangular, gravel is fine, subrounded to rounded, trace angular gravels [MISSOULA FLOOD DEPOSITS]	90	5	<1		
59					GW	
59	57.1 - 60.0 ft: Very loose, moist to wet, light brown to brown to yellow, well graded GRAVEL (GW), trace to few silt, trace to few sand is fine to course, subrounded to subangular, gravel					

<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 565.32 feet amsl		
<b>BORING LOCATION:</b>	45.829377, -119.391692	<b>TOTAL DEPTH (ft bgs):</b> 140	<b>DATE STARTED:</b> 11/29/2022	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 12/1/2022	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 57.1	<b>COMPLETED:</b> 58.82
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	AS-BUILT WELL CONSTRUCTION
60	is subrounded to rounded, few subrounded to rounded cobbles (<4 in) [MISSOULA FLOOD DEPOSITS]				 <p>2-inch ID, schedule 80, 100-slot PVC slotted well screen</p>
61					
62	60.0 - 64.5 ft: Loose, moist, dark gray, well graded GRAVEL (GW), trace to few silt, trace to few sand is fine to course, subrounded to subangular, gravel is subrounded to rounded, few cobbles (<4 in) [MISSOULA FLOOD DEPOSITS]	85	15	<1	
63					
64					
65	64.5 - 65.2 ft: NO RECOVERY				
66	65.2 - 65.9 ft: Very loose, moist to wet, light brown to brown to yellow, well graded GRAVEL (GW), trace to few silt, trace to few sand is fine to course, subrounded to subangular, gravel is subrounded to rounded, few subrounded to rounded cobbles (<4 in) [MISSOULA FLOOD DEPOSITS]	90	<5	<1	
67	65.9 - 67.0 ft: Loose, moist, dark gray to dark brown, poorly graded GRAVEL (GW), trace silt, trace sand is fine to course, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	90	<5	<1	
68					
69	67.0 - 70.0 ft: Very loose, wet, light brown to brown, well graded GRAVEL (GW), trace silt, trace sand is fine to course, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	90	<5	<1	
70					
71					
72	70.0 - 75.0 ft: Very loose, wet, yellow brown to brown, well graded GRAVEL (GW), trace sand is medium to course, subrounded to subangular, gravel is subrounded to angular, little cobbles (<4 in) [MISSOULA FLOOD DEPOSITS]	90	<1	<1	
73					
74					
75	75.0 - 75.7 ft: Very loose, wet, dark gray to brown, well graded SAND with gravel (SW), sand is subrounded to subangular, fine gravel is poorly sorted, subrounded to rounded [MISSOULA FLOOD DEPOSITS]	40	50	<1	
76					



<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 565.32 feet amsl		
<b>BORING LOCATION:</b>	45.829377, -119.391692	<b>TOTAL DEPTH (ft bgs):</b> 140	<b>DATE STARTED:</b> 11/29/2022	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 12/1/2022	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 57.1	<b>COMPLETED:</b> 58.82
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	AS-BUILT WELL CONSTRUCTION
77	75.7 - 77.0 ft: Very loose, wet, yellow brown to brown, well graded GRAVEL (GW), trace sand is medium to coarse, subrounded to subangular, gravel is subrounded to angular, little cobbles (<4 in) [MISSOULA FLOOD DEPOSITS]	95	<5	<1	<p>Final Depth: 80 feet</p> <p>High Solids Sodium Bentonite Backfill Material</p>
78	77.0 - 78.4 ft: Very loose, wet, brown, poorly graded GRAVEL (GP), trace silt, trace sand is fine to very coarse, subrounded to subangular, fine gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	95	<5	<1	
79	78.4 - 79.3 ft: Very loose, wet, brown, well graded GRAVEL (GW), trace silt, trace sand is fine to very coarse, subrounded to subangular, fine gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	95	<5	<1	
80	79.3 - 80.0 ft: Very loose, wet, brown, poorly graded GRAVEL (GP), trace silt, trace sand is fine to very coarse, subrounded to subangular, fine gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	95	<5	<1	
81	80.0 - 82.0 ft: Very loose, wet, dark gray, well graded GRAVEL with sand (GW), sand is very fine to very coarse, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	85	15	<1	
82					
83					
84					
85	82.0 - 87.5 ft: Very loose, wet, dark gray, brown, well graded GRAVEL (GW), sand is very fine to very coarse, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	95	<5	<1	
86					
87					
88	87.5 - 87.7 ft: Very loose, wet, dark gray, poorly graded SAND (SP), sand is coarse to very coarse, subrounded to subangular [MISSOULA FLOOD DEPOSITS]	<1	99	<1	
89	87.7 - 90.0 ft: Very loose, wet, dark gray to brown, poorly graded GRAVEL (GP), sand is fine to coarse, subrounded to subangular, gravel is fine, subrounded to rounded [MISSOULA FLOOD DEPOSITS]	95	<5	<1	
90					
91					
92					



<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 565.32 feet amsl		
<b>BORING LOCATION:</b>	45.829377, -119.391692	<b>TOTAL DEPTH (ft bgs):</b> 140	<b>DATE STARTED:</b> 11/29/2022	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 12/1/2022	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 57.1	<b>COMPLETED:</b> 58.82
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	AS-BUILT WELL CONSTRUCTION	
93 94 95	90.0 - 95.7 ft: Very loose, wet, dark gray, poorly graded GFRAVEL with sand (GP), sand is medium to very course, subrounded to subangular, gravel is fine to very fine, subrounded to rounded [MISSOULA FLOOD DEPOSITS]	85	15	<1		
96 97 98	95.7 - 98.7 ft: Very loose, wet, dark gray to brown, poorly graded GRAVEL (GP), sand is fine to very course, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	90	10	<1		
99 100	98.7 - 100.0 ft: Very loose, wet, dark gray to brown, poorly graded GRAVEL (GP), sand is fine to very course, subrounded to subangular, gravel is fine, subrounded to rounded [MISSOULA FLOOD DEPOSITS]	90	<5	<5		
101 102 103 104 105 106 107 108	100.0 - 108.5 ft: Very loose, wet, dark gray to brown, poorly graded GRAVEL (GP), sand is fine to very course, subrounded to subangular, gravel is fine, subrounded to rounded [MISSOULA FLOOD DEPOSITS]	90	10	<5		



<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 565.32 feet amsl		
<b>BORING LOCATION:</b>	45.829377, -119.391692	<b>TOTAL DEPTH (ft bgs):</b> 140	<b>DATE STARTED:</b> 11/29/2022	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 12/1/2022	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 57.1	<b>COMPLETED:</b> 58.82
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	AS-BUILT WELL CONSTRUCTION
109	108.5 - 109.0 ft: Very loose, wet, brown, well graded GRAVEL (GP), sand is fine to coarse, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	95	<5	<1	
110					
111					
112					
113					
114					
115					
116					
117					
118					
119	109.0 - 129.7 ft: Very loose, wet, dark gray to brown, poorly graded GRAVEL (GP), sand is fine to very course, subrounded to subangular, gravel is fine, subrounded to rounded [MISSOULA FLOOD DEPOSITS]	90	10	<1	
120					
121					
122					
123					
124					

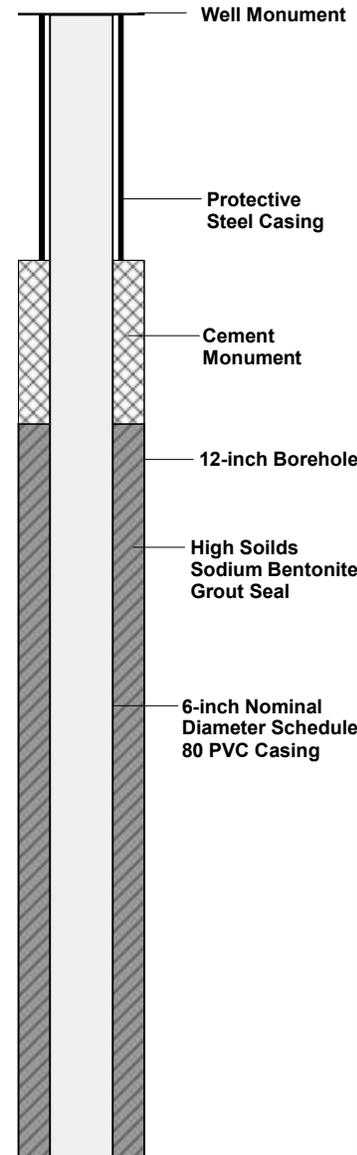


<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 565.32 feet amsl		
<b>BORING LOCATION:</b>	45.829377, -119.391692	<b>TOTAL DEPTH (ft bgs):</b> 140	<b>DATE STARTED:</b> 11/29/2022	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 12/1/2022	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 57.1	<b>COMPLETED:</b> 58.82
<b>DRILLING METHOD:</b>	Sonic			

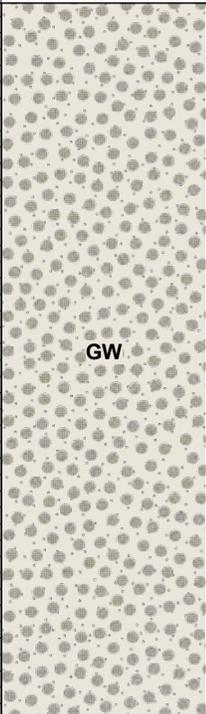
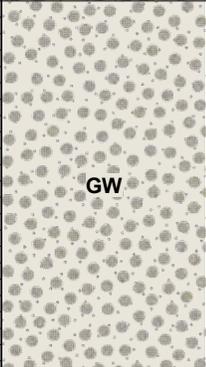
DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	AS-BUILT WELL CONSTRUCTION
125					
126					
127					
128					
129					
130	<b>GW</b> 129.7 - 130.0 ft: Very loose, brown, wet, well graded GRAVEL (GW), trace sand is fine to course, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	95	5	<1	
131	<b>GW-SM</b> 130.0 - 132.5 ft: Loose, wet, dark gray to brown, well graded GRAVEL with sand and silt (GW-SM), few silt, little sand is very fine to course, subrounded to subangular, gravel is fine to medium, subrounded to rounded [MISSOULA FLOOD DEPOSITS]	75	15	10	
132					
133	<b>GP</b> 132.5 - 133.7 ft: Very loose, wet, dark gray to brown, poorly graded GRAVEL with sand (GP), little sand is fine to very course, subrounded to subangular, gravel is fine, subrounded to rounded [MISSOULA FLOOD DEPOSITS]	85	15	<5	
134	<b>GW-SM</b> 133.7 - 135.0 ft: Loose, wet, dark gray to brown, well graded GRAVEL with sand and silt (GW-SM), few silt, little sand is very fine to course, subrounded to subangular, gravel is fine to medium, subrounded to rounded [MISSOULA FLOOD DEPOSITS]	75	15	10	
135					
136	<b>GW</b> 135.0 - 136.4 ft: Very loose, wet, brown, well graded GRAVEL (GW), trace sand is fine to very course, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	95	<5	<1	
137	<b>GW</b> 136.4 - 137.2 ft: Very loose, wet, brown, well graded GRAVEL (GW), little sand is medium to very course, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	85	15	<1	
138	<b>GW</b> 137.2 - 139.0 ft: Very loose, wet, brown, well graded GRAVEL (GW), trace sand is fine to course, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	95	<5	<1	
139	<b>GW</b> 139.0 - 140.0 ft: Very loose, wet, brown, well graded GRAVEL with sand (GW), little sand is fine to course, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	85	15	<1	
140					

Total Depth: 140-feet bgs

<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 564.78 feet amsl		
<b>BORING LOCATION:</b>	45.82931, -119.3917	<b>TOTAL DEPTH (ft bgs):</b> 145	<b>DATE STARTED:</b> 11/15/2022	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 11/22/2022	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 62	<b>COMPLETED:</b> 56.12
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	AS-BUILT WELL CONSTRUCTION
0					
1					
2					
3					
4					
0.0 - 3.0	Loose, moist, dark brown, poorly graded SAND (SP), sand is fine, trace organics (roots) [EOLIAN SAND]	<1	95	5	
3.0 - 4.3	Loose, dry, gray to light brown, poorly graded GRAVEL with silt and sand (GP-GM), sand is very fine to fine, poorly graded, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	60	30	10	
4.3 - 7.0	Loose, dry, gray to light brown, poorly graded GRAVEL with sand (GP), some cobbles (< 5 inches), sand is fine to medium, subangular to angular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	70	30	<5	
7.0 - 11.0	Loose, dry, gray to light brown, well graded GRAVEL with silt and sand (GW-GM), sand is very fine and poorly graded, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	60	30	10	
11					

<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 564.78 feet amsl		
<b>BORING LOCATION:</b>	45.82931, -119.3917	<b>TOTAL DEPTH (ft bgs):</b> 145	<b>DATE STARTED:</b> 11/15/2022	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 11/22/2022	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 62	<b>COMPLETED:</b> 56.12
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	AS-BUILT WELL CONSTRUCTION	
12	 <p>11.0 - 20.0 ft: Loose, moist, light gray to gray, well graded GRAVEL with sand (GW), sand is very fine to medium, subangular to subrounded, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]</p>	85	15	<1		
13						
14						
15						
16	 <p>20.0 - 24.5 ft: Loose, moist, light gray to gray, well graded GRAVEL (GW), some subangular to subrounded fine to coarse sand, some subrounded to rounded cobbles [MISSOULA FLOOD DEPOSITS]</p>	90	10	<1		
17						
18						
19	 <p>24.5 - 25.5 ft: Loose, moist, light gray to gray, well graded GRAVEL with sand (GW), gravel is subrounded to rounded, sand is very fine to coarse, subangular to subrounded with trace cobbles [MISSOULA FLOOD DEPOSITS]</p>	85	15	<1		
20						
21	 <p>25.5 - 28.0 ft: Loose, dry, light brown to gray, poorly graded SAND with silt and gravel (SP-SM), sand is very fine to fine, some subrounded to rounded gravel with trace cobbles (&lt; 6 inches) [MISSOULA FLOOD DEPOSITS]</p>	40	50	10		
22						
23						
24						
25						
26						
27						

<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 564.78 feet amsl		
<b>BORING LOCATION:</b>	45.82931, -119.3917	<b>TOTAL DEPTH (ft bgs):</b> 145	<b>DATE STARTED:</b> 11/15/2022	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 11/22/2022	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 62	<b>COMPLETED:</b> 56.12
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	AS-BUILT WELL CONSTRUCTION	
28						
29	28.0 - 30.0 ft: Very loose, moist, light gray to gray, well graded GRAVEL with sand (GW), sand is fine to coarse, subrounded to subangular, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	85	15	<1		
30						
31						
32	30.0 - 34.5 ft: Very loose, moist, light gray to gray, well graded GRAVEL (GW), trace silt, few subrounded to subangular fine to coarse sand, gravel is subrounded to rounded, some cobbles (<4 inches) [MISSOULA FLOOD DEPOSITS]	90	10	<5		
33						
34						
35						
36						
37						
38						
39	34.5 - 44.0 ft: Loose, moist, brown, well graded GRAVEL (GW), few silt, few very fine to fine poorly-graded sand and few cobbles (<4 inches), gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	90	5	5		
40						
41						
42						
43						

<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 564.78 feet amsl		
<b>BORING LOCATION:</b>	45.82931, -119.3917	<b>TOTAL DEPTH (ft bgs):</b> 145	<b>DATE STARTED:</b> 11/15/2022	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 11/22/2022	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 62	<b>COMPLETED:</b> 56.12
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	AS-BUILT WELL CONSTRUCTION	
44	44.0 - 45.0 ft: Loose, moist, brown, well graded GRAVEL (GW), trace silt, few subrounded to subangular very fine to coarse sand, little subrounded to angular cobbles (< 6 inches, signs of crushed rock from drilling) [MISSOULA FLOOD DEPOSITS]	90	5	5	12-inch borehole	12-inch borehole
45						
46	45.0 - 55.0 ft: Loose, moist, brown, well graded GRAVEL (GW), few silt, few subround to subangular very fine to fine poorly graded sand, gravel is subrounded to rounded, few cobbles (< 7 inches at 46.5 feet) [MISSOULA FLOOD DEPOSITS]	90	5	5	10-inch borehole	10-inch borehole
47						
48						
49						
50						
51						
52						
53						
54						
55						
56	55.0 - 58.5 ft: Loose, moist, brown to dark gray, well graded GRAVEL (GW-GM) with silt, few silt, few very fine to fine subrounded to rounded gravel with few cobbles (< 4 inches) [MISSOULA FLOOD DEPOSITS]	85	5	10	10-inch borehole	10-inch borehole
57						
58	58.5 - 60.0 ft: Loose, moist, brown to dark gray, well graded GRAVEL (GW), trace silt, few well graded subround to subangular sand, gravel is subrounded to rounded, cobbles are angular to subangular, mostly basalt (< 7 inches) (signs of broken boulder in drilling, round weathered outside, angular	90	5	5	10-inch borehole	10-inch borehole
59						

<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 564.78 feet amsl		
<b>BORING LOCATION:</b>	45.82931, -119.3917	<b>TOTAL DEPTH (ft bgs):</b> 145	<b>DATE STARTED:</b> 11/15/2022	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 11/22/2022	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 62	<b>COMPLETED:</b> 56.12
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	AS-BUILT WELL CONSTRUCTION	
60	where broken), some red-orange staining [MISSOULA FLOOD DEPOSITS]					
61						
62						
63						
64						
65						
66						
67						
68	60.0 - 76.5 ft: Loose, moist, brown to dark brown, well graded GRAVEL (GW), trace silt, few subrounded to subangular very fine to fine sand, gravel is subrounded to rounded, few cobbles (< 4 inches) [MISSOULA FLOOD DEPOSITS]	90	5	5		
69						
70						
71						
72						
73						
74						
75						
76						

<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 564.78 feet amsl		
<b>BORING LOCATION:</b>	45.82931, -119.3917	<b>TOTAL DEPTH (ft bgs):</b> 145	<b>DATE STARTED:</b> 11/15/2022	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 11/22/2022	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 62	<b>COMPLETED:</b> 56.12
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	AS-BUILT WELL CONSTRUCTION	
77	76.5 - 77.0 ft: Very loose, wet, dark brown to dark gray, well graded GRAVEL (GW), few subrounded to angular fine to very coarse sand, gravel is subrounded to rounded (< 2 inches) [MISSOULA FLOOD DEPOSITS]	90	10	<1		
81	77.0 - 85.0 ft: Very loose, wet, dark brown to dark gray, well graded GRAVEL (GW), trace silt, few subrounded to subangular very fine to very coarse sand, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	95	5	<1		
91	85.0 - 97.8 ft: Very loose, wet, dark brown to dark gray, poorly graded GRAVEL (GP), few silt, few subrounded to subangular fine to very coarse sand, gravel is fine, subrounded to rounded, with few coarse gravel [MISSOULA FLOOD DEPOSITS]	90	5	5		

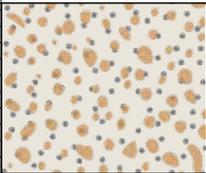
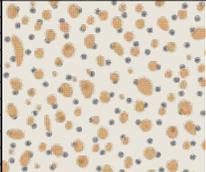
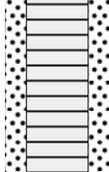
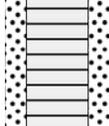
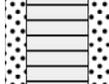
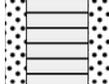
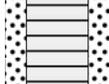
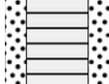
<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 564.78 feet amsl		
<b>BORING LOCATION:</b>	45.82931, -119.3917	<b>TOTAL DEPTH (ft bgs):</b> 145	<b>DATE STARTED:</b> 11/15/2022	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 11/22/2022	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 62	<b>COMPLETED:</b> 56.12
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	AS-BUILT WELL CONSTRUCTION	
93						
94						
95						
96						
97						
98						
99	97.8 - 100.0 ft: Very loose, wet, dark brown to dark gray, poorly graded GRAVEL (GP), trace fine to very fine sand, few silt, fine subrounded to rounded gravel, trace coarse gravel, trace light tan angular to subangular clasts [MISSOULA FLOOD DEPOSITS]	90	5	5		
100						
101	100.0 - 101.5 ft: Very loose, wet, dark gray, poorly graded GRAVEL with sand (GP), few silt (driller's note: could be due to heaving), little sand is dark grey, very fine to fine, subrounded to subangular, gravel is subrounded to rounded, trace light tan fine to very fine gravel [MISSOULA FLOOD DEPOSITS]	80	15	5		
102						
103						
104	101.5 - 106.3 ft: Very loose, wet, dark gray, well graded GRAVEL (GW), few fine to coarse subrounded to subangular sand, gravel is subrounded to rounded, trace light tan fine to very fine gravel [MISSOULA FLOOD DEPOSITS]	90	5	<1		
105						
106						
107						
108	106.3 - 109.0 ft: Very loose, wet, brown, poorly graded GRAVEL (GP), few silt, few subrounded to subangular very fine to medium sand, gravel is subrounded to rounded, fine to very fine [MISSOULA FLOOD DEPOSITS]	90	5	5		

<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 564.78 feet amsl		
<b>BORING LOCATION:</b>	45.82931, -119.3917	<b>TOTAL DEPTH (ft bgs):</b> 145	<b>DATE STARTED:</b> 11/15/2022	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 11/22/2022	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 62	<b>COMPLETED:</b> 56.12
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	AS-BUILT WELL CONSTRUCTION
109	109.0 - 110.0 ft: Very loose, wet, brown, well graded GRAVEL (GW), few silt, few subrounded to subangular very fine to medium sand, gravel is subrounded to rounded, at 109.6 feet, lens of white/tan malleable, clumpy material [MISSOULA FLOOD DEPOSITS]	90	5	5	
110					
111	110.0 - 113.0 ft: Very loose, wet, dark gray, well graded GRAVEL (GW), trace subangular to angular coarse to very coarse sand, gravel is subrounded to rounded with many colors (tan, orange, red, green, gray) [MISSOULA FLOOD DEPOSITS]	90	5	5	Fine sand
112					
113	113.0 - 113.6 ft: Very loose, wet, dark gray, poorly graded GRAVEL (GP), few subround to angular coarse to very coarse sand, trace light tan coarse sand, gravel is subrounded to rounded, fine grained, colorful [MISSOULA FLOOD DEPOSITS]	90	5	5	
114					
114	113.6 - 114.0 ft: Very loose, wet, dark gray, well graded GRAVEL (GW), trace coarse to very coarse subrounded to angular sand, gravel is subrounded to rounded, colorful [MISSOULA FLOOD DEPOSITS]	90	5	5	
115					
115	114.0 - 114.6 ft: Very loose, wet, dark gray, poorly graded SAND (SP), sand is subrounded to subangular, medium to very coarse [MISSOULA FLOOD DEPOSITS]	5	95	<1	1/4-inch by 1/8-inch Silica Sand Filter Pack
116					
117	114.6 - 120.0 ft: Very loose, wet, dark brown, poorly graded GRAVEL (GP), trace silt, few fine to very coarse subrounded to angular sand, gravel (1-inch) is fine, subrounded to rounded [MISSOULA FLOOD DEPOSITS]	90	5	5	6-inch ID, schedule 80, 100-slot PVC slotted well screen
118					
119	120.0 - 120.5 ft: Very loose, wet, dark gray, poorly graded SAND (SP), sand is subrounded to subangular, fine to medium [MISSOULA FLOOD DEPOSITS]	<5	95	<5	
120					
121	120.5 - 127.0 ft: Very loose, wet, dark gray to dark brown, poorly graded GRAVEL (GP), trace silt, few fine to very coarse subrounded to subangular sand, gravel is fine, subrounded to rounded [MISSOULA FLOOD DEPOSITS]	90	5	5	
122					
123					
124					

<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 564.78 feet amsl		
<b>BORING LOCATION:</b>	45.82931, -119.3917	<b>TOTAL DEPTH (ft bgs):</b> 145	<b>DATE STARTED:</b> 11/15/2022	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 11/22/2022	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 62	<b>COMPLETED:</b> 56.12
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	AS-BUILT WELL CONSTRUCTION
125		90	10	<5	
126					
127		90	10	<5	
128					
129	<b>GP</b> 127.0 - 131.6 ft: Very loose, wet, brown, poorly graded GRAVEL with sand (GP), trace silt, sand is subrounded to subangular, some light colored coarse grains, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	90	10	<5	
130					
131		70	30	<5	
132					
133	<b>GP</b> 131.6 - 132.5 ft: Very loose, wet, dark gray, poorly graded GRAVEL with sand (GP), trace silt, sand is subrounded to subangular, fine to very coarse, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	55	15	30	
134					
135	<b>GM</b> 132.5 - 133.4 ft: Very loose, wet, brown, poorly graded GRAVEL with sand (GP), trace silt, sand is subrounded to subangular, fine to very coarse, some light colored coarse grains, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	55	15	30	
136					
137		70	30	<5	
138					
139	<b>GP</b> 133.4 - 134.0 ft: Medium dense, wet, brown, silty GRAVEL (GM), little very fine to fine subrounded to subangular sand, gravel is subrounded to rounded, fine [MISSOULA FLOOD DEPOSITS]	15	80	5	
140					
141		90	5	5	
142					
143	<b>SW</b> 134.0 - 135.9 ft: Very loose, wet, brown, poorly graded GRAVEL with sand (GP), trace silt, subround to subangular fine to very coarse sand, some light colored coarse grains, gravel is fine, subrounded to rounded with trace coarse gravel [MISSOULA FLOOD DEPOSITS]	15	80	5	
144					
145	<b>GP</b> 135.9 - 137.9 ft: Very loose, wet, dark gray, well graded SAND with gravel (SW), trace silt, sand is fine to very coarse subround to subangular with coarse light grains, gravel is subrounded to rounded [MISSOULA FLOOD DEPOSITS]	90	5	5	
146					
147		90	5	5	
148					
149	<b>GP</b> 137.9 - 138.2 ft: Very loose, wet, brown, poorly graded GRAVEL (GP), trace silt, trace sand, gravel is subrounded to rounded and coarse [MISSOULA FLOOD DEPOSITS]	90	5	5	
150					
151		<5	90	<5	
152					
153	NOTE: Missing description of the Alkali Canyon Formation at 140 feet and the Columbia River Basalt Group at 145 feet.				

<b>PROJECT:</b>	Umatilla Army Depot	<b>GROUND SURFACE ELEVATION AND DATUM:</b> 564.78 feet amsl		
<b>BORING LOCATION:</b>	45.82931, -119.3917	<b>TOTAL DEPTH (ft bgs):</b> 145	<b>DATE STARTED:</b> 11/15/2022	
<b>DRILLING CONTRACTOR:</b>	Holt	<b>LOGGED BY:</b> Matt Thomas	<b>DATE FINISHED:</b> 11/22/2022	
<b>SAMPLING METHOD:</b>	Continuous Core	<b>DEPTH TO WATER (ft bgs)</b>	<b>FIRST:</b> 62	<b>COMPLETED:</b> 56.12
<b>DRILLING METHOD:</b>	Sonic			

DEPTH (feet bgs)	SAMPLE DESCRIPTION Flow, color, weathering, grain size, vesicles primary and secondary minerals, alterations	% GRAVEL	% SAND	% SILT	AS-BUILT WELL CONSTRUCTION
142	140.0 - 144.0 ft: Medium dense, wet, dark brown to brown, silty GRAVEL (GM), some silt, few fine to coarse subround to sunangular sand, gravel is well graded subround to round [ALKALI CANYON FORMATION]	50	10	40	
143					
144	144.0 - 145.0 ft: Basalt [COLUMBIA RIVER BASALTS]	-	-	-	
145					

**Total Depth: 145-feet bgs**

**ATTACHMENT B**

Soil Quality Results



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[www.alsglobal.com](http://www.alsglobal.com)

March 15, 2023

**Analytical Report for Service Request No: K2301517**

Matt Thomas  
GSI Water Solutions, Inc  
6500 NE Holladay Street  
Suite 900  
Portland, OR 97232

**RE: 2022-Umatilla Depot / 913.001.002.002**

Dear Matt,

Enclosed are the results of the sample(s) submitted to our laboratory February 06, 2023  
For your reference, these analyses have been assigned our service request number **K2301517**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at [www.alsglobal.com](http://www.alsglobal.com). All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at [Mark.Harris@alsglobal.com](mailto:Mark.Harris@alsglobal.com).

Respectfully submitted,

**ALS Group USA, Corp. dba ALS Environmental**

Mark Harris  
Project Manager



---

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Volatile Organic Compounds by GCMS

## Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

### **Inorganic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

### **Metals Data Qualifiers**

- # The control limit criteria is not applicable.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.  
  
i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Organic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Additional Petroleum Hydrocarbon Specific Qualifiers**

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso  
State Certifications, Accreditations, and Licenses**

<b>Agency</b>	<b>Web Site</b>	<b>Number</b>
Alaska DEH	<a href="http://dec.alaska.gov/eh/lab/cs/csapproval.htm">http://dec.alaska.gov/eh/lab/cs/csapproval.htm</a>	UST-040
Arizona DHS	<a href="http://www.azdhs.gov/lab/license/env.htm">http://www.azdhs.gov/lab/license/env.htm</a>	AZ0339
Arkansas - DEQ	<a href="http://www.adeq.state.ar.us/techsvs/labcert.htm">http://www.adeq.state.ar.us/techsvs/labcert.htm</a>	88-0637
California DHS (ELAP)	<a href="http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx">http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx</a>	2795
DOD ELAP	<a href="http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm">http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm</a>	L16-58-R4
Florida DOH	<a href="http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm">http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm</a>	E87412
Hawaii DOH	<a href="http://health.hawaii.gov/">http://health.hawaii.gov/</a>	-
ISO 17025	<a href="http://www.pjllabs.com/">http://www.pjllabs.com/</a>	L16-57
Louisiana DEQ	<a href="http://www.deq.louisiana.gov/page/la-lab-accreditation">http://www.deq.louisiana.gov/page/la-lab-accreditation</a>	03016
Maine DHS	<a href="http://www.maine.gov/dhhs/">http://www.maine.gov/dhhs/</a>	WA01276
Minnesota DOH	<a href="http://www.health.state.mn.us/accreditation">http://www.health.state.mn.us/accreditation</a>	053-999-457
Nevada DEP	<a href="http://ndep.nv.gov/bsdw/labservice.htm">http://ndep.nv.gov/bsdw/labservice.htm</a>	WA01276
New Jersey DEP	<a href="http://www.nj.gov/dep/enforcement/oqa.html">http://www.nj.gov/dep/enforcement/oqa.html</a>	WA005
New York - DOH	<a href="https://www.wadsworth.org/regulatory/elap">https://www.wadsworth.org/regulatory/elap</a>	12060
North Carolina DEQ	<a href="https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification">https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification</a>	605
Oklahoma DEQ	<a href="http://www.deq.state.ok.us/CSDnew/labcert.htm">http://www.deq.state.ok.us/CSDnew/labcert.htm</a>	9801
Oregon – DEQ (NELAP)	<a href="http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx">http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx</a>	WA100010
South Carolina DHEC	<a href="http://www.scdhec.gov/environment/EnvironmentalLabCertification/">http://www.scdhec.gov/environment/EnvironmentalLabCertification/</a>	61002
Texas CEQ	<a href="http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html">http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html</a>	T104704427
Washington DOE	<a href="http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html">http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html</a>	C544
Wyoming (EPA Region 8)	<a href="https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water">https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water</a>	-
Kelso Laboratory Website	<a href="http://www.alsglobal.com">www.alsglobal.com</a>	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at [www.ALSGlobal.com](http://www.ALSGlobal.com) or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.



## Case Narrative

**ALS Environmental—Kelso Laboratory**  
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**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot  
**Sample Matrix:** Soil, Water

**Service Request:** K2301517  
**Date Received:** 02/06/2023

### CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

#### Sample Receipt:

Five soil, water samples were received for analysis at ALS Environmental on 02/06/2023. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

#### General Chemistry:

Method 353.2M, 02/22/2023: The analysis of samples in this delivery group for Nitrate+Nitrite as Nitrogen was initially performed past the recommended holding time due to a login error. An incorrect test code was initially assigned to this analysis. Efforts were made to analyze the samples as soon as the error was identified. The data was flagged to indicate the holding time violation.

#### Volatiles by GC/MS:

Method 8260C, 02/22/2023 (low level):The upper control criterion was exceeded for Toluene-d8 in Initial Calibration Verification (ICV). The problem indicated a potential high bias, the data quality was not significantly affected. No further corrective action was taken.

Method 8260C, 02/22/2023 (low level):The upper control criterion was exceeded for 4-Bromofluorobenzene, Dibromofluoromethane, and Toluene-d8 in Continuing Calibration Verification (CCV) KQ2303409-02, Laboratory Control Sample (LCS) KQ2303372-03 and Duplicate Laboratory Control Sample (DLCS) KQ2303372-04. The problem indicated a potential high bias. No further corrective action was taken.

Method 8260C, 02/22/2023 (low level):The lower control criterion was exceeded for Hexachlorobutadiene and 1,2,4-Trichlorobenzene in Continuing Calibration Verification (CCV) KQ2303409-02. The problem indicated a potential low bias. No further corrective action was taken.

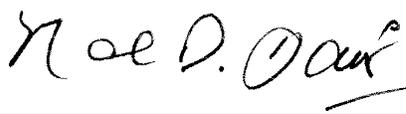
Method 8260C, 02/22/2023 (low level):The spike recovery of Hexachlorobutadiene, Naphthalene, 1,2,3-Trichlorobenzene, and 1,2,4-Trichlorobenzene for Laboratory Control Sample (LCS) KQ2303372-03 and Duplicate Laboratory Control Sample (DLCS) KQ2303372-04 was outside the lower control criterion. The analytes in question were not detected above the LOQ in the associated field samples. The error associated with reduced recovery indicated a potential low bias. The data was flagged to indicate the problem.

Method 8260C, 02/22/2023 (low level):The upper control criterion was exceeded for 4-Bromofluorobenzene, Dibromofluoromethane, and Toluene-d8 in samples B-1-020123-10.0, B-1-020123-20.0, and Method Blank (MB) KQ2303372-05. The error associated with an elevated recovery equated to a potential high bias. No further corrective action was appropriate.

Method 8260C:The methanol extracts (medium level) were initially analyzed for samples due to instrument issues affecting the low level procedure. The samples were re-analyzed at low level, seven days past the recommended holding time. The low level data was flagged to indicate the holding time violation. The results for the low and medium level runs were reported.

Method 8260C, 02/10/2023 (medium level and water):The primary evaluation criterion was exceeded for Bromomethane, n-Butylbenzene, Dibromochloromethane, 4-Methyl-2-pentanone (MIBK), and 1,3,5-Trimethylbenzene in Initial Calibration (ICAL) ID KC2300110/KC2300104. The RSD for these analytes was >15 but <20. For this Initial Calibration, the surrogate was calibrated at 10 ug/L only.

Method 8260C, 02/15/2023 (medium level):The upper control criterion was exceeded for multiple analytes in Continuing

Approved by 

Date 03/15/2023

Calibration Verification (CCV) KQ2303442-02. The field samples analyzed in this sequence did not contain the analytes in question at concentration above the MRL. Since the apparent problem indicated a potential high bias, the data quality was not significantly affected. No further corrective action was taken.

Method 8260C, 02/15/2023 (medium level):The Method Blank KQ2303442-05 contained low levels of Naphthalene at a concentration at 1/2 the LOQ. This analyte is flagged B in the associated field samples.

Method 8260C, 02/20/2023:The primary evaluation criterion was exceeded for Bromomethane, n-Butylbenzene, Dibromochloromethane, 4-Isopropyltoluene, 4-Methyl-2-pentanone (MIBK), and 1,3,5-Trimethylbenzene in Initial Calibration (ICAL) ID KC2300110. The RSD for these analytes was >15 but <20. For this Initial Calibration, the surrogate was calibrated at 10 ug/L only. Due to laboratory error, no closing CCV was analyzed.

Method 8260C, 02/20/2023 (medium level):The Method Blank KQ2303372-05 contained low levels of Naphthalene at a concentration > 1/2 the LOQ. This analyte is flagged B in the associated field sample.

Method 8260C, 02/20/2023:The DOD QSM lower control criterion was exceeded for the surrogate 4-Bromofluorobenzene in sample Trip Blank. The error associated with reduced recoveries equates to a potential slight bias. The recoveries of the surrogate in question were within ALS control Charted limits. The results were flagged to indicate the issue. No further corrective action was taken.

Approved by 

Date 03/15/2023



## Chain of Custody

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ALS Environmental



CHAIN OF CUSTODY  
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SR# 12201517  
COC Set \_\_\_\_\_ of \_\_\_\_\_  
COC# \_\_\_\_\_

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www.alsglobal.com

Project Name <u>1222-Ventilla Dept</u>		Project Number <u>913-001-002-002</u>		NUMBER OF CONTAINERS	14D	28D	180D	365D	999D	Remarks								
Project Manager <u>Matt Kuhlbecker</u>		Company <u>CSI Water Solutions</u>			3280C / VOC FP	3270D / SYO	3330A / NitroAro Am'n	7471A / Hg	3036A / NO2 NO3		3010C / Metals T	3020A / Metals T	ASTM D422 / Part Size	ASTM D422M / Part Size	ASTM D854 / Sp Grav	3062A / PCB LL	160.3 Modified / TS	Grind / Grind
Address <u>650 NE Holladay St Suite 900 PDX, OR</u>		Phone # <u>971.200.6533</u>			3280C / VOC FP	3270D / SYO	3330A / NitroAro Am'n	7471A / Hg	3036A / NO2 NO3		3010C / Metals T	3020A / Metals T	ASTM D422 / Part Size	ASTM D422M / Part Size	ASTM D854 / Sp Grav	3062A / PCB LL	160.3 Modified / TS	Grind / Grind
Sampler Signature <u>[Signature]</u>		Sampler Printed Name <u>Matt Thomas</u>			3280C / VOC FP	3270D / SYO	3330A / NitroAro Am'n	7471A / Hg	3036A / NO2 NO3		3010C / Metals T	3020A / Metals T	ASTM D422 / Part Size	ASTM D422M / Part Size	ASTM D854 / Sp Grav	3062A / PCB LL	160.3 Modified / TS	Grind / Grind
CLIENT SAMPLE ID		LABID			SAMPLING Date Time		Matrix											
1. B-1-020123-10.0				2/1/23 9:08		Soil		5 X										
2. B-1-020123-20.0				2/1/23 9:40		Soil		5 X										
3.																		
4. B-1-020123-20.0				2/1/23 9:40		Soil		4 X X										
5. B-1-020123-40.0				2/1/23 9:40		Soil		4 X X										
6. B-1-020123-60.0				2/1/23		Soil		1 X X										
7.																		
8.																		
9.																		
10.																		

<b>Report Requirements</b> <input type="checkbox"/> I. Routine Report Method Blank, Surrogate, as required <input type="checkbox"/> II. Report Dup., MS, MSD as required <input type="checkbox"/> III. CLP Like Summary (no raw data) <input type="checkbox"/> IV. Data Validation Report <input type="checkbox"/> V. EDD	<b>Invoice Information</b> P.O.# _____ Bill To: <u>John Schuster</u> <u>216 SE 4th St</u> <u>Pendleton, OR 97201</u>	Circle which metals are to be analyzed Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg			
	<b>Turnaround Requirements</b> <input type="checkbox"/> 24 hr <input type="checkbox"/> 5 Day <input checked="" type="checkbox"/> Standard	Special Instructions/Comments: <u>Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other _____ (Circle One)</u> Address Invoice To: <u>John Schuster: 216 SE 4th St, Pendleton, OR 97201</u> Email Invoice To: <u>Matt Kuhlbecker @ MKuhlbecker @ gsiws.com</u>			
Relinquished By: <u>[Signature]</u>	Received By: <u>[Signature]</u>	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature <u>Chris Wick</u>	Signature <u>Miriam Pedersen</u>	Signature	Signature	Signature	Signature
Printed Name <u>CSI</u>	Printed Name <u>ALS</u>	Printed Name	Printed Name	Printed Name	Printed Name
Firm <u>2/6/23 12:00</u>	Firm <u>2/6/23 1300</u>	Firm	Firm	Firm	Firm
Date/Time	Date/Time	Date/Time	Date/Time	Date/Time	Date/Time

### Cooler Receipt and Preservation Form

Client GSI Service Request K23 01517  
Received: 7/6/23 Opened: 7/6/23 By: AP Unloaded: 7/6/23 By: AP

- Samples were received via? **USPS** **Fed Ex** **UPS** **DHL** **PDX** Courier **Hand Delivered**
- Samples were received in: (circle) Cooler **Box** **Envelope** **Other** **NA**
- Were custody seals on coolers? **NA** **Y** N If yes, how many and where? \_\_\_\_\_
- If present, were custody seals intact? **Y** **N** If present, were they signed and dated? **Y** **N**

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp Indicate with "X"	PM Notified If out of temp	Tracking Number <u>NA</u>	Filed
<u>7.4</u>	<u>3.4</u>	<u>1802</u>	<u>127378</u>				

- Was a Temperature Blank present in cooler? **NA** Y **N** If yes, notate the temperature in the appropriate column above:  
If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
- Were samples received within the method specified temperature ranges? **NA** Y **N**  
If no, were they received on ice and same day as collected? If not, notate the cooler # above and notify the PM. NA **Y** **N**
- If applicable, tissue samples were received: **Frozen** **Partially Thawed** **Thawed**
- Packing material: Inserts Baggies **Bubble Wrap** **Gel Packs** Wet Ice **Dry Ice** **Sleeves** \_\_\_\_\_
- Were custody papers properly filled out (ink, signed, etc.)? **NA** Y **N**
- Were samples received in good condition (unbroken) **NA** Y **N**
- Were all sample labels complete (ie, analysis, preservation, etc.)? **NA** Y **N**
- Did all sample labels and tags agree with custody papers? **NA** Y **N**
- Were appropriate bottles/containers and volumes received for the tests indicated? **NA** Y **N**
- Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below NA **Y** **N**
- Were VOA vials received without headspace? Indicate in the table below. **NA** Y **N**
- Was C12/Res negative? NA **Y** **N**
- Were samples received within the method specified time limit? If not, notate the error below and notify the PM NA **Y** **N**
- Were 100ml sterile microbiology bottles filled exactly to the 100ml mark? NA **Y** **N** Underfilled Overfilled

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Head- space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, Resolutions: Temp blank was at the top of cooler, away from ice  
Receive water von trip not on COC  
 G:\SMO\2022 Forms **SOP: SMO-GEN** Reviewed: 12/9/2022



# Total Solids

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil  
**Analysis Method:** 160.3 Modified  
**Prep Method:** None

**Service Request:** K2301517  
**Date Collected:** 02/1/23  
**Date Received:** 02/6/23  
**Units:** Percent  
**Basis:** As Received

**Solids, Total**

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
B-1-020123-10.0	K2301517-001	96.4	-	-	1	02/10/23 14:32	
B-1-020123-20.0	K2301517-002	90.1	-	-	1	02/10/23 14:32	
B-1-020123-40.0	K2301517-003	95.3	-	-	1	02/10/23 14:32	
B-1-020123-60.0	K2301517-004	95.4	-	-	1	02/10/23 14:32	



# General Chemistry

**ALS Environmental—Kelso Laboratory**  
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**ALS Group USA, Corp.**  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil  
**Analysis Method:** 353.2M  
**Prep Method:** ALS SOP

**Service Request:** K2301517  
**Date Collected:** 02/1/23  
**Date Received:** 02/6/23  
**Units:** mg/Kg  
**Basis:** Dry

**Nitrate+Nitrite as Nitrogen**

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
B-1-020123-10.0	K2301517-001	<b>0.27 J</b>	0.51	0.08	1	02/22/23 13:42	2/14/23	*
B-1-020123-20.0	K2301517-002	<b>0.36 J</b>	0.55	0.08	1	02/22/23 13:42	2/14/23	*
Method Blank	K2301517-MB	ND U	0.50	0.07	1	02/22/23 13:42	2/14/23	

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2301517  
**Date Analyzed:** 02/22/23  
**Date Extracted:** 02/14/23

**Lab Control Sample Summary**  
**Nitrate+Nitrite as Nitrogen**

**Analysis Method:** 353.2M  
**Prep Method:** ALS SOP

**Units:** mg/Kg  
**Basis:** Dry  
**Analysis Lot:** 794177

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2301517-LCS	7.29	7.20	101	87-113

**ALS Group USA, Corp.**  
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**Analytical Report**

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2301517  
**Date Collected:** 02/01/23  
**Date Received:** 02/06/23  
**Date Analyzed:** 03/07/23

**Particle Size Determination**  
**ASTM D422**

**Sample Name:** B-1-020123-20.0  
**Lab Code:** K2301517-002

**Gravel and Sand**  
**(Sieve Analysis)**

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	88.42
Gravel (9.50 mm)	No.3/8"(9.50 mm)	1.3959	85.44
Gravel, Medium	No.4 (4.75 mm)	18.8710	45.16
Gravel, Fine	No.10 (2.00 mm)	12.1774	19.17
Sand, Very Coarse	No.20 (0.850 mm)	2.5637	15.73
Sand, Coarse	No.40 (0.425 mm)	0.7663	14.70
Sand, Medium	No.60 (0.250 mm)	0.4458	14.10
Sand, Fine	No.140 (0.106 mm)	0.8107	13.01
Sand, Very Fine	No.200 (0.0750 mm)	0.4156	12.45

**Silt and Clay**  
**(Hydrometer Analysis)**

Particle Diameter	Percent Passing
0.074 mm	12.33
0.005 mm	7.63
0.001 mm	4.83

**ALS Group USA, Corp.**  
dba ALS Environmental  
**Analytical Report**

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2301517  
**Date Collected:** 02/01/23  
**Date Received:** 02/06/23  
**Date Analyzed:** 03/07/23

**Particle Size Determination**  
**ASTM D422**

**Sample Name:** B-1-020123-40.0  
**Lab Code:** K2301517-003

**Gravel and Sand**  
**(Sieve Analysis)**

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	95.88
Gravel (9.50 mm)	No.3/8"(9.50 mm)	4.7367	85.74
Gravel, Medium	No.4 (4.75 mm)	17.7352	47.76
Gravel, Fine	No.10 (2.00 mm)	10.5207	25.22
Sand, Very Coarse	No.20 (0.850 mm)	4.1329	17.55
Sand, Coarse	No.40 (0.425 mm)	1.8230	14.16
Sand, Medium	No.60 (0.250 mm)	0.8319	12.62
Sand, Fine	No.140 (0.106 mm)	0.9425	10.87
Sand, Very Fine	No.200 (0.0750 mm)	0.3322	10.25

**Silt and Clay**  
**(Hydrometer Analysis)**

Particle Diameter	Percent Passing
0.074 mm	10.24
0.005 mm	6.76
0.001 mm	4.09

**ALS Group USA, Corp.**  
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**Analytical Report**

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2301517  
**Date Collected:** 02/01/23  
**Date Received:** 02/06/23  
**Date Analyzed:** 03/07/23

**Particle Size Determination**  
**ASTM D422**

**Sample Name:** B-1-020123-60.0  
**Lab Code:** K2301517-004

**Gravel and Sand**  
**(Sieve Analysis)**

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	90.48
Gravel (9.50 mm)	No.3/8"(9.50 mm)	4.3998	81.23
Gravel, Medium	No.4 (4.75 mm)	13.4051	53.05
Gravel, Fine	No.10 (2.00 mm)	8.8937	34.36
Sand, Very Coarse	No.20 (0.850 mm)	4.7598	26.46
Sand, Coarse	No.40 (0.425 mm)	2.5135	22.29
Sand, Medium	No.60 (0.250 mm)	1.4042	19.96
Sand, Fine	No.140 (0.106 mm)	1.8514	16.89
Sand, Very Fine	No.200 (0.0750 mm)	0.6367	15.83

**Silt and Clay**  
**(Hydrometer Analysis)**

Particle Diameter	Percent Passing
0.074 mm	15.74
0.005 mm	7.55
0.001 mm	2.25



# Volatile Organic Compounds by GC/MS

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

**ALS Group USA, Corp.**  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil  
**Sample Name:** B-1-020123-10.0  
**Lab Code:** K2301517-001

**Service Request:** K2301517  
**Date Collected:** 02/01/23 09:08  
**Date Received:** 02/06/23 13:00

**Units:** ug/Kg  
**Basis:** Dry

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Acetone	18 J	20	4.0	3.0	1	02/22/23 19:02	*
Benzene	ND U	5.0	0.20	0.055	1	02/22/23 19:02	*
Bromobenzene	ND U	5.0	0.30	0.089	1	02/22/23 19:02	*
Bromochloromethane	ND U	5.0	0.50	0.25	1	02/22/23 19:02	*
Bromodichloromethane	ND U	5.0	0.50	0.17	1	02/22/23 19:02	*
Bromoform	ND U	5.0	0.50	0.15	1	02/22/23 19:02	*
Bromomethane	0.65 J	5.0	0.50	0.21	1	02/22/23 19:02	*
2-Butanone (MEK)	ND U	20	1.0	0.91	1	02/22/23 19:02	*
n-Butylbenzene	ND U	20	0.20	0.070	1	02/22/23 19:02	*
sec-Butylbenzene	ND U	20	0.20	0.075	1	02/22/23 19:02	*
tert-Butylbenzene	ND U	20	0.50	0.15	1	02/22/23 19:02	*
Carbon Disulfide	ND U	5.0	0.30	0.093	1	02/22/23 19:02	*
Carbon Tetrachloride	ND U	5.0	0.30	0.095	1	02/22/23 19:02	*
Chlorobenzene	ND U	5.0	0.20	0.066	1	02/22/23 19:02	*
Chloroethane	ND U	5.0	1.0	0.75	1	02/22/23 19:02	*
Chloroform	ND U	5.0	0.40	0.12	1	02/22/23 19:02	*
Chloromethane	ND U	5.0	0.50	0.19	1	02/22/23 19:02	*
2-Chlorotoluene	ND U	20	0.40	0.13	1	02/22/23 19:02	*
4-Chlorotoluene	ND U	20	0.40	0.089	1	02/22/23 19:02	*
1,2-Dibromo-3-chloropropane	ND U	20	1.4	0.41	1	02/22/23 19:02	*
Dibromochloromethane	ND U	5.0	0.50	0.19	1	02/22/23 19:02	*
1,2-Dibromoethane (EDB)	ND U	20	0.30	0.095	1	02/22/23 19:02	*
Dibromomethane	ND U	5.0	0.50	0.29	1	02/22/23 19:02	*
1,2-Dichlorobenzene	ND U	5.0	0.30	0.078	1	02/22/23 19:02	*
1,3-Dichlorobenzene	ND U	6.0	0.30	0.095	1	02/22/23 19:02	*
1,4-Dichlorobenzene	ND U	2.0	0.30	0.087	1	02/22/23 19:02	*
Dichlorodifluoromethane	ND U	5.0	0.40	0.13	1	02/22/23 19:02	*
1,1-Dichloroethane	ND U	5.0	0.40	0.13	1	02/22/23 19:02	*
1,2-Dichloroethane (EDC)	ND U	5.0	0.20	0.071	1	02/22/23 19:02	*
1,1-Dichloroethene	ND U	5.0	0.50	0.26	1	02/22/23 19:02	*
cis-1,2-Dichloroethene	ND U	5.0	0.40	0.13	1	02/22/23 19:02	*
trans-1,2-Dichloroethene	ND U	5.0	0.40	0.13	1	02/22/23 19:02	*
1,2-Dichloropropane	ND U	5.0	0.50	0.14	1	02/22/23 19:02	*
1,3-Dichloropropane	ND U	2.0	0.40	0.13	1	02/22/23 19:02	*
2,2-Dichloropropane	ND U	5.0	0.30	0.099	1	02/22/23 19:02	*
1,1-Dichloropropene	ND U	5.0	0.50	0.14	1	02/22/23 19:02	*
cis-1,3-Dichloropropene	ND U	5.0	0.50	0.14	1	02/22/23 19:02	*
trans-1,3-Dichloropropene	ND U	5.0	0.40	0.12	1	02/22/23 19:02	*
Ethylbenzene	ND U	5.0	0.30	0.095	1	02/22/23 19:02	*
Hexachlorobutadiene	ND U	20	0.80	0.41	1	02/22/23 19:02	*
2-Hexanone	ND U	20	2.0	0.94	1	02/22/23 19:02	*

**ALS Group USA, Corp.**  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil  
**Sample Name:** B-1-020123-10.0  
**Lab Code:** K2301517-001

**Service Request:** K2301517  
**Date Collected:** 02/01/23 09:08  
**Date Received:** 02/06/23 13:00

**Units:** ug/Kg  
**Basis:** Dry

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Isopropylbenzene	ND U	20	0.30	0.082	1	02/22/23 19:02	*
4-Isopropyltoluene	ND U	20	0.20	0.065	1	02/22/23 19:02	*
Methyl tert-Butyl Ether	ND U	5.0	0.40	0.13	1	02/22/23 19:02	*
4-Methyl-2-pentanone (MIBK)	ND U	20	1.9	1.9	1	02/22/23 19:02	*
Methylene Chloride	<b>1.3 J</b>	10	0.50	0.17	1	02/22/23 19:02	*
Naphthalene	<b>0.23 J</b>	20	0.50	0.14	1	02/22/23 19:02	*
n-Propylbenzene	ND U	20	0.50	0.14	1	02/22/23 19:02	*
Styrene	ND U	5.0	0.50	0.15	1	02/22/23 19:02	*
1,1,1,2-Tetrachloroethane	ND U	5.0	0.40	0.12	1	02/22/23 19:02	*
1,1,2,2-Tetrachloroethane	ND U	5.0	0.50	0.14	1	02/22/23 19:02	*
Tetrachloroethene (PCE)	ND U	5.0	0.50	0.17	1	02/22/23 19:02	*
Toluene	ND U	5.0	0.50	0.16	1	02/22/23 19:02	*
1,2,3-Trichlorobenzene	ND U	20	0.50	0.20	1	02/22/23 19:02	*
1,2,4-Trichlorobenzene	ND U	20	0.50	0.14	1	02/22/23 19:02	*
1,1,2-Trichloroethane	ND U	5.0	0.50	0.16	1	02/22/23 19:02	*
1,1,1-Trichloroethane (TCA)	ND U	5.0	0.40	0.12	1	02/22/23 19:02	*
Trichloroethene (TCE)	ND U	5.0	0.50	0.16	1	02/22/23 19:02	*
Trichlorofluoromethane (CFC 11)	ND U	5.0	0.30	0.086	1	02/22/23 19:02	*
1,2,3-Trichloropropane	ND U	5.0	1.4	0.46	1	02/22/23 19:02	*
1,2,4-Trimethylbenzene	ND U	20	0.20	0.055	1	02/22/23 19:02	*
1,3,5-Trimethylbenzene	ND U	20	0.30	0.093	1	02/22/23 19:02	*
Vinyl Chloride	ND U	5.0	0.50	0.19	1	02/22/23 19:02	*
o-Xylene	ND U	5.0	0.30	0.082	1	02/22/23 19:02	*
m,p-Xylenes	ND U	20	0.40	0.11	1	02/22/23 19:02	*

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	124	79 - 119	02/22/23 19:02	*
Dibromofluoromethane	125	78 - 119	02/22/23 19:02	*
1,2-Dichloroethane-d4	118	71 - 136	02/22/23 19:02	*
Toluene-d8	138	85 - 116	02/22/23 19:02	*

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil  
**Sample Name:** B-1-020123-20.0  
**Lab Code:** K2301517-002

**Service Request:** K2301517  
**Date Collected:** 02/01/23 09:40  
**Date Received:** 02/06/23 13:00

**Units:** ug/Kg  
**Basis:** Dry

Volatile Organic Compounds by GC/MS

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Acetone	14 J	21	4.3	3.1	1	02/22/23 19:23	*
Benzene	ND U	5.3	0.21	0.058	1	02/22/23 19:23	*
Bromobenzene	ND U	5.3	0.32	0.094	1	02/22/23 19:23	*
Bromochloromethane	ND U	5.3	0.53	0.26	1	02/22/23 19:23	*
Bromodichloromethane	ND U	5.3	0.53	0.18	1	02/22/23 19:23	*
Bromoform	ND U	5.3	0.53	0.15	1	02/22/23 19:23	*
Bromomethane	0.63 J	5.3	0.53	0.22	1	02/22/23 19:23	*
2-Butanone (MEK)	ND U	21	1.1	0.96	1	02/22/23 19:23	*
n-Butylbenzene	ND U	21	0.21	0.074	1	02/22/23 19:23	*
sec-Butylbenzene	ND U	21	0.21	0.079	1	02/22/23 19:23	*
tert-Butylbenzene	ND U	21	0.53	0.15	1	02/22/23 19:23	*
Carbon Disulfide	1.7 J	5.3	0.32	0.098	1	02/22/23 19:23	*
Carbon Tetrachloride	ND U	5.3	0.32	0.10	1	02/22/23 19:23	*
Chlorobenzene	ND U	5.3	0.21	0.070	1	02/22/23 19:23	*
Chloroethane	ND U	5.3	1.1	0.79	1	02/22/23 19:23	*
Chloroform	ND U	5.3	0.43	0.12	1	02/22/23 19:23	*
Chloromethane	ND U	5.3	0.53	0.20	1	02/22/23 19:23	*
2-Chlorotoluene	ND U	21	0.43	0.13	1	02/22/23 19:23	*
4-Chlorotoluene	ND U	21	0.43	0.094	1	02/22/23 19:23	*
1,2-Dibromo-3-chloropropane	ND U	21	1.5	0.43	1	02/22/23 19:23	*
Dibromochloromethane	ND U	5.3	0.53	0.20	1	02/22/23 19:23	*
1,2-Dibromoethane (EDB)	ND U	21	0.32	0.10	1	02/22/23 19:23	*
Dibromomethane	ND U	5.3	0.53	0.30	1	02/22/23 19:23	*
1,2-Dichlorobenzene	ND U	5.3	0.32	0.082	1	02/22/23 19:23	*
1,3-Dichlorobenzene	ND U	6.4	0.32	0.10	1	02/22/23 19:23	*
1,4-Dichlorobenzene	ND U	2.1	0.32	0.092	1	02/22/23 19:23	*
Dichlorodifluoromethane	ND U	5.3	0.43	0.13	1	02/22/23 19:23	*
1,1-Dichloroethane	ND U	5.3	0.43	0.13	1	02/22/23 19:23	*
1,2-Dichloroethane (EDC)	ND U	5.3	0.21	0.075	1	02/22/23 19:23	*
1,1-Dichloroethene	ND U	5.3	0.53	0.27	1	02/22/23 19:23	*
cis-1,2-Dichloroethene	ND U	5.3	0.43	0.13	1	02/22/23 19:23	*
trans-1,2-Dichloroethene	ND U	5.3	0.43	0.13	1	02/22/23 19:23	*
1,2-Dichloropropane	ND U	5.3	0.53	0.14	1	02/22/23 19:23	*
1,3-Dichloropropane	ND U	2.1	0.43	0.13	1	02/22/23 19:23	*
2,2-Dichloropropane	ND U	5.3	0.32	0.11	1	02/22/23 19:23	*
1,1-Dichloropropene	ND U	5.3	0.53	0.14	1	02/22/23 19:23	*
cis-1,3-Dichloropropene	ND U	5.3	0.53	0.14	1	02/22/23 19:23	*
trans-1,3-Dichloropropene	ND U	5.3	0.43	0.12	1	02/22/23 19:23	*
Ethylbenzene	ND U	5.3	0.32	0.10	1	02/22/23 19:23	*
Hexachlorobutadiene	ND U	21	0.85	0.43	1	02/22/23 19:23	*
2-Hexanone	ND U	21	2.1	0.99	1	02/22/23 19:23	*

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil  
**Sample Name:** B-1-020123-20.0  
**Lab Code:** K2301517-002

**Service Request:** K2301517  
**Date Collected:** 02/01/23 09:40  
**Date Received:** 02/06/23 13:00

**Units:** ug/Kg  
**Basis:** Dry

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Isopropylbenzene	ND U	21	0.32	0.087	1	02/22/23 19:23	*
4-Isopropyltoluene	ND U	21	0.21	0.069	1	02/22/23 19:23	*
Methyl tert-Butyl Ether	ND U	5.3	0.43	0.13	1	02/22/23 19:23	*
4-Methyl-2-pentanone (MIBK)	ND U	21	2.0	2.0	1	02/22/23 19:23	*
Methylene Chloride	<b>1.2 J</b>	11	0.53	0.18	1	02/22/23 19:23	*
Naphthalene	ND U	21	0.53	0.14	1	02/22/23 19:23	*
n-Propylbenzene	ND U	21	0.53	0.14	1	02/22/23 19:23	*
Styrene	ND U	5.3	0.53	0.15	1	02/22/23 19:23	*
1,1,1,2-Tetrachloroethane	ND U	5.3	0.43	0.12	1	02/22/23 19:23	*
1,1,2,2-Tetrachloroethane	ND U	5.3	0.53	0.14	1	02/22/23 19:23	*
Tetrachloroethene (PCE)	ND U	5.3	0.53	0.18	1	02/22/23 19:23	*
Toluene	<b>0.49 J</b>	5.3	0.53	0.16	1	02/22/23 19:23	*
1,2,3-Trichlorobenzene	ND U	21	0.53	0.21	1	02/22/23 19:23	*
1,2,4-Trichlorobenzene	ND U	21	0.53	0.14	1	02/22/23 19:23	*
1,1,2-Trichloroethane	ND U	5.3	0.53	0.16	1	02/22/23 19:23	*
1,1,1-Trichloroethane (TCA)	ND U	5.3	0.43	0.12	1	02/22/23 19:23	*
Trichloroethene (TCE)	ND U	5.3	0.53	0.16	1	02/22/23 19:23	*
Trichlorofluoromethane (CFC 11)	ND U	5.3	0.32	0.091	1	02/22/23 19:23	*
1,2,3-Trichloropropane	ND U	5.3	1.5	0.48	1	02/22/23 19:23	*
1,2,4-Trimethylbenzene	<b>0.20 J</b>	21	0.21	0.058	1	02/22/23 19:23	*
1,3,5-Trimethylbenzene	ND U	21	0.32	0.098	1	02/22/23 19:23	*
Vinyl Chloride	ND U	5.3	0.53	0.20	1	02/22/23 19:23	*
o-Xylene	ND U	5.3	0.32	0.087	1	02/22/23 19:23	*
m,p-Xylenes	<b>0.31 J</b>	21	0.43	0.11	1	02/22/23 19:23	*

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	125	79 - 119	02/22/23 19:23	*
Dibromofluoromethane	125	78 - 119	02/22/23 19:23	*
1,2-Dichloroethane-d4	117	71 - 136	02/22/23 19:23	*
Toluene-d8	136	85 - 116	02/22/23 19:23	*

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2301517  
**Date Collected:** NA  
**Date Received:** 02/06/23 17:18

**Sample Name:** Trip Blank  
**Lab Code:** K2301517-005

**Units:** ug/L  
**Basis:** NA

Volatile Organic Compounds by GC/MS

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Acetone	ND U	20	10	3.3	1	02/20/23 14:00	
Benzene	ND U	0.50	0.20	0.062	1	02/20/23 14:00	
Bromobenzene	ND U	2.0	0.30	0.12	1	02/20/23 14:00	
Bromochloromethane	ND U	0.50	0.40	0.16	1	02/20/23 14:00	
Bromodichloromethane	ND U	0.50	0.30	0.091	1	02/20/23 14:00	
Bromoform	ND U	0.50	0.40	0.16	1	02/20/23 14:00	
Bromomethane	ND U	0.50	0.40	0.16	1	02/20/23 14:00	*
2-Butanone (MEK)	ND U	20	4.0	1.9	1	02/20/23 14:00	
n-Butylbenzene	ND U	4.0	4.0	0.054	1	02/20/23 14:00	*
sec-Butylbenzene	ND U	2.0	0.20	0.062	1	02/20/23 14:00	
tert-Butylbenzene	ND U	2.0	0.20	0.059	1	02/20/23 14:00	
Carbon Disulfide	ND U	0.50	0.20	0.069	1	02/20/23 14:00	
Carbon Tetrachloride	ND U	0.50	0.20	0.096	1	02/20/23 14:00	
Chlorobenzene	ND U	0.50	0.30	0.11	1	02/20/23 14:00	
Chloroethane	ND U	0.50	0.30	0.16	1	02/20/23 14:00	
Chloroform	ND U	0.50	0.20	0.072	1	02/20/23 14:00	
Chloromethane	ND U	0.50	0.20	0.068	1	02/20/23 14:00	
2-Chlorotoluene	ND U	2.0	0.20	0.10	1	02/20/23 14:00	
4-Chlorotoluene	ND U	2.0	0.30	0.13	1	02/20/23 14:00	
1,2-Dibromo-3-chloropropane	ND U	2.0	0.44	0.22	1	02/20/23 14:00	
Dibromochloromethane	ND U	0.50	0.30	0.14	1	02/20/23 14:00	*
1,2-Dibromoethane (EDB)	ND U	2.0	0.20	0.10	1	02/20/23 14:00	
Dibromomethane	ND U	0.50	0.30	0.15	1	02/20/23 14:00	
1,2-Dichlorobenzene	ND U	0.50	0.30	0.12	1	02/20/23 14:00	
1,3-Dichlorobenzene	ND U	0.50	0.20	0.10	1	02/20/23 14:00	
1,4-Dichlorobenzene	ND U	0.50	0.30	0.12	1	02/20/23 14:00	
Dichlorodifluoromethane	ND U	0.50	0.30	0.13	1	02/20/23 14:00	
1,1-Dichloroethane	ND U	0.50	0.20	0.077	1	02/20/23 14:00	
1,2-Dichloroethane (EDC)	ND U	0.50	0.20	0.080	1	02/20/23 14:00	
1,1-Dichloroethene	ND U	0.50	0.20	0.080	1	02/20/23 14:00	
cis-1,2-Dichloroethene	ND U	0.50	0.20	0.067	1	02/20/23 14:00	
trans-1,2-Dichloroethene	ND U	0.50	0.20	0.072	1	02/20/23 14:00	
1,2-Dichloropropane	ND U	0.50	0.20	0.095	1	02/20/23 14:00	
1,3-Dichloropropane	ND U	0.50	0.30	0.14	1	02/20/23 14:00	
2,2-Dichloropropane	ND U	0.50	0.50	0.065	1	02/20/23 14:00	
1,1-Dichloropropene	ND U	0.50	0.20	0.089	1	02/20/23 14:00	
cis-1,3-Dichloropropene	ND U	0.50	0.40	0.18	1	02/20/23 14:00	
trans-1,3-Dichloropropene	ND U	0.50	0.20	0.068	1	02/20/23 14:00	
Ethylbenzene	ND U	0.50	0.10	0.050	1	02/20/23 14:00	
Hexachlorobutadiene	<b>0.15 J</b>	2.0	0.30	0.11	1	02/20/23 14:00	
2-Hexanone	ND U	20	10	2.7	1	02/20/23 14:00	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2301517  
**Date Collected:** NA  
**Date Received:** 02/06/23 17:18

**Sample Name:** Trip Blank  
**Lab Code:** K2301517-005

**Units:** ug/L  
**Basis:** NA

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Isopropylbenzene	ND U	2.0	0.20	0.051	1	02/20/23 14:00	
4-Isopropyltoluene	ND U	2.0	0.20	0.060	1	02/20/23 14:00	*
Methyl tert-Butyl Ether	ND U	0.50	0.30	0.11	1	02/20/23 14:00	
4-Methyl-2-pentanone (MIBK)	ND U	20	10	2.6	1	02/20/23 14:00	*
Methylene Chloride	<b>0.18 J</b>	2.0	0.20	0.10	1	02/20/23 14:00	
Naphthalene	<b>1.0 BJ</b>	2.0	0.30	0.088	1	02/20/23 14:00	
n-Propylbenzene	ND U	2.0	0.20	0.054	1	02/20/23 14:00	
Styrene	ND U	0.50	0.20	0.089	1	02/20/23 14:00	
1,1,1,2-Tetrachloroethane	ND U	0.50	0.30	0.11	1	02/20/23 14:00	
1,1,2,2-Tetrachloroethane	ND U	0.50	0.40	0.16	1	02/20/23 14:00	
Tetrachloroethene (PCE)	ND U	0.50	0.20	0.099	1	02/20/23 14:00	
Toluene	ND U	0.50	0.10	0.054	1	02/20/23 14:00	
1,2,3-Trichlorobenzene	<b>0.37 J</b>	2.0	0.40	0.11	1	02/20/23 14:00	*
1,2,4-Trichlorobenzene	ND U	2.0	0.30	0.096	1	02/20/23 14:00	
1,1,2-Trichloroethane	ND U	0.50	0.40	0.14	1	02/20/23 14:00	
1,1,1-Trichloroethane (TCA)	ND U	0.50	0.20	0.075	1	02/20/23 14:00	
Trichloroethene (TCE)	ND U	0.50	0.20	0.10	1	02/20/23 14:00	
Trichlorofluoromethane (CFC 11)	ND U	0.50	0.30	0.12	1	02/20/23 14:00	
1,2,3-Trichloropropane	ND U	0.50	0.40	0.20	1	02/20/23 14:00	
1,2,4-Trimethylbenzene	ND U	2.0	0.20	0.069	1	02/20/23 14:00	
1,3,5-Trimethylbenzene	ND U	2.0	0.20	0.089	1	02/20/23 14:00	*
Vinyl Chloride	ND U	0.50	0.15	0.075	1	02/20/23 14:00	
o-Xylene	ND U	0.50	0.20	0.074	1	02/20/23 14:00	
m,p-Xylenes	ND U	0.50	0.30	0.11	1	02/20/23 14:00	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	84	85 - 114	02/20/23 14:00	*
Dibromofluoromethane	94	80 - 119	02/20/23 14:00	
1,2-Dichloroethane-d4	110	81 - 118	02/20/23 14:00	
Toluene-d8	92	89 - 112	02/20/23 14:00	

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2301517

**SURROGATE RECOVERY SUMMARY**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Extraction Method:** None

Sample Name	Lab Code	4-Bromofluorobenzene	Dibromofluoromethane	1,2-Dichloroethane-d4
		79-119	78-119	71-136
B-1-020123-10.0	K2301517-001	124*	125*	118
B-1-020123-20.0	K2301517-002	125*	125*	117
Method Blank	KQ2303409-05	121*	126*	113
Lab Control Sample	KQ2303409-03	122*	129*	111
Duplicate Lab Control Sample	KQ2303409-04	124*	129*	112

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2301517

**SURROGATE RECOVERY SUMMARY**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Extraction Method:** None

<b>Sample Name</b>	<b>Lab Code</b>	<b>Toluene-d8 85-116</b>
B-1-020123-10.0	K2301517-001	138*
B-1-020123-20.0	K2301517-002	136*
Method Blank	KQ2303409-05	138*
Lab Control Sample	KQ2303409-03	140*
Duplicate Lab Control Sample	KQ2303409-04	137*

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2301517

**SURROGATE RECOVERY SUMMARY**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Extraction Method:** None

Sample Name	Lab Code	4-Bromofluorobenzene	Dibromofluoromethane	1,2-Dichloroethane-d4
		85-114	80-119	81-118
Trip Blank	K2301517-005	84*	94	110
Method Blank	KQ2303372-05	86	94	110
Lab Control Sample	KQ2303372-03	102	99	100
Duplicate Lab Control Sample	KQ2303372-04	100	98	98

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2301517

**SURROGATE RECOVERY SUMMARY**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Extraction Method:** None

<b>Sample Name</b>	<b>Lab Code</b>	<b>Toluene-d8</b>
		<b>89-112</b>
Trip Blank	K2301517-005	92
Method Blank	KQ2303372-05	91
Lab Control Sample	KQ2303372-03	101
Duplicate Lab Control Sample	KQ2303372-04	101

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2303372-05

**Service Request:** K2301517  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/L  
**Basis:** NA

Volatile Organic Compounds by GC/MS

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Acetone	ND U	20	10	3.3	1	02/20/23 13:35	
Benzene	ND U	0.50	0.20	0.062	1	02/20/23 13:35	
Bromobenzene	ND U	2.0	0.30	0.12	1	02/20/23 13:35	
Bromochloromethane	ND U	0.50	0.40	0.16	1	02/20/23 13:35	
Bromodichloromethane	ND U	0.50	0.30	0.091	1	02/20/23 13:35	
Bromoform	ND U	0.50	0.40	0.16	1	02/20/23 13:35	
Bromomethane	ND U	0.50	0.40	0.16	1	02/20/23 13:35	
2-Butanone (MEK)	ND U	20	4.0	1.9	1	02/20/23 13:35	
n-Butylbenzene	ND U	4.0	4.0	0.054	1	02/20/23 13:35	
sec-Butylbenzene	ND U	2.0	0.20	0.062	1	02/20/23 13:35	
tert-Butylbenzene	ND U	2.0	0.20	0.059	1	02/20/23 13:35	
Carbon Disulfide	<b>0.080 J</b>	0.50	0.20	0.069	1	02/20/23 13:35	
Carbon Tetrachloride	ND U	0.50	0.20	0.096	1	02/20/23 13:35	
Chlorobenzene	ND U	0.50	0.30	0.11	1	02/20/23 13:35	
Chloroethane	ND U	0.50	0.30	0.16	1	02/20/23 13:35	
Chloroform	ND U	0.50	0.20	0.072	1	02/20/23 13:35	
Chloromethane	ND U	0.50	0.20	0.068	1	02/20/23 13:35	
2-Chlorotoluene	ND U	2.0	0.20	0.10	1	02/20/23 13:35	
4-Chlorotoluene	ND U	2.0	0.30	0.13	1	02/20/23 13:35	
1,2-Dibromo-3-chloropropane	ND U	2.0	0.44	0.22	1	02/20/23 13:35	
Dibromochloromethane	ND U	0.50	0.30	0.14	1	02/20/23 13:35	
1,2-Dibromoethane (EDB)	ND U	2.0	0.20	0.10	1	02/20/23 13:35	
Dibromomethane	ND U	0.50	0.30	0.15	1	02/20/23 13:35	
1,2-Dichlorobenzene	ND U	0.50	0.30	0.12	1	02/20/23 13:35	
1,3-Dichlorobenzene	ND U	0.50	0.20	0.10	1	02/20/23 13:35	
1,4-Dichlorobenzene	ND U	0.50	0.30	0.12	1	02/20/23 13:35	
Dichlorodifluoromethane	ND U	0.50	0.30	0.13	1	02/20/23 13:35	
1,1-Dichloroethane	ND U	0.50	0.20	0.077	1	02/20/23 13:35	
1,2-Dichloroethane (EDC)	ND U	0.50	0.20	0.080	1	02/20/23 13:35	
1,1-Dichloroethene	ND U	0.50	0.20	0.080	1	02/20/23 13:35	
cis-1,2-Dichloroethene	ND U	0.50	0.20	0.067	1	02/20/23 13:35	
trans-1,2-Dichloroethene	ND U	0.50	0.20	0.072	1	02/20/23 13:35	
1,2-Dichloropropane	ND U	0.50	0.20	0.095	1	02/20/23 13:35	
1,3-Dichloropropane	ND U	0.50	0.30	0.14	1	02/20/23 13:35	
2,2-Dichloropropane	ND U	0.50	0.50	0.065	1	02/20/23 13:35	
1,1-Dichloropropene	ND U	0.50	0.20	0.089	1	02/20/23 13:35	
cis-1,3-Dichloropropene	ND U	0.50	0.40	0.18	1	02/20/23 13:35	
trans-1,3-Dichloropropene	ND U	0.50	0.20	0.068	1	02/20/23 13:35	
Ethylbenzene	ND U	0.50	0.10	0.050	1	02/20/23 13:35	
Hexachlorobutadiene	<b>0.35 J</b>	2.0	0.30	0.11	1	02/20/23 13:35	
2-Hexanone	ND U	20	10	2.7	1	02/20/23 13:35	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2303372-05

**Service Request:** K2301517  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/L  
**Basis:** NA

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Isopropylbenzene	ND U	2.0	0.20	0.051	1	02/20/23 13:35	
4-Isopropyltoluene	ND U	2.0	0.20	0.060	1	02/20/23 13:35	
Methyl tert-Butyl Ether	ND U	0.50	0.30	0.11	1	02/20/23 13:35	
4-Methyl-2-pentanone (MIBK)	ND U	20	10	2.6	1	02/20/23 13:35	
Methylene Chloride	<b>0.12 J</b>	2.0	0.20	0.10	1	02/20/23 13:35	
Naphthalene	<b>1.3 J</b>	2.0	0.30	0.088	1	02/20/23 13:35	
n-Propylbenzene	ND U	2.0	0.20	0.054	1	02/20/23 13:35	
Styrene	ND U	0.50	0.20	0.089	1	02/20/23 13:35	
1,1,1,2-Tetrachloroethane	ND U	0.50	0.30	0.11	1	02/20/23 13:35	
1,1,2,2-Tetrachloroethane	ND U	0.50	0.40	0.16	1	02/20/23 13:35	
Tetrachloroethene (PCE)	ND U	0.50	0.20	0.099	1	02/20/23 13:35	
Toluene	ND U	0.50	0.10	0.054	1	02/20/23 13:35	
1,2,3-Trichlorobenzene	<b>0.69 J</b>	2.0	0.40	0.11	1	02/20/23 13:35	
1,2,4-Trichlorobenzene	<b>0.30 J</b>	2.0	0.30	0.096	1	02/20/23 13:35	
1,1,2-Trichloroethane	ND U	0.50	0.40	0.14	1	02/20/23 13:35	
1,1,1-Trichloroethane (TCA)	ND U	0.50	0.20	0.075	1	02/20/23 13:35	
Trichloroethene (TCE)	ND U	0.50	0.20	0.10	1	02/20/23 13:35	
Trichlorofluoromethane (CFC 11)	ND U	0.50	0.30	0.12	1	02/20/23 13:35	
1,2,3-Trichloropropane	ND U	0.50	0.40	0.20	1	02/20/23 13:35	
1,2,4-Trimethylbenzene	ND U	2.0	0.20	0.069	1	02/20/23 13:35	
1,3,5-Trimethylbenzene	ND U	2.0	0.20	0.089	1	02/20/23 13:35	
Vinyl Chloride	ND U	0.50	0.15	0.075	1	02/20/23 13:35	
o-Xylene	ND U	0.50	0.20	0.074	1	02/20/23 13:35	
m,p-Xylenes	ND U	0.50	0.30	0.11	1	02/20/23 13:35	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	86	85 - 114	02/20/23 13:35	
Dibromofluoromethane	94	80 - 119	02/20/23 13:35	
1,2-Dichloroethane-d4	110	81 - 118	02/20/23 13:35	
Toluene-d8	91	89 - 112	02/20/23 13:35	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil  
**Sample Name:** Method Blank  
**Lab Code:** KQ2303409-05

**Service Request:** K2301517  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/Kg  
**Basis:** Dry

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Acetone	ND U	20	4.0	2.9	1	02/22/23 18:41	
Benzene	<b>0.53 J</b>	5.0	0.20	0.054	1	02/22/23 18:41	
Bromobenzene	ND U	5.0	0.30	0.088	1	02/22/23 18:41	
Bromochloromethane	ND U	5.0	0.50	0.24	1	02/22/23 18:41	
Bromodichloromethane	ND U	5.0	0.50	0.16	1	02/22/23 18:41	
Bromoform	ND U	5.0	0.50	0.14	1	02/22/23 18:41	
Bromomethane	<b>0.60 J</b>	5.0	0.50	0.20	1	02/22/23 18:41	
2-Butanone (MEK)	ND U	20	1.0	0.90	1	02/22/23 18:41	
n-Butylbenzene	ND U	20	0.20	0.069	1	02/22/23 18:41	
sec-Butylbenzene	ND U	20	0.20	0.074	1	02/22/23 18:41	
tert-Butylbenzene	ND U	20	0.50	0.14	1	02/22/23 18:41	
Carbon Disulfide	ND U	5.0	0.30	0.092	1	02/22/23 18:41	
Carbon Tetrachloride	ND U	5.0	0.30	0.094	1	02/22/23 18:41	
Chlorobenzene	ND U	5.0	0.20	0.065	1	02/22/23 18:41	
Chloroethane	ND U	5.0	1.0	0.74	1	02/22/23 18:41	
Chloroform	ND U	5.0	0.40	0.11	1	02/22/23 18:41	
Chloromethane	ND U	5.0	0.50	0.18	1	02/22/23 18:41	
2-Chlorotoluene	ND U	20	0.40	0.12	1	02/22/23 18:41	
4-Chlorotoluene	ND U	20	0.40	0.088	1	02/22/23 18:41	
1,2-Dibromo-3-chloropropane	ND U	20	1.4	0.40	1	02/22/23 18:41	
Dibromochloromethane	ND U	5.0	0.50	0.18	1	02/22/23 18:41	
1,2-Dibromoethane (EDB)	ND U	20	0.30	0.094	1	02/22/23 18:41	
Dibromomethane	ND U	5.0	0.50	0.28	1	02/22/23 18:41	
1,2-Dichlorobenzene	ND U	5.0	0.30	0.077	1	02/22/23 18:41	
1,3-Dichlorobenzene	ND U	6.0	0.30	0.094	1	02/22/23 18:41	
1,4-Dichlorobenzene	ND U	2.0	0.30	0.086	1	02/22/23 18:41	
Dichlorodifluoromethane	ND U	5.0	0.40	0.12	1	02/22/23 18:41	
1,1-Dichloroethane	ND U	5.0	0.40	0.12	1	02/22/23 18:41	
1,2-Dichloroethane (EDC)	ND U	5.0	0.20	0.070	1	02/22/23 18:41	
1,1-Dichloroethene	ND U	5.0	0.50	0.25	1	02/22/23 18:41	
cis-1,2-Dichloroethene	ND U	5.0	0.40	0.12	1	02/22/23 18:41	
trans-1,2-Dichloroethene	ND U	5.0	0.40	0.12	1	02/22/23 18:41	
1,2-Dichloropropane	ND U	5.0	0.50	0.13	1	02/22/23 18:41	
1,3-Dichloropropane	ND U	2.0	0.40	0.12	1	02/22/23 18:41	
2,2-Dichloropropane	ND U	5.0	0.30	0.098	1	02/22/23 18:41	
1,1-Dichloropropene	ND U	5.0	0.50	0.13	1	02/22/23 18:41	
cis-1,3-Dichloropropene	ND U	5.0	0.50	0.13	1	02/22/23 18:41	
trans-1,3-Dichloropropene	ND U	5.0	0.40	0.11	1	02/22/23 18:41	
Ethylbenzene	ND U	5.0	0.30	0.094	1	02/22/23 18:41	
Hexachlorobutadiene	ND U	20	0.80	0.40	1	02/22/23 18:41	
2-Hexanone	ND U	20	2.0	0.93	1	02/22/23 18:41	

**ALS Group USA, Corp.**  
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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil  
**Sample Name:** Method Blank  
**Lab Code:** KQ2303409-05

**Service Request:** K2301517  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/Kg  
**Basis:** Dry

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Isopropylbenzene	ND U	20	0.30	0.081	1	02/22/23 18:41	
4-Isopropyltoluene	ND U	20	0.20	0.064	1	02/22/23 18:41	
Methyl tert-Butyl Ether	ND U	5.0	0.40	0.12	1	02/22/23 18:41	
4-Methyl-2-pentanone (MIBK)	ND U	20	1.8	1.8	1	02/22/23 18:41	
Methylene Chloride	<b>0.89 J</b>	10	0.50	0.16	1	02/22/23 18:41	
Naphthalene	<b>0.27 J</b>	20	0.50	0.13	1	02/22/23 18:41	
n-Propylbenzene	ND U	20	0.50	0.13	1	02/22/23 18:41	
Styrene	ND U	5.0	0.50	0.14	1	02/22/23 18:41	
1,1,1,2-Tetrachloroethane	ND U	5.0	0.40	0.11	1	02/22/23 18:41	
1,1,2,2-Tetrachloroethane	ND U	5.0	0.50	0.13	1	02/22/23 18:41	
Tetrachloroethene (PCE)	ND U	5.0	0.50	0.16	1	02/22/23 18:41	
Toluene	<b>1.9 J</b>	5.0	0.50	0.15	1	02/22/23 18:41	
1,2,3-Trichlorobenzene	ND U	20	0.50	0.19	1	02/22/23 18:41	
1,2,4-Trichlorobenzene	ND U	20	0.50	0.13	1	02/22/23 18:41	
1,1,2-Trichloroethane	ND U	5.0	0.50	0.15	1	02/22/23 18:41	
1,1,1-Trichloroethane (TCA)	ND U	5.0	0.40	0.11	1	02/22/23 18:41	
Trichloroethene (TCE)	ND U	5.0	0.50	0.15	1	02/22/23 18:41	
Trichlorofluoromethane (CFC 11)	ND U	5.0	0.30	0.085	1	02/22/23 18:41	
1,2,3-Trichloropropane	ND U	5.0	1.4	0.45	1	02/22/23 18:41	
1,2,4-Trimethylbenzene	ND U	20	0.20	0.054	1	02/22/23 18:41	
1,3,5-Trimethylbenzene	ND U	20	0.30	0.092	1	02/22/23 18:41	
Vinyl Chloride	ND U	5.0	0.50	0.18	1	02/22/23 18:41	
o-Xylene	ND U	5.0	0.30	0.081	1	02/22/23 18:41	
m,p-Xylenes	ND U	20	0.40	0.10	1	02/22/23 18:41	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	121	79 - 119	02/22/23 18:41	*
Dibromofluoromethane	126	78 - 119	02/22/23 18:41	*
1,2-Dichloroethane-d4	113	71 - 136	02/22/23 18:41	
Toluene-d8	138	85 - 116	02/22/23 18:41	*

**ALS Group USA, Corp.**  
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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2301517  
**Date Analyzed:** 02/20/23  
**Date Extracted:** NA

**Duplicate Lab Control Sample Summary**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 795367

Analyte Name	Lab Control Sample KQ2303372-03			Duplicate Lab Control Sample KQ2303372-04			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1,2-Tetrachloroethane	9.35	10.0	94	8.68	10.0	87	78-124	7	20
1,1,1-Trichloroethane (TCA)	10.8	10.0	108	9.89	10.0	99	74-131	9	20
1,1,2,2-Tetrachloroethane	10.1	10.0	101	9.63	10.0	96	71-121	5	20
1,1,2-Trichloroethane	10.1	10.0	101	9.26	10.0	93	80-119	8	20
1,1-Dichloroethane	11.0	10.0	110	10.5	10.0	105	77-125	5	20
1,1-Dichloroethene	9.86	10.0	99	9.40	10.0	94	71-131	5	20
1,1-Dichloropropene	11.4	10.0	114	10.4	10.0	104	79-125	10	20
1,2,3-Trichlorobenzene	10.5	10.0	105	10.1	10.0	101	69-129	4	20
1,2,3-Trichloropropane	9.73	10.0	97	9.21	10.0	92	73-122	5	20
1,2,4-Trichlorobenzene	9.93	10.0	99	9.50	10.0	95	69-130	4	20
1,2,4-Trimethylbenzene	10.9	10.0	109	10.0	10.0	100	76-124	9	20
1,2-Dibromo-3-chloropropane	8.77	10.0	88	7.44	10.0	74	62-128	16	20
1,2-Dibromoethane (EDB)	9.94	10.0	99	9.15	10.0	92	77-121	8	20
1,2-Dichlorobenzene	10.3	10.0	103	9.64	10.0	96	80-119	7	20
1,2-Dichloroethane (EDC)	9.66	10.0	97	9.24	10.0	92	73-128	4	20
1,2-Dichloropropane	10.5	10.0	105	9.78	10.0	98	78-122	7	20
1,3,5-Trimethylbenzene	11.2	10.0	112	10.3	10.0	103	75-124	8	20
1,3-Dichlorobenzene	10.6	10.0	106	9.83	10.0	98	80-119	8	20
1,3-Dichloropropane	10.3	10.0	103	9.56	10.0	96	80-119	7	20
1,4-Dichlorobenzene	9.87	10.0	99	9.34	10.0	93	79-118	6	20
2,2-Dichloropropane	11.3	10.0	113	10.4	10.0	104	60-139	8	20
2-Butanone (MEK)	53.9	50.0	108	50.7	50.0	101	56-143	6	20
2-Chlorotoluene	11.4	10.0	114	10.5	10.0	105	79-122	8	20
2-Hexanone	49.7	50.0	99	46.7	50.0	93	57-139	6	20
4-Chlorotoluene	11.0	10.0	110	10.1	10.0	101	78-122	8	20
4-Isopropyltoluene	11.2	10.0	112	10.4	10.0	104	77-127	8	20
4-Methyl-2-pentanone (MIBK)	53.6	50.0	107	51.2	50.0	102	67-130	5	20
Acetone	53.7	50.0	107	50.4	50.0	101	39-160	6	20
Benzene	10.6	10.0	106	9.81	10.0	98	79-120	7	20
Bromobenzene	10.2	10.0	102	9.50	10.0	95	80-120	7	20
Bromochloromethane	9.91	10.0	99	9.27	10.0	93	78-123	7	20
Bromodichloromethane	10.2	10.0	102	9.36	10.0	94	79-127	8	20
Bromoform	9.28	10.0	93	8.27	10.0	83	66-130	12	20
Bromomethane	9.03	10.0	90	8.61	10.0	86	53-141	5	20
Carbon Disulfide	22.0	20.0	110	20.3	20.0	102	64-133	8	20
Carbon Tetrachloride	10.2	10.0	102	9.38	10.0	94	72-136	9	20
Chlorobenzene	10.0	10.0	100	9.24	10.0	92	82-118	8	20
Chloroethane	8.54	10.0	85	7.86	10.0	79	60-138	8	20
Chloroform	10.8	10.0	108	9.82	10.0	98	79-124	9	20
Chloromethane	9.40	10.0	94	8.83	10.0	88	50-139	6	20
cis-1,2-Dichloroethene	10.5	10.0	105	9.57	10.0	96	78-123	9	20

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2301517  
**Date Analyzed:** 02/20/23  
**Date Extracted:** NA

**Duplicate Lab Control Sample Summary**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 795367

Analyte Name	Lab Control Sample KQ2303372-03			Duplicate Lab Control Sample KQ2303372-04			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
cis-1,3-Dichloropropene	8.77	10.0	88	8.32	10.0	83	75-124	5	20
Dibromochloromethane	9.21	10.0	92	8.46	10.0	85	74-126	8	20
Dibromomethane	9.71	10.0	97	9.09	10.0	91	79-123	7	20
Dichlorodifluoromethane	9.23	10.0	92	8.37	10.0	84	32-152	10	20
Ethylbenzene	10.9	10.0	109	9.78	10.0	98	79-121	11	20
Hexachlorobutadiene	10.5	10.0	105	9.43	10.0	94	66-134	10	20
Isopropylbenzene	9.77	10.0	98	8.86	10.0	89	72-131	10	20
m,p-Xylenes	22.6	20.0	113	20.4	20.0	102	80-121	10	20
Methyl tert-Butyl Ether	10.4	10.0	104	9.63	10.0	96	71-124	7	20
Methylene Chloride	9.75	10.0	98	9.04	10.0	90	74-124	8	20
Naphthalene	8.60	10.0	86	8.67	10.0	87	61-128	<1	20
n-Butylbenzene	11.4	10.0	114	10.4	10.0	104	75-128	9	20
n-Propylbenzene	11.1	10.0	111	10.3	10.0	103	76-126	8	20
o-Xylene	10.6	10.0	106	9.75	10.0	98	78-122	8	20
sec-Butylbenzene	11.6	10.0	116	10.6	10.0	106	77-126	9	20
Styrene	9.56	10.0	96	8.63	10.0	86	78-123	10	20
tert-Butylbenzene	10.9	10.0	109	10.0	10.0	100	78-124	8	20
Tetrachloroethene (PCE)	9.87	10.0	99	8.90	10.0	89	74-129	10	20
Toluene	10.3	10.0	103	9.62	10.0	96	80-121	7	20
trans-1,2-Dichloroethene	10.6	10.0	106	9.72	10.0	97	75-124	9	20
trans-1,3-Dichloropropene	8.20	10.0	82	7.70	10.0	77	73-127	6	20
Trichloroethene (TCE)	10.2	10.0	102	9.44	10.0	94	79-123	8	20
Trichlorofluoromethane (CFC 11)	10.2	10.0	102	9.45	10.0	95	65-141	8	20
Vinyl Chloride	9.94	10.0	99	9.19	10.0	92	58-137	8	20

**ALS Group USA, Corp.**  
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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2301517  
**Date Analyzed:** 02/22/23  
**Date Extracted:** NA

**Duplicate Lab Control Sample Summary**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

**Units:** ug/Kg  
**Basis:** Dry  
**Analysis Lot:** 795448

Analyte Name	Lab Control Sample KQ2303409-03			Duplicate Lab Control Sample KQ2303409-04			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1,2-Tetrachloroethane	44.9	50.0	90	44.3	50.0	89	78-125	1	20
1,1,1-Trichloroethane (TCA)	47.7	50.0	95	45.0	50.0	90	73-130	6	20
1,1,2,2-Tetrachloroethane	45.9	50.0	92	46.7	50.0	93	70-124	2	20
1,1,2-Trichloroethane	43.4	50.0	87	43.2	50.0	86	78-121	<1	20
1,1-Dichloroethane	44.6	50.0	89	47.7	50.0	95	76-125	7	20
1,1-Dichloroethene	47.0	50.0	94	44.2	50.0	88	70-131	6	20
1,1-Dichloropropene	49.1	50.0	98	45.5	50.0	91	76-125	8	20
1,2,3-Trichlorobenzene	29.9	50.0	60 *	28.8	50.0	58 *	66-130	4	20
1,2,3-Trichloropropane	46.5	50.0	93	49.5	50.0	99	73-125	6	20
1,2,4-Trichlorobenzene	29.4	50.0	59 *	26.6	50.0	53 *	67-129	10	20
1,2,4-Trimethylbenzene	47.7	50.0	95	47.2	50.0	94	75-123	1	20
1,2-Dibromo-3-chloropropane	32.6	50.0	65	34.1	50.0	68	61-132	5	20
1,2-Dibromoethane (EDB)	45.1	50.0	90	45.1	50.0	90	78-122	<1	20
1,2-Dichlorobenzene	43.0	50.0	86	40.4	50.0	81	78-121	6	20
1,2-Dichloroethane (EDC)	45.4	50.0	91	44.1	50.0	88	73-128	3	20
1,2-Dichloropropane	43.8	50.0	88	43.4	50.0	87	76-123	<1	20
1,3,5-Trimethylbenzene	48.2	50.0	96	46.4	50.0	93	73-124	4	20
1,3-Dichlorobenzene	46.9	50.0	94	46.1	50.0	92	77-121	2	20
1,3-Dichloropropane	44.4	50.0	89	43.9	50.0	88	77-121	1	20
1,4-Dichlorobenzene	44.7	50.0	89	43.4	50.0	87	75-120	3	20
2,2-Dichloropropane	43.1	50.0	86	41.0	50.0	82	67-133	5	20
2-Butanone (MEK)	225	250	90	236	250	94	51-148	5	20
2-Chlorotoluene	48.0	50.0	96	47.5	50.0	95	75-122	<1	20
2-Hexanone	218	250	87	232	250	93	53-145	6	20
4-Chlorotoluene	48.4	50.0	97	46.0	50.0	92	72-124	5	20
4-Isopropyltoluene	49.4	50.0	99	46.2	50.0	92	73-127	7	20
4-Methyl-2-pentanone (MIBK)	244	250	98	254	250	102	65-135	4	20
Acetone	225	250	90	234	250	94	36-164	4	20
Benzene	46.1	50.0	92	44.5	50.0	89	77-121	4	20
Bromobenzene	47.5	50.0	95	48.3	50.0	97	78-121	2	20
Bromochloromethane	47.8	50.0	96	46.9	50.0	94	78-125	2	20
Bromodichloromethane	45.8	50.0	92	44.0	50.0	88	75-127	4	20
Bromoform	43.9	50.0	88	44.4	50.0	89	67-132	1	20
Bromomethane	49.0	50.0	98	44.2	50.0	88	53-143	10	20
Carbon Disulfide	96.8	100	97	90.5	100	90	63-132	7	20
Carbon Tetrachloride	49.9	50.0	100	47.1	50.0	94	70-135	6	20
Chlorobenzene	46.4	50.0	93	44.8	50.0	90	79-120	3	20
Chloroethane	48.8	50.0	98	45.1	50.0	90	59-139	8	20
Chloroform	46.0	50.0	92	44.2	50.0	88	78-123	4	20
Chloromethane	41.9	50.0	84	38.6	50.0	77	50-136	8	20
cis-1,2-Dichloroethene	45.8	50.0	92	43.4	50.0	87	77-123	5	20

**ALS Group USA, Corp.**  
dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2301517  
**Date Analyzed:** 02/22/23  
**Date Extracted:** NA

**Duplicate Lab Control Sample Summary**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

**Units:** ug/Kg  
**Basis:** Dry  
**Analysis Lot:** 795448

Analyte Name	Lab Control Sample KQ2303409-03			Duplicate Lab Control Sample KQ2303409-04			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
cis-1,3-Dichloropropene	45.8	50.0	92	45.0	50.0	90	74-126	2	20
Dibromochloromethane	44.2	50.0	88	43.9	50.0	88	74-126	<1	20
Dibromomethane	46.4	50.0	93	45.0	50.0	90	78-125	3	20
Dichlorodifluoromethane	35.4	50.0	71	33.0	50.0	66	29-149	7	20
Ethylbenzene	46.6	50.0	93	44.6	50.0	89	76-122	4	20
Hexachlorobutadiene	27.6	50.0	55 *	25.8	50.0	52 *	61-135	7	20
Isopropylbenzene	47.3	50.0	95	45.3	50.0	91	68-134	4	20
m,p-Xylenes	93.6	100	94	90.6	100	91	77-124	3	20
Methyl tert-Butyl Ether	48.4	50.0	97	47.9	50.0	96	73-125	<1	20
Methylene Chloride	46.0	50.0	92	43.9	50.0	88	70-128	5	20
Naphthalene	30.1	50.0	60 *	29.6	50.0	59 *	62-129	2	20
n-Butylbenzene	46.6	50.0	93	43.6	50.0	87	70-128	7	20
n-Propylbenzene	48.6	50.0	97	47.0	50.0	94	73-125	3	20
o-Xylene	47.0	50.0	94	44.8	50.0	90	77-123	5	20
sec-Butylbenzene	51.0	50.0	102	49.1	50.0	98	73-126	4	20
Styrene	47.6	50.0	95	46.2	50.0	92	76-124	3	20
tert-Butylbenzene	48.0	50.0	96	47.3	50.0	95	73-125	2	20
Tetrachloroethene (PCE)	45.1	50.0	90	43.0	50.0	86	73-128	5	20
Toluene	47.6	50.0	95	45.4	50.0	91	77-121	5	20
trans-1,2-Dichloroethene	45.1	50.0	90	41.8	50.0	84	74-125	8	20
trans-1,3-Dichloropropene	44.6	50.0	89	43.8	50.0	88	71-130	2	20
Trichloroethene (TCE)	45.4	50.0	91	45.2	50.0	90	77-123	<1	20
Trichlorofluoromethane (CFC 11)	53.2	50.0	106	49.4	50.0	99	62-140	7	20
Vinyl Chloride	47.6	50.0	95	45.4	50.0	91	56-135	5	20



# Volatile Organic Compounds by GC/MS

**ALS Environmental—Kelso Laboratory**  
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Phone (360)577-7222 Fax (360)636-1068  
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**ALS Group USA, Corp.**  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2301517  
**Date Collected:** 02/01/23 09:08  
**Date Received:** 02/06/23 13:00

**Sample Name:** B-1-020123-10.0  
**Lab Code:** K2301517-001

**Units:** mg/Kg  
**Basis:** Dry

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Acetone	ND U	1.8	1.0	0.33	1	02/15/23 14:09	
Benzene	ND U	0.045	0.010	0.0062	1	02/15/23 14:09	
Bromobenzene	ND U	0.18	0.020	0.012	1	02/15/23 14:09	*
Bromochloromethane	ND U	0.045	0.020	0.016	1	02/15/23 14:09	
Bromodichloromethane	ND U	0.045	0.030	0.0091	1	02/15/23 14:09	
Bromoform	ND U	0.050	0.050	0.016	1	02/15/23 14:09	
Bromomethane	ND U	0.045	0.030	0.010	1	02/15/23 14:09	*
2-Butanone (MEK)	ND U	1.8	0.40	0.19	1	02/15/23 14:09	
n-Butylbenzene	ND U	0.18	0.010	0.0054	1	02/15/23 14:09	*
sec-Butylbenzene	ND U	0.18	0.010	0.0062	1	02/15/23 14:09	*
tert-Butylbenzene	ND U	0.18	0.020	0.0059	1	02/15/23 14:09	*
Carbon Disulfide	ND U	0.045	0.020	0.0069	1	02/15/23 14:09	
Carbon Tetrachloride	ND U	0.045	0.020	0.0096	1	02/15/23 14:09	
Chlorobenzene	ND U	0.045	0.020	0.011	1	02/15/23 14:09	
Chloroethane	ND U	0.045	0.020	0.016	1	02/15/23 14:09	
Chloroform	ND U	0.045	0.020	0.0072	1	02/15/23 14:09	
Chloromethane	ND U	0.045	0.020	0.0068	1	02/15/23 14:09	
2-Chlorotoluene	ND U	0.18	0.020	0.010	1	02/15/23 14:09	*
4-Chlorotoluene	ND U	0.18	0.020	0.013	1	02/15/23 14:09	*
1,2-Dibromo-3-chloropropane (DBCP)	ND U	0.18	0.080	0.022	1	02/15/23 14:09	
Dibromochloromethane	ND U	0.050	0.050	0.014	1	02/15/23 14:09	*
1,2-Dibromoethane (EDB)	ND U	0.18	0.020	0.010	1	02/15/23 14:09	
Dibromomethane	ND U	0.050	0.050	0.015	1	02/15/23 14:09	
1,2-Dichlorobenzene	ND U	0.045	0.020	0.012	1	02/15/23 14:09	*
1,3-Dichlorobenzene	ND U	0.045	0.020	0.010	1	02/15/23 14:09	*
1,4-Dichlorobenzene	ND U	0.045	0.020	0.012	1	02/15/23 14:09	
Dichlorodifluoromethane (CFC 12)	ND U	0.045	0.020	0.013	1	02/15/23 14:09	
1,1-Dichloroethane (1,1-DCA)	ND U	0.045	0.020	0.0077	1	02/15/23 14:09	
1,2-Dichloroethane (EDC)	ND U	0.045	0.015	0.0080	1	02/15/23 14:09	
cis-1,2-Dichloroethene	ND U	0.045	0.020	0.0067	1	02/15/23 14:09	
trans-1,2-Dichloroethene	ND U	0.045	0.020	0.0072	1	02/15/23 14:09	
1,1-Dichloroethene (1,1-DCE)	ND U	0.045	0.020	0.0080	1	02/15/23 14:09	
1,2-Dichloropropane	ND U	0.045	0.020	0.0095	1	02/15/23 14:09	
1,3-Dichloropropane	ND U	0.045	0.030	0.014	1	02/15/23 14:09	
2,2-Dichloropropane	ND U	0.045	0.020	0.0065	1	02/15/23 14:09	
1,1-Dichloropropene	ND U	0.045	0.020	0.0089	1	02/15/23 14:09	
cis-1,3-Dichloropropene	ND U	0.045	0.020	0.018	1	02/15/23 14:09	
trans-1,3-Dichloropropene	ND U	0.045	0.020	0.0068	1	02/15/23 14:09	
Ethylbenzene	ND U	0.045	0.010	0.0050	1	02/15/23 14:09	*
Hexachlorobutadiene	ND U	0.18	0.030	0.011	1	02/15/23 14:09	
2-Hexanone	ND U	1.8	1.0	0.27	1	02/15/23 14:09	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2301517  
**Date Collected:** 02/01/23 09:08  
**Date Received:** 02/06/23 13:00

**Sample Name:** B-1-020123-10.0  
**Lab Code:** K2301517-001

**Units:** mg/Kg  
**Basis:** Dry

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Isopropylbenzene (Cumene)	ND U	0.18	0.020	0.0051	1	02/15/23 14:09	*
4-Isopropyltoluene	ND U	0.18	0.020	0.0060	1	02/15/23 14:09	
4-Methyl-2-pentanone (MIBK)	ND U	1.8	1.0	0.26	1	02/15/23 14:09	*
Methylene Chloride	<b>0.010 J</b>	0.18	0.020	0.010	1	02/15/23 14:09	
Naphthalene	<b>0.079 BJ</b>	0.18	0.030	0.0088	1	02/15/23 14:09	
n-Propylbenzene	ND U	0.18	0.020	0.0054	1	02/15/23 14:09	*
Styrene	ND U	0.045	0.020	0.0089	1	02/15/23 14:09	
1,1,1,2-Tetrachloroethane	ND U	0.045	0.020	0.011	1	02/15/23 14:09	
1,1,2,2-Tetrachloroethane	ND U	0.045	0.020	0.016	1	02/15/23 14:09	
Tetrachloroethene (PCE)	ND U	0.045	0.020	0.0099	1	02/15/23 14:09	
Toluene	ND U	0.045	0.010	0.0054	1	02/15/23 14:09	
1,2,3-Trichlorobenzene	<b>0.026 J</b>	0.18	0.040	0.011	1	02/15/23 14:09	*
1,2,4-Trichlorobenzene	<b>0.017 J</b>	0.18	0.030	0.0096	1	02/15/23 14:09	
1,1,2-Trichloroethane	ND U	0.045	0.040	0.014	1	02/15/23 14:09	
1,1,1-Trichloroethane (TCA)	ND U	0.045	0.020	0.0075	1	02/15/23 14:09	
Trichloroethene (TCE)	ND U	0.045	0.020	0.010	1	02/15/23 14:09	
Trichlorofluoromethane (CFC 11)	ND U	0.045	0.020	0.012	1	02/15/23 14:09	
1,2,3-Trichloropropane	ND U	0.050	0.050	0.020	1	02/15/23 14:09	
1,2,4-Trimethylbenzene	ND U	0.18	0.020	0.0069	1	02/15/23 14:09	*
1,3,5-Trimethylbenzene	ND U	0.18	0.020	0.0089	1	02/15/23 14:09	*
Vinyl Chloride	ND U	0.045	0.010	0.0075	1	02/15/23 14:09	
m,p-Xylenes	ND U	0.045	0.020	0.011	1	02/15/23 14:09	*
o-Xylene	ND U	0.045	0.020	0.0074	1	02/15/23 14:09	*

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	85	64 - 132	02/15/23 14:09	
Dibromofluoromethane	79	55 - 132	02/15/23 14:09	
1,2-Dichloroethane-d4	105	37 - 155	02/15/23 14:09	
Toluene-d8	90	81 - 124	02/15/23 14:09	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2301517  
**Date Collected:** 02/01/23 09:40  
**Date Received:** 02/06/23 13:00

**Sample Name:** B-1-020123-20.0  
**Lab Code:** K2301517-002

**Units:** mg/Kg  
**Basis:** Dry

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Acetone	ND U	1.8	1.0	0.33	1	02/15/23 14:33	
Benzene	ND U	0.045	0.010	0.0062	1	02/15/23 14:33	
Bromobenzene	ND U	0.18	0.020	0.012	1	02/15/23 14:33	*
Bromochloromethane	ND U	0.045	0.020	0.016	1	02/15/23 14:33	
Bromodichloromethane	ND U	0.045	0.030	0.0091	1	02/15/23 14:33	
Bromoform	ND U	0.050	0.050	0.016	1	02/15/23 14:33	
Bromomethane	ND U	0.045	0.030	0.010	1	02/15/23 14:33	*
2-Butanone (MEK)	ND U	1.8	0.40	0.19	1	02/15/23 14:33	
n-Butylbenzene	ND U	0.18	0.010	0.0054	1	02/15/23 14:33	*
sec-Butylbenzene	ND U	0.18	0.010	0.0062	1	02/15/23 14:33	*
tert-Butylbenzene	ND U	0.18	0.020	0.0059	1	02/15/23 14:33	*
Carbon Disulfide	ND U	0.045	0.020	0.0069	1	02/15/23 14:33	
Carbon Tetrachloride	ND U	0.045	0.020	0.0096	1	02/15/23 14:33	
Chlorobenzene	ND U	0.045	0.020	0.011	1	02/15/23 14:33	
Chloroethane	ND U	0.045	0.020	0.016	1	02/15/23 14:33	
Chloroform	ND U	0.045	0.020	0.0072	1	02/15/23 14:33	
Chloromethane	ND U	0.045	0.020	0.0068	1	02/15/23 14:33	
2-Chlorotoluene	ND U	0.18	0.020	0.010	1	02/15/23 14:33	*
4-Chlorotoluene	ND U	0.18	0.020	0.013	1	02/15/23 14:33	*
1,2-Dibromo-3-chloropropane (DBCP)	ND U	0.18	0.080	0.022	1	02/15/23 14:33	
Dibromochloromethane	ND U	0.050	0.050	0.014	1	02/15/23 14:33	*
1,2-Dibromoethane (EDB)	ND U	0.18	0.020	0.010	1	02/15/23 14:33	
Dibromomethane	ND U	0.050	0.050	0.015	1	02/15/23 14:33	
1,2-Dichlorobenzene	ND U	0.045	0.020	0.012	1	02/15/23 14:33	*
1,3-Dichlorobenzene	ND U	0.045	0.020	0.010	1	02/15/23 14:33	*
1,4-Dichlorobenzene	ND U	0.045	0.020	0.012	1	02/15/23 14:33	
Dichlorodifluoromethane (CFC 12)	ND U	0.045	0.020	0.013	1	02/15/23 14:33	
1,1-Dichloroethane (1,1-DCA)	ND U	0.045	0.020	0.0077	1	02/15/23 14:33	
1,2-Dichloroethane (EDC)	ND U	0.045	0.015	0.0080	1	02/15/23 14:33	
cis-1,2-Dichloroethene	ND U	0.045	0.020	0.0067	1	02/15/23 14:33	
trans-1,2-Dichloroethene	ND U	0.045	0.020	0.0072	1	02/15/23 14:33	
1,1-Dichloroethene (1,1-DCE)	ND U	0.045	0.020	0.0080	1	02/15/23 14:33	
1,2-Dichloropropane	ND U	0.045	0.020	0.0095	1	02/15/23 14:33	
1,3-Dichloropropane	ND U	0.045	0.030	0.014	1	02/15/23 14:33	
2,2-Dichloropropane	ND U	0.045	0.020	0.0065	1	02/15/23 14:33	
1,1-Dichloropropene	ND U	0.045	0.020	0.0089	1	02/15/23 14:33	
cis-1,3-Dichloropropene	ND U	0.045	0.020	0.018	1	02/15/23 14:33	
trans-1,3-Dichloropropene	ND U	0.045	0.020	0.0068	1	02/15/23 14:33	
Ethylbenzene	ND U	0.045	0.010	0.0050	1	02/15/23 14:33	*
Hexachlorobutadiene	ND U	0.18	0.030	0.011	1	02/15/23 14:33	
2-Hexanone	ND U	1.8	1.0	0.27	1	02/15/23 14:33	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2301517  
**Date Collected:** 02/01/23 09:40  
**Date Received:** 02/06/23 13:00

**Sample Name:** B-1-020123-20.0  
**Lab Code:** K2301517-002

**Units:** mg/Kg  
**Basis:** Dry

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Isopropylbenzene (Cumene)	ND U	0.18	0.020	0.0051	1	02/15/23 14:33	*
4-Isopropyltoluene	ND U	0.18	0.020	0.0060	1	02/15/23 14:33	
4-Methyl-2-pentanone (MIBK)	ND U	1.8	1.0	0.26	1	02/15/23 14:33	*
Methylene Chloride	ND U	0.18	0.020	0.010	1	02/15/23 14:33	
Naphthalene	<b>0.067 BJ</b>	0.18	0.030	0.0088	1	02/15/23 14:33	
n-Propylbenzene	ND U	0.18	0.020	0.0054	1	02/15/23 14:33	*
Styrene	ND U	0.045	0.020	0.0089	1	02/15/23 14:33	
1,1,1,2-Tetrachloroethane	ND U	0.045	0.020	0.011	1	02/15/23 14:33	
1,1,2,2-Tetrachloroethane	ND U	0.045	0.020	0.016	1	02/15/23 14:33	
Tetrachloroethene (PCE)	ND U	0.045	0.020	0.0099	1	02/15/23 14:33	
Toluene	ND U	0.045	0.010	0.0054	1	02/15/23 14:33	
1,2,3-Trichlorobenzene	<b>0.021 J</b>	0.18	0.040	0.011	1	02/15/23 14:33	*
1,2,4-Trichlorobenzene	ND U	0.18	0.030	0.0096	1	02/15/23 14:33	
1,1,2-Trichloroethane	ND U	0.045	0.040	0.014	1	02/15/23 14:33	
1,1,1-Trichloroethane (TCA)	ND U	0.045	0.020	0.0075	1	02/15/23 14:33	
Trichloroethene (TCE)	ND U	0.045	0.020	0.010	1	02/15/23 14:33	
Trichlorofluoromethane (CFC 11)	ND U	0.045	0.020	0.012	1	02/15/23 14:33	
1,2,3-Trichloropropane	ND U	0.050	0.050	0.020	1	02/15/23 14:33	
1,2,4-Trimethylbenzene	ND U	0.18	0.020	0.0069	1	02/15/23 14:33	*
1,3,5-Trimethylbenzene	ND U	0.18	0.020	0.0089	1	02/15/23 14:33	*
Vinyl Chloride	ND U	0.045	0.010	0.0075	1	02/15/23 14:33	
m,p-Xylenes	ND U	0.045	0.020	0.011	1	02/15/23 14:33	*
o-Xylene	ND U	0.045	0.020	0.0074	1	02/15/23 14:33	*

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	83	64 - 132	02/15/23 14:33	
Dibromofluoromethane	77	55 - 132	02/15/23 14:33	
1,2-Dichloroethane-d4	106	37 - 155	02/15/23 14:33	
Toluene-d8	92	81 - 124	02/15/23 14:33	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2301517

**SURROGATE RECOVERY SUMMARY**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Extraction Method:** None

Sample Name	Lab Code	4-Bromofluorobenzene	Dibromofluoromethane	1,2-Dichloroethane-d4
		64-132	55-132	37-155
B-1-020123-10.0	K2301517-001	85	79	105
B-1-020123-20.0	K2301517-002	83	77	106
Method Blank	KQ2303442-05	84	92	108
Lab Control Sample	KQ2303442-03	99	98	102
Duplicate Lab Control Sample	KQ2303442-04	99	96	100

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2301517

**SURROGATE RECOVERY SUMMARY**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Extraction Method:** None

<b>Sample Name</b>	<b>Lab Code</b>	<b>Toluene-d8</b>
		<b>81-124</b>
B-1-020123-10.0	K2301517-001	90
B-1-020123-20.0	K2301517-002	92
Method Blank	KQ2303442-05	91
Lab Control Sample	KQ2303442-03	100
Duplicate Lab Control Sample	KQ2303442-04	99

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2301517  
**Date Collected:** NA  
**Date Received:** NA

**Sample Name:** Method Blank  
**Lab Code:** KQ2303442-05

**Units:** mg/Kg  
**Basis:** Dry

Volatile Organic Compounds by GC/MS

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Acetone	ND U	2.0	1.0	0.33	1	02/15/23 13:44	
Benzene	ND U	0.050	0.010	0.0062	1	02/15/23 13:44	
Bromobenzene	ND U	0.20	0.020	0.012	1	02/15/23 13:44	
Bromochloromethane	ND U	0.050	0.020	0.016	1	02/15/23 13:44	
Bromodichloromethane	ND U	0.050	0.030	0.0091	1	02/15/23 13:44	
Bromoform	ND U	0.050	0.050	0.016	1	02/15/23 13:44	
Bromomethane	ND U	0.050	0.030	0.010	1	02/15/23 13:44	
2-Butanone (MEK)	ND U	2.0	0.40	0.19	1	02/15/23 13:44	
n-Butylbenzene	ND U	0.20	0.010	0.0054	1	02/15/23 13:44	
sec-Butylbenzene	ND U	0.20	0.010	0.0062	1	02/15/23 13:44	
tert-Butylbenzene	ND U	0.20	0.020	0.0059	1	02/15/23 13:44	
Carbon Disulfide	ND U	0.050	0.020	0.0069	1	02/15/23 13:44	
Carbon Tetrachloride	ND U	0.050	0.020	0.0096	1	02/15/23 13:44	
Chlorobenzene	ND U	0.050	0.020	0.011	1	02/15/23 13:44	
Chloroethane	ND U	0.050	0.020	0.016	1	02/15/23 13:44	
Chloroform	ND U	0.050	0.020	0.0072	1	02/15/23 13:44	
Chloromethane	ND U	0.050	0.020	0.0068	1	02/15/23 13:44	
2-Chlorotoluene	ND U	0.20	0.020	0.010	1	02/15/23 13:44	
4-Chlorotoluene	ND U	0.20	0.020	0.013	1	02/15/23 13:44	
1,2-Dibromo-3-chloropropane (DBCP)	ND U	0.20	0.080	0.022	1	02/15/23 13:44	
Dibromochloromethane	ND U	0.050	0.050	0.014	1	02/15/23 13:44	
1,2-Dibromoethane (EDB)	ND U	0.20	0.020	0.010	1	02/15/23 13:44	
Dibromomethane	ND U	0.050	0.050	0.015	1	02/15/23 13:44	
1,2-Dichlorobenzene	ND U	0.050	0.020	0.012	1	02/15/23 13:44	
1,3-Dichlorobenzene	ND U	0.050	0.020	0.010	1	02/15/23 13:44	
1,4-Dichlorobenzene	ND U	0.050	0.020	0.012	1	02/15/23 13:44	
Dichlorodifluoromethane (CFC 12)	ND U	0.050	0.020	0.013	1	02/15/23 13:44	
1,1-Dichloroethane (1,1-DCA)	ND U	0.050	0.020	0.0077	1	02/15/23 13:44	
1,2-Dichloroethane (EDC)	ND U	0.050	0.015	0.0080	1	02/15/23 13:44	
cis-1,2-Dichloroethene	ND U	0.050	0.020	0.0067	1	02/15/23 13:44	
trans-1,2-Dichloroethene	ND U	0.050	0.020	0.0072	1	02/15/23 13:44	
1,1-Dichloroethene (1,1-DCE)	ND U	0.050	0.020	0.0080	1	02/15/23 13:44	
1,2-Dichloropropane	ND U	0.050	0.020	0.0095	1	02/15/23 13:44	
1,3-Dichloropropane	ND U	0.050	0.030	0.014	1	02/15/23 13:44	
2,2-Dichloropropane	ND U	0.050	0.020	0.0065	1	02/15/23 13:44	
1,1-Dichloropropene	ND U	0.050	0.020	0.0089	1	02/15/23 13:44	
cis-1,3-Dichloropropene	ND U	0.050	0.020	0.018	1	02/15/23 13:44	
trans-1,3-Dichloropropene	ND U	0.050	0.020	0.0068	1	02/15/23 13:44	
Ethylbenzene	ND U	0.050	0.010	0.0050	1	02/15/23 13:44	
Hexachlorobutadiene	<b>0.022 J</b>	0.20	0.030	0.011	1	02/15/23 13:44	
2-Hexanone	ND U	2.0	1.0	0.27	1	02/15/23 13:44	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2301517  
**Date Collected:** NA  
**Date Received:** NA

**Sample Name:** Method Blank  
**Lab Code:** KQ2303442-05

**Units:** mg/Kg  
**Basis:** Dry

Volatile Organic Compounds by GC/MS

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Isopropylbenzene (Cumene)	ND U	0.20	0.020	0.0051	1	02/15/23 13:44	
4-Isopropyltoluene	ND U	0.20	0.020	0.0060	1	02/15/23 13:44	
4-Methyl-2-pentanone (MIBK)	ND U	2.0	1.0	0.26	1	02/15/23 13:44	
Methylene Chloride	ND U	0.20	0.020	0.010	1	02/15/23 13:44	
Naphthalene	<b>0.10 J</b>	0.20	0.030	0.0088	1	02/15/23 13:44	
n-Propylbenzene	ND U	0.20	0.020	0.0054	1	02/15/23 13:44	
Styrene	ND U	0.050	0.020	0.0089	1	02/15/23 13:44	
1,1,1,2-Tetrachloroethane	ND U	0.050	0.020	0.011	1	02/15/23 13:44	
1,1,2,2-Tetrachloroethane	ND U	0.050	0.020	0.016	1	02/15/23 13:44	
Tetrachloroethene (PCE)	ND U	0.050	0.020	0.0099	1	02/15/23 13:44	
Toluene	ND U	0.050	0.010	0.0054	1	02/15/23 13:44	
1,2,3-Trichlorobenzene	<b>0.068 J</b>	0.20	0.040	0.011	1	02/15/23 13:44	
1,2,4-Trichlorobenzene	<b>0.026 J</b>	0.20	0.030	0.0096	1	02/15/23 13:44	
1,1,2-Trichloroethane	ND U	0.050	0.040	0.014	1	02/15/23 13:44	
1,1,1-Trichloroethane (TCA)	ND U	0.050	0.020	0.0075	1	02/15/23 13:44	
Trichloroethene (TCE)	ND U	0.050	0.020	0.010	1	02/15/23 13:44	
Trichlorofluoromethane (CFC 11)	ND U	0.050	0.020	0.012	1	02/15/23 13:44	
1,2,3-Trichloropropane	ND U	0.050	0.050	0.020	1	02/15/23 13:44	
1,2,4-Trimethylbenzene	ND U	0.20	0.020	0.0069	1	02/15/23 13:44	
1,3,5-Trimethylbenzene	ND U	0.20	0.020	0.0089	1	02/15/23 13:44	
Vinyl Chloride	ND U	0.050	0.010	0.0075	1	02/15/23 13:44	
m,p-Xylenes	ND U	0.050	0.020	0.011	1	02/15/23 13:44	
o-Xylene	ND U	0.050	0.020	0.0074	1	02/15/23 13:44	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	84	64 - 132	02/15/23 13:44	
Dibromofluoromethane	92	55 - 132	02/15/23 13:44	
1,2-Dichloroethane-d4	108	37 - 155	02/15/23 13:44	
Toluene-d8	91	81 - 124	02/15/23 13:44	

**ALS Group USA, Corp.**  
dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2301517  
**Date Analyzed:** 02/15/23  
**Date Extracted:** NA

**Duplicate Lab Control Sample Summary**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

**Units:** mg/Kg  
**Basis:** Dry  
**Analysis Lot:** 795524

Analyte Name	Lab Control Sample KQ2303442-03			Duplicate Lab Control Sample KQ2303442-04			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1,2-Tetrachloroethane	0.878	1.00	88	0.810	1.00	81	71-120	8	40
1,1,1-Trichloroethane (TCA)	0.899	1.00	90	0.824	1.00	82	61-136	9	40
1,1,2,2-Tetrachloroethane	1.03	1.00	103	0.965	1.00	97	63-127	7	40
1,1,2-Trichloroethane	0.977	1.00	98	0.894	1.00	89	73-118	9	40
1,1-Dichloroethane (1,1-DCA)	0.961	1.00	96	0.872	1.00	87	70-124	10	40
1,1-Dichloroethene (1,1-DCE)	0.853	1.00	85	0.781	1.00	78	67-141	9	40
1,1-Dichloropropene	0.920	1.00	92	0.846	1.00	85	65-130	8	40
1,2,3-Trichlorobenzene	1.27	1.00	127	1.15	1.00	115	49-149	10	40
1,2,3-Trichloropropane	1.00	1.00	100	0.956	1.00	96	76-128	5	40
1,2,4-Trichlorobenzene	1.04	1.00	104	0.952	1.00	95	55-134	9	40
1,2,4-Trimethylbenzene	1.03	1.00	103	0.960	1.00	96	69-123	7	40
1,2-Dibromo-3-chloropropane (DBCP)	1.05	1.00	105	0.914	1.00	91	46-132	13	40
1,2-Dibromoethane (EDB)	0.994	1.00	99	0.910	1.00	91	70-122	9	40
1,2-Dichlorobenzene	1.01	1.00	101	0.923	1.00	92	75-114	9	40
1,2-Dichloroethane (EDC)	0.950	1.00	95	0.876	1.00	88	70-126	8	40
1,2-Dichloropropane	0.953	1.00	95	0.872	1.00	87	73-121	9	40
1,3,5-Trimethylbenzene	1.03	1.00	103	0.952	1.00	95	68-129	8	40
1,3-Dichlorobenzene	0.991	1.00	99	0.915	1.00	92	69-117	8	40
1,3-Dichloropropane	1.00	1.00	100	0.922	1.00	92	70-121	8	40
1,4-Dichlorobenzene	0.942	1.00	94	0.872	1.00	87	69-114	8	40
2,2-Dichloropropane	0.963	1.00	96	0.865	1.00	87	49-136	11	40
2-Butanone (MEK)	5.48	5.00	110	5.19	5.00	104	65-139	5	40
2-Chlorotoluene	1.04	1.00	104	0.958	1.00	96	68-127	8	40
2-Hexanone	5.31	5.00	106	4.93	5.00	99	54-123	7	40
4-Chlorotoluene	1.05	1.00	105	0.963	1.00	96	66-121	9	40
4-Isopropyltoluene	0.926	1.00	93	0.845	1.00	85	68-127	9	40
4-Methyl-2-pentanone (MIBK)	5.59	5.00	112	5.16	5.00	103	73-126	8	40
Acetone	5.77	5.00	115	5.36	5.00	107	47-142	7	40
Benzene	0.942	1.00	94	0.851	1.00	85	70-134	10	40
Bromobenzene	0.953	1.00	95	0.903	1.00	90	66-118	5	40
Bromochloromethane	0.916	1.00	92	0.850	1.00	85	73-117	7	40
Bromodichloromethane	0.894	1.00	89	0.813	1.00	81	76-128	9	40
Bromoform	0.907	1.00	91	0.816	1.00	82	54-141	11	40
Bromomethane	0.821	1.00	82	0.740	1.00	74	29-171	10	40
Carbon Disulfide	1.68	2.00	84	1.54	2.00	77	48-140	9	40
Carbon Tetrachloride	0.856	1.00	86	0.772	1.00	77	72-140	10	40
Chlorobenzene	0.926	1.00	93	0.841	1.00	84	72-115	10	40
Chloroethane	0.765	1.00	77	0.692	1.00	69	53-134	10	40
Chloroform	0.973	1.00	97	0.882	1.00	88	73-125	10	40
Chloromethane	0.853	1.00	85	0.767	1.00	77	50-121	11	40
cis-1,2-Dichloroethene	0.925	1.00	93	0.854	1.00	85	77-124	8	40

**ALS Group USA, Corp.**  
dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2301517  
**Date Analyzed:** 02/15/23  
**Date Extracted:** NA

**Duplicate Lab Control Sample Summary**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

**Units:** mg/Kg  
**Basis:** Dry  
**Analysis Lot:** 795524

Analyte Name	Lab Control Sample KQ2303442-03			Duplicate Lab Control Sample KQ2303442-04			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
cis-1,3-Dichloropropene	0.832	1.00	83	0.766	1.00	77	57-132	8	40
Dibromochloromethane	0.886	1.00	89	0.799	1.00	80	64-126	10	40
Dibromomethane	0.941	1.00	94	0.868	1.00	87	75-124	8	40
Dichlorodifluoromethane (CFC 12)	0.765	1.00	77	0.674	1.00	67	21-143	13	40
Ethylbenzene	0.969	1.00	97	0.877	1.00	88	72-121	10	40
Hexachlorobutadiene	0.955	1.00	96	0.827	1.00	83	52-136	14	40
Isopropylbenzene (Cumene)	1.01	1.00	101	0.929	1.00	93	68-121	8	40
m,p-Xylenes	2.07	2.00	103	1.88	2.00	94	74-124	9	40
Methylene Chloride	0.895	1.00	90	0.822	1.00	82	69-121	9	40
Naphthalene	1.06	1.00	106	0.964	1.00	96	48-144	9	40
n-Butylbenzene	1.00	1.00	100	0.911	1.00	91	52-142	9	40
n-Propylbenzene	1.05	1.00	105	0.968	1.00	97	61-134	8	40
o-Xylene	0.998	1.00	100	0.907	1.00	91	73-123	10	40
sec-Butylbenzene	1.08	1.00	108	0.988	1.00	99	57-132	9	40
Styrene	0.921	1.00	92	0.810	1.00	81	77-122	13	40
tert-Butylbenzene	1.01	1.00	101	0.918	1.00	92	65-131	9	40
Tetrachloroethene (PCE)	0.842	1.00	84	0.779	1.00	78	65-126	8	40
Toluene	0.933	1.00	93	0.845	1.00	85	74-118	10	40
trans-1,2-Dichloroethene	0.921	1.00	92	0.825	1.00	83	76-128	11	40
trans-1,3-Dichloropropene	0.788	1.00	79	0.723	1.00	72	55-129	9	40
Trichloroethene (TCE)	0.891	1.00	89	0.815	1.00	82	69-126	9	40
Trichlorofluoromethane (CFC 11)	0.867	1.00	87	0.794	1.00	79	42-119	9	40
Vinyl Chloride	0.858	1.00	86	0.779	1.00	78	53-125	10	40



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March 16, 2023

**Analytical Report for Service Request No: K2301181**

Matt Thomas  
GSI Water Solutions, Inc  
6500 NE Holladay Street  
Suite 900  
Portland, OR 97232

**RE: 2022-Umatilla Depot / 913.001.002.002**

Dear Matt,

Enclosed are the results of the sample(s) submitted to our laboratory January 30, 2023  
For your reference, these analyses have been assigned our service request number **K2301181**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at [www.alsglobal.com](http://www.alsglobal.com). All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at [Mark.Harris@alsglobal.com](mailto:Mark.Harris@alsglobal.com).

Respectfully submitted,

**ALS Group USA, Corp. dba ALS Environmental**

Mark Harris  
Project Manager



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## Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

### **Inorganic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

### **Metals Data Qualifiers**

- # The control limit criteria is not applicable.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.  
  
i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Organic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Additional Petroleum Hydrocarbon Specific Qualifiers**

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso  
State Certifications, Accreditations, and Licenses**

<b>Agency</b>	<b>Web Site</b>	<b>Number</b>
Alaska DEH	<a href="http://dec.alaska.gov/eh/lab/cs/csapproval.htm">http://dec.alaska.gov/eh/lab/cs/csapproval.htm</a>	UST-040
Arizona DHS	<a href="http://www.azdhs.gov/lab/license/env.htm">http://www.azdhs.gov/lab/license/env.htm</a>	AZ0339
Arkansas - DEQ	<a href="http://www.adeq.state.ar.us/techsvs/labcert.htm">http://www.adeq.state.ar.us/techsvs/labcert.htm</a>	88-0637
California DHS (ELAP)	<a href="http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx">http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx</a>	2795
DOD ELAP	<a href="http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm">http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm</a>	L16-58-R4
Florida DOH	<a href="http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm">http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm</a>	E87412
Hawaii DOH	<a href="http://health.hawaii.gov/">http://health.hawaii.gov/</a>	-
ISO 17025	<a href="http://www.pjllabs.com/">http://www.pjllabs.com/</a>	L16-57
Louisiana DEQ	<a href="http://www.deq.louisiana.gov/page/la-lab-accreditation">http://www.deq.louisiana.gov/page/la-lab-accreditation</a>	03016
Maine DHS	<a href="http://www.maine.gov/dhhs/">http://www.maine.gov/dhhs/</a>	WA01276
Minnesota DOH	<a href="http://www.health.state.mn.us/accreditation">http://www.health.state.mn.us/accreditation</a>	053-999-457
Nevada DEP	<a href="http://ndep.nv.gov/bsdw/labservice.htm">http://ndep.nv.gov/bsdw/labservice.htm</a>	WA01276
New Jersey DEP	<a href="http://www.nj.gov/dep/enforcement/oqa.html">http://www.nj.gov/dep/enforcement/oqa.html</a>	WA005
New York - DOH	<a href="https://www.wadsworth.org/regulatory/elap">https://www.wadsworth.org/regulatory/elap</a>	12060
North Carolina DEQ	<a href="https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification">https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification</a>	605
Oklahoma DEQ	<a href="http://www.deq.state.ok.us/CSDnew/labcert.htm">http://www.deq.state.ok.us/CSDnew/labcert.htm</a>	9801
Oregon – DEQ (NELAP)	<a href="http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx">http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx</a>	WA100010
South Carolina DHEC	<a href="http://www.scdhec.gov/environment/EnvironmentalLabCertification/">http://www.scdhec.gov/environment/EnvironmentalLabCertification/</a>	61002
Texas CEQ	<a href="http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html">http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html</a>	T104704427
Washington DOE	<a href="http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html">http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html</a>	C544
Wyoming (EPA Region 8)	<a href="https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water">https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water</a>	-
Kelso Laboratory Website	<a href="http://www.alsglobal.com">www.alsglobal.com</a>	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at [www.ALSGlobal.com](http://www.ALSGlobal.com) or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.



## Case Narrative

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot  
**Sample Matrix:** Soil

**Service Request:** K2301181  
**Date Received:** 01/30/2023

### CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

#### Sample Receipt:

Five soil samples were received for analysis at ALS Environmental on 01/30/2023. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

#### General Chemistry:

Method 353.2M, 02/22/2023: The analysis of samples in this delivery group for Nitrate+Nitrite as Nitrogen was initially performed past the recommended holding time due to a login error. An incorrect test code was initially assigned to this analysis. Efforts were made to analyze the samples as soon as the error was identified. The data was flagged to indicate the holding time violation.

Method ASTM D422, 03/07/2023: The hydrometer result at 0.074 mm was slightly higher than the sieve result at 0.0750 mm for samples B2-012423-41.5 and B2-012423-58.0. This is the result of variability inherent in the determination of particle size using the hydrometer technique. No additional corrective action was appropriate.

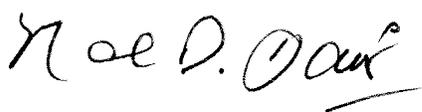
#### Volatiles by GC/MS:

Method 8260C, 02/08/2023: The upper control criterion was exceeded for Dibromofluoromethane and Toluene-d8 in Initial Calibration Verification (ICV). The field samples analyzed in this sequence did not contain the target analyte in question. Since the apparent problem indicated a potential high bias, the data quality was not affected. No further corrective action was required.

Method 8260C, 02/08/2023: The upper control criterion was exceeded for 4-Bromofluorobenzene, Dibromofluoromethane and Toluene-d8 in Continuing Calibration Verification (CCV). The field samples analyzed in this sequence did not contain the target analytes in question, other than Acetone in B2-012423-20.0. Since the apparent problem indicated a potential high bias, the data quality was not affected. No further corrective action was required.

Method 8260C, 02/08/2023: The lower control criterion was exceeded for 1,2,3-Trichloropropane in Continuing Calibration Verification (CCV). In accordance with ALS standard operating procedures, a Method Reporting Limit (MRL) check standard containing the analytes of concern was analyzed each day of analysis. The MRL check standard verified instrument sensitivity was adequate to detect the analytes at the MRL on the day of analysis. Because the sensitivity was shown to be adequate to detect the compound in question and the compound was not detected in the field sample, the data quality was not significantly affected. No further corrective action was taken.

Method 8260C, 02/08/2023: The upper control criterion was exceeded for many surrogates in samples and QC. Since the apparent problem equates to a high bias, the data quality was not significantly affected as samples were below MRL for target analytes, other than Acetone in B2-012423-20.0. No further corrective action was taken.

Approved by 

Date 03/16/2023



## Chain of Custody

**ALS Environmental—Kelso Laboratory**  
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[www.alsglobal.com](http://www.alsglobal.com)



**Cooler Receipt and Preservation Form**

Client GSI Water Solutions Service Request K2301181

Received: 1-30-23 Opened: 1-30-23 By: VM Unloaded: 1-30-23 By: VM

- Samples were received via?  USPS  Fed Ex  UPS  DHL  PDX  Courier  Hand Delivered
- Samples were received in: (circle)  Cooler  Box  Envelope  Other  NA
- Were custody seals on coolers?  NA  Y  N If yes, how many and where? \_\_\_\_\_  
 If present, were custody seals intact?  Y  N If present, were they signed and dated?  Y  N

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with 'X'	PM Notified If out of temp	Tracking Number NA	Filed
-10.5	-20.5	IR02	127378				

- Was a Temperature Blank present in cooler?  NA  Y  N If yes, notate the temperature in the appropriate column above:  
 If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
- Were samples received within the method specified temperature ranges?  NA  Y  N  
 If no, were they received on ice and same day as collected? If not, notate the cooler # above and notify the PM.  NA  Y  N
- If applicable, tissue samples were received:  Frozen  Partially Thawed  Thawed
- Packing material:  Inserts  Baggies  Bubble Wrap  Gel Packs  Wet Ice  Dry Ice  Sleeves \_\_\_\_\_
- Were custody papers properly filled out (ink, signed, etc.)?  NA  Y  N
- Were samples received in good condition (unbroken)  NA  Y  N
- Were all sample labels complete (ie, analysis, preservation, etc.)?  NA  Y  N
- Did all sample labels and tags agree with custody papers?  NA  Y  N
- Were appropriate bottles/containers and volumes received for the tests indicated?  NA  Y  N
- Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below  NA  Y  N
- Were VOA vials received without headspace? Indicate in the table below  NA  Y  N
- Was C12/Res negative?  NA  Y  N
- Were samples received within the method specified time limit? If not, notate the error below and notify the PM  NA  Y  N
- Were 100ml sterile microbiology bottles filled exactly to the 100ml mark?  NA  Y  N Underfilled Overfilled

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, Resolutions: \_\_\_\_\_



# Total Solids

**ALS Environmental—Kelso Laboratory**  
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ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil  
**Analysis Method:** 160.3 Modified  
**Prep Method:** None

**Service Request:** K2301181  
**Date Collected:** 01/24/23  
**Date Received:** 01/30/23  
**Units:** Percent  
**Basis:** As Received

**Solids, Total**

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
B2-012423-10.0	K2301181-001	91.6	-	-	1	02/02/23 11:14	
B2-012423-20.0	K2301181-002	89.5	-	-	1	02/02/23 11:14	
B2-012423-20.0	K2301181-003	90.8	-	-	1	02/02/23 11:14	
B2-012423-41.5	K2301181-004	93.2	-	-	1	02/02/23 11:14	
B2-012423-58.0	K2301181-005	93.9	-	-	1	02/02/23 11:14	

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2301181  
**Date Collected:** 01/24/23  
**Date Received:** 01/30/23  
**Date Analyzed:** 02/02/23

**Replicate Sample Summary**  
**Inorganic Parameters**

**Sample Name:** B2-012423-10.0  
**Lab Code:** K2301181-001

**Units:** Percent  
**Basis:** As Received

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>MRL</u>	<u>Sample Result</u>	<u>Duplicate Sample K2301181-001DUP Result</u>	<u>Average</u>	<u>RPD</u>	<u>RPD Limit</u>
Solids, Total	160.3 Modified	-	91.6	92.3	92.0	<1	20

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.



# General Chemistry

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ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil  
**Analysis Method:** 353.2M  
**Prep Method:** ALS SOP

**Service Request:** K2301181  
**Date Collected:** 01/24/23  
**Date Received:** 01/30/23  
**Units:** mg/Kg  
**Basis:** Dry

Nitrate+Nitrite as Nitrogen

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
B2-012423-10.0	K2301181-001	<b>0.55</b>	0.54	0.08	1	02/22/23 13:42	2/6/23	*
B2-012423-20.0	K2301181-002	<b>1.08</b>	0.55	0.08	1	02/22/23 13:42	2/6/23	*
Method Blank	K2301181-MB	ND U	0.50	0.07	1	02/22/23 13:42	2/6/23	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2301181  
**Date Analyzed:** 02/22/23  
**Date Extracted:** 02/06/23

**Lab Control Sample Summary**  
**Nitrate+Nitrite as Nitrogen**

**Analysis Method:** 353.2M  
**Prep Method:** ALS SOP

**Units:** mg/Kg  
**Basis:** Dry  
**Analysis Lot:** 794177

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2301181-LCS	6.99	7.20	97	87-113

**ALS Group USA, Corp.**  
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**Analytical Report**

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2301181  
**Date Collected:** 01/24/23  
**Date Received:** 01/30/23  
**Date Analyzed:** 03/07/23

**Particle Size Determination**  
**ASTM D422**

**Sample Name:** B2-012423-20.0  
**Lab Code:** K2301181-003

**Gravel and Sand**  
**(Sieve Analysis)**

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	94.29
Gravel (9.50 mm)	No.3/8"(9.50 mm)	14.2758	62.95
Gravel, Medium	No.4 (4.75 mm)	11.4704	37.77
Gravel, Fine	No.10 (2.00 mm)	6.5669	23.36
Sand, Very Coarse	No.20 (0.850 mm)	1.9289	19.92
Sand, Coarse	No.40 (0.425 mm)	0.7683	18.55
Sand, Medium	No.60 (0.250 mm)	0.3768	17.88
Sand, Fine	No.140 (0.106 mm)	0.6142	16.78
Sand, Very Fine	No.200 (0.0750 mm)	0.3411	16.17

**Silt and Clay**  
**(Hydrometer Analysis)**

Particle Diameter	Percent Passing
0.074 mm	15.02
0.005 mm	7.97
0.001 mm	3.75

**ALS Group USA, Corp.**  
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**Analytical Report**

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2301181  
**Date Collected:** 01/24/23  
**Date Received:** 01/30/23  
**Date Analyzed:** 03/07/23

**Particle Size Determination**  
**ASTM D422**

**Sample Name:** B2-012423-20.0  
**Lab Code:** K2301181-003DUP

**Gravel and Sand**  
**(Sieve Analysis)**

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	94.70
Gravel (9.50 mm)	No.3/8"(9.50 mm)	16.4055	58.40
Gravel, Medium	No.4 (4.75 mm)	12.5756	30.58
Gravel, Fine	No.10 (2.00 mm)	4.8372	19.88
Sand, Very Coarse	No.20 (0.850 mm)	1.4340	17.34
Sand, Coarse	No.40 (0.425 mm)	0.6201	16.25
Sand, Medium	No.60 (0.250 mm)	0.3408	15.65
Sand, Fine	No.140 (0.106 mm)	0.5201	14.73
Sand, Very Fine	No.200 (0.0750 mm)	0.2932	14.21

**Silt and Clay**  
**(Hydrometer Analysis)**

Particle Diameter	Percent Passing
0.074 mm	13.68
0.005 mm	8.01
0.001 mm	4.62

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**Analytical Report**

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2301181  
**Date Collected:** 01/24/23  
**Date Received:** 01/30/23  
**Date Analyzed:** 03/07/23

**Particle Size Determination**  
**ASTM D422**

**Sample Name:** B2-012423-41.5  
**Lab Code:** K2301181-004

**Gravel and Sand**  
**(Sieve Analysis)**

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	95.59
Gravel (9.50 mm)	No.3/8"(9.50 mm)	21.8748	49.77
Gravel, Medium	No.4 (4.75 mm)	9.7438	29.36
Gravel, Fine	No.10 (2.00 mm)	6.9905	14.71
Sand, Very Coarse	No.20 (0.850 mm)	3.1804	9.54
Sand, Coarse	No.40 (0.425 mm)	1.0483	7.84
Sand, Medium	No.60 (0.250 mm)	0.4124	7.17
Sand, Fine	No.140 (0.106 mm)	0.4819	6.38
Sand, Very Fine	No.200 (0.0750 mm)	0.1633	6.12

**Silt and Clay**  
**(Hydrometer Analysis)**

Particle Diameter	Percent Passing
0.074 mm	7.06
0.005 mm	5.84
0.001 mm	4.98

**ALS Group USA, Corp.**  
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**Analytical Report**

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2301181  
**Date Collected:** 01/24/23  
**Date Received:** 01/30/23  
**Date Analyzed:** 03/07/23

**Particle Size Determination**  
**ASTM D422**

**Sample Name:** B2-012423-58.0  
**Lab Code:** K2301181-005

**Gravel and Sand**  
**(Sieve Analysis)**

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	82.69
Gravel (9.50 mm)	No.3/8"(9.50 mm)	16.1549	47.48
Gravel, Medium	No.4 (4.75 mm)	8.5574	28.83
Gravel, Fine	No.10 (2.00 mm)	5.8972	15.98
Sand, Very Coarse	No.20 (0.850 mm)	3.4852	12.30
Sand, Coarse	No.40 (0.425 mm)	1.7782	10.43
Sand, Medium	No.60 (0.250 mm)	0.9287	9.45
Sand, Fine	No.140 (0.106 mm)	1.1250	8.26
Sand, Very Fine	No.200 (0.0750 mm)	0.3916	7.85

**Silt and Clay**  
**(Hydrometer Analysis)**

Particle Diameter	Percent Passing
0.074 mm	8.38
0.005 mm	4.96
0.001 mm	2.84



# Volatile Organic Compounds by GC/MS

**ALS Environmental—Kelso Laboratory**  
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**ALS Group USA, Corp.**  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil  
**Sample Name:** B2-012423-10.0  
**Lab Code:** K2301181-001

**Service Request:** K2301181  
**Date Collected:** 01/24/23 12:00  
**Date Received:** 01/30/23 13:15  
**Units:** ug/Kg  
**Basis:** Dry

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Acetone	17 J	22	4.4	3.2	1	01/31/23 15:27	
Benzene	ND U	5.5	0.22	0.060	1	01/31/23 15:27	
Bromobenzene	ND U	5.5	0.33	0.097	1	01/31/23 15:27	
Bromochloromethane	ND U	5.5	0.55	0.27	1	01/31/23 15:27	
Bromodichloromethane	ND U	5.5	0.55	0.18	1	01/31/23 15:27	
Bromoform	ND U	5.5	0.55	0.16	1	01/31/23 15:27	
Bromomethane	ND U	5.5	0.55	0.22	1	01/31/23 15:27	
2-Butanone (MEK)	ND U	22	1.1	0.99	1	01/31/23 15:27	
n-Butylbenzene	ND U	22	0.22	0.076	1	01/31/23 15:27	
sec-Butylbenzene	ND U	22	0.22	0.082	1	01/31/23 15:27	
tert-Butylbenzene	ND U	22	0.55	0.16	1	01/31/23 15:27	
Carbon Disulfide	ND U	5.5	0.33	0.11	1	01/31/23 15:27	
Carbon Tetrachloride	ND U	5.5	0.33	0.11	1	01/31/23 15:27	
Chlorobenzene	ND U	5.5	0.22	0.072	1	01/31/23 15:27	
Chloroethane	ND U	5.5	1.1	0.82	1	01/31/23 15:27	
Chloroform	ND U	5.5	0.44	0.13	1	01/31/23 15:27	
Chloromethane	ND U	5.5	0.55	0.20	1	01/31/23 15:27	
2-Chlorotoluene	ND U	22	0.44	0.14	1	01/31/23 15:27	
4-Chlorotoluene	ND U	22	0.44	0.097	1	01/31/23 15:27	
1,2-Dibromo-3-chloropropane	ND U	22	1.5	0.44	1	01/31/23 15:27	
Dibromochloromethane	ND U	5.5	0.55	0.20	1	01/31/23 15:27	
1,2-Dibromoethane (EDB)	ND U	22	0.33	0.11	1	01/31/23 15:27	
Dibromomethane	ND U	5.5	0.55	0.31	1	01/31/23 15:27	
1,2-Dichlorobenzene	ND U	5.5	0.33	0.085	1	01/31/23 15:27	
1,3-Dichlorobenzene	ND U	6.6	0.33	0.11	1	01/31/23 15:27	
1,4-Dichlorobenzene	ND U	2.2	0.33	0.095	1	01/31/23 15:27	
Dichlorodifluoromethane	ND U	5.5	0.44	0.14	1	01/31/23 15:27	
1,1-Dichloroethane	ND U	5.5	0.44	0.14	1	01/31/23 15:27	
1,2-Dichloroethane (EDC)	ND U	5.5	0.22	0.077	1	01/31/23 15:27	
1,1-Dichloroethene	ND U	5.5	0.55	0.28	1	01/31/23 15:27	
cis-1,2-Dichloroethene	ND U	5.5	0.44	0.14	1	01/31/23 15:27	
trans-1,2-Dichloroethene	ND U	5.5	0.44	0.14	1	01/31/23 15:27	
1,2-Dichloropropane	ND U	5.5	0.55	0.15	1	01/31/23 15:27	
1,3-Dichloropropane	ND U	2.2	0.44	0.14	1	01/31/23 15:27	
2,2-Dichloropropane	ND U	5.5	0.33	0.11	1	01/31/23 15:27	
1,1-Dichloropropene	ND U	5.5	0.55	0.15	1	01/31/23 15:27	
cis-1,3-Dichloropropene	ND U	5.5	0.55	0.15	1	01/31/23 15:27	
trans-1,3-Dichloropropene	ND U	5.5	0.44	0.13	1	01/31/23 15:27	
Ethylbenzene	ND U	5.5	0.33	0.11	1	01/31/23 15:27	
Hexachlorobutadiene	ND U	22	0.88	0.44	1	01/31/23 15:27	
2-Hexanone	ND U	22	2.2	1.1	1	01/31/23 15:27	

**ALS Group USA, Corp.**  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil  
**Sample Name:** B2-012423-10.0  
**Lab Code:** K2301181-001

**Service Request:** K2301181  
**Date Collected:** 01/24/23 12:00  
**Date Received:** 01/30/23 13:15

**Units:** ug/Kg  
**Basis:** Dry

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Isopropylbenzene	ND U	22	0.33	0.089	1	01/31/23 15:27	
4-Isopropyltoluene	ND U	22	0.22	0.071	1	01/31/23 15:27	
Methyl tert-Butyl Ether	ND U	5.5	0.44	0.14	1	01/31/23 15:27	
4-Methyl-2-pentanone (MIBK)	ND U	22	2.0	2.0	1	01/31/23 15:27	
Methylene Chloride	<b>0.57 J</b>	11	0.55	0.18	1	01/31/23 15:27	
Naphthalene	ND U	22	0.55	0.15	1	01/31/23 15:27	
n-Propylbenzene	ND U	22	0.55	0.15	1	01/31/23 15:27	
Styrene	ND U	5.5	0.55	0.16	1	01/31/23 15:27	
1,1,1,2-Tetrachloroethane	ND U	5.5	0.44	0.13	1	01/31/23 15:27	
1,1,2,2-Tetrachloroethane	ND U	5.5	0.55	0.15	1	01/31/23 15:27	
Tetrachloroethene (PCE)	ND U	5.5	0.55	0.18	1	01/31/23 15:27	
Toluene	ND U	5.5	0.55	0.17	1	01/31/23 15:27	
1,2,3-Trichlorobenzene	ND U	22	0.55	0.21	1	01/31/23 15:27	
1,2,4-Trichlorobenzene	ND U	22	0.55	0.15	1	01/31/23 15:27	
1,1,2-Trichloroethane	ND U	5.5	0.55	0.17	1	01/31/23 15:27	
1,1,1-Trichloroethane (TCA)	ND U	5.5	0.44	0.13	1	01/31/23 15:27	
Trichloroethene (TCE)	ND U	5.5	0.55	0.17	1	01/31/23 15:27	
Trichlorofluoromethane (CFC 11)	ND U	5.5	0.33	0.094	1	01/31/23 15:27	
1,2,3-Trichloropropane	ND U	5.5	1.5	0.50	1	01/31/23 15:27	*
1,2,4-Trimethylbenzene	ND U	22	0.22	0.060	1	01/31/23 15:27	
1,3,5-Trimethylbenzene	ND U	22	0.33	0.11	1	01/31/23 15:27	
Vinyl Chloride	ND U	5.5	0.55	0.20	1	01/31/23 15:27	
o-Xylene	ND U	5.5	0.33	0.089	1	01/31/23 15:27	
m,p-Xylenes	ND U	22	0.44	0.11	1	01/31/23 15:27	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	124	79 - 119	01/31/23 15:27	*
Dibromofluoromethane	118	78 - 119	01/31/23 15:27	
1,2-Dichloroethane-d4	124	71 - 136	01/31/23 15:27	
Toluene-d8	133	85 - 116	01/31/23 15:27	*

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil  
**Sample Name:** B2-012423-20.0  
**Lab Code:** K2301181-002

**Service Request:** K2301181  
**Date Collected:** 01/24/23 12:30  
**Date Received:** 01/30/23 13:15

**Units:** ug/Kg  
**Basis:** Dry

Volatile Organic Compounds by GC/MS

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Acetone	26	20	4.0	2.9	1	01/31/23 15:47	
Benzene	ND U	4.9	0.20	0.054	1	01/31/23 15:47	
Bromobenzene	ND U	4.9	0.30	0.088	1	01/31/23 15:47	
Bromochloromethane	ND U	4.9	0.50	0.24	1	01/31/23 15:47	
Bromodichloromethane	ND U	4.9	0.50	0.16	1	01/31/23 15:47	
Bromoform	ND U	4.9	0.50	0.14	1	01/31/23 15:47	
Bromomethane	ND U	4.9	0.50	0.20	1	01/31/23 15:47	
2-Butanone (MEK)	3.6 J	20	1.0	0.90	1	01/31/23 15:47	
n-Butylbenzene	ND U	20	0.20	0.069	1	01/31/23 15:47	
sec-Butylbenzene	ND U	20	0.20	0.074	1	01/31/23 15:47	
tert-Butylbenzene	ND U	20	0.50	0.14	1	01/31/23 15:47	
Carbon Disulfide	ND U	4.9	0.30	0.092	1	01/31/23 15:47	
Carbon Tetrachloride	ND U	4.9	0.30	0.094	1	01/31/23 15:47	
Chlorobenzene	ND U	4.9	0.20	0.065	1	01/31/23 15:47	
Chloroethane	ND U	4.9	1.0	0.74	1	01/31/23 15:47	
Chloroform	ND U	4.9	0.40	0.11	1	01/31/23 15:47	
Chloromethane	ND U	4.9	0.50	0.18	1	01/31/23 15:47	
2-Chlorotoluene	ND U	20	0.40	0.12	1	01/31/23 15:47	
4-Chlorotoluene	ND U	20	0.40	0.088	1	01/31/23 15:47	
1,2-Dibromo-3-chloropropane	ND U	20	1.4	0.40	1	01/31/23 15:47	
Dibromochloromethane	ND U	4.9	0.50	0.18	1	01/31/23 15:47	
1,2-Dibromoethane (EDB)	ND U	20	0.30	0.094	1	01/31/23 15:47	
Dibromomethane	ND U	4.9	0.50	0.28	1	01/31/23 15:47	
1,2-Dichlorobenzene	ND U	4.9	0.30	0.077	1	01/31/23 15:47	
1,3-Dichlorobenzene	ND U	5.9	0.30	0.094	1	01/31/23 15:47	
1,4-Dichlorobenzene	ND U	2.0	0.30	0.086	1	01/31/23 15:47	
Dichlorodifluoromethane	ND U	4.9	0.40	0.12	1	01/31/23 15:47	
1,1-Dichloroethane	ND U	4.9	0.40	0.12	1	01/31/23 15:47	
1,2-Dichloroethane (EDC)	ND U	4.9	0.20	0.070	1	01/31/23 15:47	
1,1-Dichloroethene	ND U	4.9	0.50	0.25	1	01/31/23 15:47	
cis-1,2-Dichloroethene	ND U	4.9	0.40	0.12	1	01/31/23 15:47	
trans-1,2-Dichloroethene	ND U	4.9	0.40	0.12	1	01/31/23 15:47	
1,2-Dichloropropane	ND U	4.9	0.50	0.13	1	01/31/23 15:47	
1,3-Dichloropropane	ND U	2.0	0.40	0.12	1	01/31/23 15:47	
2,2-Dichloropropane	ND U	4.9	0.30	0.098	1	01/31/23 15:47	
1,1-Dichloropropene	ND U	4.9	0.50	0.13	1	01/31/23 15:47	
cis-1,3-Dichloropropene	ND U	4.9	0.50	0.13	1	01/31/23 15:47	
trans-1,3-Dichloropropene	ND U	4.9	0.40	0.11	1	01/31/23 15:47	
Ethylbenzene	ND U	4.9	0.30	0.094	1	01/31/23 15:47	
Hexachlorobutadiene	ND U	20	0.80	0.40	1	01/31/23 15:47	
2-Hexanone	ND U	20	2.0	0.93	1	01/31/23 15:47	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil  
**Sample Name:** B2-012423-20.0  
**Lab Code:** K2301181-002

**Service Request:** K2301181  
**Date Collected:** 01/24/23 12:30  
**Date Received:** 01/30/23 13:15

**Units:** ug/Kg  
**Basis:** Dry

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Isopropylbenzene	ND U	20	0.30	0.081	1	01/31/23 15:47	
4-Isopropyltoluene	ND U	20	0.20	0.064	1	01/31/23 15:47	
Methyl tert-Butyl Ether	ND U	4.9	0.40	0.12	1	01/31/23 15:47	
4-Methyl-2-pentanone (MIBK)	ND U	20	1.8	1.8	1	01/31/23 15:47	
Methylene Chloride	<b>0.76 J</b>	9.9	0.50	0.16	1	01/31/23 15:47	
Naphthalene	ND U	20	0.50	0.13	1	01/31/23 15:47	
n-Propylbenzene	ND U	20	0.50	0.13	1	01/31/23 15:47	
Styrene	ND U	4.9	0.50	0.14	1	01/31/23 15:47	
1,1,1,2-Tetrachloroethane	ND U	4.9	0.40	0.11	1	01/31/23 15:47	
1,1,2,2-Tetrachloroethane	ND U	4.9	0.50	0.13	1	01/31/23 15:47	
Tetrachloroethene (PCE)	ND U	4.9	0.50	0.16	1	01/31/23 15:47	
Toluene	<b>0.68 J</b>	4.9	0.50	0.15	1	01/31/23 15:47	
1,2,3-Trichlorobenzene	ND U	20	0.50	0.19	1	01/31/23 15:47	
1,2,4-Trichlorobenzene	ND U	20	0.50	0.13	1	01/31/23 15:47	
1,1,2-Trichloroethane	ND U	4.9	0.50	0.15	1	01/31/23 15:47	
1,1,1-Trichloroethane (TCA)	ND U	4.9	0.40	0.11	1	01/31/23 15:47	
Trichloroethene (TCE)	ND U	4.9	0.50	0.15	1	01/31/23 15:47	
Trichlorofluoromethane (CFC 11)	ND U	4.9	0.30	0.085	1	01/31/23 15:47	
1,2,3-Trichloropropane	ND U	4.9	1.4	0.45	1	01/31/23 15:47	*
1,2,4-Trimethylbenzene	<b>0.22 J</b>	20	0.20	0.054	1	01/31/23 15:47	
1,3,5-Trimethylbenzene	ND U	20	0.30	0.092	1	01/31/23 15:47	
Vinyl Chloride	ND U	4.9	0.50	0.18	1	01/31/23 15:47	
o-Xylene	<b>0.11 J</b>	4.9	0.30	0.081	1	01/31/23 15:47	
m,p-Xylenes	<b>0.38 J</b>	20	0.40	0.10	1	01/31/23 15:47	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	120	79 - 119	01/31/23 15:47	*
Dibromofluoromethane	121	78 - 119	01/31/23 15:47	*
1,2-Dichloroethane-d4	122	71 - 136	01/31/23 15:47	
Toluene-d8	133	85 - 116	01/31/23 15:47	*

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2301181

**SURROGATE RECOVERY SUMMARY**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Extraction Method:** None

Sample Name	Lab Code	4-Bromofluorobenzene	Dibromofluoromethane	1,2-Dichloroethane-d4
		79-119	78-119	71-136
B2-012423-10.0	K2301181-001	124*	118	124
B2-012423-20.0	K2301181-002	120*	121*	122
Method Blank	KQ2302313-05	121*	116	109
Lab Control Sample	KQ2302313-03	118	125*	114
Duplicate Lab Control Sample	KQ2302313-04	122*	123*	116

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2301181

**SURROGATE RECOVERY SUMMARY**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Extraction Method:** None

Sample Name	Lab Code	Toluene-d8
		85-116
B2-012423-10.0	K2301181-001	133*
B2-012423-20.0	K2301181-002	133*
Method Blank	KQ2302313-05	114
Lab Control Sample	KQ2302313-03	133*
Duplicate Lab Control Sample	KQ2302313-04	135*

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil  
**Sample Name:** Method Blank  
**Lab Code:** KQ2302313-05

**Service Request:** K2301181  
**Date Collected:** NA  
**Date Received:** NA

**Units:** ug/Kg  
**Basis:** Dry

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Acetone	ND U	20	4.0	2.9	1	01/31/23 12:34	
Benzene	ND U	5.0	0.20	0.054	1	01/31/23 12:34	
Bromobenzene	ND U	5.0	0.30	0.088	1	01/31/23 12:34	
Bromochloromethane	ND U	5.0	0.50	0.24	1	01/31/23 12:34	
Bromodichloromethane	ND U	5.0	0.50	0.16	1	01/31/23 12:34	
Bromoform	ND U	5.0	0.50	0.14	1	01/31/23 12:34	
Bromomethane	ND U	5.0	0.50	0.20	1	01/31/23 12:34	
2-Butanone (MEK)	<b>3.2 J</b>	20	1.0	0.90	1	01/31/23 12:34	
n-Butylbenzene	ND U	20	0.20	0.069	1	01/31/23 12:34	
sec-Butylbenzene	ND U	20	0.20	0.074	1	01/31/23 12:34	
tert-Butylbenzene	ND U	20	0.50	0.14	1	01/31/23 12:34	
Carbon Disulfide	ND U	5.0	0.30	0.092	1	01/31/23 12:34	
Carbon Tetrachloride	ND U	5.0	0.30	0.094	1	01/31/23 12:34	
Chlorobenzene	ND U	5.0	0.20	0.065	1	01/31/23 12:34	
Chloroethane	ND U	5.0	1.0	0.74	1	01/31/23 12:34	
Chloroform	ND U	5.0	0.40	0.11	1	01/31/23 12:34	
Chloromethane	ND U	5.0	0.50	0.18	1	01/31/23 12:34	
2-Chlorotoluene	ND U	20	0.40	0.12	1	01/31/23 12:34	
4-Chlorotoluene	ND U	20	0.40	0.088	1	01/31/23 12:34	
1,2-Dibromo-3-chloropropane	ND U	20	1.4	0.40	1	01/31/23 12:34	
Dibromochloromethane	ND U	5.0	0.50	0.18	1	01/31/23 12:34	
1,2-Dibromoethane (EDB)	ND U	20	0.30	0.094	1	01/31/23 12:34	
Dibromomethane	ND U	5.0	0.50	0.28	1	01/31/23 12:34	
1,2-Dichlorobenzene	ND U	5.0	0.30	0.077	1	01/31/23 12:34	
1,3-Dichlorobenzene	ND U	6.0	0.30	0.094	1	01/31/23 12:34	
1,4-Dichlorobenzene	ND U	2.0	0.30	0.086	1	01/31/23 12:34	
Dichlorodifluoromethane	ND U	5.0	0.40	0.12	1	01/31/23 12:34	
1,1-Dichloroethane	ND U	5.0	0.40	0.12	1	01/31/23 12:34	
1,2-Dichloroethane (EDC)	ND U	5.0	0.20	0.070	1	01/31/23 12:34	
1,1-Dichloroethene	ND U	5.0	0.50	0.25	1	01/31/23 12:34	
cis-1,2-Dichloroethene	ND U	5.0	0.40	0.12	1	01/31/23 12:34	
trans-1,2-Dichloroethene	ND U	5.0	0.40	0.12	1	01/31/23 12:34	
1,2-Dichloropropane	ND U	5.0	0.50	0.13	1	01/31/23 12:34	
1,3-Dichloropropane	ND U	2.0	0.40	0.12	1	01/31/23 12:34	
2,2-Dichloropropane	ND U	5.0	0.30	0.098	1	01/31/23 12:34	
1,1-Dichloropropene	ND U	5.0	0.50	0.13	1	01/31/23 12:34	
cis-1,3-Dichloropropene	ND U	5.0	0.50	0.13	1	01/31/23 12:34	
trans-1,3-Dichloropropene	ND U	5.0	0.40	0.11	1	01/31/23 12:34	
Ethylbenzene	ND U	5.0	0.30	0.094	1	01/31/23 12:34	
Hexachlorobutadiene	ND U	20	0.80	0.40	1	01/31/23 12:34	
2-Hexanone	ND U	20	2.0	0.93	1	01/31/23 12:34	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil  
**Sample Name:** Method Blank  
**Lab Code:** KQ2302313-05

**Service Request:** K2301181  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/Kg  
**Basis:** Dry

Volatile Organic Compounds by GC/MS

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Isopropylbenzene	ND U	20	0.30	0.081	1	01/31/23 12:34	
4-Isopropyltoluene	ND U	20	0.20	0.064	1	01/31/23 12:34	
Methyl tert-Butyl Ether	ND U	5.0	0.40	0.12	1	01/31/23 12:34	
4-Methyl-2-pentanone (MIBK)	ND U	20	1.8	1.8	1	01/31/23 12:34	
Methylene Chloride	ND U	10	0.50	0.16	1	01/31/23 12:34	
Naphthalene	0.41 J	20	0.50	0.13	1	01/31/23 12:34	
n-Propylbenzene	ND U	20	0.50	0.13	1	01/31/23 12:34	
Styrene	ND U	5.0	0.50	0.14	1	01/31/23 12:34	
1,1,1,2-Tetrachloroethane	ND U	5.0	0.40	0.11	1	01/31/23 12:34	
1,1,2,2-Tetrachloroethane	ND U	5.0	0.50	0.13	1	01/31/23 12:34	
Tetrachloroethene (PCE)	ND U	5.0	0.50	0.16	1	01/31/23 12:34	
Toluene	ND U	5.0	0.50	0.15	1	01/31/23 12:34	
1,2,3-Trichlorobenzene	0.36 J	20	0.50	0.19	1	01/31/23 12:34	
1,2,4-Trichlorobenzene	ND U	20	0.50	0.13	1	01/31/23 12:34	
1,1,2-Trichloroethane	ND U	5.0	0.50	0.15	1	01/31/23 12:34	
1,1,1-Trichloroethane (TCA)	ND U	5.0	0.40	0.11	1	01/31/23 12:34	
Trichloroethene (TCE)	ND U	5.0	0.50	0.15	1	01/31/23 12:34	
Trichlorofluoromethane (CFC 11)	ND U	5.0	0.30	0.085	1	01/31/23 12:34	
1,2,3-Trichloropropane	ND U	5.0	1.4	0.45	1	01/31/23 12:34	
1,2,4-Trimethylbenzene	ND U	20	0.20	0.054	1	01/31/23 12:34	
1,3,5-Trimethylbenzene	ND U	20	0.30	0.092	1	01/31/23 12:34	
Vinyl Chloride	ND U	5.0	0.50	0.18	1	01/31/23 12:34	
o-Xylene	ND U	5.0	0.30	0.081	1	01/31/23 12:34	
m,p-Xylenes	ND U	20	0.40	0.10	1	01/31/23 12:34	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	121	79 - 119	01/31/23 12:34	*
Dibromofluoromethane	116	78 - 119	01/31/23 12:34	
1,2-Dichloroethane-d4	109	71 - 136	01/31/23 12:34	
Toluene-d8	114	85 - 116	01/31/23 12:34	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2301181  
**Date Analyzed:** 01/31/23  
**Date Extracted:** NA

**Duplicate Lab Control Sample Summary**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

**Units:** ug/Kg  
**Basis:** Dry  
**Analysis Lot:** 793159

Analyte Name	Lab Control Sample KQ2302313-03			Duplicate Lab Control Sample KQ2302313-04			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1,2-Tetrachloroethane	44.7	50.0	89	44.7	50.0	89	78-125	<1	20
1,1,1-Trichloroethane (TCA)	48.6	50.0	97	44.8	50.0	90	73-130	8	20
1,1,2,2-Tetrachloroethane	44.1	50.0	88	43.2	50.0	86	70-124	2	20
1,1,2-Trichloroethane	43.4	50.0	87	43.5	50.0	87	78-121	<1	20
1,1-Dichloroethane	46.6	50.0	93	51.2	50.0	102	76-125	9	20
1,1-Dichloroethene	51.2	50.0	102	48.2	50.0	96	70-131	6	20
1,1-Dichloropropene	47.8	50.0	96	44.8	50.0	90	76-125	6	20
1,2,3-Trichlorobenzene	47.3	50.0	95	45.9	50.0	92	66-130	3	20
1,2,3-Trichloropropane	42.0	50.0	84	41.4	50.0	83	73-125	1	20
1,2,4-Trichlorobenzene	47.0	50.0	94	44.3	50.0	89	67-129	6	20
1,2,4-Trimethylbenzene	48.9	50.0	98	47.0	50.0	94	75-123	4	20
1,2-Dibromo-3-chloropropane	45.0	50.0	90	41.3	50.0	83	61-132	9	20
1,2-Dibromoethane (EDB)	45.8	50.0	92	46.0	50.0	92	78-122	<1	20
1,2-Dichlorobenzene	47.6	50.0	95	45.8	50.0	92	78-121	4	20
1,2-Dichloroethane (EDC)	48.9	50.0	98	48.9	50.0	98	73-128	<1	20
1,2-Dichloropropane	45.8	50.0	92	44.5	50.0	89	76-123	3	20
1,3,5-Trimethylbenzene	47.9	50.0	96	45.2	50.0	90	73-124	6	20
1,3-Dichlorobenzene	48.3	50.0	97	47.2	50.0	94	77-121	2	20
1,3-Dichloropropane	44.4	50.0	89	45.2	50.0	90	77-121	2	20
1,4-Dichlorobenzene	48.4	50.0	97	46.3	50.0	93	75-120	4	20
2,2-Dichloropropane	46.5	50.0	93	44.3	50.0	89	67-133	5	20
2-Butanone (MEK)	211	250	85	213	250	85	51-148	<1	20
2-Chlorotoluene	46.2	50.0	92	44.4	50.0	89	75-122	4	20
2-Hexanone	228	250	91	229	250	91	53-145	<1	20
4-Chlorotoluene	48.1	50.0	96	46.5	50.0	93	72-124	3	20
4-Isopropyltoluene	50.9	50.0	102	47.2	50.0	94	73-127	8	20
4-Methyl-2-pentanone (MIBK)	244	250	98	242	250	97	65-135	<1	20
Acetone	242	250	97	245	250	98	36-164	1	20
Benzene	45.2	50.0	90	44.5	50.0	89	77-121	2	20
Bromobenzene	45.2	50.0	90	43.8	50.0	88	78-121	3	20
Bromochloromethane	45.6	50.0	91	44.2	50.0	88	78-125	3	20
Bromodichloromethane	47.7	50.0	95	47.1	50.0	94	75-127	1	20
Bromoform	46.5	50.0	93	47.6	50.0	95	67-132	2	20
Bromomethane	46.1	50.0	92	49.3	50.0	99	53-143	7	20
Carbon Disulfide	91.6	100	92	85.5	100	86	63-132	7	20
Carbon Tetrachloride	47.3	50.0	95	44.9	50.0	90	70-135	5	20
Chlorobenzene	46.3	50.0	93	46.0	50.0	92	79-120	<1	20
Chloroethane	46.4	50.0	93	47.7	50.0	95	59-139	3	20
Chloroform	47.6	50.0	95	46.5	50.0	93	78-123	2	20
Chloromethane	44.5	50.0	89	42.7	50.0	85	50-136	4	20
cis-1,2-Dichloroethene	45.8	50.0	92	44.1	50.0	88	77-123	4	20

**ALS Group USA, Corp.**  
dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2301181  
**Date Analyzed:** 01/31/23  
**Date Extracted:** NA

**Duplicate Lab Control Sample Summary**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

**Units:** ug/Kg  
**Basis:** Dry  
**Analysis Lot:** 793159

Analyte Name	Lab Control Sample KQ2302313-03			Duplicate Lab Control Sample KQ2302313-04			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
cis-1,3-Dichloropropene	46.8	50.0	94	46.7	50.0	93	74-126	<1	20
Dibromochloromethane	46.3	50.0	93	46.2	50.0	92	74-126	<1	20
Dibromomethane	46.3	50.0	93	46.0	50.0	92	78-125	<1	20
Dichlorodifluoromethane	39.5	50.0	79	37.3	50.0	75	29-149	6	20
Ethylbenzene	46.3	50.0	93	45.3	50.0	91	76-122	2	20
Hexachlorobutadiene	46.8	50.0	94	43.2	50.0	86	61-135	8	20
Isopropylbenzene	47.0	50.0	94	45.5	50.0	91	68-134	3	20
m,p-Xylenes	92.0	100	92	90.4	100	90	77-124	2	20
Methyl tert-Butyl Ether	50.8	50.0	102	51.6	50.0	103	73-125	1	20
Methylene Chloride	47.7	50.0	95	48.9	50.0	98	70-128	2	20
Naphthalene	47.3	50.0	95	45.8	50.0	92	62-129	3	20
n-Butylbenzene	49.8	50.0	100	46.8	50.0	94	70-128	6	20
n-Propylbenzene	47.3	50.0	95	44.9	50.0	90	73-125	5	20
o-Xylene	46.3	50.0	93	46.1	50.0	92	77-123	<1	20
sec-Butylbenzene	52.1	50.0	104	48.3	50.0	97	73-126	7	20
Styrene	47.3	50.0	95	47.7	50.0	95	76-124	<1	20
tert-Butylbenzene	48.3	50.0	97	45.8	50.0	92	73-125	5	20
Tetrachloroethene (PCE)	44.0	50.0	88	42.8	50.0	86	73-128	3	20
Toluene	45.9	50.0	92	45.6	50.0	91	77-121	<1	20
trans-1,2-Dichloroethene	52.5	50.0	105	49.1	50.0	98	74-125	7	20
trans-1,3-Dichloropropene	46.3	50.0	93	46.5	50.0	93	71-130	<1	20
Trichloroethene (TCE)	45.3	50.0	91	44.4	50.0	89	77-123	2	20
Trichlorofluoromethane (CFC 11)	49.3	50.0	99	47.9	50.0	96	62-140	3	20
Vinyl Chloride	49.7	50.0	99	47.4	50.0	95	56-135	5	20



---

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December 30, 2022

**Analytical Report for Service Request No: K2213950**

Matt Thomas  
GSI Water Solutions, Inc  
55 SW Yamhill, Suite 300  
Portland, OR 97204

**RE: 2022-Umatilla Depot / 913.001.002.002**

Dear Matt,

Enclosed are the results of the sample(s) submitted to our laboratory November 28, 2022  
For your reference, these analyses have been assigned our service request number **K2213950**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at [www.alsglobal.com](http://www.alsglobal.com). All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at [Mark.Harris@alsglobal.com](mailto:Mark.Harris@alsglobal.com).

Respectfully submitted,

**ALS Group USA, Corp. dba ALS Environmental**

Mark Harris  
Project Manager



---

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## Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

### **Inorganic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

### **Metals Data Qualifiers**

- # The control limit criteria is not applicable.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.  
  - i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Organic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Additional Petroleum Hydrocarbon Specific Qualifiers**

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso  
State Certifications, Accreditations, and Licenses**

<b>Agency</b>	<b>Web Site</b>	<b>Number</b>
Alaska DEH	<a href="http://dec.alaska.gov/eh/lab/cs/csapproval.htm">http://dec.alaska.gov/eh/lab/cs/csapproval.htm</a>	UST-040
Arizona DHS	<a href="http://www.azdhs.gov/lab/license/env.htm">http://www.azdhs.gov/lab/license/env.htm</a>	AZ0339
Arkansas - DEQ	<a href="http://www.adeq.state.ar.us/techsvs/labcert.htm">http://www.adeq.state.ar.us/techsvs/labcert.htm</a>	88-0637
California DHS (ELAP)	<a href="http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx">http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx</a>	2795
DOD ELAP	<a href="http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm">http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm</a>	L16-58-R4
Florida DOH	<a href="http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm">http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm</a>	E87412
Hawaii DOH	<a href="http://health.hawaii.gov/">http://health.hawaii.gov/</a>	-
ISO 17025	<a href="http://www.pjllabs.com/">http://www.pjllabs.com/</a>	L16-57
Louisiana DEQ	<a href="http://www.deq.louisiana.gov/page/la-lab-accreditation">http://www.deq.louisiana.gov/page/la-lab-accreditation</a>	03016
Maine DHS	<a href="http://www.maine.gov/dhhs/">http://www.maine.gov/dhhs/</a>	WA01276
Minnesota DOH	<a href="http://www.health.state.mn.us/accreditation">http://www.health.state.mn.us/accreditation</a>	053-999-457
Nevada DEP	<a href="http://ndep.nv.gov/bsdw/labservice.htm">http://ndep.nv.gov/bsdw/labservice.htm</a>	WA01276
New Jersey DEP	<a href="http://www.nj.gov/dep/enforcement/oqa.html">http://www.nj.gov/dep/enforcement/oqa.html</a>	WA005
New York - DOH	<a href="https://www.wadsworth.org/regulatory/elap">https://www.wadsworth.org/regulatory/elap</a>	12060
North Carolina DEQ	<a href="https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification">https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification</a>	605
Oklahoma DEQ	<a href="http://www.deq.state.ok.us/CSDnew/labcert.htm">http://www.deq.state.ok.us/CSDnew/labcert.htm</a>	9801
Oregon – DEQ (NELAP)	<a href="http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx">http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx</a>	WA100010
South Carolina DHEC	<a href="http://www.scdhec.gov/environment/EnvironmentalLabCertification/">http://www.scdhec.gov/environment/EnvironmentalLabCertification/</a>	61002
Texas CEQ	<a href="http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html">http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html</a>	T104704427
Washington DOE	<a href="http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html">http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html</a>	C544
Wyoming (EPA Region 8)	<a href="https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water">https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water</a>	-
Kelso Laboratory Website	<a href="http://www.alsglobal.com">www.alsglobal.com</a>	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at [www.ALSGlobal.com](http://www.ALSGlobal.com) or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.



## Case Narrative

**ALS Environmental—Kelso Laboratory**  
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## Chain of Custody

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CHAIN OF CUSTODY  
127378

001

SR# \_\_\_\_\_  
COC Set \_\_\_\_\_ of \_\_\_\_\_  
COC# \_\_\_\_\_

1317 South 13th Ave, Kelso, WA 98626 Phone (360) 577-7222 / 800-695-7222 / FAX (360) 636-1068  
www.alsglobal.com

Page 1 of 1

K22 13950

Project Name 11/22 - Umbrella Dept		Project Number 913 COL 02 082		NUMBER OF CONTAINERS	14D		28D		180D		365D		999D		Remarks		
Project Manager Matt Kuhlbecker		Company COSI Water Solutions			B260C / VOC FP	B270D / SVO	B330A / NitroAro Amin	7471A / Hg	P056A / NO2 NO3	P010C / Metals T	P020A / Metals T	ASTM D422 / Part Size	ASTM D422M / Part Size	ASTM D854 / Sp Grav		P082A / PCB LL	P60.3 Modified / TS
Address 53 SW Humbill Suite 300 Portland OR 97204		Phone # 503-20-1533		Sampler Signature Matt Thomas		Sampler Printed Name Matt Thomas		email mkuhlbecker@cosiws.com									
CLIENT SAMPLE ID	LABID	SAMPLING Date	SAMPLING Time	Matrix													
1. B-3-112322-10.0		11/23/22	8:00	Water	5	X											
2. B-3-112322-20.0		11/23/22	9:30	Water	5	X											
3.																	
4. B-3-112322-70.0		* 11/23/22	0930	Sol	1						X	X					
5. B-3-112322-40.0		* ↓	1300	Sol	1						X	X					
6. B-3-112322-50.0		* ↓	1315	Sol	1						X	X					
7.																	
8.																	
9.																	
10.																	

**Report Requirements**  
 I. Routine Report: Method Blank, Surrogate, as required  
 II. Report Dup., MS, MSD as required  
 III. CLP Like Summary (no raw data)  
 IV. Data Validation Report  
 V. EDD

**Invoice Information**  
 P.O.# \_\_\_\_\_  
 Bill To: John Scher  
 216 SE 4th St  
 Pendleton, OR 97801  
**Turnaround Requirements**  
 24 hr  
 5 Day  
 Standard

Circle which metals are to be analyzed  
 Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg  
 Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg  
 Special Instructions/Comments: \*MR  
 Address invoice to: John Scher: 216 SE 4th St, Pendleton, OR 97801  
 Email invoice to: Matt Kuhlbecker @ mkuhlbecker@cosiws.com  
 \*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other \_\_\_\_\_ (Circle One)

Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature <i>[Signature]</i>	Signature <i>[Signature]</i>	Signature	Signature	Signature	Signature
Printed Name Chris Wick	Printed Name Vicklyn Mfola	Printed Name	Printed Name	Printed Name	Printed Name
Firm COSI Water Solutions	Firm ALS	Firm	Firm	Firm	Firm
Date/Time 11/23/22 9:30	Date/Time 11/23/22 1:50	Date/Time	Date/Time	Date/Time	Date/Time

PM MH

### Cooler Receipt and Preservation Form

Client GSI Service Request K22 13950

Received: 11/28/22 Opened: 11/28/22 By: VIM Unloaded: 11/28/22 By: VIM

- 1. Samples were received via? **USPS** *Fed Ex* *UPS* *DHL* *PDX* Courier *Hand Delivered*
- 2. Samples were received in: (circle) Cooler *Box* *Envelope* *Other* *NA*
- 3. Were custody seals on coolers? *NA* *Y* N If yes, how many and where? \_\_\_\_\_  
If present, were custody seals intact? *Y* *N* If present, were they signed and dated? *Y* *N*

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with 'X'	PM Notified if out of temp	Tracking Number NA	Filed
<u>2.9</u>		<u>IR02</u>					

- 4. Was a Temperature Blank present in cooler? *NA* Y *N* If yes, note the temperature in the appropriate column above:  
If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
- 5. Were samples received within the method specified temperature ranges? *NA* Y *N*  
If no, were they received on ice and same day as collected? If not, note the cooler # below and notify the PM. NA *Y* *N*

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

- 6. Packing material: *Inserts* Baggies Bubble Wrap Gel Packs *Wet Ice* *Dry Ice* *Sleeves*
- 7. Were custody papers properly filled out (ink, signed, etc.)? *NA* Y *N*
- 8. Were samples received in good condition (unbroken) *NA* Y *N*
- 9. Were all sample labels complete (ie, analysis, preservation, etc.)? *NA* Y *N*
- 10. Did all sample labels and tags agree with custody papers? *NA* Y *N*
- 11. Were appropriate bottles/containers and volumes received for the tests indicated? *NA* Y *N*
- 12. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below NA *Y* *N*
- 13. Were VOA vials received without headspace? Indicate in the table below NA *Y* *N*
- 14. Was C12/Res negative? NA *Y* *N*
- 15. Were 100ml sterile microbiology bottles filled exactly to the 100ml mark? NA *Y* *N* Under filled Overfilled

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, Resolutions: Received Top blank not listed on COC  
No date/time on COC used date/time on bags. First two samples are Soil not  
1/13/22 water as indicated on COC



# Total Solids

**ALS Environmental—Kelso Laboratory**  
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ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil  
**Analysis Method:** 160.3 Modified  
**Prep Method:** None

**Service Request:** K2213950  
**Date Collected:** 11/23/22  
**Date Received:** 11/28/22  
**Units:** Percent  
**Basis:** As Received

**Solids, Total**

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
B-3-11232022-10.0	K2213950-001	84.4	-	-	1	12/02/22 13:11	
B-3-11232022-20.0	K2213950-002	80.9	-	-	1	12/02/22 13:11	
B-3-11232022-20.0	K2213950-003	82.0	-	-	1	12/02/22 13:11	
B-3-11232022-40.0	K2213950-004	81.9	-	-	1	12/02/22 13:11	
B-3-11232022-56.0	K2213950-005	75.8	-	-	1	12/02/22 13:11	

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2213950  
**Date Collected:** 11/23/22  
**Date Received:** 11/28/22  
**Date Analyzed:** 12/02/22

**Replicate Sample Summary**  
**Inorganic Parameters**

**Sample Name:** B-3-11232022-10.0  
**Lab Code:** K2213950-001

**Units:** Percent  
**Basis:** As Received

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>MRL</u>	<u>Sample Result</u>	<u>Duplicate Sample K2213950-001DUP Result</u>	<u>Average</u>	<u>RPD</u>	<u>RPD Limit</u>
Solids, Total	160.3 Modified	-	84.4	84.5	84.5	<1	20

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.



# General Chemistry

**ALS Environmental—Kelso Laboratory**  
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[www.alsglobal.com](http://www.alsglobal.com)

ALS Group USA, Corp.  
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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil  
**Analysis Method:** 353.2M  
**Prep Method:** ALS SOP

**Service Request:** K2213950  
**Date Collected:** 11/23/22  
**Date Received:** 11/28/22  
**Units:** mg/Kg  
**Basis:** Dry

Nitrate+Nitrite as Nitrogen

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
B-3-11232022-10.0	K2213950-001	0.38 J	0.56	0.08	1	12/08/22 15:38	11/30/22	
B-3-11232022-20.0	K2213950-002	0.16 J	0.59	0.09	1	12/08/22 15:38	11/30/22	
Method Blank	K2213950-MB	ND U	0.50	0.07	1	12/08/22 15:38	11/30/22	

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QA/QC Report

Client: GSI Water Solutions, Inc
Project: 2022-Umatilla Depot/913.001.002.002
Sample Matrix: Soil

Service Request: K2213950
Date Collected: 11/23/22
Date Received: 11/28/22
Date Analyzed: 12/08/22

Replicate Sample Summary
General Chemistry Parameters

Sample Name: B-3-11232022-10.0
Lab Code: K2213950-001

Units: mg/Kg
Basis: Dry

Table with 9 columns: Analyte Name, Analysis Method, MRL, MDL, Sample Result, Duplicate Sample Result (K2213950-001DUP), Average, RPD, RPD Limit. Row 1: Nitrate+Nitrite as Nitrogen, 353.2M, 0.59, 0.09, 0.38 J, 0.34 J, 0.358, 11, 20.

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2213950  
**Date Collected:** 11/23/22  
**Date Received:** 11/28/22  
**Date Analyzed:** 12/8/22  
**Date Extracted:** 11/30/22

**Duplicate Matrix Spike Summary**  
**Nitrate+Nitrite as Nitrogen**

**Sample Name:** B-3-11232022-10.0  
**Lab Code:** K2213950-001  
**Analysis Method:** 353.2M  
**Prep Method:** ALS SOP

**Units:** mg/Kg  
**Basis:** Dry

Analyte Name	Sample Result	Matrix Spike K2213950-001MS			Duplicate Matrix Spike K2213950-001DMS			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Nitrate+Nitrite as Nitrogen	0.38 J	576	577	100	584	580	101	82-115	2	20

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2213950  
**Date Analyzed:** 12/08/22  
**Date Extracted:** 11/30/22

**Lab Control Sample Summary**  
**Nitrate+Nitrite as Nitrogen**

**Analysis Method:** 353.2M  
**Prep Method:** ALS SOP

**Units:** mg/Kg  
**Basis:** Dry  
**Analysis Lot:** 787494

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2213950-LCS	9.30	9.11	102	87-113

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**Analytical Report**

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2213950  
**Date Collected:** 11/23/22  
**Date Received:** 11/28/22  
**Date Analyzed:** 12/15/22

**Particle Size Determination**  
**ASTM D422**

**Sample Name:** B-3-11232022-20.0  
**Lab Code:** K2213950-003

**Gravel and Sand**  
**(Sieve Analysis)**

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	86.99
Gravel (9.50 mm)	No.3/8"(9.50 mm)	0.0000	86.99
Gravel, Medium	No.4 (4.75 mm)	7.2209	71.33
Gravel, Fine	No.10 (2.00 mm)	13.4044	42.26
Sand, Very Coarse	No.20 (0.850 mm)	8.0852	28.73
Sand, Coarse	No.40 (0.425 mm)	2.6145	24.35
Sand, Medium	No.60 (0.250 mm)	1.0487	22.59
Sand, Fine	No.140 (0.106 mm)	1.2590	20.49
Sand, Very Fine	No.200 (0.0750 mm)	0.5449	19.58

**Silt and Clay**  
**(Hydrometer Analysis)**

Particle Diameter	Percent Passing
0.074 mm	18.37
0.005 mm	7.56
0.001 mm	1.10

**ALS Group USA, Corp.**  
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**Analytical Report**

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2213950  
**Date Collected:** 11/23/22  
**Date Received:** 11/28/22  
**Date Analyzed:** 12/15/22

**Particle Size Determination**  
**ASTM D422**

**Sample Name:** B-3-11232022-20.0  
**Lab Code:** K2213950-003DUP

**Gravel and Sand**  
**(Sieve Analysis)**

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	90.44
Gravel (9.50 mm)	No.3/8"(9.50 mm)	3.0449	83.89
Gravel, Medium	No.4 (4.75 mm)	14.4054	52.87
Gravel, Fine	No.10 (2.00 mm)	14.0684	22.59
Sand, Very Coarse	No.20 (0.850 mm)	5.3496	14.42
Sand, Coarse	No.40 (0.425 mm)	1.2903	12.45
Sand, Medium	No.60 (0.250 mm)	0.5026	11.68
Sand, Fine	No.140 (0.106 mm)	0.6184	10.73
Sand, Very Fine	No.200 (0.0750 mm)	0.2868	10.30

**Silt and Clay**  
**(Hydrometer Analysis)**

Particle Diameter	Percent Passing
0.074 mm	9.53
0.005 mm	4.04
0.001 mm	0.76

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**Analytical Report**

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2213950  
**Date Collected:** 11/23/22  
**Date Received:** 11/28/22  
**Date Analyzed:** 12/15/22

**Particle Size Determination**  
**ASTM D422**

**Sample Name:** B-3-11232022-40.0  
**Lab Code:** K2213950-004

**Gravel and Sand**  
**(Sieve Analysis)**

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	74.46
Gravel (9.50 mm)	No.3/8"(9.50 mm)	0.0000	74.46
Gravel, Medium	No.4 (4.75 mm)	13.3366	45.76
Gravel, Fine	No.10 (2.00 mm)	10.3899	23.39
Sand, Very Coarse	No.20 (0.850 mm)	5.4858	17.70
Sand, Coarse	No.40 (0.425 mm)	2.0755	15.55
Sand, Medium	No.60 (0.250 mm)	1.1468	14.36
Sand, Fine	No.140 (0.106 mm)	1.6956	12.60
Sand, Very Fine	No.200 (0.0750 mm)	0.6495	11.93

**Silt and Clay**  
**(Hydrometer Analysis)**

Particle Diameter	Percent Passing
0.074 mm	11.45
0.005 mm	4.66
0.001 mm	0.61

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**Analytical Report**

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2213950  
**Date Collected:** 11/23/22  
**Date Received:** 11/28/22  
**Date Analyzed:** 12/15/22

**Particle Size Determination**  
**ASTM D422**

**Sample Name:** B-3-11232022-56.0  
**Lab Code:** K2213950-005

**Gravel and Sand**  
**(Sieve Analysis)**

Description	Sieve Size	Weight (g)	Percent Passing
Gravel (19.0 mm)	No.3/4"(19.0 mm)	0.0000	98.29
Gravel (9.50 mm)	No.3/8"(9.50 mm)	38.1934	21.61
Gravel, Medium	No.4 (4.75 mm)	7.6963	6.15
Gravel, Fine	No.10 (2.00 mm)	2.1651	1.81
Sand, Very Coarse	No.20 (0.850 mm)	0.1586	1.64
Sand, Coarse	No.40 (0.425 mm)	0.0458	1.59
Sand, Medium	No.60 (0.250 mm)	0.0300	1.56
Sand, Fine	No.140 (0.106 mm)	0.0464	1.51
Sand, Very Fine	No.200 (0.0750 mm)	0.0442	1.47

**Silt and Clay**  
**(Hydrometer Analysis)**

Particle Diameter	Percent Passing
0.074 mm	1.35
0.005 mm	1.04
0.001 mm	0.85



# Volatile Organic Compounds by GC/MS

**ALS Environmental—Kelso Laboratory**  
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**ALS Group USA, Corp.**  
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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2213950  
**Date Collected:** 11/23/22 08:10  
**Date Received:** 11/28/22 11:50

**Sample Name:** B-3-11232022-10.0  
**Lab Code:** K2213950-001

**Units:** ug/Kg  
**Basis:** Dry

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Acetone	5.6 J	21	4.3	3.2	1	12/07/22 12:24	*
Benzene	ND U	5.4	0.21	0.058	1	12/07/22 12:24	
Bromobenzene	ND U	5.4	0.32	0.095	1	12/07/22 12:24	
Bromochloromethane	ND U	5.4	0.54	0.26	1	12/07/22 12:24	
Bromodichloromethane	ND U	5.4	0.54	0.18	1	12/07/22 12:24	
Bromoform	ND U	5.4	0.54	0.16	1	12/07/22 12:24	
Bromomethane	ND U	5.4	0.54	0.22	1	12/07/22 12:24	
2-Butanone (MEK)	ND U	21	1.1	0.97	1	12/07/22 12:24	
n-Butylbenzene	ND U	21	0.21	0.075	1	12/07/22 12:24	
sec-Butylbenzene	ND U	21	0.21	0.080	1	12/07/22 12:24	
tert-Butylbenzene	ND U	21	0.54	0.16	1	12/07/22 12:24	
Carbon Disulfide	4.3 J	5.4	0.32	0.099	1	12/07/22 12:24	
Carbon Tetrachloride	ND U	5.4	0.32	0.11	1	12/07/22 12:24	
Chlorobenzene	ND U	5.4	0.21	0.070	1	12/07/22 12:24	
Chloroethane	ND U	5.4	1.1	0.80	1	12/07/22 12:24	*
Chloroform	ND U	5.4	0.43	0.12	1	12/07/22 12:24	
Chloromethane	ND U	5.4	0.54	0.20	1	12/07/22 12:24	
2-Chlorotoluene	ND U	21	0.43	0.13	1	12/07/22 12:24	
4-Chlorotoluene	ND U	21	0.43	0.095	1	12/07/22 12:24	
1,2-Dibromo-3-chloropropane	ND U	21	1.5	0.43	1	12/07/22 12:24	
Dibromochloromethane	ND U	5.4	0.54	0.20	1	12/07/22 12:24	
1,2-Dibromoethane (EDB)	ND U	21	0.32	0.11	1	12/07/22 12:24	
Dibromomethane	ND U	5.4	0.54	0.31	1	12/07/22 12:24	
1,2-Dichlorobenzene	ND U	5.4	0.32	0.083	1	12/07/22 12:24	
1,3-Dichlorobenzene	ND U	6.4	0.32	0.11	1	12/07/22 12:24	
1,4-Dichlorobenzene	ND U	2.1	0.32	0.093	1	12/07/22 12:24	
Dichlorodifluoromethane	ND U	5.4	0.43	0.13	1	12/07/22 12:24	
1,1-Dichloroethane	ND U	5.4	0.43	0.13	1	12/07/22 12:24	
1,2-Dichloroethane (EDC)	ND U	5.4	0.21	0.076	1	12/07/22 12:24	
1,1-Dichloroethene	ND U	5.4	0.54	0.27	1	12/07/22 12:24	
cis-1,2-Dichloroethene	ND U	5.4	0.43	0.13	1	12/07/22 12:24	
trans-1,2-Dichloroethene	ND U	5.4	0.43	0.13	1	12/07/22 12:24	
1,2-Dichloropropane	ND U	5.4	0.54	0.14	1	12/07/22 12:24	
1,3-Dichloropropane	ND U	2.1	0.43	0.13	1	12/07/22 12:24	
2,2-Dichloropropane	ND U	5.4	0.32	0.11	1	12/07/22 12:24	
1,1-Dichloropropene	ND U	5.4	0.54	0.14	1	12/07/22 12:24	
cis-1,3-Dichloropropene	ND U	5.4	0.54	0.14	1	12/07/22 12:24	
trans-1,3-Dichloropropene	ND U	5.4	0.43	0.12	1	12/07/22 12:24	
Ethylbenzene	ND U	5.4	0.32	0.11	1	12/07/22 12:24	
Hexachlorobutadiene	ND U	21	0.86	0.43	1	12/07/22 12:24	*
2-Hexanone	ND U	21	2.1	1.0	1	12/07/22 12:24	

**ALS Group USA, Corp.**  
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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil  
**Sample Name:** B-3-11232022-10.0  
**Lab Code:** K2213950-001

**Service Request:** K2213950  
**Date Collected:** 11/23/22 08:10  
**Date Received:** 11/28/22 11:50

**Units:** ug/Kg  
**Basis:** Dry

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Isopropylbenzene	ND U	21	0.32	0.087	1	12/07/22 12:24	*
4-Isopropyltoluene	ND U	21	0.21	0.069	1	12/07/22 12:24	
4-Methyl-2-pentanone (MIBK)	ND U	21	2.0	2.0	1	12/07/22 12:24	
Methylene Chloride	ND U	11	0.54	0.18	1	12/07/22 12:24	
Naphthalene	ND U	21	0.54	0.14	1	12/07/22 12:24	*
n-Propylbenzene	ND U	21	0.54	0.14	1	12/07/22 12:24	
Styrene	ND U	5.4	0.54	0.16	1	12/07/22 12:24	*
1,1,1,2-Tetrachloroethane	ND U	5.4	0.43	0.12	1	12/07/22 12:24	
1,1,2,2-Tetrachloroethane	ND U	5.4	0.54	0.14	1	12/07/22 12:24	
Tetrachloroethene (PCE)	ND U	5.4	0.54	0.18	1	12/07/22 12:24	*
Toluene	ND U	5.4	0.54	0.17	1	12/07/22 12:24	
1,2,3-Trichlorobenzene	ND U	21	0.54	0.21	1	12/07/22 12:24	
1,2,4-Trichlorobenzene	ND U	21	0.54	0.14	1	12/07/22 12:24	*
1,1,2-Trichloroethane	ND U	5.4	0.54	0.17	1	12/07/22 12:24	
1,1,1-Trichloroethane (TCA)	ND U	5.4	0.43	0.12	1	12/07/22 12:24	
Trichloroethene (TCE)	ND U	5.4	0.54	0.17	1	12/07/22 12:24	
Trichlorofluoromethane (CFC 11)	ND U	5.4	0.32	0.092	1	12/07/22 12:24	
1,2,3-Trichloropropane	ND U	5.4	1.5	0.49	1	12/07/22 12:24	
1,2,4-Trimethylbenzene	ND U	21	0.21	0.058	1	12/07/22 12:24	
1,3,5-Trimethylbenzene	ND U	21	0.32	0.099	1	12/07/22 12:24	
Vinyl Chloride	ND U	5.4	0.54	0.20	1	12/07/22 12:24	
o-Xylene	ND U	5.4	0.32	0.087	1	12/07/22 12:24	
m,p-Xylenes	ND U	21	0.43	0.11	1	12/07/22 12:24	*
Xylenes, Total	ND U	-	-	-	1	12/07/22 12:24	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	107	79 - 119	12/07/22 12:24	
Dibromofluoromethane	102	78 - 119	12/07/22 12:24	
Toluene-d8	113	85 - 116	12/07/22 12:24	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil  
**Sample Name:** B-3-11232022-20.0  
**Lab Code:** K2213950-002

**Service Request:** K2213950  
**Date Collected:** 11/23/22 09:30  
**Date Received:** 11/28/22 11:50

**Units:** ug/Kg  
**Basis:** Dry

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Acetone	10 J	26	5.2	3.8	1	12/07/22 12:45	*
Benzene	ND U	6.5	0.26	0.071	1	12/07/22 12:45	
Bromobenzene	ND U	6.5	0.39	0.12	1	12/07/22 12:45	
Bromochloromethane	ND U	6.5	0.65	0.32	1	12/07/22 12:45	
Bromodichloromethane	ND U	6.5	0.65	0.21	1	12/07/22 12:45	
Bromoform	ND U	6.5	0.65	0.19	1	12/07/22 12:45	
Bromomethane	ND U	6.5	0.65	0.27	1	12/07/22 12:45	
2-Butanone (MEK)	ND U	26	1.3	1.2	1	12/07/22 12:45	
n-Butylbenzene	ND U	26	0.26	0.090	1	12/07/22 12:45	
sec-Butylbenzene	ND U	26	0.26	0.097	1	12/07/22 12:45	
tert-Butylbenzene	ND U	26	0.65	0.19	1	12/07/22 12:45	
Carbon Disulfide	4.7 J	6.5	0.39	0.12	1	12/07/22 12:45	
Carbon Tetrachloride	ND U	6.5	0.39	0.13	1	12/07/22 12:45	
Chlorobenzene	ND U	6.5	0.26	0.085	1	12/07/22 12:45	
Chloroethane	ND U	6.5	1.3	0.97	1	12/07/22 12:45	*
Chloroform	ND U	6.5	0.52	0.15	1	12/07/22 12:45	
Chloromethane	ND U	6.5	0.65	0.24	1	12/07/22 12:45	
2-Chlorotoluene	ND U	26	0.52	0.16	1	12/07/22 12:45	
4-Chlorotoluene	ND U	26	0.52	0.12	1	12/07/22 12:45	
1,2-Dibromo-3-chloropropane	ND U	26	1.8	0.53	1	12/07/22 12:45	
Dibromochloromethane	ND U	6.5	0.65	0.24	1	12/07/22 12:45	
1,2-Dibromoethane (EDB)	ND U	26	0.39	0.13	1	12/07/22 12:45	
Dibromomethane	ND U	6.5	0.65	0.37	1	12/07/22 12:45	
1,2-Dichlorobenzene	ND U	6.5	0.39	0.11	1	12/07/22 12:45	
1,3-Dichlorobenzene	ND U	7.8	0.39	0.13	1	12/07/22 12:45	
1,4-Dichlorobenzene	ND U	2.6	0.39	0.12	1	12/07/22 12:45	
Dichlorodifluoromethane	ND U	6.5	0.52	0.16	1	12/07/22 12:45	
1,1-Dichloroethane	ND U	6.5	0.52	0.16	1	12/07/22 12:45	
1,2-Dichloroethane (EDC)	ND U	6.5	0.26	0.092	1	12/07/22 12:45	
1,1-Dichloroethene	ND U	6.5	0.65	0.33	1	12/07/22 12:45	
cis-1,2-Dichloroethene	ND U	6.5	0.52	0.16	1	12/07/22 12:45	
trans-1,2-Dichloroethene	ND U	6.5	0.52	0.16	1	12/07/22 12:45	
1,2-Dichloropropane	ND U	6.5	0.65	0.17	1	12/07/22 12:45	
1,3-Dichloropropane	ND U	2.6	0.52	0.16	1	12/07/22 12:45	
2,2-Dichloropropane	ND U	6.5	0.39	0.13	1	12/07/22 12:45	
1,1-Dichloropropene	ND U	6.5	0.65	0.17	1	12/07/22 12:45	
cis-1,3-Dichloropropene	ND U	6.5	0.65	0.17	1	12/07/22 12:45	
trans-1,3-Dichloropropene	ND U	6.5	0.52	0.15	1	12/07/22 12:45	
Ethylbenzene	ND U	6.5	0.39	0.13	1	12/07/22 12:45	
Hexachlorobutadiene	ND U	26	1.0	0.53	1	12/07/22 12:45	*
2-Hexanone	ND U	26	2.6	1.3	1	12/07/22 12:45	

**ALS Group USA, Corp.**  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil  
**Sample Name:** B-3-11232022-20.0  
**Lab Code:** K2213950-002

**Service Request:** K2213950  
**Date Collected:** 11/23/22 09:30  
**Date Received:** 11/28/22 11:50

**Units:** ug/Kg  
**Basis:** Dry

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Isopropylbenzene	ND U	26	0.39	0.11	1	12/07/22 12:45	*
4-Isopropyltoluene	ND U	26	0.26	0.084	1	12/07/22 12:45	
4-Methyl-2-pentanone (MIBK)	ND U	26	2.4	2.4	1	12/07/22 12:45	
Methylene Chloride	ND U	13	0.65	0.21	1	12/07/22 12:45	
Naphthalene	ND U	26	0.65	0.17	1	12/07/22 12:45	*
n-Propylbenzene	ND U	26	0.65	0.17	1	12/07/22 12:45	
Styrene	ND U	6.5	0.65	0.19	1	12/07/22 12:45	*
1,1,1,2-Tetrachloroethane	ND U	6.5	0.52	0.15	1	12/07/22 12:45	
1,1,2,2-Tetrachloroethane	ND U	6.5	0.65	0.17	1	12/07/22 12:45	
Tetrachloroethene (PCE)	ND U	6.5	0.65	0.21	1	12/07/22 12:45	*
Toluene	<b>0.50 J</b>	6.5	0.65	0.20	1	12/07/22 12:45	
1,2,3-Trichlorobenzene	ND U	26	0.65	0.25	1	12/07/22 12:45	
1,2,4-Trichlorobenzene	ND U	26	0.65	0.17	1	12/07/22 12:45	*
1,1,2-Trichloroethane	ND U	6.5	0.65	0.20	1	12/07/22 12:45	
1,1,1-Trichloroethane (TCA)	ND U	6.5	0.52	0.15	1	12/07/22 12:45	
Trichloroethene (TCE)	ND U	6.5	0.65	0.20	1	12/07/22 12:45	
Trichlorofluoromethane (CFC 11)	ND U	6.5	0.39	0.12	1	12/07/22 12:45	
1,2,3-Trichloropropane	ND U	6.5	1.8	0.59	1	12/07/22 12:45	
1,2,4-Trimethylbenzene	ND U	26	0.26	0.071	1	12/07/22 12:45	
1,3,5-Trimethylbenzene	ND U	26	0.39	0.12	1	12/07/22 12:45	
Vinyl Chloride	ND U	6.5	0.65	0.24	1	12/07/22 12:45	
o-Xylene	ND U	6.5	0.39	0.11	1	12/07/22 12:45	
m,p-Xylenes	ND U	26	0.52	0.14	1	12/07/22 12:45	*
Xylenes, Total	ND U	-	-	-	1	12/07/22 12:45	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	104	79 - 119	12/07/22 12:45	
Dibromofluoromethane	100	78 - 119	12/07/22 12:45	
Toluene-d8	110	85 - 116	12/07/22 12:45	

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2213950

**SURROGATE RECOVERY SUMMARY**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Extraction Method:** None

Sample Name	Lab Code	4-Bromofluorobenzene	Dibromofluoromethane	Toluene-d8
		79-119	78-119	85-116
B-3-11232022-10.0	K2213950-001	107	102	113
B-3-11232022-20.0	K2213950-002	104	100	110
Method Blank	KQ2221595-05	109	101	107
Lab Control Sample	KQ2221595-03	115	105	112
Duplicate Lab Control Sample	KQ2221595-04	115	107	124*

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil  
**Sample Name:** Method Blank  
**Lab Code:** KQ2221595-05

**Service Request:** K2213950  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/Kg  
**Basis:** Dry

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Acetone	ND U	20	4.0	2.9	1	12/07/22 12:03	
Benzene	ND U	5.0	0.20	0.054	1	12/07/22 12:03	
Bromobenzene	ND U	5.0	0.30	0.088	1	12/07/22 12:03	
Bromochloromethane	ND U	5.0	0.50	0.24	1	12/07/22 12:03	
Bromodichloromethane	ND U	5.0	0.50	0.16	1	12/07/22 12:03	
Bromoform	ND U	5.0	0.50	0.14	1	12/07/22 12:03	
Bromomethane	ND U	5.0	0.50	0.20	1	12/07/22 12:03	
2-Butanone (MEK)	ND U	20	1.0	0.90	1	12/07/22 12:03	
n-Butylbenzene	ND U	20	0.20	0.069	1	12/07/22 12:03	
sec-Butylbenzene	ND U	20	0.20	0.074	1	12/07/22 12:03	
tert-Butylbenzene	ND U	20	0.50	0.14	1	12/07/22 12:03	
Carbon Disulfide	ND U	5.0	0.30	0.092	1	12/07/22 12:03	
Carbon Tetrachloride	ND U	5.0	0.30	0.094	1	12/07/22 12:03	
Chlorobenzene	ND U	5.0	0.20	0.065	1	12/07/22 12:03	
Chloroethane	ND U	5.0	1.0	0.74	1	12/07/22 12:03	
Chloroform	ND U	5.0	0.40	0.11	1	12/07/22 12:03	
Chloromethane	ND U	5.0	0.50	0.18	1	12/07/22 12:03	
2-Chlorotoluene	ND U	20	0.40	0.12	1	12/07/22 12:03	
4-Chlorotoluene	ND U	20	0.40	0.088	1	12/07/22 12:03	
1,2-Dibromo-3-chloropropane	ND U	20	1.4	0.40	1	12/07/22 12:03	
Dibromochloromethane	ND U	5.0	0.50	0.18	1	12/07/22 12:03	
1,2-Dibromoethane (EDB)	ND U	20	0.30	0.094	1	12/07/22 12:03	
Dibromomethane	ND U	5.0	0.50	0.28	1	12/07/22 12:03	
1,2-Dichlorobenzene	ND U	5.0	0.30	0.077	1	12/07/22 12:03	
1,3-Dichlorobenzene	ND U	6.0	0.30	0.094	1	12/07/22 12:03	
1,4-Dichlorobenzene	ND U	2.0	0.30	0.086	1	12/07/22 12:03	
Dichlorodifluoromethane	ND U	5.0	0.40	0.12	1	12/07/22 12:03	
1,1-Dichloroethane	ND U	5.0	0.40	0.12	1	12/07/22 12:03	
1,2-Dichloroethane (EDC)	ND U	5.0	0.20	0.070	1	12/07/22 12:03	
1,1-Dichloroethene	ND U	5.0	0.50	0.25	1	12/07/22 12:03	
cis-1,2-Dichloroethene	ND U	5.0	0.40	0.12	1	12/07/22 12:03	
trans-1,2-Dichloroethene	ND U	5.0	0.40	0.12	1	12/07/22 12:03	
1,2-Dichloropropane	ND U	5.0	0.50	0.13	1	12/07/22 12:03	
1,3-Dichloropropane	ND U	2.0	0.40	0.12	1	12/07/22 12:03	
2,2-Dichloropropane	ND U	5.0	0.30	0.098	1	12/07/22 12:03	
1,1-Dichloropropene	ND U	5.0	0.50	0.13	1	12/07/22 12:03	
cis-1,3-Dichloropropene	ND U	5.0	0.50	0.13	1	12/07/22 12:03	
trans-1,3-Dichloropropene	ND U	5.0	0.40	0.11	1	12/07/22 12:03	
Ethylbenzene	ND U	5.0	0.30	0.094	1	12/07/22 12:03	
Hexachlorobutadiene	ND U	20	0.80	0.40	1	12/07/22 12:03	
2-Hexanone	ND U	20	2.0	0.93	1	12/07/22 12:03	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil  
**Sample Name:** Method Blank  
**Lab Code:** KQ2221595-05

**Service Request:** K2213950  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/Kg  
**Basis:** Dry

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Isopropylbenzene	ND U	20	0.30	0.081	1	12/07/22 12:03	
4-Isopropyltoluene	ND U	20	0.20	0.064	1	12/07/22 12:03	
4-Methyl-2-pentanone (MIBK)	ND U	20	1.8	1.8	1	12/07/22 12:03	
Methylene Chloride	ND U	10	0.50	0.16	1	12/07/22 12:03	
Naphthalene	<b>0.44 J</b>	20	0.50	0.13	1	12/07/22 12:03	
n-Propylbenzene	ND U	20	0.50	0.13	1	12/07/22 12:03	
Styrene	ND U	5.0	0.50	0.14	1	12/07/22 12:03	
1,1,1,2-Tetrachloroethane	ND U	5.0	0.40	0.11	1	12/07/22 12:03	
1,1,2,2-Tetrachloroethane	ND U	5.0	0.50	0.13	1	12/07/22 12:03	
Tetrachloroethene (PCE)	ND U	5.0	0.50	0.16	1	12/07/22 12:03	
Toluene	ND U	5.0	0.50	0.15	1	12/07/22 12:03	
1,2,3-Trichlorobenzene	<b>0.30 J</b>	20	0.50	0.19	1	12/07/22 12:03	
1,2,4-Trichlorobenzene	ND U	20	0.50	0.13	1	12/07/22 12:03	
1,1,2-Trichloroethane	ND U	5.0	0.50	0.15	1	12/07/22 12:03	
1,1,1-Trichloroethane (TCA)	ND U	5.0	0.40	0.11	1	12/07/22 12:03	
Trichloroethene (TCE)	ND U	5.0	0.50	0.15	1	12/07/22 12:03	
Trichlorofluoromethane (CFC 11)	ND U	5.0	0.30	0.085	1	12/07/22 12:03	
1,2,3-Trichloropropane	ND U	5.0	1.4	0.45	1	12/07/22 12:03	
1,2,4-Trimethylbenzene	ND U	20	0.20	0.054	1	12/07/22 12:03	
1,3,5-Trimethylbenzene	ND U	20	0.30	0.092	1	12/07/22 12:03	
Vinyl Chloride	ND U	5.0	0.50	0.18	1	12/07/22 12:03	
o-Xylene	ND U	5.0	0.30	0.081	1	12/07/22 12:03	
m,p-Xylenes	ND U	20	0.40	0.10	1	12/07/22 12:03	
Xylenes, Total	ND U	-	-	-	1	12/07/22 12:03	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	109	79 - 119	12/07/22 12:03	
Dibromofluoromethane	101	78 - 119	12/07/22 12:03	
Toluene-d8	107	85 - 116	12/07/22 12:03	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2213950  
**Date Analyzed:** 12/07/22  
**Date Extracted:** NA

**Duplicate Lab Control Sample Summary**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

**Units:** ug/Kg  
**Basis:** Dry  
**Analysis Lot:** 787523

Analyte Name	Lab Control Sample KQ2221595-03			Duplicate Lab Control Sample KQ2221595-04			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1,2-Tetrachloroethane	51.8	50.0	104	52.1	50.0	104	78-125	<1	20
1,1,1-Trichloroethane (TCA)	46.4	50.0	93	46.2	50.0	92	73-130	<1	20
1,1,2,2-Tetrachloroethane	48.5	50.0	97	47.3	50.0	95	70-124	3	20
1,1,2-Trichloroethane	49.1	50.0	98	47.3	50.0	95	78-121	4	20
1,1-Dichloroethane	47.2	50.0	94	49.8	50.0	100	76-125	5	20
1,1-Dichloroethene	45.7	50.0	91	46.0	50.0	92	70-131	<1	20
1,1-Dichloropropene	49.6	50.0	99	51.0	50.0	102	76-125	3	20
1,2,3-Trichlorobenzene	60.7	50.0	121	58.2	50.0	116	66-130	4	20
1,2,3-Trichloropropane	45.7	50.0	91	45.1	50.0	90	73-125	1	20
1,2,4-Trichlorobenzene	61.9	50.0	124	57.9	50.0	116	67-129	7	20
1,2,4-Trimethylbenzene	52.3	50.0	105	51.6	50.0	103	75-123	1	20
1,2-Dibromo-3-chloropropane	54.7	50.0	109	55.3	50.0	111	61-132	1	20
1,2-Dibromoethane (EDB)	49.0	50.0	98	47.5	50.0	95	78-122	3	20
1,2-Dichlorobenzene	53.6	50.0	107	51.2	50.0	102	78-121	4	20
1,2-Dichloroethane (EDC)	43.1	50.0	86	44.9	50.0	90	73-128	4	20
1,2-Dichloropropane	47.5	50.0	95	51.4	50.0	103	76-123	8	20
1,3,5-Trimethylbenzene	52.3	50.0	105	49.7	50.0	99	73-124	5	20
1,3-Dichlorobenzene	52.1	50.0	104	50.5	50.0	101	77-121	3	20
1,3-Dichloropropane	48.5	50.0	97	46.7	50.0	93	77-121	4	20
1,4-Dichlorobenzene	51.6	50.0	103	49.3	50.0	99	75-120	4	20
2,2-Dichloropropane	44.2	50.0	88	42.7	50.0	85	67-133	4	20
2-Butanone (MEK)	93.2	100	93	92.9	100	93	51-148	<1	20
2-Chlorotoluene	51.5	50.0	103	50.3	50.0	101	75-122	2	20
2-Hexanone	96.7	100	97	89.8	100	90	53-145	7	20
4-Chlorotoluene	54.0	50.0	108	52.0	50.0	104	72-124	4	20
4-Isopropyltoluene	52.5	50.0	105	50.4	50.0	101	73-127	4	20
4-Methyl-2-pentanone (MIBK)	104	100	104	97.8	100	98	65-135	7	20
Acetone	84.3	100	84	91.5	100	91	36-164	8	20
Benzene	48.0	50.0	96	42.0	50.0	84	77-121	13	20
Bromobenzene	47.2	50.0	94	48.4	50.0	97	78-121	3	20
Bromochloromethane	48.7	50.0	97	51.3	50.0	103	78-125	5	20
Bromodichloromethane	49.0	50.0	98	48.2	50.0	96	75-127	2	20
Bromoform	54.6	50.0	109	52.6	50.0	105	67-132	4	20
Bromomethane	46.3	50.0	93	49.6	50.0	99	53-143	7	20
Carbon Disulfide	40.4	50.0	81	38.6	50.0	77	63-132	4	20
Carbon Tetrachloride	46.8	50.0	94	47.7	50.0	95	70-135	2	20
Chlorobenzene	52.4	50.0	105	49.0	50.0	98	79-120	7	20
Chloroethane	38.4	50.0	77	43.3	50.0	87	59-139	12	20
Chloroform	47.2	50.0	94	46.2	50.0	92	78-123	2	20
Chloromethane	40.4	50.0	81	43.3	50.0	87	50-136	7	20
cis-1,2-Dichloroethene	46.2	50.0	92	48.9	50.0	98	77-123	6	20

**ALS Group USA, Corp.**  
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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** 2022-Umatilla Depot/913.001.002.002  
**Sample Matrix:** Soil

**Service Request:** K2213950  
**Date Analyzed:** 12/07/22  
**Date Extracted:** NA

**Duplicate Lab Control Sample Summary**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

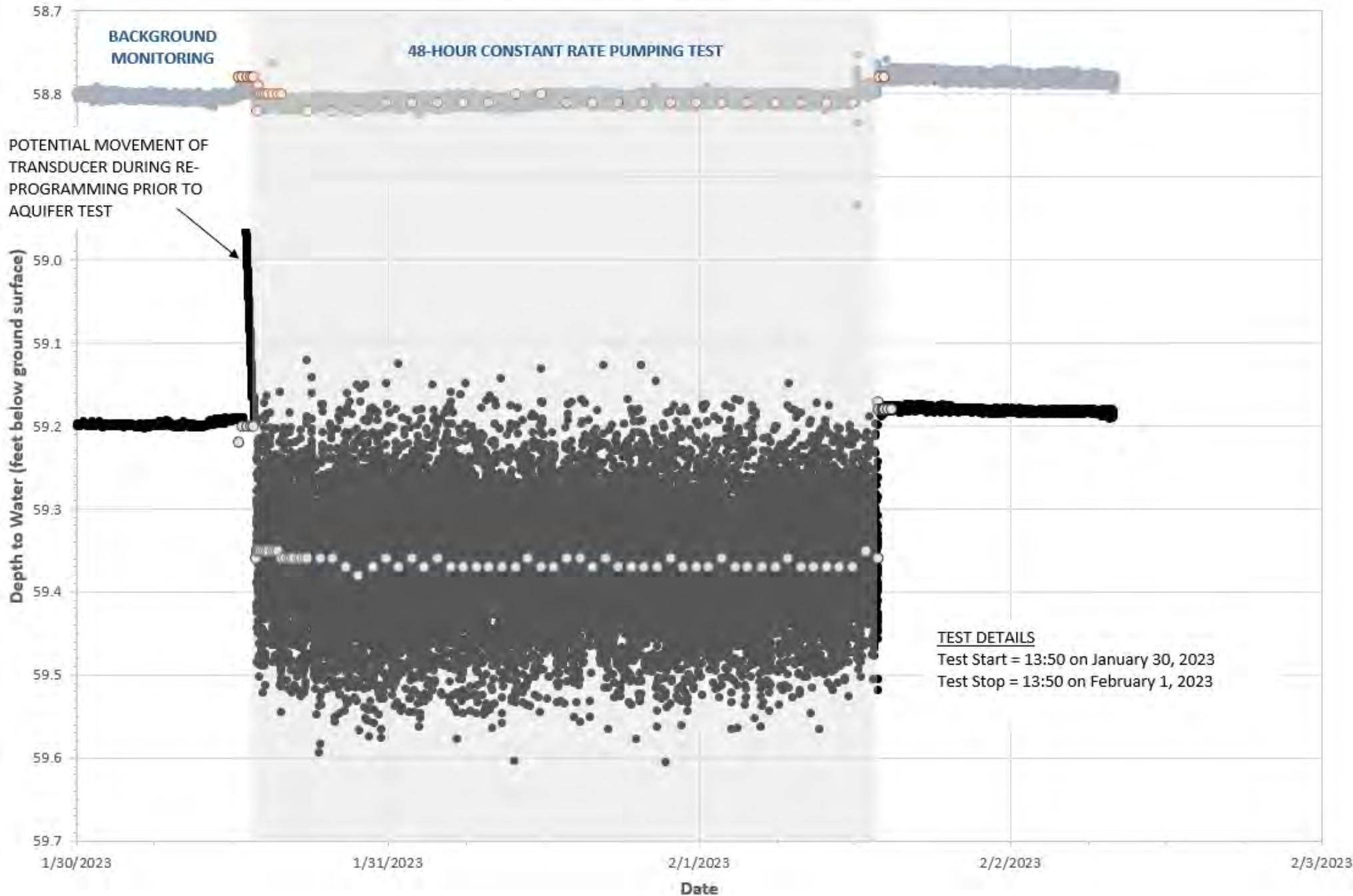
**Units:** ug/Kg  
**Basis:** Dry  
**Analysis Lot:** 787523

Analyte Name	Lab Control Sample KQ2221595-03			Duplicate Lab Control Sample KQ2221595-04			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
cis-1,3-Dichloropropene	47.0	50.0	94	48.4	50.0	97	74-126	3	20
Dibromochloromethane	49.4	50.0	99	47.3	50.0	95	74-126	4	20
Dibromomethane	46.7	50.0	93	50.9	50.0	102	78-125	9	20
Dichlorodifluoromethane	47.5	50.0	95	48.2	50.0	96	29-149	1	20
Ethylbenzene	56.1	50.0	112	52.9	50.0	106	76-122	6	20
Hexachlorobutadiene	60.6	50.0	121	57.8	50.0	116	61-135	5	20
Isopropylbenzene	62.1	50.0	124	59.1	50.0	118	68-134	5	20
m,p-Xylenes	115	100	115	112	100	112	77-124	3	20
Methylene Chloride	41.7	50.0	83	41.7	50.0	83	70-128	<1	20
Naphthalene	63.2	50.0	126	61.1	50.0	122	62-129	3	20
n-Butylbenzene	53.8	50.0	108	51.1	50.0	102	70-128	5	20
n-Propylbenzene	48.2	50.0	96	46.2	50.0	92	73-125	4	20
o-Xylene	57.6	50.0	115	54.4	50.0	109	77-123	6	20
sec-Butylbenzene	49.3	50.0	99	48.1	50.0	96	73-126	2	20
Styrene	59.0	50.0	118	55.5	50.0	111	76-124	6	20
tert-Butylbenzene	48.9	50.0	98	47.5	50.0	95	73-125	3	20
Tetrachloroethene (PCE)	57.3	50.0	115	54.3	50.0	109	73-128	5	20
Toluene	53.5	50.0	107	55.2	50.0	110	77-121	3	20
trans-1,2-Dichloroethene	47.4	50.0	95	40.4	50.0	81	74-125	16	20
trans-1,3-Dichloropropene	49.3	50.0	99	47.4	50.0	95	71-130	4	20
Trichloroethene (TCE)	50.7	50.0	101	53.1	50.0	106	77-123	5	20
Trichlorofluoromethane (CFC 11)	44.8	50.0	90	47.3	50.0	95	62-140	5	20
Vinyl Chloride	39.3	50.0	79	38.4	50.0	77	56-135	2	20

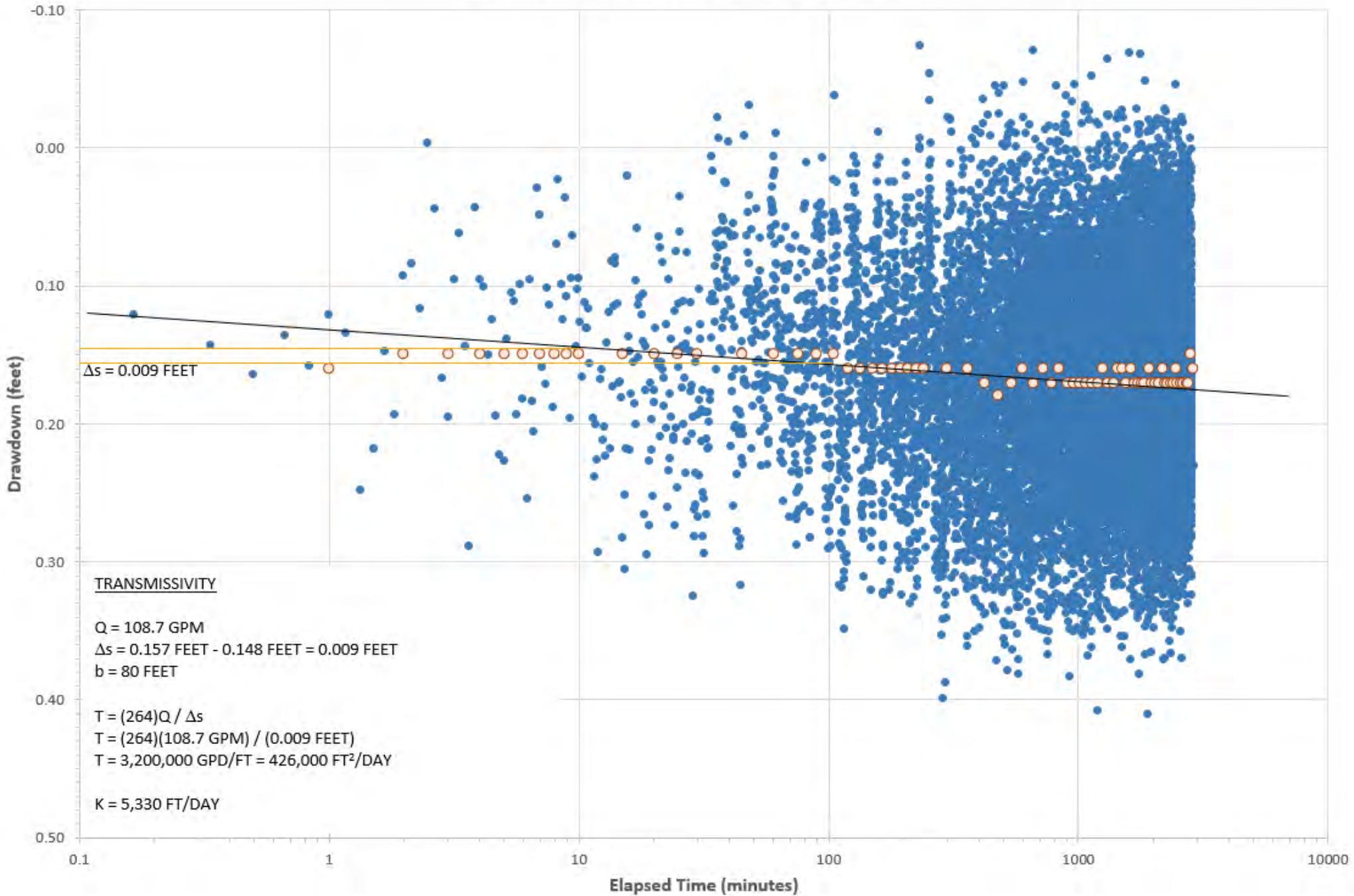
**ATTACHMENT C**

Aquifer Test Analysis

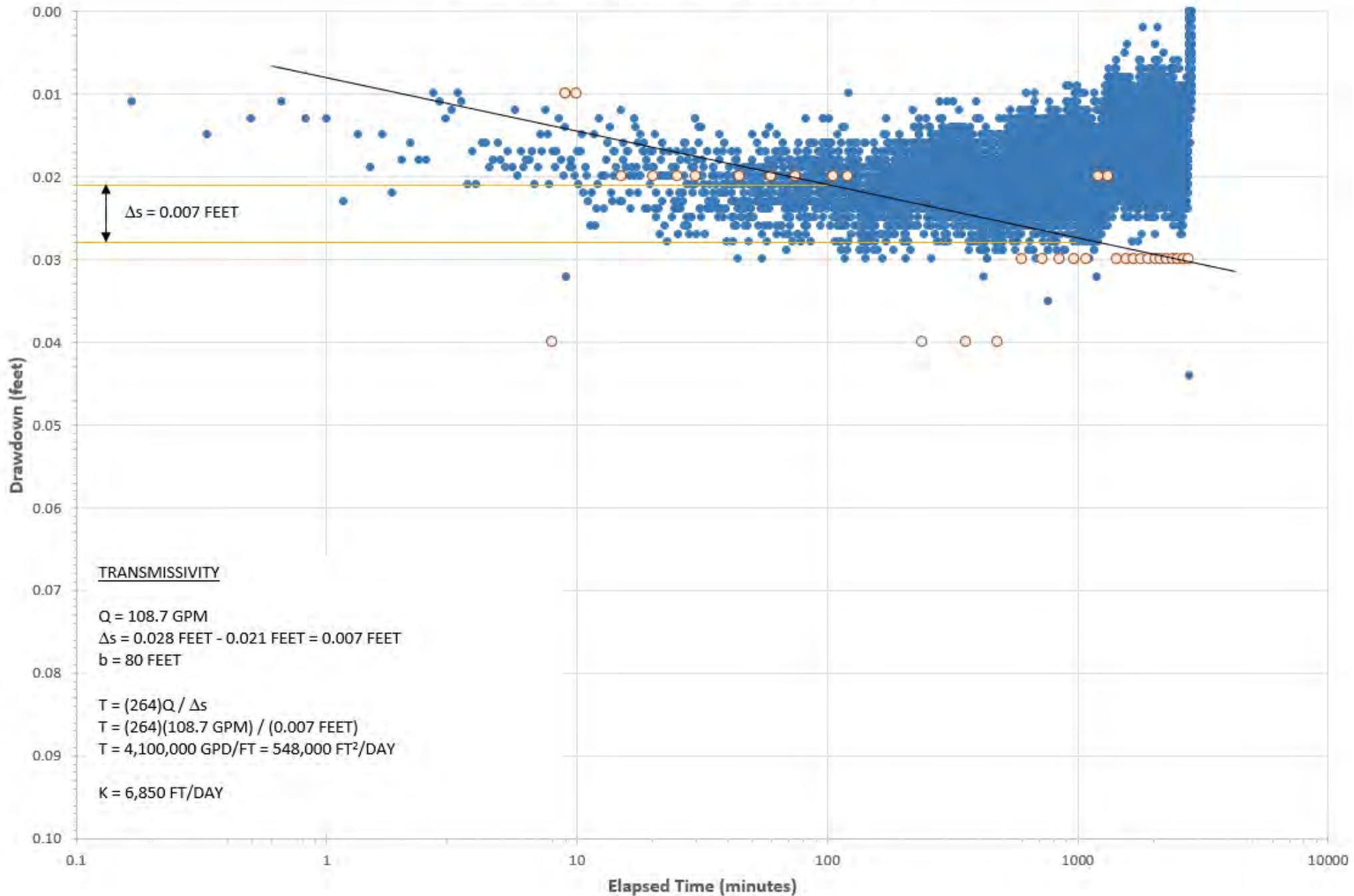
### Attachment C.1: Depth to Water vs Time



### Attachment C.2: Drawdown vs Time in RMW-3



### Attachment C.3 Drawdown vs Time in RMW-2



**ATTACHMETN C.4: DRAWDOWN PREDICTIONS: RMW-2**

GENERAL EQUATION USED

$$(-528*Q/T)*(LOG(r)+(.5*(LOG(S/0.3*T*t))))$$

VARIABLE	UNITS	SET 1	CHANGES ?	SET 2	CHANGES ?
TRANSMISSIVITY ?	GPD/FT	4057000		4200000	
STORATIVITY ?	FT/FT	0.19		0.19	
AQUIFER THICKNESS ?	FT/FT	80		80	
Well Efficiency		50%		50%	
PUMPING RATE ?	GPM	108.7		108.7	
TIME ?	DAYS	2		2	

		SET 1 DRAWDOWN (ft)	u	SET 2 DRAWDOWN (ft)	u
DISTANCE ?	FT	0.25	2.7E-09	0.085	2.6E-09
		0.5	1.09E-08	0.079	1.1E-08
		1	4.38E-08	0.049	4.2E-08
		2	1.75E-07	0.045	1.7E-07
		5	1.09E-06	0.039	1.1E-06
		7	2.15E-06	0.037	2.1E-06
		10	4.38E-06	0.035	4.2E-06
		20	1.75E-05	0.031	1.7E-05
RMW-2		25	2.74E-05	0.030	2.6E-05
		30	3.94E-05	0.028	3.8E-05
		40	7.01E-05	0.027	6.8E-05
		50	0.000109	0.025	0.00011
		60	0.000158	0.024	0.00015
		70	0.000215	0.023	0.00021
		80	0.00028	0.023	0.00027
		90	0.000355	0.022	0.00034
		100	0.000438	0.021	0.00042
		125	0.000684	0.020	0.00066
		150	0.000985	0.019	0.00095
		175	0.001341	0.018	0.0013
		200	0.001752	0.017	0.00169
		225	0.002217	0.017	0.00214
		250	0.002737	0.016	0.00264
		275	0.003312	0.015	0.0032
		300	0.003941	0.015	0.00381
		350	0.005364	0.014	0.00518
		400	0.007006	0.013	0.00677
		450	0.008867	0.012	0.00857
		500	0.010947	0.012	0.01057
		550	0.013246	0.011	0.0128
		600	0.015764	0.011	0.01523
		650	0.018501	0.010	0.01787
		700	0.021456	0.010	0.02073
		750	0.024631	0.009	0.02379
		800	0.028025	0.009	0.02707
		850	0.031637	0.009	0.03056
		900	0.035469	0.008	0.03426
		950	0.039519	0.008	0.03817
		1000	0.043789	0.008	0.0423
		1500	0.098524	0.005	0.09517
		2000	0.175154	0.004	0.16919
		2500	0.273678	0.002	0.26436
		3000	0.394097	0.001	0.38068
		3500	0.536409	0.000	0.51815
		4000	0.700616	0.000	0.67676
		4500	0.886717	0.000	0.85653

## ATTACHMENT F

### Artificial Recharge Groundwater Mounding Analysis

## MEMORANDUM

July 9, 2023

TO: Matt Kohlbecker, GSI Water Solutions, Inc.

FROM: Jason Keller, GeoSystems Analysis, Inc.

CC: Scott Waibel, GeoSystems Analysis, Inc.

RE: Umatilla Army Depot Managed Aquifer Recharge Groundwater Mounding Analysis

---

### INTRODUCTION

Geosystems Analysis, Inc. (GSA) conducted a groundwater mounding analysis for the aquifer beneath the proposed Umatilla Army Depot Managed Aquifer Recharge (MAR) site near Hermiston, Oregon (Figure 1) to assess the feasibility of using MAR to recharge the underlying alluvial aquifer. A MAR prefeasibility analysis was completed by GSI Water Solutions, Inc. and GSA that included development of the hydrogeologic conceptual model for the alluvial aquifer system and unsaturated zone beneath the project site (GSI, 2023a; GSI, 2023b). The groundwater mounding analysis presented herein utilizes aquifer and vadose zone hydraulic parameters from the developed hydrogeologic conceptual model and from personal communication with GSI.

### METHODS

The Zlotnik (2017) analytical solution for groundwater mounding and decay as applied in MOUNDSOLV (Hydrosolve, 2023) was used to estimate groundwater mound growth and decay beneath a MAR facility in the project area. The Zlotnik analytical solution considers both horizontal and dipping aquifers that are assumed to be of infinite extent, homogenous, and isotropic. Required model parameters include:

- Aquifer horizontal saturated hydraulic conductivity ( $K_h$ )
- Aquifer specific yield ( $S_y$ )
- Aquifer initial saturated thickness

- Aquifer dip
- Recharge basin geometry (length and width)
- Recharge rate and duration.

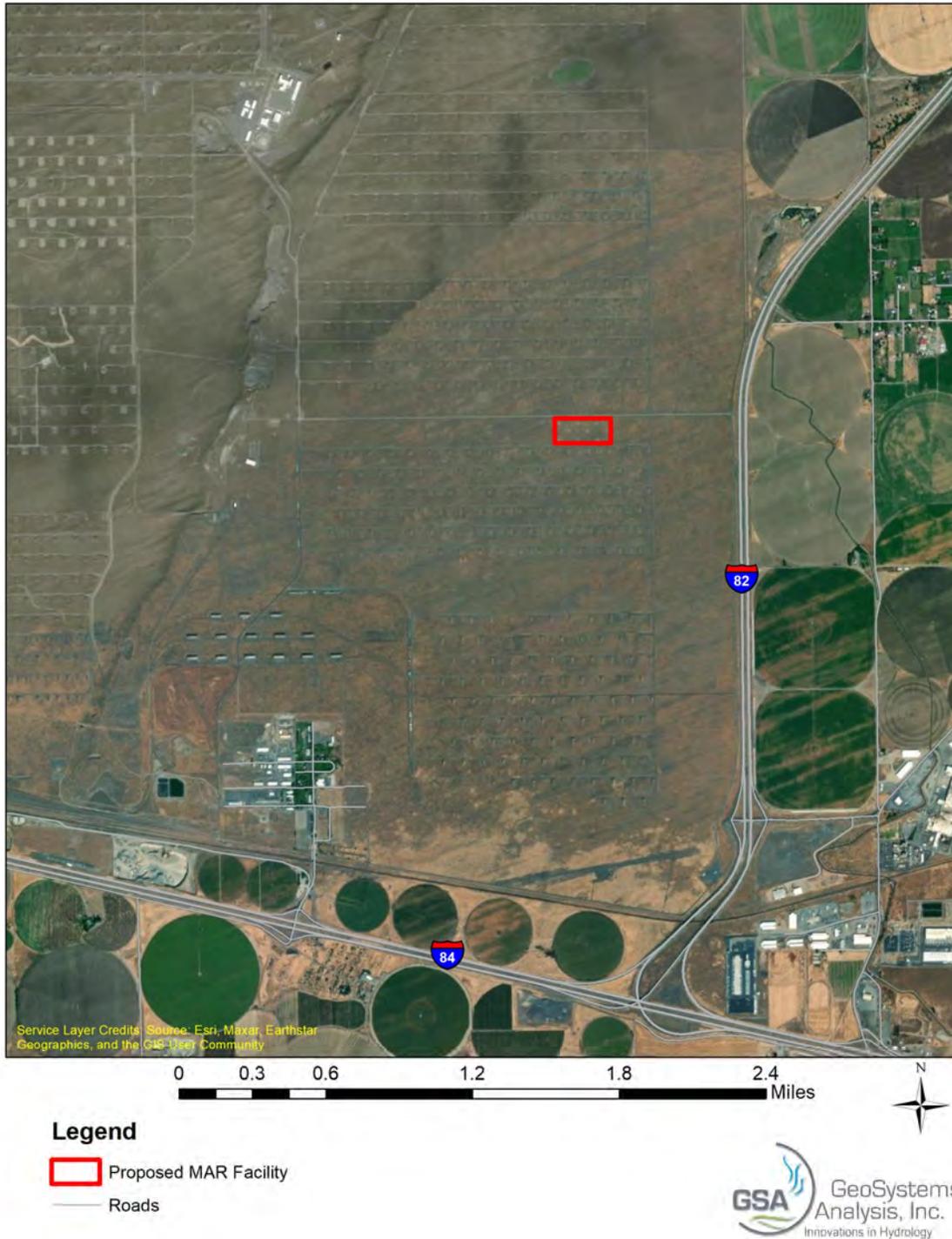


Figure 1. Proposed MAR facility location

GSI (2023a) identified at the proposed site highly hydraulically conductive gravel material with low fines beginning at depths ranging from 5 to 9 ft below ground surface (bgs). The gravel material was generally observed to be continuous to the groundwater table of the alluvial aquifer at approximately 60 ft bgs (GSI, 2023b). The target aquifer for recharge is the upper alluvial aquifer consisting of Missoula flood deposits that sit atop the Alkali Canyon Formation. The upper alluvial aquifer thickness is 80 ft thick (GSI, 2023b).

Groundwater mounding model parameters are summarized in Table 1. Depth to groundwater of 50 ft below the basin bottom was assigned, assuming the recharge basins will be excavated 10 ft bgs to access the hydraulically conductive gravel material. The aquifer resides in a structural and erosional basin that creates complex aquifer geometry; thus, the aquifer was conservatively assumed to be flat for this analysis. An aquifer  $S_y$  value of 0.19 for gravel was selected (M. Kohlbecker, personal communication, February 14, 2023; Heath 1983). Additionally, the sensitivity of  $S_y$  to mounding estimates was performed using a lower  $S_y$  value of 0.15. Groundwater mounding was evaluated for  $K_h$  values of 5,330 and 7,020 ft/day, spanning the range of measured aquifer  $K_h$  (GSI, 2023b).

Potential recharge basin dimensions within the 15-acre site (Figure 1) have not been defined at this stage of the prefeasibility analysis; thus, groundwater mounding was evaluated for four 240 ft by 430 ft MAR basins totaling 9.5 acres of recharge area.

Two MAR target recharge rates were evaluated: 5,000 acre-ft over 120 days of continuous recharge (4.4 ft/day) and 18,000 acre-ft over 120 days of continuous recharge (15.8 ft/day). The simulated recharge rates are less than the 36.9 ft/day geometric mean measured effective saturated hydraulic conductivity of the clean gravels targeted for the base of the recharge basins (GSI, 2023a). Dissipation of the groundwater mound was evaluated after 120 days of recharge.

Table 1. Groundwater mounding model parameters

Parameter	Input
Specific yield ( $S_y$ )	0.19 or 0.15
Aquifer Initial Saturated Thickness	80 ft
Horizontal Hydraulic Conductivity ( $K_h$ )	5,330 or 7,020 ft/day
Recharge Volume	5,000 or 18,000 acre-ft
Recharge Duration	120 days
Depth to Water Table	50 ft below basin floor
Aquifer Slope	flat

## RESULTS

Mounding model predicted mound growth and decay after termination of 120 days of recharge is presented in Figure 2 and Figure 3 for the 5,000 acre-ft and 18,000 acre-ft recharge scenarios, respectively. The maximum predicted groundwater mound for the 5,000 acre-ft recharge scenario with  $K_h$  of 5,330 ft/day was 3 ft above the initial (pre-mounding) water table, which is equivalent to 47 ft below the basin floor (Figure 2). Increasing  $K_h$  to 7,020 ft/day resulted in a predicted 2.5 ft maximum groundwater rise for 5,000 acre-ft of recharge (Figure 2).

The maximum predicted groundwater mound for the 18,000 acre-ft recharge scenario with  $K_h$  of 5,330 ft/day was approximately 11 ft above the initial (pre-mounding) water table, or 39 ft below the basin floor (Figure 3). Increasing  $K_h$  to 7,020 ft/day predicted an approximately 9 ft maximum groundwater rise (41 ft below basin floor) for 18,000 acre-ft of recharge. Decreasing  $S_y$  to 0.15 increased the maximum predicted groundwater mound height by approximately 0.5 ft for the 18,000 acre-ft recharge scenario with  $K_h = 5,330$  ft/day (Figure 3). For all scenarios, the maximum groundwater mound height occurred on the last day of recharge (day 120).

Model predicted groundwater mound decay rate increased as  $K_h$  increased (Figure 2, Figure 3). At day 365 (245 days after the end of recharge) the model predicted groundwater mound was approximately 0.1 ft above the initial water table for the 5,000 acre-ft recharge scenario (Figure 2) and 0.5 ft above the initial water table for the 18,000 acre-ft recharge scenario (Figure 3). Decreasing  $S_y$  was not predicted to impact the mound decay rate (Figure 3).

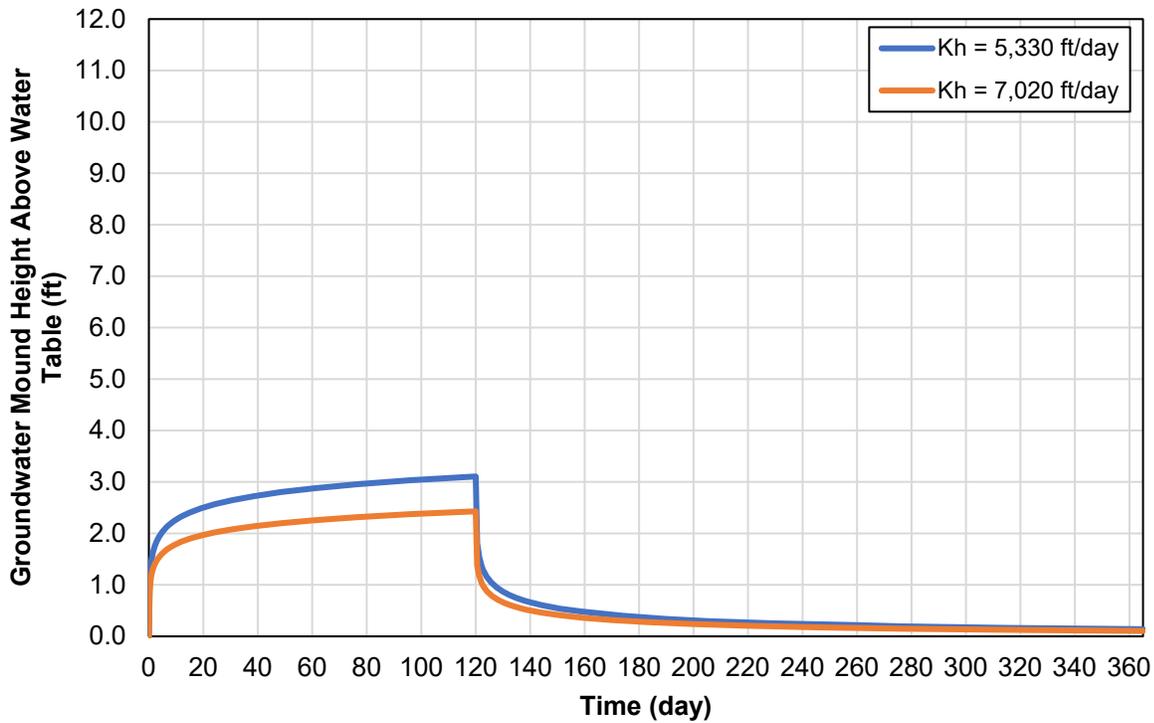


Figure 2. Model predicted groundwater mound growth and decay for 5,000 acre-ft of recharge over 120 days

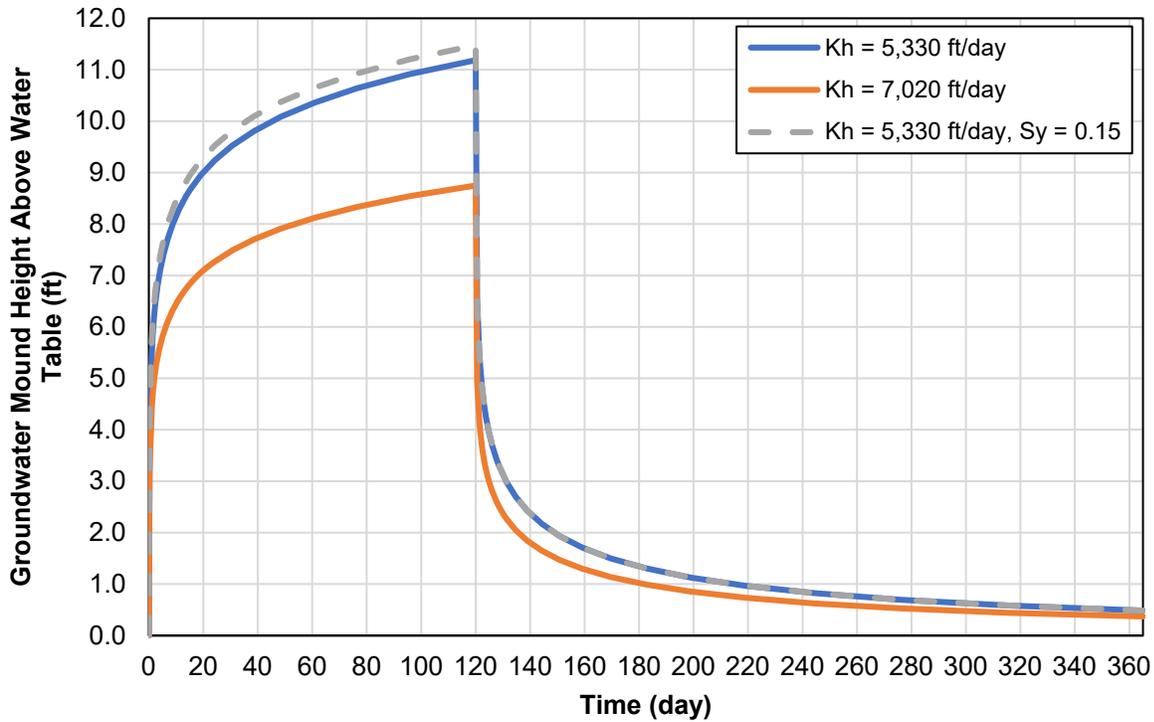


Figure 3. Model predicted groundwater mound growth and decay for 18,000 acre-ft recharge over 120 days

## CONCLUSIONS

The maximum predicted groundwater mound for the 5,000 acre-ft recharge scenario ranged from 3 ft above the initial (pre-mounding) water table (47 ft below the basin floor) to 2.5 ft. The maximum predicted groundwater mound for the 18,000 acre-ft recharge scenario ranged from 11 ft above the initial water table (39 ft below the basin floor) to approximately 9 ft (41 ft below basin floor). Maximum predicted mounding decreased with increased  $K_h$ . Decreasing  $S_y$  to 0.15 increased the maximum predicted groundwater mound height by approximately 0.5 ft.

Model predicted groundwater mound at day 365 (245 days after the end of recharge) was approximately 0.1 ft above the initial water table for the 5,000 acre-ft recharge scenario and 0.5 ft above the initial water table for the 18,000 acre-ft recharge scenario. Decreasing  $S_y$  was not predicted to impact the mound decay rate. Model results indicate groundwater mounding should not impact groundwater recharge rates for the basin area and recharge rates evaluated.

## REFERENCES

- Hydrosolve, Inc, 2023. Moundsolv version 4.0. Available online at the following link:  
<http://www.aqtesolv.com/moundsolv.htm>
- GSI, see GSI Water Solutions, Inc.
- GSI Water Solutions, Inc, 2023a. Phase I subsurface characterization results, Umatilla Army Depot Artificial Recharge Project, Umatilla County, Oregon.
- GSI Water Solutions, Inc, 2023b. Phase II subsurface characterization results, Umatilla Army Depot Artificial Recharge Project, Umatilla County, Oregon.
- Zlotnik, V.A., Kacimov, A. and A. Al-Maktoumi, 2017. Estimating groundwater mounding in sloping aquifers for managed aquifer recharge, *Groundwater*, vol. 55, no. 6, pp. 797-810.
- Heath, R.C., 1983. Basic ground-water hydrology, U.S. Geological Survey Water-Supply Paper 2220, 86p.

**ATTACHMENT G**

Source and Groundwater Quality Monitoring Results



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F : +1 360 636 1068  
[www.alsglobal.com](http://www.alsglobal.com)

June 22, 2023

**Analytical Report for Service Request No: K2303703**

Matt Thomas  
GSI Water Solutions, Inc  
650 NE Holladay Street  
Suite 900  
Portland, OR 97232

**RE: Umatilla Depot / 913.001.002.000**

Dear Matt,

Enclosed are the results of the sample(s) submitted to our laboratory March 30, 2023  
For your reference, these analyses have been assigned our service request number **K2303703**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at [www.alsglobal.com](http://www.alsglobal.com). All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at [Mark.Harris@alsglobal.com](mailto:Mark.Harris@alsglobal.com).

Respectfully submitted,

**ALS Group USA, Corp. dba ALS Environmental**

Mark Harris  
Project Manager



---

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Semivolatile Organic Compounds by GCMS  
Subcontract Lab Results

## Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

### **Inorganic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

### **Metals Data Qualifiers**

- # The control limit criteria is not applicable.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.  
  
i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Organic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Additional Petroleum Hydrocarbon Specific Qualifiers**

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso  
State Certifications, Accreditations, and Licenses**

<b>Agency</b>	<b>Web Site</b>	<b>Number</b>
Alaska DEH	<a href="http://dec.alaska.gov/eh/lab/cs/csapproval.htm">http://dec.alaska.gov/eh/lab/cs/csapproval.htm</a>	UST-040
Arizona DHS	<a href="http://www.azdhs.gov/lab/license/env.htm">http://www.azdhs.gov/lab/license/env.htm</a>	AZ0339
Arkansas - DEQ	<a href="http://www.adeq.state.ar.us/techsvs/labcert.htm">http://www.adeq.state.ar.us/techsvs/labcert.htm</a>	88-0637
California DHS (ELAP)	<a href="http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx">http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx</a>	2795
DOD ELAP	<a href="http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm">http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm</a>	L16-58-R4
Florida DOH	<a href="http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm">http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm</a>	E87412
Hawaii DOH	<a href="http://health.hawaii.gov/">http://health.hawaii.gov/</a>	-
ISO 17025	<a href="http://www.pjllabs.com/">http://www.pjllabs.com/</a>	L16-57
Louisiana DEQ	<a href="http://www.deq.louisiana.gov/page/la-lab-accreditation">http://www.deq.louisiana.gov/page/la-lab-accreditation</a>	03016
Maine DHS	<a href="http://www.maine.gov/dhhs/">http://www.maine.gov/dhhs/</a>	WA01276
Minnesota DOH	<a href="http://www.health.state.mn.us/accreditation">http://www.health.state.mn.us/accreditation</a>	053-999-457
Nevada DEP	<a href="http://ndep.nv.gov/bsdw/labservice.htm">http://ndep.nv.gov/bsdw/labservice.htm</a>	WA01276
New Jersey DEP	<a href="http://www.nj.gov/dep/enforcement/oqa.html">http://www.nj.gov/dep/enforcement/oqa.html</a>	WA005
New York - DOH	<a href="https://www.wadsworth.org/regulatory/elap">https://www.wadsworth.org/regulatory/elap</a>	12060
North Carolina DEQ	<a href="https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification">https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification</a>	605
Oklahoma DEQ	<a href="http://www.deq.state.ok.us/CSDnew/labcert.htm">http://www.deq.state.ok.us/CSDnew/labcert.htm</a>	9801
Oregon – DEQ (NELAP)	<a href="http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx">http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx</a>	WA100010
South Carolina DHEC	<a href="http://www.scdhec.gov/environment/EnvironmentalLabCertification/">http://www.scdhec.gov/environment/EnvironmentalLabCertification/</a>	61002
Texas CEQ	<a href="http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html">http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html</a>	T104704427
Washington DOE	<a href="http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html">http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html</a>	C544
Wyoming (EPA Region 8)	<a href="https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water">https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water</a>	-
Kelso Laboratory Website	<a href="http://www.alsglobal.com">www.alsglobal.com</a>	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at [www.ALSGlobal.com](http://www.ALSGlobal.com) or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.



## Case Narrative

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)



**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Received:** 03/30/2023

**CASE NARRATIVE**

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

**Sample Receipt:**

One water sample was received for analysis at ALS Environmental on 03/30/2023. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The sample was stored at minimum in accordance with the analytical method requirements.

**Semivolatiles by GC/MS:**

Method 8270D, 04/10/2023: The upper control criterion was exceeded for Hexachlorocyclopentadiene in Laboratory Control Sample (LCS) KQ2306108-02 and Duplicate Laboratory Control Sample (DLCS) KQ2306108-03. The analyte in question was not detected in the associated field samples. The error associated with elevated recovery indicated a high bias. The sample data was not significantly affected. No further corrective action was appropriate.

Method 8270D, 04/10/2023: Manual integration of one or more chromatographic peaks in sample APS-1-BKGND-03292023 was required to correct the integration performed by the automated data processing program. The manual integration was performed in accordance with ALS policy, which is consistent with the National Environmental Laboratory Accreditation Program (NELAP), Department of Defense (DOD), and other certifying agencies. Refer to the raw data for the compounds impacted by the manual integration.

Method 8270D, 04/10/2023: Insufficient sample volume was received to perform a Matrix Spike/Matrix Spike Duplicate (MS/MSD) with this sample batch. A Laboratory Control Sample/Duplicate Laboratory Control Sample (LCS/DLCS) was analyzed and reported in lieu of the MS/MSD for this sample.

**Semivolatile GC:**

Method 8081B, : Manual integration of one or more chromatographic peaks in several samples was required to correct the integration performed by the automated data processing program. The manual integration was performed in accordance with ALS policy, which is consistent with the National Environmental Laboratory Accreditation Program (NELAP), Department of Defense (DOD), and other certifying agencies. Refer to the raw data for the compounds impacted by the manual integration.

Method 8081B, : The upper control criterion was exceeded for Methoxychlor in the associated opening Continuing Calibration Verification (CCV). The field samples analyzed in this sequence did not contain the analyte in question. Since the apparent problem indicated a potential high bias, the data quality was not affected. No further corrective action was required.

Method 8081B, 04/27/2023: Due to a problem with the lowest concentration standard during the calibration of the instrument, the minimum reporting limit was elevated from 0.010ug/L to 0.025ug/L for Methoxychlor. The results were adjusted to indicate the raised MRL.

Method 8082A, : The recovery of Decachlorobiphenyl in sample name APS-1-BKGND-03292023 was outside the control limits listed in the results summary. The limits are default values temporarily in use until sufficient data points are generated to calculate statistical control limits. Based on the method and historic data, the recoveries observed were in the range expected for this procedure. No further corrective action was taken.

Method 8151A, 05/10/2023: The upper control criterion was exceeded for multiple target analytes in Continuing Calibration

Approved by \_\_\_\_\_

Date 06/22/2023



Verification (CCV) KQ2308597-01,-03. The field samples analyzed in this sequence did not contain the analyte(s) in question. Since the apparent problem indicated a potential high bias, the data quality was not affected. No further corrective action was required.

Method 8151A, 05/10/2023: The upper control criterion was exceeded for all analytes in Duplicate Laboratory Control Sample (DLCS) KQ2306106-03. The analytes in question were not detected in the associated field sample. The error associated with elevated recovery indicated a high bias. Recovery in the LCS met control criteria. The sample data was not significantly affected. No further corrective action was appropriate.

**Metals:**

No significant anomalies were noted with this analysis.

**General Chemistry:**

No significant anomalies were noted with this analysis.

**Subcontracted Analytical Parameters:**

900.0, 903.1, 904.0

These analyses were performed at Gel Labs LLC in Charleston, SC. The data for this analysis is included in the corresponding section of this report.

8330A

This analysis was performed at ALS Middletown, PA Laboratory. The data for this analysis is included in the corresponding section of this report.

**Volatiles by GC/MS:**

Method 8260C, 04/04/2023: The DOD QSM lower control criterion was exceeded for the surrogate 4-Bromofluorobenzene in sample APS-1-BKGND-03292023 and Method Blank (MB) KQ2306252-05. The error associated with reduced recoveries equates to a potential slight bias. The recoveries of the surrogate in question were within ALS control Charted limits. The results were flagged to indicate the issue. No further corrective action was taken.

Approved by

*Noel D. O'Connell*

Date

06/22/2023



# Chain of Custody

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CHAIN OF CUSTODY

129889

002

SR# 129889  
 COC Set \_\_\_\_\_ of \_\_\_\_\_  
 COC# \_\_\_\_\_

1317 South 13th Ave, Kelso, WA 98626 Phone (360) 577-7222 / 800-695-7222 / FAX (360) 636-1068  
 www.alsglobal.com

Project Name <u>Amalgam Report</u>		Project Number <u>913001002-002</u>		NUMBER OF CONTAINERS	7D										14D			28D			180D	365D	Remarks						
Project Manager <u>Matt Winkler</u>		Company <u>GSI Water Solutions, Inc.</u>			9081B / Pest OC	9151A / HERB	9270D / SVO	9330A / NitroAro Amin	900.0 / Radioact	903.1 / Radium 226	904.0 / Radium 228	SM 2540 C / TDS	SM 2540 D / TSS	9280C / VOC FP	SM 2320 B / Alkalinity Tit	SM 2320 B / Carbonate Alk	SM 4500-CN- E / CN T	900.0 / Chloride	900.0 / F	900.0 / SO4	953.2 / NO2 NO3 T	7470A / Hg T		SM 4500-P E / T Phos	SM 5310 C / TOC T	9010C / Metals T	9020A / Metals T	9082A / PCB 3520	
Address <u>670 NE Holladay St. Ste 900</u>	Phone # <u>425-957-4716</u>	email <u>mthomas@gsws.com</u>		Sampler Signature <u>Matthew Thomas</u>		Sampler Printed Name <u>Matthew Thomas</u>		CLIENT SAMPLE ID		LABID	SAMPLING Date Time	Matrix																	
<u>1. ADS-1-DUGND-03201213</u>		<u>3/20/13</u>	<u>1400</u>	<u>Water</u>	<u>20</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
2.																													
3.																													
4.																													
5.																													
6.																													
7.																													
8.																													
9.																													
10.																													

**Report Requirements**

I. Routine Report: Method Blank, Surrogate, as required

II. Report Dup., MS, MSD as required

III. CLP Like Summary (no raw data)

IV. Data Validation Report

V. EDD

**Invoice Information**

P.O.# \_\_\_\_\_

Bill To: \_\_\_\_\_

\_\_\_\_\_

**Turnaround Requirements**

\_\_\_ 24 hr. \_\_\_ 48 hr.

\_\_\_ 5 Day

\_\_\_ Standard

Requested Report Date \_\_\_\_\_

Circle which metals are to be analyzed

Total Metals:  Al  As  Sb  Ba  Be  B  Ca  Cd  Co  Cr  Cu  Fe  Pb  Mg  Mn  Mo  Ni  K  Ag  Na  Se  Sr  Ti  Sn  V  Zn  Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg

Special Instructions/Comments: Thallium, Antimony, Nickel (don't remember formula)

\*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other \_\_\_\_\_ (Circle One)

Address Invoice to: John Schorfer  
216 SE 4th St. Pendleton, OR 97801

See project files

Email Invoice to: m.winkler@gsws.com

Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature <u>Matthew Thomas</u>	Signature <u>[Signature]</u>	Signature	Signature	Signature	Signature
Printed Name <u>Matthew Thomas</u>	Printed Name <u>ALS</u>	Printed Name	Printed Name	Printed Name	Printed Name
Firm <u>GSI Water Solutions</u>	Firm <u>3/30/13 1040</u>	Firm	Firm	Firm	Firm
Date/Time <u>3/20/13 1345</u>	Date/Time	Date/Time	Date/Time	Date/Time	Date/Time



CHAIN OF CUSTODY  
129889

002

SR# K2203703  
COC Set \_\_\_ of \_\_\_  
COC# \_\_\_\_\_

1317 South 13th Ave, Kelso, WA 98626 Phone (360) 577-7222 / 800-695-7222 / FAX (360) 636-1068  
www.alsglobal.com

Project Name		Project Number:		NUMBER OF CONTAINERS	999D	SM 2330B / Lingieridk Calc	SM 2340 B / Hardness Calc	1	2	3	4	5	Remarks
Project Manager													
Company													
Address													
Phone #	email												
Sampler Signature		Sampler Printed Name											
CLIENT SAMPLE ID	LABID	SAMPLING Date	SAMPLING Time	Matrix									
1. AP3-1-BV64D-03292023		3/29/23	1400	water	20	X	X						
2.													
3.													
4.													
5.													
6.													
7.													
8.													
9.													
10.													

<b>Report Requirements</b> <input checked="" type="checkbox"/> I. Routine Report: Method Blank, Surrogate, as required <input type="checkbox"/> II. Report Dup., MS, MSD as required <input type="checkbox"/> III. CLP Like Summary (no raw data) <input type="checkbox"/> IV. Data Validation Report <input type="checkbox"/> V. EDD	<b>Invoice Information</b> P.O.# _____ Bill To: _____ _____	Circle which metals are to be analyzed Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg	
	<b>Turnaround Requirements</b> <input type="checkbox"/> 24 hr. <input type="checkbox"/> 48 hr. <input type="checkbox"/> 5 Day <input type="checkbox"/> Standard	Special Instructions/Comments: _____ *Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other _____ (Circle One)	
	Requested Report Date _____		

Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature <i>Matthew Thomas</i>	Signature <i>[Signature]</i>	Signature	Signature	Signature	Signature
Printed Name Matthew Thomas	Printed Name ALS	Printed Name	Printed Name	Printed Name	Printed Name
Firm GSI Water Solutions	Firm 3/30/23 1040	Firm	Firm	Firm	Firm
Date/Time 3/29/23 1345	Date/Time	Date/Time	Date/Time	Date/Time	Date/Time

### Cooler Receipt and Preservation Form

Client GSI Service Request K23 03703  
 Received: 3/30/23 Opened: 3/30/23 By: [Signature] Unloaded: 3/30/23 By: [Signature]

1. Samples were received via?  USPS  Fed Ex  UPS  DHL  PDX  Courier  Hand Delivered
2. Samples were received in: (circle)  Cooler  Box  Envelope  Other \_\_\_\_\_ NA
3. Were custody seals on coolers? NA  Y  N If yes, how many and where? 1, front  
 If present, were custody seals intact?  Y  N If present, were they signed and dated?  Y  N

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp Indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
<u>3.6</u>	<u>0.9</u>	<u>1202</u>	<u>124884</u>			<u>1Z6018YA2310000384</u>	

4. Was a Temperature Blank present in cooler? NA  Y  N If yes, notate the temperature in the appropriate column above:  
 If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA  Y  N  
 If no, were they received on ice and same day as collected? If not, notate the cooler # above and notify the PM.  NA  Y  N  
 If applicable, tissue samples were received: Frozen Partially Thawed Thawed
6. Packing material: Inserts Baggies  Bubble Wrap Gel Packs  Wet Ice Dry Ice Sleeves \_\_\_\_\_
7. Were custody papers properly filled out (ink, signed, etc.)? NA  Y  N
8. Were samples received in good condition (unbroken) NA  Y  N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA  Y  N
10. Did all sample labels and tags agree with custody papers? NA  Y  N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA  Y  N
12. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below NA  Y  N
13. Were VOA vials received without headspace? Indicate in the table below.  NA  Y  N
14. Was C12/Res negative?  NA  Y  N
15. Were samples received within the method specified time limit? If not, notate the error below and notify the PM  NA  Y  N
16. Were 100ml sterile microbiology bottles filled exactly to the 100ml mark?  NA  Y  N Underfilled Overfilled

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, Resolutions: No bottles for TOC T or 8200 VOC. Lab to create bottles  
 G:\SMO\2022 Forms SOP: SMO-GEN Reviewed: 12/9/2022



# General Chemistry

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water  
**Analysis Method:** 300.0  
**Prep Method:** None

**Service Request:** K2303703  
**Date Collected:** 03/29/23  
**Date Received:** 03/30/23  
**Units:** mg/L  
**Basis:** NA

Chloride

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
APS-1-BKGND-03292023	K2303703-001	6.81	0.20	0.03	0.010	2	04/08/23 01:08	
Method Blank	K2303703-MB1	ND U	0.10	0.02	0.005	1	04/07/23 23:17	

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Collected:** 03/29/23  
**Date Received:** 03/30/23  
**Date Analyzed:** 04/08/23

**Replicate Sample Summary**  
**General Chemistry Parameters**

**Sample Name:** APS-1-BKGND-03292023  
**Lab Code:** K2303703-001

**Units:** mg/L  
**Basis:** NA

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>LOQ</u>	<u>LOD</u>	<u>MDL</u>	<u>Sample Result</u>	<u>Duplicate Sample K2303703-001DUP Result</u>	<u>Average</u>	<u>RPD</u>	<u>RPD Limit</u>
Chloride	300.0	0.20	0.03	0.01	6.81	6.81	6.81	<1	20

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Collected:** 03/29/23  
**Date Received:** 03/30/23  
**Date Analyzed:** 04/8/23  
**Date Extracted:** NA

**Duplicate Matrix Spike Summary**  
**Chloride**

**Sample Name:** APS-1-BKGND-03292023  
**Lab Code:** K2303703-001  
**Analysis Method:** 300.0  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA

Analyte Name	Sample Result	Result	Matrix Spike K2303703-001MS		Duplicate Matrix Spike K2303703-001DMS		% Rec Limits	RPD	RPD Limit	
			Spike Amount	% Rec	Result	Spike Amount				% Rec
Chloride	6.81	14.4	8.00	95	14.4	8.00	95	90-110	<1	20

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Analyzed:** 04/07/23  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**Chloride**

**Analysis Method:** 300.0  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 800163

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2303703-LCS2	4.84	5.00	97	90-110

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water  
**Analysis Method:** 300.0  
**Prep Method:** None

**Service Request:** K2303703  
**Date Collected:** 03/29/23  
**Date Received:** 03/30/23  
**Units:** mg/L  
**Basis:** NA

Fluoride

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
APS-1-BKGND-03292023	K2303703-001	0.17 J	0.20	0.06	0.02	2	04/08/23 01:08	
Method Blank	K2303703-MB1	ND U	0.10	0.03	0.010	1	04/07/23 23:17	

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: GSI Water Solutions, Inc
Project: Umatilla Depot/913.001.002.000
Sample Matrix: Water

Service Request: K2303703
Date Collected: 03/29/23
Date Received: 03/30/23
Date Analyzed: 04/08/23

Replicate Sample Summary
General Chemistry Parameters

Sample Name: APS-1-BKGND-03292023
Lab Code: K2303703-001

Units: mg/L
Basis: NA

Table with 10 columns: Analyte Name, Analysis Method, LOQ, LOD, MDL, Sample Result, Duplicate Sample K2303703-001DUP Result, Average, RPD, RPD Limit. Row 1: Fluoride, 300.0, 0.20, 0.06, 0.02, 0.17 J, 0.17 J, 0.172, <1, 20

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Collected:** 03/29/23  
**Date Received:** 03/30/23  
**Date Analyzed:** 04/8/23  
**Date Extracted:** NA

**Duplicate Matrix Spike Summary  
Fluoride**

**Sample Name:** APS-1-BKGND-03292023  
**Lab Code:** K2303703-001  
**Analysis Method:** 300.0  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA

Analyte Name	Sample Result	Result	Matrix Spike K2303703-001MS		Duplicate Matrix Spike K2303703-001DMS		% Rec Limits	RPD	RPD Limit	
			Spike Amount	% Rec	Result	Spike Amount				% Rec
Fluoride	0.17 J	8.15	8.00	100	8.13	8.00	100	90-110	<1	20

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Analyzed:** 04/07/23  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**Fluoride**

**Analysis Method:** 300.0  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 800163

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2303703-LCS2	4.99	5.00	100	90-110

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water  
**Analysis Method:** 300.0  
**Prep Method:** None

**Service Request:** K2303703  
**Date Collected:** 03/29/23  
**Date Received:** 03/30/23  
**Units:** mg/L  
**Basis:** NA

Sulfate

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
APS-1-BKGND-03292023	K2303703-001	20.0	0.40	0.30	0.12	2	04/08/23 01:08	
Method Blank	K2303703-MB1	ND U	0.20	0.15	0.06	1	04/07/23 23:17	

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Collected:** 03/29/23  
**Date Received:** 03/30/23  
**Date Analyzed:** 04/08/23

**Replicate Sample Summary**  
**General Chemistry Parameters**

**Sample Name:** APS-1-BKGND-03292023  
**Lab Code:** K2303703-001

**Units:** mg/L  
**Basis:** NA

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>LOQ</u>	<u>LOD</u>	<u>MDL</u>	<u>Sample Result</u>	<u>Duplicate Sample K2303703-001DUP Result</u>	<u>Average</u>	<u>RPD</u>	<u>RPD Limit</u>
Sulfate	300.0	0.40	0.30	0.12	20.0	20.0	20.0	<1	20

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Collected:** 03/29/23  
**Date Received:** 03/30/23  
**Date Analyzed:** 04/8/23  
**Date Extracted:** NA

**Duplicate Matrix Spike Summary**  
**Sulfate**

**Sample Name:** APS-1-BKGND-03292023  
**Lab Code:** K2303703-001  
**Analysis Method:** 300.0  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA

Analyte Name	Sample Result	Result	Matrix Spike K2303703-001MS		Duplicate Matrix Spike K2303703-001DMS		% Rec Limits	RPD	RPD Limit	
			Spike Amount	% Rec	Result	Spike Amount				% Rec
Sulfate	20.0	27.8	8.00	97	27.7	8.00	97	90-110	<1	20

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Analyzed:** 04/07/23  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**Sulfate**

**Analysis Method:** 300.0  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 800163

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2303703-LCS2	5.03	5.00	101	90-110

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water  
**Analysis Method:** 353.2  
**Prep Method:** Method

**Service Request:** K2303703  
**Date Collected:** 03/29/23  
**Date Received:** 03/30/23  
**Units:** mg/L  
**Basis:** NA

Nitrate+Nitrite as Nitrogen

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
APS-1-BKGND-03292023	K2303703-001	<b>0.824</b>	0.050	0.020	0.006	1	04/03/23	4/3/23	
Method Blank	K2303703-MB1	ND U	0.050	0.020	0.006	1	04/03/23	4/3/23	

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Collected:** 03/29/23  
**Date Received:** 03/30/23  
**Date Analyzed:** 04/03/23

**Replicate Sample Summary**  
**General Chemistry Parameters**

**Sample Name:** APS-1-BKGND-03292023  
**Lab Code:** K2303703-001

**Units:** mg/L  
**Basis:** NA

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>LOQ</u>	<u>LOD</u>	<u>MDL</u>	<u>Sample Result</u>	<u>Duplicate Sample K2303703-001DUP Result</u>	<u>Average</u>	<u>RPD</u>	<u>RPD Limit</u>
Nitrate+Nitrite as Nitrogen	353.2	0.050	0.020	0.006	0.824	0.820	0.822	<1	20

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Collected:** 03/29/23  
**Date Received:** 03/30/23  
**Date Analyzed:** 04/3/23  
**Date Extracted:** 04/3/23

**Duplicate Matrix Spike Summary**  
**Nitrate+Nitrite as Nitrogen**

**Sample Name:** APS-1-BKGND-03292023  
**Lab Code:** K2303703-001  
**Analysis Method:** 353.2  
**Prep Method:** Method

**Units:** mg/L  
**Basis:** NA

Analyte Name	Matrix Spike K2303703-001MS				Duplicate Matrix Spike K2303703-001DMS				% Rec Limits	RPD	RPD Limit
	Sample Result	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec				
Nitrate+Nitrite as Nitrogen	0.824	1.81	1.00	98	1.79	1.00	97	90-110	1	20	

Results flagged with an asterisk (\*) indicate values outside control criteria.

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Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Analyzed:** 04/03/23  
**Date Extracted:** 04/03/23

**Lab Control Sample Summary**  
**Nitrate+Nitrite as Nitrogen**

**Analysis Method:** 353.2  
**Prep Method:** Method

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 799768

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2303703-LCS2	7.27	7.20	101	90-110

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water  
**Analysis Method:** SM 2320 B  
**Prep Method:** None

**Service Request:** K2303703  
**Date Collected:** 03/29/23  
**Date Received:** 03/30/23  
**Units:** mg/L  
**Basis:** NA

Alkalinity as CaCO3, Total

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
APS-1-BKGND-03292023	K2303703-001	90.4	2.0	1.2	0.6	1	03/30/23 23:23	
Method Blank	K2303703-MB1	0.6 J	2.0	1.2	0.6	1	03/30/23 23:23	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Analyzed:** 03/30/23  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**Alkalinity as CaCO<sub>3</sub>, Total**

**Analysis Method:** SM 2320 B  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 799474

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2303703-LCS2	181	178	102	85-115
Lab Control Sample	K2303703-LCS3	182	178	102	85-115

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water  
**Analysis Method:** SM 2320 B  
**Prep Method:** None

**Service Request:** K2303703  
**Date Collected:** 03/29/23  
**Date Received:** 03/30/23  
**Units:** mg/L  
**Basis:** NA

Carbonate as CaCO3

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
APS-1-BKGND-03292023	K2303703-001	ND U	2.0	1.2	0.6	1	03/30/23 23:23	
Method Blank	K2303703-MB1	ND U	2.0	1.2	0.6	1	03/30/23 23:23	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Analyzed:** 03/30/23  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**Carbonate as CaCO<sub>3</sub>**

**Analysis Method:** SM 2320 B  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 799474

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2303703-LCS2	181	178	102	85-115
Lab Control Sample	K2303703-LCS3	182	178	102	85-115

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Collected:** 3/29/2023  
**Date Received:** 3/30/2023  
**Date Extracted:** NA  
**Date Analyzed:** NA

Langelier Index  
SM 2330B

<b>Sample Name</b>	<b>Lab Code</b>	<b>Temp °C</b>	<b>Result</b>
APS-1-BKGND-03292023	K2303703-001	17.8	-0.00275

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water  
**Analysis Method:** SM 2540 C  
**Prep Method:** None

**Service Request:** K2303703  
**Date Collected:** 03/29/23  
**Date Received:** 03/30/23  
**Units:** mg/L  
**Basis:** NA

**Solids, Total Dissolved**

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
APS-1-BKGND-03292023	K2303703-001	136	5.0	-	-	1	04/05/23 12:57	
Method Blank	K2303703-MB1	ND U	5.0	-	-	1	04/05/23 12:57	
Method Blank	K2303703-MB2	ND U	5.0	-	-	1	04/05/23 12:57	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Analyzed:** 04/05/23  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**Solids, Total Dissolved**

**Analysis Method:** SM 2540 C  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 799874

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2303703-LCS2	1890	1920	98	85-115

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water  
**Analysis Method:** SM 2540 D  
**Prep Method:** None

**Service Request:** K2303703  
**Date Collected:** 03/29/23  
**Date Received:** 03/30/23  
**Units:** mg/L  
**Basis:** NA

Solids, Total Suspended (TSS)

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
APS-1-BKGND-03292023	K2303703-001	ND U	5.0	-	-	1	04/04/23 11:57	
Method Blank	K2303703-MB1	ND U	5.0	-	-	1	04/04/23 11:57	
Method Blank	K2303703-MB2	ND U	5.0	-	-	1	04/04/23 11:57	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Analyzed:** 04/04/23  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**Solids, Total Suspended (TSS)**

**Analysis Method:** SM 2540 D  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 799741

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2303703-LCS2	398	400	100	85-115

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water  
**Analysis Method:** SM 4500-CN- E  
**Prep Method:** SM 4500-CN-C

**Service Request:** K2303703  
**Date Collected:** 03/29/23  
**Date Received:** 03/30/23  
**Units:** mg/L  
**Basis:** NA

Cyanide, Total

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
APS-1-BKGND-03292023	K2303703-001	ND U	0.020	0.002	0.0005	1	04/08/23	4/8/23	
Method Blank	K2303703-MB1	ND U	0.020	0.002	0.0005	1	04/08/23	4/8/23	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Analyzed:** 04/08/23  
**Date Extracted:** 04/08/23

**Duplicate Lab Control Sample Summary**  
**General Chemistry Parameters**

**Analysis Method:** SM 4500-CN- E  
**Prep Method:** SM 4500-CN-C

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 800437

**Lab Control Sample**  
**K2303703-LCS1**

**Duplicate Lab Control Sample**  
**K2303703-DLCS1**

<u>Analyte Name</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>% Rec Limits</u>	<u>RPD</u>	<u>RPD Limit</u>
Cyanide, Total	0.072	0.075	96	0.069	0.075	92	84-115	4	20

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water  
**Analysis Method:** SM 4500-H+ B  
**Prep Method:** None

**Service Request:** K2303703  
**Date Collected:** 03/29/23  
**Date Received:** 03/30/23  
**Units:** pH Units  
**Basis:** NA

**pH**

Sample Name	Lab Code	Result	LOQ	LOD	Dil.	Date Analyzed	Q
APS-1-BKGND-03292023	K2303703-001	8.20	-	-	1	03/30/23 16:51	H

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Analyzed:** 03/30/23  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**pH**

**Analysis Method:** SM 4500-H+ B  
**Prep Method:** None

**Units:** pH Units  
**Basis:** NA  
**Analysis Lot:** 799447

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2303703-LCS2	5.62	5.58	101	85-115

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water  
**Analysis Method:** SM 4500-P E  
**Prep Method:** Method

**Service Request:** K2303703  
**Date Collected:** 03/29/23  
**Date Received:** 03/30/23  
**Units:** mg/L  
**Basis:** NA

Phosphorus, Total

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
APS-1-BKGND-03292023	K2303703-001	0.018 J	0.020	0.010	0.005	1	04/12/23	4/11/23	
Method Blank	K2303703-MB1	ND U	0.020	0.010	0.005	1	04/12/23	NA	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Analyzed:** 04/12/23  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**Phosphorus, Total**

**Analysis Method:** SM 4500-P E  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 800654

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2303703-LCS2	2.73	2.66	103	85-115

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water  
**Analysis Method:** SM 5310 C  
**Prep Method:** None

**Service Request:** K2303703  
**Date Collected:** 03/29/23  
**Date Received:** 03/30/23  
**Units:** mg/L  
**Basis:** NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
APS-1-BKGND-03292023	K2303703-001	1.40	0.50	0.20	0.07	1	04/04/23 15:27	
Method Blank	K2303703-MB1	0.08 J	0.50	0.20	0.07	1	04/04/23 15:27	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Collected:** 03/29/23  
**Date Received:** 03/30/23  
**Date Analyzed:** 04/04/23

**Replicate Sample Summary**  
**General Chemistry Parameters**

**Sample Name:** APS-1-BKGND-03292023  
**Lab Code:** K2303703-001

**Units:** mg/L  
**Basis:** NA

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>LOQ</u>	<u>LOD</u>	<u>MDL</u>	<u>Sample Result</u>	<u>Duplicate Sample K2303703-001DUP Result</u>	<u>Average</u>	<u>RPD</u>	<u>RPD Limit</u>
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	1.40	1.50	1.45	7	10

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Collected:** 03/29/23  
**Date Received:** 03/30/23  
**Date Analyzed:** 04/4/23  
**Date Extracted:** NA

**Matrix Spike Summary**  
**Carbon, Total Organic**

**Sample Name:** APS-1-BKGND-03292023  
**Lab Code:** K2303703-001  
**Analysis Method:** SM 5310 C  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA

**Matrix Spike**  
K2303703-001MS

<u>Analyte Name</u>	<u>Sample Result</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>% Rec Limits</u>
Carbon, Total Organic	1.40	25.5	25.0	96	83-117

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Analyzed:** 04/04/23  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**Carbon, Total Organic**

**Analysis Method:** SM 5310 C  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 799779

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2303703-LCS2	25.7	25.0	103	83-117



# Metals

**ALS Environmental—Kelso Laboratory**  
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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water  
**Sample Name:** APS-1-BKGND-03292023  
**Lab Code:** K2303703-001

**Service Request:** K2303703  
**Date Collected:** 03/29/23 14:00  
**Date Received:** 03/30/23 10:40  
**Basis:** NA

**Hardness by ICP-AES Calculation 20th Ed.**

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>LOQ</u>	<u>LOD</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Q</u>
Hardness, Total as CaCO3	SM 2340 B	<b>103</b>	mg/L	0.09	0.053	0.023	1	04/19/23 15:08	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Collected:** 03/29/23 14:00  
**Date Received:** 03/30/23 10:40

**Sample Name:** APS-1-BKGND-03292023  
**Lab Code:** K2303703-001

**Basis:** NA

Total Metals

Analyte Name	Analysis		Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Date	
	Method	Result							Extracted	Q
Aluminum	6020A	40.2	ug/L	4.0	2.0	0.5	1	04/19/23 15:08	04/17/23	
Antimony	6020A	0.118	ug/L	0.050	0.045	0.020	1	04/19/23 15:08	04/17/23	
Arsenic	6020A	1.38	ug/L	0.50	0.25	0.09	1	04/19/23 15:08	04/17/23	
Barium	6020A	30.1	ug/L	0.050	0.045	0.020	1	04/19/23 15:08	04/17/23	
Beryllium	6020A	ND U	ug/L	0.020	0.015	0.005	1	04/19/23 15:08	04/17/23	
Cadmium	6020A	0.010 J	ug/L	0.020	0.018	0.008	1	04/19/23 15:08	04/17/23	
Calcium	6020A	27900	ug/L	20	13	6	1	04/19/23 15:08	04/17/23	
Chromium	6020A	0.27	ug/L	0.20	0.10	0.03	1	04/19/23 15:08	04/17/23	
Copper	6020A	1.93	ug/L	0.20	0.09	0.05	1	04/19/23 15:08	04/17/23	
Iron	6020A	58.2	ug/L	2.0	1.0	0.3	1	04/19/23 15:08	04/17/23	
Lead	6020A	0.151	ug/L	0.020	0.018	0.006	1	04/19/23 15:08	04/17/23	
Magnesium	6020A	8100	ug/L	10	5	2	1	04/19/23 15:08	04/17/23	
Manganese	6020A	9.88	ug/L	0.20	0.10	0.04	1	04/19/23 15:08	04/17/23	
Mercury	7470A	ND U	ug/L	0.20	0.05	0.02	1	04/11/23 10:02	04/10/23	
Nickel	6020A	0.41	ug/L	0.20	0.15	0.04	1	04/19/23 15:08	04/17/23	
Potassium	6020A	1910	ug/L	50	45	20	1	04/19/23 15:08	04/17/23	
Selenium	6020A	0.3 J	ug/L	1.0	0.5	0.2	1	04/19/23 15:08	04/17/23	
Silver	6020A	ND U	ug/L	0.020	0.018	0.009	1	04/19/23 15:08	04/17/23	
Sodium	6020A	11600	ug/L	50	45	20	1	04/19/23 15:08	04/17/23	
Thallium	6020A	0.030	ug/L	0.020	0.018	0.009	1	04/19/23 15:08	04/17/23	
Zinc	6020A	2.8	ug/L	2.0	1.0	0.5	1	04/19/23 15:08	04/17/23	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2305906-01

**Service Request:** K2303703  
**Date Collected:** NA  
**Date Received:** NA  
**Basis:** NA

**Total Metals**

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Date	
									Extracted	Q
Aluminum	6020A	<b>1.3 J</b>	ug/L	4.0	2.0	0.5	1	04/19/23 14:50	04/17/23	
Antimony	6020A	ND U	ug/L	0.050	0.045	0.020	1	04/19/23 14:50	04/17/23	
Arsenic	6020A	ND U	ug/L	0.50	0.25	0.09	1	04/19/23 14:50	04/17/23	
Barium	6020A	ND U	ug/L	0.050	0.045	0.020	1	04/19/23 14:50	04/17/23	
Beryllium	6020A	ND U	ug/L	0.020	0.015	0.005	1	04/19/23 14:50	04/17/23	
Cadmium	6020A	ND U	ug/L	0.020	0.018	0.008	1	04/19/23 14:50	04/17/23	
Calcium	6020A	ND U	ug/L	20	13	6	1	04/19/23 14:50	04/17/23	
Chromium	6020A	ND U	ug/L	0.20	0.10	0.03	1	04/19/23 14:50	04/17/23	
Copper	6020A	ND U	ug/L	0.20	0.09	0.05	1	04/19/23 14:50	04/17/23	
Iron	6020A	<b>1.2 J</b>	ug/L	2.0	1.0	0.3	1	04/19/23 14:50	04/17/23	
Lead	6020A	ND U	ug/L	0.020	0.018	0.006	1	04/19/23 14:50	04/17/23	
Magnesium	6020A	ND U	ug/L	10	5	2	1	04/19/23 14:50	04/17/23	
Manganese	6020A	ND U	ug/L	0.20	0.10	0.04	1	04/19/23 14:50	04/17/23	
Nickel	6020A	ND U	ug/L	0.20	0.15	0.04	1	04/19/23 14:50	04/17/23	
Potassium	6020A	ND U	ug/L	50	45	20	1	04/19/23 14:50	04/17/23	
Selenium	6020A	ND U	ug/L	1.0	0.5	0.2	1	04/19/23 14:50	04/17/23	
Silver	6020A	ND U	ug/L	0.020	0.018	0.009	1	04/19/23 14:50	04/17/23	
Sodium	6020A	ND U	ug/L	50	45	20	1	04/19/23 14:50	04/17/23	
Thallium	6020A	ND U	ug/L	0.020	0.018	0.009	1	04/19/23 14:50	04/17/23	
Zinc	6020A	ND U	ug/L	2.0	1.0	0.5	1	04/19/23 14:50	04/17/23	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2306360-01

**Service Request:** K2303703  
**Date Collected:** NA  
**Date Received:** NA  
**Basis:** NA

Total Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>LOQ</u>	<u>LOD</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Mercury	7470A	ND U	ug/L	0.20	0.05	0.02	1	04/11/23 09:59	04/10/23	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Analyzed:** 04/19/23

**Lab Control Sample Summary**  
**Total Metals**

**Units:**ug/L  
**Basis:**NA

**Lab Control Sample**  
KQ2305906-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Aluminum	6020A	109	100	109	84-117
Antimony	6020A	10.5	10.0	105	85-117
Arsenic	6020A	48.5	50.0	97	84-116
Barium	6020A	102	100	102	86-114
Beryllium	6020A	2.53	2.50	101	83-121
Cadmium	6020A	25.3	25.0	101	87-115
Calcium	6020A	278	250	111	87-118
Chromium	6020A	10.0	10.0	100	85-116
Copper	6020A	13.0	12.5	104	85-118
Iron	6020A	50.7	50.0	101	87-118
Lead	6020A	51.1	50.0	102	88-115
Magnesium	6020A	254	250	102	83-118
Manganese	6020A	24.8	25.0	99	87-115
Nickel	6020A	25.7	25.0	103	85-117
Potassium	6020A	255	250	102	87-115
Selenium	6020A	49.6	50.0	99	80-120
Silver	6020A	12.9	12.5	103	85-116
Sodium	6020A	257	250	103	85-117
Thallium	6020A	51.1	50.0	102	82-116
Zinc	6020A	25.6	25.0	102	83-119

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Analyzed:** 04/11/23

**Lab Control Sample Summary**  
**Total Metals**

**Units:**ug/L  
**Basis:**NA

**Lab Control Sample**  
KQ2306360-02

<b>Analyte Name</b>	<b>Analytical Method</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Mercury	7470A	5.01	5.00	100	82-119



# Low Level Organochlorine Pesticides by GC

**ALS Environmental—Kelso Laboratory**  
*1317 South 13th Avenue, Kelso, WA 98626*  
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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Collected:** 03/29/23 14:00  
**Date Received:** 03/30/23 10:40

**Sample Name:** APS-1-BKGND-03292023  
**Lab Code:** K2303703-001

**Units:** ug/L  
**Basis:** NA

**Low Level Organochlorine Pesticides by GC**

**Analysis Method:** 8081B  
**Prep Method:** None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
gamma-BHC (Lindane)	ND U	0.010	1	05/10/23 20:47	4/5/23	
Chlordane	ND U	0.20	1	05/10/23 20:47	4/5/23	
2,4'-DDD	ND U	0.010	1	05/10/23 20:47	4/5/23	
2,4'-DDE	ND U	0.010	1	05/10/23 20:47	4/5/23	
2,4'-DDT	ND U	0.010	1	05/10/23 20:47	4/5/23	
Endrin	ND U	0.010	1	05/10/23 20:47	4/5/23	
Heptachlor	ND U	0.010	1	05/10/23 20:47	4/5/23	
Heptachlor Epoxide	ND U	0.010	1	05/10/23 20:47	4/5/23	
Hexachlorobenzene	ND U	0.010	1	05/10/23 20:47	4/5/23	
Methoxychlor	ND U	0.025	1	05/10/23 20:47	4/5/23	*
Toxaphene	ND U	0.60	1	05/10/23 20:47	4/5/23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Decachlorobiphenyl	75	14 - 160	05/10/23 20:47	
Tetrachloro-m-xylene	68	30 - 148	05/10/23 20:47	

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703

**SURROGATE RECOVERY SUMMARY**  
**Low Level Organochlorine Pesticides by GC**

**Analysis Method:** 8081B  
**Extraction Method:** None

Sample Name	Lab Code	Decachlorobiphenyl	Tetrachloro-m-xylene
		14 - 160	30 - 148
APS-1-BKGND-03292023	K2303703-001	75	68
Method Blank	KQ2308580-01	66	68
Lab Control Sample	KQ2308580-02	74	66
Duplicate Lab Control Sample	KQ2308580-03	73	69
Lab Control Sample	KQ2308580-04	66	66
Duplicate Lab Control Sample	KQ2308580-05	66	70

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2308580-01

**Service Request:** K2303703  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/L  
**Basis:** NA

**Low Level Organochlorine Pesticides by GC**

**Analysis Method:** 8081B  
**Prep Method:** None

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
gamma-BHC (Lindane)	ND U	0.010	1	05/10/23 19:17	4/5/23	
Chlordane	ND U	0.20	1	05/10/23 19:17	4/5/23	
2,4'-DDD	ND U	0.010	1	05/10/23 19:17	4/5/23	
2,4'-DDE	ND U	0.010	1	05/10/23 19:17	4/5/23	
2,4'-DDT	ND U	0.010	1	05/10/23 19:17	4/5/23	
Endrin	ND U	0.010	1	05/10/23 19:17	4/5/23	
Heptachlor	ND U	0.010	1	05/10/23 19:17	4/5/23	
Heptachlor Epoxide	ND U	0.010	1	05/10/23 19:17	4/5/23	
Hexachlorobenzene	ND U	0.010	1	05/10/23 19:17	4/5/23	
Methoxychlor	ND U <sub>i</sub>	0.025	1	05/10/23 19:17	4/5/23	
Toxaphene	ND U	0.60	1	05/10/23 19:17	4/5/23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Decachlorobiphenyl	66	14 - 160	05/10/23 19:17	
Tetrachloro-m-xylene	68	30 - 148	05/10/23 19:17	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Analyzed:** 05/10/23  
**Date Extracted:** 04/05/23

**Duplicate Lab Control Sample Summary**  
**Low Level Organochlorine Pesticides by GC**

**Analysis Method:** 8081B  
**Prep Method:** None

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 804043

**Lab Control Sample**  
**KQ2308580-02**

**Duplicate Lab Control Sample**  
**KQ2308580-03**

Analyte Name	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec	% Rec	RPD	RPD Limit
							Limits		
2,4'-DDD	0.243	0.250	97	0.249	0.250	100	28-173	3	30
2,4'-DDE	0.202	0.250	81	0.207	0.250	83	37-182	2	30
2,4'-DDT	0.209	0.250	83	0.210	0.250	84	29-179	<1	30
Endrin	0.199	0.250	79	0.207	0.250	83	66-178	4	30
gamma-BHC (Lindane)	0.213	0.250	85	0.216	0.250	86	67-172	1	30
Heptachlor	0.162	0.250	65	0.172	0.250	69	61-178	6	30
Heptachlor Epoxide	0.195	0.250	78	0.201	0.250	80	59-163	3	30
Hexachlorobenzene	0.200	0.250	80	0.199	0.250	80	52-132	<1	30
Methoxychlor	0.250 P	0.250	100	0.262 P	0.250	105	65-183	5	30

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Analyzed:** 05/10/23  
**Date Extracted:** 04/05/23

**Duplicate Lab Control Sample Summary**  
**Low Level Organochlorine Pesticides by GC**

**Analysis Method:** 8081B  
**Prep Method:** None

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 804043

**Lab Control Sample**  
**KQ2308580-04**

**Duplicate Lab Control Sample**  
**KQ2308580-05**

<b>Analyte Name</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>	<b>RPD</b>	<b>RPD Limit</b>
Chlordane	3.58	5.00	72	3.68	5.00	74	27-172	3	30
Toxaphene	10.9	10.0	109	10.7	10.0	107	66-154	2	30

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Confirmation Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Matrix:** Water

**Service Request:** K2303703  
**Date Collected:** NA  
**Date Received:**

**Sample Name:** Lab Control Sample  
**Lab Code:** KQ2308580-02

**Units:** ug/L  
**Basis:** NA

Low Level Organochlorine Pesticides by GC

**Analytical Method:** 8081B  
**Prep Method:** None

LOQ	LOQ	Primary Result	Confirmation Result	RPD	Q	Dilution Factor	Date Analyzed
2,4'-DDD	0.010	0.243	0.252	4		1	05/10/23 21:17
2,4'-DDE	0.010	0.202	0.227	12		1	05/10/23 21:17
2,4'-DDT	0.010	0.209	0.276	28		1	05/10/23 21:17
Endrin	0.010	0.199	0.232	15		1	05/10/23 21:17
Heptachlor	0.010	0.162	0.199	20		1	05/10/23 21:17
Heptachlor Epoxide	0.010	0.195	0.234	18		1	05/10/23 21:17
Hexachlorobenzene	0.010	0.200	0.212	6		1	05/10/23 21:17
Methoxychlor	0.025	0.250	0.143	54	P	1	05/10/23 21:17
gamma-BHC (Lindane)	0.010	0.213	0.232	9		1	05/10/23 21:17

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Confirmation Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Matrix:** Water  
**Sample Name:** Duplicate Lab Control Sample  
**Lab Code:** KQ2308580-03

**Service Request:** K2303703  
**Date Collected:** NA  
**Date Received:**

**Units:** ug/L  
**Basis:** NA

Low Level Organochlorine Pesticides by GC

**Analytical Method:** 8081B  
**Prep Method:** None

LOQ	LOQ	Primary Result	Confirmation Result	RPD	Q	Dilution Factor	Date Analyzed
2,4'-DDD	0.010	0.249	0.260	4		1	05/10/23 21:47
2,4'-DDE	0.010	0.207	0.233	12		1	05/10/23 21:47
2,4'-DDT	0.010	0.210	0.294	33		1	05/10/23 21:47
Endrin	0.010	0.207	0.243	16		1	05/10/23 21:47
Heptachlor	0.010	0.172	0.211	20		1	05/10/23 21:47
Heptachlor Epoxide	0.010	0.201	0.244	19		1	05/10/23 21:47
Hexachlorobenzene	0.010	0.199	0.214	7		1	05/10/23 21:47
Methoxychlor	0.025	0.262	0.155	51	P	1	05/10/23 21:47
gamma-BHC (Lindane)	0.010	0.216	0.238	10		1	05/10/23 21:47

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Confirmation Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Matrix:** Water  
**Sample Name:** Lab Control Sample  
**Lab Code:** KQ2308580-04

**Service Request:** K2303703  
**Date Collected:** NA  
**Date Received:**

**Units:** ug/L  
**Basis:** NA

Low Level Organochlorine Pesticides by GC

**Analytical Method:** 8081B  
**Prep Method:** None

<b>LOQ</b>	<b>LOQ</b>	<b>Primary Result</b>	<b>Confirmation Result</b>	<b>RPD</b>	<b>Q</b>	<b>Dilution Factor</b>	<b>Date Analyzed</b>
Chlordane	0.20	3.58	3.59	<1		1	05/10/23 19:47
Toxaphene	0.60	10.9	13.7	23		1	05/10/23 19:47

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Confirmation Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Matrix:** Water  
**Sample Name:** Duplicate Lab Control Sample  
**Lab Code:** KQ2308580-05

**Service Request:** K2303703  
**Date Collected:** NA  
**Date Received:**

**Units:** ug/L  
**Basis:** NA

Low Level Organochlorine Pesticides by GC

**Analytical Method:** 8081B  
**Prep Method:** None

<b>LOQ</b>	<b>LOQ</b>	<b>Primary Result</b>	<b>Confirmation Result</b>	<b>RPD</b>	<b>Q</b>	<b>Dilution Factor</b>	<b>Date Analyzed</b>
Chlordane	0.20	3.68	3.72	1		1	05/10/23 20:17
Toxaphene	0.60	10.7	11.8	10		1	05/10/23 20:17



## Polychlorinated Biphenyls (PCBs)

**ALS Environmental—Kelso Laboratory**  
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Phone (360)577-7222 Fax (360)636-1068  
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Analytical Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Collected:** 03/29/2023  
**Date Received:** 03/30/2023

**Polychlorinated Biphenyls (PCBs)**

**Sample Name:** APS-1-BKGND-03292023  
**Lab Code:** K2303703-001  
**Extraction Method:** EPA 3520C  
**Analysis Method:** 8082A

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	0.021		0.021	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1221	ND	U	0.041		0.041	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1232	ND	U	0.021		0.021	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1242	ND	U	0.021		0.021	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1248	ND	U	0.021		0.021	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1254	ND	U	0.021		0.021	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1260	ND	U	0.021		0.021	1	05/17/23	05/26/23	KWG2300805	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	62	70-130	05/26/23	Outside Control Limits

**Comments:** \_\_\_\_\_

Analytical Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Collected:** NA  
**Date Received:** NA

**Polychlorinated Biphenyls (PCBs)**

**Sample Name:** Method Blank  
**Lab Code:** KWG2300805-1  
**Extraction Method:** EPA 3520C  
**Analysis Method:** 8082A

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1221	ND	U	0.040		0.040	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1232	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1242	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1248	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1254	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1260	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	83	70-130	05/26/23	Acceptable

**Comments:** \_\_\_\_\_

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703

**Surrogate Recovery Summary  
 Polychlorinated Biphenyls (PCBs)**

**Extraction Method:** EPA 3520C  
**Analysis Method:** 8082A

**Units:** Percent  
**Level:** Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
APS-1-BKGND-03292023	K2303703-001	62 *
Method Blank	KWG2300805-1	83
Lab Control Sample	KWG2300805-2	79
Duplicate Lab Control Sample	KWG2300805-3	79

**Surrogate Recovery Control Limits (%)**

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Sur1 = Decachlorobiphenyl 70-130

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Results flagged with an asterisk (\*) indicate values outside control criteria.  
 Results flagged with a pound (#) indicate the control criteria is not applicable.

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Extracted:** 05/17/2023  
**Date Analyzed:** 05/26/2023

**Lab Control Spike/Duplicate Lab Control Spike Summary**  
**Polychlorinated Biphenyls (PCBs)**

**Extraction Method:** EPA 3520C  
**Analysis Method:** 8082A

**Units:** ug/L  
**Basis:** NA  
**Level:** Low  
**Extraction Lot:** KWG2300805

Analyte Name	Lab Control Sample KWG2300805-2 Lab Control Spike			Duplicate Lab Control Sample KWG2300805-3 Duplicate Lab Control Spike			%Rec Limits	RPD	RPD Limit
	Result	Spike Amount	%Rec	Result	Spike Amount	%Rec			
Aroclor 1016	0.196	0.250	78	0.175	0.250	70	70-130	11	30
Aroclor 1260	0.188	0.250	75	0.205	0.250	82	70-130	8	30

Results flagged with an asterisk (\*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.



# Chlorinated Herbicides by GC

**ALS Environmental—Kelso Laboratory**  
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**ALS Group USA, Corp.**  
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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water  
**Sample Name:** APS-1-BKGND-03292023  
**Lab Code:** K2303703-001

**Service Request:** K2303703  
**Date Collected:** 03/29/23 14:00  
**Date Received:** 03/30/23 10:40  
**Units:** ug/L  
**Basis:** NA

**Chlorinated Herbicides by GC**

**Analysis Method:** 8151A  
**Prep Method:** Method

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
2,4,5-T	ND U	0.19	0.10	0.033	1	05/10/23 11:23	4/5/23	*
2,4,5-TP (Silvex)	ND U	0.19	0.10	0.045	1	05/10/23 11:23	4/5/23	*
2,4-D	ND U	0.38	0.10	0.036	1	05/10/23 11:23	4/5/23	*
2,4-DB	ND U	0.38	0.20	0.10	1	05/10/23 11:23	4/5/23	*
Dalapon	ND U	0.38	0.28	0.28	1	05/10/23 11:23	4/5/23	
Dicamba	ND U	0.19	0.10	0.025	1	05/10/23 11:23	4/5/23	*
Dichlorprop	ND U	0.38	0.10	0.030	1	05/10/23 11:23	4/5/23	*
Dinoseb	ND U	0.19	0.060	0.015	1	05/10/23 11:23	4/5/23	*
MCPA	ND U	94	20	8.7	1	05/10/23 11:23	4/5/23	*
MCPD	ND U	94	20	14	1	05/10/23 11:23	4/5/23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4-Dichlorophenylacetic Acid	58	17 - 113	05/10/23 11:23	

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703

**SURROGATE RECOVERY SUMMARY**  
**Chlorinated Herbicides by GC**

**Analysis Method:** 8151A  
**Extraction Method:** Method

<b>Sample Name</b>	<b>Lab Code</b>	<b>2,4-Dichlorophenylacetic Acid 17 - 113</b>
APS-1-BKGND-03292023	K2303703-001	58
Method Blank	KQ2306106-01	56
Lab Control Sample	KQ2306106-02	59
Duplicate Lab Control Sample	KQ2306106-03	151 *

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2306106-01

**Service Request:** K2303703  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/L  
**Basis:** NA

**Chlorinated Herbicides by GC**

**Analysis Method:** 8151A  
**Prep Method:** Method

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
2,4,5-T	ND U	0.19	0.10	0.033	1	05/10/23 10:11	4/5/23	
2,4,5-TP (Silvex)	ND U	0.19	0.10	0.045	1	05/10/23 10:11	4/5/23	
2,4-D	ND U	0.38	0.10	0.036	1	05/10/23 10:11	4/5/23	
2,4-DB	<b>0.14 J</b>	0.38	0.20	0.10	1	05/10/23 10:11	4/5/23	
Dalapon	ND U	0.38	0.28	0.28	1	05/10/23 10:11	4/5/23	
Dicamba	ND U	0.19	0.10	0.025	1	05/10/23 10:11	4/5/23	
Dichlorprop	ND U	0.38	0.10	0.030	1	05/10/23 10:11	4/5/23	
Dinoseb	ND U	0.19	0.060	0.015	1	05/10/23 10:11	4/5/23	
MCPA	ND U	94	20	8.7	1	05/10/23 10:11	4/5/23	
MCPP	ND U	94	20	14	1	05/10/23 10:11	4/5/23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4-Dichlorophenylacetic Acid	56	17 - 113	05/10/23 10:11	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Analyzed:** 05/10/23  
**Date Extracted:** 04/05/23

**Duplicate Lab Control Sample Summary**  
**Chlorinated Herbicides by GC**

**Analysis Method:** 8151A  
**Prep Method:** Method

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 804074

**Lab Control Sample**  
**KQ2306106-02**

**Duplicate Lab Control Sample**  
**KQ2306106-03**

Analyte Name	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec	% Rec	RPD	RPD Limit
							Limits		
2,4,5-T	1.92	2.50	77	4.75 E	2.50	190 *	30-120	85 *	30
2,4,5-TP (Silvex)	1.78	2.50	71	4.38 E	2.50	175 *	37-114	85 *	30
2,4-D	1.66	2.50	66	4.04 E	2.50	161 *	35-110	84 *	30
2,4-DB	1.85	2.50	74	5.20 E	2.50	208 *	10-134	95 *	30
Dalapon	1.32	2.50	53	2.00	2.50	80	14-110	41 *	30
Dicamba	1.85	2.50	74	4.40 E	2.50	176 *	30-108	81 *	30
Dichlorprop	1.78	2.50	71	4.36 E	2.50	174 *	29-104	84 *	30
Dinoseb	1.86	2.50	74	4.00 E	2.50	160 *	11-105	73 *	30
MCPA	169	250	68	376 E	250	150 *	21-117	76 *	30
MCPD	157	250	63	336	250	134	16-141	72 *	30

ALS Group USA, Corp.  
dba ALS Environmental

Confirmation Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2306106-01

**Service Request:** K2303703  
**Date Collected:** NA  
**Date Received:**

**Units:** ug/L  
**Basis:** NA

Chlorinated Herbicides by GC

**Analytical Method:** 8151A  
**Prep Method:** Method

<b>LOQ</b>	<b>LOQ</b>	<b>MDL</b>	<b>Primary Result</b>	<b>Confirmation Result</b>	<b>RPD</b>	<b>Q</b>	<b>Dilution Factor</b>	<b>Date Analyzed</b>
2,4-DB		0.10	0.14	0.20	35	J	1	05/10/23 10:11

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dba ALS Environmental

Confirmation Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Matrix:** Water  
**Sample Name:** Lab Control Sample  
**Lab Code:** KQ2306106-02

**Service Request:** K2303703  
**Date Collected:** NA  
**Date Received:**

**Units:** ug/L  
**Basis:** NA

Chlorinated Herbicides by GC

**Analytical Method:** 8151A  
**Prep Method:** Method

LOQ	LOQ	MDL	Primary Result	Confirmation Result	RPD	Q	Dilution Factor	Date Analyzed
2,4,5-T		0.033	1.92	2.08	8		1	05/10/23 10:35
2,4,5-TP (Silvex)		0.045	1.78	1.83	3		1	05/10/23 10:35
2,4-D		0.036	1.66	1.74	5		1	05/10/23 10:35
2,4-DB		0.10	1.85	2.77	40		1	05/10/23 10:35
Dalapon		0.28	1.32	1.59	19		1	05/10/23 10:35
Dicamba		0.025	1.85	1.95	5		1	05/10/23 10:35
Dichlorprop		0.030	1.78	1.93	8		1	05/10/23 10:35
Dinoseb		0.015	1.86	1.94	4		1	05/10/23 10:35
MCPA		8.7	169	176	4		1	05/10/23 10:35
MCPP		14	157	164	4		1	05/10/23 10:35

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Confirmation Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Matrix:** Water  
**Sample Name:** Duplicate Lab Control Sample  
**Lab Code:** KQ2306106-03

**Service Request:** K2303703  
**Date Collected:** NA  
**Date Received:**

**Units:** ug/L  
**Basis:** NA

Chlorinated Herbicides by GC

**Analytical Method:** 8151A  
**Prep Method:** Method

LOQ	LOQ	MDL	Primary Result	Confirmation Result	RPD	Q	Dilution Factor	Date Analyzed
2,4,5-T		0.033	4.75	4.88	3	E	1	05/10/23 10:59
2,4,5-TP (Silvex)		0.045	4.38	4.40	<1	E	1	05/10/23 10:59
2,4-D		0.036	4.04	4.12	2	E	1	05/10/23 10:59
2,4-DB		0.10	5.20	6.60	24	E	1	05/10/23 10:59
Dalapon		0.28	2.00	2.28	13		1	05/10/23 10:59
Dicamba		0.025	4.40	4.44	<1	E	1	05/10/23 10:59
Dichlorprop		0.030	4.36	4.47	2	E	1	05/10/23 10:59
Dinoseb		0.015	4.00	4.02	<1	E	1	05/10/23 10:59
MCPA		8.7	376	398	6	E	1	05/10/23 10:59
MCPP		14	336	356	6		1	05/10/23 10:59



# Volatile Organic Compounds by GC/MS

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

**ALS Group USA, Corp.**  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water  
**Sample Name:** APS-1-BKGND-03292023  
**Lab Code:** K2303703-001

**Service Request:** K2303703  
**Date Collected:** 03/29/23 14:00  
**Date Received:** 03/30/23 10:40

**Units:** ug/L  
**Basis:** NA

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Q
1,1,1-Trichloroethane (TCA)	ND U	0.50	0.075	1	04/04/23 12:35	
1,1,2-Trichloroethane	ND U	0.50	0.14	1	04/04/23 12:35	
1,1-Dichloroethene	ND U	0.50	0.080	1	04/04/23 12:35	
1,2,4-Trichlorobenzene	ND U	2.0	0.096	1	04/04/23 12:35	
1,2-Dibromo-3-chloropropane	ND U	2.0	0.22	1	04/04/23 12:35	
1,2-Dibromoethane (EDB)	ND U	2.0	0.10	1	04/04/23 12:35	
1,2-Dichloroethane (EDC)	ND U	0.50	0.080	1	04/04/23 12:35	
1,2-Dichloropropane	ND U	0.50	0.095	1	04/04/23 12:35	
Benzene	ND U	0.50	0.062	1	04/04/23 12:35	
Chlorobenzene	ND U	0.50	0.11	1	04/04/23 12:35	
Ethylbenzene	ND U	0.50	0.050	1	04/04/23 12:35	
Methylene Chloride	ND U	2.0	0.10	1	04/04/23 12:35	
Styrene	ND U	0.50	0.089	1	04/04/23 12:35	
Tetrachloroethene (PCE)	ND U	0.50	0.099	1	04/04/23 12:35	
Toluene	ND U	0.50	0.054	1	04/04/23 12:35	
Trichloroethene (TCE)	ND U	0.50	0.10	1	04/04/23 12:35	
Vinyl Chloride	ND U	0.50	0.075	1	04/04/23 12:35	
cis-1,2-Dichloroethene	ND U	0.50	0.067	1	04/04/23 12:35	
m,p-Xylenes	ND U	0.50	0.11	1	04/04/23 12:35	
o-Xylene	ND U	0.50	0.074	1	04/04/23 12:35	
trans-1,2-Dichloroethene	ND U	0.50	0.072	1	04/04/23 12:35	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,2-Dichloroethane-d4	116	81 - 118	04/04/23 12:35	
4-Bromofluorobenzene	81	85 - 114	04/04/23 12:35	*
Dibromofluoromethane	118	80 - 119	04/04/23 12:35	
Toluene-d8	102	89 - 112	04/04/23 12:35	

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703

**SURROGATE RECOVERY SUMMARY**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Extraction Method:** None

Sample Name	Lab Code	1,2-Dichloroethane-d4	4-Bromofluorobenzene	Dibromofluoromethane
		81-118	85-114	80-119
APS-1-BKGND-03292023	K2303703-001	116	81*	118
Method Blank	KQ2306252-05	110	83*	116
Lab Control Sample	KQ2306252-03	100	92	106
Duplicate Lab Control Sample	KQ2306252-04	103	92	104

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703

**SURROGATE RECOVERY SUMMARY**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Extraction Method:** None

Sample Name	Lab Code	Toluene-d8
		89-112
APS-1-BKGND-03292023	K2303703-001	102
Method Blank	KQ2306252-05	100
Lab Control Sample	KQ2306252-03	104
Duplicate Lab Control Sample	KQ2306252-04	105

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2306252-05

**Service Request:** K2303703  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/L  
**Basis:** NA

Volatile Organic Compounds by GC/MS

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Q
1,1,1-Trichloroethane (TCA)	ND U	0.50	0.075	1	04/04/23 11:36	
1,1,2-Trichloroethane	ND U	0.50	0.14	1	04/04/23 11:36	
1,1-Dichloroethene	ND U	0.50	0.080	1	04/04/23 11:36	
1,2,4-Trichlorobenzene	ND U	2.0	0.096	1	04/04/23 11:36	
1,2-Dibromo-3-chloropropane	ND U	2.0	0.22	1	04/04/23 11:36	
1,2-Dibromoethane (EDB)	ND U	2.0	0.10	1	04/04/23 11:36	
1,2-Dichloroethane (EDC)	ND U	0.50	0.080	1	04/04/23 11:36	
1,2-Dichloropropane	ND U	0.50	0.095	1	04/04/23 11:36	
Benzene	ND U	0.50	0.062	1	04/04/23 11:36	
Chlorobenzene	ND U	0.50	0.11	1	04/04/23 11:36	
Ethylbenzene	ND U	0.50	0.050	1	04/04/23 11:36	
Methylene Chloride	<b>0.18 J</b>	2.0	0.10	1	04/04/23 11:36	
Styrene	ND U	0.50	0.089	1	04/04/23 11:36	
Tetrachloroethene (PCE)	ND U	0.50	0.099	1	04/04/23 11:36	
Toluene	ND U	0.50	0.054	1	04/04/23 11:36	
Trichloroethene (TCE)	ND U	0.50	0.10	1	04/04/23 11:36	
Vinyl Chloride	ND U	0.50	0.075	1	04/04/23 11:36	
cis-1,2-Dichloroethene	ND U	0.50	0.067	1	04/04/23 11:36	
m,p-Xylenes	ND U	0.50	0.11	1	04/04/23 11:36	
o-Xylene	ND U	0.50	0.074	1	04/04/23 11:36	
trans-1,2-Dichloroethene	ND U	0.50	0.072	1	04/04/23 11:36	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,2-Dichloroethane-d4	110	81 - 118	04/04/23 11:36	
4-Bromofluorobenzene	83	85 - 114	04/04/23 11:36	*
Dibromofluoromethane	116	80 - 119	04/04/23 11:36	
Toluene-d8	100	89 - 112	04/04/23 11:36	

**ALS Group USA, Corp.**  
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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Analyzed:** 04/04/23  
**Date Extracted:** NA

**Duplicate Lab Control Sample Summary**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 799762

Analyte Name	Lab Control Sample KQ2306252-03			Duplicate Lab Control Sample KQ2306252-04			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1-Trichloroethane (TCA)	12.0	10.0	120	11.6	10.0	116	74-131	3	20
1,1,2-Trichloroethane	8.85	10.0	89	9.22	10.0	92	80-119	4	20
1,1-Dichloroethene	12.0	10.0	120	11.4	10.0	114	71-131	5	20
1,2,4-Trichlorobenzene	8.14	10.0	81	8.53	10.0	85	69-130	5	20
1,2-Dibromo-3-chloropropane	8.14	10.0	81	8.77	10.0	88	62-128	7	20
1,2-Dibromoethane (EDB)	8.74	10.0	87	9.30	10.0	93	77-121	6	20
1,2-Dichloroethane (EDC)	10.5	10.0	105	10.6	10.0	106	73-128	1	20
1,2-Dichloropropane	10.2	10.0	102	10.5	10.0	105	78-122	3	20
Benzene	11.0	10.0	110	10.9	10.0	109	79-120	<1	20
Chlorobenzene	9.63	10.0	96	9.81	10.0	98	82-118	2	20
cis-1,2-Dichloroethene	10.7	10.0	107	10.8	10.0	108	78-123	<1	20
Ethylbenzene	10.1	10.0	101	10.1	10.0	101	79-121	<1	20
m,p-Xylenes	20.9	20.0	104	21.0	20.0	105	80-121	<1	20
Methylene Chloride	10.3	10.0	103	10.4	10.0	104	74-124	<1	20
o-Xylene	10.2	10.0	102	10.2	10.0	102	78-122	<1	20
Styrene	10.4	10.0	104	10.8	10.0	108	78-123	4	20
Tetrachloroethene (PCE)	10.0	10.0	100	9.99	10.0	100	74-129	<1	20
Toluene	11.1	10.0	111	11.1	10.0	111	80-121	<1	20
trans-1,2-Dichloroethene	11.0	10.0	110	10.9	10.0	109	75-124	1	20
Trichloroethene (TCE)	10.9	10.0	109	10.5	10.0	105	79-123	3	20
Vinyl Chloride	11.5	10.0	115	11.3	10.0	113	58-137	2	20



# Semi-Volatile Organic Compounds by GC/MS

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

**ALS Group USA, Corp.**  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water  
**Sample Name:** APS-1-BKGND-03292023  
**Lab Code:** K2303703-001

**Service Request:** K2303703  
**Date Collected:** 03/29/23 14:00  
**Date Received:** 03/30/23 10:40  
**Units:** ug/L  
**Basis:** NA

**Semivolatile Organic Compounds by GC/MS**

**Analysis Method:** 8270D  
**Prep Method:** EPA 3520C

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Benzo(a)pyrene	ND U	9.6	0.75	0.26	1	04/10/23 18:21	4/5/23	
Bis(2-ethylhexyl) Phthalate	ND U	9.6	0.75	0.27	1	04/10/23 18:21	4/5/23	
Hexachlorobenzene	ND U	9.6	0.75	0.35	1	04/10/23 18:21	4/5/23	
Hexachlorocyclopentadiene	ND U	48	5.0	1.5	1	04/10/23 18:21	4/5/23	*
Pentachlorophenol	ND U	24	10	3.5	1	04/10/23 18:21	4/5/23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2-Fluorobiphenyl	80	44 - 119	04/10/23 18:21	
Terphenyl-d14	97	50 - 134	04/10/23 18:21	
2,4,6-Tribromophenol	86	43 - 140	04/10/23 18:21	

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703

**SURROGATE RECOVERY SUMMARY**  
**Semivolatile Organic Compounds by GC/MS**

**Analysis Method:** 8270D  
**Extraction Method:** EPA 3520C

Sample Name	Lab Code	2,4,6-Tribromophenol	2-Fluorobiphenyl	Terphenyl-d14
		43 - 140	44 - 119	50 - 134
APS-1-BKGND-03292023	K2303703-001	86	80	97
Method Blank	KQ2306108-01	81	75	100
Lab Control Sample	KQ2306108-02	87	80	77
Duplicate Lab Control Sample	KQ2306108-03	89	80	79

**ALS Group USA, Corp.**  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2306108-01

**Service Request:** K2303703  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/L  
**Basis:** NA

**Semivolatile Organic Compounds by GC/MS**

**Analysis Method:** 8270D  
**Prep Method:** EPA 3520C

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Benzo(a)pyrene	ND U	9.4	0.75	0.26	1	04/10/23 17:17	4/5/23	
Bis(2-ethylhexyl) Phthalate	ND U	9.4	0.75	0.27	1	04/10/23 17:17	4/5/23	
Hexachlorobenzene	ND U	9.4	0.75	0.35	1	04/10/23 17:17	4/5/23	
Hexachlorocyclopentadiene	ND U	47	5.0	1.5	1	04/10/23 17:17	4/5/23	
Pentachlorophenol	ND U	24	10	3.5	1	04/10/23 17:17	4/5/23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2-Fluorobiphenyl	75	44 - 119	04/10/23 17:17	
Terphenyl-d14	100	50 - 134	04/10/23 17:17	
2,4,6-Tribromophenol	81	43 - 140	04/10/23 17:17	

**ALS Group USA, Corp.**  
dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.000  
**Sample Matrix:** Water

**Service Request:** K2303703  
**Date Analyzed:** 04/10/23  
**Date Extracted:** 04/05/23

**Duplicate Lab Control Sample Summary**  
**Semivolatile Organic Compounds by GC/MS**

**Analysis Method:** 8270D  
**Prep Method:** EPA 3520C

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 803502

**Lab Control Sample**  
**KQ2306108-02**

**Duplicate Lab Control Sample**  
**KQ2306108-03**

Analyte Name	Lab Control Sample			Duplicate Lab Control Sample			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Benzo(a)pyrene	93.9	100	94	98.2	100	98	54-128	5	20
Bis(2-ethylhexyl) Phthalate	91.6	100	92	95.1	100	95	55-135	4	20
Hexachlorobenzene	77.5	100	77	81.7	100	82	53-125	5	20
Hexachlorocyclopentadiene	52.8	100	53 *	57.6	100	58 *	10-45	9	20
Pentachlorophenol	68.1	100	68	70.0	100	70	35-138	3	20



# Subcontract Lab Results

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)



April 26, 2023

Mark Harris  
ALS  
1317 South 13th Avenue  
Kelso, Washington 98626

Re: Kelso - Harris L2  
Work Order: 617061

Dear Mark Harris:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on April 04, 2023. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Test results for NELAP or ISO 17025 accredited tests are verified to meet the requirements of those standards, with any exceptions noted. The results reported relate only to the items tested and to the sample as received by the laboratory. These results may not be reproduced except as full reports without approval by the laboratory. Copies of GEL's accreditations and certifications can be found on our website at [www.gel.com](http://www.gel.com).

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4422.

Sincerely,

Adrian Melendrez for  
Jake Crook  
Project Manager

Purchase Order: 51K2303703  
Enclosures



# Case Narrative

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: April 26, 2023

Company : ALS  
 Address : 1317 South 13th Avenue  
  
 Kelso, Washington 98626  
 Contact: Mark Harris  
 Project: Kelso - Harris L2

Client Sample ID: APS-1-BKGND-03292023	Project: ALSE01223
Sample ID: 617061001	Client ID: ALSE001
Matrix: Water	
Collect Date: 29-MAR-23 14:00	
Receive Date: 04-APR-23	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>Metals Analysis-ICP-MS</b>												
200.2/200.8 Uranium "As Received"												
Uranium		1.51	0.0670	0.200	ug/L	1.00	1	BAJ	04/12/23	0229	2410003	1
<b>Rad Gas Flow Proportional Counting</b>												
GFPC Gross A/B, Liquid "As Received"												
Alpha	U	1.52	2.44	4.00	pCi/L			KP1	04/20/23	1656	2412887	2
Beta	U	1.08	3.91	4.00	pCi/L							
GFPC Ra228, Liquid "As Received"												
Radium-228	U	-0.423	1.43	3.00	pCi/L			JXK3	04/24/23	1614	2416445	3
Rad Radium-226												
Lucas Cell, Ra226, Liquid "As Received"												
Radium-226		0.627	0.495	1.00	pCi/L			LXP1	04/20/23	0942	2410783	4

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 200.2	ICP-MS 200.2 PREP	EM2	04/10/23	1615	2410002

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 200.8	
2	EPA 900.0/SW846 9310	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC Ra228, Liquid "As Received"			88.3	(15%-125%)

**Notes:**

Column headers are defined as follows:

- |                                       |                                |
|---------------------------------------|--------------------------------|
| DF: Dilution Factor                   | Lc/LC: Critical Level          |
| DL: Detection Limit                   | PF: Prep Factor                |
| MDA: Minimum Detectable Activity      | RL: Reporting Limit            |
| MDC: Minimum Detectable Concentration | SQL: Sample Quantitation Limit |

**Receipt Narrative  
for  
ALS Environmental  
SDG: 617061**

**April 26, 2023**

**Laboratory Identification:**

GEL Laboratories LLC  
2040 Savage Road  
Charleston, South Carolina 29407  
(843) 556-8171

**Summary:**

**Sample receipt:** The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on April 04, 2023 for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

**Sample Identification:** The laboratory received the following sample:

<b><u>Laboratory ID</u></b>	<b><u>Client ID</u></b>
617061001	APS-1-BKGND-03292023

**Case Narrative:**

Sample analyses were conducted using methodology as outlined in GEL's Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Radiochemistry and Metals.



Adrian Melendrez for  
Jake Crook  
Project Manager

# **Chain of Custody and Supporting Documentation**

Project Number: K2303703  
 Project Manager: Mark Harris  
 Q.C.: DOD QSM v5.1 Kelso

Sample ID	Matrix	Date	Time	Lab ID	Misc Out 1	Radiact	Radium 226	Radium 228
AFS-1-BKGNB-02292023	Water	3/29/23	1400	GEL Labs LLC	X	X	X	X

617061

# of Cont. 24

Sample

Date

Time

Matrix

Sample ID

Lab Code

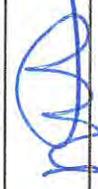
Uranium

K2303703-001

List Comments

Misc Out 1 - None

Special Instructions/Comments Please provide the electronic (PDF and EDD) report to the following e-mail address: ALKLS.Data@alsglobal.com.	Turnaround Requirements ___ RUSH (Surcharges Apply) PLEASE CIRCLE WORK DAYS 1 2 3 4 5 ___ STANDARD Requested FAX Date: _____ Requested Report Date: 04/19/23	Report Requirements ___ I. Results Only ___ II. Results + QC Summaries ___ III. Results + QC and Calibration Summaries ___ IV. Data Validation Report with Raw Data PQL/MDL/J <u>Y</u> EDD <u>Y</u>	Invoice Information PO# 51K2303703 Bill to _____

Relinquished By:  4/13/23  
 Received By:  4/13/23  
 Airbill Number: 955

617061

K2303703

✓  
Ship To: GEL Labs LLC  
GEL Laboratories, LLC  
2040 Savage Road  
Charleston, SC 29407

PC MDA Date 4/5/23  
SMO [Signature] Date 4/13/23

Instructions:

Ice \_\_\_\_\_  
Dry Ice \_\_\_\_\_  
No Ice

Bill to Client Account \_\_\_\_\_

Shipping:

Overnight   
2nd Day \_\_\_\_\_  
Ground \_\_\_\_\_

Comments:

ALS Group USA, Corp.  
www.alsglobal.com  
An ALS Limited Company



# Laboratory Certifications

**List of current GEL Certifications as of 26 April 2023**

<b>State</b>	<b>Certification</b>
Alabama	42200
Alaska	17-018
Alaska Drinking Water	SC00012
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana Drinking Water	LA024
Louisiana NELAP	03046 (AI33904)
Maine	2019020
Maryland	270
Massachusetts	M-SC012
Massachusetts PFAS Approv	Letter
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122023-4
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	2022-160
Pennsylvania NELAP	68-00485
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
Sanitation Districts of L	9255651
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-22-20
Utah NELAP	SC000122022-37
Vermont	VT87156
Virginia NELAP	460202
Washington	C780



301 Fulling Mill Road | Middletown, PA 17057 | Phone: 717-944-5541 | Fax: 717-944-1430 | [www.alsglobal.com](http://www.alsglobal.com)

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618  
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

Analytical Results Report For

**ALS Environmental-Kelso**

Project [ALK048|K2303703](#)  
Workorder [3295882](#)  
Report ID [236976 on 4/13/2023](#)

### Certificate of Analysis

Enclosed are the analytical results for samples received by the laboratory on Apr 04, 2023.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Sarah Leung (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at [www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads](http://www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads).

This laboratory report may not be reproduced, except in full, without the written approval of ALS Global.  
ALS Middletown: 301 Fulling Mill Road, Middletown, PA 17057 : 717-944-5541.

Recipient(s):

ALKLS Data - ALS Environmental-Kelso  
Mark Harris - ALS Environmental-Kelso

*Sarah Leung*

**Sarah Leung**  
Project Coordinator

(ALS Digital Signature)

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*



**Project** ALK048|K2303703  
**Workorder** 3295882

### Sample Summary

<u>Lab ID</u>	<u>Sample ID</u>	<u>Matrix</u>	<u>Date Collected</u>	<u>Date Received</u>	<u>Collector</u>	<u>Collection Company</u>
3295882001	APS-1-BKGND-03292023	Water	03/29/2023 14:00	04/04/2023 08:45	CBC	Collected By Client



## Reference

### Notes

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- Except as qualified, Clean Water Act sample analyses are consistent with methodology requirements in 40 CFR Part 136.
- Except as qualified, Safe Drinking Water Act sample analyses are consistent with methodology requirements in 40 CFR Part 141.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are performed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.

### Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND) above the MDL
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Practical Quantitation Limit for this Project
ND	Not Detected - indicates that the analyte was Not Detected
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits
#	Please reference the result in the Results Section for analyte-level flags.



**Project** ALK048|K2303703  
**Workorder** 3295882

**Project Notations**

**Sample Notations**

**Lab ID**      **Sample ID**

**Result Notations**

**Notation Ref.**

1      The QC sample type LCS for method SW846 8330B was outside the control limits for the analyte Tetryl. The % Recovery was reported as 60.5 and the control limits were 64 to 128.



**Detected Results Summary**

Not applicable for this WO.



## Results

Client Sample ID	APS-1-BKGND-03292023	Collected	03/29/2023 14:00
Lab Sample ID	3295882001	Lab Receipt	04/04/2023 08:45

### ENERGETICS

Compound	Result	Flag	Units	LOQ	LOD	DL	Method	Dilution	Analysis Date/Time	By	Cntr
1,3,5-Trinitrobenzene	0.29U	U	ug/L	0.34	0.29	0.077	SW846 8330B	1	04/06/2023 21:46	CGS	
1,3-Dinitrobenzene	0.29U	U	ug/L	0.34	0.29	0.087	SW846 8330B	1	04/06/2023 21:46	CGS	
2,4,6-Trinitrotoluene	0.29U	U	ug/L	0.34	0.29	0.077	SW846 8330B	1	04/06/2023 21:46	CGS	
2,4-Dinitrotoluene	0.29U	U	ug/L	0.34	0.29	0.097	SW846 8330B	1	04/06/2023 21:46	CGS	
HMX	0.29U	U	ug/L	0.34	0.29	0.087	SW846 8330B	1	04/06/2023 21:46	CGS	
Nitrobenzene	0.29U	U	ug/L	0.34	0.29	0.087	SW846 8330B	1	04/06/2023 21:46	CGS	
RDX	0.29U	U	ug/L	0.34	0.29	0.087	SW846 8330B	1	04/06/2023 21:46	CGS	
Tetryl	0.29U	U,1	ug/L	0.34	0.29	0.087	SW846 8330B	1	04/06/2023 21:46	CGS	

### SURROGATES

Compound	CAS No	Recovery	Limits(%)	Analysis Date/Time	Qualifiers
1,4-Dinitrobenzene	100-25-4	98.3%	50 - 150	04/06/2023 21:46	



### Sample - Method Cross Reference Table

Lab ID	Sample ID	Analysis Method	Preparation Method	Leachate Method
3295882001	APS-1-BKGND-03292023	SW846 8330B	SW846 8330B	



### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Lab ID	Sample ID	Preparation Method	Prep Batch	Prep Date/Time	By	Analysis Method	Anly Batch
3295882001	APS-1-BKGND-03292023	SW846 8330B	970673	04/05/2023 23:45	KMR	SW846 8330B	971015

# ALS Environmental Chain of Custody

1317 South 13th Avenue • Kelso, WA 98626 • 1-360-577-7222 • FAX 1-360-636-1068

Project Number: K2303703  
 Project Manager: Mark Harris  
 DOD QSM v5.1 Kelso  
 PMP:

ALS Contact: Mark Harris



3295882

Logged By: KSB  
 PM: SSL



Lab Code	Sample ID	# of Cont.	Matrix	Sample		Lab ID
				Date	Time	
K2303703-001	APS-1-DKGN0-03292023	2	Water	3/29/23	1400	Middletown ALS
						X

NitroAro Amin  
8330A

Temp By: KSB W/O Temp (°C) 1 Therm ID 590

Receipt Info Completed By: KSB  
 Cooler Custody Seal Intact Y N NA  
 Sample Custody Seal Intact Y N NA  
 Received on Ice Y N NA  
 Cooler & Samples Intact Y N NA  
 Correct Containers Provided Y N NA  
 Sample Label/COC Agree Y N NA  
 Adequate Sample Volumes Y N NA  
 CR6 Samples Filtered Y N NA  
 OP Samples Filtered Y N NA  
 VOA Headspace Present Y N NA  
 Voa Trip Blank Y N NA  
 NUS 4 Days? Y N NA  
 Rad Screen (uCi) Y N NA

Courier/Tracking #: 6195 1658 7779  
 SDWA Compliance Y N NA  
 PWSID Y N NA  
 WV Containers 0-6°C Y N NA

<b>Special Instructions/Comments</b> Please provide the electronic (PDF and EDD) report to the following e-mail address: ALKLS.Data@alsglobal.com.	<b>Turnaround Requirements</b> RUSH (Surcharges Apply) PLEASE CIRCLE WORK DAYS 1 2 3 4 5 STANDARD Requested FAX Date: _____ Requested Report Date: 04/19/23	<b>Report Requirements</b> I. Results Only _____ II. Results + QC Summaries _____ III. Results + QC and Calibration Summaries _____ IV. Data Validation Report with Raw Data _____ PQL/MDL/1 <u>Y</u> EDD <u>Y</u>	<b>Invoice Information</b> PO# 51K2303703 Bill to
	H - Test is On Hold P - Test is Authorized for Prep Only 4.4.23 946 Via Fedex Received By: <u>[Signature]</u> Airbill Number:		

2989

Aluminum (Total)
Arsenic (Total)
Barium (Total)
Beryllium (Total)
Cadmium (Total)
Chromium (Total)
Copper (Total)
Iron (Total)
Lead (Total)
Manganese (Total)
Mercury (Total)
Nickel (Total)
Selenium (Total)
Silver (Total)
Thallium (Total)
Zinc (Total)
<b>Synthetic Organic Compounds (SOCs)</b>
2, 4-D
2, 4, 5-TP (Silvex)
Alachlor (Alanex)
Atrazine
Benzo(a)Pyrene
BHC-gamma (Lindane)
Carbofuran
Chlordane
Dalapon
Di(2-ethylhexyl)adipate ( <i>adipates</i> )
Di(2-ethylhexyl)phthalate ( <i>phthalates</i> )
Dibromochloropropane (DBCP)
Dinoseb
Diquat
Ethylene Dibromide (EDB)
Endothall
Endrin
Glyphosate
Heptachlor
Heptachlor Epoxide
Hexachlorobenzene (HCB)
Hexachlorocyclopentadiene
Methoxychlor
Pentachlorophenol
Picloram
Simazine
Total Polychlorinated Biphenyls (PCBs)
Toxaphene
Vydate (Oxamyl)

Radium 226
Radium 228
Uranium
<b>Bacteriological</b>
Total Coliform
Fecal Coliform
<b>Explosives</b>
2,4,6-trinitrotoluene (TNT)
hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)
octahydro-1,3,4,7-tetranitro-1,3,5,7-tetrazocine
2,4,6-trinitrophenyl-n-methylnitramine (teryll)
2,4-dinitrotoluene (2,4-DNT)
1,3,5-trinitrobenzene (2,6-DNT)
1,3-dinitrobenzene (DNB)
nitrobenzene (NB)

NOTE: PESTICIDE ANALYSES SHOWN ON FOLLOWING

K2303703

9882

✓ **Ship To: Middletown ALS**  
ALS Environmental - Middletown  
301 Fulling Mill Rd.  
Middletown, PA 17057

PC 104

Date 4/13/23

SMO

4/13/23

Date

**Instructions:**

Ice

Dry Ice

No Ice

**Shipping:**

Overnight

2nd Day

Ground

Bill to Client Account

Comments:

[Empty rectangular box for comments]



April 17, 2023

Service Request No:K2303793

Matt Thomas  
GSI Water Solutions, Inc  
650 NE Holladay Street  
Suite 900  
Portland, OR 97232

**Laboratory Results for: Umatilla Depot**

Dear Matt,

Enclosed are the results of the sample(s) submitted to our laboratory April 01, 2023  
For your reference, these analyses have been assigned our service request number **K2303793**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at [www.alsglobal.com](http://www.alsglobal.com). All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at [Mark.Harris@alsglobal.com](mailto:Mark.Harris@alsglobal.com).

Respectfully submitted,

**ALS Group USA, Corp. dba ALS Environmental**

Mark Harris  
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626  
PHONE +1 360 577 7222 | FAX +1 360 636 1068  
ALS Group USA, Corp.  
dba ALS Environmental



# Narrative Documents

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360) 577-7222 Fax (360) 425-9096  
[www.alsglobal.com](http://www.alsglobal.com)



**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot  
**Sample Matrix:** Water

**Service Request:** K2303793  
**Date Received:** 04/01/2023

**CASE NARRATIVE**

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

**Sample Receipt:**

Three water samples were received for analysis at ALS Environmental on 04/01/2023. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

**General Chemistry:**

No significant anomalies were noted with this analysis.

**Volatiles by GC/MS:**

Method 8260C, 04/04/2023: The DOD QSM lower control criterion was exceeded for the surrogate 4-Bromofluorobenzene in all samples and Method Blank (MB) KQ2306252-05. The error associated with reduced recoveries equates to a potential slight bias. The recoveries of the surrogate in question were within ALS control Charted limits. The results were flagged to indicate the issue. No further corrective action was taken.

Approved by \_\_\_\_\_

Date 04/17/2023



### SAMPLE DETECTION SUMMARY

This form includes only detections above the reporting levels. For a full listing of sample results, continue to the Sample Results section of this Report.

<b>CLIENT ID: APS-1-BKGND-03292023</b>	<b>Lab ID: K2303793-001</b>					
--	-----------------------------	--	--	--	--	--

Analyte	Results	Flag	MDL	MRL	Units	Method
Carbon, Total Organic	1.60		0.07	0.50	mg/L	SM 5310 C

<b>CLIENT ID: APS-1-BKGND-03292023</b>	<b>Lab ID: K2303793-002</b>					
--	-----------------------------	--	--	--	--	--

Analyte	Results	Flag	MDL	MRL	Units	Method
Conductivity at 25 Degrees Celsius	241		0.4	2.0	uMHOS/cm	SM 2510 B

<b>CLIENT ID: Trip Blank</b>	<b>Lab ID: K2303793-003</b>					
------------------------------	-----------------------------	--	--	--	--	--

Analyte	Results	Flag	MDL	MRL	Units	Method
Methylene Chloride	0.30	J	0.10	2.0	ug/L	8260C



## Sample Receipt Information

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360) 577-7222 Fax (360) 425-9096  
[www.alsglobal.com](http://www.alsglobal.com)

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002

**Service Request:**K2303793

**SAMPLE CROSS-REFERENCE**

<u>SAMPLE #</u>	<u>CLIENT SAMPLE ID</u>	<u>DATE</u>	<u>TIME</u>
K2303793-001	APS-1-BKGND-03292023	3/29/2023	1400
K2303793-002	APS-1-BKGND-03292023	3/29/2023	1400
K2303793-003	Trip Blank	3/29/2023	1400



CHAIN OF CUSTODY

129889

002

SR# K2303793  
 COC Set \_\_\_\_\_ of \_\_\_\_\_  
 COC# \_\_\_\_\_

1317 South 13th Ave, Kelso, WA 98626 Phone (360) 577-7222 / 800-695-7222 / FAX (360) 636-1068  
 www.alsglobal.com

Project Name: <u>Umatilla DEPOT</u>		Project Number: <u>913.001.002.002</u>		NUMBER OF CONTAINERS	7D							14D			28D				180D		365D	Remarks								
Project Manager: <u>Matt Kohlbecker</u>					3081B / Pest OC	3151A / HERB	3270D / SVO	3330A / NitroAro Amin	300.0 / Radioact	303.1 / Radium 226	304.0 / Radium 228	SM 2540 C / TDS	SM 2540 D / TSS	3260C / VOC FP	SM 2320 B / Alkalinity Tit	SM 2320 B / Carbonate Alk	SM 4500-CN- E / CN T	300.0 / Chloride	300.0 / F	300.0 / SO4	353.2 / NO2 NO3 T		7470A / Hg T	SM 4500-P E / T Phos	SM 5310 C / TOC T	3010C / Metals T	3020A / Metals T	3082A / PCB 3520		
Company: <u>GSI Water Solutions</u>					3081B / Pest OC	3151A / HERB	3270D / SVO	3330A / NitroAro Amin	300.0 / Radioact	303.1 / Radium 226	304.0 / Radium 228	SM 2540 C / TDS	SM 2540 D / TSS	3260C / VOC FP	SM 2320 B / Alkalinity Tit	SM 2320 B / Carbonate Alk	SM 4500-CN- E / CN T	300.0 / Chloride	300.0 / F	300.0 / SO4	353.2 / NO2 NO3 T		7470A / Hg T	SM 4500-P E / T Phos	SM 5310 C / TOC T	3010C / Metals T	3020A / Metals T	3082A / PCB 3520		
Address: <u>650 NE Holladay St Ste 900 Portland OR 97232</u>					3081B / Pest OC	3151A / HERB	3270D / SVO	3330A / NitroAro Amin	300.0 / Radioact	303.1 / Radium 226	304.0 / Radium 228	SM 2540 C / TDS	SM 2540 D / TSS	3260C / VOC FP	SM 2320 B / Alkalinity Tit	SM 2320 B / Carbonate Alk	SM 4500-CN- E / CN T	300.0 / Chloride	300.0 / F	300.0 / SO4	353.2 / NO2 NO3 T		7470A / Hg T	SM 4500-P E / T Phos	SM 5310 C / TOC T	3010C / Metals T	3020A / Metals T	3082A / PCB 3520		
Phone #: <u>503-947-4716</u>		email: <u>mthomas@gsws.com</u>			3081B / Pest OC	3151A / HERB	3270D / SVO	3330A / NitroAro Amin	300.0 / Radioact	303.1 / Radium 226	304.0 / Radium 228	SM 2540 C / TDS	SM 2540 D / TSS	3260C / VOC FP	SM 2320 B / Alkalinity Tit	SM 2320 B / Carbonate Alk	SM 4500-CN- E / CN T	300.0 / Chloride	300.0 / F	300.0 / SO4	353.2 / NO2 NO3 T		7470A / Hg T	SM 4500-P E / T Phos	SM 5310 C / TOC T	3010C / Metals T	3020A / Metals T	3082A / PCB 3520		
Sampler Signature: <u>Matthew Thomas</u>					3081B / Pest OC	3151A / HERB	3270D / SVO	3330A / NitroAro Amin	300.0 / Radioact	303.1 / Radium 226	304.0 / Radium 228	SM 2540 C / TDS	SM 2540 D / TSS	3260C / VOC FP	SM 2320 B / Alkalinity Tit	SM 2320 B / Carbonate Alk	SM 4500-CN- E / CN T	300.0 / Chloride	300.0 / F	300.0 / SO4	353.2 / NO2 NO3 T		7470A / Hg T	SM 4500-P E / T Phos	SM 5310 C / TOC T	3010C / Metals T	3020A / Metals T	3082A / PCB 3520		
Sampler Printed Name: <u>Matthew Thomas</u>					3081B / Pest OC	3151A / HERB	3270D / SVO	3330A / NitroAro Amin	300.0 / Radioact	303.1 / Radium 226	304.0 / Radium 228	SM 2540 C / TDS	SM 2540 D / TSS	3260C / VOC FP	SM 2320 B / Alkalinity Tit	SM 2320 B / Carbonate Alk	SM 4500-CN- E / CN T	300.0 / Chloride	300.0 / F	300.0 / SO4	353.2 / NO2 NO3 T		7470A / Hg T	SM 4500-P E / T Phos	SM 5310 C / TOC T	3010C / Metals T	3020A / Metals T	3082A / PCB 3520		
CLIENT SAMPLE ID	LABID	SAMPLING Date Time	Matrix																											
1. AP3-1-BV6ND-03292023		3/29/23 1400	Water		4									X											X					
2. AP3-1-BV6ND-03292023		3/29/23 1400	Water		2							X																		TG & Cond.
3.																														
4.																														
5.																														
6.																														
7.																														
8.																														
9.																														
10.																														

<b>Report Requirements</b> <input checked="" type="checkbox"/> I. Routine Report: Method Blank, Surrogate, as required <input type="checkbox"/> II. Report Dup., MS, MSD as required <input type="checkbox"/> III. CLP Like Summary (no raw data) <input type="checkbox"/> IV. Data Validation Report <input type="checkbox"/> V. EDD	<b>Invoice Information</b> P.O.# _____ Bill To: _____ _____	Circle which metals are to be analyzed Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg	
	<b>Turnaround Requirements</b> <input type="checkbox"/> 24 hr. _____ 48 hr. <input checked="" type="checkbox"/> 5 Day Standard	Special Instructions/Comments: *Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other _____ (Circle One) Address invoice to: John Schaefer, 216 SE 4th St, Pendleton OR 97801 Email invoice to: mkohlbecker@gsws.com Send invoice for (2) 1L bottles to Shannon Souza + results at ssouza@obind.com/renewables.com	
<b>Relinquished By:</b> Signature: <u>Matthew Thomas</u> Printed Name: <u>Matthew Thomas</u> Firm: <u>GSI Water Solutions</u> Date/Time: <u>3/31/23 1215</u>	<b>Received By:</b> Signature: <u>Josh Mepherson</u> Printed Name: <u>Josh Mepherson</u> Firm: <u>ALS</u> Date/Time: <u>4.1.23 1020</u>	<b>Relinquished By:</b> Signature: _____ Printed Name: _____ Firm: _____ Date/Time: _____	<b>Received By:</b> Signature: _____ Printed Name: _____ Firm: _____ Date/Time: _____





# Miscellaneous Forms

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### **Inorganic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

### **Metals Data Qualifiers**

- # The control limit criteria is not applicable.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.  
  - i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Organic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Additional Petroleum Hydrocarbon Specific Qualifiers**

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso  
State Certifications, Accreditations, and Licenses**

<b>Agency</b>	<b>Web Site</b>	<b>Number</b>
Alaska DEH	<a href="http://dec.alaska.gov/eh/lab/cs/csapproval.htm">http://dec.alaska.gov/eh/lab/cs/csapproval.htm</a>	UST-040
Arizona DHS	<a href="http://www.azdhs.gov/lab/license/env.htm">http://www.azdhs.gov/lab/license/env.htm</a>	AZ0339
Arkansas - DEQ	<a href="http://www.adeq.state.ar.us/techsvs/labcert.htm">http://www.adeq.state.ar.us/techsvs/labcert.htm</a>	88-0637
California DHS (ELAP)	<a href="http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx">http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx</a>	2795
DOD ELAP	<a href="http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm">http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm</a>	L16-58-R4
Florida DOH	<a href="http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm">http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm</a>	E87412
Hawaii DOH	<a href="http://health.hawaii.gov/">http://health.hawaii.gov/</a>	-
ISO 17025	<a href="http://www.pjllabs.com/">http://www.pjllabs.com/</a>	L16-57
Louisiana DEQ	<a href="http://www.deq.louisiana.gov/page/la-lab-accreditation">http://www.deq.louisiana.gov/page/la-lab-accreditation</a>	03016
Maine DHS	<a href="http://www.maine.gov/dhhs/">http://www.maine.gov/dhhs/</a>	WA01276
Minnesota DOH	<a href="http://www.health.state.mn.us/accreditation">http://www.health.state.mn.us/accreditation</a>	053-999-457
Nevada DEP	<a href="http://ndep.nv.gov/bsdw/labservice.htm">http://ndep.nv.gov/bsdw/labservice.htm</a>	WA01276
New Jersey DEP	<a href="http://www.nj.gov/dep/enforcement/oqa.html">http://www.nj.gov/dep/enforcement/oqa.html</a>	WA005
New York - DOH	<a href="https://www.wadsworth.org/regulatory/elap">https://www.wadsworth.org/regulatory/elap</a>	12060
North Carolina DEQ	<a href="https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification">https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification</a>	605
Oklahoma DEQ	<a href="http://www.deq.state.ok.us/CSDnew/labcert.htm">http://www.deq.state.ok.us/CSDnew/labcert.htm</a>	9801
Oregon – DEQ (NELAP)	<a href="http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx">http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx</a>	WA100010
South Carolina DHEC	<a href="http://www.scdhec.gov/environment/EnvironmentalLabCertification/">http://www.scdhec.gov/environment/EnvironmentalLabCertification/</a>	61002
Texas CEQ	<a href="http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html">http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html</a>	T104704427
Washington DOE	<a href="http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html">http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html</a>	C544
Wyoming (EPA Region 8)	<a href="https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water">https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water</a>	-
Kelso Laboratory Website	<a href="http://www.alsglobal.com">www.alsglobal.com</a>	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at [www.ALSGlobal.com](http://www.ALSGlobal.com) or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.

## Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

ALS Group USA, Corp.  
dba ALS Environmental

Analyst Summary report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002

**Service Request:** K2303793

**Sample Name:** APS-1-BKGND-03292023  
**Lab Code:** K2303793-001  
**Sample Matrix:** Water

**Date Collected:** 03/29/23  
**Date Received:** 04/1/23

**Analysis Method**  
8260C  
SM 5310 C

**Extracted/Digested By**

**Analyzed By**  
GROETTGER  
MSPECHT

**Sample Name:** APS-1-BKGND-03292023  
**Lab Code:** K2303793-002  
**Sample Matrix:** Water

**Date Collected:** 03/29/23  
**Date Received:** 04/1/23

**Analysis Method**  
SM 2510 B  
SM 2540 D

**Extracted/Digested By**

**Analyzed By**  
JBYMAN  
JBYMAN

**Sample Name:** Trip Blank  
**Lab Code:** K2303793-003  
**Sample Matrix:** Water

**Date Collected:** 03/29/23  
**Date Received:** 04/1/23

**Analysis Method**  
8260C

**Extracted/Digested By**

**Analyzed By**  
GROETTGER



# Sample Results

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## Volatile Organic Compounds by GC/MS

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**ALS Group USA, Corp.**  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2303793  
**Date Collected:** 03/29/23 14:00  
**Date Received:** 04/01/23 10:20

**Sample Name:** APS-1-BKGND-03292023  
**Lab Code:** K2303793-001

**Units:** ug/L  
**Basis:** NA

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
1,1,1-Trichloroethane (TCA)	ND U	0.50	0.20	0.075	1	04/04/23 11:56	
1,1,2-Trichloroethane	ND U	0.50	0.40	0.14	1	04/04/23 11:56	
1,1-Dichloroethene	ND U	0.50	0.20	0.080	1	04/04/23 11:56	
1,2,4-Trichlorobenzene	ND U	2.0	0.30	0.096	1	04/04/23 11:56	
1,2-Dibromo-3-chloropropane	ND U	2.0	0.44	0.22	1	04/04/23 11:56	
1,2-Dibromoethane (EDB)	ND U	2.0	0.20	0.10	1	04/04/23 11:56	
1,2-Dichloroethane (EDC)	ND U	0.50	0.20	0.080	1	04/04/23 11:56	
1,2-Dichloropropane	ND U	0.50	0.20	0.095	1	04/04/23 11:56	
Benzene	ND U	0.50	0.20	0.062	1	04/04/23 11:56	
Chlorobenzene	ND U	0.50	0.30	0.11	1	04/04/23 11:56	
Ethylbenzene	ND U	0.50	0.10	0.050	1	04/04/23 11:56	
Methylene Chloride	ND U	2.0	0.20	0.10	1	04/04/23 11:56	
Styrene	ND U	0.50	0.20	0.089	1	04/04/23 11:56	
Tetrachloroethene (PCE)	ND U	0.50	0.20	0.099	1	04/04/23 11:56	
Toluene	ND U	0.50	0.10	0.054	1	04/04/23 11:56	
Trichloroethene (TCE)	ND U	0.50	0.20	0.10	1	04/04/23 11:56	
Vinyl Chloride	ND U	0.50	0.15	0.075	1	04/04/23 11:56	
cis-1,2-Dichloroethene	ND U	0.50	0.20	0.067	1	04/04/23 11:56	
m,p-Xylenes	ND U	0.50	0.30	0.11	1	04/04/23 11:56	
o-Xylene	ND U	0.50	0.20	0.074	1	04/04/23 11:56	
trans-1,2-Dichloroethene	ND U	0.50	0.20	0.072	1	04/04/23 11:56	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,2-Dichloroethane-d4	112	81 - 118	04/04/23 11:56	
4-Bromofluorobenzene	80	85 - 114	04/04/23 11:56	*
Dibromofluoromethane	118	80 - 119	04/04/23 11:56	
Toluene-d8	102	89 - 112	04/04/23 11:56	

**ALS Group USA, Corp.**  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2303793  
**Date Collected:** 03/29/23 14:00  
**Date Received:** 04/01/23 10:20

**Sample Name:** Trip Blank  
**Lab Code:** K2303793-003

**Units:** ug/L  
**Basis:** NA

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
1,1,1-Trichloroethane (TCA)	ND U	0.50	0.20	0.075	1	04/04/23 12:15	
1,1,2-Trichloroethane	ND U	0.50	0.40	0.14	1	04/04/23 12:15	
1,1-Dichloroethene	ND U	0.50	0.20	0.080	1	04/04/23 12:15	
1,2,4-Trichlorobenzene	ND U	2.0	0.30	0.096	1	04/04/23 12:15	
1,2-Dibromo-3-chloropropane	ND U	2.0	0.44	0.22	1	04/04/23 12:15	
1,2-Dibromoethane (EDB)	ND U	2.0	0.20	0.10	1	04/04/23 12:15	
1,2-Dichloroethane (EDC)	ND U	0.50	0.20	0.080	1	04/04/23 12:15	
1,2-Dichloropropane	ND U	0.50	0.20	0.095	1	04/04/23 12:15	
Benzene	ND U	0.50	0.20	0.062	1	04/04/23 12:15	
Chlorobenzene	ND U	0.50	0.30	0.11	1	04/04/23 12:15	
Ethylbenzene	ND U	0.50	0.10	0.050	1	04/04/23 12:15	
Methylene Chloride	<b>0.30 J</b>	2.0	0.20	0.10	1	04/04/23 12:15	
Styrene	ND U	0.50	0.20	0.089	1	04/04/23 12:15	
Tetrachloroethene (PCE)	ND U	0.50	0.20	0.099	1	04/04/23 12:15	
Toluene	ND U	0.50	0.10	0.054	1	04/04/23 12:15	
Trichloroethene (TCE)	ND U	0.50	0.20	0.10	1	04/04/23 12:15	
Vinyl Chloride	ND U	0.50	0.15	0.075	1	04/04/23 12:15	
cis-1,2-Dichloroethene	ND U	0.50	0.20	0.067	1	04/04/23 12:15	
m,p-Xylenes	ND U	0.50	0.30	0.11	1	04/04/23 12:15	
o-Xylene	ND U	0.50	0.20	0.074	1	04/04/23 12:15	
trans-1,2-Dichloroethene	ND U	0.50	0.20	0.072	1	04/04/23 12:15	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,2-Dichloroethane-d4	113	81 - 118	04/04/23 12:15	
4-Bromofluorobenzene	81	85 - 114	04/04/23 12:15	*
Dibromofluoromethane	115	80 - 119	04/04/23 12:15	
Toluene-d8	100	89 - 112	04/04/23 12:15	



# General Chemistry

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ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Sample Name:** APS-1-BKGND-03292023  
**Lab Code:** K2303793-001

**Service Request:** K2303793  
**Date Collected:** 03/29/23 14:00  
**Date Received:** 04/01/23 10:20  
**Basis:** NA

General Chemistry Parameters

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>LOQ</u>	<u>LOD</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Q</u>
Carbon, Total Organic	SM 5310 C	1.60	mg/L	0.50	0.20	0.07	1	04/04/23 15:27	

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Sample Name:** APS-1-BKGND-03292023  
**Lab Code:** K2303793-002

**Service Request:** K2303793  
**Date Collected:** 03/29/23 14:00  
**Date Received:** 04/01/23 10:20  
**Basis:** NA

General Chemistry Parameters

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>LOQ</u>	<u>LOD</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Q</u>
Conductivity at 25 Degrees Celsius	SM 2510 B	241	uMHOS/cm	2.0	1.0	0.4	1	04/12/23 11:45	
Solids, Total Suspended (TSS)	SM 2540 D	ND U	mg/L	5.0	-	-	1	04/04/23 11:57	



# QC Summary Forms

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## Volatile Organic Compounds by GC/MS

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Phone (360) 577-7222 Fax (360) 425-9096  
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**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2303793

**SURROGATE RECOVERY SUMMARY**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Extraction Method:** None

Sample Name	Lab Code	1,2-Dichloroethane-d4	4-Bromofluorobenzene	Dibromofluoromethane
		81-118	85-114	80-119
APS-1-BKGND-03292023	K2303793-001	112	80*	118
Trip Blank	K2303793-003	113	81*	115
Method Blank	KQ2306252-05	110	83*	116
Lab Control Sample	KQ2306252-03	100	92	106
Duplicate Lab Control Sample	KQ2306252-04	103	92	104

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2303793

**SURROGATE RECOVERY SUMMARY**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Extraction Method:** None

<b>Sample Name</b>	<b>Lab Code</b>	<b>Toluene-d8</b>
		<b>89-112</b>
APS-1-BKGND-03292023	K2303793-001	102
Trip Blank	K2303793-003	100
Method Blank	KQ2306252-05	100
Lab Control Sample	KQ2306252-03	104
Duplicate Lab Control Sample	KQ2306252-04	105

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2303793  
**Date Collected:** NA  
**Date Received:** NA

**Sample Name:** Method Blank  
**Lab Code:** KQ2306252-05

**Units:** ug/L  
**Basis:** NA

Volatile Organic Compounds by GC/MS

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
1,1,1-Trichloroethane (TCA)	ND U	0.50	0.20	0.075	1	04/04/23 11:36	
1,1,2-Trichloroethane	ND U	0.50	0.40	0.14	1	04/04/23 11:36	
1,1-Dichloroethene	ND U	0.50	0.20	0.080	1	04/04/23 11:36	
1,2,4-Trichlorobenzene	ND U	2.0	0.30	0.096	1	04/04/23 11:36	
1,2-Dibromo-3-chloropropane	ND U	2.0	0.44	0.22	1	04/04/23 11:36	
1,2-Dibromoethane (EDB)	ND U	2.0	0.20	0.10	1	04/04/23 11:36	
1,2-Dichloroethane (EDC)	ND U	0.50	0.20	0.080	1	04/04/23 11:36	
1,2-Dichloropropane	ND U	0.50	0.20	0.095	1	04/04/23 11:36	
Benzene	ND U	0.50	0.20	0.062	1	04/04/23 11:36	
Chlorobenzene	ND U	0.50	0.30	0.11	1	04/04/23 11:36	
Ethylbenzene	ND U	0.50	0.10	0.050	1	04/04/23 11:36	
Methylene Chloride	<b>0.18 J</b>	2.0	0.20	0.10	1	04/04/23 11:36	
Styrene	ND U	0.50	0.20	0.089	1	04/04/23 11:36	
Tetrachloroethene (PCE)	ND U	0.50	0.20	0.099	1	04/04/23 11:36	
Toluene	ND U	0.50	0.10	0.054	1	04/04/23 11:36	
Trichloroethene (TCE)	ND U	0.50	0.20	0.10	1	04/04/23 11:36	
Vinyl Chloride	ND U	0.50	0.15	0.075	1	04/04/23 11:36	
cis-1,2-Dichloroethene	ND U	0.50	0.20	0.067	1	04/04/23 11:36	
m,p-Xylenes	ND U	0.50	0.30	0.11	1	04/04/23 11:36	
o-Xylene	ND U	0.50	0.20	0.074	1	04/04/23 11:36	
trans-1,2-Dichloroethene	ND U	0.50	0.20	0.072	1	04/04/23 11:36	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,2-Dichloroethane-d4	110	81 - 118	04/04/23 11:36	
4-Bromofluorobenzene	83	85 - 114	04/04/23 11:36	*
Dibromofluoromethane	116	80 - 119	04/04/23 11:36	
Toluene-d8	100	89 - 112	04/04/23 11:36	

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2303793  
**Date Analyzed:** 04/04/23  
**Date Extracted:** NA

**Duplicate Lab Control Sample Summary**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 799762

Analyte Name	Lab Control Sample KQ2306252-03			Duplicate Lab Control Sample KQ2306252-04			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1-Trichloroethane (TCA)	12.0	10.0	120	11.6	10.0	116	74-131	3	20
1,1,2-Trichloroethane	8.85	10.0	89	9.22	10.0	92	80-119	4	20
1,1-Dichloroethene	12.0	10.0	120	11.4	10.0	114	71-131	5	20
1,2,4-Trichlorobenzene	8.14	10.0	81	8.53	10.0	85	69-130	5	20
1,2-Dibromo-3-chloropropane	8.14	10.0	81	8.77	10.0	88	62-128	7	20
1,2-Dibromoethane (EDB)	8.74	10.0	87	9.30	10.0	93	77-121	6	20
1,2-Dichloroethane (EDC)	10.5	10.0	105	10.6	10.0	106	73-128	1	20
1,2-Dichloropropane	10.2	10.0	102	10.5	10.0	105	78-122	3	20
Benzene	11.0	10.0	110	10.9	10.0	109	79-120	<1	20
Chlorobenzene	9.63	10.0	96	9.81	10.0	98	82-118	2	20
cis-1,2-Dichloroethene	10.7	10.0	107	10.8	10.0	108	78-123	<1	20
Ethylbenzene	10.1	10.0	101	10.1	10.0	101	79-121	<1	20
m,p-Xylenes	20.9	20.0	104	21.0	20.0	105	80-121	<1	20
Methylene Chloride	10.3	10.0	103	10.4	10.0	104	74-124	<1	20
o-Xylene	10.2	10.0	102	10.2	10.0	102	78-122	<1	20
Styrene	10.4	10.0	104	10.8	10.0	108	78-123	4	20
Tetrachloroethene (PCE)	10.0	10.0	100	9.99	10.0	100	74-129	<1	20
Toluene	11.1	10.0	111	11.1	10.0	111	80-121	<1	20
trans-1,2-Dichloroethene	11.0	10.0	110	10.9	10.0	109	75-124	1	20
Trichloroethene (TCE)	10.9	10.0	109	10.5	10.0	105	79-123	3	20
Vinyl Chloride	11.5	10.0	115	11.3	10.0	113	58-137	2	20



# General Chemistry

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360) 577-7222 Fax (360) 425-9096  
[www.alsglobal.com](http://www.alsglobal.com)

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** K2303793-MB1

**Service Request:** K2303793  
**Date Collected:** NA  
**Date Received:** NA  
**Basis:** NA

General Chemistry Parameters

<b>Analyte Name</b>	<b>Analysis Method</b>	<b>Result</b>	<b>Units</b>	<b>LOQ</b>	<b>LOD</b>	<b>MDL</b>	<b>Dil.</b>	<b>Date Analyzed</b>	<b>Q</b>
Carbon, Total Organic	SM 5310 C	0.08 J	mg/L	0.50	0.20	0.07	1	04/04/23 15:27	
Conductivity at 25 Degrees Celsius	SM 2510 B	1.0 J	uMHOS/cm	2.0	1.0	0.4	1	04/12/23 11:45	
Solids, Total Suspended (TSS)	SM 2540 D	ND U	mg/L	5.0	-	-	1	04/04/23 11:57	

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** K2303793-MB2

**Service Request:** K2303793  
**Date Collected:** NA  
**Date Received:** NA  
**Basis:** NA

General Chemistry Parameters

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>LOQ</u>	<u>LOD</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Q</u>
Solids, Total Suspended (TSS)	SM 2540 D	ND U	mg/L	5.0	-	-	1	04/04/23 11:57	

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2303793  
**Date Analyzed:** 04/04/23

**Lab Control Sample Summary**  
**General Chemistry Parameters**

**Units:**mg/L  
**Basis:**NA

**Lab Control Sample**  
K2303793-LCS

<b>Analyte Name</b>	<b>Analytical Method</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Carbon, Total Organic	SM 5310 C	25.7	25.0	103	83-117
Solids, Total Suspended (TSS)	SM 2540 D	398	400	100	85-115

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2303793  
**Date Analyzed:** 04/12/23

**Lab Control Sample Summary**  
**General Chemistry Parameters**

**Units:**uMHOS/cm  
**Basis:**NA

**Lab Control Sample**  
K2303793-LCS

<u>Analyte Name</u>	<u>Analytical Method</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>% Rec Limits</u>
Conductivity at 25 Degrees Celsius	SM 2510 B	306	306	100	86-113

# Anatek Labs, Inc.

1282 Alturas Drive - Moscow, ID 83843 - (208) 883-2839 - email moscow@anateklabs.com  
504 E Sprague Ste. D - Spokane, WA 99202 - (509) 838-3999 - email spokane@anateklabs.com

**Client:** GSI Water Solutions, Inc.  
**Address:** 650 NE Holladay st, Suite 900  
Portland, OR 97232  
**Attn:** Matt Thomas

**Work Order:** MDD0105  
**Project:** 913.001.002.002  
**Reported:** 4/18/2023 12:50

## Analytical Results Report

**Sample Location:** APS-1BKGND-03292023  
**Lab/Sample Number:** MDD0105-01      **Collect Date:** 03/29/23 14:00  
**Date Received:** 04/04/23 10:21      **Collected By:**  
**Matrix:** Water

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
<b>Semivolatiles</b>							
Endothall	ND	ug/L	9.00	4/7/23 23:13	GPB	EPA 548.1	
<i>Surrogate: 2,4-DCPA</i>	<i>96.3%</i>		<i>70-130</i>	<i>4/7/23 23:13</i>	<i>GPB</i>	<i>EPA 548.1</i>	
bis-2(ethylhexyl)adipate	ND	ug/L	0.210	4/13/23 5:51	BMM	EPA 525.2	

Authorized Signature,



Justin Doty For Todd Taruscio, Laboratory Manager

PQL      Practical Quantitation Limit  
ND      Not Detected  
MCL      EPA's Maximum Contaminant Level  
Dry      Sample results reported on a dry weight basis  
\*      Not a state-certified analyte

This report shall not be reproduced except in full, without the written approval of the laboratory  
The results reported related only to the samples indicated.

# Anatek Labs, Inc.

1282 Alturas Drive - Moscow, ID 83843 - (208) 883-2839 - email moscow@anateklabs.com  
 504 E Sprague Ste. D - Spokane, WA 99202 - (509) 838-3999 - email spokane@anateklabs.com

## Quality Control Data

### Semivolatiles

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch: BDD0135 - SVOC Water</b>										
<b>Blank (BDD0135-BLK1)</b>										
Di (2-ethylhexyl) adipate	ND		0.200	ug/L						
					Prepared: 4/5/2023 Analyzed: 4/12/2023					
<b>LCS (BDD0135-BS1)</b>										
Di (2-ethylhexyl) adipate	0.173		0.200	ug/L	0.200		86.3	20-130		
					Prepared: 4/5/2023 Analyzed: 4/12/2023					
<b>LCS Dup (BDD0135-BS1)</b>										
Di (2-ethylhexyl) adipate	0.206		0.200	ug/L	0.200		103	20-130	17.8	200
					Prepared: 4/5/2023 Analyzed: 4/12/2023					
<b>Batch: BDD0295 - Endothall</b>										
<b>Blank (BDD0295-BLK1)</b>										
Endothall	ND		9.00	ug/L						
					Prepared: 4/5/2023 Analyzed: 4/7/2023					
<i>Surrogate: 2,4-DCPA</i>			50.2	ug/L	50.0		100	70-130		
<b>LCS (BDD0295-BS1)</b>										
Endothall	44.8		9.00	ug/L	50.0		89.6	70-130		
					Prepared: 4/5/2023 Analyzed: 4/7/2023					
<i>Surrogate: 2,4-DCPA</i>			48.9	ug/L	50.0		97.9	70-130		



# Chain of Custody Record

**Anatek Labs Inc.**  
 1282 Alturas Drive,  
 504 E Sprague Ste D,

MDD0105  
  
 Due: 04/18/23

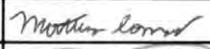
Company Name: <u>GSI Water Solutions, Inc</u>	Project Manager: <u>Matt Kuhlbecher</u>
Address: <u>650 NE Holladay St. Ste 900</u>	Project Name & #: <u>Umatilla Dept 913.001.002.002</u>
City: <u>Portland</u> State: <u>OR</u> Zip: <u>97232</u>	Purchase Order #: <u>913.001.002.002</u>
Phone: <u>423-957-4716</u>	Sampler Name & Phone: <u>Matthew Thomas 423-957-4716</u>
Email Address(es): <u>mthomas@gsiws.com</u>	

Normal  
 Next Day\*  
 2nd Day\*  
 Other\*

\*All rush order requests must have prior approval

				List Analyses Requested								Note Special Instructions/Comments				
Lab ID	Sample Identification	Sampling Date/Time	Matrix	# of Containers	Sample Volume	Preservative:		Dilution (if any)	Other	Endotoxin						
						W/A	N/A									
																Address invoice to: <u>John Schaefer 216 SE 4th St Pendleton, OR 97401</u> Email invoice to: <u>mkuhlbecher@gsiws.com</u>
	<u>APS-1-BKGD-03292023</u>	<u>3/29/23 1400</u>	<u>water</u>	<u>2</u>	<u>2L</u>	<u>X</u>	<u>X</u>									

Inspection Checklist		
Received Intact?	<u>Y</u>	N
Labels & Chains Agree?	<u>Y</u>	N
Containers Sealed?	<u>Y</u>	N
No VOC Head Space?	<u>Y</u>	N
Cooler?	<u>Y</u>	N
Ice/Ice Packs Present?	<u>Y</u>	N

	Printed Name	Signature	Company	Date	Time
Relinquished by	<u>Matthew Thomas</u>		<u>GSI Water Solutions</u>	<u>4/31/23</u>	<u>1330</u>
Received by	<u>Joseph Jiggar</u>		<u>Anatek</u>	<u>4/14/23</u>	<u>1021</u>
Relinquished by					
Received by					
Relinquished by					
Received by					

Temperature (°C): 11.2/11.2

Number of Containers: 2

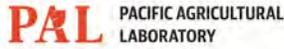
Shipped Via: UPS

Preservative: \_\_\_\_\_

Date & Time: \_\_\_\_\_

Inspected By: 

Samples submitted to Anatek Labs may be subcontracted to other accredited labs if necessary. This message serves as notice of this possibility. Subcontracted analyses will be clearly noted on the analytical report.



GSI Water Solutions, Inc.  
650 NE Holladay Street Suite 900  
Portland, OR 97232

Report Number: P230373  
Report Date: April 18, 2023  
Client Project ID: 913.001.002.002

## Analytical Report

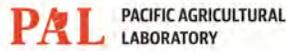
Client Sample ID: APS-1-BUGND-03292023  
Matrix: water

PAL Sample ID: P230373-01  
Sample Date: 3/29/23  
Received Date: 4/4/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
<b>Method:</b> Modified EPA 547 (LC-FLD)					
4/11/23	4/12/23	AMPA	ND	10 ug/L	
4/11/23	4/12/23	Glyphosate	ND	10 ug/L	
<b>Method:</b> Modified EPA 8151A (GC-MS/MS)					
4/05/23	4/7/23	Picloram	ND	0.080 ug/L	
<b>Surrogate Recovery:</b> 102 % <b>Surrogate Recovery Range:</b> 25-130 (DCPAA used as Surrogate)					
<b>Method:</b> Modified EPA 8270D (GC-MS/MS)					
4/04/23	4/10/23	a-BHC	ND	0.060 ug/L	
4/04/23	4/10/23	Acetochlor	ND	0.060 ug/L	
4/04/23	4/10/23	Alachlor	ND	0.060 ug/L	
4/04/23	4/10/23	Aldrin	ND	0.060 ug/L	
4/04/23	4/10/23	Ametryn	ND	0.060 ug/L	
4/04/23	4/10/23	Aspon	ND	0.060 ug/L	
4/04/23	4/10/23	b-BHC	ND	0.060 ug/L	
4/04/23	4/10/23	Benfluralin	ND	0.060 ug/L	
4/04/23	4/10/23	Bifenthrin	ND	0.060 ug/L	
4/04/23	4/10/23	Bolstar	ND	0.060 ug/L	
4/04/23	4/10/23	Bromopropylate	ND	0.060 ug/L	
4/04/23	4/10/23	Buprofezin	ND	0.060 ug/L	
4/04/23	4/10/23	Captan	ND	0.60 ug/L	
4/04/23	4/10/23	Chlordane	ND	0.060 ug/L	
4/04/23	4/10/23	Chlorfenapyr	ND	0.060 ug/L	
4/04/23	4/10/23	Chlorfenvinphos	ND	0.060 ug/L	
4/04/23	4/10/23	Chlorobenzilate	ND	0.060 ug/L	
4/04/23	4/10/23	Chloroneb	ND	0.060 ug/L	
4/04/23	4/10/23	Chlorpropham	ND	0.060 ug/L	
4/04/23	4/10/23	Chlorpyrifos	ND	0.060 ug/L	
4/04/23	4/10/23	Chlorpyrifos-methyl	ND	0.060 ug/L	

Kara Greer, Project Manager

This analytical report complies with the ISO/IEC 17025:2017  
Quality Standard.



GSI Water Solutions, Inc.  
650 NE Holladay Street Suite 900  
Portland, OR 97232

Report Number: P230373  
Report Date: April 18, 2023  
Client Project ID: 913.001.002.002

### Analytical Report

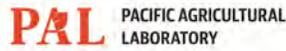
Client Sample ID: APS-1-BUGND-03292023  
Matrix: water

PAL Sample ID: P230373-01  
Sample Date: 3/29/23  
Received Date: 4/4/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/04/23	4/10/23	cis-Nonachlor	ND	0.060 ug/L	
4/04/23	4/10/23	Cyfluthrin	ND	0.30 ug/L	
4/04/23	4/10/23	Cypermethrin	ND	0.30 ug/L	
4/04/23	4/10/23	Dacthal	ND	0.060 ug/L	
4/04/23	4/10/23	d-BHC	ND	0.060 ug/L	
4/04/23	4/10/23	Deltamethrin	ND	0.30 ug/L	
4/04/23	4/10/23	Demeton	ND	0.060 ug/L	
4/04/23	4/10/23	Diazinon	ND	0.060 ug/L	
4/04/23	4/10/23	Dichlobenil	ND	0.060 ug/L	
4/04/23	4/10/23	Dichlorofenthion	ND	0.060 ug/L	
4/04/23	4/10/23	Dichlorvos	ND	0.060 ug/L	
4/04/23	4/10/23	Diclofop-methyl	ND	0.060 ug/L	
4/04/23	4/10/23	Dicloran	ND	0.30 ug/L	
4/04/23	4/10/23	Dicofol	ND	0.060 ug/L	
4/04/23	4/10/23	Dieldrin	ND	0.060 ug/L	
4/04/23	4/10/23	Dimethenamid	ND	0.060 ug/L	
4/04/23	4/10/23	Diphenamid	ND	0.060 ug/L	
4/04/23	4/10/23	Diphenylamine	ND	0.060 ug/L	
4/04/23	4/10/23	Disulfoton	ND	0.060 ug/L	
4/04/23	4/10/23	Dithiopyr	ND	0.060 ug/L	
4/04/23	4/10/23	Endosulfan I	ND	0.12 ug/L	
4/04/23	4/10/23	Endosulfan II	ND	0.12 ug/L	
4/04/23	4/10/23	Endosulfan sulfate	ND	0.12 ug/L	
4/04/23	4/10/23	Endrin	ND	0.060 ug/L	
4/04/23	4/10/23	Endrin ketone	ND	0.060 ug/L	
4/04/23	4/10/23	EPN	ND	0.060 ug/L	
4/04/23	4/10/23	EPTC	ND	0.060 ug/L	
4/04/23	4/10/23	Esfenvalerate	ND	0.060 ug/L	
4/04/23	4/10/23	Ethalfuralin	ND	0.060 ug/L	
4/04/23	4/10/23	Ethofumesate	ND	0.060 ug/L	
4/04/23	4/10/23	Ethoprop	ND	0.060 ug/L	
4/04/23	4/10/23	Etoxazole	ND	0.060 ug/L	
4/04/23	4/10/23	Etridiazole	ND	0.060 ug/L	

Kara Greer, Project Manager

This analytical report complies with the ISO/IEC 17025:2017 Quality Standard.



GSI Water Solutions, Inc.  
650 NE Holladay Street Suite 900  
Portland, OR 97232

Report Number: P230373  
Report Date: April 18, 2023  
Client Project ID: 913.001.002.002

## Analytical Report

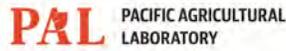
Client Sample ID: APS-1-BUGND-03292023  
Matrix: water

PAL Sample ID: P230373-01  
Sample Date: 3/29/23  
Received Date: 4/4/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/04/23	4/10/23	Fenarimol	ND	0.060 ug/L	
4/04/23	4/10/23	Fenitrothion	ND	0.060 ug/L	
4/04/23	4/10/23	Fenoxaprop-ethyl	ND	0.060 ug/L	
4/04/23	4/10/23	Fenthion	ND	0.060 ug/L	
4/04/23	4/10/23	Fenvalerate	ND	0.060 ug/L	
4/04/23	4/10/23	Fipronil	ND	0.060 ug/L	
4/04/23	4/10/23	Fluazifop-p-butyl	ND	0.060 ug/L	
4/04/23	4/10/23	Fludioxonil	ND	0.060 ug/L	
4/04/23	4/10/23	Fluroxypyr-meptyl	ND	0.060 ug/L	
4/04/23	4/10/23	Flutolanil	ND	0.060 ug/L	
4/04/23	4/10/23	g-BHC	ND	0.060 ug/L	
4/04/23	4/10/23	Heptachlor	ND	0.060 ug/L	
4/04/23	4/10/23	Heptachlor epoxide	ND	0.060 ug/L	
4/04/23	4/10/23	Hexachlorobenzene	ND	0.060 ug/L	
4/04/23	4/10/23	Kresoxim-methyl	ND	0.060 ug/L	
4/04/23	4/10/23	lambda-Cyhalothrin	ND	0.060 ug/L	
4/04/23	4/10/23	Leptophos	ND	0.060 ug/L	
4/04/23	4/10/23	Malathion	ND	0.060 ug/L	
4/04/23	4/10/23	Mefenoxam	ND	0.060 ug/L	
4/04/23	4/10/23	Methoxychlor	ND	0.060 ug/L	
4/04/23	4/10/23	Metolachlor	ND	0.060 ug/L	
4/04/23	4/10/23	MGK-264	ND	0.060 ug/L	
4/04/23	4/10/23	Myclobutanil	ND	0.060 ug/L	
4/04/23	4/10/23	Napropamide	ND	0.060 ug/L	
4/04/23	4/10/23	o-Phenylphenol	ND	0.060 ug/L	
4/04/23	4/10/23	Ovex	ND	0.060 ug/L	
4/04/23	4/10/23	Oxadiazon	ND	0.060 ug/L	
4/04/23	4/10/23	Oxyfluorfen	ND	0.060 ug/L	
4/04/23	4/10/23	p,p'-DDD	ND	0.060 ug/L	
4/04/23	4/10/23	p,p'-DDE	ND	0.060 ug/L	
4/04/23	4/10/23	p,p'-DDT	ND	0.060 ug/L	
4/04/23	4/10/23	Paclobutrazol	ND	0.060 ug/L	
4/04/23	4/10/23	Parathion	ND	0.060 ug/L	

Kara Greer, Project Manager

This analytical report complies with the ISO/IEC 17025:2017  
Quality Standard.



GSI Water Solutions, Inc.  
650 NE Holladay Street Suite 900  
Portland, OR 97232

Report Number: P230373  
Report Date: April 18, 2023  
Client Project ID: 913.001.002.002

### Analytical Report

Client Sample ID: APS-1-BUGND-03292023  
Matrix: water

PAL Sample ID: P230373-01  
Sample Date: 3/29/23  
Received Date: 4/4/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/04/23	4/10/23	Parathion-methyl	ND	0.060 ug/L	
4/04/23	4/10/23	PCA	ND	0.060 ug/L	
4/04/23	4/10/23	PCB	ND	0.060 ug/L	
4/04/23	4/10/23	PCNB	ND	0.060 ug/L	
4/04/23	4/10/23	Pendimethalin	ND	0.060 ug/L	
4/04/23	4/10/23	Pentachlorothioanisole	ND	0.060 ug/L	
4/04/23	4/10/23	Permethrin	ND	0.12 ug/L	
4/04/23	4/10/23	Phorate	ND	0.060 ug/L	
4/04/23	4/10/23	Procymidone	ND	0.060 ug/L	
4/04/23	4/10/23	Prodiamine	ND	0.060 ug/L	
4/04/23	4/10/23	Pronamide	ND	0.060 ug/L	
4/04/23	4/10/23	Propachlor	ND	0.060 ug/L	
4/04/23	4/10/23	Pyriproxyfen	ND	0.060 ug/L	
4/04/23	4/10/23	Quinoxyfen	ND	0.060 ug/L	
4/04/23	4/10/23	Ronnel	ND	0.060 ug/L	
4/04/23	4/10/23	Spirodiclofen	ND	0.060 ug/L	
4/04/23	4/10/23	Sulfotep	ND	0.060 ug/L	
4/04/23	4/10/23	Tefluthrin	ND	0.060 ug/L	
4/04/23	4/10/23	Terbufos	ND	0.060 ug/L	
4/04/23	4/10/23	Tetraconazole	ND	0.060 ug/L	
4/04/23	4/10/23	Tetradifon	ND	0.060 ug/L	
4/04/23	4/10/23	Thionazin	ND	0.060 ug/L	
4/04/23	4/10/23	Tokuthion	ND	0.060 ug/L	
4/04/23	4/10/23	trans-Nonachlor	ND	0.060 ug/L	
4/04/23	4/10/23	Trichloronate	ND	0.060 ug/L	
4/04/23	4/10/23	Trifluralin	ND	0.060 ug/L	
4/04/23	4/10/23	Vinclozalin	ND	0.060 ug/L	

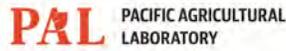
Surrogate Recovery: 86 %  
Surrogate Recovery Range: 60-141  
(TPP-d15 used as Surrogate)

Method: Modified EPA 8321B (LC-MS/MS)

4/04/23	4/7/23	Abamectin	ND	0.060 ug/L	
4/04/23	4/7/23	Acetamiprid	ND	0.060 ug/L	

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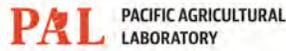
### Analytical Report

Client Sample ID: APS-1-BUGND-03292023  
Matrix: water

PAL Sample ID: P230373-01  
Sample Date: 3/29/23  
Received Date: 4/4/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/04/23	4/7/23	Acibenzolar-S-methyl	ND	0.12 ug/L	
4/04/23	4/7/23	Afidopyropen	ND	0.060 ug/L	
4/04/23	4/7/23	Aldicarb	ND	0.060 ug/L	
4/04/23	4/7/23	Allethrin	ND	0.060 ug/L	
4/04/23	4/7/23	Ametoctradin	ND	0.060 ug/L	
4/04/23	4/7/23	Atrazine	ND	0.060 ug/L	
4/04/23	4/7/23	Azinphos-ethyl	ND	0.060 ug/L	
4/04/23	4/7/23	Azinphos-methyl	ND	0.12 ug/L	
4/04/23	4/7/23	Azoxystrobin	ND	0.060 ug/L	
4/04/23	4/7/23	Bendiocarb	ND	0.060 ug/L	
4/04/23	4/7/23	Bensulide	ND	0.060 ug/L	
4/04/23	4/7/23	Bicyclopyrone	ND	0.060 ug/L	
4/04/23	4/7/23	Bitertanol	ND	0.060 ug/L	
4/04/23	4/7/23	Boscalid	ND	0.060 ug/L	
4/04/23	4/7/23	Bromacil	ND	0.060 ug/L	
4/04/23	4/7/23	Carbaryl	ND	0.060 ug/L	
4/04/23	4/7/23	Carbendazim	ND	0.060 ug/L	
4/04/23	4/7/23	Carbofuran	ND	0.060 ug/L	
4/04/23	4/7/23	Carfentrazone-ethyl	ND	0.060 ug/L	
4/04/23	4/7/23	Chlorantraniliprole	ND	0.060 ug/L	
4/04/23	4/7/23	Clethodim	ND	0.12 ug/L	
4/04/23	4/7/23	Clofentezine	ND	0.060 ug/L	
4/04/23	4/7/23	Clomazone	ND	0.060 ug/L	
4/04/23	4/7/23	Cyanazine	ND	0.060 ug/L	
4/04/23	4/7/23	Cyantraniliprole	ND	0.060 ug/L	
4/04/23	4/7/23	Cyazofamid	ND	0.060 ug/L	
4/04/23	4/7/23	Cyclaniliprole	ND	0.060 ug/L	
4/04/23	4/7/23	Cycloate	ND	0.12 ug/L	
4/04/23	4/7/23	Cyflufenamid	ND	0.060 ug/L	
4/04/23	4/7/23	Cyflumetofen	ND	0.060 ug/L	
4/04/23	4/7/23	Cyhalofop-butyl	ND	0.12 ug/L	
4/04/23	4/7/23	Cymoxanil	ND	0.060 ug/L	
4/04/23	4/7/23	Cyprodinil	ND	0.060 ug/L	

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Portland, OR 97232

Report Number: P230373  
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Client Project ID: 913.001.002.002

## Analytical Report

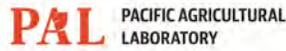
Client Sample ID: APS-1-BUGND-03292023  
Matrix: water

PAL Sample ID: P230373-01  
Sample Date: 3/29/23  
Received Date: 4/4/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/04/23	4/7/23	Cyprosulfamide	ND	0.060 ug/L	
4/04/23	4/7/23	DCPMU	ND	0.060 ug/L	
4/04/23	4/7/23	Diazoxon	ND	0.060 ug/L	
4/04/23	4/7/23	Difenoconazole	ND	0.060 ug/L	
4/04/23	4/7/23	Diflubenzuron	ND	0.060 ug/L	
4/04/23	4/7/23	Diflufenican	ND	0.060 ug/L	
4/04/23	4/7/23	Dimethoate	ND	0.060 ug/L	
4/04/23	4/7/23	Dimethomorph	ND	0.060 ug/L	
4/04/23	4/7/23	Dioxathion	ND	0.060 ug/L	
4/04/23	4/7/23	Disulfoton sulfone	ND	0.060 ug/L	
4/04/23	4/7/23	Diuron	ND	0.060 ug/L	
4/04/23	4/7/23	d-Phenothrin	ND	0.060 ug/L	
4/04/23	4/7/23	Ethion	ND	0.060 ug/L	
4/04/23	4/7/23	Etofenprox	ND	0.060 ug/L	
4/04/23	4/7/23	Famoxadone	ND	0.060 ug/L	
4/04/23	4/7/23	Famphur	ND	0.060 ug/L	
4/04/23	4/7/23	Fenamidone	ND	0.060 ug/L	
4/04/23	4/7/23	Fenamiphos sulfone	ND	0.060 ug/L	
4/04/23	4/7/23	Fenamiphos sulfoxide	ND	0.060 ug/L	
4/04/23	4/7/23	Fenazaquin	ND	0.060 ug/L	
4/04/23	4/7/23	Fenbuconazole	ND	0.060 ug/L	
4/04/23	4/7/23	Fenbutatin oxide	ND	0.060 ug/L	
4/04/23	4/7/23	Fenhexamid	ND	0.060 ug/L	
4/04/23	4/7/23	Fenobucarb	ND	0.060 ug/L	
4/04/23	4/7/23	Fenoxycarb	ND	0.060 ug/L	
4/04/23	4/7/23	Fenpropathrin	ND	0.060 ug/L	
4/04/23	4/7/23	Fenpyroximate	ND	0.060 ug/L	
4/04/23	4/7/23	Fenuron	ND	0.060 ug/L	
4/04/23	4/7/23	Fluazinam	ND	0.060 ug/L	
4/04/23	4/7/23	Flubendiamide	ND	0.12 ug/L	
4/04/23	4/7/23	Flufenacet	ND	0.060 ug/L	
4/04/23	4/7/23	Flumioxazin	ND	0.060 ug/L	
4/04/23	4/7/23	Fluometuron	ND	0.060 ug/L	

Kara Greer, Project Manager

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### Analytical Report

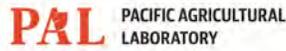
Client Sample ID: APS-1-BUGND-03292023  
Matrix: water

PAL Sample ID: P230373-01  
Sample Date: 3/29/23  
Received Date: 4/4/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/04/23	4/7/23	Fluopicolide	ND	0.060 ug/L	
4/04/23	4/7/23	Fluopyram	ND	0.060 ug/L	
4/04/23	4/7/23	Fluoxastrobin	ND	0.060 ug/L	
4/04/23	4/7/23	Flupyradifurone	ND	0.060 ug/L	
4/04/23	4/7/23	Fluridone	ND	0.060 ug/L	
4/04/23	4/7/23	Flutianil	ND	0.060 ug/L	
4/04/23	4/7/23	Flutriafol	ND	0.060 ug/L	
4/04/23	4/7/23	Fluvalinate	ND	0.060 ug/L	
4/04/23	4/7/23	Fluxapyroxad	ND	0.060 ug/L	
4/04/23	4/7/23	Fonofos	ND	0.12 ug/L	
4/04/23	4/7/23	Hexaconazole	ND	0.060 ug/L	
4/04/23	4/7/23	Hexazinone	ND	0.060 ug/L	
4/04/23	4/7/23	Hexythiazox	ND	0.060 ug/L	
4/04/23	4/7/23	Imazalil	ND	0.060 ug/L	
4/04/23	4/7/23	Imidacloprid	ND	0.060 ug/L	
4/04/23	4/7/23	Indaziflam	ND	0.060 ug/L	
4/04/23	4/7/23	Indoxacarb	ND	0.060 ug/L	
4/04/23	4/7/23	Iodosulfuron-methyl	ND	0.060 ug/L	
4/04/23	4/7/23	Ipconazole	ND	0.060 ug/L	
4/04/23	4/7/23	Iprodione	ND	0.30 ug/L	
4/04/23	4/7/23	Isofetamid	ND	0.060 ug/L	
4/04/23	4/7/23	Isoxaben	ND	0.060 ug/L	
4/04/23	4/7/23	Isoxadifen-ethyl	ND	0.060 ug/L	
4/04/23	4/7/23	Lactofen	ND	0.060 ug/L	
4/04/23	4/7/23	Linuron	ND	0.060 ug/L	
4/04/23	4/7/23	Malaoxon	ND	0.060 ug/L	
4/04/23	4/7/23	Mandipropamid	ND	0.060 ug/L	
4/04/23	4/7/23	Metconazole	ND	0.060 ug/L	
4/04/23	4/7/23	Methidathion	ND	0.060 ug/L	
4/04/23	4/7/23	Methiocarb	ND	0.060 ug/L	
4/04/23	4/7/23	Methomyl	ND	0.060 ug/L	
4/04/23	4/7/23	Methoxyfenozide	ND	0.060 ug/L	
4/04/23	4/7/23	Metrafenone	ND	0.060 ug/L	

Kara Greer, Project Manager

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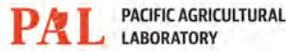
### Analytical Report

Client Sample ID: APS-1-BUGND-03292023  
Matrix: water

PAL Sample ID: P230373-01  
Sample Date: 3/29/23  
Received Date: 4/4/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/04/23	4/7/23	Metribuzin	ND	0.060 ug/L	
4/04/23	4/7/23	Mevinphos	ND	0.060 ug/L	
4/04/23	4/7/23	Monuron	ND	0.060 ug/L	
4/04/23	4/7/23	Neburon	ND	0.060 ug/L	
4/04/23	4/7/23	Norflurazon	ND	0.060 ug/L	
4/04/23	4/7/23	Novaluron	ND	0.060 ug/L	
4/04/23	4/7/23	Oryzalin	ND	0.060 ug/L	
4/04/23	4/7/23	Oxadixyl	ND	0.060 ug/L	
4/04/23	4/7/23	Oxamyl	ND	0.060 ug/L	
4/04/23	4/7/23	Penoxsulam	ND	0.060 ug/L	
4/04/23	4/7/23	Penthiopyrad	ND	0.060 ug/L	
4/04/23	4/7/23	Phorate Sulfone	ND	0.060 ug/L	
4/04/23	4/7/23	Phorate Sulfoxide	ND	0.060 ug/L	
4/04/23	4/7/23	Phosalone	ND	0.060 ug/L	
4/04/23	4/7/23	Phosmet	ND	0.060 ug/L	
4/04/23	4/7/23	Phosphamidon	ND	0.060 ug/L	
4/04/23	4/7/23	Picoxystrobin	ND	0.060 ug/L	
4/04/23	4/7/23	Piperonyl Butoxide	ND	0.060 ug/L	
4/04/23	4/7/23	Pirimicarb	ND	0.060 ug/L	
4/04/23	4/7/23	Pirimiphos-methyl	ND	0.060 ug/L	
4/04/23	4/7/23	Prallethrin	ND	0.060 ug/L	
4/04/23	4/7/23	Prometon	ND	0.060 ug/L	
4/04/23	4/7/23	Prometryn	ND	0.060 ug/L	
4/04/23	4/7/23	Propanil	ND	0.060 ug/L	
4/04/23	4/7/23	Propargite	ND	0.060 ug/L	
4/04/23	4/7/23	Propazine	ND	0.060 ug/L	
4/04/23	4/7/23	Propiconazole	ND	0.12 ug/L	
4/04/23	4/7/23	Propoxur	ND	0.060 ug/L	
4/04/23	4/7/23	Pyraclostrobin	ND	0.060 ug/L	
4/04/23	4/7/23	Pyraflufen-ethyl	ND	0.060 ug/L	
4/04/23	4/7/23	Pyrethrin	ND	0.30 ug/L	
4/04/23	4/7/23	Pyridaben	ND	0.060 ug/L	
4/04/23	4/7/23	Pyridalyl	ND	0.060 ug/L	

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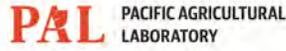
### Analytical Report

Client Sample ID: APS-1-BUGND-03292023  
Matrix: water

PAL Sample ID: P230373-01  
Sample Date: 3/29/23  
Received Date: 4/4/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/04/23	4/7/23	Pyrimethanil	ND	0.060 ug/L	
4/04/23	4/7/23	Pyroxasulfone	ND	0.060 ug/L	
4/04/23	4/7/23	Quizalofop-p-ethyl	ND	0.060 ug/L	
4/04/23	4/7/23	Rotenone	ND	0.060 ug/L	
4/04/23	4/7/23	Saflufenacil	ND	0.060 ug/L	
4/04/23	4/7/23	Sethoxydim	ND	0.12 ug/L	
4/04/23	4/7/23	Siduron	ND	0.060 ug/L	
4/04/23	4/7/23	Simazine	ND	0.060 ug/L	
4/04/23	4/7/23	Simetryn	ND	0.060 ug/L	
4/04/23	4/7/23	Spinetoram	ND	0.060 ug/L	
4/04/23	4/7/23	Spinosad	ND	0.060 ug/L	
4/04/23	4/7/23	Spiromesifen	ND	0.12 ug/L	
4/04/23	4/7/23	Spirotetramat	ND	0.060 ug/L	
4/04/23	4/7/23	Spiroxamine	ND	0.060 ug/L	
4/04/23	4/7/23	Sulfentrazone	ND	0.060 ug/L	
4/04/23	4/7/23	Sulfoxaflor	ND	0.060 ug/L	
4/04/23	4/7/23	Tebuconazole	ND	0.060 ug/L	
4/04/23	4/7/23	Tebufenozide	ND	0.060 ug/L	
4/04/23	4/7/23	Tebuthiuron	ND	0.060 ug/L	
4/04/23	4/7/23	Terbacil	ND	0.060 ug/L	
4/04/23	4/7/23	Terbuthylazine	ND	0.060 ug/L	
4/04/23	4/7/23	Terbutryn	ND	0.060 ug/L	
4/04/23	4/7/23	Thiabendazole	ND	0.060 ug/L	
4/04/23	4/7/23	Thiacloprid	ND	0.060 ug/L	
4/04/23	4/7/23	Thiamethoxam	ND	0.060 ug/L	
4/04/23	4/7/23	Thiencarbazone-methyl	ND	0.060 ug/L	
4/04/23	4/7/23	Thiobencarb	ND	0.060 ug/L	
4/04/23	4/7/23	Thiodicarb	ND	0.060 ug/L	
4/04/23	4/7/23	Tolfenpyrad	ND	0.060 ug/L	
4/04/23	4/7/23	Triadimefon	ND	0.060 ug/L	
4/04/23	4/7/23	Triadimenol	ND	0.12 ug/L	
4/04/23	4/7/23	Triallate	ND	0.060 ug/L	
4/04/23	4/7/23	Trifloxystrobin	ND	0.060 ug/L	

This analytical report complies with the ISO/IEC 17025:2017 Quality Standard.



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503.626.7943

21830 S.W. Alexander Ln  
Sherwood, OR 97140

GSI Water Solutions, Inc.  
650 NE Holladay Street Suite 900  
Portland, OR 97232

Report Number: P230373  
Report Date: April 18, 2023  
Client Project ID: 913.001.002.002

## Analytical Report

Client Sample ID: APS-1-BUGND-03292023

Matrix: water

PAL Sample ID: P230373-01

Sample Date: 3/29/23

Received Date: 4/4/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/04/23	4/7/23	Trifloxysulfuron-sodium	ND	0.060 ug/L	
4/04/23	4/7/23	Triflumizole	ND	0.060 ug/L	
4/04/23	4/7/23	Trinexapac-ethyl	ND	0.060 ug/L	
4/04/23	4/7/23	Triticonazole	ND	0.060 ug/L	

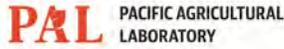
Surrogate Recovery: 86 %

Surrogate Recovery Range: 69-120

(TPP-d15 used as Surrogate)

*This analytical report complies with the ISO/IEC 17025:2017  
Quality Standard.*

Kara Greer, Project Manager



GSI Water Solutions, Inc.  
650 NE Holladay Street Suite 900  
Portland, OR 97232

Report Number: P230373  
Report Date: April 18, 2023  
Client Project ID: 913.001.002.002

### Quality Assurance

Method Blank Data Matrix: water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/4/23	4/6/23	23D0401-BLK1	Abamectin	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	a-BHC	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Acetamiprid	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Acetochlor	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Acibenzolar-S-methyl	Not Detected	< 0.12 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Afidopyropen	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Alachlor	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Aldicarb	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Aldrin	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Allethrin	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Ametoctradin	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Ametryn	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Aspon	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Atrazine	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Azinphos-ethyl	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Azinphos-methyl	Not Detected	< 0.12 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Azoxystrobin	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	b-BHC	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Bendiocarb	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Benfluralin	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Bensulide	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Bifenthrin	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Bitertanol	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Bolstar	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Boscalid	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Bromacil	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Bromopropylate	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Buprofezin	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Captan	Not Detected	< 0.60 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Carbaryl	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Carbendazim	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Carbofuran	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Carboxin	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Carfentrazone-ethyl	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Chlorantraniliprole	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Chlordane	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Chlorfenapyr	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Chlorfenvinphos	Not Detected	< 0.060 ug/L	

Kara Greer, Project Manager

This analytical report complies with the ISO/IEC 17025:2017 Quality Standard.

**GSI Water Solutions, Inc.**  
650 NE Holladay Street Suite 900  
Portland, OR 97232

**Report Number:** P230373  
**Report Date:** April 18, 2023  
**Client Project ID:** 913.001.002.002

**Method Blank Data**      **Matrix:** water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/4/23	4/7/23	23D0401-BLK1	Chlorobenzilate	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Chloroneb	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Chlorpropham	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Chlorpyrifos	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Chlorpyrifos-methyl	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	cis-Nonachlor	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Clethodim	Not Detected	< 0.12 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Clofentezine	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Clomazone	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Cyanazine	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Cyantraniliprole	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Cyazofamid	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Cyclaniliprole	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Cycloate	Not Detected	< 0.12 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Cyflufenamid	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Cyflumetofen	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Cyfluthrin	Not Detected	< 0.30 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Cyhalofop-butyl	Not Detected	< 0.12 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Cymoxanil	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Cypermethrin	Not Detected	< 0.30 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Cyprodinil	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Cyprosulfamide	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Dacthal	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	d-BHC	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	DCPMU	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Deltamethrin	Not Detected	< 0.30 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Demeton	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Diazinon	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Diazoxon	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Dichlobenil	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Dichlorofenthion	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Dichlorvos	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Diclofop-methyl	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Dicloran	Not Detected	< 0.30 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Dicofol	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Dieldrin	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Difenoconazole	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Diflubenuron	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Diflufenican	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Dimethenamid	Not Detected	< 0.060 ug/L	

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Quality Standard.*



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Portland, OR 97232

Report Number: P230373  
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Client Project ID: 913.001.002.002

Method Blank Data Matrix: water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/4/23	4/6/23	23D0401-BLK1	Dimethoate	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Dimethomorph	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Dioxathion	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Diphenamid	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Diphenylamine	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Disulfoton	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Disulfoton sulfone	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Dithiopyr	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Diuron	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	d-Phenothrin	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Endosulfan I	Not Detected	< 0.12 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Endosulfan II	Not Detected	< 0.12 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Endosulfan sulfate	Not Detected	< 0.12 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Endrin	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Endrin ketone	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	EPN	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	EPTC	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Esfenvalerate	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Ethalfuralin	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Ethion	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Ethofumesate	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Ethoprop	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Etofenprox	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Etoxazole	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Etridiazole	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Famoxadone	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Famphur	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Fenamidone	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Fenamiphos sulfone	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Fenamiphos sulfoxide	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Fenarimol	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Fenazaquin	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Fenbuconazole	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Fenbutatin oxide	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Fenhexamid	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Fenitrothion	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Fenobucarb	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Fenoxaprop-ethyl	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Fenoxycarb	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Fenpropathrin	Not Detected	< 0.060 ug/L	

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GSI Water Solutions, Inc.  
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Portland, OR 97232

Report Number: P230373  
Report Date: April 18, 2023  
Client Project ID: 913.001.002.002

Method Blank Data Matrix: water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/4/23	4/6/23	23D0401-BLK1	Fenpyroximate	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Fenthion	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Fenuron	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Fenvalerate	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Fipronil	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Fluazifop-p-butyl	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Fluazinam	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Flubendiamide	Not Detected	< 0.12 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Fludioxonil	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Flufenacet	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Flumioxazin	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Fluometuron	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Fluopicolide	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Fluopyram	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Fluoxastrobin	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Flupyradifurone	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Fluridone	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Fluroxypyr-meptyl	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Flutianil	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Flutolanil	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Flutriafol	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Fluvalinate	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Fluxapyroxad	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Fonofos	Not Detected	< 0.12 ug/L	
4/4/23	4/7/23	23D0401-BLK1	g-BHC	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Heptachlor	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Heptachlor epoxide	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Hexachlorobenzene	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Hexaconazole	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Hexazinone	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Hexythiazox	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Imazalil	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Imidacloprid	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Indaziflam	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Indoxacarb	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Iodosulfuron-methyl	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Ipconazole	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Iprodione	Not Detected	< 0.30 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Isofetamid	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Isoxaben	Not Detected	< 0.060 ug/L	



Kara Greer, Project Manager

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**Report Number:** P230373  
**Report Date:** April 18, 2023  
**Client Project ID:** 913.001.002.002

**Method Blank Data**      **Matrix:** water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/4/23	4/6/23	23D0401-BLK1	Isoxadifen-ethyl	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Kresoxim-methyl	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Lactofen	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	lambda-Cyhalothrin	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Leptophos	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Linuron	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Malaoxon	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Malathion	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Mandipropamid	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Mefenoxam	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Metconazole	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Methidathion	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Methiocarb	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Methomyl	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Methoxychlor	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Methoxyfenozide	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Metolachlor	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Metrafenone	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Metribuzin	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Mevinphos	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	MGK-264	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Monuron	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Myclobutanil	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Napropamide	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Neburon	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Norflurazon	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Novaluron	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	o-Phenylphenol	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Oryzalin	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Ovex	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Oxadiazon	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Oxadixyl	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Oxamyl	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Oxyfluorfen	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	p,p'-DDD	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	p,p'-DDE	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	p,p'-DDT	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Paclobutrazol	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Parathion	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Parathion-methyl	Not Detected	< 0.060 ug/L	



Kara Greer, Project Manager

*This analytical report complies with the ISO/IEC 17025:2017 Quality Standard.*

GSI Water Solutions, Inc.  
650 NE Holladay Street Suite 900  
Portland, OR 97232

Report Number: P230373  
Report Date: April 18, 2023  
Client Project ID: 913.001.002.002

Method Blank Data Matrix: water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/4/23	4/7/23	23D0401-BLK1	PCA	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	PCB	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	PCNB	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Pendimethalin	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Penoxsulam	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Pentachlorothioanisole	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Penthiopyrad	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Permethrin	Not Detected	< 0.12 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Phorate	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Phorate Sulfone	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Phorate Sulfoxide	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Phosalone	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Phosmet	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Phosphamidon	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Picoxystrobin	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Piperonyl Butoxide	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Pirimicarb	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Pirimiphos-methyl	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Prallethrin	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Procymidone	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Prodiamine	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Prometon	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Prometryn	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Pronamide	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Propachlor	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Propanil	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Propargite	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Propazine	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Propiconazole	Not Detected	< 0.12 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Propoxur	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Pyraclostrobin	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Pyraflufen-ethyl	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Pyrethrin	Not Detected	< 0.30 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Pyridaben	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Pyridalyl	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Pyrimethanil	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Pyriproxyfen	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Pyroxasulfone	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Quinoxifen	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Quizalofop-p-ethyl	Not Detected	< 0.060 ug/L	



Kara Greer, Project Manager

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GSI Water Solutions, Inc.  
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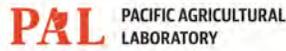
Report Number: P230373  
Report Date: April 18, 2023  
Client Project ID: 913.001.002.002

Method Blank Data Matrix: water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/4/23	4/7/23	23D0401-BLK1	Ronnel	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Rotenone	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Saflufenacil	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Sethoxydim	Not Detected	< 0.12 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Siduron	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Simazine	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Simetryn	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Spinetoram	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Spinosad	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Spirodiclofen	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Spiromesifen	Not Detected	< 0.12 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Spirotetramat	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Spiroxamine	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Sulfentrazone	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Sulfotep	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Sulfoxaflor	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Tebuconazole	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Tebufenozide	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Tebuthiuron	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Tefluthrin	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Terbacil	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Terbufos	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Terbutylazine	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Terbutryn	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Tetraconazole	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Tetradifon	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Thiabendazole	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Thiacloprid	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Thiamethoxam	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Thiencarbazone-methyl	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Thiobencarb	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Thiodicarb	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Thionazin	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Tokuthion	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Tolfenpyrad	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	trans-Nonachlor	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Triadimefon	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Triadimenol	Not Detected	< 0.12 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Triallate	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Trichloronate	Not Detected	< 0.060 ug/L	

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Quality Standard.





GSI Water Solutions, Inc.  
650 NE Holladay Street Suite 900  
Portland, OR 97232

Report Number: P230373  
Report Date: April 18, 2023  
Client Project ID: 913.001.002.002

Method Blank Data Matrix: water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/4/23	4/6/23	23D0401-BLK1	Trifloxystrobin	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Trifloxysulfuron-sodium	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Triflumizole	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Trifluralin	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Trinexapac-ethyl	Not Detected	< 0.060 ug/L	
4/4/23	4/6/23	23D0401-BLK1	Triticonazole	Not Detected	< 0.060 ug/L	
4/4/23	4/7/23	23D0401-BLK1	Vinclozalin	Not Detected	< 0.060 ug/L	

Method Blank Data Matrix: water

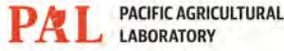
Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/5/23	4/7/23	23D0501-BLK1	Picloram	Not Detected	< 0.080 ug/L	

Method Blank Data Matrix: water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/11/23	4/12/23	23D1102-BLK1	AMPA	Not Detected	< 10 ug/L	
4/11/23	4/12/23	23D1102-BLK1	Glyphosate	Not Detected	< 10 ug/L	

Kara Greer, Project Manager

This analytical report complies with the ISO/IEC 17025:2017 Quality Standard.



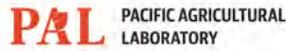
GSI Water Solutions, Inc.  
650 NE Holladay Street Suite 900  
Portland, OR 97232

Report Number: P230373  
Report Date: April 18, 2023  
Client Project ID: 913.001.002.002

Blank Spike Data Matrix: water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/4/23	4/7/23	23D0401-BS1	Acetochlor	95	67-129	
4/4/23	4/7/23	23D0401-BSD1	Acetochlor	102	67-129	
4/4/23	4/6/23	23D0401-BS1	Afidopyropen	95	60-140	
4/4/23	4/6/23	23D0401-BSD1	Afidopyropen	106	60-140	
4/4/23	4/6/23	23D0401-BS1	Aldicarb	96	56-112	
4/4/23	4/6/23	23D0401-BSD1	Aldicarb	99	56-112	
4/4/23	4/7/23	23D0401-BS1	Ametryn	95	60-134	
4/4/23	4/7/23	23D0401-BSD1	Ametryn	94	60-134	
4/4/23	4/7/23	23D0401-BS1	Aspon	101	60-140	
4/4/23	4/7/23	23D0401-BSD1	Aspon	106	60-140	
4/4/23	4/6/23	23D0401-BS1	Atrazine	103	76-113	
4/4/23	4/6/23	23D0401-BSD1	Atrazine	104	76-113	
4/4/23	4/6/23	23D0401-BS1	Azinphos-ethyl	105	73-114	
4/4/23	4/6/23	23D0401-BSD1	Azinphos-ethyl	105	73-114	
4/4/23	4/6/23	23D0401-BS1	Azinphos-methyl	109	76-117	
4/4/23	4/6/23	23D0401-BSD1	Azinphos-methyl	105	76-117	
4/4/23	4/7/23	23D0401-BS1	Bifenthrin	99	63-142	
4/4/23	4/7/23	23D0401-BSD1	Bifenthrin	93	63-142	
4/4/23	4/7/23	23D0401-BS1	Bolstar	105	60-140	
4/4/23	4/7/23	23D0401-BSD1	Bolstar	110	60-140	
4/4/23	4/7/23	23D0401-BS1	Buprofezin	98	70-134	
4/4/23	4/7/23	23D0401-BSD1	Buprofezin	101	70-134	
4/4/23	4/7/23	23D0401-BS1	Captan	148	25-143	R3
4/4/23	4/7/23	23D0401-BSD1	Captan	203	25-143	R3
4/4/23	4/6/23	23D0401-BS1	Carbaryl	104	80-109	
4/4/23	4/6/23	23D0401-BSD1	Carbaryl	108	80-109	
4/4/23	4/6/23	23D0401-BS1	Carbofuran	104	78-109	
4/4/23	4/6/23	23D0401-BSD1	Carbofuran	105	78-109	
4/4/23	4/6/23	23D0401-BS1	Carboxin	98	60-140	
4/4/23	4/6/23	23D0401-BSD1	Carboxin	101	60-140	
4/4/23	4/7/23	23D0401-BS1	Chlorfenvinphos	105	60-140	
4/4/23	4/7/23	23D0401-BSD1	Chlorfenvinphos	116	60-140	
4/4/23	4/7/23	23D0401-BS1	Chlorpropham	94	67-127	
4/4/23	4/7/23	23D0401-BSD1	Chlorpropham	97	67-127	
4/4/23	4/7/23	23D0401-BS1	Chlorpyrifos	105	69-128	
4/4/23	4/7/23	23D0401-BSD1	Chlorpyrifos	105	69-128	
4/4/23	4/7/23	23D0401-BS1	Chlorpyrifos-methyl	104	61-131	
4/4/23	4/7/23	23D0401-BSD1	Chlorpyrifos-methyl	106	61-131	
4/4/23	4/7/23	23D0401-BS1	cis-Nonachlor	103	57-130	
4/4/23	4/7/23	23D0401-BSD1	cis-Nonachlor	112	57-130	
4/4/23	4/6/23	23D0401-BS1	Cyanazine	103	66-115	
4/4/23	4/6/23	23D0401-BSD1	Cyanazine	107	66-115	
4/4/23	4/6/23	23D0401-BS1	Cyclanilprole	103	60-140	

This analytical report complies with the ISO/IEC 17025:2017 Quality Standard.



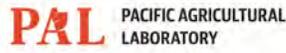
GSI Water Solutions, Inc.  
650 NE Holladay Street Suite 900  
Portland, OR 97232

Report Number: P230373  
Report Date: April 18, 2023  
Client Project ID: 913.001.002.002

Blank Spike Data Matrix: water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/4/23	4/6/23	23D0401-BSD1	Cyfluprolle	104	60-140	
4/4/23	4/7/23	23D0401-BS1	Cyfluthrin	98	50-158	
4/4/23	4/7/23	23D0401-BSD1	Cyfluthrin	104	50-158	
4/4/23	4/6/23	23D0401-BS1	Cyhalofop-butyl	106	60-140	
4/4/23	4/6/23	23D0401-BSD1	Cyhalofop-butyl	107	60-140	
4/4/23	4/7/23	23D0401-BS1	Cypermethrin	93	48-163	
4/4/23	4/7/23	23D0401-BSD1	Cypermethrin	105	48-163	
4/4/23	4/7/23	23D0401-BS1	Dacthal	90	72-120	
4/4/23	4/7/23	23D0401-BSD1	Dacthal	95	72-120	
4/4/23	4/7/23	23D0401-BS1	Deltamethrin	94	59-148	
4/4/23	4/7/23	23D0401-BSD1	Deltamethrin	104	59-148	
4/4/23	4/7/23	23D0401-BS1	Demeton	85	60-140	
4/4/23	4/7/23	23D0401-BSD1	Demeton	88	60-140	
4/4/23	4/7/23	23D0401-BS1	Diazinon	104	67-136	
4/4/23	4/7/23	23D0401-BSD1	Diazinon	100	67-136	
4/4/23	4/7/23	23D0401-BS1	Dichlobenil	88	60-111	
4/4/23	4/7/23	23D0401-BSD1	Dichlobenil	91	60-111	
4/4/23	4/7/23	23D0401-BS1	Dichlorofenthion	96	64-124	
4/4/23	4/7/23	23D0401-BSD1	Dichlorofenthion	105	64-124	
4/4/23	4/7/23	23D0401-BS1	Dichlorvos	92	43-125	
4/4/23	4/7/23	23D0401-BSD1	Dichlorvos	96	43-125	
4/4/23	4/7/23	23D0401-BS1	Dicloran	94	63-128	
4/4/23	4/7/23	23D0401-BSD1	Dicloran	100	63-128	
4/4/23	4/7/23	23D0401-BS1	Dicofol	95	70-129	
4/4/23	4/7/23	23D0401-BSD1	Dicofol	102	70-129	
4/4/23	4/7/23	23D0401-BS1	Dimethenamid	94	68-128	
4/4/23	4/7/23	23D0401-BSD1	Dimethenamid	102	68-128	
4/4/23	4/6/23	23D0401-BS1	Dimethoate	104	72-116	
4/4/23	4/6/23	23D0401-BSD1	Dimethoate	106	72-116	
4/4/23	4/6/23	23D0401-BS1	Dioxathion	102	60-140	
4/4/23	4/6/23	23D0401-BSD1	Dioxathion	104	60-140	
4/4/23	4/7/23	23D0401-BS1	Diphenamid	97	70-128	
4/4/23	4/7/23	23D0401-BSD1	Diphenamid	104	70-128	
4/4/23	4/7/23	23D0401-BS1	Diphenylamine	92	67-120	
4/4/23	4/7/23	23D0401-BSD1	Diphenylamine	94	67-120	
4/4/23	4/7/23	23D0401-BS1	Disulfoton	92	64-128	
4/4/23	4/7/23	23D0401-BSD1	Disulfoton	101	64-128	
4/4/23	4/7/23	23D0401-BS1	Endosulfan I	94	72-117	
4/4/23	4/7/23	23D0401-BSD1	Endosulfan I	99	72-117	
4/4/23	4/7/23	23D0401-BS1	Endosulfan II	99	59-119	
4/4/23	4/7/23	23D0401-BSD1	Endosulfan II	105	59-119	
4/4/23	4/7/23	23D0401-BS1	Endosulfan sulfate	85	68-128	
4/4/23	4/7/23	23D0401-BSD1	Endosulfan sulfate	101	68-128	

This analytical report complies with the ISO/IEC 17025:2017 Quality Standard.



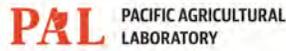
GSI Water Solutions, Inc.  
650 NE Holladay Street Suite 900  
Portland, OR 97232

Report Number: P230373  
Report Date: April 18, 2023  
Client Project ID: 913.001.002.002

Blank Spike Data Matrix: water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/4/23	4/7/23	23D0401-BS1	EPN	106	60-140	
4/4/23	4/7/23	23D0401-BSD1	EPN	102	60-140	
4/4/23	4/7/23	23D0401-BS1	Esfenvalerate	85	36-154	
4/4/23	4/7/23	23D0401-BSD1	Esfenvalerate	94	36-154	
4/4/23	4/6/23	23D0401-BS1	Ethion	102	74-113	
4/4/23	4/6/23	23D0401-BSD1	Ethion	104	74-113	
4/4/23	4/7/23	23D0401-BS1	Ethofumesate	86	69-130	
4/4/23	4/7/23	23D0401-BSD1	Ethofumesate	90	69-130	
4/4/23	4/7/23	23D0401-BS1	Ethoprop	102	65-126	
4/4/23	4/7/23	23D0401-BSD1	Ethoprop	103	65-126	
4/4/23	4/7/23	23D0401-BS1	Etoxazole	101	64-137	
4/4/23	4/7/23	23D0401-BSD1	Etoxazole	98	64-137	
4/4/23	4/6/23	23D0401-BS1	Famphur	102	73-116	
4/4/23	4/6/23	23D0401-BSD1	Famphur	104	73-116	
4/4/23	4/7/23	23D0401-BS1	Fenarimol	96	70-125	
4/4/23	4/7/23	23D0401-BSD1	Fenarimol	101	70-125	
4/4/23	4/7/23	23D0401-BS1	Fenitrothion	102	60-140	
4/4/23	4/7/23	23D0401-BSD1	Fenitrothion	104	60-140	
4/4/23	4/6/23	23D0401-BS1	Fenoxycarb	105	60-140	
4/4/23	4/6/23	23D0401-BSD1	Fenoxycarb	107	60-140	
4/4/23	4/7/23	23D0401-BS1	Fenthion	103	60-140	
4/4/23	4/7/23	23D0401-BSD1	Fenthion	101	60-140	
4/4/23	4/7/23	23D0401-BS1	Fenvalerate	76	52-161	
4/4/23	4/7/23	23D0401-BSD1	Fenvalerate	81	52-161	
4/4/23	4/7/23	23D0401-BS1	Fipronil	88	51-146	
4/4/23	4/7/23	23D0401-BSD1	Fipronil	87	51-146	
4/4/23	4/7/23	23D0401-BS1	Fluazifop-p-butyl	89	61-152	
4/4/23	4/7/23	23D0401-BSD1	Fluazifop-p-butyl	92	61-152	
4/4/23	4/7/23	23D0401-BS1	Fludioxonil	101	49-143	
4/4/23	4/7/23	23D0401-BSD1	Fludioxonil	107	49-143	
4/4/23	4/6/23	23D0401-BS1	Fluopicolide	105	79-110	
4/4/23	4/6/23	23D0401-BSD1	Fluopicolide	109	79-110	
4/4/23	4/6/23	23D0401-BS1	Fluridone	99	78-107	
4/4/23	4/6/23	23D0401-BSD1	Fluridone	104	78-107	
4/4/23	4/7/23	23D0401-BS1	Fluroxypyr-meptyl	94	53-145	
4/4/23	4/7/23	23D0401-BSD1	Fluroxypyr-meptyl	88	53-145	
4/4/23	4/6/23	23D0401-BS1	Flutianil	100	60-140	
4/4/23	4/6/23	23D0401-BSD1	Flutianil	104	60-140	
4/4/23	4/7/23	23D0401-BS1	Flutolanil	100	57-152	
4/4/23	4/7/23	23D0401-BSD1	Flutolanil	105	57-152	
4/4/23	4/6/23	23D0401-BS1	Fluvalinate	103	55-116	
4/4/23	4/6/23	23D0401-BSD1	Fluvalinate	102	55-116	
4/4/23	4/6/23	23D0401-BS1	Fonofos	100	44-123	

This analytical report complies with the ISO/IEC 17025:2017  
Quality Standard.



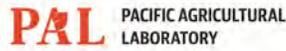
GSI Water Solutions, Inc.  
650 NE Holladay Street Suite 900  
Portland, OR 97232

Report Number: P230373  
Report Date: April 18, 2023  
Client Project ID: 913.001.002.002

Blank Spike Data Matrix: water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/4/23	4/6/23	23D0401-BSD1	Fonofos	106	44-123	
4/4/23	4/7/23	23D0401-BS1	Hexachlorobenzene	94	38-118	
4/4/23	4/7/23	23D0401-BSD1	Hexachlorobenzene	98	38-118	
4/4/23	4/6/23	23D0401-BS1	Hexaconazole	104	78-109	
4/4/23	4/6/23	23D0401-BSD1	Hexaconazole	110	78-109	
4/4/23	4/6/23	23D0401-BS1	Hexazinone	105	76-112	
4/4/23	4/6/23	23D0401-BSD1	Hexazinone	108	76-112	
4/4/23	4/6/23	23D0401-BS1	Imidacloprid	105	61-115	
4/4/23	4/6/23	23D0401-BSD1	Imidacloprid	105	61-115	
4/4/23	4/6/23	23D0401-BS1	Indoxacarb	104	76-109	
4/4/23	4/6/23	23D0401-BSD1	Indoxacarb	106	76-109	
4/4/23	4/6/23	23D0401-BS1	Ipconazole	105	60-140	
4/4/23	4/6/23	23D0401-BSD1	Ipconazole	107	60-140	
4/4/23	4/6/23	23D0401-BS1	Isofetamid	105	60-140	
4/4/23	4/6/23	23D0401-BSD1	Isofetamid	109	60-140	
4/4/23	4/7/23	23D0401-BS1	Kresoxim-methyl	97	70-131	
4/4/23	4/7/23	23D0401-BSD1	Kresoxim-methyl	104	70-131	
4/4/23	4/7/23	23D0401-BS1	lambda-Cyhalothrin	101	61-141	
4/4/23	4/7/23	23D0401-BSD1	lambda-Cyhalothrin	96	61-141	
4/4/23	4/7/23	23D0401-BS1	Leptophos	112	60-140	
4/4/23	4/7/23	23D0401-BSD1	Leptophos	119	60-140	
4/4/23	4/6/23	23D0401-BS1	Linuron	104	76-114	
4/4/23	4/6/23	23D0401-BSD1	Linuron	108	76-114	
4/4/23	4/6/23	23D0401-BS1	Malaoxon	103	77-109	
4/4/23	4/6/23	23D0401-BSD1	Malaoxon	108	77-109	
4/4/23	4/7/23	23D0401-BS1	Malathion	106	45-157	
4/4/23	4/7/23	23D0401-BSD1	Malathion	110	45-157	
4/4/23	4/6/23	23D0401-BS1	Mandipropamid	101	80-107	
4/4/23	4/6/23	23D0401-BSD1	Mandipropamid	104	80-107	
4/4/23	4/7/23	23D0401-BS1	Mefenoxam	101	69-130	
4/4/23	4/7/23	23D0401-BSD1	Mefenoxam	96	69-130	
4/4/23	4/6/23	23D0401-BS1	Metconazole	105	76-114	
4/4/23	4/6/23	23D0401-BSD1	Metconazole	107	76-114	
4/4/23	4/6/23	23D0401-BS1	Methiocarb	102	77-109	
4/4/23	4/6/23	23D0401-BSD1	Methiocarb	108	77-109	
4/4/23	4/6/23	23D0401-BS1	Methomyl	97	70-100	
4/4/23	4/6/23	23D0401-BSD1	Methomyl	98	70-100	
4/4/23	4/6/23	23D0401-BS1	Methoxyfenozide	103	79-108	
4/4/23	4/6/23	23D0401-BSD1	Methoxyfenozide	105	79-108	
4/4/23	4/7/23	23D0401-BS1	Metolachlor	96	71-128	
4/4/23	4/7/23	23D0401-BSD1	Metolachlor	101	71-128	
4/4/23	4/6/23	23D0401-BS1	Metrafenone	102	79-107	
4/4/23	4/6/23	23D0401-BSD1	Metrafenone	103	79-107	

This analytical report complies with the ISO/IEC 17025:2017  
Quality Standard.



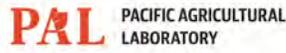
GSI Water Solutions, Inc.  
650 NE Holladay Street Suite 900  
Portland, OR 97232

Report Number: P230373  
Report Date: April 18, 2023  
Client Project ID: 913.001.002.002

Blank Spike Data Matrix: water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/4/23	4/6/23	23D0401-BS1	Metribuzin	102	63-123	
4/4/23	4/6/23	23D0401-BSD1	Metribuzin	104	63-123	
4/4/23	4/6/23	23D0401-BS1	Mevinphos	98	49-121	
4/4/23	4/6/23	23D0401-BSD1	Mevinphos	98	49-121	
4/4/23	4/7/23	23D0401-BS1	MGK-264	88	70-124	
4/4/23	4/7/23	23D0401-BSD1	MGK-264	93	70-124	
4/4/23	4/7/23	23D0401-BS1	Myclobutanil	96	61-141	
4/4/23	4/7/23	23D0401-BSD1	Myclobutanil	103	61-141	
4/4/23	4/7/23	23D0401-BS1	Napropamide	90	65-138	
4/4/23	4/7/23	23D0401-BSD1	Napropamide	94	65-138	
4/4/23	4/6/23	23D0401-BS1	Norflurazon	103	80-106	
4/4/23	4/6/23	23D0401-BSD1	Norflurazon	106	80-106	
4/4/23	4/6/23	23D0401-BS1	Novaluron	98	79-108	
4/4/23	4/6/23	23D0401-BSD1	Novaluron	100	79-108	
4/4/23	4/6/23	23D0401-BS1	Oryzalin	106	67-113	
4/4/23	4/6/23	23D0401-BSD1	Oryzalin	98	67-113	
4/4/23	4/6/23	23D0401-BS1	Oxadixyl	103	77-109	
4/4/23	4/6/23	23D0401-BSD1	Oxadixyl	106	77-109	
4/4/23	4/6/23	23D0401-BS1	Oxamyl	85	64-90	
4/4/23	4/6/23	23D0401-BSD1	Oxamyl	88	64-90	
4/4/23	4/7/23	23D0401-BS1	Oxyfluorfen	95	63-140	
4/4/23	4/7/23	23D0401-BSD1	Oxyfluorfen	95	63-140	
4/4/23	4/7/23	23D0401-BS1	Parathion	103	60-140	
4/4/23	4/7/23	23D0401-BSD1	Parathion	104	60-140	
4/4/23	4/7/23	23D0401-BS1	Parathion-methyl	105	49-149	
4/4/23	4/7/23	23D0401-BSD1	Parathion-methyl	106	49-149	
4/4/23	4/7/23	23D0401-BS1	PCA	91	66-112	
4/4/23	4/7/23	23D0401-BSD1	PCA	95	66-112	
4/4/23	4/7/23	23D0401-BS1	PCB	76	19-117	
4/4/23	4/7/23	23D0401-BSD1	PCB	77	19-117	
4/4/23	4/7/23	23D0401-BS1	PCNB	92	61-114	
4/4/23	4/7/23	23D0401-BSD1	PCNB	103	61-114	
4/4/23	4/7/23	23D0401-BS1	Pendimethalin	92	65-131	
4/4/23	4/7/23	23D0401-BSD1	Pendimethalin	92	65-131	
4/4/23	4/6/23	23D0401-BS1	Penoxsulam	103	60-140	
4/4/23	4/6/23	23D0401-BSD1	Penoxsulam	106	60-140	
4/4/23	4/7/23	23D0401-BS1	Pentachlorothioanisole	101	61-125	
4/4/23	4/7/23	23D0401-BSD1	Pentachlorothioanisole	104	61-125	
4/4/23	4/6/23	23D0401-BS1	Penthiopyrad	108	78-111	
4/4/23	4/6/23	23D0401-BSD1	Penthiopyrad	108	78-111	
4/4/23	4/7/23	23D0401-BS1	Permethrin	100	62-146	
4/4/23	4/7/23	23D0401-BSD1	Permethrin	105	62-146	
4/4/23	4/7/23	23D0401-BS1	Phorate	97	60-140	

This analytical report complies with the ISO/IEC 17025:2017 Quality Standard.



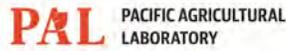
GSI Water Solutions, Inc.  
650 NE Holladay Street Suite 900  
Portland, OR 97232

Report Number: P230373  
Report Date: April 18, 2023  
Client Project ID: 913.001.002.002

Blank Spike Data Matrix: water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/4/23	4/7/23	23D0401-BSD1	Phorate	94	60-140	
4/4/23	4/6/23	23D0401-BS1	Phorate Sulfone	104	76-111	
4/4/23	4/6/23	23D0401-BSD1	Phorate Sulfone	105	76-111	
4/4/23	4/6/23	23D0401-BS1	Phorate Sulfoxide	105	76-121	
4/4/23	4/6/23	23D0401-BSD1	Phorate Sulfoxide	107	76-121	
4/4/23	4/6/23	23D0401-BS1	Phosalone	100	79-110	
4/4/23	4/6/23	23D0401-BSD1	Phosalone	102	79-110	
4/4/23	4/6/23	23D0401-BS1	Phosmet	110	37-153	
4/4/23	4/6/23	23D0401-BSD1	Phosmet	109	37-153	
4/4/23	4/6/23	23D0401-BS1	Phosphamidon	103	75-113	
4/4/23	4/6/23	23D0401-BSD1	Phosphamidon	103	75-113	
4/4/23	4/6/23	23D0401-BS1	Piperonyl Butoxide	105	76-107	
4/4/23	4/6/23	23D0401-BSD1	Piperonyl Butoxide	107	76-107	
4/4/23	4/6/23	23D0401-BS1	Pirimiphos-methyl	102	72-108	
4/4/23	4/6/23	23D0401-BSD1	Pirimiphos-methyl	104	72-108	
4/4/23	4/6/23	23D0401-BS1	Prallethrin	104	60-140	
4/4/23	4/6/23	23D0401-BSD1	Prallethrin	105	60-140	
4/4/23	4/7/23	23D0401-BS1	Procymidone	88	74-123	
4/4/23	4/7/23	23D0401-BSD1	Procymidone	97	74-123	
4/4/23	4/6/23	23D0401-BS1	Prometon	102	73-110	
4/4/23	4/6/23	23D0401-BSD1	Prometon	104	73-110	
4/4/23	4/6/23	23D0401-BS1	Prometryn	102	71-110	
4/4/23	4/6/23	23D0401-BSD1	Prometryn	106	71-110	
4/4/23	4/7/23	23D0401-BS1	Pronamide	97	70-133	
4/4/23	4/7/23	23D0401-BSD1	Pronamide	96	70-133	
4/4/23	4/6/23	23D0401-BS1	Propanil	102	60-140	
4/4/23	4/6/23	23D0401-BSD1	Propanil	107	60-140	
4/4/23	4/6/23	23D0401-BS1	Propazine	102	72-110	
4/4/23	4/6/23	23D0401-BSD1	Propazine	104	72-110	
4/4/23	4/6/23	23D0401-BS1	Propiconazole	101	78-111	
4/4/23	4/6/23	23D0401-BSD1	Propiconazole	106	78-111	
4/4/23	4/6/23	23D0401-BS1	Propoxur	101	60-140	
4/4/23	4/6/23	23D0401-BSD1	Propoxur	104	60-140	
4/4/23	4/6/23	23D0401-BS1	Pyraclostrobin	104	81-104	
4/4/23	4/6/23	23D0401-BSD1	Pyraclostrobin	105	81-104	R3
4/4/23	4/6/23	23D0401-BS1	Pyrethrin	97	58-106	
4/4/23	4/6/23	23D0401-BSD1	Pyrethrin	103	58-106	
4/4/23	4/6/23	23D0401-BS1	Pyrimethanil	103	72-108	
4/4/23	4/6/23	23D0401-BSD1	Pyrimethanil	104	72-108	
4/4/23	4/7/23	23D0401-BS1	Pyriproxyfen	98	50-149	
4/4/23	4/7/23	23D0401-BSD1	Pyriproxyfen	102	50-149	
4/4/23	4/7/23	23D0401-BS1	Quinoxifen	103	63-132	
4/4/23	4/7/23	23D0401-BSD1	Quinoxifen	99	63-132	

This analytical report complies with the ISO/IEC 17025:2017 Quality Standard.



GSI Water Solutions, Inc.  
650 NE Holladay Street Suite 900  
Portland, OR 97232

Report Number: P230373  
Report Date: April 18, 2023  
Client Project ID: 913.001.002.002

Blank Spike Data Matrix: water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/4/23	4/6/23	23D0401-BS1	Quizalofop-p-ethyl	102	60-140	
4/4/23	4/6/23	23D0401-BSD1	Quizalofop-p-ethyl	105	60-140	
4/4/23	4/6/23	23D0401-BS1	Rotenone	103	70-107	
4/4/23	4/6/23	23D0401-BSD1	Rotenone	102	70-107	
4/4/23	4/6/23	23D0401-BS1	Saflufenacil	115	67-114	
4/4/23	4/6/23	23D0401-BSD1	Saflufenacil	110	67-114	
4/4/23	4/6/23	23D0401-BS1	Simazine	104	64-138	
4/4/23	4/6/23	23D0401-BSD1	Simazine	107	64-138	
4/4/23	4/6/23	23D0401-BS1	Simetryn	100	73-105	
4/4/23	4/6/23	23D0401-BSD1	Simetryn	103	73-105	
4/4/23	4/6/23	23D0401-BS1	Spinetoram	92	29-109	
4/4/23	4/6/23	23D0401-BSD1	Spinetoram	99	29-109	
4/4/23	4/6/23	23D0401-BS1	Spinosad	88	26-111	
4/4/23	4/6/23	23D0401-BSD1	Spinosad	97	26-111	
4/4/23	4/7/23	23D0401-BS1	Spirodiclofen	100	57-136	
4/4/23	4/7/23	23D0401-BSD1	Spirodiclofen	120	57-136	
4/4/23	4/6/23	23D0401-BS1	Spirotetramat	100	76-107	
4/4/23	4/6/23	23D0401-BSD1	Spirotetramat	105	76-107	
4/4/23	4/6/23	23D0401-BS1	Spiroxamine	102	62-109	
4/4/23	4/6/23	23D0401-BSD1	Spiroxamine	104	62-109	
4/4/23	4/6/23	23D0401-BS1	Sulfentrazone	111	73-113	
4/4/23	4/6/23	23D0401-BSD1	Sulfentrazone	116	73-113	
4/4/23	4/6/23	23D0401-BS1	Tebufenozide	107	80-106	
4/4/23	4/6/23	23D0401-BSD1	Tebufenozide	109	80-106	
4/4/23	4/6/23	23D0401-BS1	Terbacil	99	65-117	
4/4/23	4/6/23	23D0401-BSD1	Terbacil	103	65-117	
4/4/23	4/6/23	23D0401-BS1	Terbuthylazine	104	72-107	
4/4/23	4/6/23	23D0401-BSD1	Terbuthylazine	108	72-107	
4/4/23	4/6/23	23D0401-BS1	Terbutryn	104	72-107	
4/4/23	4/6/23	23D0401-BSD1	Terbutryn	108	72-107	
4/4/23	4/7/23	23D0401-BS1	Tetraconazole	91	58-143	
4/4/23	4/7/23	23D0401-BSD1	Tetraconazole	100	58-143	
4/4/23	4/6/23	23D0401-BS1	Thiabendazole	97	67-103	
4/4/23	4/6/23	23D0401-BSD1	Thiabendazole	101	67-103	
4/4/23	4/6/23	23D0401-BS1	Thiacloprid	101	79-108	
4/4/23	4/6/23	23D0401-BSD1	Thiacloprid	104	79-108	
4/4/23	4/6/23	23D0401-BS1	Thiamethoxam	95	62-104	
4/4/23	4/6/23	23D0401-BSD1	Thiamethoxam	99	62-104	
4/4/23	4/6/23	23D0401-BS1	Thiodicarb	105	75-107	
4/4/23	4/6/23	23D0401-BSD1	Thiodicarb	107	75-107	
4/4/23	4/6/23	23D0401-BS1	Tolfenpyrad	105	75-113	
4/4/23	4/6/23	23D0401-BSD1	Tolfenpyrad	107	75-113	
4/4/23	4/6/23	23D0401-BS1	Triadimefon	104	76-110	

This analytical report complies with the ISO/IEC 17025:2017 Quality Standard.

**GSI Water Solutions, Inc.**  
650 NE Holladay Street Suite 900  
Portland, OR 97232

**Report Number:** P230373  
**Report Date:** April 18, 2023  
**Client Project ID:** 913.001.002.002

**Blank Spike Data**                      **Matrix:** water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/4/23	4/6/23	23D0401-BSD1	Triadimefon	104	76-110	
4/4/23	4/6/23	23D0401-BS1	Triadimenol	106	80-109	
4/4/23	4/6/23	23D0401-BSD1	Triadimenol	107	80-109	
4/4/23	4/6/23	23D0401-BS1	Triallate	99	60-140	
4/4/23	4/6/23	23D0401-BSD1	Triallate	94	60-140	
4/4/23	4/6/23	23D0401-BS1	Trifloxysulfuron-sodium	113	60-140	
4/4/23	4/6/23	23D0401-BSD1	Trifloxysulfuron-sodium	112	60-140	
4/4/23	4/6/23	23D0401-BS1	Trinexapac-ethyl	105	60-140	
4/4/23	4/6/23	23D0401-BSD1	Trinexapac-ethyl	106	60-140	
4/4/23	4/6/23	23D0401-BS1	Triticonazole	106	60-140	
4/4/23	4/6/23	23D0401-BSD1	Triticonazole	107	60-140	

**Blank Spike Data**                      **Matrix:** water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/5/23	4/7/23	23D0501-BS1	Picloram	99	67-135	
4/5/23	4/7/23	23D0501-BSD1	Picloram	107	67-135	

**Blank Spike Data**                      **Matrix:** water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/11/23	4/12/23	23D1102-BS1	AMPA	87	78-121	
4/11/23	4/12/23	23D1102-BSD1	AMPA	94	78-121	
4/11/23	4/12/23	23D1102-BS1	Glyphosate	92	78-123	
4/11/23	4/12/23	23D1102-BSD1	Glyphosate	95	78-123	

**Project Notes**

Notes	Definition
R3	Spike recovery above control limit. Sample results are not detected, data quality has not been affected.



Kara Greer, Project Manager

*This analytical report complies with the ISO/IEC 17025:2017 Quality Standard.*



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June 16, 2023

Analytical Report for Service Request No: K2304148

Matt Thomas  
GSI Water Solutions, Inc  
650 NE Holladay Street  
Suite 900  
Portland, OR 97232

**RE: Umatilla Depot / 913.001.002.002**

Dear Matt,

Enclosed are the results of the sample(s) submitted to our laboratory April 08, 2023  
For your reference, these analyses have been assigned our service request number **K2304148**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at [www.alsglobal.com](http://www.alsglobal.com). All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at [Mark.Harris@alsglobal.com](mailto:Mark.Harris@alsglobal.com).

Respectfully submitted,

**ALS Group USA, Corp. dba ALS Environmental**

Mark Harris  
Project Manager



---

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## Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

### **Inorganic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

### **Metals Data Qualifiers**

- # The control limit criteria is not applicable.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.  
  - i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Organic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Additional Petroleum Hydrocarbon Specific Qualifiers**

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso  
State Certifications, Accreditations, and Licenses**

<b>Agency</b>	<b>Web Site</b>	<b>Number</b>
Alaska DEH	<a href="http://dec.alaska.gov/eh/lab/cs/csapproval.htm">http://dec.alaska.gov/eh/lab/cs/csapproval.htm</a>	UST-040
Arizona DHS	<a href="http://www.azdhs.gov/lab/license/env.htm">http://www.azdhs.gov/lab/license/env.htm</a>	AZ0339
Arkansas - DEQ	<a href="http://www.adeq.state.ar.us/techsvs/labcert.htm">http://www.adeq.state.ar.us/techsvs/labcert.htm</a>	88-0637
California DHS (ELAP)	<a href="http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx">http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx</a>	2795
DOD ELAP	<a href="http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm">http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm</a>	L16-58-R4
Florida DOH	<a href="http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm">http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm</a>	E87412
Hawaii DOH	<a href="http://health.hawaii.gov/">http://health.hawaii.gov/</a>	-
ISO 17025	<a href="http://www.pjllabs.com/">http://www.pjllabs.com/</a>	L16-57
Louisiana DEQ	<a href="http://www.deq.louisiana.gov/page/la-lab-accreditation">http://www.deq.louisiana.gov/page/la-lab-accreditation</a>	03016
Maine DHS	<a href="http://www.maine.gov/dhhs/">http://www.maine.gov/dhhs/</a>	WA01276
Minnesota DOH	<a href="http://www.health.state.mn.us/accreditation">http://www.health.state.mn.us/accreditation</a>	053-999-457
Nevada DEP	<a href="http://ndep.nv.gov/bsdw/labservice.htm">http://ndep.nv.gov/bsdw/labservice.htm</a>	WA01276
New Jersey DEP	<a href="http://www.nj.gov/dep/enforcement/oqa.html">http://www.nj.gov/dep/enforcement/oqa.html</a>	WA005
New York - DOH	<a href="https://www.wadsworth.org/regulatory/elap">https://www.wadsworth.org/regulatory/elap</a>	12060
North Carolina DEQ	<a href="https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification">https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification</a>	605
Oklahoma DEQ	<a href="http://www.deq.state.ok.us/CSDnew/labcert.htm">http://www.deq.state.ok.us/CSDnew/labcert.htm</a>	9801
Oregon – DEQ (NELAP)	<a href="http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx">http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx</a>	WA100010
South Carolina DHEC	<a href="http://www.scdhec.gov/environment/EnvironmentalLabCertification/">http://www.scdhec.gov/environment/EnvironmentalLabCertification/</a>	61002
Texas CEQ	<a href="http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html">http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html</a>	T104704427
Washington DOE	<a href="http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html">http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html</a>	C544
Wyoming (EPA Region 8)	<a href="https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water">https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water</a>	-
Kelso Laboratory Website	<a href="http://www.alsglobal.com">www.alsglobal.com</a>	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at [www.ALSGlobal.com](http://www.ALSGlobal.com) or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.



## Case Narrative

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**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot  
**Sample Matrix:** Water

**Service Request:** K2304148  
**Date Received:** 04/08/2023

### CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

#### Sample Receipt:

One water sample was received for analysis at ALS Environmental on 04/08/2023. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The sample was stored at minimum in accordance with the analytical method requirements.

#### Semivolatiles by GC/MS:

Method 8270D, 05/18/2023: The extraction of sample RMW-1-BKGND-04052023 was initially performed within the recommended holding time. Re-extraction was required due to QC failures. The re-extraction was performed past the recommended holding time. The results from the second analysis were reported.

Method 8270D, 05/18/2023: The upper control criterion was exceeded for Bis(2-ethylhexyl) Phthalate in Continuing Calibration Verification (CCV) KQ2308997-02. The field sample analyzed in this sequence did not contain the analyte in question. Since the apparent problem indicated a potential high bias, the data quality was not affected. No further corrective action was required.

Method 8270D, 05/18/2023: The upper control criterion was exceeded for Hexachlorocyclopentadiene in Laboratory Control Sample (LCS) KQ2308254-02 and Duplicate Laboratory Control Sample (DLCS) KQ2308254-03. The analyte in question was not detected in the associated field samples. The error associated with elevated recovery indicated a high bias. The sample data was not significantly affected. No further corrective action was appropriate.

#### Semivolatile GC:

Method 8081B, 06/06/2023: The analysis of sample RMW-1-BKGND-04052023 was performed passed the recommended analytical holding time due to instrument failure. Efforts were made to analyze the sample as soon as possible after the analytical system was back in control. However, the analysis was performed 14 days past the recommended holding time. The data was flagged to indicate the holding time violation.

Method 8081B, 06/06/2023: The spike recovery of Chlordane for Laboratory Control (LCS) Sample and Duplicate Laboratory Control Sample (DLCS) was not performed. The analytes in question were not detected in the associated field samples.

Method 8151A, 05/10/2023: The upper control criterion was exceeded for many target analytes in Continuing Calibration Verification (CCV) KQ2309788-01, -03. The field samples analyzed in this sequence did not contain the analytes in question. Since the apparent problem indicated a potential high bias, the data quality was not affected. No further corrective action was required.

#### Metals:

No significant anomalies were noted with this analysis.

#### General Chemistry:

No significant anomalies were noted with this analysis.

#### Subcontracted Analytical Parameters:

900.0

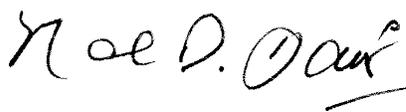
This analysis was performed at Gel Labs LLC in Charleston, SC. The data for this analysis is included in the corresponding section of this report.

903.1

This analysis was performed at Gel Labs LLC in Charleston, SC. The data for this analysis is included in the corresponding section of this report.

904.0

This analysis was performed at Gel Labs LLC in Charleston, SC. The data for this analysis is included in the corresponding

Approved by 

Date 06/16/2023





# Chain of Custody

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[www.alsglobal.com](http://www.alsglobal.com)



CHAIN OF CUSTODY  
129889

002

62304148

SR# \_\_\_\_\_  
COC Set \_\_\_\_\_ of \_\_\_\_\_  
COC# \_\_\_\_\_

1317 South 13th Ave, Kelso, WA 98626 Phone (360) 577-7222 / 800-695-7222 / FAX (360) 636-1068  
www.alsglobal.com

Project Name: <u>Umatilla Depot</u>		Project Number: <u>913.001.002.002</u>		NUMBER OF CONTAINERS	7D										14D			28D			180D	365D	Remarks						
Project Manager: <u>Matt Kuhlbecker</u>		Company: <u>ESI Water Solutions, Inc.</u>			3081B / Pest OC	3151A / HERB	32700 / SVO	3330A / NitroAro Amin	300.0 / Radioact	303.1 / Radium 226	304.0 / Radium 228	SM 2540 C / TDS	SM 2540 D / TSS	3260C / VOC FP	SM 2320 B / Alkalinity Titr	SM 2320 B / Carbonate Alk	SM 4500-CN- E / CN T	300.0 / Chloride	300.0 / F	300.0 / SO4	353.2 / NO2 NO3 T	7470A / Hg T		SM 4500-P E / T Phos	SM 5310 C / TOC T	3010C / Metals T	3020A / Metals T	3082A / PCB 3520	
Address: <u>650 NE Holladay St Ste 900 Portland, OR 97232</u>	Phone #: <u>503-987-4716</u>	email: <u>mthomas@esiw.com</u>	Sampler Signature: <u>Matthew Thomas</u>	Sampler Printed Name: <u>Matthew Thomas</u>																									
CLIENT SAMPLE ID	LABID	SAMPLING Date	Time	Matrix																									
1. <u>RMW-1-04610-04052023</u>		<u>4/5/23</u>	<u>1345</u>	<u>Water</u>	<u>20</u>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2.																													
3.																													
4.																													
5.																													
6.																													
7.																													
8.																													
9.																													
10.																													

<b>Report Requirements</b> <input checked="" type="checkbox"/> I. Routine Report: Method Blank, Surrogate, as required <input type="checkbox"/> II. Report Dup., MS, MSD as required <input type="checkbox"/> III. CLP Like Summary (no raw data) <input type="checkbox"/> IV. Data Validation Report <input type="checkbox"/> V. EDD	<b>Invoice Information</b> P.O.# _____ Bill To: _____ _____	Circle which metals are to be analyzed Total Metals: (Al) (As) (Sb) (Ba) (Be) (B) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Mo) (Ni) (K) (Ag) (Na) (Se) (Sr) (Ti) (Sn) (V) (Zn) (Hg) Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr/Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg
	<b>Turnaround Requirements</b> <input type="checkbox"/> 24 hr. _____ 48 hr. _____ <input checked="" type="checkbox"/> 5 Day Standard Requested Report Date _____	Special Instructions/Comments: Address invoice to: <u>John Schofer</u> <u>216 SE 4th St</u> <u>Perkleton, OR 97801</u> Email invoice to: <u>mkuhlbecker@esiw.com</u> Don't remember formula: <u>Thallium</u> <u>Antimony</u> <u>Nickel</u>

Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature: <u>Matthew Thomas</u>	Signature: <u>Joshua E. Smith</u>	Signature:	Signature:	Signature:	Signature:
Printed Name: <u>Matthew Thomas</u>	Printed Name: <u>ALS</u>	Printed Name:	Printed Name:	Printed Name:	Printed Name:
Firm: <u>ESI Water Solutions</u>	Firm: <u>4-8-23 1100</u>	Firm:	Firm:	Firm:	Firm:
Date/Time: <u>4/8/23 1200</u>	Date/Time:	Date/Time:	Date/Time:	Date/Time:	Date/Time:



Cooler Receipt and Preservation Form

Client ASI water SOLUTIONS Service Request K23 04148  
Received: 4-8-23 Opened: 4-8-23 By: JM Unloaded: 4-8-23 By: JM

- 1. Samples were received via?  USPS  Fed Ex  UPS  DHL  PDX  Courier  Hand Delivered
- 2. Samples were received in: (circle)  Cooler  Box  Envelope  Other  NA
- 3. Were custody seals on coolers? NA  Y  N If yes, how many and where? 1 front
- If present, were custody seals intact?  Y  N If present, were they signed and dated?  Y  N

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
2.5	1.6	IR02	129889 103			8171 1574 7504	
2.5		IR02	129889 203			8171 1574 7515	
1.1		IR02	129889 303			8164 5983 9440	

- 4. Was a Temperature Blank present in cooler? NA  Y  N If yes, notate the temperature in the appropriate column above:  
If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
- 5. Were samples received within the method specified temperature ranges? NA  Y  N  
If no, were they received on ice and same day as collected? If not, notate the cooler # above and notify the PM.  NA  Y  N

If applicable, tissue samples were received: Frozen Partially Thawed Thawed

- 6. Packing material: Inserts  Baggies  Bubble Wrap  Gel Packs  Wet Ice  Dry Ice  Sleeves
- 7. Were custody papers properly filled out (ink, signed, etc.)? NA  Y  N
- 8. Were samples received in good condition (unbroken) NA  Y  N
- 9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA  Y  N
- 10. Did all sample labels and tags agree with custody papers? NA  Y  N
- 11. Were appropriate bottles/containers and volumes received for the tests indicated? NA  Y  N
- 12. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below NA  Y  N
- 13. Were VOA vials received without headspace? Indicate in the table below.  NA  Y  N
- 14. Was C12/Res negative? NA  Y  N
- 15. Were samples received within the method specified time limit? If not, notate the error below and notify the PM  NA  Y  N
- 16. Were 100ml sterile microbiology bottles filled exactly to the 100ml mark?  NA  Y  N Underfilled Overfilled

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, Resolutions: \_\_\_\_\_



# General Chemistry

**ALS Environmental—Kelso Laboratory**  
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ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Analysis Method:** 300.0  
**Prep Method:** None

**Service Request:** K 2304148  
**Date Collected:** 04/5/23  
**Date Received:** 04/8/23

**Units:** mg/L  
**Basis:** NA

Chloride

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
RMW-1-BK GND-04052023	K 2304148-001	11.8	0.20	0.03	0.010	2	04/12/23 01:10	
Method Blank	K 2304148-MB1	ND U	0.10	0.02	0.005	1	04/11/23 14:19	
Method Blank	K 2304148-MB2	ND U	0.10	0.02	0.005	1	04/11/23 18:03	
Method Blank	K 2304148-MB3	ND U	0.10	0.02	0.005	1	04/11/23 21:45	
Method Blank	K 2304148-MB4	ND U	0.10	0.02	0.005	1	04/12/23 01:01	

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K 2304148  
**Date Analyzed:** 04/11/23  
**Date Extracted:** NA

Lab Control Sample Summary  
Chloride

**Analysis Method:** 300.0  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 800488

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K 2304148-L CS2	4.79	5.00	96	90-110
Lab Control Sample	K 2304148-L CS3	4.81	5.00	96	90-110
Lab Control Sample	K 2304148-L CS4	4.83	5.00	97	90-110
Lab Control Sample	K 2304148-L CS5	4.86	5.00	97	90-110

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Analysis Method:** 300.0  
**Prep Method:** None

**Service Request:** K 2304148  
**Date Collected:** 04/5/23  
**Date Received:** 04/8/23

**Units:** mg/L  
**Basis:** NA

Fluoride

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
RMW-1-BK GND-04052023	K 2304148-001	<b>0.30</b>	0.20	0.06	0.02	2	04/12/23 01:10	
Method Blank	K 2304148-MB1	ND U	0.10	0.03	0.010	1	04/11/23 14:19	
Method Blank	K 2304148-MB2	ND U	0.10	0.03	0.010	1	04/11/23 18:03	
Method Blank	K 2304148-MB3	ND U	0.10	0.03	0.010	1	04/11/23 21:45	
Method Blank	K 2304148-MB4	ND U	0.10	0.03	0.010	1	04/12/23 01:01	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K 2304148  
**Date Analyzed:** 04/11/23  
**Date Extracted:** NA

Lab Control Sample Summary  
Fluoride

**Analysis Method:** 300.0  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 800488

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K 2304148-L CS2	4.93	5.00	99	90-110
Lab Control Sample	K 2304148-L CS3	4.94	5.00	99	90-110
Lab Control Sample	K 2304148-L CS4	4.97	5.00	99	90-110
Lab Control Sample	K 2304148-L CS5	4.98	5.00	100	90-110

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Analysis Method:** 300.0  
**Prep Method:** None

**Service Request:** K 2304148  
**Date Collected:** 04/5/23  
**Date Received:** 04/8/23

**Units:** mg/L  
**Basis:** NA

Sulfate

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
RMW-1-BK GND-04052023	K 2304148-001	19.7	0.40	0.30	0.12	2	04/12/23 01:10	
Method Blank	K 2304148-MB1	ND U	0.20	0.15	0.06	1	04/11/23 14:19	
Method Blank	K 2304148-MB2	ND U	0.20	0.15	0.06	1	04/11/23 18:03	
Method Blank	K 2304148-MB3	ND U	0.20	0.15	0.06	1	04/11/23 21:45	
Method Blank	K 2304148-MB4	ND U	0.20	0.15	0.06	1	04/12/23 01:01	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K 2304148  
**Date Analyzed:** 04/11/23  
**Date Extracted:** NA

Lab Control Sample Summary  
Sulfate

**Analysis Method:** 300.0  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 800488

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K 2304148-L CS2	4.91	5.00	98	90-110
Lab Control Sample	K 2304148-L CS3	4.95	5.00	99	90-110
Lab Control Sample	K 2304148-L CS4	4.97	5.00	99	90-110
Lab Control Sample	K 2304148-L CS5	4.99	5.00	100	90-110

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Analysis Method:** 353.2  
**Prep Method:** Method

**Service Request:** K 2304148  
**Date Collected:** 04/5/23  
**Date Received:** 04/8/23  
**Units:** mg/L  
**Basis:** NA

Nitrate+Nitrite as Nitrogen

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
RMW-1-BK GND-04052023	K 2304148-001	5.75	0.25	0.10	0.03	5	04/18/23	4/18/23	
Method Blank	K 2304148-MB1	ND U	0.050	0.020	0.006	1	04/18/23	4/18/23	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K 2304148  
**Date Analyzed:** 04/18/23  
**Date Extracted:** 04/18/23

**Lab Control Sample Summary**  
**Nitrate+Nitrite as Nitrogen**

**Analysis Method:** 353.2  
**Prep Method:** Method

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 801269

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K 2304148-L CS2	7.39	7.20	103	90-110

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Analysis Method:** SM 2320 B  
**Prep Method:** None

**Service Request:** K 2304148  
**Date Collected:** 04/5/23  
**Date Received:** 04/8/23  
**Units:** mg/L  
**Basis:** NA

Alkalinity as CaCO<sub>3</sub>, Total

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
RMW-1-BK GND-04052023	K 2304148-001	174	2.0	1.2	0.6	1	04/18/23 18:06	
Method Blank	K 2304148-MB1	0.8 J	2.0	1.2	0.6	1	04/18/23 18:06	

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dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K 2304148  
**Date Collected:** 04/05/23  
**Date Received:** 04/08/23  
**Date Analyzed:** 04/18/23

**Replicate Sample Summary**  
**General Chemistry Parameters**

**Sample Name:** RMW-1-BK GND-04052023  
**Lab Code:** K 2304148-001

**Units:** mg/L  
**Basis:** NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K2304148- 001DUP Result	Average	RPD	RPD Limit
Alkalinity as CaCO <sub>3</sub> , Total	SM 2320 B	2.0	1.2	0.6	174	174	174	<1	20

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K 2304148  
**Date Analyzed:** 04/18/23  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**Alkalinity as CaCO<sub>3</sub>, Total**

**Analysis Method:** SM 2320 B  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 801283

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K 2304148-L CS2	183	178	103	85-115
Lab Control Sample	K 2304148-L CS3	183	178	103	85-115

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dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Analysis Method:** SM 2320 B  
**Prep Method:** None

**Service Request:** K 2304148  
**Date Collected:** 04/5/23  
**Date Received:** 04/8/23  
**Units:** mg/L  
**Basis:** NA

Carbonate as CaCO3

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
RMW-1-BK GND-04052023	K 2304148-001	ND U	2.0	1.2	0.6	1	04/18/23 18:06	
Method Blank	K 2304148-MB1	ND U	2.0	1.2	0.6	1	04/18/23 18:06	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K 2304148  
**Date Collected:** 04/05/23  
**Date Received:** 04/08/23  
**Date Analyzed:** 04/18/23

**Replicate Sample Summary**  
**General Chemistry Parameters**

**Sample Name:** RMW-1-BK GND-04052023  
**Lab Code:** K 2304148-001

**Units:** mg/L  
**Basis:** NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K2304148-001 DUP Result	Average	RPD	RPD Limit
Carbonate as CaCO3	SM 2320 B	2.0	1.2	0.6	ND U	ND U	NC	NC	20

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K 2304148  
**Date Analyzed:** 04/18/23  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**Carbonate as CaCO<sub>3</sub>**

**Analysis Method:** SM 2320 B  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 801283

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K 2304148-L CS2	183	178	103	85-115
Lab Control Sample	K 2304148-L CS3	183	178	103	85-115

**ALS Group USA, Corp.**

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304148  
**Date Collected:** 4/5/2023  
**Date Received:** 4/8/2023  
**Date Extracted:** NA  
**Date Analyzed:** NA

Langelier Index  
SM 2330B

<b>Sample Name</b>	<b>Lab Code</b>	<b>Temp °C</b>	<b>Result</b>
RMW-1-BKGND-04052023	K2304148-001	16.8	0.386

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Analysis Method:** SM 2540 C  
**Prep Method:** None

**Service Request:** K 2304148  
**Date Collected:** 04/5/23  
**Date Received:** 04/8/23  
**Units:** mg/L  
**Basis:** NA

**Solids, Total Dissolved**

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
RMW-1-BK GND-04052023	K 2304148-001	279	5.0	-	-	1	04/11/23 17:00	
Method Blank	K 2304148-MB1	ND U	5.0	-	-	1	04/11/23 17:00	
Method Blank	K 2304148-MB2	ND U	5.0	-	-	1	04/11/23 17:00	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K 2304148  
**Date Analyzed:** 04/11/23  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**Solids, Total Dissolved**

**Analysis Method:** SM 2540 C  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 800496

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K 2304148-L CS2	1880	1920	98	85-115

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Analysis Method:** SM 2540 D  
**Prep Method:** None

**Service Request:** K 2304148  
**Date Collected:** 04/5/23  
**Date Received:** 04/8/23  
**Units:** mg/L  
**Basis:** NA

Solids, Total Suspended (TSS)

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
RMW-1-BK GND-04052023	K 2304148-001	ND U	5.0	-	-	1	04/11/23 10:19	
Method Blank	K 2304148-MB1	ND U	5.0	-	-	1	04/11/23 10:19	

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K 2304148  
**Date Analyzed:** 04/11/23  
**Date Extracted:** NA

**Duplicate Lab Control Sample Summary  
General Chemistry Parameters**

**Analysis Method:** SM 2540 D  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 800438

**Lab Control Sample  
K2304148-LCS1**

**Duplicate Lab Control Sample  
K2304148-DLCS1**

Analyte Name	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec	% Rec Limits	RPD	RPD Limit
Solids, Total Suspended (TSS)	400	400	100	406	400	102	85-115	1	5

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Analysis Method:** SM 4500-CN- E  
**Prep Method:** SM 4500-CN-C

**Service Request:** K 2304148  
**Date Collected:** 04/5/23  
**Date Received:** 04/8/23  
**Units:** mg/L  
**Basis:** NA

Cyanide, Total

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
RMW-1-BK GND-04052023	K 2304148-001	ND U	0.020	0.002	0.0005	1	04/13/23	4/12/23	
Method Blank	K 2304148-MB1	ND U	0.020	0.002	0.0005	1	04/13/23	4/12/23	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K 2304148  
**Date Analyzed:** 04/13/23  
**Date Extracted:** 04/12/23

**Lab Control Sample Summary**  
**Cyanide, Total**

**Analysis Method:** SM 4500-CN- E  
**Prep Method:** SM 4500-CN-C

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 800743

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K 2304148-L CS2	0.0724	0.075	97	84-115

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Analysis Method:** SM 4500-H+ B  
**Prep Method:** None

**Service Request:** K 2304148  
**Date Collected:** 04/5/23  
**Date Received:** 04/8/23  
**Units:** pH Units  
**Basis:** NA

pH

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
RMW-1-BK GND-04052023	K 2304148-001	8.13	-	-	-	1	05/03/23 10:21	H

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K 2304148  
**Date Analyzed:** 05/02/23  
**Date Extracted:** NA

Lab Control Sample Summary  
pH

**Analysis Method:** SM 4500-H+ B  
**Prep Method:** None

**Units:** pH Units  
**Basis:** NA  
**Analysis Lot:** 802898

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K 2304148-L CS2	5.57	5.58	100	85-115

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Analysis Method:** SM 4500-P E  
**Prep Method:** Method

**Service Request:** K 2304148  
**Date Collected:** 04/5/23  
**Date Received:** 04/8/23

**Units:** mg/L  
**Basis:** NA

Phosphorus, Total

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
RMW-1-BK GND-04052023	K 2304148-001	<b>0.049</b>	0.020	0.010	0.005	1	04/19/23	4/19/23	
Method Blank	K 2304148-MB1	ND U	0.020	0.010	0.005	1	04/19/23	NA	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K 2304148  
**Date Analyzed:** 04/19/23  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**Phosphorus, Total**

**Analysis Method:** SM 4500-P E  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 801669

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K 2304148-L CS2	2.65	2.66	100	85-115



# Metals

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
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[www.alsglobal.com](http://www.alsglobal.com)

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Sample Name:** RMW-1-BK GND-04052023  
**Lab Code:** K2304148-001

**Service Request:** K2304148  
**Date Collected:** 04/05/23 13:45  
**Date Received:** 04/08/23 11:00  
**Basis:** NA

Hardness by ICP-AES Calculation 20th Ed.

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Hardness, Total as CaCO3	SM 2340 B	189	mg/L	0.09	0.053	0.023	1	04/19/23 14:57	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Sample Name:** RMW-1-BK GND-04052023  
**Lab Code:** K 2304148-001

**Service Request:** K 2304148  
**Date Collected:** 04/05/23 13:45  
**Date Received:** 04/08/23 11:00

**Basis:** NA

Total Metals

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020A	4.2	ug/L	4.0	2.0	0.5	1	04/19/23 14:57	04/17/23	
Antimony	6020A	0.146	ug/L	0.050	0.045	0.020	1	04/19/23 14:57	04/17/23	
Arsenic	6020A	6.78	ug/L	0.50	0.25	0.09	1	04/19/23 14:57	04/17/23	
Barium	6020A	33.7	ug/L	0.050	0.045	0.020	1	04/19/23 14:57	04/17/23	
Beryllium	6020A	ND U	ug/L	0.020	0.015	0.005	1	04/19/23 14:57	04/17/23	
Cadmium	6020A	ND U	ug/L	0.020	0.018	0.008	1	04/19/23 14:57	04/17/23	
Calcium	6020A	50000	ug/L	20	13	6	1	04/19/23 14:57	04/17/23	
Chromium	6020A	1.17	ug/L	0.20	0.10	0.03	1	04/19/23 14:57	04/17/23	
Copper	6020A	0.28	ug/L	0.20	0.09	0.05	1	04/19/23 14:57	04/17/23	
Iron	6020A	5.9	ug/L	2.0	1.0	0.3	1	04/19/23 14:57	04/17/23	
Lead	6020A	0.011 J	ug/L	0.020	0.018	0.006	1	04/19/23 14:57	04/17/23	
Magnesium	6020A	15500	ug/L	10	5	2	1	04/19/23 14:57	04/17/23	
Manganese	6020A	3.40	ug/L	0.20	0.10	0.04	1	04/19/23 14:57	04/17/23	
Mercury	7470A	ND U	ug/L	0.20	0.05	0.02	1	04/18/23 08:23	04/17/23	
Nickel	6020A	0.25	ug/L	0.20	0.15	0.04	1	04/19/23 14:57	04/17/23	
Potassium	6020A	4610	ug/L	50	45	20	1	04/19/23 14:57	04/17/23	
Selenium	6020A	0.6 J	ug/L	1.0	0.5	0.2	1	04/19/23 14:57	04/17/23	
Silver	6020A	ND U	ug/L	0.020	0.018	0.009	1	04/19/23 14:57	04/17/23	
Sodium	6020A	23400	ug/L	50	45	20	1	04/19/23 14:57	04/17/23	
Thallium	6020A	ND U	ug/L	0.020	0.018	0.009	1	04/19/23 14:57	04/17/23	
Zinc	6020A	0.5 J	ug/L	2.0	1.0	0.5	1	04/19/23 14:57	04/17/23	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2305906-01

**Service Request:** K2304148  
**Date Collected:** NA  
**Date Received:** NA  
**Basis:** NA

Total Metals

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum	6020A	1.3 J	ug/L	4.0	2.0	0.5	1	04/19/23 14:50	04/17/23	
Antimony	6020A	ND U	ug/L	0.050	0.045	0.020	1	04/19/23 14:50	04/17/23	
Arsenic	6020A	ND U	ug/L	0.50	0.25	0.09	1	04/19/23 14:50	04/17/23	
Barium	6020A	ND U	ug/L	0.050	0.045	0.020	1	04/19/23 14:50	04/17/23	
Beryllium	6020A	ND U	ug/L	0.020	0.015	0.005	1	04/19/23 14:50	04/17/23	
Cadmium	6020A	ND U	ug/L	0.020	0.018	0.008	1	04/19/23 14:50	04/17/23	
Calcium	6020A	ND U	ug/L	20	13	6	1	04/19/23 14:50	04/17/23	
Chromium	6020A	ND U	ug/L	0.20	0.10	0.03	1	04/19/23 14:50	04/17/23	
Copper	6020A	ND U	ug/L	0.20	0.09	0.05	1	04/19/23 14:50	04/17/23	
Iron	6020A	1.2 J	ug/L	2.0	1.0	0.3	1	04/19/23 14:50	04/17/23	
Lead	6020A	ND U	ug/L	0.020	0.018	0.006	1	04/19/23 14:50	04/17/23	
Magnesium	6020A	ND U	ug/L	10	5	2	1	04/19/23 14:50	04/17/23	
Manganese	6020A	ND U	ug/L	0.20	0.10	0.04	1	04/19/23 14:50	04/17/23	
Nickel	6020A	ND U	ug/L	0.20	0.15	0.04	1	04/19/23 14:50	04/17/23	
Potassium	6020A	ND U	ug/L	50	45	20	1	04/19/23 14:50	04/17/23	
Selenium	6020A	ND U	ug/L	1.0	0.5	0.2	1	04/19/23 14:50	04/17/23	
Silver	6020A	ND U	ug/L	0.020	0.018	0.009	1	04/19/23 14:50	04/17/23	
Sodium	6020A	ND U	ug/L	50	45	20	1	04/19/23 14:50	04/17/23	
Thallium	6020A	ND U	ug/L	0.020	0.018	0.009	1	04/19/23 14:50	04/17/23	
Zinc	6020A	ND U	ug/L	2.0	1.0	0.5	1	04/19/23 14:50	04/17/23	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2306768-01

**Service Request:** K2304148  
**Date Collected:** NA  
**Date Received:** NA  
**Basis:** NA

Total Metals

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Mercury	7470A	ND U	ug/L	0.20	0.05	0.02	1	04/18/23 08:20	04/17/23	

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

Client: GSI Water Solutions, Inc  
Project: Umatilla Depot/913.001.002.002  
Sample Matrix: Water

Service Request: K 2304148  
Date Collected: 04/05/23  
Date Received: 04/08/23  
Date Analyzed: 04/19/23  
Date Extracted: 04/17/23

Duplicate Matrix Spike Summary  
Total Metals

Sample Name: RMW-1-BK GND-04052023  
Lab Code: K 2304148-001  
Analysis Method: 6020A  
Prep Method: EPA CLP ILM04.0

Units: ug/L  
Basis: NA

Analyte Name	Sample Result	Result	Matrix Spike K Q2305906-04		Duplicate Matrix Spike K Q2305906-05		% Rec Limits	RPD	RPD Limit	
			Spike Amount	% Rec	Result	Spike Amount				% Rec
Aluminum	4.2	113	100	109	114	100	110	84-117	<1	20
Antimony	0.146	10.8	10.0	106	10.9	10.0	108	85-117	<1	20
Arsenic	6.78	56.3	50.0	99	56.1	50.0	99	84-116	<1	20
Barium	33.7	137	100	103	137	100	103	86-114	<1	20
Beryllium	ND U	2.61	2.50	104	2.67	2.50	107	83-121	2	20
Cadmium	ND U	25.5	25.0	102	25.4	25.0	101	87-115	<1	20
Calcium	50000	50200	250	97 #	50900	250	354 #	87-118	1	20
Chromium	1.17	11.0	10.0	98	11.0	10.0	98	85-116	<1	20
Copper	0.28	12.6	12.5	99	12.4	12.5	97	85-118	2	20
Iron	5.9	54.7	50.0	98	54.3	50.0	97	87-118	<1	20
Lead	0.011 J	49.5	50.0	99	49.8	50.0	100	88-115	<1	20
Magnesium	15500	15600	250	8 #	16000	250	199 #	83-118	3	20
Manganese	3.40	27.8	25.0	98	28.1	25.0	99	87-115	1	20
Nickel	0.25	24.6	25.0	97	24.4	25.0	97	85-117	<1	20
Potassium	4610	4820	250	83 #	4890	250	110 #	87-115	1	20
Selenium	0.6 J	49.2	50.0	97	49.5	50.0	98	80-120	<1	20
Silver	ND U	12.5	12.5	100	12.5	12.5	100	85-116	<1	20
Sodium	23400	23800	250	194 #	23900	250	198 #	85-117	<1	20
Thallium	ND U	49.8	50.0	100	50.1	50.0	100	82-116	<1	20
Zinc	0.5 J	25.9	25.0	101	25.2	25.0	99	83-119	3	20

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

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dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K 2304148  
**Date Analyzed:** 04/19/23

**Lab Control Sample Summary**  
**Total Metals**

**Units:**ug/L  
**Basis:**NA

**Lab Control Sample**  
K Q2305906-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Aluminum	6020A	109	100	109	84-117
Antimony	6020A	10.5	10.0	105	85-117
Arsenic	6020A	48.5	50.0	97	84-116
Barium	6020A	102	100	102	86-114
Beryllium	6020A	2.53	2.50	101	83-121
Cadmium	6020A	25.3	25.0	101	87-115
Calcium	6020A	278	250	111	87-118
Chromium	6020A	10.0	10.0	100	85-116
Copper	6020A	13.0	12.5	104	85-118
Iron	6020A	50.7	50.0	101	87-118
Lead	6020A	51.1	50.0	102	88-115
Magnesium	6020A	254	250	102	83-118
Manganese	6020A	24.8	25.0	99	87-115
Nickel	6020A	25.7	25.0	103	85-117
Potassium	6020A	255	250	102	87-115
Selenium	6020A	49.6	50.0	99	80-120
Silver	6020A	12.9	12.5	103	85-116
Sodium	6020A	257	250	103	85-117
Thallium	6020A	51.1	50.0	102	82-116
Zinc	6020A	25.6	25.0	102	83-119

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K 2304148  
**Date Analyzed:** 04/18/23

**Lab Control Sample Summary**  
**Total Metals**

**Units:**ug/L  
**Basis:**NA

**Lab Control Sample**  
K Q2306768-02

<b>Analyte Name</b>	<b>Analytical Method</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Mercury	7470A	5.01	5.00	100	82-119



# Low Level Organochlorine Pesticides by GC

**ALS Environmental—Kelso Laboratory**  
*1317 South 13th Avenue, Kelso, WA 98626*  
*Phone (360)577-7222 Fax (360)636-1068*  
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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Sample Name:** RMW-1-BK GND-04052023  
**Lab Code:** K 2304148-001

**Service Request:** K 2304148  
**Date Collected:** 04/05/23 13:45  
**Date Received:** 04/08/23 11:00  
**Units:** ug/L  
**Basis:** NA

Low Level Organochlorine Pesticides by GC

**Analysis Method:** 8081B  
**Prep Method:** None

Analyte Name	Result	LOQ	Dil.	Date Analyzed	Date Extracted	Q
gamma-BHC (Lindane)	ND U	0.010	1	06/06/23 10:07	4/11/23	*
Chlordane	ND U	0.20	1	06/06/23 10:07	4/11/23	*
Endrin	ND U	0.010	1	06/06/23 10:07	4/11/23	*
Heptachlor	ND U	0.010	1	06/06/23 10:07	4/11/23	*
Heptachlor Epoxide	ND U	0.010	1	06/06/23 10:07	4/11/23	*
Hexachlorobenzene	ND U	0.010	1	06/06/23 10:07	4/11/23	*
Methoxychlor	ND U	0.010	1	06/06/23 10:07	4/11/23	*
Toxaphene	ND U	0.60	1	06/06/23 10:07	4/11/23	*

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Decachlorobiphenyl	76	14 - 160	06/06/23 10:07	
Tetrachloro-m-xylene	86	30 - 148	06/06/23 10:07	

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304148

**SURROGATE RECOVERY SUMMARY**  
**Low Level Organochlorine Pesticides by GC**

**Analysis Method:** 8081B  
**Extraction Method:** None

Sample Name	Lab Code	Decachlorobiphenyl	Tetrachloro-m-xylene
		14 - 160	30 - 148
RMW-1-BK GND-04052023	K 2304148-001	76	86
Method Blank	K Q2306501-06	76	87
Lab Control Sample	K Q2306501-07	76	86
Duplicate Lab Control Sample	K Q2306501-08	76	87
Lab Control Sample	K Q2306501-09	74	87
Duplicate Lab Control Sample	K Q2306501-10	69	86

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** K Q2306501-06

**Service Request:** K 2304148  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/L  
**Basis:** NA

Low Level Organochlorine Pesticides by GC

**Analysis Method:** 8081B  
**Prep Method:** None

Analyte Name	Result	LOQ	Dil.	Date Analyzed	Date Extracted	Q
gamma-BHC (Lindane)	ND U	0.010	1	06/06/23 07:34	4/11/23	
Chlordane	ND U	0.20	1	06/06/23 07:34	4/11/23	
Endrin	ND U	0.010	1	06/06/23 07:34	4/11/23	
Heptachlor	ND U	0.010	1	06/06/23 07:34	4/11/23	
Heptachlor Epoxide	ND U	0.010	1	06/06/23 07:34	4/11/23	
Hexachlorobenzene	ND U	0.010	1	06/06/23 07:34	4/11/23	
Methoxychlor	ND U	0.010	1	06/06/23 07:34	4/11/23	
Toxaphene	ND U	0.60	1	06/06/23 07:34	4/11/23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Decachlorobiphenyl	76	14 - 160	06/06/23 07:34	
Tetrachloro-m-xylene	87	30 - 148	06/06/23 07:34	

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K 2304148  
**Date Analyzed:** 06/06/23  
**Date Extracted:** 04/11/23

**Duplicate Lab Control Sample Summary**  
**Low Level Organochlorine Pesticides by GC**

**Analysis Method:** 8081B  
**Prep Method:** None

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 806887

**Lab Control Sample**  
**KQ2306501-07**

**Duplicate Lab Control Sample**  
**KQ2306501-08**

Analyte Name	Lab Control Sample			Duplicate Lab Control Sample			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Endrin	0.191	0.250	77	0.194	0.250	78	66-178	1	30
gamma-BHC (Lindane)	0.205	0.250	82	0.211	0.250	84	67-172	3	30
Heptachlor	0.206	0.250	83	0.213	0.250	85	61-178	3	30
Heptachlor Epoxide	0.184	0.250	74	0.191	0.250	76	59-163	3	30
Hexachlorobenzene	0.209	0.250	84	0.217	0.250	87	52-132	4	30
Methoxychlor	0.198	0.250	79	0.205	0.250	82	65-183	3	30

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K 2304148  
**Date Analyzed:** 06/06/23  
**Date Extracted:** 04/11/23

**Duplicate Lab Control Sample Summary**  
**Low Level Organochlorine Pesticides by GC**

**Analysis Method:** 8081B  
**Prep Method:** None

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 806887

**Lab Control Sample**  
**KQ2306501-09**

**Duplicate Lab Control Sample**  
**KQ2306501-10**

<b>Analyte Name</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>	<b>RPD</b>	<b>RPD Limit</b>
Toxaphene	12.0	10.0	120	12.0	10.0	120	66-154	<1	30

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Confirmation Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Matrix:** Water

**Service Request:** K2304148  
**Date Collected:** NA  
**Date Received:**

**Sample Name:** Lab Control Sample  
**Lab Code:** KQ2306501-07

**Units:** ug/L  
**Basis:** NA

Low Level Organochlorine Pesticides by GC

**Analytical Method:** 8081B  
**Prep Method:** None

LOQ	LOQ	Primary Result	Confirmation Result	RPD	Q	Dilution Factor	Date Analyzed
Endrin	0.010	0.191	0.194	2		1	06/06/23 08:05
Heptachlor	0.010	0.206	0.219	6		1	06/06/23 08:05
Heptachlor E poxide	0.010	0.184	0.197	7		1	06/06/23 08:05
Hexachlorobenzene	0.010	0.209	0.214	2		1	06/06/23 08:05
Methoxychlor	0.010	0.198	0.212	7		1	06/06/23 08:05
gamma-BHC (Lindane)	0.010	0.205	0.219	7		1	06/06/23 08:05

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Confirmation Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Matrix:** Water

**Service Request:** K2304148  
**Date Collected:** NA  
**Date Received:**

**Sample Name:** Duplicate Lab Control Sample  
**Lab Code:** KQ2306501-08

**Units:** ug/L  
**Basis:** NA

Low Level Organochlorine Pesticides by GC

**Analytical Method:** 8081B  
**Prep Method:** None

LOQ	LOQ	Primary Result	Confirmation Result	RPD	Q	Dilution Factor	Date Analyzed
Endrin	0.010	0.194	0.198	2		1	06/06/23 08:35
Heptachlor	0.010	0.213	0.226	6		1	06/06/23 08:35
Heptachlor E poxide	0.010	0.191	0.202	6		1	06/06/23 08:35
Hexachlorobenzene	0.010	0.217	0.223	3		1	06/06/23 08:35
Methoxychlor	0.010	0.205	0.213	4		1	06/06/23 08:35
gamma-BHC (Lindane)	0.010	0.211	0.225	6		1	06/06/23 08:35

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Confirmation Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Matrix:** Water

**Service Request:** K2304148  
**Date Collected:** NA  
**Date Received:**

**Sample Name:** Lab Control Sample  
**Lab Code:** KQ2306501-09

**Units:** ug/L  
**Basis:** NA

Low Level Organochlorine Pesticides by GC

**Analytical Method:** 8081B  
**Prep Method:** None

<u>LOQ</u>	<u>LOQ</u>	<u>Primary Result</u>	<u>Confirmation Result</u>	<u>RPD</u>	<u>Q</u>	<u>Dilution Factor</u>	<u>Date Analyzed</u>
Toxaphene	0.60	12.0	13.1	9		1	06/06/23 09:06

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Confirmation Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Matrix:** Water  
**Sample Name:** Duplicate Lab Control Sample  
**Lab Code:** KQ2306501-10

**Service Request:** K2304148  
**Date Collected:** NA  
**Date Received:**

**Units:** ug/L  
**Basis:** NA

Low Level Organochlorine Pesticides by GC

**Analytical Method:** 8081B  
**Prep Method:** None

<u>LOQ</u>	<u>LOQ</u>	<u>Primary Result</u>	<u>Confirmation Result</u>	<u>RPD</u>	<u>Q</u>	<u>Dilution Factor</u>	<u>Date Analyzed</u>
Toxaphene	0.60	12.0	12.8	6		1	06/06/23 09:36



## Polychlorinated Biphenyls (PCBs)

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

Analytical Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304148  
**Date Collected:** 04/05/2023  
**Date Received:** 04/08/2023

**Polychlorinated Biphenyls (PCBs)**

**Sample Name:** RMW-1-BKGND-04052023  
**Lab Code:** K2304148-001  
**Extraction Method:** EPA 3520C  
**Analysis Method:** 8082A

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1221	ND	U	0.040		0.040	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1232	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1242	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1248	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1254	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1260	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	71	70-130	05/26/23	Acceptable

**Comments:** \_\_\_\_\_

Analytical Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304148  
**Date Collected:** NA  
**Date Received:** NA

**Polychlorinated Biphenyls (PCBs)**

**Sample Name:** Method Blank  
**Lab Code:** KWG2300805-1  
**Extraction Method:** EPA 3520C  
**Analysis Method:** 8082A

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1221	ND	U	0.040		0.040	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1232	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1242	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1248	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1254	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1260	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	83	70-130	05/26/23	Acceptable

**Comments:** \_\_\_\_\_

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304148

**Surrogate Recovery Summary  
Polychlorinated Biphenyls (PCBs)**

**Extraction Method:** EPA 3520C  
**Analysis Method:** 8082A

**Units:** Percent  
**Level:** Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
RMW-1-BKGND-04052023	K2304148-001	71
Method Blank	KWG2300805-1	83
Lab Control Sample	KWG2300805-2	79
Duplicate Lab Control Sample	KWG2300805-3	79

**Surrogate Recovery Control Limits (%)**

Sur1 = Decachlorobiphenyl 70-130

Results flagged with an asterisk (\*) indicate values outside control criteria.  
Results flagged with a pound (#) indicate the control criteria is not applicable.

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304148  
**Date Extracted:** 05/17/2023  
**Date Analyzed:** 05/26/2023

**Lab Control Spike/Duplicate Lab Control Spike Summary**  
**Polychlorinated Biphenyls (PCBs)**

**Extraction Method:** EPA 3520C  
**Analysis Method:** 8082A

**Units:** ug/L  
**Basis:** NA  
**Level:** Low  
**Extraction Lot:** KWG2300805

Analyte Name	Lab Control Sample KWG2300805-2 Lab Control Spike			Duplicate Lab Control Sample KWG2300805-3 Duplicate Lab Control Spike			%Rec Limits	RPD	RPD Limit
	Result	Spike Amount	%Rec	Result	Spike Amount	%Rec			
Aroclor 1016	0.196	0.250	78	0.175	0.250	70	70-130	11	30
Aroclor 1260	0.188	0.250	75	0.205	0.250	82	70-130	8	30

Results flagged with an asterisk (\*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.



# Chlorinated Herbicides by GC

**ALS Environmental—Kelso Laboratory**  
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ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Sample Name:** RMW-1-BK GND-04052023  
**Lab Code:** K 2304148-001

**Service Request:** K 2304148  
**Date Collected:** 04/05/23 13:45  
**Date Received:** 04/08/23 11:00  
**Units:** ug/L  
**Basis:** NA

Chlorinated Herbicides by GC

**Analysis Method:** 8151A  
**Prep Method:** Method

Analyte Name	Result	LO Q	LO D	MDL	Dil.	Date Analyzed	Date Extracted	Q
2,4,5-T	ND U	0.20	0.10	0.033	1	05/10/23 12:58	4/12/23	
2,4,5-TP (Silvex)	ND U	0.20	0.10	0.045	1	05/10/23 12:58	4/12/23	*
2,4-D	ND U	0.40	0.10	0.036	1	05/10/23 12:58	4/12/23	
2,4-DB	<b>0.18 J</b>	0.40	0.20	0.10	1	05/10/23 12:58	4/12/23	
Dalapon	ND U	0.40	0.28	0.28	1	05/10/23 12:58	4/12/23	
Dicamba	ND U	0.20	0.10	0.025	1	05/10/23 12:58	4/12/23	*
Dichlorprop	ND U	0.40	0.10	0.030	1	05/10/23 12:58	4/12/23	*
Dinoseb	ND U	0.20	0.060	0.015	1	05/10/23 12:58	4/12/23	
MCPA	ND U	100	20	8.7	1	05/10/23 12:58	4/12/23	
MCP	ND U	100	20	14	1	05/10/23 12:58	4/12/23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4-Dichlorophenylacetic Acid	54	17 - 113	05/10/23 12:58	

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304148

**SURROGATE RECOVERY SUMMARY**  
**Chlorinated Herbicides by GC**

**Analysis Method:** 8151A  
**Extraction Method:** Method

<b>Sample Name</b>	<b>Lab Code</b>	<b>2,4-Dichlorophenylacetic Acid 17 - 113</b>
RMW-1-BK GND-04052023	K 2304148-001	54
Method Blank	K Q2306579-01	56
Lab Control Sample	K Q2306579-02	68
Duplicate Lab Control Sample	K Q2306579-03	78

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2306579-01

**Service Request:** K2304148  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/L  
**Basis:** NA

Chlorinated Herbicides by GC

**Analysis Method:** 8151A  
**Prep Method:** Method

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
2,4,5-T	ND U	0.20	0.10	0.033	1	05/10/23 11:47	4/12/23	
2,4,5-TP (Silvex)	ND U	0.20	0.10	0.045	1	05/10/23 11:47	4/12/23	
2,4-D	ND U	0.40	0.10	0.036	1	05/10/23 11:47	4/12/23	
2,4-DB	<b>0.13 J P</b>	0.40	0.20	0.10	1	05/10/23 11:47	4/12/23	
Dalapon	ND U	0.40	0.28	0.28	1	05/10/23 11:47	4/12/23	
Dicamba	ND U	0.20	0.10	0.025	1	05/10/23 11:47	4/12/23	
Dichlorprop	ND U	0.40	0.10	0.030	1	05/10/23 11:47	4/12/23	
Dinoseb	ND U	0.20	0.060	0.015	1	05/10/23 11:47	4/12/23	
MCPA	ND U	100	20	8.7	1	05/10/23 11:47	4/12/23	
MCP	ND U	100	20	14	1	05/10/23 11:47	4/12/23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4-Dichlorophenylacetic Acid	56	17 - 113	05/10/23 11:47	

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K 2304148  
**Date Analyzed:** 05/10/23  
**Date Extracted:** 04/12/23

**Duplicate Lab Control Sample Summary  
Chlorinated Herbicides by GC**

**Analysis Method:** 8151A  
**Prep Method:** Method

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 806155

**Lab Control Sample  
KQ2306579-02**

**Duplicate Lab Control Sample  
KQ2306579-03**

Analyte Name	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec	% Rec Limits	RPD	RPD Limit
2,4,5-T	2.07	2.50	83	2.24	2.50	90	30-120	8	30
2,4,5-TP (Silvex)	1.90	2.50	76	2.11	2.50	85	37-114	11	30
2,4-D	1.80	2.50	72	2.04	2.50	82	35-110	13	30
2,4-DB	2.12	2.50	85	2.11	2.50	84	10-134	<1	30
Dalapon	1.55	2.50	62	1.94	2.50	77	14-110	22	30
Dicamba	2.00	2.50	80	2.20	2.50	88	30-108	9	30
Dichlorprop	1.95	2.50	78	2.30	2.50	92	29-104	17	30
Dinoseb	2.04	2.50	82	2.06	2.50	83	11-105	1	30
MCPA	194	250	78	214	250	86	21-117	10	30
MCPA	175	250	70	199	250	80	16-141	13	30

ALS Group USA, Corp.  
dba ALS Environmental

Confirmation Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Matrix:** Water  
**Sample Name:** RMW-1-BKGND-04052023  
**Lab Code:** K2304148-001

**Service Request:** K2304148  
**Date Collected:** 04/05/23 13:45  
**Date Received:** 4/8/23

**Units:** ug/L  
**Basis:** NA

Chlorinated Herbicides by GC

**Analytical Method:** 8151A  
**Prep Method:** Method

LOQ	LOQ	MDL	Primary Result	Confirmation Result	RPD	Q	Dilution Factor	Date Analyzed
2,4-DB		0.10	0.18	0.22	20	J	1	05/10/23 12:58

ALS Group USA, Corp.  
dba ALS Environmental

Confirmation Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2306579-01

**Service Request:** K2304148  
**Date Collected:** NA  
**Date Received:**

**Units:** ug/L  
**Basis:** NA

Chlorinated Herbicides by GC

**Analytical Method:** 8151A  
**Prep Method:** Method

LOQ	LOQ	MDL	Primary Result	Confirmation Result	RPD	Q	Dilution Factor	Date Analyzed
2,4-DB		0.10	0.13	0.22	51	J P	1	05/10/23 11:47

ALS Group USA, Corp.  
dba ALS Environmental

Confirmation Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Matrix:** Water

**Service Request:** K2304148  
**Date Collected:** NA  
**Date Received:**

**Sample Name:** Lab Control Sample  
**Lab Code:** KQ2306579-02

**Units:** ug/L  
**Basis:** NA

Chlorinated Herbicides by GC

**Analytical Method:** 8151A  
**Prep Method:** Method

LOQ	LOQ	MDL	Primary Result	Confirmation Result	RPD	Q	Dilution Factor	Date Analyzed
2,4,5-T		0.033	2.07	2.24	8		1	05/10/23 12:11
2,4,5-TP (Silvex)		0.045	1.90	1.96	3		1	05/10/23 12:11
2,4-D		0.036	1.80	1.85	3		1	05/10/23 12:11
2,4-DB		0.10	2.12	2.96	33		1	05/10/23 12:11
Dalapon		0.28	1.55	1.66	7		1	05/10/23 12:11
Dicamba		0.025	2.00	2.09	4		1	05/10/23 12:11
Dichlorprop		0.030	1.95	2.07	6		1	05/10/23 12:11
Dinoseb		0.015	2.04	2.09	2		1	05/10/23 12:11
MCPA		8.7	194	198	2		1	05/10/23 12:11
MCPP		14	175	179	2		1	05/10/23 12:11

ALS Group USA, Corp.  
dba ALS Environmental

Confirmation Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Matrix:** Water  
**Sample Name:** Duplicate Lab Control Sample  
**Lab Code:** KQ2306579-03

**Service Request:** K2304148  
**Date Collected:** NA  
**Date Received:**

**Units:** ug/L  
**Basis:** NA

Chlorinated Herbicides by GC

**Analytical Method:** 8151A  
**Prep Method:** Method

LOQ	LOQ	MDL	Primary Result	Confirmation Result	RPD	Q	Dilution Factor	Date Analyzed
2,4,5-T		0.033	2.24	2.30	3		1	05/10/23 12:34
2,4,5-TP (Silvex)		0.045	2.11	2.15	2		1	05/10/23 12:34
2,4-D		0.036	2.04	2.05	<1		1	05/10/23 12:34
2,4-DB		0.10	2.11	2.11	<1		1	05/10/23 12:34
Dalapon		0.28	1.94	2.09	7		1	05/10/23 12:34
Dicamba		0.025	2.20	2.28	4		1	05/10/23 12:34
Dichlorprop		0.030	2.30	2.32	<1		1	05/10/23 12:34
Dinoseb		0.015	2.06	2.09	1		1	05/10/23 12:34
MCPA		8.7	214	220	3		1	05/10/23 12:34
MCPP		14	199	199	<1		1	05/10/23 12:34



# Semi-Volatile Organic Compounds by GC/MS

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Sample Name:** RMW-1-BK GND-04052023  
**Lab Code:** K 2304148-001

**Service Request:** K 2304148  
**Date Collected:** 04/05/23 13:45  
**Date Received:** 04/08/23 11:00  
**Units:** ug/L  
**Basis:** NA

Semivolatile Organic Compounds by GC/MS

**Analysis Method:** 8270D  
**Prep Method:** EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Benzo(a)pyrene	ND U	10	0.27	1	05/18/23 18:04	5/8/23	*
Bis(2-ethylhexyl) Phthalate	ND U	10	0.28	1	05/18/23 18:04	5/8/23	*
Hexachlorobenzene	ND U	10	0.36	1	05/18/23 18:04	5/8/23	*
Hexachlorocyclopentadiene	ND U	51	1.6	1	05/18/23 18:04	5/8/23	*
Pentachlorophenol	ND U	26	3.6	1	05/18/23 18:04	5/8/23	*

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2-Fluorobiphenyl	80	44 - 119	05/18/23 18:04	
Terphenyl-d14	106	50 - 134	05/18/23 18:04	
2,4,6-Tribromophenol	76	43 - 140	05/18/23 18:04	

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304148

**SURROGATE RECOVERY SUMMARY**  
**Semivolatile Organic Compounds by GC/MS**

**Analysis Method:** 8270D  
**Extraction Method:** EPA 3520C

Sample Name	Lab Code	2,4,6-Tribromophenol	2-Fluorobiphenyl	Terphenyl-d14
		43 - 140	44 - 119	50 - 134
RMW-1-BK GND-04052023	K 2304148-001	76	80	106
Method Blank	K Q2308254-01	76	83	108
Lab Control Sample	K Q2308254-02	78	75	79
Duplicate Lab Control Sample	K Q2308254-03	83	75	81

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** K Q2308254-01

**Service Request:** K 2304148  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/L  
**Basis:** NA

Semivolatile Organic Compounds by GC/MS

**Analysis Method:** 8270D  
**Prep Method:** EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Benzo(a)pyrene	ND U	10	0.26	1	05/18/23 16:58	5/8/23	
Bis(2-ethylhexyl) Phthalate	ND U	10	0.27	1	05/18/23 16:58	5/8/23	
Hexachlorobenzene	ND U	10	0.35	1	05/18/23 16:58	5/8/23	
Hexachlorocyclopentadiene	ND U	50	1.5	1	05/18/23 16:58	5/8/23	
Pentachlorophenol	ND U	25	3.5	1	05/18/23 16:58	5/8/23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2-Fluorobiphenyl	83	44 - 119	05/18/23 16:58	
Terphenyl-d14	108	50 - 134	05/18/23 16:58	
2,4,6-Tribromophenol	76	43 - 140	05/18/23 16:58	

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K 2304148  
**Date Analyzed:** 05/18/23  
**Date Extracted:** 05/08/23

**Duplicate Lab Control Sample Summary**  
**Semivolatile Organic Compounds by GC/MS**

**Analysis Method:** 8270D  
**Prep Method:** EPA 3520C

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 804819

**Lab Control Sample**  
**KQ2308254-02**

**Duplicate Lab Control Sample**  
**KQ2308254-03**

Analyte Name	Lab Control Sample			Duplicate Lab Control Sample			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Benzo(a)pyrene	106	100	106	105	100	105	54-128	1	20
Bis(2-ethylhexyl) Phthalate	113	100	113	110	100	110	55-135	3	20
Hexachlorobenzene	84.2	100	84	81.8	100	82	53-125	3	20
Hexachlorocyclopentadiene	56.2	100	56 *	53.3	100	53 *	10-45	5	20
Pentachlorophenol	74.3	100	74	77.0	100	77	35-138	4	20



# Subcontract Lab Results

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)



May 03, 2023

Mark Harris  
ALS  
1317 South 13th Avenue  
Kelso, Washington 98626

Re: Kelso - Harris L2  
Work Order: 618246

Dear Mark Harris:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on April 13, 2023. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Test results for NELAP or ISO 17025 accredited tests are verified to meet the requirements of those standards, with any exceptions noted. The results reported relate only to the items tested and to the sample as received by the laboratory. These results may not be reproduced except as full reports without approval by the laboratory. Copies of GEL's accreditations and certifications can be found on our website at [www.gel.com](http://www.gel.com).

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4422.

Sincerely,

Jake Crook  
Project Manager

Purchase Order: 51K2304148  
Enclosures



# Case Narrative

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: May 3, 2023

Company : ALS  
Address : 1317 South 13th Avenue

Kelso, Washington 98626

Contact: Mark Harris

Project: Kelso - Harris L2

Client Sample ID: RMW-1-BKGN0-04052023

Project: ALSE01223

Sample ID: 618246001

Client ID: ALSE001

Matrix: Water

Collect Date: 05-APR-23 13:45

Receive Date: 13-APR-23

Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
200.2/200.8 Uranium "As Received"												
Uranium		3.01	0.0670	0.200	ug/L	1.00	1	SKJ	04/17/23	2351	2413024	1
Rad Gas Flow Proportional Counting												
GFPC Gross A/B, Liquid "As Received"												
Alpha		4.34	2.99	4.00	pCi/L			KP1	05/02/23	1641	2415696	2
Beta		4.42	3.50	4.00	pCi/L							
GFPC Ra228, Liquid "As Received"												
Radium-228		2.95	1.67	3.00	pCi/L			JE1	05/02/23	0909	2414124	3
Rad Radium-226												
Lucas Cell, Ra226, Liquid "As Received"												
Radium-226	U	0.442	0.468	1.00	pCi/L			LXP1	05/02/23	0924	2414112	4

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 200.2	ICP-MS 200.2 PREP	EM2	04/13/23	1540	2413022

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 200.8	
2	EPA 900.0/SW846 9310	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer	Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer		GFPC Ra228, Liquid "As Received"			86	(15%-125%)

### Notes:

Column headers are defined as follows:

DF: Dilution Factor  
DL: Detection Limit  
MDA: Minimum Detectable Activity  
MDC: Minimum Detectable Concentration  
Lc/LC: Critical Level  
PF: Prep Factor  
RL: Reporting Limit  
SQL: Sample Quantitation Limit

**Receipt Narrative  
for  
ALS Environmental  
SDG: 618246**

**May 03, 2023**

**Laboratory Identification:**

GEL Laboratories LLC  
2040 Savage Road  
Charleston, South Carolina 29407  
(843) 556-8171

**Summary:**

**Sample receipt:** The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on April 13, 2023 for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

**Sample Identification:** The laboratory received the following sample:

<b><u>Laboratory ID</u></b>	<b><u>Client ID</u></b>
618246001	RMW-1-BKGN0-04052023

**Case Narrative:**

Sample analyses were conducted using methodology as outlined in GEL's Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Radiochemistry and Metals.



Jake Crook  
Project Manager

# **Chain of Custody and Supporting Documentation**

# ALS Environmental Chain of Custody

ALS Contact: Mark Harris

618246

1317 South 13th Avenue • Kelso, WA 98626 • 1-360-577-7222 • FAX 1-360-636-1068

Project Number: K2304148  
 Project Manager: Mark Harris  
 QID: DOD QSM v5.1 Kelso

Misc Out 1	Radioact	900.0	Radium 226	903.1	Radium 228	904.0
X	X	X	X	X	X	X

Lab Code	Sample ID	# of Cont.	Matrix	Sample		
				Date	Time	Lab ID
K2304148-001	RMW-1-BKGN0-04052023	4	Water	4/5/23	1345	GEL Labs LLC

Test Comments  
 Misc Out 1 - None

Uranium

K2304148-001

<b>Special Instructions/Comments</b> Please provide the electronic (PDF and EDD) report to the following e-mail address: ALKLS.Data@alsglobal.com.	<b>Turnaround Requirements</b> RUSH (Surcharges Apply) PLEASE CIRCLE WORK DAYS 1 2 3 4 5 STANDARD Requested FAX Date: _____ Requested Report Date: 04/28/23	<b>Report Requirements</b> I. Results Only _____ II. Results + QC Summaries <input checked="" type="checkbox"/> III. Results + QC and Calibration Summaries _____ IV. Data Validation Report with Raw Data _____ PQL/MDL/ <u>Y</u> EDD <u>Y</u>	<b>Invoice Information</b> PO# 51K2304148 Bill to

Relinquished By: *M. Mueggler* 4/27/23 Received By: *[Signature]* 4/19/23 Airbill Number: \_\_\_\_\_

K2304148

✓  
**Ship To: GEL Labs LLC**  
GEL Laboratories, LLC  
2040 Savage Road  
Charleston, SC 29407

PC  
SMO

Date  
Date

MM 4/11/23  
MM 4/12/23

**Instructions:**

Ice \_\_\_\_\_  
Dry Ice \_\_\_\_\_  
No Ice

Bill to Client Account \_\_\_\_\_

**Shipping:**

Overnight   
2nd Day \_\_\_\_\_  
Ground \_\_\_\_\_

Comments:

ALS Group USA, Corp.  
www.alsglobal.com  
An ALS Limited Company



# Laboratory Certifications

**List of current GEL Certifications as of 03 May 2023**

<b>State</b>	<b>Certification</b>
Alabama	42200
Alaska	17-018
Alaska Drinking Water	SC00012
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana Drinking Water	LA024
Louisiana NELAP	03046 (AI33904)
Maine	2019020
Maryland	270
Massachusetts	M-SC012
Massachusetts PFAS Approv	Letter
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122023-4
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	2022-160
Pennsylvania NELAP	68-00485
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
Sanitation Districts of L	9255651
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-22-20
Utah NELAP	SC000122022-37
Vermont	VT87156
Virginia NELAP	460202
Washington	C780



301 Fulling Mill Road | Middletown, PA 17057 | Phone: 717-944-5541 | Fax: 717-944-1430 | [www.alsglobal.com](http://www.alsglobal.com)

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618

State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

Analytical Results Report For

**ALS Environmental-Kelso**

Project [ALK051K2304148](#)

Workorder [3298414](#)

Report ID [240308 on 4/28/2023](#)

### Certificate of Analysis

Enclosed are the analytical results for samples received by the laboratory on Apr 13, 2023.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Sarah Leung (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at [www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads](http://www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads).

This laboratory report may not be reproduced, except in full, without the written approval of ALS Global.  
ALS Middletown: 301 Fulling Mill Road, Middletown, PA 17057 : 717-944-5541.

Recipient(s):

ALKLS Data - ALS Environmental-Kelso

Mark Harris - ALS Environmental-Kelso

*Sarah Leung*

**Sarah Leung**  
Project Coordinator

(ALS Digital Signature)

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*



**Project** ALK051|K2304148

**Workorder** 3298414

### Sample Summary

<u>Lab ID</u>	<u>Sample ID</u>	<u>Matrix</u>	<u>Date Collected</u>	<u>Date Received</u>	<u>Collector</u>	<u>Collection Company</u>
3298414001	RMW-1-BKGN0-04052023	Water	04/05/2023 13:45	04/13/2023 08:53	CBC	Collected By Client



## Reference

### Notes

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- Except as qualified, Clean Water Act sample analyses are consistent with methodology requirements in 40 CFR Part 136.
- Except as qualified, Safe Drinking Water Act sample analyses are consistent with methodology requirements in 40 CFR Part 141.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are performed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.

### Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND) above the MDL
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Practical Quantitation Limit for this Project
ND	Not Detected - indicates that the analyte was Not Detected
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits
#	Please reference the result in the Results Section for analyte-level flags.



**Project** ALK051|K2304148  
**Workorder** 3298414

### Project Notations

### Sample Notations

**Lab ID**      **Sample ID**

### Result Notations

**Notation Ref.**

- |   |  |
|---|--|
| 1 | The QC sample type MS for method SW846 8330B was outside the control limits for the analyte 1,3-Dinitrobenzene. The % Recovery was reported as 122 and the control limits were 78 to 120.    |
| 2 | The QC sample type MS for method SW846 8330B was outside the control limits for the analyte RDX. The % Recovery was reported as 131 and the control limits were 68 to 130.                   |
| 3 | The QC sample type MS for method SW846 8330B was outside the control limits for the analyte 1,3,5-Trinitrobenzene. The % Recovery was reported as 128 and the control limits were 73 to 125. |



**Detected Results Summary**

Not applicable for this WO.



## Results

Client Sample ID	RMW-1-BKGN0-04052023	Collected	04/05/2023 13:45
Lab Sample ID	3298414001	Lab Receipt	04/13/2023 08:53

### ENERGETICS

Compound	Result	Flag	Units	LOQ	LOD	DL	Method	Dilution	Analysis Date/Time	By	Cntr
1,3,5-Trinitrobenzene	0.31U	U,3	ug/L	0.36	0.31	0.083	SW846 8330B	1	04/25/2023 20:28	CGS	A1
1,3-Dinitrobenzene	0.31U	U,1	ug/L	0.36	0.31	0.093	SW846 8330B	1	04/25/2023 20:28	CGS	A1
2,4,6-Trinitrotoluene	0.31U	U	ug/L	0.36	0.31	0.083	SW846 8330B	1	04/25/2023 20:28	CGS	A1
2,4-Dinitrotoluene	0.31U	U	ug/L	0.36	0.31	0.10	SW846 8330B	1	04/25/2023 20:28	CGS	A1
HMX	0.31U	U	ug/L	0.36	0.31	0.093	SW846 8330B	1	04/25/2023 20:28	CGS	A1
Nitrobenzene	0.31U	U	ug/L	0.36	0.31	0.093	SW846 8330B	1	04/25/2023 20:28	CGS	A1
RDX	0.31U	U,2	ug/L	0.36	0.31	0.093	SW846 8330B	1	04/25/2023 20:28	CGS	A1
Tetryl	0.31U	U	ug/L	0.36	0.31	0.093	SW846 8330B	1	04/25/2023 20:28	CGS	A1

### SURROGATES

Compound	CAS No	Recovery	Limits(%)	Analysis Date/Time	Qualifiers
1,4-Dinitrobenzene	100-25-4	106%	50 - 150	04/25/2023 20:28	



**Sample - Method Cross Reference Table**

Lab ID	Sample ID	Analysis Method	Preparation Method	Leachate Method
3298414001	RMW-1-BKGN0-04052023	SW846 8330B	SW846 8330B	



**QUALITY CONTROL SAMPLES**

**ENERGETICS**

QC Batch			
QC Batch	977157	Prep Method	SW846 8330B
Date	04/22/2023 01:40	Analysis Method	SW846 8330B
Tech.	KMR		

Associated Samples
3298414001

**Duplicate** 3658125 (DUP) 3298413001 (non-Project Sample) For QC Batch 977157

\*\*\*\*NOTE - The Original Result and Duplicate Result shown below are raw results and are only used for the purpose of calculating Sample Duplicate percent recoveries. This result is not a final value and cannot be used as such.

**RESULTS**

Compound	CAS No		Result (ug/L)	Orig. Result (ug/L)		Qualifiers
1,3,5-Trinitrobenzene	99-35-4	DUP	0	0	RPD 0 (Max-20)	U
1,3-Dinitrobenzene	99-65-0	DUP	0	0	RPD 0 (Max-20)	U
2,4,6-Trinitrotoluene	118-96-7	DUP	0	0	RPD 0 (Max-20)	U
2,4-Dinitrotoluene	121-14-2	DUP	0	0	RPD 0 (Max-20)	U
HMX	2691-41-0	DUP	0	0	RPD 0 (Max-20)	U
Nitrobenzene	98-95-3	DUP	0	0	RPD 0 (Max-20)	U
RDX	121-82-4	DUP	0	0	RPD 0 (Max-20)	U
Tetryl	479-45-8	DUP	0	0	RPD 0 (Max-20)	U

**SURROGATES**

Compound	CAS No		Result (ug/L)	Expected (ug/L)	Rec. (%)	Limits (%)	Qualifiers
1,4-Dinitrobenzene	100-25-4	DUP	5.60	5.10	110	50 - 150	

**Matrix Spike** 3658124 (MS) 3298414001 For QC Batch 977157

\*\*\*\*NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

**RESULTS**

Compound	CAS No		Result (ug/L)	Orig. Result (ug/L)	Spk Added (ug/L)	Rec. (%)	Limits (%)	RPD Limit (%)	Qualifiers
1,3,5-Trinitrobenzene	99-35-4	MS	1.30	0	1	128*	73 - 125		
1,3-Dinitrobenzene	99-65-0	MS	1.30	0	1	122*	78 - 120		
2,4,6-Trinitrotoluene	118-96-7	MS	1.30	0	1	120	71 - 123		
2,4-Dinitrotoluene	121-14-2	MS	1.20	0	1	118	78 - 120		
HMX	2691-41-0	MS	1.20	0	1	118	65 - 135		
Nitrobenzene	98-95-3	MS	1.20	0	1	116	65 - 134		
RDX	121-82-4	MS	1.40	0	1	131*	68 - 130		
Tetryl	479-45-8	MS	1.30	0	1	124	64 - 128		



**QUALITY CONTROL SAMPLES**

**ENERGETICS (cont.)**

*SURROGATES*

Compound	CAS No		Result (ug/L)	Expected (ug/L)	Rec. (%)	Limits (%)	Qualifiers
1,4-Dinitrobenzene	100-25-4	MS	6	5.20	115	50 - 150	

**Method Blank** 3658126 (MB) Created on 04/22/2023 00:57 For QC Batch 977157

*RESULTS*

Compound	CAS No		Result	Units	LOQ	Qualifiers
1,3,5-Trinitrobenzene	99-35-4	BLK	0.30U	ug/L	0.35	U
1,3-Dinitrobenzene	99-65-0	BLK	0.30U	ug/L	0.35	U
2,4,6-Trinitrotoluene	118-96-7	BLK	0.30U	ug/L	0.35	U
2,4-Dinitrotoluene	121-14-2	BLK	0.30U	ug/L	0.35	U
HMX	2691-41-0	BLK	0.30U	ug/L	0.35	U
Nitrobenzene	98-95-3	BLK	0.30U	ug/L	0.35	U
RDX	121-82-4	BLK	0.30U	ug/L	0.35	U
Tetryl	479-45-8	BLK	0.30U	ug/L	0.35	U

*SURROGATES*

Compound	CAS No		Result (ug/L)	Expected (ug/L)	Rec. (%)	Limits (%)	Qualifiers
1,4-Dinitrobenzene	100-25-4	BLK	5.30	5	106	50 - 150	
1,4-Dinitrobenzene	100-25-4	BLK	5.70	5	115	50 - 150	

**Lab Control Standard** 3658127 (LCS) Created on 04/22/2023 00:57 For QC Batch 977157

*RESULTS*

Compound	CAS No		Result (ug/L)	Orig. Result (ug/L)	Spk Added (ug/L)	Rec. (%)	Limits (%)	RPD Limit (%)	Qualifiers
1,3,5-Trinitrobenzene	99-35-4	LCS	1.20		1	122	73 - 125		
1,3-Dinitrobenzene	99-65-0	LCS	1.20		1	117	78 - 120		
2,4,6-Trinitrotoluene	118-96-7	LCS	1.20		1	117	71 - 123		
2,4-Dinitrotoluene	121-14-2	LCS	1.20		1	116	78 - 120		
HMX	2691-41-0	LCS	1.10		1	113	65 - 135		
Nitrobenzene	98-95-3	LCS	1.10		1	110	65 - 134		
RDX	121-82-4	LCS	1.20		1	120	68 - 130		
Tetryl	479-45-8	LCS	1.10		1	110	64 - 128		

*SURROGATES*

Compound	CAS No		Result (ug/L)	Expected (ug/L)	Rec. (%)	Limits (%)	Qualifiers
1,4-Dinitrobenzene	100-25-4	LCS	5.50	5	109	50 - 150	



### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Lab ID	Sample ID	Preparation Method	Prep Batch	Prep Date/Time	By	Analysis Method	Anly Batch
3298414001	RMW-1-BKGN0-04052023	SW846 8330B	977157	04/22/2023 01:40	KMR	SW846 8330B	979018

# ALS Environmental Chain of Custody

1317 South 13th Avenue • Kelso, WA 98626 • 1-360-577-7222 • FAX 1-360-636-1068

**Project Number:** K2304148  
**Project Manager:** Mark Harris  
**QAP:** DOD QSM v5.1 Kelso

**ALS Contact:** Mark Harris



3298414  
 Logged By: CKW  
 PM: SSL



Lab Code	Sample ID	# of Cont.	Matrix	Sample		Lab ID	NitroAro Amin 8330A
				Date	Time		
K2304148-001	RMW-1-BKGN0-04052023	2	Water	4/5/23	1345	Middletown ALS	X

Temp By: WJ WO Temp (°C) u Therm ID 612  
 Receipt Info Completed By: WJ  
 Cooler Custody Seal Intact Y N NA  
 Sample Custody Seal Intact Y N NA  
 Received on Ice Y N NA  
 Cooler & Samples Intact Y N NA  
 Correct Container's Provided Y N NA  
 Sample Label/COC Agree Y N NA  
 Adequate Sample Volumes Y N NA  
 CR6 Samples Filtered Y N NA  
 OP Samples Filtered Y N NA  
 VOA Headspace Present Y N NA  
 Voa Trip Blank Y N NA  
 NLS 4 Days? Y  
 Rad Screen (uCi) Y  
 Courier/Tracking #: 619516590483  
 SDWA Compliance Y N NA  
 PWSID Y N NA  
 WV Containers 0-6°C Y N NA

<b>Special Instructions/Comments</b> Please provide the electronic (PDF and EDD) report to the following e-mail address: ALS.Data@alsglobal.com.  H - Test is On Hold P - Test is Authorized for Prep Only	<b>Turnaround Requirements</b> RUSH (Surcharges Apply) PLEASE CIRCLE WORK DAYS 1 2 3 4 5 <input checked="" type="checkbox"/> STANDARD Requested FAX Date: _____ Requested Report Date: 04/28/23	<b>Report Requirements</b> I. Results Only _____ <input checked="" type="checkbox"/> II. Results + QC Summaries III. Results + QC and Calibration Summaries _____ IV. Data Validation Report with Raw Data _____ PQL/MDL/J <u>Y</u> EDD <u>Y</u>	<b>Invoice Information</b> PO# 51K2304148 Bill to _____
	Relinquished By: <u>M. Mulli. on 4/12/23</u> Received By: <u>Calvin A. N. AK 4/10/23</u>		

K2304148

✓  
Ship To: Middletown ALS  
ALS Environmental - Middletown  
301 Fulling Mill Rd.  
Middletown, PA 17057

PC NA Date 4/11/25  
SMO MM Date 4/12/23

Instructions:

Ice   
Dry Ice   
No Ice

Shipping:

Overnight   
2nd Day   
Ground

Bill to Client Account

Comments:

ALS Group USA, Corp.  
www.alsglobal.com  
An ALS Limited Company

Aluminum (Total)
Arsenic (Total)
Barium (Total)
Beryllium (Total)
Cadmium (Total)
Chromium (Total)
Copper (Total)
Iron (Total)
Lead (Total)
Manganese (Total)
Mercury (Total)
Nickel (Total)
Selenium (Total)
Silver (Total)
Thallium (Total)
Zinc (Total)
<i>Synthetic Organic Compounds (SOCs)</i>
2, 4-D
2, 4, 5-TP (Silvex)
Alachlor (Alanex)
Atrazine
Benzo(a)Pyrene
BHC-gamma (Lindane)
Carbofuran
Chlordane
Dalapon
Di(2-ethylhexyl)adipate ( <i>adipates</i> )
Di(2-ethylhexyl)phthalate ( <i>phthalates</i> )
Dibromochloropropane (DBCP)
Dinoseb
Diquat
Ethylene Dibromide (EDB)
Endothall
Endrin
Glyphosate
Heptachlor
Heptachlor Epoxide
Hexachlorobenzene (HCB)
Hexachlorocyclopentadiene
Methoxychlor
Pentachlorophenol
Picloram
Simazine
Total Polychlorinated Biphenyls (PCBs)
Toxaphene
Vydate (Oxamyl)

Radium 226
Radium 228
Uranium
<i>Bacteriological</i>
Total Coliform
Fecal Coliform
<i>Explosives</i>
2,4,6-trinitrotoluene (TNT)
hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)
octahydro-1,3,4,7-tetranitro-1,3,5,7-tetrazocine
2,4,6-trinitrophenyl-n-methylnitramine (teryl)
2,4-dinitrotoluene (2,4-DNT)
1,3,5-trinitrobenzene (2,6-DNT)
1,3-dinitrobenzene (DNB)
nitrobenzene (NB)

NOTE: PESTICIDE ANALYSES SHOWN ON FOLLOW





---

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[www.alsglobal.com](http://www.alsglobal.com)

June 14, 2023

**Analytical Report for Service Request No: K2304152**

Matt Thomas  
GSI Water Solutions, Inc  
650 NE Holladay Street  
Suite 900  
Portland, OR 97232

**RE: Umatilla Depot / 913.001.002.002**

Dear Matt,

Enclosed are the results of the sample(s) submitted to our laboratory April 08, 2023  
For your reference, these analyses have been assigned our service request number **K2304152**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at [www.alsglobal.com](http://www.alsglobal.com). All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at [Mark.Harris@alsglobal.com](mailto:Mark.Harris@alsglobal.com).

Respectfully submitted,

**ALS Group USA, Corp. dba ALS Environmental**

Mark Harris  
Project Manager



---

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## Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

### **Inorganic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

### **Metals Data Qualifiers**

- # The control limit criteria is not applicable.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.  
  
i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Organic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Additional Petroleum Hydrocarbon Specific Qualifiers**

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso  
State Certifications, Accreditations, and Licenses**

<b>Agency</b>	<b>Web Site</b>	<b>Number</b>
Alaska DEH	<a href="http://dec.alaska.gov/eh/lab/cs/csapproval.htm">http://dec.alaska.gov/eh/lab/cs/csapproval.htm</a>	UST-040
Arizona DHS	<a href="http://www.azdhs.gov/lab/license/env.htm">http://www.azdhs.gov/lab/license/env.htm</a>	AZ0339
Arkansas - DEQ	<a href="http://www.adeq.state.ar.us/techsvs/labcert.htm">http://www.adeq.state.ar.us/techsvs/labcert.htm</a>	88-0637
California DHS (ELAP)	<a href="http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx">http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx</a>	2795
DOD ELAP	<a href="http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm">http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm</a>	L16-58-R4
Florida DOH	<a href="http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm">http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm</a>	E87412
Hawaii DOH	<a href="http://health.hawaii.gov/">http://health.hawaii.gov/</a>	-
ISO 17025	<a href="http://www.pjllabs.com/">http://www.pjllabs.com/</a>	L16-57
Louisiana DEQ	<a href="http://www.deq.louisiana.gov/page/la-lab-accreditation">http://www.deq.louisiana.gov/page/la-lab-accreditation</a>	03016
Maine DHS	<a href="http://www.maine.gov/dhhs/">http://www.maine.gov/dhhs/</a>	WA01276
Minnesota DOH	<a href="http://www.health.state.mn.us/accreditation">http://www.health.state.mn.us/accreditation</a>	053-999-457
Nevada DEP	<a href="http://ndep.nv.gov/bsdw/labservice.htm">http://ndep.nv.gov/bsdw/labservice.htm</a>	WA01276
New Jersey DEP	<a href="http://www.nj.gov/dep/enforcement/oqa.html">http://www.nj.gov/dep/enforcement/oqa.html</a>	WA005
New York - DOH	<a href="https://www.wadsworth.org/regulatory/elap">https://www.wadsworth.org/regulatory/elap</a>	12060
North Carolina DEQ	<a href="https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification">https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification</a>	605
Oklahoma DEQ	<a href="http://www.deq.state.ok.us/CSDnew/labcert.htm">http://www.deq.state.ok.us/CSDnew/labcert.htm</a>	9801
Oregon – DEQ (NELAP)	<a href="http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx">http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx</a>	WA100010
South Carolina DHEC	<a href="http://www.scdhec.gov/environment/EnvironmentalLabCertification/">http://www.scdhec.gov/environment/EnvironmentalLabCertification/</a>	61002
Texas CEQ	<a href="http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html">http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html</a>	T104704427
Washington DOE	<a href="http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html">http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html</a>	C544
Wyoming (EPA Region 8)	<a href="https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water">https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water</a>	-
Kelso Laboratory Website	<a href="http://www.alsglobal.com">www.alsglobal.com</a>	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at [www.ALSGlobal.com](http://www.ALSGlobal.com) or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.



## Case Narrative

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)



**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot  
**Sample Matrix:** Water

**Service Request:** K2304152  
**Date Received:** 04/08/2023

**CASE NARRATIVE**

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

**Sample Receipt:**

Four water samples were received for analysis at ALS Environmental on 04/08/2023. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

**Semivolatiles by GC/MS:**

Method 8270D, 05/18/2023: The extraction of sample RMW-2-BKGND-04062023 was initially performed within the recommended holding time. Re-extraction was required due to QC failures. The re-extraction was performed past the recommended holding time. The results from the second analysis were reported.

Method 8270D, 05/18/2023: The upper control criterion was exceeded for Bis(2-ethylhexyl) Phthalate in Continuing Calibration Verification (CCV) KQ2308997-02. The field sample analyzed in this sequence did not contain the analyte in question. Since the apparent problem indicated a potential high bias, the data quality was not affected. No further corrective action was required.

Method 8270D, 05/18/2023: The upper control criterion was exceeded for Hexachlorocyclopentadiene in Laboratory Control Sample (LCS) KQ2308254-02 and Duplicate Laboratory Control Sample (DLCS) KQ2308254-03. The analyte in question was not detected in the associated field samples. The error associated with elevated recovery indicated a high bias. The sample data was not significantly affected. No further corrective action was appropriate.

**Semivolatile GC:**

Method 8081B, 06/06/2023: The analysis of method EPA 8081B requires the use of dual column confirmation. When the Continuing Calibration Verification (CCV) criterion is met for both columns, the lower of the two sample results is generally reported. The primary evaluation criteria were not met on the confirmation column for DCB. The results were reported from the column with an acceptable CCV KQ2310297-02. The data quality was not affected. No further corrective action was necessary.

Method 8081B, 06/06/2023: The upper control criterion was exceeded for Toxaphene and TCMX in Laboratory Control Sample (LCS) KQ2306685-09. The analyte in question was not detected in the associated field samples. The error associated with elevated recovery indicate a high bias. The sample data was not significantly affected. No further corrective action was appropriate.

Method 8081B, 06/06/2023: The analysis of sample RMW-2-BKGND-04062023 was performed passed the recommended analytical holding time due to instrument failure. Efforts were made to analyze the sample as soon as possible after the analytical system was back in control. However, the analysis was performed 14 days past the recommended holding time. The data was flagged to indicate the holding time violation.

Method 8081B, 06/06/2023: The spike recovery of Chlordane for Laboratory Control (LCS) Sample and Duplicate Laboratory Control Sample (DLCS) was not performed. The analytes in question were not detected in the associated field samples.

Method 8082A, : The recovery of Decachlorobiphenyl in sample name RMW-2-BKGND-04062023 was outside the control limits listed in the results summary. The limits are default values temporarily in use until sufficient data points are generated to calculate statistical control limits. Based on the method and historic data, the recoveries observed were in the range expected for this procedure. No further corrective action was taken.

Method 8151A, 05/10/2023: The upper control criterion was exceeded for many target analytes in Continuing Calibration

Approved by \_\_\_\_\_

Date 06/14/2023





# Chain of Custody

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)



CHAIN OF CUSTODY  
129889

002

SR# K2304152  
COC Set \_\_\_\_\_ of \_\_\_\_\_  
COC# \_\_\_\_\_

1317 South 13th Ave, Kelso, WA 98626 Phone (360) 577-7222 / 800-695-7222 / FAX (360) 636-1068  
www.alsglobal.com

Project Name: <u>Umatilla Depot</u>		Project Number: <u>913.001.002.002</u>		NUMBER OF CONTAINERS	7D							14D				28D				180D	365D	Remarks										
Project Manager: <u>Matt Kohlbecker</u>					3081B / Pest OC	3151A / HERB	3270D / SVO	3330A / NitroAro Amin	300.0 / Radioact	303.1 / Radium 226	304.0 / Radium 228	SM 2540 C / TDS	SM 2540 D / TSS	3280C / VOC FP	SM 2320 B / Alkalinity Tit	SM 2320 B / Carbonate Alk	SM 4500-CN- E / CN T	300.0 / Chloride	300.0 / F	300.0 / SO4	353.2 / NO2 NO3 T		7470A / Hg T	SM 4500-P E / T Phos	SM 5310 C / TOC T	3010C / Metals T	3020A / Metals T	3082A / PCB 3520				
Company: <u>ESI Water Solutions, Inc</u>					3081B / Pest OC	3151A / HERB	3270D / SVO	3330A / NitroAro Amin	300.0 / Radioact	303.1 / Radium 226	304.0 / Radium 228	SM 2540 C / TDS	SM 2540 D / TSS	3280C / VOC FP	SM 2320 B / Alkalinity Tit	SM 2320 B / Carbonate Alk	SM 4500-CN- E / CN T	300.0 / Chloride	300.0 / F	300.0 / SO4	353.2 / NO2 NO3 T		7470A / Hg T	SM 4500-P E / T Phos	SM 5310 C / TOC T	3010C / Metals T	3020A / Metals T	3082A / PCB 3520				
Address: <u>650 NE Holladay St Ste 900 Portland, OR 97232</u>					3081B / Pest OC	3151A / HERB	3270D / SVO	3330A / NitroAro Amin	300.0 / Radioact	303.1 / Radium 226	304.0 / Radium 228	SM 2540 C / TDS	SM 2540 D / TSS	3280C / VOC FP	SM 2320 B / Alkalinity Tit	SM 2320 B / Carbonate Alk	SM 4500-CN- E / CN T	300.0 / Chloride	300.0 / F	300.0 / SO4	353.2 / NO2 NO3 T		7470A / Hg T	SM 4500-P E / T Phos	SM 5310 C / TOC T	3010C / Metals T	3020A / Metals T	3082A / PCB 3520				
Phone #: <u>503-947-4716</u>		email: <u>mtomas@esivw.com</u>			3081B / Pest OC	3151A / HERB	3270D / SVO	3330A / NitroAro Amin	300.0 / Radioact	303.1 / Radium 226	304.0 / Radium 228	SM 2540 C / TDS	SM 2540 D / TSS	3280C / VOC FP	SM 2320 B / Alkalinity Tit	SM 2320 B / Carbonate Alk	SM 4500-CN- E / CN T	300.0 / Chloride	300.0 / F	300.0 / SO4	353.2 / NO2 NO3 T		7470A / Hg T	SM 4500-P E / T Phos	SM 5310 C / TOC T	3010C / Metals T	3020A / Metals T	3082A / PCB 3520				
Sampler Signature: <u>Matthew Thomas</u>		Sampler Printed Name: <u>Matthew Thomas</u>		3081B / Pest OC	3151A / HERB	3270D / SVO	3330A / NitroAro Amin	300.0 / Radioact	303.1 / Radium 226	304.0 / Radium 228	SM 2540 C / TDS	SM 2540 D / TSS	3280C / VOC FP	SM 2320 B / Alkalinity Tit	SM 2320 B / Carbonate Alk	SM 4500-CN- E / CN T	300.0 / Chloride	300.0 / F	300.0 / SO4	353.2 / NO2 NO3 T	7470A / Hg T	SM 4500-P E / T Phos	SM 5310 C / TOC T	3010C / Metals T	3020A / Metals T	3082A / PCB 3520						
CLIENT SAMPLE ID	LABID	SAMPLING Date	Time	Matrix																												
1. RMW-2-BK6ND-01062023		4/6/23	1555	Water	24	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
2. RMW-1-BK6ND-01052023		4/5/23	1315	Water	4								X									X									4 VOAs	
3. 4-166-BK6ND-01062023		4/6/23	1125	Water	4								X									X								4 VOAs		
4.																																
5.																																
6.																																
7.																																
8.																																
9.																																
10.																																

<b>Report Requirements</b> <input checked="" type="checkbox"/> I. Routine Report: Method Blank, Surrogate, as required <input type="checkbox"/> II. Report Dup., MS, MSD as required <input type="checkbox"/> III. CLP Like Summary (no raw data) <input type="checkbox"/> IV. Data Validation Report <input type="checkbox"/> V. EDD	<b>Invoice Information</b> P.O.# _____ Bill To: _____ _____ _____	Circle which metals are to be analyzed Total Metals: <input type="checkbox"/> Al <input type="checkbox"/> As <input type="checkbox"/> Sb <input type="checkbox"/> Ba <input type="checkbox"/> Be <input type="checkbox"/> B <input type="checkbox"/> Ca <input type="checkbox"/> Cd <input type="checkbox"/> Co <input type="checkbox"/> Cr <input type="checkbox"/> Cu <input type="checkbox"/> Fe <input type="checkbox"/> Pb <input type="checkbox"/> Mg <input type="checkbox"/> Mn <input type="checkbox"/> Mo <input type="checkbox"/> Ni <input type="checkbox"/> K <input type="checkbox"/> Ag <input type="checkbox"/> Na <input type="checkbox"/> Se <input type="checkbox"/> Sr <input type="checkbox"/> Ti <input type="checkbox"/> Sn <input type="checkbox"/> V <input type="checkbox"/> Zn <input type="checkbox"/> Hg Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg
	<b>Turnaround Requirements</b> <input type="checkbox"/> 24 hr. <input type="checkbox"/> 48 hr. <input type="checkbox"/> 5 Day <input type="checkbox"/> Standard Requested Report Date _____	<b>Special Instructions/Comments:</b> Address Invoice to: <u>John Schaffer</u> <u>216 SE 4th St.</u> <u>Pendleton, OR 97801</u> *Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other _____ (Circle One) Email Invoice to: <u>m.kohlbecker@esivw.com</u>

<b>Relinquished By:</b>	<b>Received By:</b>	<b>Relinquished By:</b>	<b>Received By:</b>	<b>Relinquished By:</b>	<b>Received By:</b>
Signature: <u>Matthew Thomas</u>	Signature: <u>Josh McPherson</u>	Signature:	Signature:	Signature:	Signature:
Printed Name: <u>Matthew Thomas</u>	Printed Name: <u>ALS</u>	Printed Name:	Printed Name:	Printed Name:	Printed Name:
Firm: <u>ESI Water Solutions</u>	Firm: <u>4-8-23 1100</u>	Firm:	Firm:	Firm:	Firm:
Date/Time: <u>4/9/23 1200</u>	Date/Time:	Date/Time:	Date/Time:	Date/Time:	Date/Time:







## General Chemistry

**ALS Environmental—Kelso Laboratory**  
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ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Analysis Method:** 300.0  
**Prep Method:** None

**Service Request:** K2304152  
**Date Collected:** 04/6/23  
**Date Received:** 04/8/23  
**Units:** mg/L  
**Basis:** NA

Chloride

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
RMW-2-BKGND-04062023	K2304152-001	14.2	0.20	0.03	0.010	2	04/12/23 01:27	
Method Blank	K2304152-MB1	ND U	0.10	0.02	0.005	1	04/11/23 14:19	
Method Blank	K2304152-MB2	ND U	0.10	0.02	0.005	1	04/11/23 18:03	
Method Blank	K2304152-MB3	ND U	0.10	0.02	0.005	1	04/11/23 21:45	
Method Blank	K2304152-MB4	ND U	0.10	0.02	0.005	1	04/12/23 01:01	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152  
**Date Analyzed:** 04/11/23  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**Chloride**

**Analysis Method:** 300.0  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 800488

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2304152-LCS2	4.79	5.00	96	90-110
Lab Control Sample	K2304152-LCS3	4.81	5.00	96	90-110
Lab Control Sample	K2304152-LCS4	4.83	5.00	97	90-110
Lab Control Sample	K2304152-LCS5	4.86	5.00	97	90-110

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Analysis Method:** 300.0  
**Prep Method:** None

**Service Request:** K2304152  
**Date Collected:** 04/6/23  
**Date Received:** 04/8/23  
**Units:** mg/L  
**Basis:** NA

**Fluoride**

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
RMW-2-BKGND-04062023	K2304152-001	<b>0.28</b>	0.20	0.06	0.02	2	04/12/23 01:27	
Method Blank	K2304152-MB1	ND U	0.10	0.03	0.010	1	04/11/23 14:19	
Method Blank	K2304152-MB2	ND U	0.10	0.03	0.010	1	04/11/23 18:03	
Method Blank	K2304152-MB3	ND U	0.10	0.03	0.010	1	04/11/23 21:45	
Method Blank	K2304152-MB4	ND U	0.10	0.03	0.010	1	04/12/23 01:01	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152  
**Date Analyzed:** 04/11/23  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**Fluoride**

**Analysis Method:** 300.0  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 800488

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2304152-LCS2	4.93	5.00	99	90-110
Lab Control Sample	K2304152-LCS3	4.94	5.00	99	90-110
Lab Control Sample	K2304152-LCS4	4.97	5.00	99	90-110
Lab Control Sample	K2304152-LCS5	4.98	5.00	100	90-110

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Analysis Method:** 300.0  
**Prep Method:** None

**Service Request:** K2304152  
**Date Collected:** 04/6/23  
**Date Received:** 04/8/23  
**Units:** mg/L  
**Basis:** NA

Sulfate

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
RMW-2-BKGND-04062023	K2304152-001	22.6	2.0	1.5	0.6	10	04/17/23 17:47	
Method Blank	K2304152-MB1	ND U	0.20	0.15	0.06	1	04/17/23 14:39	
Method Blank	K2304152-MB2	ND U	0.20	0.15	0.06	1	04/17/23 18:21	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152  
**Date Analyzed:** 04/17/23  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**Sulfate**

**Analysis Method:** 300.0  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 801073

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2304152-LCS2	4.92	5.00	98	90-110
Lab Control Sample	K2304152-LCS3	4.92	5.00	98	90-110

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Analysis Method:** 353.2  
**Prep Method:** Method

**Service Request:** K2304152  
**Date Collected:** 04/6/23  
**Date Received:** 04/8/23  
**Units:** mg/L  
**Basis:** NA

Nitrate+Nitrite as Nitrogen

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
RMW-2-BKGND-04062023	K2304152-001	6.71	0.25	0.10	0.03	5	04/18/23	4/18/23	
Method Blank	K2304152-MB1	ND U	0.050	0.020	0.006	1	04/18/23	4/18/23	

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dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152  
**Date Analyzed:** 04/18/23  
**Date Extracted:** 04/18/23

**Lab Control Sample Summary**  
**Nitrate+Nitrite as Nitrogen**

**Analysis Method:** 353.2  
**Prep Method:** Method

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 801269

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2304152-LCS2	7.31	7.20	102	90-110

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Analysis Method:** SM 2320 B  
**Prep Method:** None

**Service Request:** K2304152  
**Date Collected:** 04/6/23  
**Date Received:** 04/8/23  
**Units:** mg/L  
**Basis:** NA

Alkalinity as CaCO3, Total

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
RMW-2-BKGND-04062023	K2304152-001	169	2.0	1.2	0.6	1	04/18/23 18:06	
Method Blank	K2304152-MB1	0.8 J	2.0	1.2	0.6	1	04/18/23 18:06	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152  
**Date Analyzed:** 04/18/23  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**Alkalinity as CaCO<sub>3</sub>, Total**

**Analysis Method:** SM 2320 B  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 801283

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2304152-LCS2	183	178	103	85-115
Lab Control Sample	K2304152-LCS3	183	178	103	85-115

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dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Analysis Method:** SM 2320 B  
**Prep Method:** None

**Service Request:** K2304152  
**Date Collected:** 04/6/23  
**Date Received:** 04/8/23  
**Units:** mg/L  
**Basis:** NA

Carbonate as CaCO3

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
RMW-2-BKGND-04062023	K2304152-001	ND U	2.0	1.2	0.6	1	04/18/23 18:06	
Method Blank	K2304152-MB1	ND U	2.0	1.2	0.6	1	04/18/23 18:06	

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dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152  
**Date Analyzed:** 04/18/23  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**Carbonate as CaCO<sub>3</sub>**

**Analysis Method:** SM 2320 B  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 801283

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2304152-LCS2	183	178	103	85-115
Lab Control Sample	K2304152-LCS3	183	178	103	85-115

**ALS Group USA, Corp.**

dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152  
**Date Collected:** 4/6/2023  
**Date Received:** 4/8/2023  
**Date Extracted:** NA  
**Date Analyzed:** NA

Langelier Index  
SM 2330B

<b>Sample Name</b>	<b>Lab Code</b>	<b>Temp °C</b>	<b>Result</b>
RMW-2-BKGND-04062023	K2304152-001	16.5	0.288

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Analysis Method:** SM 2540 C  
**Prep Method:** None

**Service Request:** K2304152  
**Date Collected:** 04/6/23  
**Date Received:** 04/8/23  
**Units:** mg/L  
**Basis:** NA

**Solids, Total Dissolved**

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
RMW-2-BKGND-04062023	K2304152-001	291	5.0	-	-	1	04/11/23 17:00	
Method Blank	K2304152-MB1	ND U	5.0	-	-	1	04/11/23 17:00	
Method Blank	K2304152-MB2	ND U	5.0	-	-	1	04/11/23 17:00	

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dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152  
**Date Analyzed:** 04/11/23  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**Solids, Total Dissolved**

**Analysis Method:** SM 2540 C  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 800496

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2304152-LCS2	1880	1920	98	85-115

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Analysis Method:** SM 2540 D  
**Prep Method:** None

**Service Request:** K2304152  
**Date Collected:** 04/6/23  
**Date Received:** 04/8/23  
**Units:** mg/L  
**Basis:** NA

Solids, Total Suspended (TSS)

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
RMW-2-BKGND-04062023	K2304152-001	ND U	5.0	-	-	1	04/11/23 10:19	
Method Blank	K2304152-MB1	ND U	5.0	-	-	1	04/11/23 10:19	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152  
**Date Analyzed:** 04/11/23  
**Date Extracted:** NA

**Duplicate Lab Control Sample Summary**  
**General Chemistry Parameters**

**Analysis Method:** SM 2540 D  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 800438

**Lab Control Sample**  
**K2304152-LCS1**

**Duplicate Lab Control Sample**  
**K2304152-DLCS1**

<u>Analyte Name</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>% Rec Limits</u>	<u>RPD</u>	<u>RPD Limit</u>
Solids, Total Suspended (TSS)	400	400	100	406	400	102	85-115	1	5

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Analysis Method:** SM 4500-CN- E  
**Prep Method:** SM 4500-CN-C

**Service Request:** K2304152  
**Date Collected:** 04/6/23  
**Date Received:** 04/8/23  
**Units:** mg/L  
**Basis:** NA

Cyanide, Total

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
RMW-2-BKGND-04062023	K2304152-001	ND U	0.020	0.002	0.0005	1	04/13/23	4/12/23	
Method Blank	K2304152-MB1	ND U	0.020	0.002	0.0005	1	04/13/23	4/12/23	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152  
**Date Analyzed:** 04/13/23  
**Date Extracted:** 04/12/23

**Lab Control Sample Summary**  
**Cyanide, Total**

**Analysis Method:** SM 4500-CN- E  
**Prep Method:** SM 4500-CN-C

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 800743

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2304152-LCS2	0.0724	0.075	97	84-115

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Analysis Method:** SM 4500-H+ B  
**Prep Method:** None

**Service Request:** K2304152  
**Date Collected:** 04/6/23  
**Date Received:** 04/8/23  
**Units:** pH Units  
**Basis:** NA

**pH**

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
RMW-2-BKGND-04062023	K2304152-001	8.02	-	-	-	1	05/03/23 10:27	H

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152  
**Date Analyzed:** 05/02/23  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**pH**

**Analysis Method:** SM 4500-H+ B  
**Prep Method:** None

**Units:** pH Units  
**Basis:** NA  
**Analysis Lot:** 802898

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2304152-LCS2	5.57	5.58	100	85-115

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Analysis Method:** SM 4500-P E  
**Prep Method:** Method

**Service Request:** K2304152  
**Date Collected:** 04/6/23  
**Date Received:** 04/8/23  
**Units:** mg/L  
**Basis:** NA

Phosphorus, Total

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
RMW-2-BKGND-04062023	K2304152-001	0.059	0.020	0.010	0.005	1	04/19/23	4/19/23	
Method Blank	K2304152-MB1	ND U	0.020	0.010	0.005	1	04/19/23	NA	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152  
**Date Collected:** 04/06/23  
**Date Received:** 04/08/23  
**Date Analyzed:** 04/19/23

**Replicate Sample Summary**  
**General Chemistry Parameters**

**Sample Name:** RMW-2-BKGND-04062023  
**Lab Code:** K2304152-001

**Units:** mg/L  
**Basis:** NA

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>LOQ</u>	<u>LOD</u>	<u>MDL</u>	<u>Sample Result</u>	<u>Duplicate Sample K2304152-001DUP Result</u>	<u>Average</u>	<u>RPD</u>	<u>RPD Limit</u>
Phosphorus, Total	SM 4500-P E	0.020	0.010	0.005	0.059	0.058	0.0585	2	20

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152  
**Date Collected:** 04/06/23  
**Date Received:** 04/08/23  
**Date Analyzed:** 04/19/23  
**Date Extracted:** NA

**Duplicate Matrix Spike Summary**  
**Phosphorus, Total**

**Sample Name:** RMW-2-BKGND-04062023  
**Lab Code:** K2304152-001  
**Analysis Method:** SM 4500-P E  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA

Analyte Name	Sample Result	Result	Matrix Spike K2304152-001MS		Duplicate Matrix Spike K2304152-001DMS		% Rec Limits	RPD	RPD Limit	
			Spike Amount	% Rec	Result	Spike Amount				% Rec
Phosphorus, Total	0.059	0.382	0.400	81	0.389	0.400	83	60-135	2	20

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152  
**Date Analyzed:** 04/19/23  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**Phosphorus, Total**

**Analysis Method:** SM 4500-P E  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 801669

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2304152-LCS2	2.65	2.66	100	85-115

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Analysis Method:** SM 5310 C  
**Prep Method:** None

**Service Request:** K2304152  
**Date Collected:** 04/05/23 - 04/06/23  
**Date Received:** 04/8/23  
**Units:** mg/L  
**Basis:** NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
RMW-2-BKGND-04062023	K2304152-001	0.46 J	0.50	0.20	0.07	1	04/11/23 15:06	
RMW-1-BKGND-04052023	K2304152-002	0.50 J	0.50	0.20	0.07	1	04/11/23 15:06	
4-166-BKGND-04062023	K2304152-003	1.10	0.50	0.20	0.07	1	04/11/23 15:06	
Method Blank	K2304152-MB1	ND U	0.50	0.20	0.07	1	04/11/23 15:06	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152  
**Date Analyzed:** 04/11/23  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**Carbon, Total Organic**

**Analysis Method:** SM 5310 C  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 800518

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2304152-LCS2	24.6	25.0	98	83-117



# Metals

**ALS Environmental—Kelso Laboratory**  
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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Sample Name:** RMW-2-BKGND-04062023  
**Lab Code:** K2304152-001

**Service Request:** K2304152  
**Date Collected:** 04/06/23 15:55  
**Date Received:** 04/08/23 11:00  
**Basis:** NA

Hardness by ICP-AES Calculation 20th Ed.

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>LOQ</u>	<u>LOD</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Q</u>
Hardness, Total as CaCO3	SM 2340 B	198	mg/L	0.09	0.053	0.023	1	04/19/23 15:17	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152  
**Date Collected:** 04/06/23 15:55  
**Date Received:** 04/08/23 11:00

**Sample Name:** RMW-2-BKGND-04062023  
**Lab Code:** K2304152-001

**Basis:** NA

**Total Metals**

Analyte Name	Analysis		Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Date	
	Method	Result							Extracted	Q
Aluminum	6020A	6.2	ug/L	4.0	2.0	0.5	1	04/19/23 15:17	04/17/23	
Antimony	6020A	0.091	ug/L	0.050	0.045	0.020	1	04/19/23 15:17	04/17/23	
Arsenic	6020A	4.83	ug/L	0.50	0.25	0.09	1	04/19/23 15:17	04/17/23	
Barium	6020A	33.3	ug/L	0.050	0.045	0.020	1	04/19/23 15:17	04/17/23	
Beryllium	6020A	ND U	ug/L	0.020	0.015	0.005	1	04/19/23 15:17	04/17/23	
Cadmium	6020A	ND U	ug/L	0.020	0.018	0.008	1	04/19/23 15:17	04/17/23	
Calcium	6020A	54200	ug/L	20	13	6	1	04/19/23 15:17	04/17/23	
Chromium	6020A	1.44	ug/L	0.20	0.10	0.03	1	04/19/23 15:17	04/17/23	
Copper	6020A	0.19 J	ug/L	0.20	0.09	0.05	1	04/19/23 15:17	04/17/23	
Iron	6020A	2.5	ug/L	2.0	1.0	0.3	1	04/19/23 15:17	04/17/23	
Lead	6020A	ND U	ug/L	0.020	0.018	0.006	1	04/19/23 15:17	04/17/23	
Magnesium	6020A	15200	ug/L	10	5	2	1	04/19/23 15:17	04/17/23	
Manganese	6020A	1.07	ug/L	0.20	0.10	0.04	1	04/19/23 15:17	04/17/23	
Mercury	7470A	ND U	ug/L	0.20	0.05	0.02	1	04/18/23 08:27	04/17/23	
Nickel	6020A	0.07 J	ug/L	0.20	0.15	0.04	1	04/19/23 15:17	04/17/23	
Potassium	6020A	4450	ug/L	50	45	20	1	04/19/23 15:17	04/17/23	
Selenium	6020A	0.7 J	ug/L	1.0	0.5	0.2	1	04/19/23 15:17	04/17/23	
Silver	6020A	ND U	ug/L	0.020	0.018	0.009	1	04/19/23 15:17	04/17/23	
Sodium	6020A	22700	ug/L	50	45	20	1	04/19/23 15:17	04/17/23	
Thallium	6020A	ND U	ug/L	0.020	0.018	0.009	1	04/19/23 15:17	04/17/23	
Zinc	6020A	ND U	ug/L	2.0	1.0	0.5	1	04/19/23 15:17	04/17/23	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2305906-01

**Service Request:** K2304152  
**Date Collected:** NA  
**Date Received:** NA  
**Basis:** NA

**Total Metals**

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Date	
									Extracted	Q
Aluminum	6020A	<b>1.3 J</b>	ug/L	4.0	2.0	0.5	1	04/19/23 14:50	04/17/23	
Antimony	6020A	ND U	ug/L	0.050	0.045	0.020	1	04/19/23 14:50	04/17/23	
Arsenic	6020A	ND U	ug/L	0.50	0.25	0.09	1	04/19/23 14:50	04/17/23	
Barium	6020A	ND U	ug/L	0.050	0.045	0.020	1	04/19/23 14:50	04/17/23	
Beryllium	6020A	ND U	ug/L	0.020	0.015	0.005	1	04/19/23 14:50	04/17/23	
Cadmium	6020A	ND U	ug/L	0.020	0.018	0.008	1	04/19/23 14:50	04/17/23	
Calcium	6020A	ND U	ug/L	20	13	6	1	04/19/23 14:50	04/17/23	
Chromium	6020A	ND U	ug/L	0.20	0.10	0.03	1	04/19/23 14:50	04/17/23	
Copper	6020A	ND U	ug/L	0.20	0.09	0.05	1	04/19/23 14:50	04/17/23	
Iron	6020A	<b>1.2 J</b>	ug/L	2.0	1.0	0.3	1	04/19/23 14:50	04/17/23	
Lead	6020A	ND U	ug/L	0.020	0.018	0.006	1	04/19/23 14:50	04/17/23	
Magnesium	6020A	ND U	ug/L	10	5	2	1	04/19/23 14:50	04/17/23	
Manganese	6020A	ND U	ug/L	0.20	0.10	0.04	1	04/19/23 14:50	04/17/23	
Nickel	6020A	ND U	ug/L	0.20	0.15	0.04	1	04/19/23 14:50	04/17/23	
Potassium	6020A	ND U	ug/L	50	45	20	1	04/19/23 14:50	04/17/23	
Selenium	6020A	ND U	ug/L	1.0	0.5	0.2	1	04/19/23 14:50	04/17/23	
Silver	6020A	ND U	ug/L	0.020	0.018	0.009	1	04/19/23 14:50	04/17/23	
Sodium	6020A	ND U	ug/L	50	45	20	1	04/19/23 14:50	04/17/23	
Thallium	6020A	ND U	ug/L	0.020	0.018	0.009	1	04/19/23 14:50	04/17/23	
Zinc	6020A	ND U	ug/L	2.0	1.0	0.5	1	04/19/23 14:50	04/17/23	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2306768-01

**Service Request:** K2304152  
**Date Collected:** NA  
**Date Received:** NA  
**Basis:** NA

Total Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>LOQ</u>	<u>LOD</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Mercury	7470A	ND U	ug/L	0.20	0.05	0.02	1	04/18/23 08:20	04/17/23	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152  
**Date Analyzed:** 04/19/23

**Lab Control Sample Summary**  
**Total Metals**

**Units:**ug/L  
**Basis:**NA

**Lab Control Sample**  
KQ2305906-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Aluminum	6020A	109	100	109	84-117
Antimony	6020A	10.5	10.0	105	85-117
Arsenic	6020A	48.5	50.0	97	84-116
Barium	6020A	102	100	102	86-114
Beryllium	6020A	2.53	2.50	101	83-121
Cadmium	6020A	25.3	25.0	101	87-115
Calcium	6020A	278	250	111	87-118
Chromium	6020A	10.0	10.0	100	85-116
Copper	6020A	13.0	12.5	104	85-118
Iron	6020A	50.7	50.0	101	87-118
Lead	6020A	51.1	50.0	102	88-115
Magnesium	6020A	254	250	102	83-118
Manganese	6020A	24.8	25.0	99	87-115
Nickel	6020A	25.7	25.0	103	85-117
Potassium	6020A	255	250	102	87-115
Selenium	6020A	49.6	50.0	99	80-120
Silver	6020A	12.9	12.5	103	85-116
Sodium	6020A	257	250	103	85-117
Thallium	6020A	51.1	50.0	102	82-116
Zinc	6020A	25.6	25.0	102	83-119

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152  
**Date Analyzed:** 04/18/23

**Lab Control Sample Summary**  
**Total Metals**

**Units:**ug/L  
**Basis:**NA

**Lab Control Sample**  
KQ2306768-02

<b>Analyte Name</b>	<b>Analytical Method</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Mercury	7470A	5.01	5.00	100	82-119



# Low Level Organochlorine Pesticides by GC

**ALS Environmental—Kelso Laboratory**  
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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Sample Name:** RMW-2-BKGND-04062023  
**Lab Code:** K2304152-001

**Service Request:** K2304152  
**Date Collected:** 04/06/23 15:55  
**Date Received:** 04/08/23 11:00

**Units:** ug/L  
**Basis:** NA

**Low Level Organochlorine Pesticides by GC**

**Analysis Method:** 8081B  
**Prep Method:** None

Analyte Name	Result	LOQ	Dil.	Date Analyzed	Date Extracted	Q
gamma-BHC (Lindane)	ND U	0.010	1	06/06/23 07:04	4/13/23	*
Chlordane	ND U	0.20	1	06/06/23 07:04	4/13/23	*
Endrin	ND U	0.010	1	06/06/23 07:04	4/13/23	*
Heptachlor	ND U	0.010	1	06/06/23 07:04	4/13/23	*
Heptachlor Epoxide	ND U	0.010	1	06/06/23 07:04	4/13/23	*
Hexachlorobenzene	ND U	0.010	1	06/06/23 07:04	4/13/23	*
Methoxychlor	ND U	0.010	1	06/06/23 07:04	4/13/23	*
Toxaphene	ND U	0.60	1	06/06/23 07:04	4/13/23	*

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Decachlorobiphenyl	72	14 - 160	06/06/23 07:04	
Tetrachloro-m-xylene	83	30 - 148	06/06/23 07:04	

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152

**SURROGATE RECOVERY SUMMARY**  
**Low Level Organochlorine Pesticides by GC**

**Analysis Method:** 8081B  
**Extraction Method:** None

Sample Name	Lab Code	Decachlorobiphenyl	Tetrachloro-m-xylene
		14 - 160	30 - 148
RMW-2-BKGND-04062023	K2304152-001	72	83
Method Blank	KQ2306685-06	106	83
Lab Control Sample	KQ2306685-07	78	89
Duplicate Lab Control Sample	KQ2306685-08	72	84
Lab Control Sample	KQ2306685-09	153	170 *
Duplicate Lab Control Sample	KQ2306685-10	76	86

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2306685-06

**Service Request:** K2304152  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/L  
**Basis:** NA

**Low Level Organochlorine Pesticides by GC**

**Analysis Method:** 8081B  
**Prep Method:** EPA 3511

Analyte Name	Result	LOQ	Dil.	Date Analyzed	Date Extracted	Q
gamma-BHC (Lindane)	ND U	0.010	1	06/05/23 23:58	4/13/23	
Chlordane	ND U	0.20	1	06/05/23 23:58	4/13/23	
Endrin	ND U	0.010	1	06/05/23 23:58	4/13/23	
Heptachlor	ND U	0.010	1	06/05/23 23:58	4/13/23	
Heptachlor Epoxide	ND U	0.010	1	06/05/23 23:58	4/13/23	
Hexachlorobenzene	ND U	0.010	1	06/05/23 23:58	4/13/23	
Methoxychlor	ND U	0.010	1	06/05/23 23:58	4/13/23	
Toxaphene	ND U	0.60	1	06/05/23 23:58	4/13/23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Decachlorobiphenyl	106	14 - 160	06/05/23 23:58	
Tetrachloro-m-xylene	83	30 - 148	06/05/23 23:58	

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152  
**Date Analyzed:** 06/06/23  
**Date Extracted:** 04/13/23

**Duplicate Lab Control Sample Summary**  
**Low Level Organochlorine Pesticides by GC**

**Analysis Method:** 8081B  
**Prep Method:** EPA 3511

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 806889

**Lab Control Sample**  
**KQ2306685-07**

**Duplicate Lab Control Sample**  
**KQ2306685-08**

Analyte Name	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec	% Rec	RPD	RPD Limit
							Limits		
Endrin	0.209	0.250	84	0.192	0.250	77	66-178	9	30
gamma-BHC (Lindane)	0.217	0.250	87	0.213	0.250	85	67-172	2	30
Heptachlor	0.214	0.250	86	0.211	0.250	84	61-178	1	30
Heptachlor Epoxide	0.189	0.250	76	0.192	0.250	77	59-163	2	30
Hexachlorobenzene	0.225	0.250	90	0.220	0.250	88	52-132	2	30
Methoxychlor	0.203	0.250	81	0.198	0.250	79	65-183	2	30

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dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152  
**Date Analyzed:** 06/06/23  
**Date Extracted:** 04/13/23

**Duplicate Lab Control Sample Summary**  
**Low Level Organochlorine Pesticides by GC**

**Analysis Method:** 8081B  
**Prep Method:** None

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 806889

**Lab Control Sample**  
**KQ2306685-09**

**Duplicate Lab Control Sample**  
**KQ2306685-10**

<u>Analyte Name</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>% Rec Limits</u>	<u>RPD</u>	<u>RPD Limit</u>
Toxaphene	23.4	10.0	234 *	12.5	10.0	125	66-154	60 *	30

ALS Group USA, Corp.  
dba ALS Environmental

Confirmation Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Matrix:** Water  
**Sample Name:** Lab Control Sample  
**Lab Code:** KQ2306685-07

**Service Request:** K2304152  
**Date Collected:** NA  
**Date Received:**

**Units:** ug/L  
**Basis:** NA

Low Level Organochlorine Pesticides by GC

**Analytical Method:** 8081B  
**Prep Method:** EPA 3511

LOQ	LOQ	Primary Result	Confirmation Result	RPD	Q	Dilution Factor	Date Analyzed
Endrin	0.010	0.209	0.210	<1		1	06/06/23 00:29
Heptachlor	0.010	0.214	0.262	20		1	06/06/23 00:29
Heptachlor Epoxide	0.010	0.189	0.205	8		1	06/06/23 00:29
Hexachlorobenzene	0.010	0.225	0.233	3		1	06/06/23 00:29
Methoxychlor	0.010	0.203	0.230	12		1	06/06/23 00:29
gamma-BHC (Lindane)	0.010	0.217	0.233	7		1	06/06/23 00:29

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Confirmation Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Matrix:** Water  
**Sample Name:** Duplicate Lab Control Sample  
**Lab Code:** KQ2306685-08

**Service Request:** K2304152  
**Date Collected:** NA  
**Date Received:**

**Units:** ug/L  
**Basis:** NA

Low Level Organochlorine Pesticides by GC

**Analytical Method:** 8081B  
**Prep Method:** EPA 3511

LOQ	LOQ	Primary Result	Confirmation Result	RPD	Q	Dilution Factor	Date Analyzed
Endrin	0.010	0.192	0.201	5		1	06/06/23 00:59
Heptachlor	0.010	0.211	0.235	11		1	06/06/23 00:59
Heptachlor Epoxide	0.010	0.192	0.204	6		1	06/06/23 00:59
Hexachlorobenzene	0.010	0.220	0.227	3		1	06/06/23 00:59
Methoxychlor	0.010	0.198	0.234	17		1	06/06/23 00:59
gamma-BHC (Lindane)	0.010	0.213	0.229	7		1	06/06/23 00:59

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Confirmation Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Matrix:** Water  
**Sample Name:** Lab Control Sample  
**Lab Code:** KQ2306685-09

**Service Request:** K2304152  
**Date Collected:** NA  
**Date Received:**

**Units:** ug/L  
**Basis:** NA

Low Level Organochlorine Pesticides by GC

**Analytical Method:** 8081B  
**Prep Method:** None

<b>LOQ</b>	<b>LOQ</b>	<b>Primary Result</b>	<b>Confirmation Result</b>	<b>RPD</b>	<b>Q</b>	<b>Dilution Factor</b>	<b>Date Analyzed</b>
Toxaphene	0.60	23.4	24.6	5		1	06/06/23 05:33

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Confirmation Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Matrix:** Water  
**Sample Name:** Duplicate Lab Control Sample  
**Lab Code:** KQ2306685-10

**Service Request:** K2304152  
**Date Collected:** NA  
**Date Received:**

**Units:** ug/L  
**Basis:** NA

Low Level Organochlorine Pesticides by GC

**Analytical Method:** 8081B  
**Prep Method:** None

<b>LOQ</b>	<b>LOQ</b>	<b>Primary Result</b>	<b>Confirmation Result</b>	<b>RPD</b>	<b>Q</b>	<b>Dilution Factor</b>	<b>Date Analyzed</b>
Toxaphene	0.60	12.5	12.6	<1		1	06/06/23 06:03



## Polychlorinated Biphenyls (PCBs)

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

Analytical Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152  
**Date Collected:** 04/06/2023  
**Date Received:** 04/08/2023

Polychlorinated Biphenyls (PCBs)

**Sample Name:** RMW-2-BKGND-04062023  
**Lab Code:** K2304152-001  
**Extraction Method:** EPA 3520C  
**Analysis Method:** 8082A

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1221	ND	U	0.040		0.040	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1232	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1242	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1248	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1254	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1260	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	69	70-130	05/26/23	Outside Control Limits

**Comments:** \_\_\_\_\_

Analytical Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152  
**Date Collected:** NA  
**Date Received:** NA

**Polychlorinated Biphenyls (PCBs)**

**Sample Name:** Method Blank  
**Lab Code:** KWG2300805-1  
**Extraction Method:** EPA 3520C  
**Analysis Method:** 8082A

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1221	ND	U	0.040		0.040	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1232	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1242	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1248	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1254	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1260	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	83	70-130	05/26/23	Acceptable

**Comments:** \_\_\_\_\_

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152

**Surrogate Recovery Summary  
 Polychlorinated Biphenyls (PCBs)**

**Extraction Method:** EPA 3520C  
**Analysis Method:** 8082A

**Units:** Percent  
**Level:** Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
RMW-2-BKGND-04062023	K2304152-001	69 *
Method Blank	KWG2300805-1	83
Lab Control Sample	KWG2300805-2	79
Duplicate Lab Control Sample	KWG2300805-3	79

**Surrogate Recovery Control Limits (%)**

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Sur1 = Decachlorobiphenyl 70-130

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Results flagged with an asterisk (\*) indicate values outside control criteria.  
 Results flagged with a pound (#) indicate the control criteria is not applicable.

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152  
**Date Extracted:** 05/17/2023  
**Date Analyzed:** 05/26/2023

**Lab Control Spike/Duplicate Lab Control Spike Summary**  
**Polychlorinated Biphenyls (PCBs)**

**Extraction Method:** EPA 3520C  
**Analysis Method:** 8082A

**Units:** ug/L  
**Basis:** NA  
**Level:** Low  
**Extraction Lot:** KWG2300805

Analyte Name	Lab Control Sample KWG2300805-2 Lab Control Spike			Duplicate Lab Control Sample KWG2300805-3 Duplicate Lab Control Spike			%Rec Limits	RPD	RPD Limit
	Result	Spike Amount	%Rec	Result	Spike Amount	%Rec			
Aroclor 1016	0.196	0.250	78	0.175	0.250	70	70-130	11	30
Aroclor 1260	0.188	0.250	75	0.205	0.250	82	70-130	8	30

Results flagged with an asterisk (\*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.



# Chlorinated Herbicides by GC

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

**ALS Group USA, Corp.**  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Sample Name:** RMW-2-BKGND-04062023  
**Lab Code:** K2304152-001

**Service Request:** K2304152  
**Date Collected:** 04/06/23 15:55  
**Date Received:** 04/08/23 11:00

**Units:** ug/L  
**Basis:** NA

**Chlorinated Herbicides by GC**

**Analysis Method:** 8151A  
**Prep Method:** Method

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
2,4,5-T	ND U	0.20	0.10	0.033	1	05/10/23 13:46	4/12/23	
2,4,5-TP (Silvex)	ND U	0.20	0.10	0.045	1	05/10/23 13:46	4/12/23	*
2,4-D	ND U	0.40	0.10	0.036	1	05/10/23 13:46	4/12/23	
2,4-DB	<b>0.12 J</b>	0.40	0.20	0.10	1	05/10/23 13:46	4/12/23	
Dalapon	ND U	0.40	0.28	0.28	1	05/10/23 13:46	4/12/23	
Dicamba	ND U	0.20	0.10	0.025	1	05/10/23 13:46	4/12/23	*
Dichlorprop	ND U	0.40	0.10	0.030	1	05/10/23 13:46	4/12/23	*
Dinoseb	ND U	0.20	0.060	0.015	1	05/10/23 13:46	4/12/23	
MCPA	ND U	100	20	8.7	1	05/10/23 13:46	4/12/23	
MCPP	ND U	100	20	14	1	05/10/23 13:46	4/12/23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4-Dichlorophenylacetic Acid	78	17 - 113	05/10/23 13:46	

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152

**SURROGATE RECOVERY SUMMARY**  
**Chlorinated Herbicides by GC**

**Analysis Method:** 8151A  
**Extraction Method:** Method

<b>Sample Name</b>	<b>Lab Code</b>	<b>2,4-Dichlorophenylacetic Acid 17 - 113</b>
RMW-2-BKGND-04062023	K2304152-001	78
Method Blank	KQ2306579-01	56
Lab Control Sample	KQ2306579-02	68
Duplicate Lab Control Sample	KQ2306579-03	78

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152  
**Date Collected:** NA  
**Date Received:** NA

**Sample Name:** Method Blank  
**Lab Code:** KQ2306579-01

**Units:** ug/L  
**Basis:** NA

**Chlorinated Herbicides by GC**

**Analysis Method:** 8151A  
**Prep Method:** Method

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
2,4,5-T	ND U	0.20	0.10	0.033	1	05/10/23 11:47	4/12/23	
2,4,5-TP (Silvex)	ND U	0.20	0.10	0.045	1	05/10/23 11:47	4/12/23	
2,4-D	ND U	0.40	0.10	0.036	1	05/10/23 11:47	4/12/23	
2,4-DB	<b>0.13 JP</b>	0.40	0.20	0.10	1	05/10/23 11:47	4/12/23	
Dalapon	ND U	0.40	0.28	0.28	1	05/10/23 11:47	4/12/23	
Dicamba	ND U	0.20	0.10	0.025	1	05/10/23 11:47	4/12/23	
Dichlorprop	ND U	0.40	0.10	0.030	1	05/10/23 11:47	4/12/23	
Dinoseb	ND U	0.20	0.060	0.015	1	05/10/23 11:47	4/12/23	
MCPA	ND U	100	20	8.7	1	05/10/23 11:47	4/12/23	
MCPD	ND U	100	20	14	1	05/10/23 11:47	4/12/23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4-Dichlorophenylacetic Acid	56	17 - 113	05/10/23 11:47	

**ALS Group USA, Corp.**  
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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152  
**Date Analyzed:** 05/10/23  
**Date Extracted:** 04/12/23

**Duplicate Lab Control Sample Summary**  
**Chlorinated Herbicides by GC**

**Analysis Method:** 8151A  
**Prep Method:** Method

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 806155

**Lab Control Sample**  
**KQ2306579-02**

**Duplicate Lab Control Sample**  
**KQ2306579-03**

Analyte Name	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec	% Rec Limits	RPD	RPD Limit
2,4,5-T	2.07	2.50	83	2.24	2.50	90	30-120	8	30
2,4,5-TP (Silvex)	1.90	2.50	76	2.11	2.50	85	37-114	11	30
2,4-D	1.80	2.50	72	2.04	2.50	82	35-110	13	30
2,4-DB	2.12	2.50	85	2.11	2.50	84	10-134	<1	30
Dalapon	1.55	2.50	62	1.94	2.50	77	14-110	22	30
Dicamba	2.00	2.50	80	2.20	2.50	88	30-108	9	30
Dichlorprop	1.95	2.50	78	2.30	2.50	92	29-104	17	30
Dinoseb	2.04	2.50	82	2.06	2.50	83	11-105	1	30
MCPA	194	250	78	214	250	86	21-117	10	30
MCPP	175	250	70	199	250	80	16-141	13	30

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Confirmation Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Matrix:** Water  
**Sample Name:** RMW-2-BKGND-04062023  
**Lab Code:** K2304152-001

**Service Request:** K2304152  
**Date Collected:** 04/06/23 15:55  
**Date Received:** 4/8/23

**Units:** ug/L  
**Basis:** NA

Chlorinated Herbicides by GC

**Analytical Method:** 8151A  
**Prep Method:** Method

<u>LOQ</u>	<u>LOQ</u>	<u>MDL</u>	<u>Primary Result</u>	<u>Confirmation Result</u>	<u>RPD</u>	<u>Q</u>	<u>Dilution Factor</u>	<u>Date Analyzed</u>
2,4-DB		0.10	0.12	0.18	40	J	1	05/10/23 13:46

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Confirmation Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2306579-01

**Service Request:** K2304152  
**Date Collected:** NA  
**Date Received:**

**Units:** ug/L  
**Basis:** NA

Chlorinated Herbicides by GC

**Analytical Method:** 8151A  
**Prep Method:** Method

<b>LOQ</b>	<b>LOQ</b>	<b>MDL</b>	<b>Primary Result</b>	<b>Confirmation Result</b>	<b>RPD</b>	<b>Q</b>	<b>Dilution Factor</b>	<b>Date Analyzed</b>
2,4-DB		0.10	0.13	0.22	51	JP	1	05/10/23 11:47

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Confirmation Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Matrix:** Water  
**Sample Name:** Lab Control Sample  
**Lab Code:** KQ2306579-02

**Service Request:** K2304152  
**Date Collected:** NA  
**Date Received:**

**Units:** ug/L  
**Basis:** NA

Chlorinated Herbicides by GC

**Analytical Method:** 8151A  
**Prep Method:** Method

LOQ	LOQ	MDL	Primary Result	Confirmation Result	RPD	Q	Dilution Factor	Date Analyzed
2,4,5-T		0.033	2.07	2.24	8		1	05/10/23 12:11
2,4,5-TP (Silvex)		0.045	1.90	1.96	3		1	05/10/23 12:11
2,4-D		0.036	1.80	1.85	3		1	05/10/23 12:11
2,4-DB		0.10	2.12	2.96	33		1	05/10/23 12:11
Dalapon		0.28	1.55	1.66	7		1	05/10/23 12:11
Dicamba		0.025	2.00	2.09	4		1	05/10/23 12:11
Dichlorprop		0.030	1.95	2.07	6		1	05/10/23 12:11
Dinoseb		0.015	2.04	2.09	2		1	05/10/23 12:11
MCPA		8.7	194	198	2		1	05/10/23 12:11
MCPP		14	175	179	2		1	05/10/23 12:11

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dba ALS Environmental

Confirmation Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Matrix:** Water  
**Sample Name:** Duplicate Lab Control Sample  
**Lab Code:** KQ2306579-03

**Service Request:** K2304152  
**Date Collected:** NA  
**Date Received:**

**Units:** ug/L  
**Basis:** NA

Chlorinated Herbicides by GC

**Analytical Method:** 8151A  
**Prep Method:** Method

LOQ	LOQ	MDL	Primary Result	Confirmation Result	RPD	Q	Dilution Factor	Date Analyzed
2,4,5-T		0.033	2.24	2.30	3		1	05/10/23 12:34
2,4,5-TP (Silvex)		0.045	2.11	2.15	2		1	05/10/23 12:34
2,4-D		0.036	2.04	2.05	<1		1	05/10/23 12:34
2,4-DB		0.10	2.11	2.11	<1		1	05/10/23 12:34
Dalapon		0.28	1.94	2.09	7		1	05/10/23 12:34
Dicamba		0.025	2.20	2.28	4		1	05/10/23 12:34
Dichlorprop		0.030	2.30	2.32	<1		1	05/10/23 12:34
Dinoseb		0.015	2.06	2.09	1		1	05/10/23 12:34
MCPA		8.7	214	220	3		1	05/10/23 12:34
MCPP		14	199	199	<1		1	05/10/23 12:34



# Volatile Organic Compounds by GC/MS

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

**ALS Group USA, Corp.**  
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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152  
**Date Collected:** 04/06/23 15:55  
**Date Received:** 04/08/23 11:00

**Sample Name:** RMW-2-BKGND-04062023  
**Lab Code:** K2304152-001

**Units:** ug/L  
**Basis:** NA

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Q
1,1,1-Trichloroethane (TCA)	ND U	0.50	0.075	1	04/13/23 14:42	*
1,1,2-Trichloroethane	ND U	0.50	0.14	1	04/13/23 14:42	
1,1-Dichloroethene	ND U	0.50	0.080	1	04/13/23 14:42	*
1,2,4-Trichlorobenzene	ND U	2.0	0.096	1	04/13/23 14:42	
1,2-Dibromo-3-chloropropane	ND U	2.0	0.22	1	04/13/23 14:42	
1,2-Dibromoethane (EDB)	ND U	2.0	0.10	1	04/13/23 14:42	
1,2-Dichloroethane (EDC)	ND U	0.50	0.080	1	04/13/23 14:42	
1,2-Dichloropropane	ND U	0.50	0.095	1	04/13/23 14:42	
Benzene	ND U	0.50	0.062	1	04/13/23 14:42	*
Chlorobenzene	ND U	0.50	0.11	1	04/13/23 14:42	
Ethylbenzene	ND U	0.50	0.050	1	04/13/23 14:42	*
Methylene Chloride	ND U	2.0	0.10	1	04/13/23 14:42	
Styrene	ND U	0.50	0.089	1	04/13/23 14:42	*
Tetrachloroethene (PCE)	ND U	0.50	0.099	1	04/13/23 14:42	
Toluene	ND U	0.50	0.054	1	04/13/23 14:42	*
Trichloroethene (TCE)	ND U	0.50	0.10	1	04/13/23 14:42	
Vinyl Chloride	ND U	0.50	0.075	1	04/13/23 14:42	
cis-1,2-Dichloroethene	ND U	0.50	0.067	1	04/13/23 14:42	
m,p-Xylenes	ND U	0.50	0.11	1	04/13/23 14:42	*
o-Xylene	ND U	0.50	0.074	1	04/13/23 14:42	*
trans-1,2-Dichloroethene	ND U	0.50	0.072	1	04/13/23 14:42	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,2-Dichloroethane-d4	110	81 - 118	04/13/23 14:42	
4-Bromofluorobenzene	84	85 - 114	04/13/23 14:42	*
Dibromofluoromethane	120	80 - 119	04/13/23 14:42	*
Toluene-d8	102	89 - 112	04/13/23 14:42	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152  
**Date Collected:** 04/05/23 13:45  
**Date Received:** 04/08/23 11:00

**Sample Name:** RMW-1-BKGND-04052023  
**Lab Code:** K2304152-002

**Units:** ug/L  
**Basis:** NA

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Q
1,1,1-Trichloroethane (TCA)	ND U	0.50	0.075	1	04/13/23 15:02	*
1,1,2-Trichloroethane	ND U	0.50	0.14	1	04/13/23 15:02	
1,1-Dichloroethene	ND U	0.50	0.080	1	04/13/23 15:02	*
1,2,4-Trichlorobenzene	ND U	2.0	0.096	1	04/13/23 15:02	
1,2-Dibromo-3-chloropropane	ND U	2.0	0.22	1	04/13/23 15:02	
1,2-Dibromoethane (EDB)	ND U	2.0	0.10	1	04/13/23 15:02	
1,2-Dichloroethane (EDC)	ND U	0.50	0.080	1	04/13/23 15:02	
1,2-Dichloropropane	ND U	0.50	0.095	1	04/13/23 15:02	
Benzene	ND U	0.50	0.062	1	04/13/23 15:02	*
Chlorobenzene	ND U	0.50	0.11	1	04/13/23 15:02	
Ethylbenzene	ND U	0.50	0.050	1	04/13/23 15:02	*
Methylene Chloride	ND U	2.0	0.10	1	04/13/23 15:02	
Styrene	ND U	0.50	0.089	1	04/13/23 15:02	*
Tetrachloroethene (PCE)	ND U	0.50	0.099	1	04/13/23 15:02	
Toluene	ND U	0.50	0.054	1	04/13/23 15:02	*
Trichloroethene (TCE)	ND U	0.50	0.10	1	04/13/23 15:02	
Vinyl Chloride	ND U	0.50	0.075	1	04/13/23 15:02	
cis-1,2-Dichloroethene	ND U	0.50	0.067	1	04/13/23 15:02	
m,p-Xylenes	ND U	0.50	0.11	1	04/13/23 15:02	*
o-Xylene	ND U	0.50	0.074	1	04/13/23 15:02	*
trans-1,2-Dichloroethene	ND U	0.50	0.072	1	04/13/23 15:02	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,2-Dichloroethane-d4	111	81 - 118	04/13/23 15:02	
4-Bromofluorobenzene	82	85 - 114	04/13/23 15:02	*
Dibromofluoromethane	121	80 - 119	04/13/23 15:02	*
Toluene-d8	99	89 - 112	04/13/23 15:02	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152  
**Date Collected:** 04/06/23 13:45  
**Date Received:** 04/08/23 11:00

**Sample Name:** 4-166-BKGND-04062023  
**Lab Code:** K2304152-003

**Units:** ug/L  
**Basis:** NA

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Q
1,1,1-Trichloroethane (TCA)	ND U	0.50	0.075	1	04/13/23 15:22	*
1,1,2-Trichloroethane	ND U	0.50	0.14	1	04/13/23 15:22	
1,1-Dichloroethene	ND U	0.50	0.080	1	04/13/23 15:22	*
1,2,4-Trichlorobenzene	ND U	2.0	0.096	1	04/13/23 15:22	
1,2-Dibromo-3-chloropropane	ND U	2.0	0.22	1	04/13/23 15:22	
1,2-Dibromoethane (EDB)	ND U	2.0	0.10	1	04/13/23 15:22	
1,2-Dichloroethane (EDC)	ND U	0.50	0.080	1	04/13/23 15:22	
1,2-Dichloropropane	ND U	0.50	0.095	1	04/13/23 15:22	
Benzene	ND U	0.50	0.062	1	04/13/23 15:22	*
Chlorobenzene	ND U	0.50	0.11	1	04/13/23 15:22	
Ethylbenzene	ND U	0.50	0.050	1	04/13/23 15:22	*
Methylene Chloride	ND U	2.0	0.10	1	04/13/23 15:22	
Styrene	ND U	0.50	0.089	1	04/13/23 15:22	*
Tetrachloroethene (PCE)	ND U	0.50	0.099	1	04/13/23 15:22	
Toluene	ND U	0.50	0.054	1	04/13/23 15:22	*
Trichloroethene (TCE)	ND U	0.50	0.10	1	04/13/23 15:22	
Vinyl Chloride	ND U	0.50	0.075	1	04/13/23 15:22	
cis-1,2-Dichloroethene	ND U	0.50	0.067	1	04/13/23 15:22	
m,p-Xylenes	ND U	0.50	0.11	1	04/13/23 15:22	*
o-Xylene	ND U	0.50	0.074	1	04/13/23 15:22	*
trans-1,2-Dichloroethene	ND U	0.50	0.072	1	04/13/23 15:22	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,2-Dichloroethane-d4	114	81 - 118	04/13/23 15:22	
4-Bromofluorobenzene	83	85 - 114	04/13/23 15:22	*
Dibromofluoromethane	122	80 - 119	04/13/23 15:22	*
Toluene-d8	103	89 - 112	04/13/23 15:22	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Sample Name:** Trip Blank  
**Lab Code:** K2304152-004

**Service Request:** K2304152  
**Date Collected:** 04/05/23 13:45  
**Date Received:** 04/08/23 11:00

**Units:** ug/L  
**Basis:** NA

**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Q
1,1,1-Trichloroethane (TCA)	ND U	0.50	0.075	1	04/13/23 14:22	*
1,1,2-Trichloroethane	ND U	0.50	0.14	1	04/13/23 14:22	
1,1-Dichloroethene	ND U	0.50	0.080	1	04/13/23 14:22	*
1,2,4-Trichlorobenzene	ND U	2.0	0.096	1	04/13/23 14:22	
1,2-Dibromo-3-chloropropane	ND U	2.0	0.22	1	04/13/23 14:22	
1,2-Dibromoethane (EDB)	ND U	2.0	0.10	1	04/13/23 14:22	
1,2-Dichloroethane (EDC)	ND U	0.50	0.080	1	04/13/23 14:22	
1,2-Dichloropropane	ND U	0.50	0.095	1	04/13/23 14:22	
Benzene	ND U	0.50	0.062	1	04/13/23 14:22	*
Chlorobenzene	ND U	0.50	0.11	1	04/13/23 14:22	
Ethylbenzene	ND U	0.50	0.050	1	04/13/23 14:22	*
Methylene Chloride	<b>0.25 J</b>	2.0	0.10	1	04/13/23 14:22	
Styrene	ND U	0.50	0.089	1	04/13/23 14:22	*
Tetrachloroethene (PCE)	ND U	0.50	0.099	1	04/13/23 14:22	
Toluene	ND U	0.50	0.054	1	04/13/23 14:22	*
Trichloroethene (TCE)	ND U	0.50	0.10	1	04/13/23 14:22	
Vinyl Chloride	ND U	0.50	0.075	1	04/13/23 14:22	
cis-1,2-Dichloroethene	ND U	0.50	0.067	1	04/13/23 14:22	
m,p-Xylenes	ND U	0.50	0.11	1	04/13/23 14:22	*
o-Xylene	ND U	0.50	0.074	1	04/13/23 14:22	*
trans-1,2-Dichloroethene	ND U	0.50	0.072	1	04/13/23 14:22	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,2-Dichloroethane-d4	106	81 - 118	04/13/23 14:22	
4-Bromofluorobenzene	81	85 - 114	04/13/23 14:22	*
Dibromofluoromethane	117	80 - 119	04/13/23 14:22	
Toluene-d8	101	89 - 112	04/13/23 14:22	

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152

**SURROGATE RECOVERY SUMMARY**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Extraction Method:** None

Sample Name	Lab Code	1,2-Dichloroethane-d4	4-Bromofluorobenzene	Dibromofluoromethane
		81 - 118	85 - 114	80 - 119
RMW-2-BKGND-04062023	K2304152-001	110	84 *	120 *
RMW-1-BKGND-04052023	K2304152-002	111	82 *	121 *
4-166-BKGND-04062023	K2304152-003	114	83 *	122 *
Trip Blank	K2304152-004	106	81 *	117
Lab Control Sample	KQ2306796-03	95	93	104
Duplicate Lab Control Sample	KQ2306796-04	97	94	108
Method Blank	KQ2306796-05	110	83 *	118

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152

**SURROGATE RECOVERY SUMMARY**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Extraction Method:** None

Sample Name	Lab Code	Toluene-d8
		89 - 112
RMW-2-BKGND-04062023	K2304152-001	102
RMW-1-BKGND-04052023	K2304152-002	99
4-166-BKGND-04062023	K2304152-003	103
Trip Blank	K2304152-004	101
Lab Control Sample	KQ2306796-03	105
Duplicate Lab Control Sample	KQ2306796-04	102
Method Blank	KQ2306796-05	100

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2306796-05

**Service Request:** K2304152  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/L  
**Basis:** NA

Volatile Organic Compounds by GC/MS

**Analysis Method:** 8260C  
**Prep Method:** None

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Q
1,1,1-Trichloroethane (TCA)	ND U	0.50	0.075	1	04/13/23 14:02	
1,1,2-Trichloroethane	ND U	0.50	0.14	1	04/13/23 14:02	
1,1-Dichloroethene	ND U	0.50	0.080	1	04/13/23 14:02	
1,2,4-Trichlorobenzene	ND U	2.0	0.096	1	04/13/23 14:02	
1,2-Dibromo-3-chloropropane	ND U	2.0	0.22	1	04/13/23 14:02	
1,2-Dibromoethane (EDB)	ND U	2.0	0.10	1	04/13/23 14:02	
1,2-Dichloroethane (EDC)	ND U	0.50	0.080	1	04/13/23 14:02	
1,2-Dichloropropane	ND U	0.50	0.095	1	04/13/23 14:02	
Benzene	ND U	0.50	0.062	1	04/13/23 14:02	
Chlorobenzene	ND U	0.50	0.11	1	04/13/23 14:02	
Ethylbenzene	ND U	0.50	0.050	1	04/13/23 14:02	
Methylene Chloride	<b>0.16 J</b>	2.0	0.10	1	04/13/23 14:02	
Styrene	ND U	0.50	0.089	1	04/13/23 14:02	
Tetrachloroethene (PCE)	ND U	0.50	0.099	1	04/13/23 14:02	
Toluene	ND U	0.50	0.054	1	04/13/23 14:02	
Trichloroethene (TCE)	ND U	0.50	0.10	1	04/13/23 14:02	
Vinyl Chloride	ND U	0.50	0.075	1	04/13/23 14:02	
cis-1,2-Dichloroethene	ND U	0.50	0.067	1	04/13/23 14:02	
m,p-Xylenes	ND U	0.50	0.11	1	04/13/23 14:02	
o-Xylene	ND U	0.50	0.074	1	04/13/23 14:02	
trans-1,2-Dichloroethene	ND U	0.50	0.072	1	04/13/23 14:02	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,2-Dichloroethane-d4	110	81 - 118	04/13/23 14:02	
4-Bromofluorobenzene	83	85 - 114	04/13/23 14:02	*
Dibromofluoromethane	118	80 - 119	04/13/23 14:02	
Toluene-d8	100	89 - 112	04/13/23 14:02	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152  
**Date Analyzed:** 04/13/23  
**Date Extracted:** NA

**Duplicate Lab Control Sample Summary**  
**Volatile Organic Compounds by GC/MS**

**Analysis Method:** 8260C  
**Prep Method:** None

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 800776

Analyte Name	Lab Control Sample KQ2306796-03			Duplicate Lab Control Sample KQ2306796-04			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
1,1,1-Trichloroethane (TCA)	11.8	10.0	118	13.2	10.0	132 *	74-131	12	20
1,1,2-Trichloroethane	9.76	10.0	98	11.0	10.0	110	80-119	12	20
1,1-Dichloroethene	11.9	10.0	119	13.2	10.0	132 *	71-131	10	20
1,2,4-Trichlorobenzene	8.94	10.0	89	9.65	10.0	97	69-130	8	20
1,2-Dibromo-3-chloropropane	9.56	10.0	96	10.5	10.0	105	62-128	9	20
1,2-Dibromoethane (EDB)	9.94	10.0	99	11.4	10.0	114	77-121	14	20
1,2-Dichloroethane (EDC)	10.7	10.0	107	11.4	10.0	114	73-128	6	20
1,2-Dichloropropane	10.8	10.0	108	11.7	10.0	117	78-122	8	20
Benzene	11.7	10.0	117	12.4	10.0	124 *	79-120	6	20
Chlorobenzene	10.3	10.0	103	11.8	10.0	118	82-118	14	20
cis-1,2-Dichloroethene	11.4	10.0	114	12.2	10.0	122	78-123	7	20
Ethylbenzene	10.4	10.0	104	12.4	10.0	124 *	79-121	17	20
m,p-Xylenes	22.0	20.0	110	25.2	20.0	126 *	80-121	14	20
Methylene Chloride	10.8	10.0	108	11.5	10.0	115	74-124	6	20
o-Xylene	10.7	10.0	107	12.4	10.0	124 *	78-122	15	20
Styrene	11.3	10.0	113	12.8	10.0	128 *	78-123	13	20
Tetrachloroethene (PCE)	10.6	10.0	106	12.0	10.0	120	74-129	13	20
Toluene	11.9	10.0	119	12.7	10.0	127 *	80-121	7	20
trans-1,2-Dichloroethene	11.6	10.0	116	12.4	10.0	124	75-124	7	20
Trichloroethene (TCE)	11.3	10.0	113	12.3	10.0	123	79-123	8	20
Vinyl Chloride	11.9	10.0	119	13.1	10.0	131	58-137	9	20



# Semi-Volatile Organic Compounds by GC/MS

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

**ALS Group USA, Corp.**  
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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Sample Name:** RMW-2-BKGND-04062023  
**Lab Code:** K2304152-001

**Service Request:** K2304152  
**Date Collected:** 04/06/23 15:55  
**Date Received:** 04/08/23 11:00  
**Units:** ug/L  
**Basis:** NA

**Semivolatile Organic Compounds by GC/MS**

**Analysis Method:** 8270D  
**Prep Method:** EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Benzo(a)pyrene	ND U	10	0.27	1	05/18/23 18:48	5/8/23	*
Bis(2-ethylhexyl) Phthalate	ND U	10	0.28	1	05/18/23 18:48	5/8/23	*
Hexachlorobenzene	ND U	10	0.36	1	05/18/23 18:48	5/8/23	*
Hexachlorocyclopentadiene	ND U	51	1.6	1	05/18/23 18:48	5/8/23	*
Pentachlorophenol	ND U	26	3.6	1	05/18/23 18:48	5/8/23	*

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2-Fluorobiphenyl	75	44 - 119	05/18/23 18:48	
Terphenyl-d14	95	50 - 134	05/18/23 18:48	
2,4,6-Tribromophenol	67	43 - 140	05/18/23 18:48	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152

**SURROGATE RECOVERY SUMMARY**  
**Semivolatile Organic Compounds by GC/MS**

**Analysis Method:** 8270D  
**Extraction Method:** EPA 3520C

Sample Name	Lab Code	2,4,6-Tribromophenol	2-Fluorobiphenyl	Terphenyl-d14
		43 - 140	44 - 119	50 - 134
RMW-2-BKGND-04062023	K2304152-001	67	75	95
Method Blank	KQ2308254-01	76	83	108
Lab Control Sample	KQ2308254-02	78	75	79
Duplicate Lab Control Sample	KQ2308254-03	83	75	81

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2308254-01

**Service Request:** K2304152  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/L  
**Basis:** NA

**Semivolatile Organic Compounds by GC/MS**

**Analysis Method:** 8270D  
**Prep Method:** EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Benzo(a)pyrene	ND U	10	0.26	1	05/18/23 16:58	5/8/23	
Bis(2-ethylhexyl) Phthalate	ND U	10	0.27	1	05/18/23 16:58	5/8/23	
Hexachlorobenzene	ND U	10	0.35	1	05/18/23 16:58	5/8/23	
Hexachlorocyclopentadiene	ND U	50	1.5	1	05/18/23 16:58	5/8/23	
Pentachlorophenol	ND U	25	3.5	1	05/18/23 16:58	5/8/23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2-Fluorobiphenyl	83	44 - 119	05/18/23 16:58	
Terphenyl-d14	108	50 - 134	05/18/23 16:58	
2,4,6-Tribromophenol	76	43 - 140	05/18/23 16:58	

**ALS Group USA, Corp.**  
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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304152  
**Date Analyzed:** 05/18/23  
**Date Extracted:** 05/08/23

**Duplicate Lab Control Sample Summary**  
**Semivolatile Organic Compounds by GC/MS**

**Analysis Method:** 8270D  
**Prep Method:** EPA 3520C

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 804819

**Lab Control Sample**  
**KQ2308254-02**

**Duplicate Lab Control Sample**  
**KQ2308254-03**

Analyte Name	Lab Control Sample			Duplicate Lab Control Sample			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Benzo(a)pyrene	106	100	106	105	100	105	54-128	1	20
Bis(2-ethylhexyl) Phthalate	113	100	113	110	100	110	55-135	3	20
Hexachlorobenzene	84.2	100	84	81.8	100	82	53-125	3	20
Hexachlorocyclopentadiene	56.2	100	56 *	53.3	100	53 *	10-45	5	20
Pentachlorophenol	74.3	100	74	77.0	100	77	35-138	4	20



# Subcontract Lab Results

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)



May 03, 2023

Mark Harris  
ALS  
1317 South 13th Avenue  
Kelso, Washington 98626

Re: Kelso - Harris L2  
Work Order: 618243

Dear Mark Harris:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on April 13, 2023. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Test results for NELAP or ISO 17025 accredited tests are verified to meet the requirements of those standards, with any exceptions noted. The results reported relate only to the items tested and to the sample as received by the laboratory. These results may not be reproduced except as full reports without approval by the laboratory. Copies of GEL's accreditations and certifications can be found on our website at [www.gel.com](http://www.gel.com).

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4422.

Sincerely,

Adrian Melendrez for  
Jake Crook  
Project Manager

Purchase Order: 51K2304152  
Enclosures



# Case Narrative

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: May 3, 2023

Company : ALS  
 Address : 1317 South 13th Avenue  
  
 Kelso, Washington 98626  
 Contact: Mark Harris  
 Project: Kelso - Harris L2

Client Sample ID: RMW-2-BKND-04062023	Project: ALSE01223
Sample ID: 618243001	Client ID: ALSE001
Matrix: Water	
Collect Date: 06-APR-23 15:55	
Receive Date: 13-APR-23	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
<b>Metals Analysis-ICP-MS</b>												
200.2/200.8 Uranium "As Received"												
Uranium		2.22	0.0670	0.200	ug/L	1.00	1	SKJ	04/17/23	2348	2413024	1
<b>Rad Gas Flow Proportional Counting</b>												
GFPC Gross A/B, Liquid "As Received"												
Alpha	U	1.79	2.78	4.00	pCi/L			KP1	05/02/23	1641	2415696	2
Beta	U	2.45	3.53	4.00	pCi/L							
GFPC Ra228, Liquid "As Received"												
Radium-228		2.00	1.53	3.00	pCi/L			JE1	05/02/23	0907	2414124	3
Rad Radium-226												
Lucas Cell, Ra226, Liquid "As Received"												
Radium-226	U	0.257	0.361	1.00	pCi/L			LXP1	05/02/23	0924	2414112	4

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 200.2	ICP-MS 200.2 PREP	EM2	04/13/23	1540	2413022

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 200.8	
2	EPA 900.0/SW846 9310	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC Ra228, Liquid "As Received"			79.2	(15%-125%)

**Notes:**

Column headers are defined as follows:

- |                                       |                                |
|---------------------------------------|--------------------------------|
| DF: Dilution Factor                   | Lc/LC: Critical Level          |
| DL: Detection Limit                   | PF: Prep Factor                |
| MDA: Minimum Detectable Activity      | RL: Reporting Limit            |
| MDC: Minimum Detectable Concentration | SQL: Sample Quantitation Limit |

**Receipt Narrative  
for  
ALS Environmental  
SDG: 618243**

**May 03, 2023**

**Laboratory Identification:**

GEL Laboratories LLC  
2040 Savage Road  
Charleston, South Carolina 29407  
(843) 556-8171

**Summary:**

**Sample receipt:** The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on April 13, 2023 for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

**Sample Identification:** The laboratory received the following sample:

<b><u>Laboratory ID</u></b>	<b><u>Client ID</u></b>
618243001	RMW-2-BKND-04062023

**Case Narrative:**

Sample analyses were conducted using methodology as outlined in GEL's Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Radiochemistry and Metals.



Adrian Melendrez for  
Jake Crook  
Project Manager

# **Chain of Custody and Supporting Documentation**

# ALS Environmental Chain of Custody

1317 South 13th Avenue • Kelso, WA 98626 • 1-360-577-7222 • FAX 1-360-636-1068

ALS Contact: Mark Harris

Project Number: K2304152  
 Project Manager: Mark Harris  
 QAPP: DOD QSM v5.1 Kelso

Lab Code	Sample ID	# of Cont.	Matrix	Sample Time		Lab ID	Misc Out 1	Radioact 900.0	Radium 226 903.1	Radium 228 904.0
				Date	Time					
K2304152-001	RMW-2-BKND-04062023	4	Water	4/6/23	1555	GEL Labs LLC	X	X	X	X

618243

Test Comments  
 Misc Out 1 - None

K2304152-001

Uranium

<b>Special Instructions/Comments</b> Please provide the electronic (PDF and EDD) report to the following e-mail address: ALS.Data@alsglobal.com.	<b>Turnaround Requirements</b> ___ RUSH (Surcharges Apply) <b>PLEASE CIRCLE WORK DAYS</b> 1 2 3 4 5 ___ STANDARD Requested FAX Date: _____ Requested Report Date: 04/28/23	<b>Report Requirements</b> ___ I. Results Only ___ II. Results + QC Summaries ___ III. Results + QC and Calibration Summaries ___ IV. Data Validation Report with Raw Data PQL/MDL/1 ___ Y ___ EDD ___ Y ___	<b>Invoice Information</b> PO# 51K2304152 Bill to

Relinquished By: M. Munnigan 4/13/23 Received By: [Signature] Airbill Number: 4113128 950

K2304152

**Ship To: GEL Labs LLC**  
GEL Laboratories, LLC  
2040 Savage Road  
Charleston, SC 29407

PC MA Date 4/11/23  
SMO MA Date 4/12/23

**Instructions:**

Ice \_\_\_\_\_  
Dry Ice \_\_\_\_\_  
No Ice

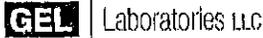
**Shipping:**

Overnight   
2nd Day \_\_\_\_\_  
Ground \_\_\_\_\_

Bill to Client Account \_\_\_\_\_

Comments:

ALS Group USA, Corp.  
www.alsglobal.com  
An ALS Limited Company



**SAMPLE RECEIPT & REVIEW FORM**

Client: <b>ALSE</b>		SDG/AR/COC/Work Order: <b>618243</b>			
Received By: <b>SNS</b>		Date Received: <b>4/12/23</b>			
Carrier and Tracking Number		Circle Applicable: <input checked="" type="radio"/> FedEx Express <input type="radio"/> FedEx Ground <input type="radio"/> UPS <input type="radio"/> Field Services <input type="radio"/> Courier <input type="radio"/> Other <b>619516590499</b>			
Suspected Hazard Information		*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.			
A) Shipped as a DOT Hazardous?		Hazard Class Shipped: _____ UN#: _____ If UN2910, Is the Radioactive Shipment Survey Compliant? Yes ___ No ___			
B) Did the client designate the samples are to be received as radioactive?		COC notation or radioactive stickers on containers equal client designation.			
C) Did the RSO classify the samples as radioactive?		Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u> (CPM) mR/Hr Classified as: Rad 1    Rad 2    Rad 3			
D) Did the client designate samples are hazardous?		COC notation or hazard labels on containers equal client designation.			
E) Did the RSO identify possible hazards?		If D or E is yes, select Hazards below. PCB's    Flammable    Foreign Soil    RCRA    Asbestos    Beryllium    Other:			
Sample Receipt Criteria		Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	X			Circle Applicable:    Seals broken    Damaged container    Leaking container    Other (describe)
2	Chain of custody documents included with shipment?	X			Circle Applicable:    Client contacted and provided COC    COC created upon receipt
3	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	X			Preservation Method: Wet Ice    Ice Packs    Dry Ice <u>None</u> Other: *all temperatures are recorded in Celsius    TEMP: <u>20</u>
4	Daily check performed and passed on IR temperature gun?	X			Temperature Device Serial #: <u>JR1-23</u> Secondary Temperature Device Serial # (If Applicable): _____
5	Sample containers intact and sealed?	X			Circle Applicable:    Seals broken    Damaged container    Leaking container    Other (describe)
6	Samples requiring chemical preservation at proper pH?	X			Sample ID's and Containers Affected: If Preservation added, Lot#: _____
7	Do any samples require Volatile Analysis?			X	If Yes, are Encores or Soil Kits present for solids? Yes ___ No ___ NA ___ (If yes, take to VOA Freezer) Do liquid VOA vials contain acid preservation? Yes ___ No ___ NA ___ (If unknown, select No) Are liquid VOA vials free of headspace? Yes ___ No ___ NA ___ Sample ID's and containers affected: _____
8	Samples received within holding time?	X			ID's and tests affected: _____
9	Sample ID's on COC match ID's on bottles?	X			ID's and containers affected: _____
10	Date & time on COC match date & time on bottles?	X			Circle Applicable:    No dates on containers    No times on containers    COC missing info    Other (describe)
11	Number of containers received match number indicated on COC?	X			Circle Applicable:    No container count on COC    Other (describe)
12	Are sample containers identifiable as GEL provided by use of GEL labels?	X			
13	COC form is properly signed in relinquished/received sections?	X			Circle Applicable:    Not relinquished    Other (describe)
Comments (Use Continuation Form if needed):					

PM (or PMA) review: Initials JM    Date 4-14-23    Page 1 of 1

# Laboratory Certifications

**List of current GEL Certifications as of 03 May 2023**

<b>State</b>	<b>Certification</b>
Alabama	42200
Alaska	17-018
Alaska Drinking Water	SC00012
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana Drinking Water	LA024
Louisiana NELAP	03046 (AI33904)
Maine	2019020
Maryland	270
Massachusetts	M-SC012
Massachusetts PFAS Approv	Letter
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122023-4
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	2022-160
Pennsylvania NELAP	68-00485
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
Sanitation Districts of L	9255651
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-22-20
Utah NELAP	SC000122022-37
Vermont	VT87156
Virginia NELAP	460202
Washington	C780



301 Fulling Mill Road | Middletown, PA 17057 | Phone: 717-944-5541 | Fax: 717-944-1430 | [www.alsglobal.com](http://www.alsglobal.com)

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618

State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

Analytical Results Report For

**ALS Environmental-Kelso**

Project [ALK049JK2304152](#)

Workorder [3298412](#)

Report ID [240310 on 4/28/2023](#)

### Certificate of Analysis

Enclosed are the analytical results for samples received by the laboratory on Apr 13, 2023.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Sarah Leung (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at [www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads](http://www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads).

This laboratory report may not be reproduced, except in full, without the written approval of ALS Global.  
ALS Middletown: 301 Fulling Mill Road, Middletown, PA 17057 : 717-944-5541.

Recipient(s):

ALKLS Data - ALS Environmental-Kelso

Mark Harris - ALS Environmental-Kelso

*Sarah Leung*

**Sarah Leung**  
Project Coordinator

(ALS Digital Signature)

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*



**Project** ALK049|K2304152

**Workorder** 3298412

### Sample Summary

<u>Lab ID</u>	<u>Sample ID</u>	<u>Matrix</u>	<u>Date Collected</u>	<u>Date Received</u>	<u>Collector</u>	<u>Collection Company</u>
3298412001	RMW-2-BKND-04062023	Water	04/06/2023 15:55	04/13/2023 08:53	CBC	Collected By Client



Reference

**Notes**

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- Except as qualified, Clean Water Act sample analyses are consistent with methodology requirements in 40 CFR Part 136.
- Except as qualified, Safe Drinking Water Act sample analyses are consistent with methodology requirements in 40 CFR Part 141.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are performed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.

**Standard Acronyms/Flags**

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND) above the MDL
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Practical Quantitation Limit for this Project
ND	Not Detected - indicates that the analyte was Not Detected
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits
#	Please reference the result in the Results Section for analyte-level flags.



**Project** ALK049|K2304152  
**Workorder** 3298412

**Project Notations**

**Sample Notations**

**Lab ID**      **Sample ID**

**Result Notations**

**Notation Ref.**



**Project** ALK049|K2304152  
**Workorder** 3298412

### Detected Results Summary

Client Sample ID	RMW-2-BKND-04062023	Collected	04/06/2023 15:55
Lab Sample ID	3298412001	Lab Receipt	04/13/2023 08:53

<u>Compound</u>	<u>Result</u>	<u>Units</u>	<u>LOQ</u>	<u>LOD</u>	<u>DL</u>	<u>Method</u>	<u>Flag</u>
<b>ENERGETICS</b>							
RDX	0.97	ug/L	0.35	0.30	0.090	SW846 8330B	#



Project ALK049|K2304152  
 Workorder 3298412

## Results

Client Sample ID	RMW-2-BKND-04062023	Collected	04/06/2023 15:55
Lab Sample ID	3298412001	Lab Receipt	04/13/2023 08:53

### ENERGETICS

Compound	Result	Flag	Units	LOQ	LOD	DL	Method	Dilution	Analysis Date/Time	By	Cntr
1,3,5-Trinitrobenzene	0.30U	U	ug/L	0.35	0.30	0.080	SW846 8330B	1	04/25/2023 23:32	CGS	A1
1,3-Dinitrobenzene	0.30U	U	ug/L	0.35	0.30	0.090	SW846 8330B	1	04/25/2023 23:32	CGS	A1
2,4,6-Trinitrotoluene	0.30U	U	ug/L	0.35	0.30	0.080	SW846 8330B	1	04/25/2023 23:32	CGS	A1
2,4-Dinitrotoluene	0.30U	U	ug/L	0.35	0.30	0.10	SW846 8330B	1	04/25/2023 23:32	CGS	A1
HMX	0.30U	U	ug/L	0.35	0.30	0.090	SW846 8330B	1	04/25/2023 23:32	CGS	A1
Nitrobenzene	0.30U	U	ug/L	0.35	0.30	0.090	SW846 8330B	1	04/25/2023 23:32	CGS	A1
RDX	0.97		ug/L	0.35	0.30	0.090	SW846 8330B	1	04/25/2023 23:32	CGS	A1
Tetryl	0.30U	U	ug/L	0.35	0.30	0.090	SW846 8330B	1	04/25/2023 23:32	CGS	A1

### SURROGATES

Compound	CAS No	Recovery	Limits(%)	Analysis Date/Time	Qualifiers
1,4-Dinitrobenzene	100-25-4	113%	50 - 150	04/25/2023 23:32	



### Sample - Method Cross Reference Table

Lab ID	Sample ID	Analysis Method	Preparation Method	Leachate Method
3298412001	RMW-2-BKND-04062023	SW846 8330B	SW846 8330B	



Project ALK049|K2304152  
 Workorder 3298412

**QUALITY CONTROL SAMPLES**

**ENERGETICS**

QC Batch			
QC Batch	977157	Prep Method	SW846 8330B
Date	04/22/2023 01:40	Analysis Method	SW846 8330B
Tech.	KMR		

Associated Samples
3298412001

**Matrix Spike** 3658124 (MS) 3298414001 (non-Project Sample) For QC Batch 977157

\*\*\*\*NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

**RESULTS**

Compound	CAS No		Result (ug/L)	Orig. Result (ug/L)	Spk Added (ug/L)	Rec. (%)	Limits (%)	RPD Limit (%)	Qualifiers
1,3,5-Trinitrobenzene	99-35-4	MS	1.30	0	1	128*	73 - 125		
1,3-Dinitrobenzene	99-65-0	MS	1.30	0	1	122*	78 - 120		
2,4,6-Trinitrotoluene	118-96-7	MS	1.30	0	1	120	71 - 123		
2,4-Dinitrotoluene	121-14-2	MS	1.20	0	1	118	78 - 120		
HMX	2691-41-0	MS	1.20	0	1	118	65 - 135		
Nitrobenzene	98-95-3	MS	1.20	0	1	116	65 - 134		
RDX	121-82-4	MS	1.40	0	1	131*	68 - 130		
Tetryl	479-45-8	MS	1.30	0	1	124	64 - 128		

**SURROGATES**

Compound	CAS No		Result (ug/L)	Expected (ug/L)	Rec. (%)	Limits (%)	Qualifiers
1,4-Dinitrobenzene	100-25-4	MS	6	5.20	115	50 - 150	

**Duplicate** 3658125 (DUP) 3298413001 (non-Project Sample) For QC Batch 977157

\*\*\*\*NOTE - The Original Result and Duplicate Result shown below are raw results and are only used for the purpose of calculating Sample Duplicate percent recoveries. This result is not a final value and cannot be used as such.

**RESULTS**

Compound	CAS No		Result (ug/L)	Orig. Result (ug/L)	Qualifiers
1,3,5-Trinitrobenzene	99-35-4	DUP	0	0	RPD <u>0</u> (Max-20) U
1,3-Dinitrobenzene	99-65-0	DUP	0	0	RPD <u>0</u> (Max-20) U
2,4,6-Trinitrotoluene	118-96-7	DUP	0	0	RPD <u>0</u> (Max-20) U
2,4-Dinitrotoluene	121-14-2	DUP	0	0	RPD <u>0</u> (Max-20) U
HMX	2691-41-0	DUP	0	0	RPD <u>0</u> (Max-20) U
Nitrobenzene	98-95-3	DUP	0	0	RPD <u>0</u> (Max-20) U
RDX	121-82-4	DUP	0	0	RPD <u>0</u> (Max-20) U
Tetryl	479-45-8	DUP	0	0	RPD <u>0</u> (Max-20) U



**QUALITY CONTROL SAMPLES**

**ENERGETICS (cont.)**

*SURROGATES*

Compound	CAS No		Result (ug/L)	Expected (ug/L)	Rec. (%)	Limits (%)	Qualifiers
1,4-Dinitrobenzene	100-25-4	DUP	5.60	5.10	110	50 - 150	

**Method Blank** 3658126 (MB) Created on 04/22/2023 00:57 For QC Batch 977157

*RESULTS*

Compound	CAS No		Result	Units	LOQ	Qualifiers
1,3,5-Trinitrobenzene	99-35-4	BLK	0.30U	ug/L	0.35	U
1,3-Dinitrobenzene	99-65-0	BLK	0.30U	ug/L	0.35	U
2,4,6-Trinitrotoluene	118-96-7	BLK	0.30U	ug/L	0.35	U
2,4-Dinitrotoluene	121-14-2	BLK	0.30U	ug/L	0.35	U
HMX	2691-41-0	BLK	0.30U	ug/L	0.35	U
Nitrobenzene	98-95-3	BLK	0.30U	ug/L	0.35	U
RDX	121-82-4	BLK	0.30U	ug/L	0.35	U
Tetryl	479-45-8	BLK	0.30U	ug/L	0.35	U

*SURROGATES*

Compound	CAS No		Result (ug/L)	Expected (ug/L)	Rec. (%)	Limits (%)	Qualifiers
1,4-Dinitrobenzene	100-25-4	BLK	5.30	5	106	50 - 150	
1,4-Dinitrobenzene	100-25-4	BLK	5.70	5	115	50 - 150	

**Lab Control Standard** 3658127 (LCS) Created on 04/22/2023 00:57 For QC Batch 977157

*RESULTS*

Compound	CAS No		Result (ug/L)	Orig. Result (ug/L)	Spk Added (ug/L)	Rec. (%)	Limits (%)	RPD Limit (%)	Qualifiers
1,3,5-Trinitrobenzene	99-35-4	LCS	1.20		1	122	73 - 125		
1,3-Dinitrobenzene	99-65-0	LCS	1.20		1	117	78 - 120		
2,4,6-Trinitrotoluene	118-96-7	LCS	1.20		1	117	71 - 123		
2,4-Dinitrotoluene	121-14-2	LCS	1.20		1	116	78 - 120		
HMX	2691-41-0	LCS	1.10		1	113	65 - 135		
Nitrobenzene	98-95-3	LCS	1.10		1	110	65 - 134		
RDX	121-82-4	LCS	1.20		1	120	68 - 130		
Tetryl	479-45-8	LCS	1.10		1	110	64 - 128		

*SURROGATES*

Compound	CAS No		Result (ug/L)	Expected (ug/L)	Rec. (%)	Limits (%)	Qualifiers
1,4-Dinitrobenzene	100-25-4	LCS	5.50	5	109	50 - 150	



### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Lab ID	Sample ID	Preparation Method	Prep Batch	Prep Date/Time	By	Analysis Method	Anly Batch
3298412001	RMW-2-BKND-04062023	SW846 8330B	977157	04/22/2023 01:40	KMR	SW846 8330B	979018

# ALS Environmental Chain of Custody

1317 South 13th Avenue • Kelso, WA 98626 • 1-360-577-7222 • FAX 1-360-636-1068

Project Number: K2304152  
 Project Manager: Mark Harris  
 QAP: DOD QSM v5.1 Kelso

ALS Contact: Mark Harris



3298412

Logged By: CXW  
 PM: SSL



Lab Code	Sample ID	# of Cont.	Matrix	Sample		Lab ID	NitroAro Amin 8330A
				Date	Time		
K2304152-001	RMW-2-BKND-04062023	2	Water	4/6/23	1555	Middletown ALS	X

Temp By: WJ WO Temp (°C) 3 Therm ID 510  
 Receipt Info Completed By: WJ  
 Cooler Custody Seal Intact Y N NA  
 Sample Custody Seal Intact Y N NA  
 Received on Ice Y N NA  
 Cooler & Samples Intact Y N NA  
 Correct Containers Provided Y N NA  
 Sample Label/COC Agree Y N NA  
 Adequate Sample Volumes Y N NA  
 CR6 Samples Filtered Y N NA  
 OP Samples Filtered Y N NA  
 VOA Headspace Present Y N NA  
 Voa Trip Blank Y N NA  
 NIS 4 Days? Y N NA  
 Rad Screen (uCi) Y N NA  
 Courier/Tracking #: ★  
 SDWA Compliance Y N NA  
 PWSID Y N NA  
 WV Containers 0-6°C Y N NA

519516590488

<p><b>Special Instructions/Comments</b>                  Please provide the electronic (PDF and EDD) report to the following e-mail address:                  ALKLS.Data@alsglobal.com.</p> <p>H - Test is On Hold                  P - Test is Authorized for Prep Only</p>	<p><b>Turnaround Requirements</b>                  RUSH (Surcharges Apply) _____                  PLEASE CIRCLE WORK DAYS                  1 2 3 4 5  <input checked="" type="checkbox"/> STANDARD                  Requested FAX Date: _____                  Requested Report Date: 04/28/23</p>	<p><b>Report Requirements</b>                  I. Results Only _____  <input checked="" type="checkbox"/> II. Results + QC Summaries                  III. Results + QC and Calibration Summaries _____                  IV. Data Validation Report with Raw Data _____                  PQL/MDL/J <u>Y</u>                  EDD <u>Y</u></p>
		<p><b>Invoice Information</b>                  PO# 51K2304152                  Bill to _____</p>

Relinquished By: M. Miller on 4/12/23 Received By: SMX on 4/12/23 (11272) (X57) Airbill Number

K2304152

**Ship To: Middletown ALS**  
ALS Environmental - Middletown  
301 Fulling Mill Rd.  
Middletown, PA 17057

PC MOA Date 4/11/23  
SMO MM Date 4/12/23

**Instructions:**

Ice   
Dry Ice \_\_\_\_\_  
No Ice \_\_\_\_\_

**Shipping:**

Overnight   
2nd Day \_\_\_\_\_  
Ground \_\_\_\_\_

Bill to Client Account \_\_\_\_\_

Comments:

Aluminum (Total)
Arsenic (Total)
Barium (Total)
Beryllium (Total)
Cadmium (Total)
Chromium (Total)
Copper (Total)
Iron (Total)
Lead (Total)
Manganese (Total)
Mercury (Total)
Nickel (Total)
Selenium (Total)
Silver (Total)
Thallium (Total)
Zinc (Total)
<i>Synthetic Organic Compounds (SOCs)</i>
2, 4-D
2, 4, 5-TP (Silvex)
Alachlor (Alanex)
Atrazine
Benzo(a)Pyrene
BHC-gamma (Lindane)
Carbofuran
Chlordane
Dalapon
Di(2-ethylhexyl)adipate ( <i>adipates</i> )
Di(2-ethylhexyl)phthalate ( <i>phthalates</i> )
Dibromochloropropane (DBCP)
Dinoseb
Diquat
Ethylene Dibromide (EDB)
Endothall
Endrin
Glyphosate
Heptachlor
Heptachlor Epoxide
Hexachlorobenzene (HCB)
Hexachlorocyclopentadiene
Methoxychlor
Pentachlorophenol
Picloram
Simazine
Total Polychlorinated Biphenyls (PCBs)
Toxaphene
Vydate (Oxamyl)

Radium 226
Radium 228
Uranium
<i>Bacteriological</i>
Total Coliform
Fecal Coliform
<i>Explosives</i>
2,4,6-trinitrotoluene (TNT)
hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)
octahydro-1,3,4,7-tetranitro-1,3,5,7-tetrazocine
2,4,6-trinitrophenyl-n-methylnitramine (teryl)
2,4-dinitrotoluene (2,4-DNT)
1,3,5-trinitrobenzene (2,6-DNT)
1,3-dinitrobenzene (DNB)
nitrobenzene (NB)

NOTE: PESTICIDE ANALYSES SHOWN ON FOLLOWING





---

ALS Environmental  
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Kelso, WA 98626  
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F : +1 360 636 1068  
[www.alsglobal.com](http://www.alsglobal.com)

June 14, 2023

**Analytical Report for Service Request No: K2304151**

Matt Thomas  
GSI Water Solutions, Inc  
650 NE Holladay Street  
Suite 900  
Portland, OR 97232

**RE: Umatilla Depot / 913.001.002.022**

Dear Matt,

Enclosed are the results of the sample(s) submitted to our laboratory April 08, 2023  
For your reference, these analyses have been assigned our service request number **K2304151**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at [www.alsglobal.com](http://www.alsglobal.com). All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at [Mark.Harris@alsglobal.com](mailto:Mark.Harris@alsglobal.com).

Respectfully submitted,

**ALS Group USA, Corp. dba ALS Environmental**

Mark Harris  
Project Manager



---

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[www.alsglobal.com](http://www.alsglobal.com)

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## Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

### **Inorganic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

### **Metals Data Qualifiers**

- # The control limit criteria is not applicable.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.  
  
i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Organic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Additional Petroleum Hydrocarbon Specific Qualifiers**

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso  
State Certifications, Accreditations, and Licenses**

<b>Agency</b>	<b>Web Site</b>	<b>Number</b>
Alaska DEH	<a href="http://dec.alaska.gov/eh/lab/cs/csapproval.htm">http://dec.alaska.gov/eh/lab/cs/csapproval.htm</a>	UST-040
Arizona DHS	<a href="http://www.azdhs.gov/lab/license/env.htm">http://www.azdhs.gov/lab/license/env.htm</a>	AZ0339
Arkansas - DEQ	<a href="http://www.adeq.state.ar.us/techsvs/labcert.htm">http://www.adeq.state.ar.us/techsvs/labcert.htm</a>	88-0637
California DHS (ELAP)	<a href="http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx">http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx</a>	2795
DOD ELAP	<a href="http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm">http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm</a>	L16-58-R4
Florida DOH	<a href="http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm">http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm</a>	E87412
Hawaii DOH	<a href="http://health.hawaii.gov/">http://health.hawaii.gov/</a>	-
ISO 17025	<a href="http://www.pjlabs.com/">http://www.pjlabs.com/</a>	L16-57
Louisiana DEQ	<a href="http://www.deq.louisiana.gov/page/la-lab-accreditation">http://www.deq.louisiana.gov/page/la-lab-accreditation</a>	03016
Maine DHS	<a href="http://www.maine.gov/dhhs/">http://www.maine.gov/dhhs/</a>	WA01276
Minnesota DOH	<a href="http://www.health.state.mn.us/accreditation">http://www.health.state.mn.us/accreditation</a>	053-999-457
Nevada DEP	<a href="http://ndep.nv.gov/bsdw/labservice.htm">http://ndep.nv.gov/bsdw/labservice.htm</a>	WA01276
New Jersey DEP	<a href="http://www.nj.gov/dep/enforcement/oqa.html">http://www.nj.gov/dep/enforcement/oqa.html</a>	WA005
New York - DOH	<a href="https://www.wadsworth.org/regulatory/elap">https://www.wadsworth.org/regulatory/elap</a>	12060
North Carolina DEQ	<a href="https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification">https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification</a>	605
Oklahoma DEQ	<a href="http://www.deq.state.ok.us/CSDnew/labcert.htm">http://www.deq.state.ok.us/CSDnew/labcert.htm</a>	9801
Oregon – DEQ (NELAP)	<a href="http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx">http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx</a>	WA100010
South Carolina DHEC	<a href="http://www.scdhec.gov/environment/EnvironmentalLabCertification/">http://www.scdhec.gov/environment/EnvironmentalLabCertification/</a>	61002
Texas CEQ	<a href="http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html">http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html</a>	T104704427
Washington DOE	<a href="http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html">http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html</a>	C544
Wyoming (EPA Region 8)	<a href="https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water">https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water</a>	-
Kelso Laboratory Website	<a href="http://www.alsglobal.com">www.alsglobal.com</a>	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at [www.ALSGlobal.com](http://www.ALSGlobal.com) or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.



## Case Narrative

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)



**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot  
**Sample Matrix:** Water

**Service Request:** K2304151  
**Date Received:** 04/08/2023

**CASE NARRATIVE**

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

**Sample Receipt:**

One water sample was received for analysis at ALS Environmental on 04/08/2023. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The sample was stored at minimum in accordance with the analytical method requirements.

**Semivolatiles by GC/MS:**

Method 8270D, 05/18/2023: The extraction of sample 4-166-BKGND-04062023 was initially performed within the recommended holding time. Re-extraction was required due to QC failures. The re-extraction was performed past the recommended holding time. The results from the second analysis were reported.

Method 8270D, 05/18/2023: The upper control criterion was exceeded for Bis(2-ethylhexyl) Phthalate in Continuing Calibration Verification (CCV) KQ2308997-02. The field sample analyzed in this sequence did not contain the analyte in question. Since the apparent problem indicated a potential high bias, the data quality was not affected. No further corrective action was required.

Method 8270D, 05/18/2023: The upper control criterion was exceeded for Hexachlorocyclopentadiene in Laboratory Control Sample (LCS) KQ2308254-02 and Duplicate Laboratory Control Sample (DLCS) KQ2308254-03. The analyte in question was not detected in the associated field samples. The error associated with elevated recovery indicated a high bias. The sample data was not significantly affected. No further corrective action was appropriate.

**Semivolatile GC:**

Method 8081B, 06/06/2023: The analysis of method EPA 8081B requires the use of dual column confirmation. When the Continuing Calibration Verification (CCV) criterion is met for both columns, the lower of the two sample results is generally reported. The primary evaluation criteria were not met on the confirmation column for DCB. The results were reported from the column with an acceptable CCV KQ2310297-02. The data quality was not affected. No further corrective action was necessary.

Method 8081B, 06/06/2023: The upper control criterion was exceeded for Toxaphene and TCMX in Laboratory Control Sample (LCS) KQ2306685-09. The analyte in question was not detected in the associated field samples. The error associated with elevated recovery indicate a high bias. The sample data was not significantly affected. No further corrective action was appropriate.

Method 8081B, 06/06/2023: The analysis of sample 4-166-BKGND-04062023 was performed passed the recommended analytical holding time due to instrument failure. Efforts were made to analyze the sample as soon as possible after the analytical system was back in control. However, the analysis was performed 14 days past the recommended holding time. The data was flagged to indicate the holding time violation.

Method 8081B, 06/06/2023: The spike recovery of Chlordane for Laboratory Control (LCS) Sample and Duplicate Laboratory Control Sample (DLCS) was not performed. The analytes in question were not detected in the associated field samples.

Method 8151A, 05/10/2023: The upper control criterion was exceeded for many target analytes in Continuing Calibration Verification (CCV) KQ2309788-01, -03. The field samples analyzed in this sequence did not contain the analytes in question.

Approved by \_\_\_\_\_

Date 06/14/2023





## Chain of Custody

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)



CHAIN OF CUSTODY  
129889

002 162304151

SR# \_\_\_\_\_  
COC Set \_\_\_\_\_ of \_\_\_\_\_  
COC# \_\_\_\_\_

1317 South 13th Ave, Kelso, WA 98625 Phone (360) 577-7222 / 800-695-7222 / FAX (360) 636-1068  
www.alsglobal.com

Project Name: <u>Umatilla Depot</u>		Project Number: <u>913.001.002.002</u>		NUMBER OF CONTAINERS	7D							14D			28D			180D	365D	Remarks														
Project Manager: <u>Matt Kowbecker</u>					3081B / Pest OC	3151A / HERB	3270D / SVC	3330A / NitroAro Amin	3300 / Radioact	303.1 / Radium 226	304.0 / Radium 228	SM 2540 C / TDS	SM 2540 D / TSS	3260C / VOC FP	SM 2320 B / Alkalinity Tit	SM 2320 B / Carbonate Alk	SM 4500-CN- E / CN T	300.0 / Chloride	300.0 / F		300.0 / SO4	353.2 / NO2 NO3 T	7470A / Hg T	SM 4500-P E / T Phos	SM 5310 C / TOC T	3010C / Metals T	3020A / Metals T	3082A / PCB 3520						
Company: <u>GSI Water Solutions</u>					3081B / Pest OC	3151A / HERB	3270D / SVC	3330A / NitroAro Amin	3300 / Radioact	303.1 / Radium 226	304.0 / Radium 228	SM 2540 C / TDS	SM 2540 D / TSS	3260C / VOC FP	SM 2320 B / Alkalinity Tit	SM 2320 B / Carbonate Alk	SM 4500-CN- E / CN T	300.0 / Chloride	300.0 / F		300.0 / SO4	353.2 / NO2 NO3 T	7470A / Hg T	SM 4500-P E / T Phos	SM 5310 C / TOC T	3010C / Metals T	3020A / Metals T	3082A / PCB 3520						
Address: <u>650 NE Holladay St Ste 900 Portland, OR 97232</u>					3081B / Pest OC	3151A / HERB	3270D / SVC	3330A / NitroAro Amin	3300 / Radioact	303.1 / Radium 226	304.0 / Radium 228	SM 2540 C / TDS	SM 2540 D / TSS	3260C / VOC FP	SM 2320 B / Alkalinity Tit	SM 2320 B / Carbonate Alk	SM 4500-CN- E / CN T	300.0 / Chloride	300.0 / F		300.0 / SO4	353.2 / NO2 NO3 T	7470A / Hg T	SM 4500-P E / T Phos	SM 5310 C / TOC T	3010C / Metals T	3020A / Metals T	3082A / PCB 3520						
Phone # <u>473-947-4716</u>		email <u>mthomas@gsws.com</u>			3081B / Pest OC	3151A / HERB	3270D / SVC	3330A / NitroAro Amin	3300 / Radioact	303.1 / Radium 226	304.0 / Radium 228	SM 2540 C / TDS	SM 2540 D / TSS	3260C / VOC FP	SM 2320 B / Alkalinity Tit	SM 2320 B / Carbonate Alk	SM 4500-CN- E / CN T	300.0 / Chloride	300.0 / F		300.0 / SO4	353.2 / NO2 NO3 T	7470A / Hg T	SM 4500-P E / T Phos	SM 5310 C / TOC T	3010C / Metals T	3020A / Metals T	3082A / PCB 3520						
Sampler Signature: <u>Matthew Thomas</u>		Sampler Printed Name: <u>Matthew Thomas</u>		3081B / Pest OC	3151A / HERB	3270D / SVC	3330A / NitroAro Amin	3300 / Radioact	303.1 / Radium 226	304.0 / Radium 228	SM 2540 C / TDS	SM 2540 D / TSS	3260C / VOC FP	SM 2320 B / Alkalinity Tit	SM 2320 B / Carbonate Alk	SM 4500-CN- E / CN T	300.0 / Chloride	300.0 / F	300.0 / SO4	353.2 / NO2 NO3 T	7470A / Hg T	SM 4500-P E / T Phos	SM 5310 C / TOC T	3010C / Metals T	3020A / Metals T	3082A / PCB 3520								
CLIENT SAMPLE ID	LABID	SAMPLING Date	Time	Matrix																														
1. <u>U-166-BK6ND-04062023</u>		<u>4/6/23</u>	<u>1125</u>	<u>Water</u>	<u>20</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>				
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9.																																		
10.																																		

<b>Report Requirements</b> <input checked="" type="checkbox"/> I. Routine Report: Method Blank, Surrogate, as required <input type="checkbox"/> II. Report Dup., MS, MSD as required <input type="checkbox"/> III. CLP Like Summary (no raw data) <input type="checkbox"/> IV. Data Validation Report <input type="checkbox"/> V. EDD	<b>Invoice Information</b> P.O.# _____ Bill To: _____ _____	Circle which metals are to be analyzed Total Metals: <u>(A)</u> <u>(As)</u> <u>(Sb)</u> <u>(Ba)</u> <u>(Be)</u> <u>(B)</u> <u>(Ca)</u> <u>(Cd)</u> <u>(Co)</u> <u>(Cr)</u> <u>(Cu)</u> <u>(Fe)</u> <u>(Pb)</u> <u>(Mg)</u> <u>(Mn)</u> <u>(Mo)</u> <u>(Ni)</u> <u>(K)</u> <u>(Ag)</u> <u>(Na)</u> <u>(Se)</u> <u>(Sr)</u> <u>(Ti)</u> <u>(Sn)</u> <u>(V)</u> <u>(Zn)</u> <u>(Hg)</u> Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg	
	<b>Turnaround Requirements</b> _____ 24 hr. _____ 48 hr. <input checked="" type="checkbox"/> Standard	Special Instructions/Comments: Address invoice to: <u>John Schaefer</u> <u>216 SE 4th St</u> <u>Pendleton, OR 97401</u> Email invoice to: <u>m.kowbecker@gsws.com</u>	
<b>Relinquished By:</b> Signature: <u>Matthew Thomas</u> Printed Name: <u>Matthew Thomas</u> Firm: <u>GSI Water Solutions</u> Date/Time: <u>4/7/23 1200</u>	<b>Received By:</b> Signature: <u>Josh McPherson</u> Printed Name: <u>ALS</u> Firm: _____ Date/Time: <u>4-9-23 1100</u>	<b>Relinquished By:</b> Signature: _____ Printed Name: _____ Firm: _____ Date/Time: _____	<b>Received By:</b> Signature: _____ Printed Name: _____ Firm: _____ Date/Time: _____



**Cooler Receipt and Preservation Form**

Client ASI WATER SOLUTIONS Service Request K23 04151  
 Received: 4-8-23 Opened: 4-8-23 By: JM Unloaded: 4-8-23 By: JM

1. Samples were received via?  USPS  Fed Ex  UPS  DHL  PDX  Courier  Hand Delivered
2. Samples were received in: (circle)  Cooler  Box  Envelope  Other  NA
3. Were custody seals on coolers? NA  Y  N If yes, how many and where? 1 front  
 If present, were custody seals intact?  Y  N If present, were they signed and dated?  Y  N

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
2.5	1.6	IR02	129889 10#3			8171 1574 7504	
2.5		IR02	129889 20#3			8171 1574 7515	
1.1		IR02	129889 30#3			8164 5983 9440	

4. Was a Temperature Blank present in cooler? NA  Y  N If yes, notate the temperature in the appropriate column above:  
 If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA  Y  N  
 If no, were they received on ice and same day as collected? If not, notate the cooler # above and notify the PM.  NA  Y  N
- If applicable, tissue samples were received: Frozen Partially Thawed Thawed
6. Packing material: Inserts  Baggies  Bubble Wrap  Gel Packs  Wet Ice  Dry Ice  Sleeves
7. Were custody papers properly filled out (ink, signed, etc.)? NA  Y  N
8. Were samples received in good condition (unbroken) NA  Y  N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA  Y  N
10. Did all sample labels and tags agree with custody papers? NA  Y  N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA  Y  N
12. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below NA  Y  N
13. Were VOA vials received without headspace? Indicate in the table below.  NA  Y  N
14. Was C12/Res negative? NA  Y  N
15. Were samples received within the method specified time limit? If not, notate the error below and notify the PM  NA  Y  N
16. Were 100ml sterile microbiology bottles filled exactly to the 100ml mark?  NA  Y  N Underfilled Overfilled

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, Resolutions: \_\_\_\_\_





# General Chemistry

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water  
**Analysis Method:** 300.0  
**Prep Method:** None

**Service Request:** K2304151  
**Date Collected:** 04/6/23  
**Date Received:** 04/8/23  
**Units:** mg/L  
**Basis:** NA

Chloride

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
4-166-BKGND-04062023	K2304151-001	23.6	1.0	0.2	0.05	10	04/17/23 17:39	
Method Blank	K2304151-MB1	ND U	0.10	0.02	0.005	1	04/17/23 14:39	
Method Blank	K2304151-MB2	ND U	0.10	0.02	0.005	1	04/17/23 18:21	

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dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water

**Service Request:** K2304151  
**Date Analyzed:** 04/17/23  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**Chloride**

**Analysis Method:** 300.0  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 801073

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2304151-LCS2	4.80	5.00	96	90-110
Lab Control Sample	K2304151-LCS3	4.80	5.00	96	90-110

**ALS Group USA, Corp.**  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water  
**Analysis Method:** 300.0  
**Prep Method:** None

**Service Request:** K2304151  
**Date Collected:** 04/6/23  
**Date Received:** 04/8/23  
**Units:** mg/L  
**Basis:** NA

**Fluoride**

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
4-166-BKGND-04062023	K2304151-001	<b>0.24</b>	0.20	0.06	0.02	2	04/12/23 01:18	
Method Blank	K2304151-MB1	ND U	0.10	0.03	0.010	1	04/11/23 14:19	
Method Blank	K2304151-MB2	ND U	0.10	0.03	0.010	1	04/11/23 18:03	
Method Blank	K2304151-MB3	ND U	0.10	0.03	0.010	1	04/11/23 21:45	
Method Blank	K2304151-MB4	ND U	0.10	0.03	0.010	1	04/12/23 01:01	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water

**Service Request:** K2304151  
**Date Analyzed:** 04/11/23  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**Fluoride**

**Analysis Method:** 300.0  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 800488

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2304151-LCS2	4.93	5.00	99	90-110
Lab Control Sample	K2304151-LCS3	4.94	5.00	99	90-110
Lab Control Sample	K2304151-LCS4	4.97	5.00	99	90-110
Lab Control Sample	K2304151-LCS5	4.98	5.00	100	90-110

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water  
**Analysis Method:** 300.0  
**Prep Method:** None

**Service Request:** K2304151  
**Date Collected:** 04/6/23  
**Date Received:** 04/8/23  
**Units:** mg/L  
**Basis:** NA

Sulfate

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
4-166-BKGND-04062023	K2304151-001	34.4	2.0	1.5	0.6	10	04/17/23 17:39	
Method Blank	K2304151-MB1	ND U	0.20	0.15	0.06	1	04/17/23 14:39	
Method Blank	K2304151-MB2	ND U	0.20	0.15	0.06	1	04/17/23 18:21	

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dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water

**Service Request:** K2304151  
**Date Analyzed:** 04/17/23  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**Sulfate**

**Analysis Method:** 300.0  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 801073

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2304151-LCS2	4.92	5.00	98	90-110
Lab Control Sample	K2304151-LCS3	4.92	5.00	98	90-110

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dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water  
**Analysis Method:** 353.2  
**Prep Method:** Method

**Service Request:** K2304151  
**Date Collected:** 04/6/23  
**Date Received:** 04/8/23  
**Units:** mg/L  
**Basis:** NA

Nitrate+Nitrite as Nitrogen

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
4-166-BKGND-04062023	K2304151-001	12.9	0.50	0.20	0.06	10	04/18/23	4/18/23	
Method Blank	K2304151-MB1	ND U	0.050	0.020	0.006	1	04/18/23	4/18/23	

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dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water

**Service Request:** K2304151  
**Date Analyzed:** 04/18/23  
**Date Extracted:** 04/18/23

**Lab Control Sample Summary**  
**Nitrate+Nitrite as Nitrogen**

**Analysis Method:** 353.2  
**Prep Method:** Method

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 801269

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2304151-LCS2	7.31	7.20	102	90-110

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water  
**Analysis Method:** SM 2320 B  
**Prep Method:** None

**Service Request:** K2304151  
**Date Collected:** 04/6/23  
**Date Received:** 04/8/23  
**Units:** mg/L  
**Basis:** NA

Alkalinity as CaCO3, Total

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
4-166-BKGND-04062023	K2304151-001	227	2.0	1.2	0.6	1	04/18/23 18:06	
Method Blank	K2304151-MB1	0.8 J	2.0	1.2	0.6	1	04/18/23 18:06	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water

**Service Request:** K2304151  
**Date Analyzed:** 04/18/23  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**Alkalinity as CaCO<sub>3</sub>, Total**

**Analysis Method:** SM 2320 B  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 801283

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2304151-LCS2	183	178	103	85-115
Lab Control Sample	K2304151-LCS3	183	178	103	85-115

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dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water  
**Analysis Method:** SM 2320 B  
**Prep Method:** None

**Service Request:** K2304151  
**Date Collected:** 04/6/23  
**Date Received:** 04/8/23  
**Units:** mg/L  
**Basis:** NA

Carbonate as CaCO3

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
4-166-BKGND-04062023	K2304151-001	ND U	2.0	1.2	0.6	1	04/18/23 18:06	
Method Blank	K2304151-MB1	ND U	2.0	1.2	0.6	1	04/18/23 18:06	

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dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water

**Service Request:** K2304151  
**Date Analyzed:** 04/18/23  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**Carbonate as CaCO3**

**Analysis Method:** SM 2320 B  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 801283

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2304151-LCS2	183	178	103	85-115
Lab Control Sample	K2304151-LCS3	183	178	103	85-115

**ALS Group USA, Corp.**

dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.002  
**Sample Matrix:** Water

**Service Request:** K2304151

**Date Collected:** 4/6/2023

**Date Received:** 4/8/2023

**Date Extracted:** NA

**Date Analyzed:** NA

Langelier Index  
SM 2330B

<b>Sample Name</b>	<b>Lab Code</b>	<b>Temp °C</b>	<b>Result</b>
4-166-BKGND-04062023	K2304151-001	16.6	0.593

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water  
**Analysis Method:** SM 2540 C  
**Prep Method:** None

**Service Request:** K2304151  
**Date Collected:** 04/6/23  
**Date Received:** 04/8/23  
**Units:** mg/L  
**Basis:** NA

**Solids, Total Dissolved**

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
4-166-BKGND-04062023	K2304151-001	421	5.0	-	-	1	04/11/23 17:00	
Method Blank	K2304151-MB1	ND U	5.0	-	-	1	04/11/23 17:00	
Method Blank	K2304151-MB2	ND U	5.0	-	-	1	04/11/23 17:00	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water

**Service Request:** K2304151  
**Date Analyzed:** 04/11/23  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**Solids, Total Dissolved**

**Analysis Method:** SM 2540 C  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 800496

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2304151-LCS2	1880	1920	98	85-115

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dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water  
**Analysis Method:** SM 2540 D  
**Prep Method:** None

**Service Request:** K2304151  
**Date Collected:** 04/6/23  
**Date Received:** 04/8/23  
**Units:** mg/L  
**Basis:** NA

Solids, Total Suspended (TSS)

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
4-166-BKGND-04062023	K2304151-001	ND U	5.0	-	-	1	04/11/23 10:19	
Method Blank	K2304151-MB1	ND U	5.0	-	-	1	04/11/23 10:19	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water

**Service Request:** K2304151  
**Date Analyzed:** 04/11/23  
**Date Extracted:** NA

**Duplicate Lab Control Sample Summary**  
**General Chemistry Parameters**

**Analysis Method:** SM 2540 D  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 800438

**Lab Control Sample**  
**K2304151-LCS1**

**Duplicate Lab Control Sample**  
**K2304151-DLCS1**

<u>Analyte Name</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>% Rec Limits</u>	<u>RPD</u>	<u>RPD Limit</u>
Solids, Total Suspended (TSS)	400	400	100	406	400	102	85-115	1	5

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water  
**Analysis Method:** SM 4500-CN- E  
**Prep Method:** SM 4500-CN-C

**Service Request:** K2304151  
**Date Collected:** 04/6/23  
**Date Received:** 04/8/23  
**Units:** mg/L  
**Basis:** NA

Cyanide, Total

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
4-166-BKGND-04062023	K2304151-001	ND U	0.020	0.002	0.0005	1	04/13/23	4/12/23	
Method Blank	K2304151-MB1	ND U	0.020	0.002	0.0005	1	04/13/23	4/12/23	

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water

**Service Request:** K2304151  
**Date Analyzed:** 04/13/23  
**Date Extracted:** 04/12/23

**Lab Control Sample Summary**  
**Cyanide, Total**

**Analysis Method:** SM 4500-CN- E  
**Prep Method:** SM 4500-CN-C

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 800743

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2304151-LCS2	0.0724	0.075	97	84-115

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water  
**Analysis Method:** SM 4500-H+ B  
**Prep Method:** None

**Service Request:** K2304151  
**Date Collected:** 04/6/23  
**Date Received:** 04/8/23  
**Units:** pH Units  
**Basis:** NA

**pH**

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
4-166-BKGND-04062023	K2304151-001	8.05	-	-	-	1	05/03/23 10:23	H

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water

**Service Request:** K2304151  
**Date Analyzed:** 05/02/23  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**pH**

**Analysis Method:** SM 4500-H+ B  
**Prep Method:** None

**Units:** pH Units  
**Basis:** NA  
**Analysis Lot:** 802898

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2304151-LCS2	5.57	5.58	100	85-115

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water  
**Analysis Method:** SM 4500-P E  
**Prep Method:** Method

**Service Request:** K2304151  
**Date Collected:** 04/6/23  
**Date Received:** 04/8/23  
**Units:** mg/L  
**Basis:** NA

Phosphorus, Total

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
4-166-BKGND-04062023	K2304151-001	<b>0.066</b>	0.020	0.010	0.005	1	04/19/23	4/19/23	
Method Blank	K2304151-MB1	ND U	0.020	0.010	0.005	1	04/19/23	NA	

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water

**Service Request:** K2304151  
**Date Analyzed:** 04/19/23  
**Date Extracted:** NA

**Lab Control Sample Summary**  
**Phosphorus, Total**

**Analysis Method:** SM 4500-P E  
**Prep Method:** None

**Units:** mg/L  
**Basis:** NA  
**Analysis Lot:** 801669

<b>Sample Name</b>	<b>Lab Code</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Lab Control Sample	K2304151-LCS2	2.65	2.66	100	85-115



# Metals

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water  
**Sample Name:** 4-166-BKGND-04062023  
**Lab Code:** K2304151-001

**Service Request:** K2304151  
**Date Collected:** 04/06/23 11:25  
**Date Received:** 04/08/23 11:00  
**Basis:** NA

**Hardness by ICP-AES Calculation 20th Ed.**

<b>Analyte Name</b>	<b>Analysis Method</b>	<b>Result</b>	<b>Units</b>	<b>LOQ</b>	<b>LOD</b>	<b>MDL</b>	<b>Dil.</b>	<b>Date Analyzed</b>	<b>Q</b>
Hardness, Total as CaCO3	SM 2340 B	297	mg/L	0.09	0.053	0.023	1	04/19/23 15:10	

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water

**Service Request:** K2304151  
**Date Collected:** 04/06/23 11:25  
**Date Received:** 04/08/23 11:00

**Sample Name:** 4-166-BKGND-04062023  
**Lab Code:** K2304151-001

**Basis:** NA

Total Metals

Analyte Name	Analysis		Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Date	
	Method	Result							Extracted	Q
Aluminum	6020A	<b>3.1 J</b>	ug/L	4.0	2.0	0.5	1	04/19/23 15:10	04/17/23	
Antimony	6020A	<b>0.085</b>	ug/L	0.050	0.045	0.020	1	04/19/23 15:10	04/17/23	
Arsenic	6020A	<b>3.26</b>	ug/L	0.50	0.25	0.09	1	04/19/23 15:10	04/17/23	
Barium	6020A	<b>51.1</b>	ug/L	0.050	0.045	0.020	1	04/19/23 15:10	04/17/23	
Beryllium	6020A	ND U	ug/L	0.020	0.015	0.005	1	04/19/23 15:10	04/17/23	
Cadmium	6020A	ND U	ug/L	0.020	0.018	0.008	1	04/19/23 15:10	04/17/23	
Calcium	6020A	<b>82200</b>	ug/L	20	13	6	1	04/19/23 15:10	04/17/23	
Chromium	6020A	<b>1.72</b>	ug/L	0.20	0.10	0.03	1	04/19/23 15:10	04/17/23	
Copper	6020A	<b>0.36</b>	ug/L	0.20	0.09	0.05	1	04/19/23 15:10	04/17/23	
Iron	6020A	<b>13.8</b>	ug/L	2.0	1.0	0.3	1	04/19/23 15:10	04/17/23	
Lead	6020A	<b>0.009 J</b>	ug/L	0.020	0.018	0.006	1	04/19/23 15:10	04/17/23	
Magnesium	6020A	<b>22400</b>	ug/L	10	5	2	1	04/19/23 15:10	04/17/23	
Manganese	6020A	<b>0.60</b>	ug/L	0.20	0.10	0.04	1	04/19/23 15:10	04/17/23	
Mercury	7470A	<b>0.02 J</b>	ug/L	0.20	0.05	0.02	1	04/18/23 08:25	04/17/23	
Nickel	6020A	<b>0.94</b>	ug/L	0.20	0.15	0.04	1	04/19/23 15:10	04/17/23	
Potassium	6020A	<b>5450</b>	ug/L	50	45	20	1	04/19/23 15:10	04/17/23	
Selenium	6020A	<b>0.4 J</b>	ug/L	1.0	0.5	0.2	1	04/19/23 15:10	04/17/23	
Silver	6020A	ND U	ug/L	0.020	0.018	0.009	1	04/19/23 15:10	04/17/23	
Sodium	6020A	<b>29600</b>	ug/L	50	45	20	1	04/19/23 15:10	04/17/23	
Thallium	6020A	<b>0.021</b>	ug/L	0.020	0.018	0.009	1	04/19/23 15:10	04/17/23	
Zinc	6020A	ND U	ug/L	2.0	1.0	0.5	1	04/19/23 15:10	04/17/23	

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2305906-01

**Service Request:** K2304151  
**Date Collected:** NA  
**Date Received:** NA  
**Basis:** NA

**Total Metals**

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Date	
									Extracted	Q
Aluminum	6020A	<b>1.3 J</b>	ug/L	4.0	2.0	0.5	1	04/19/23 14:50	04/17/23	
Antimony	6020A	ND U	ug/L	0.050	0.045	0.020	1	04/19/23 14:50	04/17/23	
Arsenic	6020A	ND U	ug/L	0.50	0.25	0.09	1	04/19/23 14:50	04/17/23	
Barium	6020A	ND U	ug/L	0.050	0.045	0.020	1	04/19/23 14:50	04/17/23	
Beryllium	6020A	ND U	ug/L	0.020	0.015	0.005	1	04/19/23 14:50	04/17/23	
Cadmium	6020A	ND U	ug/L	0.020	0.018	0.008	1	04/19/23 14:50	04/17/23	
Calcium	6020A	ND U	ug/L	20	13	6	1	04/19/23 14:50	04/17/23	
Chromium	6020A	ND U	ug/L	0.20	0.10	0.03	1	04/19/23 14:50	04/17/23	
Copper	6020A	ND U	ug/L	0.20	0.09	0.05	1	04/19/23 14:50	04/17/23	
Iron	6020A	<b>1.2 J</b>	ug/L	2.0	1.0	0.3	1	04/19/23 14:50	04/17/23	
Lead	6020A	ND U	ug/L	0.020	0.018	0.006	1	04/19/23 14:50	04/17/23	
Magnesium	6020A	ND U	ug/L	10	5	2	1	04/19/23 14:50	04/17/23	
Manganese	6020A	ND U	ug/L	0.20	0.10	0.04	1	04/19/23 14:50	04/17/23	
Nickel	6020A	ND U	ug/L	0.20	0.15	0.04	1	04/19/23 14:50	04/17/23	
Potassium	6020A	ND U	ug/L	50	45	20	1	04/19/23 14:50	04/17/23	
Selenium	6020A	ND U	ug/L	1.0	0.5	0.2	1	04/19/23 14:50	04/17/23	
Silver	6020A	ND U	ug/L	0.020	0.018	0.009	1	04/19/23 14:50	04/17/23	
Sodium	6020A	ND U	ug/L	50	45	20	1	04/19/23 14:50	04/17/23	
Thallium	6020A	ND U	ug/L	0.020	0.018	0.009	1	04/19/23 14:50	04/17/23	
Zinc	6020A	ND U	ug/L	2.0	1.0	0.5	1	04/19/23 14:50	04/17/23	

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dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2306768-01

**Service Request:** K2304151  
**Date Collected:** NA  
**Date Received:** NA  
**Basis:** NA

Total Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>LOQ</u>	<u>LOD</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Mercury	7470A	ND U	ug/L	0.20	0.05	0.02	1	04/18/23 08:20	04/17/23	

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water

**Service Request:** K2304151

**Date Analyzed:** 04/19/23

**Lab Control Sample Summary**  
**Total Metals**

**Units:**ug/L

**Basis:**NA

**Lab Control Sample**  
KQ2305906-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Aluminum	6020A	109	100	109	84-117
Antimony	6020A	10.5	10.0	105	85-117
Arsenic	6020A	48.5	50.0	97	84-116
Barium	6020A	102	100	102	86-114
Beryllium	6020A	2.53	2.50	101	83-121
Cadmium	6020A	25.3	25.0	101	87-115
Calcium	6020A	278	250	111	87-118
Chromium	6020A	10.0	10.0	100	85-116
Copper	6020A	13.0	12.5	104	85-118
Iron	6020A	50.7	50.0	101	87-118
Lead	6020A	51.1	50.0	102	88-115
Magnesium	6020A	254	250	102	83-118
Manganese	6020A	24.8	25.0	99	87-115
Nickel	6020A	25.7	25.0	103	85-117
Potassium	6020A	255	250	102	87-115
Selenium	6020A	49.6	50.0	99	80-120
Silver	6020A	12.9	12.5	103	85-116
Sodium	6020A	257	250	103	85-117
Thallium	6020A	51.1	50.0	102	82-116
Zinc	6020A	25.6	25.0	102	83-119

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water

**Service Request:** K2304151  
**Date Analyzed:** 04/18/23

**Lab Control Sample Summary**  
**Total Metals**

**Units:**ug/L  
**Basis:**NA

**Lab Control Sample**  
KQ2306768-02

<b>Analyte Name</b>	<b>Analytical Method</b>	<b>Result</b>	<b>Spike Amount</b>	<b>% Rec</b>	<b>% Rec Limits</b>
Mercury	7470A	5.01	5.00	100	82-119



# Low Level Organochlorine Pesticides by GC

**ALS Environmental—Kelso Laboratory**  
*1317 South 13th Avenue, Kelso, WA 98626*  
*Phone (360)577-7222 Fax (360)636-1068*  
*[www.alsglobal.com](http://www.alsglobal.com)*

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**ALS Group USA, Corp.**  
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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water  
**Sample Name:** 4-166-BKGND-04062023  
**Lab Code:** K2304151-001

**Service Request:** K2304151  
**Date Collected:** 04/06/23 11:25  
**Date Received:** 04/08/23 11:00  
**Units:** ug/L  
**Basis:** NA

**Low Level Organochlorine Pesticides by GC**

**Analysis Method:** 8081B  
**Prep Method:** None

Analyte Name	Result	LOQ	Dil.	Date Analyzed	Date Extracted	Q
gamma-BHC (Lindane)	ND U	0.010	1	06/06/23 06:34	4/13/23	*
Chlordane	ND U	0.20	1	06/06/23 06:34	4/13/23	*
Endrin	ND U	0.010	1	06/06/23 06:34	4/13/23	*
Heptachlor	ND U	0.010	1	06/06/23 06:34	4/13/23	*
Heptachlor Epoxide	ND U	0.010	1	06/06/23 06:34	4/13/23	*
Hexachlorobenzene	ND U	0.010	1	06/06/23 06:34	4/13/23	*
Methoxychlor	ND U	0.010	1	06/06/23 06:34	4/13/23	*
Toxaphene	ND U	0.60	1	06/06/23 06:34	4/13/23	*

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Decachlorobiphenyl	75	14 - 160	06/06/23 06:34	
Tetrachloro-m-xylene	82	30 - 148	06/06/23 06:34	

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water

**Service Request:** K2304151

**SURROGATE RECOVERY SUMMARY**  
**Low Level Organochlorine Pesticides by GC**

**Analysis Method:** 8081B  
**Extraction Method:** None

Sample Name	Lab Code	Decachlorobiphenyl	Tetrachloro-m-xylene
		14 - 160	30 - 148
4-166-BKGND-04062023	K2304151-001	75	82
Method Blank	KQ2306685-06	106	83
Lab Control Sample	KQ2306685-07	78	89
Duplicate Lab Control Sample	KQ2306685-08	72	84
Lab Control Sample	KQ2306685-09	153	170 *
Duplicate Lab Control Sample	KQ2306685-10	76	86

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Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2306685-06

**Service Request:** K2304151  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/L  
**Basis:** NA

**Low Level Organochlorine Pesticides by GC**

**Analysis Method:** 8081B  
**Prep Method:** EPA 3511

Analyte Name	Result	LOQ	Dil.	Date Analyzed	Date Extracted	Q
gamma-BHC (Lindane)	ND U	0.010	1	06/05/23 23:58	4/13/23	
Chlordane	ND U	0.20	1	06/05/23 23:58	4/13/23	
Endrin	ND U	0.010	1	06/05/23 23:58	4/13/23	
Heptachlor	ND U	0.010	1	06/05/23 23:58	4/13/23	
Heptachlor Epoxide	ND U	0.010	1	06/05/23 23:58	4/13/23	
Hexachlorobenzene	ND U	0.010	1	06/05/23 23:58	4/13/23	
Methoxychlor	ND U	0.010	1	06/05/23 23:58	4/13/23	
Toxaphene	ND U	0.60	1	06/05/23 23:58	4/13/23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Decachlorobiphenyl	106	14 - 160	06/05/23 23:58	
Tetrachloro-m-xylene	83	30 - 148	06/05/23 23:58	

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water

**Service Request:** K2304151  
**Date Analyzed:** 06/06/23  
**Date Extracted:** 04/13/23

**Duplicate Lab Control Sample Summary**  
**Low Level Organochlorine Pesticides by GC**

**Analysis Method:** 8081B  
**Prep Method:** EPA 3511

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 806889

**Lab Control Sample**  
**KQ2306685-07**

**Duplicate Lab Control Sample**  
**KQ2306685-08**

Analyte Name	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec	% Rec	RPD	RPD Limit
							Limits		
Endrin	0.209	0.250	84	0.192	0.250	77	66-178	9	30
gamma-BHC (Lindane)	0.217	0.250	87	0.213	0.250	85	67-172	2	30
Heptachlor	0.214	0.250	86	0.211	0.250	84	61-178	1	30
Heptachlor Epoxide	0.189	0.250	76	0.192	0.250	77	59-163	2	30
Hexachlorobenzene	0.225	0.250	90	0.220	0.250	88	52-132	2	30
Methoxychlor	0.203	0.250	81	0.198	0.250	79	65-183	2	30

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QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water

**Service Request:** K2304151  
**Date Analyzed:** 06/06/23  
**Date Extracted:** 04/13/23

**Duplicate Lab Control Sample Summary**  
**Low Level Organochlorine Pesticides by GC**

**Analysis Method:** 8081B  
**Prep Method:** None

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 806889

**Lab Control Sample**  
**KQ2306685-09**

**Duplicate Lab Control Sample**  
**KQ2306685-10**

<u>Analyte Name</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>% Rec Limits</u>	<u>RPD</u>	<u>RPD Limit</u>
Toxaphene	23.4	10.0	234 *	12.5	10.0	125	66-154	60 *	30

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Confirmation Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Matrix:** Water

**Service Request:** K2304151  
**Date Collected:** NA  
**Date Received:**

**Sample Name:** Lab Control Sample  
**Lab Code:** KQ2306685-07

**Units:** ug/L  
**Basis:** NA

Low Level Organochlorine Pesticides by GC

**Analytical Method:** 8081B  
**Prep Method:** EPA 3511

LOQ	LOQ	Primary Result	Confirmation Result	RPD	Q	Dilution Factor	Date Analyzed
Endrin	0.010	0.209	0.210	<1		1	06/06/23 00:29
Heptachlor	0.010	0.214	0.262	20		1	06/06/23 00:29
Heptachlor Epoxide	0.010	0.189	0.205	8		1	06/06/23 00:29
Hexachlorobenzene	0.010	0.225	0.233	3		1	06/06/23 00:29
Methoxychlor	0.010	0.203	0.230	12		1	06/06/23 00:29
gamma-BHC (Lindane)	0.010	0.217	0.233	7		1	06/06/23 00:29

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Confirmation Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Matrix:** Water  
**Sample Name:** Duplicate Lab Control Sample  
**Lab Code:** KQ2306685-08

**Service Request:** K2304151  
**Date Collected:** NA  
**Date Received:**

**Units:** ug/L  
**Basis:** NA

Low Level Organochlorine Pesticides by GC

**Analytical Method:** 8081B  
**Prep Method:** EPA 3511

LOQ	LOQ	Primary Result	Confirmation Result	RPD	Q	Dilution Factor	Date Analyzed
Endrin	0.010	0.192	0.201	5		1	06/06/23 00:59
Heptachlor	0.010	0.211	0.235	11		1	06/06/23 00:59
Heptachlor Epoxide	0.010	0.192	0.204	6		1	06/06/23 00:59
Hexachlorobenzene	0.010	0.220	0.227	3		1	06/06/23 00:59
Methoxychlor	0.010	0.198	0.234	17		1	06/06/23 00:59
gamma-BHC (Lindane)	0.010	0.213	0.229	7		1	06/06/23 00:59

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Confirmation Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Matrix:** Water  
**Sample Name:** Lab Control Sample  
**Lab Code:** KQ2306685-09

**Service Request:** K2304151  
**Date Collected:** NA  
**Date Received:**

**Units:** ug/L  
**Basis:** NA

Low Level Organochlorine Pesticides by GC

**Analytical Method:** 8081B  
**Prep Method:** None

<b>LOQ</b>	<b>LOQ</b>	<b>Primary Result</b>	<b>Confirmation Result</b>	<b>RPD</b>	<b>Q</b>	<b>Dilution Factor</b>	<b>Date Analyzed</b>
Toxaphene	0.60	23.4	24.6	5		1	06/06/23 05:33

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Confirmation Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Matrix:** Water  
**Sample Name:** Duplicate Lab Control Sample  
**Lab Code:** KQ2306685-10

**Service Request:** K2304151  
**Date Collected:** NA  
**Date Received:**

**Units:** ug/L  
**Basis:** NA

Low Level Organochlorine Pesticides by GC

**Analytical Method:** 8081B  
**Prep Method:** None

<b>LOQ</b>	<b>LOQ</b>	<b>Primary Result</b>	<b>Confirmation Result</b>	<b>RPD</b>	<b>Q</b>	<b>Dilution Factor</b>	<b>Date Analyzed</b>
Toxaphene	0.60	12.5	12.6	<1		1	06/06/23 06:03



## Polychlorinated Biphenyls (PCBs)

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

Analytical Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water

**Service Request:** K2304151  
**Date Collected:** 04/06/2023  
**Date Received:** 04/08/2023

**Polychlorinated Biphenyls (PCBs)**

**Sample Name:** 4-166-BKGND-04062023  
**Lab Code:** K2304151-001  
**Extraction Method:** EPA 3520C  
**Analysis Method:** 8082A

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1221	ND	U	0.040		0.040	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1232	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1242	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1248	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1254	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1260	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	74	70-130	05/26/23	Acceptable

**Comments:** \_\_\_\_\_

Analytical Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water

**Service Request:** K2304151  
**Date Collected:** NA  
**Date Received:** NA

Polychlorinated Biphenyls (PCBs)

**Sample Name:** Method Blank  
**Lab Code:** KWG2300805-1  
**Extraction Method:** EPA 3520C  
**Analysis Method:** 8082A

**Units:** ug/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	LOQ	LOD	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1221	ND	U	0.040		0.040	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1232	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1242	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1248	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1254	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	
Aroclor 1260	ND	U	0.020		0.020	1	05/17/23	05/26/23	KWG2300805	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	83	70-130	05/26/23	Acceptable

**Comments:** \_\_\_\_\_

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water

**Service Request:** K2304151

**Surrogate Recovery Summary  
 Polychlorinated Biphenyls (PCBs)**

**Extraction Method:** EPA 3520C  
**Analysis Method:** 8082A

**Units:** Percent  
**Level:** Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>
4-166-BKGND-04062023	K2304151-001	74
Method Blank	KWG2300805-1	83
Lab Control Sample	KWG2300805-2	79
Duplicate Lab Control Sample	KWG2300805-3	79

**Surrogate Recovery Control Limits (%)**

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Sur1 = Decachlorobiphenyl 70-130

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Results flagged with an asterisk (\*) indicate values outside control criteria.  
 Results flagged with a pound (#) indicate the control criteria is not applicable.

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water

**Service Request:** K2304151  
**Date Extracted:** 05/17/2023  
**Date Analyzed:** 05/26/2023

**Lab Control Spike/Duplicate Lab Control Spike Summary**  
**Polychlorinated Biphenyls (PCBs)**

**Extraction Method:** EPA 3520C  
**Analysis Method:** 8082A

**Units:** ug/L  
**Basis:** NA  
**Level:** Low  
**Extraction Lot:** KWG2300805

Analyte Name	Lab Control Sample KWG2300805-2 Lab Control Spike			Duplicate Lab Control Sample KWG2300805-3 Duplicate Lab Control Spike			%Rec Limits	RPD	RPD Limit
	Result	Spike Amount	%Rec	Result	Spike Amount	%Rec			
Aroclor 1016	0.196	0.250	78	0.175	0.250	70	70-130	11	30
Aroclor 1260	0.188	0.250	75	0.205	0.250	82	70-130	8	30

Results flagged with an asterisk (\*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.



# Chlorinated Herbicides by GC

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

**ALS Group USA, Corp.**  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water  
**Sample Name:** 4-166-BKGND-04062023  
**Lab Code:** K2304151-001

**Service Request:** K2304151  
**Date Collected:** 04/06/23 11:25  
**Date Received:** 04/08/23 11:00  
**Units:** ug/L  
**Basis:** NA

**Chlorinated Herbicides by GC**

**Analysis Method:** 8151A  
**Prep Method:** Method

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
2,4,5-T	ND U	0.20	0.10	0.033	1	05/10/23 13:22	4/12/23	
2,4,5-TP (Silvex)	ND U	0.20	0.10	0.045	1	05/10/23 13:22	4/12/23	*
2,4-D	ND U	0.40	0.10	0.036	1	05/10/23 13:22	4/12/23	
2,4-DB	<b>0.15 J</b>	0.40	0.20	0.10	1	05/10/23 13:22	4/12/23	
Dalapon	ND U	0.40	0.28	0.28	1	05/10/23 13:22	4/12/23	
Dicamba	ND U	0.20	0.10	0.025	1	05/10/23 13:22	4/12/23	*
Dichlorprop	ND U	0.40	0.10	0.030	1	05/10/23 13:22	4/12/23	*
Dinoseb	ND U	0.20	0.060	0.015	1	05/10/23 13:22	4/12/23	
MCPA	ND U	100	20	8.7	1	05/10/23 13:22	4/12/23	
MCPP	ND U	100	20	14	1	05/10/23 13:22	4/12/23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4-Dichlorophenylacetic Acid	53	17 - 113	05/10/23 13:22	

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water

**Service Request:** K2304151

**SURROGATE RECOVERY SUMMARY**  
**Chlorinated Herbicides by GC**

**Analysis Method:** 8151A  
**Extraction Method:** Method

<b>Sample Name</b>	<b>Lab Code</b>	<b>2,4-Dichlorophenylacetic Acid 17 - 113</b>
4-166-BKGND-04062023	K2304151-001	53
Method Blank	KQ2306579-01	56
Lab Control Sample	KQ2306579-02	68
Duplicate Lab Control Sample	KQ2306579-03	78

**ALS Group USA, Corp.**  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2306579-01

**Service Request:** K2304151  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/L  
**Basis:** NA

**Chlorinated Herbicides by GC**

**Analysis Method:** 8151A  
**Prep Method:** Method

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
2,4,5-T	ND U	0.20	0.10	0.033	1	05/10/23 11:47	4/12/23	
2,4,5-TP (Silvex)	ND U	0.20	0.10	0.045	1	05/10/23 11:47	4/12/23	
2,4-D	ND U	0.40	0.10	0.036	1	05/10/23 11:47	4/12/23	
2,4-DB	<b>0.13 JP</b>	0.40	0.20	0.10	1	05/10/23 11:47	4/12/23	
Dalapon	ND U	0.40	0.28	0.28	1	05/10/23 11:47	4/12/23	
Dicamba	ND U	0.20	0.10	0.025	1	05/10/23 11:47	4/12/23	
Dichlorprop	ND U	0.40	0.10	0.030	1	05/10/23 11:47	4/12/23	
Dinoseb	ND U	0.20	0.060	0.015	1	05/10/23 11:47	4/12/23	
MCPA	ND U	100	20	8.7	1	05/10/23 11:47	4/12/23	
MCPP	ND U	100	20	14	1	05/10/23 11:47	4/12/23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4-Dichlorophenylacetic Acid	56	17 - 113	05/10/23 11:47	

**ALS Group USA, Corp.**  
dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water

**Service Request:** K2304151  
**Date Analyzed:** 05/10/23  
**Date Extracted:** 04/12/23

**Duplicate Lab Control Sample Summary**  
**Chlorinated Herbicides by GC**

**Analysis Method:** 8151A  
**Prep Method:** Method

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 806155

**Lab Control Sample**  
**KQ2306579-02**

**Duplicate Lab Control Sample**  
**KQ2306579-03**

Analyte Name	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec	% Rec Limits	RPD	RPD Limit
2,4,5-T	2.07	2.50	83	2.24	2.50	90	30-120	8	30
2,4,5-TP (Silvex)	1.90	2.50	76	2.11	2.50	85	37-114	11	30
2,4-D	1.80	2.50	72	2.04	2.50	82	35-110	13	30
2,4-DB	2.12	2.50	85	2.11	2.50	84	10-134	<1	30
Dalapon	1.55	2.50	62	1.94	2.50	77	14-110	22	30
Dicamba	2.00	2.50	80	2.20	2.50	88	30-108	9	30
Dichlorprop	1.95	2.50	78	2.30	2.50	92	29-104	17	30
Dinoseb	2.04	2.50	82	2.06	2.50	83	11-105	1	30
MCPA	194	250	78	214	250	86	21-117	10	30
MCPP	175	250	70	199	250	80	16-141	13	30

ALS Group USA, Corp.  
dba ALS Environmental

Confirmation Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Matrix:** Water  
**Sample Name:** 4-166-BKGND-04062023  
**Lab Code:** K2304151-001

**Service Request:** K2304151  
**Date Collected:** 04/06/23 11:25  
**Date Received:** 4/8/23

**Units:** ug/L  
**Basis:** NA

Chlorinated Herbicides by GC

**Analytical Method:** 8151A  
**Prep Method:** Method

<u>LOQ</u>	<u>LOQ</u>	<u>MDL</u>	<u>Primary Result</u>	<u>Confirmation Result</u>	<u>RPD</u>	<u>Q</u>	<u>Dilution Factor</u>	<u>Date Analyzed</u>
2,4-DB		0.10	0.15	0.19	24	J	1	05/10/23 13:22

ALS Group USA, Corp.  
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Confirmation Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2306579-01

**Service Request:** K2304151  
**Date Collected:** NA  
**Date Received:**

**Units:** ug/L  
**Basis:** NA

Chlorinated Herbicides by GC

**Analytical Method:** 8151A  
**Prep Method:** Method

<u>LOQ</u>	<u>LOQ</u>	<u>MDL</u>	<u>Primary Result</u>	<u>Confirmation Result</u>	<u>RPD</u>	<u>Q</u>	<u>Dilution Factor</u>	<u>Date Analyzed</u>
2,4-DB		0.10	0.13	0.22	51	JP	1	05/10/23 11:47

ALS Group USA, Corp.  
dba ALS Environmental

Confirmation Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Matrix:** Water  
**Sample Name:** Lab Control Sample  
**Lab Code:** KQ2306579-02

**Service Request:** K2304151  
**Date Collected:** NA  
**Date Received:**

**Units:** ug/L  
**Basis:** NA

Chlorinated Herbicides by GC

**Analytical Method:** 8151A  
**Prep Method:** Method

LOQ	LOQ	MDL	Primary Result	Confirmation Result	RPD	Q	Dilution Factor	Date Analyzed
2,4,5-T		0.033	2.07	2.24	8		1	05/10/23 12:11
2,4,5-TP (Silvex)		0.045	1.90	1.96	3		1	05/10/23 12:11
2,4-D		0.036	1.80	1.85	3		1	05/10/23 12:11
2,4-DB		0.10	2.12	2.96	33		1	05/10/23 12:11
Dalapon		0.28	1.55	1.66	7		1	05/10/23 12:11
Dicamba		0.025	2.00	2.09	4		1	05/10/23 12:11
Dichlorprop		0.030	1.95	2.07	6		1	05/10/23 12:11
Dinoseb		0.015	2.04	2.09	2		1	05/10/23 12:11
MCPA		8.7	194	198	2		1	05/10/23 12:11
MCPP		14	175	179	2		1	05/10/23 12:11

ALS Group USA, Corp.  
dba ALS Environmental

Confirmation Results

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Matrix:** Water  
**Sample Name:** Duplicate Lab Control Sample  
**Lab Code:** KQ2306579-03

**Service Request:** K2304151  
**Date Collected:** NA  
**Date Received:**

**Units:** ug/L  
**Basis:** NA

Chlorinated Herbicides by GC

**Analytical Method:** 8151A  
**Prep Method:** Method

LOQ	LOQ	MDL	Primary Result	Confirmation Result	RPD	Q	Dilution Factor	Date Analyzed
2,4,5-T		0.033	2.24	2.30	3		1	05/10/23 12:34
2,4,5-TP (Silvex)		0.045	2.11	2.15	2		1	05/10/23 12:34
2,4-D		0.036	2.04	2.05	<1		1	05/10/23 12:34
2,4-DB		0.10	2.11	2.11	<1		1	05/10/23 12:34
Dalapon		0.28	1.94	2.09	7		1	05/10/23 12:34
Dicamba		0.025	2.20	2.28	4		1	05/10/23 12:34
Dichlorprop		0.030	2.30	2.32	<1		1	05/10/23 12:34
Dinoseb		0.015	2.06	2.09	1		1	05/10/23 12:34
MCPA		8.7	214	220	3		1	05/10/23 12:34
MCPP		14	199	199	<1		1	05/10/23 12:34



# Semi-Volatile Organic Compounds by GC/MS

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

**ALS Group USA, Corp.**  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water  
**Sample Name:** 4-166-BKGND-04062023  
**Lab Code:** K2304151-001

**Service Request:** K2304151  
**Date Collected:** 04/06/23 11:25  
**Date Received:** 04/08/23 11:00  
**Units:** ug/L  
**Basis:** NA

**Semivolatile Organic Compounds by GC/MS**

**Analysis Method:** 8270D  
**Prep Method:** EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Benzo(a)pyrene	ND U	13	0.34	1	05/18/23 18:26	5/8/23	*
Bis(2-ethylhexyl) Phthalate	ND U	13	0.35	1	05/18/23 18:26	5/8/23	*
Hexachlorobenzene	ND U	13	0.45	1	05/18/23 18:26	5/8/23	*
Hexachlorocyclopentadiene	ND U	64	2.0	1	05/18/23 18:26	5/8/23	*
Pentachlorophenol	ND U	32	4.5	1	05/18/23 18:26	5/8/23	*

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2-Fluorobiphenyl	79	44 - 119	05/18/23 18:26	
Terphenyl-d14	108	50 - 134	05/18/23 18:26	
2,4,6-Tribromophenol	74	43 - 140	05/18/23 18:26	

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water

**Service Request:** K2304151

**SURROGATE RECOVERY SUMMARY**  
**Semivolatile Organic Compounds by GC/MS**

**Analysis Method:** 8270D  
**Extraction Method:** EPA 3520C

Sample Name	Lab Code	2,4,6-Tribromophenol	2-Fluorobiphenyl	Terphenyl-d14
		43 - 140	44 - 119	50 - 134
4-166-BKGND-04062023	K2304151-001	74	79	108
Method Blank	KQ2308254-01	76	83	108
Lab Control Sample	KQ2308254-02	78	75	79
Duplicate Lab Control Sample	KQ2308254-03	83	75	81

**ALS Group USA, Corp.**  
dba ALS Environmental

Analytical Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ2308254-01

**Service Request:** K2304151  
**Date Collected:** NA  
**Date Received:** NA  
**Units:** ug/L  
**Basis:** NA

**Semivolatile Organic Compounds by GC/MS**

**Analysis Method:** 8270D  
**Prep Method:** EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Benzo(a)pyrene	ND U	10	0.26	1	05/18/23 16:58	5/8/23	
Bis(2-ethylhexyl) Phthalate	ND U	10	0.27	1	05/18/23 16:58	5/8/23	
Hexachlorobenzene	ND U	10	0.35	1	05/18/23 16:58	5/8/23	
Hexachlorocyclopentadiene	ND U	50	1.5	1	05/18/23 16:58	5/8/23	
Pentachlorophenol	ND U	25	3.5	1	05/18/23 16:58	5/8/23	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2-Fluorobiphenyl	83	44 - 119	05/18/23 16:58	
Terphenyl-d14	108	50 - 134	05/18/23 16:58	
2,4,6-Tribromophenol	76	43 - 140	05/18/23 16:58	

**ALS Group USA, Corp.**  
dba ALS Environmental

QA/QC Report

**Client:** GSI Water Solutions, Inc  
**Project:** Umatilla Depot/913.001.002.022  
**Sample Matrix:** Water

**Service Request:** K2304151  
**Date Analyzed:** 05/18/23  
**Date Extracted:** 05/08/23

**Duplicate Lab Control Sample Summary**  
**Semivolatiles Organic Compounds by GC/MS**

**Analysis Method:** 8270D  
**Prep Method:** EPA 3520C

**Units:** ug/L  
**Basis:** NA  
**Analysis Lot:** 804819

**Lab Control Sample**  
**KQ2308254-02**

**Duplicate Lab Control Sample**  
**KQ2308254-03**

Analyte Name	Lab Control Sample			Duplicate Lab Control Sample			% Rec Limits	RPD	RPD Limit
	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Benzo(a)pyrene	106	100	106	105	100	105	54-128	1	20
Bis(2-ethylhexyl) Phthalate	113	100	113	110	100	110	55-135	3	20
Hexachlorobenzene	84.2	100	84	81.8	100	82	53-125	3	20
Hexachlorocyclopentadiene	56.2	100	56 *	53.3	100	53 *	10-45	5	20
Pentachlorophenol	74.3	100	74	77.0	100	77	35-138	4	20



# Subcontract Lab Results

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)



May 03, 2023

Mark Harris  
ALS  
1317 South 13th Avenue  
Kelso, Washington 98626

Re: Kelso - Harris L2  
Work Order: 618239

Dear Mark Harris:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on April 13, 2023. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Test results for NELAP or ISO 17025 accredited tests are verified to meet the requirements of those standards, with any exceptions noted. The results reported relate only to the items tested and to the sample as received by the laboratory. These results may not be reproduced except as full reports without approval by the laboratory. Copies of GEL's accreditations and certifications can be found on our website at [www.gel.com](http://www.gel.com).

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4422.

Sincerely,

Adrian Melendrez for  
Jake Crook  
Project Manager

Purchase Order: 51K2304151  
Enclosures



# Case Narrative

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Report Date: May 3, 2023

Company : ALS  
Address : 1317 South 13th Avenue

Kelso, Washington 98626

Contact: Mark Harris  
Project: Kelso - Harris L2

Client Sample ID: 4-166-BKGN0-04062023	Project: ALSE01223
Sample ID: 618239001	Client ID: ALSE001
Matrix: Water	
Collect Date: 06-APR-23 11:25	
Receive Date: 13-APR-23	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
200.2/200.8 Uranium "As Received"												
Uranium		3.95	0.0670	0.200	ug/L	1.00	1	SKJ	04/17/23	2333	2413024	1
Rad Gas Flow Proportional Counting												
GFPC Gross A/B, Liquid "As Received"												
Alpha		3.51	3.05	4.00	pCi/L			KP1	05/02/23	1641	2415696	2
Beta		4.15	3.28	4.00	pCi/L							
GFPC Ra228, Liquid "As Received"												
Radium-228		4.16	1.80	3.00	pCi/L			JE1	05/02/23	0909	2414124	3
Rad Radium-226												
Lucas Cell, Ra226, Liquid "As Received"												
Radium-226	U	0.0260	0.488	1.00	pCi/L			LXP1	05/02/23	0924	2414112	4

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 200.2	ICP-MS 200.2 PREP	EM2	04/13/23	1540	2413022

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 200.8	
2	EPA 900.0/SW846 9310	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC Ra228, Liquid "As Received"			87.4	(15%-125%)

**Notes:**

Column headers are defined as follows:

- |                                       |                                |
|---------------------------------------|--------------------------------|
| DF: Dilution Factor                   | Lc/LC: Critical Level          |
| DL: Detection Limit                   | PF: Prep Factor                |
| MDA: Minimum Detectable Activity      | RL: Reporting Limit            |
| MDC: Minimum Detectable Concentration | SQL: Sample Quantitation Limit |

**Receipt Narrative  
for  
ALS Environmental  
SDG: 618239**

**May 03, 2023**

**Laboratory Identification:**

GEL Laboratories LLC  
2040 Savage Road  
Charleston, South Carolina 29407  
(843) 556-8171

**Summary:**

**Sample receipt:** The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on April 13, 2023 for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

**Sample Identification:** The laboratory received the following sample:

<b><u>Laboratory ID</u></b>	<b><u>Client ID</u></b>
618239001	4-166-BKGN0-04062023

**Case Narrative:**

Sample analyses were conducted using methodology as outlined in GEL's Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Radiochemistry and Metals.



Adrian Melendrez for  
Jake Crook  
Project Manager

# **Chain of Custody and Supporting Documentation**

# ALS Environmental Chain of Custody

1317 South 13th Avenue • Kelso, WA 98626 • 1-360-577-7222 • FAX 1-360-636-1068

ALS Contact: Mark Harris

Project Number: K2304151  
 Project Manager: Mark Harris  
 Q#: DOD QSM v5.1 Kelso

618239

Lab Code	Sample ID	# of Cont.	Matrix	Sample		Lab ID	Misc Out 1	Radioact	Radium 226	Radium 228
				Date	Time					
K2304151-001	4-166-BKGN0-04062023	4	Water	4/6/23	1125	GEL Labs LLC	X	X	X	X

Test Comments  
 Misc Out 1 - None

Uranium

K2304151-001

<b>Special Instructions/Comments</b> Please provide the electronic (PDF and EDD) report to the following e-mail address: ALKLS.Data@alsglobal.com.	<b>Turnaround Requirements</b> RUSH (Surcharges Apply) <b>PLEASE CIRCLE WORK DAYS</b> 1 2 3 4 5 <input checked="" type="checkbox"/> STANDARD Requested FAX Date: _____ Requested Report Date: 04/28/23	<b>Report Requirements</b> I. Results Only _____ II. Results + QC Summaries <input checked="" type="checkbox"/> III. Results + QC and Calibration Summaries _____ IV. Data Validation Report with Raw Data _____ PQL/MDL/1 <u>Y</u> EDD <u>Y</u>	<b>Invoice Information</b> PO# 51K2304151 Bill to _____

Relinquished By: *Mark Harris* 4/12/23 Received By: *[Signature]* 4/13/23 950 Airbill Number: \_\_\_\_\_

K2304151

✓ **Ship To: GEL Labs LLC**  
GEL Laboratories, LLC  
2040 Savage Road  
Charleston, SC 29407

PC MDA Date 4/6/23  
SMO MMW Date \_\_\_\_\_

**Instructions:**

Ice \_\_\_\_\_  
Dry Ice \_\_\_\_\_  
No Ice

Bill to Client Account \_\_\_\_\_

**Shipping:**

Overnight   
2nd Day \_\_\_\_\_  
Ground \_\_\_\_\_

Comments:

ALS Group USA, Corp.  
www.alsglobal.com  
An ALS Limited Company

**GEL** Laboratories LLC

**SAMPLE RECEIPT & REVIEW FORM**

Client: <b>ALSE</b>	SDG/AR/COC/Work Order: <b>618239</b>
Received By: <b>SNS</b>	Date Received: <b>4/14/23</b>
Carrier and Tracking Number	Circle Applicable: <input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other  <b>619516590499</b>

Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
A) Shipped as a DOT Hazardous?		<input checked="" type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____ If UN2910, Is the Radioactive Shipment Survey Compliant? Yes ___ No ___
B) Did the client designate the samples are to be received as radioactive?		<input checked="" type="checkbox"/>	COC notation or radioactive stickers on containers equal client designation.
C) Did the RSO classify the samples as radioactive?		<input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u> (CPM) mR/Hr Classified as: Rad 1 Rad 2 Rad 3
D) Did the client designate samples are hazardous?		<input checked="" type="checkbox"/>	COC notation or hazard labels on containers equal client designation.
E) Did the RSO identify possible hazards?		<input checked="" type="checkbox"/>	If D or E is yes, select Hazards below. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other:

Sample Receipt Criteria		Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			Circle Applicable: Client contacted and provided COC COC created upon receipt
3	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>			Preservation Method: Wet Ice Ice Packs Dry ice <input checked="" type="checkbox"/> None Other: *all temperatures are recorded in Celsius TEMP: <u>20</u>
4	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>			Temperature Device Serial #: <u>IR1-23</u> Secondary Temperature Device Serial # (If Applicable):
5	Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6	Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>			Sample ID's and Containers Affected: If Preservation added, Lot#: _____ If Yes, are Encores or Soil Kits present for solids? Yes ___ No ___ NA ___ (If yes, take to VOA Freezer)
7	Do any samples require Volatile Analysis?			<input checked="" type="checkbox"/>	Do liquid VOA vials contain acid preservation? Yes ___ No ___ NA ___ (If unknown, select No) Are liquid VOA vials free of headspace? Yes ___ No ___ NA ___ Sample ID's and containers affected:
8	Samples received within holding time?	<input checked="" type="checkbox"/>			ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			ID's and containers affected:
10	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Circle Applicable: No dates on containers No times on containers COC missing info Other (describe)
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Circle Applicable: No container count on COC Other (describe)
12	Are sample containers identifiable as GEL provided by use of GEL labels?			<input checked="" type="checkbox"/>	
13	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			Circle Applicable: Not relinquished Other (describe)

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials JM Date 4-14-23 Page 1 of 1

# Laboratory Certifications

**List of current GEL Certifications as of 03 May 2023**

<b>State</b>	<b>Certification</b>
Alabama	42200
Alaska	17-018
Alaska Drinking Water	SC00012
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana Drinking Water	LA024
Louisiana NELAP	03046 (AI33904)
Maine	2019020
Maryland	270
Massachusetts	M-SC012
Massachusetts PFAS Approv	Letter
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122023-4
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	2022-160
Pennsylvania NELAP	68-00485
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
Sanitation Districts of L	9255651
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-22-20
Utah NELAP	SC000122022-37
Vermont	VT87156
Virginia NELAP	460202
Washington	C780



301 Fulling Mill Road | Middletown, PA 17057 | Phone: 717-944-5541 | Fax: 717-944-1430 | [www.alsglobal.com](http://www.alsglobal.com)

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618  
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

Analytical Results Report For

**ALS Environmental-Kelso**

Project [ALK050JK2304151](#)  
Workorder [3298413](#)  
Report ID [240307 on 4/28/2023](#)

### Certificate of Analysis

Enclosed are the analytical results for samples received by the laboratory on Apr 13, 2023.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Sarah Leung (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at [www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads](http://www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads).

This laboratory report may not be reproduced, except in full, without the written approval of ALS Global.  
ALS Middletown: 301 Fulling Mill Road, Middletown, PA 17057 : 717-944-5541.

Recipient(s):

ALKLS Data - ALS Environmental-Kelso  
Mark Harris - ALS Environmental-Kelso

**Sarah Leung**  
Project Coordinator

(ALS Digital Signature)

*This page is included as part of the Analytical Report and must be retained as a permanent record thereof.*



**Project** ALK050|K2304151  
**Workorder** 3298413

### Sample Summary

<u>Lab ID</u>	<u>Sample ID</u>	<u>Matrix</u>	<u>Date Collected</u>	<u>Date Received</u>	<u>Collector</u>	<u>Collection Company</u>
3298413001	4-166-BKGN0-04062023	Water	04/06/2023 11:25	04/13/2023 08:53	CBC	Collected By Client



Reference

**Notes**

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- Except as qualified, Clean Water Act sample analyses are consistent with methodology requirements in 40 CFR Part 136.
- Except as qualified, Safe Drinking Water Act sample analyses are consistent with methodology requirements in 40 CFR Part 141.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are performed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.

**Standard Acronyms/Flags**

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND) above the MDL
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Practical Quantitation Limit for this Project
ND	Not Detected - indicates that the analyte was Not Detected
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits
#	Please reference the result in the Results Section for analyte-level flags.



**Project** ALK050|K2304151  
**Workorder** 3298413

**Project Notations**

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**Sample Notations**

Lab ID	Sample ID
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**Result Notations**

Notation Ref.
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**Detected Results Summary**

Not applicable for this WO.



Project ALK050|K2304151  
 Workorder 3298413

## Results

Client Sample ID	4-166-BKGN0-04062023	Collected	04/06/2023 11:25
Lab Sample ID	3298413001	Lab Receipt	04/13/2023 08:53

### ENERGETICS

Compound	Result	Flag	Units	LOQ	LOD	DL	Method	Dilution	Analysis Date/Time	By	Cntr
1,3,5-Trinitrobenzene	0.30U	U	ug/L	0.35	0.30	0.079	SW846 8330B	1	04/25/2023 22:00	CGS	A1
1,3-Dinitrobenzene	0.30U	U	ug/L	0.35	0.30	0.089	SW846 8330B	1	04/25/2023 22:00	CGS	A1
2,4,6-Trinitrotoluene	0.30U	U	ug/L	0.35	0.30	0.079	SW846 8330B	1	04/25/2023 22:00	CGS	A1
2,4-Dinitrotoluene	0.30U	U	ug/L	0.35	0.30	0.099	SW846 8330B	1	04/25/2023 22:00	CGS	A1
HMX	0.30U	U	ug/L	0.35	0.30	0.089	SW846 8330B	1	04/25/2023 22:00	CGS	A1
Nitrobenzene	0.30U	U	ug/L	0.35	0.30	0.089	SW846 8330B	1	04/25/2023 22:00	CGS	A1
RDX	0.30U	U	ug/L	0.35	0.30	0.089	SW846 8330B	1	04/25/2023 22:00	CGS	A1
Tetryl	0.30U	U	ug/L	0.35	0.30	0.089	SW846 8330B	1	04/25/2023 22:00	CGS	A1

### SURROGATES

Compound	CAS No	Recovery	Limits(%)	Analysis Date/Time	Qualifiers
1,4-Dinitrobenzene	100-25-4	110%	50 - 150	04/25/2023 22:00	



**Sample - Method Cross Reference Table**

Lab ID	Sample ID	Analysis Method	Preparation Method	Leachate Method
3298413001	4-166-BKGN0-04062023	SW846 8330B	SW846 8330B	



Project ALK050|K2304151  
 Workorder 3298413

**QUALITY CONTROL SAMPLES**

**ENERGETICS**

QC Batch			
QC Batch	977157	Prep Method	SW846 8330B
Date	04/22/2023 01:40	Analysis Method	SW846 8330B
Tech.	KMR		

Associated Samples
3298413001

**Matrix Spike** 3658124 (MS) 3298414001 (non-Project Sample) For QC Batch 977157

\*\*\*\*NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

**RESULTS**

Compound	CAS No		Result (ug/L)	Orig. Result (ug/L)	Spk Added (ug/L)	Rec. (%)	Limits (%)	RPD Limit (%)	Qualifiers
1,3,5-Trinitrobenzene	99-35-4	MS	1.30	0	1	128*	73 - 125		
1,3-Dinitrobenzene	99-65-0	MS	1.30	0	1	122*	78 - 120		
2,4,6-Trinitrotoluene	118-96-7	MS	1.30	0	1	120	71 - 123		
2,4-Dinitrotoluene	121-14-2	MS	1.20	0	1	118	78 - 120		
HMX	2691-41-0	MS	1.20	0	1	118	65 - 135		
Nitrobenzene	98-95-3	MS	1.20	0	1	116	65 - 134		
RDX	121-82-4	MS	1.40	0	1	131*	68 - 130		
Tetryl	479-45-8	MS	1.30	0	1	124	64 - 128		

**SURROGATES**

Compound	CAS No		Result (ug/L)	Expected (ug/L)	Rec. (%)	Limits (%)	Qualifiers
1,4-Dinitrobenzene	100-25-4	MS	6	5.20	115	50 - 150	

**Duplicate** 3658125 (DUP) 3298413001 For QC Batch 977157

\*\*\*\*NOTE - The Original Result and Duplicate Result shown below are raw results and are only used for the purpose of calculating Sample Duplicate percent recoveries. This result is not a final value and cannot be used as such.

**RESULTS**

Compound	CAS No		Result (ug/L)	Orig. Result (ug/L)	Qualifiers
1,3,5-Trinitrobenzene	99-35-4	DUP	0	0	RPD <u>0</u> (Max-20) U
1,3-Dinitrobenzene	99-65-0	DUP	0	0	RPD <u>0</u> (Max-20) U
2,4,6-Trinitrotoluene	118-96-7	DUP	0	0	RPD <u>0</u> (Max-20) U
2,4-Dinitrotoluene	121-14-2	DUP	0	0	RPD <u>0</u> (Max-20) U
HMX	2691-41-0	DUP	0	0	RPD <u>0</u> (Max-20) U
Nitrobenzene	98-95-3	DUP	0	0	RPD <u>0</u> (Max-20) U
RDX	121-82-4	DUP	0	0	RPD <u>0</u> (Max-20) U
Tetryl	479-45-8	DUP	0	0	RPD <u>0</u> (Max-20) U



**QUALITY CONTROL SAMPLES**

**ENERGETICS (cont.)**

*SURROGATES*

Compound	CAS No		Result (ug/L)	Expected (ug/L)	Rec. (%)	Limits (%)	Qualifiers
1,4-Dinitrobenzene	100-25-4	DUP	5.60	5.10	110	50 - 150	

**Method Blank** 3658126 (MB) Created on 04/22/2023 00:57 For QC Batch 977157

*RESULTS*

Compound	CAS No		Result	Units	LOQ	Qualifiers
1,3,5-Trinitrobenzene	99-35-4	BLK	0.30U	ug/L	0.35	U
1,3-Dinitrobenzene	99-65-0	BLK	0.30U	ug/L	0.35	U
2,4,6-Trinitrotoluene	118-96-7	BLK	0.30U	ug/L	0.35	U
2,4-Dinitrotoluene	121-14-2	BLK	0.30U	ug/L	0.35	U
HMX	2691-41-0	BLK	0.30U	ug/L	0.35	U
Nitrobenzene	98-95-3	BLK	0.30U	ug/L	0.35	U
RDX	121-82-4	BLK	0.30U	ug/L	0.35	U
Tetryl	479-45-8	BLK	0.30U	ug/L	0.35	U

*SURROGATES*

Compound	CAS No		Result (ug/L)	Expected (ug/L)	Rec. (%)	Limits (%)	Qualifiers
1,4-Dinitrobenzene	100-25-4	BLK	5.30	5	106	50 - 150	
1,4-Dinitrobenzene	100-25-4	BLK	5.70	5	115	50 - 150	

**Lab Control Standard** 3658127 (LCS) Created on 04/22/2023 00:57 For QC Batch 977157

*RESULTS*

Compound	CAS No		Result (ug/L)	Orig. Result (ug/L)	Spk Added (ug/L)	Rec. (%)	Limits (%)	RPD Limit (%)	Qualifiers
1,3,5-Trinitrobenzene	99-35-4	LCS	1.20		1	122	73 - 125		
1,3-Dinitrobenzene	99-65-0	LCS	1.20		1	117	78 - 120		
2,4,6-Trinitrotoluene	118-96-7	LCS	1.20		1	117	71 - 123		
2,4-Dinitrotoluene	121-14-2	LCS	1.20		1	116	78 - 120		
HMX	2691-41-0	LCS	1.10		1	113	65 - 135		
Nitrobenzene	98-95-3	LCS	1.10		1	110	65 - 134		
RDX	121-82-4	LCS	1.20		1	120	68 - 130		
Tetryl	479-45-8	LCS	1.10		1	110	64 - 128		

*SURROGATES*

Compound	CAS No		Result (ug/L)	Expected (ug/L)	Rec. (%)	Limits (%)	Qualifiers
1,4-Dinitrobenzene	100-25-4	LCS	5.50	5	109	50 - 150	



### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Lab ID	Sample ID	Preparation Method	Prep Batch	Prep Date/Time	By	Analysis Method	Anly Batch
3298413001	4-166-BKGN0-04062023	SW846 8330B	977157	04/22/2023 01:40	KMR	SW846 8330B	979018

# ALS Environmental Chain of Custody

1317 South 13th Avenue • Kelso, WA 98626 • 1-360-577-7222 • FAX 1-360-636-1068

**Project Number:** K2304151  
**Project Manager:** Mark Harris  
**QAP:** DOD QSM v5.1 Kelso

**ALS Contact:** Mark Harris



3298413

Logged By: CXM  
 PH: SSL



Lab Code	Sample ID	# of Cont.	Matrix	Sample		Lab ID	NitroAro Amin 8330A
				Date	Time		
K2304151-001	4-166-BKGN0-04062023	2	Water	4/6/23	1125	Middletown ALS	X

Temp By: WJ WO Temp (°C) u Therm ID SD

Receipt Info Completed By: WJ

- Cooler Custody Seal Intact Y N NA
- Sample Custody Seal Intact Y N NA
- Received on Ice Y N NA
- Cooler & Samples Intact Y N NA
- Correct Containers Provided Y N NA
- Sample Label/COC Agree Y N NA
- Adequate Sample Volumes Y N NA
- CR6 Samples Filtered Y N NA
- OP Samples Filtered Y N NA
- VOA Headspace Present Y N NA
- Voa Trip Blank Y N NA
- NIS 4 Days? Y N NA
- Rad Screen (uCi) Y N NA
- Courier/Tracking #: WJ

SDWA Compliance Y N  
 PWSID Y N NA  
 WV Containers 0-6°C Y N NA

\* 6195 / 659 0488

<b>Special Instructions/Comments</b> Please provide the electronic (PDF and EDD) report to the following e-mail address: ALKLS_Data@alsglobal.com.  H - Test is On Hold      P - Test is Authorized for Prep Only	<b>Turnaround Requirements</b> RUSH (Surcharges Apply) _____ PLEASE CIRCLE WORK DAYS <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input checked="" type="checkbox"/> STANDARD Requested FAX Date: _____ Requested Report Date: 04/28/23	<b>Report Requirements</b> I. Results Only _____ <input checked="" type="checkbox"/> II. Results + QC Summaries III. Results + QC and Calibration Summaries _____ IV. Data Validation Report with Raw Data _____ PQL/MDL/J <u>Y</u> EDD <u>Y</u>	<b>Invoice Information</b> PO# 51K2304151  Bill to _____
	H - Test is On Hold      P - Test is Authorized for Prep Only		

Relinquished By: M. M. M. M. M. Received By: WJ 4/17/23

K2304151

✓ **Ship To: Middletown ALS**  
ALS Environmental - Middletown  
301 Fulling Mill Rd.  
Middletown, PA 17057

PC MA Date 4/6/23  
SMO MM Date 4/17/23

**Instructions:**

Ice   
Dry Ice \_\_\_\_\_  
No Ice \_\_\_\_\_

**Shipping:**

Overnight   
2nd Day \_\_\_\_\_  
Ground \_\_\_\_\_

Bill to Client Account \_\_\_\_\_

Comments:

Aluminum (Total)
Arsenic (Total)
Barium (Total)
Beryllium (Total)
Cadmium (Total)
Chromium (Total)
Copper (Total)
Iron (Total)
Lead (Total)
Manganese (Total)
Mercury (Total)
Nickel (Total)
Selenium (Total)
Silver (Total)
Thallium (Total)
Zinc (Total)
<i>Synthetic Organic Compounds (SOCs)</i>
2, 4-D
2, 4, 5-TP (Silvex)
Alachlor (Alanex)
Atrazine
Benzo(a)Pyrene
BHC-gamma (Lindane)
Carbofuran
Chlordane
Dalapon
Di(2-ethylhexyl)adipate ( <i>adipates</i> )
Di(2-ethylhexyl)phthalate ( <i>phthalates</i> )
Dibromochloropropane (DBCP)
Dinoseb
Diquat
Ethylene Dibromide (EDB)
Endothall
Endrin
Glyphosate
Heptachlor
Heptachlor Epoxide
Hexachlorobenzene (HCB)
Hexachlorocyclopentadiene
Methoxychlor
Pentachlorophenol
Picloram
Simazine
Total Polychlorinated Biphenyls (PCBs)
Toxaphene
Vydate (Oxamyl)

Radium 226
Radium 228
Uranium
<i>Bacteriological</i>
Total Coliform
Fecal Coliform
<i>Explosives</i>
2,4,6-trinitrotoluene (TNT)
hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)
octahydro-1,3,4,7-tetranitro-1,3,5,7-tetrazocine
2,4,6-trinitrophenyl-n-methylnitramine (teryl)
2,4-dinitrotoluene (2,4-DNT)
1,3,5-trinitrobenzene (2,6-DNT)
1,3-dinitrobenzene (DNB)
nitrobenzene (NB)

NOTE: PESTICIDE ANALYSES SHOWN ON FOLLOW



# Anatek Labs, Inc.

1282 Alturas Drive - Moscow, ID 83843 - (208) 883-2839 - email moscow@anateklabs.com  
504 E Sprague Ste. D - Spokane, WA 99202 - (509) 838-3999 - email spokane@anateklabs.com

**Client:** GSI Water Solutions, Inc.  
**Address:** 650 NE Holladay st, Suite 900  
Portland, OR 97232  
**Attn:** Matt Thomas

**Work Order:** MDD0315  
**Project:** Umatilla Depot 913.001.002.002  
**Reported:** 4/26/2023 13:03

## Analytical Results Report

**Sample Location:** RMW-1-BKGND-04052023  
**Lab/Sample Number:** MDD0315-01      **Collect Date:** 04/05/23 13:45  
**Date Received:** 04/11/23 09:54      **Collected By:**  
**Matrix:** Water

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
<b>Semivolatiles</b>							
Endothall	ND	ug/L	9.00	4/20/23 17:48	GPB	EPA 548.1	
<i>Surrogate: 2,4-DCPA</i>	<i>101%</i>		<i>70-130</i>	<i>4/20/23 17:48</i>	<i>GPB</i>	<i>EPA 548.1</i>	
bis-2(ethylhexyl)adipate	ND	ug/L	0.210	4/18/23 4:33	BMM	EPA 525.2	

# Anatek Labs, Inc.

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504 E Sprague Ste. D - Spokane, WA 99202 - (509) 838-3999 - email spokane@anateklabs.com

## Analytical Results Report

(Continued)

Sample Location: RMW-2-BKGND-04062023  
Lab/Sample Number: MDD0315-02 Collect Date: 04/06/23 15:55  
Date Received: 04/11/23 09:54 Collected By:  
Matrix: Water

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
<b>Semivolatiles</b>							
Endothall	ND	ug/L	9.00	4/20/23 18:05	GPB	EPA 548.1	
<i>Surrogate: 2,4-DCPA</i>	<i>98.8%</i>		<i>70-130</i>	<i>4/20/23 18:05</i>	<i>GPB</i>	<i>EPA 548.1</i>	
bis-2(ethylhexyl)adipate	ND	ug/L	0.209	4/18/23 5:06	BMM	EPA 525.2	

# Anatek Labs, Inc.

1282 Alturas Drive - Moscow, ID 83843 - (208) 883-2839 - email moscow@anateklabs.com  
504 E Sprague Ste. D - Spokane, WA 99202 - (509) 838-3999 - email spokane@anateklabs.com

## Analytical Results Report (Continued)

Sample Location: 4-166-BKGND-04062023  
Lab/Sample Number: MDD0315-03 Collect Date: 04/06/23 11:25  
Date Received: 04/11/23 09:54 Collected By:  
Matrix: Water

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
<b>Semivolatiles</b>							
Endothall	ND	ug/L	9.00	4/20/23 18:23	GPB	EPA 548.1	
<i>Surrogate: 2,4-DCPA</i>	<i>99.5%</i>		<i>70-130</i>	<i>4/20/23 18:23</i>	<i>GPB</i>	<i>EPA 548.1</i>	
bis-2(ethylhexyl)adipate	ND	ug/L	0.215	4/18/23 5:38	BMM	EPA 525.2	

Authorized Signature,



Justin Doty For Todd Taruscio, Laboratory Manager

PQL Practical Quantitation Limit  
ND Not Detected  
MCL EPA's Maximum Contaminant Level  
Dry Sample results reported on a dry weight basis  
\* Not a state-certified analyte

This report shall not be reproduced except in full, without the written approval of the laboratory  
The results reported related only to the samples indicated.

# Anatek Labs, Inc.

1282 Alturas Drive - Moscow, ID 83843 - (208) 883-2839 - email moscow@anateklabs.com  
 504 E Sprague Ste. D - Spokane, WA 99202 - (509) 838-3999 - email spokane@anateklabs.com

## Quality Control Data

### Semivolatiles

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch: BDD0469 - SVOC Water</b>										
<b>Blank (BDD0469-BLK1)</b>										
Di (2-ethylhexyl) adipate	ND		0.200	ug/L						
					Prepared: 4/13/2023 Analyzed: 4/17/2023					
<b>LCS (BDD0469-BS1)</b>										
Di (2-ethylhexyl) adipate	0.167		0.200	ug/L	0.200		83.4	20-130		
					Prepared: 4/13/2023 Analyzed: 4/17/2023					
<b>LCS Dup (BDD0469-BSD1)</b>										
Di (2-ethylhexyl) adipate	0.169		0.200	ug/L	0.200		84.7	20-130	1.53	25
					Prepared: 4/13/2023 Analyzed: 4/17/2023					
<b>Batch: BDD0500 - Endothall</b>										
<b>Blank (BDD0500-BLK1)</b>										
Endothall	ND		9.00	ug/L						
					Prepared: 4/12/2023 Analyzed: 4/20/2023					
<i>Surrogate: 2,4-DCPA</i>										
			51.0	ug/L	50.0		102	70-130		
<b>LCS (BDD0500-BS1)</b>										
Endothall	43.7		9.00	ug/L	50.0		87.4	70-130		
					Prepared: 4/12/2023 Analyzed: 4/20/2023					
<i>Surrogate: 2,4-DCPA</i>										
			50.8	ug/L	50.0		102	70-130		
<b>Matrix Spike (BDD0500-MS1)</b>										
			<b>Source: MDD0315-01</b>							
Endothall	44.2		9.00	ug/L	50.0	ND	88.4	55-135		
					Prepared: 4/12/2023 Analyzed: 4/20/2023					
<i>Surrogate: 2,4-DCPA</i>										
			50.4	ug/L	50.0		101	70-130		
<b>Matrix Spike Dup (BDD0500-MSD1)</b>										
			<b>Source: MDD0315-01</b>							
Endothall	44.4		9.00	ug/L	50.0	ND	88.7	55-135	0.421	25
					Prepared: 4/12/2023 Analyzed: 4/20/2023					
<i>Surrogate: 2,4-DCPA</i>										
			48.8	ug/L	50.0		97.7	70-130		



# Chain of Custody Record

**Anatek Lab.**  
 1282 Alturas Drive, Moscow ID  
 504 E Sprague Ste D, Spokane V

MDD0315  
  
 Due: 04/25/23

Company Name: <u>CSI Water Solutions</u>		Project Manager: <u>Matt Konbecher</u>	
Address: <u>650 NE Holladay St. Ste 900</u>		Project Name & #: <u>Umatilla Depot 913.001.002.002</u>	
City: <u>Portland</u>	State: <u>OR</u>	Zip: <u>97232</u>	Purchase Order #: <u>913.001.002.002</u>
Phone: <u>423-957-4716</u>		Sampler Name & Phone: <u>Matthew Thomas 423-957-4716</u>	
Email Address(es): <u>mthomas@csiw9.com</u>			

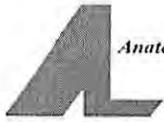
**Turn Arou**

Please refer to c  
 www.anatek.com

Normal Phone \_\_\_\_\_  
 Next Day\* Email \_\_\_\_\_  
 2nd Day\* \*All rush order requests must  
 Other\* have prior approval

				List Analyses Requested								Note Special Instructions/Comments		
Lab ID	Sample Identification	Sampling Date/Time	Matrix	# of Containers	Sample Volume	Preservative:								
						Adipate	Endothall							
	R11W-1-BK6ND-04052023	4/5/23 1315	Water	2	2L	X	X							
	R11W-2-BK6ND-04062023	4/6/23 1555	Water	2	2L	X	X							
	4-100-BK6ND-04062023	4/6/23 1125	Water	2	2L	X	X							
<b>Inspection Checklist</b>														
												Received Intact?	Y	N
												Labels & Chains Agree?	Y	N
												Containers Sealed?	Y	N
												No VOC Head Space?	Y	N
												Cooler?	Y	N
												Ice/Ice Packs Present?	Y	N
												Temperature (°C):		
		Printed Name	Signature	Company	Date	Time						Number of Containers:		
Relinquished by	<u>Matthew Thomas</u>	<u>Matthew Thomas</u>	<u>CSI Water Solutions</u>	<u>4/10/23</u>	<u>1600</u>						Shipped Via:			
Received by	<u>JR</u>		<u>Anatek</u>	<u>4/11/23</u>	<u>09:54</u>						Preservative:			
Relinquished by											Date & Time:			
Received by											Inspected By:			
Relinquished by														
Received by														

Samples submitted to Anatek Labs may be subcontracted to other accredited labs if necessary. This message serves as notice of this possibility. Subcontracted analyses will be clearly noted on the analytical report.



Anatek Labs, Inc.

### Sample Receipt and Preservation Form

Client Name: Ill water Solutions

TAT: Normal RUSH: \_\_\_\_\_ days

Samples Received From: FedEx  UPS  USPS  Client  Courier  Other: \_\_\_\_\_

Custody Seal on Cooler/Box:  Yes  No Custody Seals Intact:  Yes  No  N/A

Number of Coolers/Boxes: 1 Type of Ice: Wet Ice  Ice Packs  Dry Ice  None

Packing Material: Bubble Wrap  Bags  Foam/Peanuts  Paper  None  Other: \_\_\_\_\_

Cooler Temp As Read (°C): 3.5 Cooler Temp Corrected (°C): \_\_\_\_\_ Thermometer Used: \_\_\_\_\_

Comments:

Samples Received Intact?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
Chain of Custody Present/Complete?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
Labels and Chains Agree?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
Samples Received Within Hold Time?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
Correct Containers Received?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
Anatek Bottles Used?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	<input type="radio"/> Unknown
Total Number of Sample Bottles Received:	<u>6</u>		


Samples Properly Preserved?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
<i>If No, record preservation and pH-after details</i>			
VOC Vials Free of Headspace (<6mm)?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
VOC Trip Blanks Present?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A

Initial pH:	pH Paper ID:
<2 or	

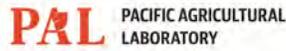
Record preservatives (and lot numbers, if known) for containers below:


Notes, comments, etc. (also use this space if contacting the client - record names and date/time)

<u>GILX6</u>

Received/Inspected By: JA Date/Time: 07:54 - 4/11/22

Form F19.01 - Eff 1 Dec 2022



GSI Water Solutions, Inc.  
650 NE Holladay Street Suite 900  
Portland, OR 97232

Report Number: P230409  
Report Date: April 25, 2023  
Client Project ID: 913.001.002.002

### Analytical Report

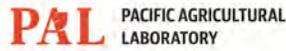
Client Sample ID: RMW-1-BUGNO-04052023  
Matrix: water

PAL Sample ID: P230409-01  
Sample Date: 4/5/23  
Received Date: 4/11/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
<b>Method:</b> Modified EPA 547 (LC-FLD)					
4/11/23	4/12/23	AMPA	ND	10 ug/L	
4/11/23	4/12/23	Glyphosate	ND	10 ug/L	
<b>Method:</b> Modified EPA 8151A (GC-MS/MS)					
4/12/23	4/18/23	Picloram	ND	0.086 ug/L	
<b>Method:</b> Modified EPA 8270D (GC-MS/MS)					
4/12/23	4/14/23	a-BHC	ND	0.060 ug/L	
4/12/23	4/14/23	Acetochlor	ND	0.060 ug/L	
4/12/23	4/14/23	Alachlor	ND	0.060 ug/L	
4/12/23	4/14/23	Aldrin	ND	0.060 ug/L	
4/12/23	4/14/23	Ametryn	ND	0.060 ug/L	
4/12/23	4/14/23	Aspon	ND	0.060 ug/L	
4/12/23	4/14/23	b-BHC	ND	0.060 ug/L	
4/12/23	4/14/23	Benfluralin	ND	0.060 ug/L	
4/12/23	4/14/23	Bifenthrin	ND	0.060 ug/L	
4/12/23	4/14/23	Bolstar	ND	0.060 ug/L	
4/12/23	4/14/23	Bromopropylate	ND	0.060 ug/L	
4/12/23	4/14/23	Buprofezin	ND	0.060 ug/L	
4/12/23	4/14/23	Captan	ND	0.60 ug/L	
4/12/23	4/14/23	Chlordane	ND	0.060 ug/L	
4/12/23	4/14/23	Chlorfenapyr	ND	0.060 ug/L	
4/12/23	4/14/23	Chlorfenvinphos	ND	0.060 ug/L	
4/12/23	4/14/23	Chlorobenzilate	ND	0.060 ug/L	
4/12/23	4/14/23	Chloroneb	ND	0.060 ug/L	
4/12/23	4/14/23	Chlorpropham	ND	0.060 ug/L	
4/12/23	4/14/23	Chlorpyrifos	ND	0.060 ug/L	
4/12/23	4/14/23	Chlorpyrifos-methyl	ND	0.060 ug/L	
4/12/23	4/14/23	cis-Nonachlor	ND	0.060 ug/L	
4/12/23	4/14/23	Cyfluthrin	ND	0.30 ug/L	
4/12/23	4/14/23	Cypermethrin	ND	0.30 ug/L	

Kara Greer, Project Manager

This analytical report complies with the ISO/IEC 17025:2017 Quality Standard.



GSI Water Solutions, Inc.  
650 NE Holladay Street Suite 900  
Portland, OR 97232

Report Number: P230409  
Report Date: April 25, 2023  
Client Project ID: 913.001.002.002

### Analytical Report

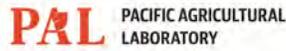
Client Sample ID: RMW-1-BUGNO-04052023  
Matrix: water

PAL Sample ID: P230409-01  
Sample Date: 4/5/23  
Received Date: 4/11/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/12/23	4/14/23	Dacthal	ND	0.060 ug/L	
4/12/23	4/14/23	d-BHC	ND	0.060 ug/L	
4/12/23	4/14/23	Deltamethrin	ND	0.30 ug/L	
4/12/23	4/14/23	Demeton	ND	0.060 ug/L	
4/12/23	4/14/23	Diazinon	ND	0.060 ug/L	
4/12/23	4/14/23	Dichlobenil	ND	0.060 ug/L	
4/12/23	4/14/23	Dichlorofenthion	ND	0.060 ug/L	
4/12/23	4/14/23	Dichlorvos	ND	0.060 ug/L	
4/12/23	4/14/23	Diclofop-methyl	ND	0.060 ug/L	
4/12/23	4/14/23	Dicloran	ND	0.30 ug/L	
4/12/23	4/14/23	Dicofol	ND	0.060 ug/L	
4/12/23	4/14/23	Dieldrin	ND	0.060 ug/L	
4/12/23	4/14/23	Dimethenamid	ND	0.060 ug/L	
4/12/23	4/14/23	Diphenamid	ND	0.060 ug/L	
4/12/23	4/14/23	Diphenylamine	ND	0.060 ug/L	
4/12/23	4/14/23	Disulfoton	ND	0.060 ug/L	
4/12/23	4/14/23	Dithiopyr	ND	0.060 ug/L	
4/12/23	4/14/23	Endosulfan I	ND	0.12 ug/L	
4/12/23	4/14/23	Endosulfan II	ND	0.12 ug/L	
4/12/23	4/14/23	Endosulfan sulfate	ND	0.12 ug/L	
4/12/23	4/14/23	Endrin	ND	0.060 ug/L	
4/12/23	4/14/23	Endrin ketone	ND	0.060 ug/L	
4/12/23	4/14/23	EPN	ND	0.060 ug/L	
4/12/23	4/14/23	EPTC	ND	0.060 ug/L	
4/12/23	4/14/23	Esfenvalerate	ND	0.060 ug/L	
4/12/23	4/14/23	Ethalfuralin	ND	0.060 ug/L	
4/12/23	4/14/23	Ethofumesate	ND	0.060 ug/L	
4/12/23	4/14/23	Ethoprop	ND	0.060 ug/L	
4/12/23	4/14/23	Etoxazole	ND	0.060 ug/L	
4/12/23	4/14/23	Etridiazole	ND	0.060 ug/L	
4/12/23	4/14/23	Fenarimol	ND	0.060 ug/L	
4/12/23	4/14/23	Fenitrothion	ND	0.060 ug/L	
4/12/23	4/14/23	Fenoxaprop-ethyl	ND	0.060 ug/L	

Kara Greer, Project Manager

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GSI Water Solutions, Inc.  
650 NE Holladay Street Suite 900  
Portland, OR 97232

Report Number: P230409  
Report Date: April 25, 2023  
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### Analytical Report

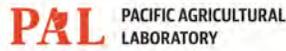
Client Sample ID: RMW-1-BUGNO-04052023  
Matrix: water

PAL Sample ID: P230409-01  
Sample Date: 4/5/23  
Received Date: 4/11/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/12/23	4/14/23	Fenthion	ND	0.060 ug/L	
4/12/23	4/14/23	Fenvalerate	ND	0.060 ug/L	
4/12/23	4/14/23	Fipronil	ND	0.060 ug/L	
4/12/23	4/14/23	Fluazifop-p-butyl	ND	0.060 ug/L	
4/12/23	4/14/23	Fludioxonil	ND	0.060 ug/L	
4/12/23	4/14/23	Fluroxypyr-meptyl	ND	0.060 ug/L	
4/12/23	4/14/23	Flutolanil	ND	0.060 ug/L	
4/12/23	4/14/23	g-BHC	ND	0.060 ug/L	
4/12/23	4/14/23	Heptachlor	ND	0.060 ug/L	
4/12/23	4/14/23	Heptachlor epoxide	ND	0.060 ug/L	
4/12/23	4/14/23	Hexachlorobenzene	ND	0.060 ug/L	
4/12/23	4/14/23	Kresoxim-methyl	ND	0.060 ug/L	
4/12/23	4/14/23	lambda-Cyhalothrin	ND	0.060 ug/L	
4/12/23	4/14/23	Leptophos	ND	0.060 ug/L	
4/12/23	4/14/23	Malathion	ND	0.060 ug/L	
4/12/23	4/14/23	Mefenoxam	ND	0.060 ug/L	
4/12/23	4/14/23	Methoxychlor	ND	0.060 ug/L	
4/12/23	4/14/23	Metolachlor	ND	0.060 ug/L	
4/12/23	4/14/23	MGK-264	ND	0.060 ug/L	
4/12/23	4/14/23	Myclobutanil	ND	0.060 ug/L	
4/12/23	4/14/23	Napropamide	ND	0.060 ug/L	
4/12/23	4/14/23	o-Phenylphenol	ND	0.060 ug/L	
4/12/23	4/14/23	Ovex	ND	0.060 ug/L	
4/12/23	4/14/23	Oxadiazon	ND	0.060 ug/L	
4/12/23	4/14/23	Oxyfluorfen	ND	0.060 ug/L	
4/12/23	4/14/23	p,p'-DDD	ND	0.060 ug/L	
4/12/23	4/14/23	p,p'-DDE	ND	0.060 ug/L	
4/12/23	4/14/23	p,p'-DDT	ND	0.060 ug/L	
4/12/23	4/14/23	Paclobutrazol	ND	0.060 ug/L	
4/12/23	4/14/23	Parathion	ND	0.060 ug/L	
4/12/23	4/14/23	Parathion-methyl	ND	0.060 ug/L	
4/12/23	4/14/23	PCA	ND	0.060 ug/L	
4/12/23	4/14/23	PCB	ND	0.060 ug/L	

Kara Greer, Project Manager

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GSI Water Solutions, Inc.  
650 NE Holladay Street Suite 900  
Portland, OR 97232

Report Number: P230409  
Report Date: April 25, 2023  
Client Project ID: 913.001.002.002

### Analytical Report

Client Sample ID: RMW-1-BUGNO-04052023  
Matrix: water

PAL Sample ID: P230409-01  
Sample Date: 4/5/23  
Received Date: 4/11/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/12/23	4/14/23	PCNB	ND	0.060 ug/L	
4/12/23	4/14/23	Pendimethalin	ND	0.060 ug/L	
4/12/23	4/14/23	Pentachlorothioanisole	ND	0.060 ug/L	
4/12/23	4/14/23	Permethrin	ND	0.12 ug/L	
4/12/23	4/14/23	Phorate	ND	0.060 ug/L	
4/12/23	4/14/23	Procymidone	ND	0.060 ug/L	
4/12/23	4/14/23	Prodiamine	ND	0.060 ug/L	
4/12/23	4/14/23	Pronamide	ND	0.060 ug/L	
4/12/23	4/14/23	Propachlor	ND	0.060 ug/L	
4/12/23	4/14/23	Pyriproxyfen	ND	0.060 ug/L	
4/12/23	4/14/23	Quinoxifen	ND	0.060 ug/L	
4/12/23	4/14/23	Ronnel	ND	0.060 ug/L	
4/12/23	4/14/23	Spirodiclofen	ND	0.060 ug/L	
4/12/23	4/14/23	Sulfotep	ND	0.060 ug/L	
4/12/23	4/14/23	Tefluthrin	ND	0.060 ug/L	
4/12/23	4/14/23	Terbufos	ND	0.060 ug/L	
4/12/23	4/14/23	Tetraconazole	ND	0.060 ug/L	
4/12/23	4/14/23	Tetradifon	ND	0.060 ug/L	
4/12/23	4/14/23	Thionazin	ND	0.060 ug/L	
4/12/23	4/14/23	Tokuthion	ND	0.060 ug/L	
4/12/23	4/14/23	trans-Nonachlor	ND	0.060 ug/L	
4/12/23	4/14/23	Trichloronate	ND	0.060 ug/L	
4/12/23	4/14/23	Trifluralin	ND	0.060 ug/L	
4/12/23	4/14/23	Vinclozalin	ND	0.060 ug/L	

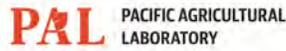
Surrogate Recovery: 140 %  
Surrogate Recovery Range: 60-141  
(TPP-d15 used as Surrogate)

Method: Modified EPA 8321B (LC-MS/MS)

4/12/23	4/12/23	Abamectin	ND	0.060 ug/L	
4/12/23	4/12/23	Acetamiprid	ND	0.060 ug/L	
4/12/23	4/12/23	Acibenzolar-S-methyl	ND	0.12 ug/L	
4/12/23	4/12/23	Afidopyropen	ND	0.060 ug/L	
4/12/23	4/12/23	Aldicarb	ND	0.060 ug/L	

Kara Greer, Project Manager

This analytical report complies with the ISO/IEC 17025:2017  
Quality Standard.



GSI Water Solutions, Inc.  
650 NE Holladay Street Suite 900  
Portland, OR 97232

Report Number: P230409  
Report Date: April 25, 2023  
Client Project ID: 913.001.002.002

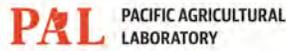
### Analytical Report

Client Sample ID: RMW-1-BUGNO-04052023  
Matrix: water

PAL Sample ID: P230409-01  
Sample Date: 4/5/23  
Received Date: 4/11/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/12/23	4/12/23	Allethrin	ND	0.060 ug/L	
4/12/23	4/12/23	Ametoctradin	ND	0.060 ug/L	
4/12/23	4/12/23	Atrazine	ND	0.060 ug/L	
4/12/23	4/12/23	Azinphos-ethyl	ND	0.060 ug/L	
4/12/23	4/12/23	Azinphos-methyl	ND	0.12 ug/L	
4/12/23	4/12/23	Azoxystrobin	ND	0.060 ug/L	
4/12/23	4/12/23	Bendiocarb	ND	0.060 ug/L	
4/12/23	4/12/23	Bensulide	ND	0.060 ug/L	
4/12/23	4/12/23	Bicyclopyrone	ND	0.060 ug/L	
4/12/23	4/12/23	Bitertanol	ND	0.060 ug/L	
4/12/23	4/12/23	Boscalid	ND	0.060 ug/L	
4/12/23	4/12/23	Bromacil	0.21 ug/L	0.060 ug/L	
4/12/23	4/12/23	Carbaryl	ND	0.060 ug/L	
4/12/23	4/12/23	Carbendazim	ND	0.060 ug/L	
4/12/23	4/12/23	Carbofuran	ND	0.060 ug/L	
4/12/23	4/12/23	Carfentrazone-ethyl	ND	0.060 ug/L	
4/12/23	4/12/23	Chlorantraniliprole	ND	0.060 ug/L	
4/12/23	4/12/23	Clethodim	ND	0.12 ug/L	
4/12/23	4/12/23	Clofentezine	ND	0.060 ug/L	
4/12/23	4/12/23	Clomazone	ND	0.060 ug/L	
4/12/23	4/12/23	Cyanazine	ND	0.060 ug/L	
4/12/23	4/12/23	Cyantraniliprole	ND	0.060 ug/L	
4/12/23	4/12/23	Cyazofamid	ND	0.060 ug/L	
4/12/23	4/12/23	Cyclaniliprole	ND	0.060 ug/L	
4/12/23	4/12/23	Cycloate	ND	0.12 ug/L	
4/12/23	4/12/23	Cyflufenamid	ND	0.060 ug/L	
4/12/23	4/12/23	Cyflumetofen	ND	0.060 ug/L	
4/12/23	4/12/23	Cyhalofop-butyl	ND	0.12 ug/L	
4/12/23	4/12/23	Cymoxanil	ND	0.060 ug/L	
4/12/23	4/12/23	Cyprodinil	ND	0.060 ug/L	
4/12/23	4/12/23	Cyprosulfamide	ND	0.060 ug/L	
4/12/23	4/12/23	DCPMU	ND	0.060 ug/L	
4/12/23	4/12/23	Diazoxon	ND	0.060 ug/L	

This analytical report complies with the ISO/IEC 17025:2017  
Quality Standard.



GSI Water Solutions, Inc.  
650 NE Holladay Street Suite 900  
Portland, OR 97232

Report Number: P230409  
Report Date: April 25, 2023  
Client Project ID: 913.001.002.002

### Analytical Report

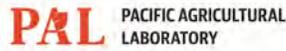
Client Sample ID: RMW-1-BUGNO-04052023  
Matrix: water

PAL Sample ID: P230409-01  
Sample Date: 4/5/23  
Received Date: 4/11/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/12/23	4/12/23	Difenoconazole	ND	0.060 ug/L	
4/12/23	4/12/23	Diflubenzuron	ND	0.060 ug/L	
4/12/23	4/12/23	Diflufenican	ND	0.060 ug/L	
4/12/23	4/12/23	Dimethoate	ND	0.060 ug/L	
4/12/23	4/12/23	Dimethomorph	ND	0.060 ug/L	
4/12/23	4/12/23	Dioxathion	ND	0.060 ug/L	
4/12/23	4/12/23	Disulfoton sulfone	ND	0.060 ug/L	
4/12/23	4/12/23	Diuron	ND	0.060 ug/L	
4/12/23	4/12/23	d-Phenothrin	ND	0.060 ug/L	
4/12/23	4/12/23	Ethion	ND	0.060 ug/L	
4/12/23	4/12/23	Etofenprox	ND	0.060 ug/L	
4/12/23	4/12/23	Famoxadone	ND	0.060 ug/L	
4/12/23	4/12/23	Famphur	ND	0.060 ug/L	
4/12/23	4/12/23	Fenamidone	ND	0.060 ug/L	
4/12/23	4/12/23	Fenamiphos sulfone	ND	0.060 ug/L	
4/12/23	4/12/23	Fenamiphos sulfoxide	ND	0.060 ug/L	
4/12/23	4/12/23	Fenazaquin	ND	0.060 ug/L	
4/12/23	4/12/23	Fenbuconazole	ND	0.060 ug/L	
4/12/23	4/12/23	Fenbutatin oxide	ND	0.060 ug/L	
4/12/23	4/12/23	Fenhexamid	ND	0.060 ug/L	
4/12/23	4/12/23	Fenobucarb	ND	0.060 ug/L	
4/12/23	4/12/23	Fenoxycarb	ND	0.060 ug/L	
4/12/23	4/12/23	Fenpropathrin	ND	0.060 ug/L	
4/12/23	4/12/23	Fenpyroximate	ND	0.060 ug/L	
4/12/23	4/12/23	Fenuron	ND	0.060 ug/L	
4/12/23	4/12/23	Fluazinam	ND	0.060 ug/L	
4/12/23	4/12/23	Flubendiamide	ND	0.12 ug/L	
4/12/23	4/12/23	Flufenacet	ND	0.060 ug/L	
4/12/23	4/12/23	Flumioxazin	ND	0.060 ug/L	
4/12/23	4/12/23	Fluometuron	ND	0.060 ug/L	
4/12/23	4/12/23	Fluopicolide	ND	0.060 ug/L	
4/12/23	4/12/23	Fluopyram	ND	0.060 ug/L	
4/12/23	4/12/23	Fluoxastrobin	ND	0.060 ug/L	

Kara Greer, Project Manager

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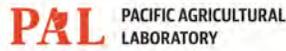
Client Sample ID: RMW-1-BUGNO-04052023  
Matrix: water

PAL Sample ID: P230409-01  
Sample Date: 4/5/23  
Received Date: 4/11/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/12/23	4/12/23	Flupyradifurone	ND	0.060 ug/L	
4/12/23	4/12/23	Fluridone	ND	0.060 ug/L	
4/12/23	4/12/23	Flutianil	ND	0.060 ug/L	
4/12/23	4/12/23	Flutriafol	ND	0.060 ug/L	
4/12/23	4/12/23	Fluvalinate	ND	0.060 ug/L	
4/12/23	4/12/23	Fluxapyroxad	ND	0.060 ug/L	
4/12/23	4/12/23	Fonofos	ND	0.12 ug/L	
4/12/23	4/12/23	Hexaconazole	ND	0.060 ug/L	
4/12/23	4/12/23	Hexazinone	ND	0.060 ug/L	
4/12/23	4/12/23	Hexythiazox	ND	0.060 ug/L	
4/12/23	4/12/23	Imazalil	ND	0.060 ug/L	
4/12/23	4/12/23	Imidacloprid	ND	0.060 ug/L	
4/12/23	4/12/23	Indaziflam	ND	0.060 ug/L	
4/12/23	4/12/23	Indoxacarb	ND	0.060 ug/L	
4/12/23	4/12/23	Iodosulfuron-methyl	ND	0.060 ug/L	
4/12/23	4/12/23	Ipconazole	ND	0.060 ug/L	
4/12/23	4/12/23	Iprodione	ND	0.30 ug/L	
4/12/23	4/12/23	Isofetamid	ND	0.060 ug/L	
4/12/23	4/12/23	Isoxaben	ND	0.060 ug/L	
4/12/23	4/12/23	Isoxadifen-ethyl	ND	0.060 ug/L	
4/12/23	4/12/23	Lactofen	ND	0.060 ug/L	
4/12/23	4/12/23	Linuron	ND	0.060 ug/L	
4/12/23	4/12/23	Malaoxon	ND	0.060 ug/L	
4/12/23	4/12/23	Mandipropamid	ND	0.060 ug/L	
4/12/23	4/12/23	Metconazole	ND	0.060 ug/L	
4/12/23	4/12/23	Methidathion	ND	0.060 ug/L	
4/12/23	4/12/23	Methiocarb	ND	0.060 ug/L	
4/12/23	4/12/23	Methomyl	ND	0.060 ug/L	
4/12/23	4/12/23	Methoxyfenozide	ND	0.060 ug/L	
4/12/23	4/12/23	Metrafenone	ND	0.060 ug/L	
4/12/23	4/12/23	Metribuzin	ND	0.060 ug/L	
4/12/23	4/12/23	Mevinphos	ND	0.060 ug/L	
4/12/23	4/12/23	Monuron	ND	0.060 ug/L	

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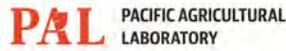
Client Sample ID: RMW-1-BUGNO-04052023  
Matrix: water

PAL Sample ID: P230409-01  
Sample Date: 4/5/23  
Received Date: 4/11/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/12/23	4/12/23	Neburon	ND	0.060 ug/L	
4/12/23	4/12/23	Norflurazon	ND	0.060 ug/L	
4/12/23	4/12/23	Novaluron	ND	0.060 ug/L	
4/12/23	4/13/23	Oryzalin	ND	0.060 ug/L	
4/12/23	4/12/23	Oxadixyl	ND	0.060 ug/L	
4/12/23	4/12/23	Oxamyl	ND	0.060 ug/L	
4/12/23	4/12/23	Penoxsulam	ND	0.060 ug/L	
4/12/23	4/12/23	Penthiopyrad	ND	0.060 ug/L	
4/12/23	4/12/23	Phorate Sulfone	ND	0.060 ug/L	
4/12/23	4/12/23	Phorate Sulfoxide	ND	0.060 ug/L	
4/12/23	4/12/23	Phosalone	ND	0.060 ug/L	
4/12/23	4/12/23	Phosmet	ND	0.060 ug/L	
4/12/23	4/12/23	Phosphamidon	ND	0.060 ug/L	
4/12/23	4/12/23	Picoxystrobin	ND	0.060 ug/L	
4/12/23	4/12/23	Piperonyl Butoxide	ND	0.060 ug/L	
4/12/23	4/12/23	Pirimicarb	ND	0.060 ug/L	
4/12/23	4/12/23	Pirimiphos-methyl	ND	0.060 ug/L	
4/12/23	4/12/23	Prallethrin	ND	0.060 ug/L	
4/12/23	4/12/23	Prometon	ND	0.060 ug/L	
4/12/23	4/12/23	Prometryn	ND	0.060 ug/L	
4/12/23	4/12/23	Propanil	ND	0.060 ug/L	
4/12/23	4/12/23	Propargite	ND	0.060 ug/L	
4/12/23	4/12/23	Propazine	ND	0.060 ug/L	
4/12/23	4/12/23	Propiconazole	ND	0.12 ug/L	
4/12/23	4/12/23	Propoxur	ND	0.060 ug/L	
4/12/23	4/12/23	Pyraclostrobin	ND	0.060 ug/L	
4/12/23	4/12/23	Pyraflufen-ethyl	ND	0.060 ug/L	
4/12/23	4/12/23	Pyrethrin	ND	0.30 ug/L	
4/12/23	4/12/23	Pyridaben	ND	0.060 ug/L	
4/12/23	4/12/23	Pyridalyl	ND	0.060 ug/L	
4/12/23	4/12/23	Pyrimethanil	ND	0.060 ug/L	
4/12/23	4/12/23	Pyroxasulfone	ND	0.060 ug/L	
4/12/23	4/12/23	Quizalofop-p-ethyl	ND	0.060 ug/L	

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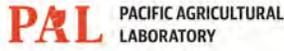
Client Sample ID: RMW-1-BUGNO-04052023  
Matrix: water

PAL Sample ID: P230409-01  
Sample Date: 4/5/23  
Received Date: 4/11/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/12/23	4/12/23	Rotenone	ND	0.060 ug/L	
4/12/23	4/12/23	Saflufenacil	ND	0.060 ug/L	
4/12/23	4/12/23	Sethoxydim	ND	0.12 ug/L	
4/12/23	4/12/23	Siduron	ND	0.060 ug/L	
4/12/23	4/12/23	Simazine	ND	0.060 ug/L	
4/12/23	4/12/23	Simetryn	ND	0.060 ug/L	
4/12/23	4/12/23	Spinetoram	ND	0.060 ug/L	
4/12/23	4/12/23	Spinosad	ND	0.060 ug/L	
4/12/23	4/12/23	Spiromesifen	ND	0.12 ug/L	
4/12/23	4/12/23	Spirotetramat	ND	0.060 ug/L	
4/12/23	4/12/23	Spiroxamine	ND	0.060 ug/L	
4/12/23	4/12/23	Sulfentrazone	ND	0.060 ug/L	
4/12/23	4/12/23	Sulfoxaflor	ND	0.060 ug/L	
4/12/23	4/12/23	Tebuconazole	ND	0.060 ug/L	
4/12/23	4/12/23	Tebufenozide	ND	0.060 ug/L	
4/12/23	4/12/23	Tebuthiuron	ND	0.060 ug/L	
4/12/23	4/12/23	Terbacil	ND	0.060 ug/L	
4/12/23	4/12/23	Terbuthylazine	ND	0.060 ug/L	
4/12/23	4/12/23	Terbutryn	ND	0.060 ug/L	
4/12/23	4/12/23	Thiabendazole	ND	0.060 ug/L	
4/12/23	4/12/23	Thiacloprid	ND	0.060 ug/L	
4/12/23	4/12/23	Thiamethoxam	ND	0.060 ug/L	
4/12/23	4/12/23	Thiencarbazone-methyl	ND	0.060 ug/L	
4/12/23	4/12/23	Thiobencarb	ND	0.060 ug/L	
4/12/23	4/12/23	Thiodicarb	ND	0.060 ug/L	
4/12/23	4/12/23	Tolfenpyrad	ND	0.060 ug/L	
4/12/23	4/12/23	Triadimefon	ND	0.060 ug/L	
4/12/23	4/12/23	Triadimenol	ND	0.12 ug/L	
4/12/23	4/12/23	Triallate	ND	0.060 ug/L	
4/12/23	4/12/23	Trifloxystrobin	ND	0.060 ug/L	
4/12/23	4/12/23	Trifloxysulfuron-sodium	ND	0.060 ug/L	
4/12/23	4/12/23	Triflumizole	ND	0.060 ug/L	
4/12/23	4/12/23	Trinexapac-ethyl	ND	0.060 ug/L	

Kara Greer, Project Manager

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503.626.7943

21830 S.W. Alexander Ln  
Sherwood, OR 97140

GSI Water Solutions, Inc.  
650 NE Holladay Street Suite 900  
Portland, OR 97232

Report Number: P230409  
Report Date: April 25, 2023  
Client Project ID: 913.001.002.002

## Analytical Report

Client Sample ID: RMW-1-BUGNO-04052023

Matrix: water

PAL Sample ID: P230409-01

Sample Date: 4/5/23

Received Date: 4/11/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/12/23	4/12/23	Triticonazole	ND	0.060 ug/L	

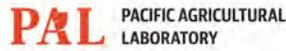
Surrogate Recovery: 94 %

Surrogate Recovery Range: 69-120

(TPP-d15 used as Surrogate)

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Kara Greer, Project Manager



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### Analytical Report

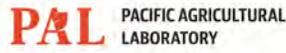
Client Sample ID: RMW-2-BUGNO-04062023  
Matrix: water

PAL Sample ID: P230409-02  
Sample Date: 4/6/23  
Received Date: 4/11/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
<b>Method:</b> Modified EPA 8270D (GC-MS/MS)					
4/12/23	4/14/23	a-BHC	ND	0.060 ug/L	
4/12/23	4/14/23	Acetochlor	ND	0.060 ug/L	
4/12/23	4/14/23	Alachlor	ND	0.060 ug/L	
4/12/23	4/14/23	Aldrin	ND	0.060 ug/L	
4/12/23	4/14/23	Ametryn	ND	0.060 ug/L	
4/12/23	4/14/23	Aspon	ND	0.060 ug/L	
4/12/23	4/14/23	b-BHC	ND	0.060 ug/L	
4/12/23	4/14/23	Benfluralin	ND	0.060 ug/L	
4/12/23	4/14/23	Bifenthrin	ND	0.060 ug/L	
4/12/23	4/14/23	Bolstar	ND	0.060 ug/L	
4/12/23	4/14/23	Bromopropylate	ND	0.060 ug/L	
4/12/23	4/14/23	Buprofezin	ND	0.060 ug/L	
4/12/23	4/14/23	Captan	ND	0.60 ug/L	
4/12/23	4/14/23	Chlordane	ND	0.060 ug/L	
4/12/23	4/14/23	Chlorfenapyr	ND	0.060 ug/L	
4/12/23	4/14/23	Chlorfenvinphos	ND	0.060 ug/L	
4/12/23	4/14/23	Chlorobenzilate	ND	0.060 ug/L	
4/12/23	4/14/23	Chloroneb	ND	0.060 ug/L	
4/12/23	4/14/23	Chlorpropham	ND	0.060 ug/L	
4/12/23	4/14/23	Chlorpyrifos	ND	0.060 ug/L	
4/12/23	4/14/23	Chlorpyrifos-methyl	ND	0.060 ug/L	
4/12/23	4/14/23	cis-Nonachlor	ND	0.060 ug/L	
4/12/23	4/14/23	Cyfluthrin	ND	0.30 ug/L	
4/12/23	4/14/23	Cypermethrin	ND	0.30 ug/L	
4/12/23	4/14/23	Dacthal	ND	0.060 ug/L	
4/12/23	4/14/23	d-BHC	ND	0.060 ug/L	
4/12/23	4/14/23	Deltamethrin	ND	0.30 ug/L	
4/12/23	4/14/23	Demeton	ND	0.060 ug/L	
4/12/23	4/14/23	Diazinon	ND	0.060 ug/L	
4/12/23	4/14/23	Dichlobenil	ND	0.060 ug/L	
4/12/23	4/14/23	Dichlorofenthion	ND	0.060 ug/L	

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## Analytical Report

Client Sample ID: RMW-2-BUGNO-04062023

Matrix: water

PAL Sample ID: P230409-02

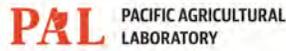
Sample Date: 4/6/23

Received Date: 4/11/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/12/23	4/14/23	Dichlorvos	ND	0.060 ug/L	
4/12/23	4/14/23	Diclofop-methyl	ND	0.060 ug/L	
4/12/23	4/14/23	Dicloran	ND	0.30 ug/L	
4/12/23	4/14/23	Dicofol	ND	0.060 ug/L	
4/12/23	4/14/23	Dieldrin	ND	0.060 ug/L	
4/12/23	4/14/23	Dimethenamid	ND	0.060 ug/L	
4/12/23	4/14/23	Diphenamid	ND	0.060 ug/L	
4/12/23	4/14/23	Diphenylamine	ND	0.060 ug/L	
4/12/23	4/14/23	Disulfoton	ND	0.060 ug/L	
4/12/23	4/14/23	Dithiopyr	ND	0.060 ug/L	
4/12/23	4/14/23	Endosulfan I	ND	0.12 ug/L	
4/12/23	4/14/23	Endosulfan II	ND	0.12 ug/L	
4/12/23	4/14/23	Endosulfan sulfate	ND	0.12 ug/L	
4/12/23	4/14/23	Endrin	ND	0.060 ug/L	
4/12/23	4/14/23	Endrin ketone	ND	0.060 ug/L	
4/12/23	4/14/23	EPN	ND	0.060 ug/L	
4/12/23	4/14/23	EPTC	ND	0.060 ug/L	
4/12/23	4/14/23	Esfenvalerate	ND	0.060 ug/L	
4/12/23	4/14/23	Ethalfuralin	ND	0.060 ug/L	
4/12/23	4/14/23	Ethofumesate	ND	0.060 ug/L	
4/12/23	4/14/23	Ethoprop	ND	0.060 ug/L	
4/12/23	4/14/23	Etoxazole	ND	0.060 ug/L	
4/12/23	4/14/23	Etridiazole	ND	0.060 ug/L	
4/12/23	4/14/23	Fenarimol	ND	0.060 ug/L	
4/12/23	4/14/23	Fenitrothion	ND	0.060 ug/L	
4/12/23	4/14/23	Fenoxaprop-ethyl	ND	0.060 ug/L	
4/12/23	4/14/23	Fenthion	ND	0.060 ug/L	
4/12/23	4/14/23	Fenvalerate	ND	0.060 ug/L	
4/12/23	4/14/23	Fipronil	ND	0.060 ug/L	
4/12/23	4/14/23	Fluazifop-p-butyl	ND	0.060 ug/L	
4/12/23	4/14/23	Fludioxonil	ND	0.060 ug/L	
4/12/23	4/14/23	Fluroxypyr-meptyl	ND	0.060 ug/L	
4/12/23	4/14/23	Flutolanil	ND	0.060 ug/L	

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Report Date: April 25, 2023  
Client Project ID: 913.001.002.002

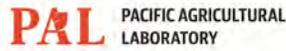
### Analytical Report

Client Sample ID: RMW-2-BUGNO-04062023  
Matrix: water

PAL Sample ID: P230409-02  
Sample Date: 4/6/23  
Received Date: 4/11/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/12/23	4/14/23	g-BHC	ND	0.060 ug/L	
4/12/23	4/14/23	Heptachlor	ND	0.060 ug/L	
4/12/23	4/14/23	Heptachlor epoxide	ND	0.060 ug/L	
4/12/23	4/14/23	Hexachlorobenzene	ND	0.060 ug/L	
4/12/23	4/14/23	Kresoxim-methyl	ND	0.060 ug/L	
4/12/23	4/14/23	lambda-Cyhalothrin	ND	0.060 ug/L	
4/12/23	4/14/23	Leptophos	ND	0.060 ug/L	
4/12/23	4/14/23	Malathion	ND	0.060 ug/L	
4/12/23	4/14/23	Mefenoxam	ND	0.060 ug/L	
4/12/23	4/14/23	Methoxychlor	ND	0.060 ug/L	
4/12/23	4/14/23	Metolachlor	ND	0.060 ug/L	
4/12/23	4/14/23	MGK-264	ND	0.060 ug/L	
4/12/23	4/14/23	Myclobutanil	ND	0.060 ug/L	
4/12/23	4/14/23	Napropamide	ND	0.060 ug/L	
4/12/23	4/14/23	o-Phenylphenol	ND	0.060 ug/L	
4/12/23	4/14/23	Ovex	ND	0.060 ug/L	
4/12/23	4/14/23	Oxadiazon	ND	0.060 ug/L	
4/12/23	4/14/23	Oxyfluorfen	ND	0.060 ug/L	
4/12/23	4/14/23	p,p'-DDD	ND	0.060 ug/L	
4/12/23	4/14/23	p,p'-DDE	ND	0.060 ug/L	
4/12/23	4/14/23	p,p'-DDT	ND	0.060 ug/L	
4/12/23	4/14/23	Paclobutrazol	ND	0.060 ug/L	
4/12/23	4/14/23	Parathion	ND	0.060 ug/L	
4/12/23	4/14/23	Parathion-methyl	ND	0.060 ug/L	
4/12/23	4/14/23	PCA	ND	0.060 ug/L	
4/12/23	4/14/23	PCB	ND	0.060 ug/L	
4/12/23	4/14/23	PCNB	ND	0.060 ug/L	
4/12/23	4/14/23	Pendimethalin	ND	0.060 ug/L	
4/12/23	4/14/23	Pentachlorothioanisole	ND	0.060 ug/L	
4/12/23	4/14/23	Permethrin	ND	0.12 ug/L	
4/12/23	4/14/23	Phorate	ND	0.060 ug/L	
4/12/23	4/14/23	Procymidone	ND	0.060 ug/L	
4/12/23	4/14/23	Prodiamine	ND	0.060 ug/L	

This analytical report complies with the ISO/IEC 17025:2017  
Quality Standard.



GSI Water Solutions, Inc.  
650 NE Holladay Street Suite 900  
Portland, OR 97232

Report Number: P230409  
Report Date: April 25, 2023  
Client Project ID: 913.001.002.002

## Analytical Report

Client Sample ID: RMW-2-BUGNO-04062023  
Matrix: water

PAL Sample ID: P230409-02  
Sample Date: 4/6/23  
Received Date: 4/11/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/12/23	4/14/23	Pronamide	ND	0.060 ug/L	
4/12/23	4/14/23	Propachlor	ND	0.060 ug/L	
4/12/23	4/14/23	Pyriproxyfen	ND	0.060 ug/L	
4/12/23	4/14/23	Quinoxifen	ND	0.060 ug/L	
4/12/23	4/14/23	Ronnel	ND	0.060 ug/L	
4/12/23	4/14/23	Spirodiclofen	ND	0.060 ug/L	
4/12/23	4/14/23	Sulfotep	ND	0.060 ug/L	
4/12/23	4/14/23	Tefluthrin	ND	0.060 ug/L	
4/12/23	4/14/23	Terbufos	ND	0.060 ug/L	
4/12/23	4/14/23	Tetraconazole	ND	0.060 ug/L	
4/12/23	4/14/23	Tetradifon	ND	0.060 ug/L	
4/12/23	4/14/23	Thionazin	ND	0.060 ug/L	
4/12/23	4/14/23	Tokuthion	ND	0.060 ug/L	
4/12/23	4/14/23	trans-Nonachlor	ND	0.060 ug/L	
4/12/23	4/14/23	Trichloronate	ND	0.060 ug/L	
4/12/23	4/14/23	Trifluralin	ND	0.060 ug/L	
4/12/23	4/14/23	Vinclozalin	ND	0.060 ug/L	

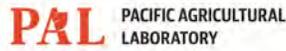
Surrogate Recovery: 104 %  
Surrogate Recovery Range: 60-141  
(TPP-d15 used as Surrogate)

Method: Modified EPA 8321B (LC-MS/MS)

4/12/23	4/12/23	Abamectin	ND	0.060 ug/L	
4/12/23	4/12/23	Acetamiprid	ND	0.060 ug/L	
4/12/23	4/12/23	Acibenzolar-S-methyl	ND	0.12 ug/L	
4/12/23	4/12/23	Afidopyropen	ND	0.060 ug/L	
4/12/23	4/12/23	Aldicarb	ND	0.060 ug/L	
4/12/23	4/12/23	Allethrin	ND	0.060 ug/L	
4/12/23	4/12/23	Ametoctradin	ND	0.060 ug/L	
4/12/23	4/12/23	Atrazine	ND	0.060 ug/L	
4/12/23	4/12/23	Azinphos-ethyl	ND	0.060 ug/L	
4/12/23	4/12/23	Azinphos-methyl	ND	0.12 ug/L	
4/12/23	4/12/23	Azoxystrobin	ND	0.060 ug/L	
4/12/23	4/12/23	Bendiocarb	ND	0.060 ug/L	

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Kara Greer, Project Manager



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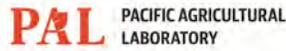
### Analytical Report

Client Sample ID: RMW-2-BUGNO-04062023  
Matrix: water

PAL Sample ID: P230409-02  
Sample Date: 4/6/23  
Received Date: 4/11/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/12/23	4/12/23	Bensulide	ND	0.060 ug/L	
4/12/23	4/12/23	Bicyclopyrone	ND	0.060 ug/L	
4/12/23	4/12/23	Bitertanol	ND	0.060 ug/L	
4/12/23	4/12/23	Boscalid	ND	0.060 ug/L	
4/12/23	4/12/23	Bromacil	ND	0.060 ug/L	
4/12/23	4/12/23	Carbaryl	ND	0.060 ug/L	
4/12/23	4/12/23	Carbendazim	ND	0.060 ug/L	
4/12/23	4/12/23	Carbofuran	ND	0.060 ug/L	
4/12/23	4/12/23	Carfentrazone-ethyl	ND	0.060 ug/L	
4/12/23	4/12/23	Chlorantraniliprole	ND	0.060 ug/L	
4/12/23	4/12/23	Clethodim	ND	0.12 ug/L	
4/12/23	4/12/23	Clofentezine	ND	0.060 ug/L	
4/12/23	4/12/23	Clomazone	ND	0.060 ug/L	
4/12/23	4/12/23	Cyanazine	ND	0.060 ug/L	
4/12/23	4/12/23	Cyantraniliprole	ND	0.060 ug/L	
4/12/23	4/12/23	Cyazofamid	ND	0.060 ug/L	
4/12/23	4/12/23	Cyclaniliprole	ND	0.060 ug/L	
4/12/23	4/12/23	Cycloate	ND	0.12 ug/L	
4/12/23	4/12/23	Cyflufenamid	ND	0.060 ug/L	
4/12/23	4/12/23	Cyflumetofen	ND	0.060 ug/L	
4/12/23	4/12/23	Cyhalofop-butyl	ND	0.12 ug/L	
4/12/23	4/12/23	Cymoxanil	ND	0.060 ug/L	
4/12/23	4/12/23	Cyprodinil	ND	0.060 ug/L	
4/12/23	4/12/23	Cyprosulfamide	ND	0.060 ug/L	
4/12/23	4/12/23	DCPMU	ND	0.060 ug/L	
4/12/23	4/12/23	Diazoxon	ND	0.060 ug/L	
4/12/23	4/12/23	Difenoconazole	ND	0.060 ug/L	
4/12/23	4/12/23	Diflubenzuron	ND	0.060 ug/L	
4/12/23	4/12/23	Diflufenican	ND	0.060 ug/L	
4/12/23	4/12/23	Dimethoate	ND	0.060 ug/L	
4/12/23	4/12/23	Dimethomorph	ND	0.060 ug/L	
4/12/23	4/12/23	Dioxathion	ND	0.060 ug/L	
4/12/23	4/12/23	Disulfoton sulfone	ND	0.060 ug/L	

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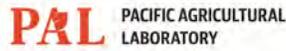
Client Sample ID: RMW-2-BUGNO-04062023  
Matrix: water

PAL Sample ID: P230409-02  
Sample Date: 4/6/23  
Received Date: 4/11/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/12/23	4/12/23	Diuron	ND	0.060 ug/L	
4/12/23	4/12/23	d-Phenothrin	ND	0.060 ug/L	
4/12/23	4/12/23	Ethion	ND	0.060 ug/L	
4/12/23	4/12/23	Etofenprox	ND	0.060 ug/L	
4/12/23	4/12/23	Famoxadone	ND	0.060 ug/L	
4/12/23	4/12/23	Famphur	ND	0.060 ug/L	
4/12/23	4/12/23	Fenamidone	ND	0.060 ug/L	
4/12/23	4/12/23	Fenamiphos sulfone	ND	0.060 ug/L	
4/12/23	4/12/23	Fenamiphos sulfoxide	ND	0.060 ug/L	
4/12/23	4/12/23	Fenazaquin	ND	0.060 ug/L	
4/12/23	4/12/23	Fenbuconazole	ND	0.060 ug/L	
4/12/23	4/12/23	Fenbutatin oxide	ND	0.060 ug/L	
4/12/23	4/12/23	Fenhexamid	ND	0.060 ug/L	
4/12/23	4/12/23	Fenobucarb	ND	0.060 ug/L	
4/12/23	4/12/23	Fenoxycarb	ND	0.060 ug/L	
4/12/23	4/12/23	Fenpropathrin	ND	0.060 ug/L	
4/12/23	4/12/23	Fenpyroximate	ND	0.060 ug/L	
4/12/23	4/12/23	Fenuron	ND	0.060 ug/L	
4/12/23	4/12/23	Fluazinam	ND	0.060 ug/L	
4/12/23	4/12/23	Flubendiamide	ND	0.12 ug/L	
4/12/23	4/12/23	Flufenacet	ND	0.060 ug/L	
4/12/23	4/12/23	Flumioxazin	ND	0.060 ug/L	
4/12/23	4/12/23	Fluometuron	ND	0.060 ug/L	
4/12/23	4/12/23	Fluopicolide	ND	0.060 ug/L	
4/12/23	4/12/23	Fluopyram	ND	0.060 ug/L	
4/12/23	4/12/23	Fluoxastrobin	ND	0.060 ug/L	
4/12/23	4/12/23	Flupyradifurone	ND	0.060 ug/L	
4/12/23	4/12/23	Fluridone	ND	0.060 ug/L	
4/12/23	4/12/23	Flutianil	ND	0.060 ug/L	
4/12/23	4/12/23	Flutriafol	ND	0.060 ug/L	
4/12/23	4/12/23	Fluvalinate	ND	0.060 ug/L	
4/12/23	4/12/23	Fluxapyroxad	ND	0.060 ug/L	
4/12/23	4/12/23	Fonofos	ND	0.12 ug/L	

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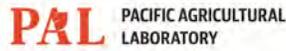
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Matrix: water

PAL Sample ID: P230409-02  
Sample Date: 4/6/23  
Received Date: 4/11/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/12/23	4/12/23	Hexaconazole	ND	0.060 ug/L	
4/12/23	4/12/23	Hexazinone	ND	0.060 ug/L	
4/12/23	4/12/23	Hexythiazox	ND	0.060 ug/L	
4/12/23	4/12/23	Imazalil	ND	0.060 ug/L	
4/12/23	4/12/23	Imidacloprid	ND	0.060 ug/L	
4/12/23	4/12/23	Indaziflam	ND	0.060 ug/L	
4/12/23	4/12/23	Indoxacarb	ND	0.060 ug/L	
4/12/23	4/12/23	Iodosulfuron-methyl	ND	0.060 ug/L	
4/12/23	4/12/23	Ipconazole	ND	0.060 ug/L	
4/12/23	4/12/23	Iprodione	ND	0.30 ug/L	
4/12/23	4/12/23	Isofetamid	ND	0.060 ug/L	
4/12/23	4/12/23	Isoxaben	ND	0.060 ug/L	
4/12/23	4/12/23	Isoxadifen-ethyl	ND	0.060 ug/L	
4/12/23	4/12/23	Lactofen	ND	0.060 ug/L	
4/12/23	4/12/23	Linuron	ND	0.060 ug/L	
4/12/23	4/12/23	Malaoxon	ND	0.060 ug/L	
4/12/23	4/12/23	Mandipropamid	ND	0.060 ug/L	
4/12/23	4/12/23	Metconazole	ND	0.060 ug/L	
4/12/23	4/12/23	Methidathion	ND	0.060 ug/L	
4/12/23	4/12/23	Methiocarb	ND	0.060 ug/L	
4/12/23	4/12/23	Methomyl	ND	0.060 ug/L	
4/12/23	4/12/23	Methoxyfenozide	ND	0.060 ug/L	
4/12/23	4/12/23	Metrafenone	ND	0.060 ug/L	
4/12/23	4/12/23	Metribuzin	ND	0.060 ug/L	
4/12/23	4/12/23	Mevinphos	ND	0.060 ug/L	
4/12/23	4/12/23	Monuron	ND	0.060 ug/L	
4/12/23	4/12/23	Neburon	ND	0.060 ug/L	
4/12/23	4/12/23	Norflurazon	ND	0.060 ug/L	
4/12/23	4/12/23	Novaluron	ND	0.060 ug/L	
4/12/23	4/13/23	Oryzalin	ND	0.060 ug/L	
4/12/23	4/12/23	Oxadixyl	ND	0.060 ug/L	
4/12/23	4/12/23	Oxamyl	ND	0.060 ug/L	
4/12/23	4/12/23	Penoxsulam	ND	0.060 ug/L	

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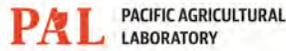
Client Sample ID: RMW-2-BUGNO-04062023  
Matrix: water

PAL Sample ID: P230409-02  
Sample Date: 4/6/23  
Received Date: 4/11/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/12/23	4/12/23	Penthiopyrad	ND	0.060 ug/L	
4/12/23	4/12/23	Phorate Sulfone	ND	0.060 ug/L	
4/12/23	4/12/23	Phorate Sulfoxide	ND	0.060 ug/L	
4/12/23	4/12/23	Phosalone	ND	0.060 ug/L	
4/12/23	4/12/23	Phosmet	ND	0.060 ug/L	
4/12/23	4/12/23	Phosphamidon	ND	0.060 ug/L	
4/12/23	4/12/23	Picoxystrobin	ND	0.060 ug/L	
4/12/23	4/12/23	Piperonyl Butoxide	ND	0.060 ug/L	
4/12/23	4/12/23	Pirimicarb	ND	0.060 ug/L	
4/12/23	4/12/23	Pirimiphos-methyl	ND	0.060 ug/L	
4/12/23	4/12/23	Prallethrin	ND	0.060 ug/L	
4/12/23	4/12/23	Prometon	ND	0.060 ug/L	
4/12/23	4/12/23	Prometryn	ND	0.060 ug/L	
4/12/23	4/12/23	Propanil	ND	0.060 ug/L	
4/12/23	4/12/23	Propargite	ND	0.060 ug/L	
4/12/23	4/12/23	Propazine	ND	0.060 ug/L	
4/12/23	4/12/23	Propiconazole	ND	0.12 ug/L	
4/12/23	4/12/23	Propoxur	ND	0.060 ug/L	
4/12/23	4/12/23	Pyraclostrobin	ND	0.060 ug/L	
4/12/23	4/12/23	Pyraflufen-ethyl	ND	0.060 ug/L	
4/12/23	4/12/23	Pyrethrin	ND	0.30 ug/L	
4/12/23	4/12/23	Pyridaben	ND	0.060 ug/L	
4/12/23	4/12/23	Pyridalyl	ND	0.060 ug/L	
4/12/23	4/12/23	Pyrimethanil	ND	0.060 ug/L	
4/12/23	4/12/23	Pyroxasulfone	ND	0.060 ug/L	
4/12/23	4/12/23	Quizalofop-p-ethyl	ND	0.060 ug/L	
4/12/23	4/12/23	Rotenone	ND	0.060 ug/L	
4/12/23	4/12/23	Saflufenacil	ND	0.060 ug/L	
4/12/23	4/12/23	Sethoxydim	ND	0.12 ug/L	
4/12/23	4/12/23	Siduron	ND	0.060 ug/L	
4/12/23	4/12/23	Simazine	ND	0.060 ug/L	
4/12/23	4/12/23	Simetryn	ND	0.060 ug/L	
4/12/23	4/12/23	Spinetoram	ND	0.060 ug/L	

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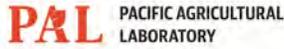
Client Sample ID: RMW-2-BUGNO-04062023  
Matrix: water

PAL Sample ID: P230409-02  
Sample Date: 4/6/23  
Received Date: 4/11/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/12/23	4/12/23	Spinosad	ND	0.060 ug/L	
4/12/23	4/12/23	Spiromesifen	ND	0.12 ug/L	
4/12/23	4/12/23	Spirotetramat	ND	0.060 ug/L	
4/12/23	4/12/23	Spiroxamine	ND	0.060 ug/L	
4/12/23	4/12/23	Sulfentrazone	ND	0.060 ug/L	
4/12/23	4/12/23	Sulfoxaflo	ND	0.060 ug/L	
4/12/23	4/12/23	Tebuconazole	ND	0.060 ug/L	
4/12/23	4/12/23	Tebufenozide	ND	0.060 ug/L	
4/12/23	4/12/23	Tebuthiuron	ND	0.060 ug/L	
4/12/23	4/12/23	Terbacil	ND	0.060 ug/L	
4/12/23	4/12/23	Terbutylazine	ND	0.060 ug/L	
4/12/23	4/12/23	Terbutryn	ND	0.060 ug/L	
4/12/23	4/12/23	Thiabendazole	ND	0.060 ug/L	
4/12/23	4/12/23	Thiacloprid	ND	0.060 ug/L	
4/12/23	4/12/23	Thiamethoxam	ND	0.060 ug/L	
4/12/23	4/12/23	Thiencarbazone-methyl	ND	0.060 ug/L	
4/12/23	4/12/23	Thiobencarb	ND	0.060 ug/L	
4/12/23	4/12/23	Thiodicarb	ND	0.060 ug/L	
4/12/23	4/12/23	Tolfenpyrad	ND	0.060 ug/L	
4/12/23	4/12/23	Triadimefon	ND	0.060 ug/L	
4/12/23	4/12/23	Triadimenol	ND	0.12 ug/L	
4/12/23	4/12/23	Triallate	ND	0.060 ug/L	
4/12/23	4/12/23	Trifloxystrobin	ND	0.060 ug/L	
4/12/23	4/12/23	Trifloxysulfuron-sodium	ND	0.060 ug/L	
4/12/23	4/12/23	Triflumizole	ND	0.060 ug/L	
4/12/23	4/12/23	Trinexapac-ethyl	ND	0.060 ug/L	
4/12/23	4/12/23	Triticonazole	ND	0.060 ug/L	

Surrogate Recovery: 81 %  
Surrogate Recovery Range: 69-120  
(TPP-d15 used as Surrogate)

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650 NE Holladay Street Suite 900  
Portland, OR 97232

Report Number: P230409  
Report Date: April 25, 2023  
Client Project ID: 913.001.002.002

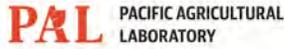
### Analytical Report

Client Sample ID: 4-166-BUGNO-04062023  
Matrix: water

PAL Sample ID: P230409-03  
Sample Date: 4/6/23  
Received Date: 4/11/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
<b>Method:</b> Modified EPA 8270D (GC-MS/MS)					
4/12/23	4/14/23	a-BHC	ND	0.060 ug/L	
4/12/23	4/14/23	Acetochlor	ND	0.060 ug/L	
4/12/23	4/14/23	Alachlor	ND	0.060 ug/L	
4/12/23	4/14/23	Aldrin	ND	0.060 ug/L	
4/12/23	4/14/23	Ametryn	ND	0.060 ug/L	
4/12/23	4/14/23	Aspon	ND	0.060 ug/L	
4/12/23	4/14/23	b-BHC	ND	0.060 ug/L	
4/12/23	4/14/23	Benfluralin	ND	0.060 ug/L	
4/12/23	4/14/23	Bifenthrin	ND	0.060 ug/L	
4/12/23	4/14/23	Bolstar	ND	0.060 ug/L	
4/12/23	4/14/23	Bromopropylate	ND	0.060 ug/L	
4/12/23	4/14/23	Buprofezin	ND	0.060 ug/L	
4/12/23	4/14/23	Captan	ND	0.60 ug/L	
4/12/23	4/14/23	Chlordane	ND	0.060 ug/L	
4/12/23	4/14/23	Chlorfenapyr	ND	0.060 ug/L	
4/12/23	4/14/23	Chlorfenvinphos	ND	0.060 ug/L	
4/12/23	4/14/23	Chlorobenzilate	ND	0.060 ug/L	
4/12/23	4/14/23	Chloroneb	ND	0.060 ug/L	
4/12/23	4/14/23	Chlorpropham	ND	0.060 ug/L	
4/12/23	4/14/23	Chlorpyrifos	ND	0.060 ug/L	
4/12/23	4/14/23	Chlorpyrifos-methyl	ND	0.060 ug/L	
4/12/23	4/14/23	cis-Nonachlor	ND	0.060 ug/L	
4/12/23	4/14/23	Cyfluthrin	ND	0.30 ug/L	
4/12/23	4/14/23	Cypermethrin	ND	0.30 ug/L	
4/12/23	4/14/23	Dacthal	ND	0.060 ug/L	
4/12/23	4/14/23	d-BHC	ND	0.060 ug/L	
4/12/23	4/14/23	Deltamethrin	ND	0.30 ug/L	
4/12/23	4/14/23	Demeton	ND	0.060 ug/L	
4/12/23	4/14/23	Diazinon	ND	0.060 ug/L	
4/12/23	4/14/23	Dichlobenil	ND	0.060 ug/L	
4/12/23	4/14/23	Dichlorofenthion	ND	0.060 ug/L	

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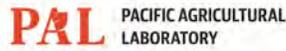
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Matrix: water

PAL Sample ID: P230409-03  
Sample Date: 4/6/23  
Received Date: 4/11/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/12/23	4/14/23	Dichlorvos	ND	0.060 ug/L	
4/12/23	4/14/23	Diclofop-methyl	ND	0.060 ug/L	
4/12/23	4/14/23	Dicloran	ND	0.30 ug/L	
4/12/23	4/14/23	Dicofol	ND	0.060 ug/L	
4/12/23	4/14/23	Dieldrin	ND	0.060 ug/L	
4/12/23	4/14/23	Dimethenamid	ND	0.060 ug/L	
4/12/23	4/14/23	Diphenamid	ND	0.060 ug/L	
4/12/23	4/14/23	Diphenylamine	ND	0.060 ug/L	
4/12/23	4/14/23	Disulfoton	ND	0.060 ug/L	
4/12/23	4/14/23	Dithiopyr	ND	0.060 ug/L	
4/12/23	4/14/23	Endosulfan I	ND	0.12 ug/L	
4/12/23	4/14/23	Endosulfan II	ND	0.12 ug/L	
4/12/23	4/14/23	Endosulfan sulfate	ND	0.12 ug/L	
4/12/23	4/14/23	Endrin	ND	0.060 ug/L	
4/12/23	4/14/23	Endrin ketone	ND	0.060 ug/L	
4/12/23	4/14/23	EPN	ND	0.060 ug/L	
4/12/23	4/14/23	EPTC	ND	0.060 ug/L	
4/12/23	4/14/23	Esfenvalerate	ND	0.060 ug/L	
4/12/23	4/14/23	Ethalfuralin	ND	0.060 ug/L	
4/12/23	4/14/23	Ethofumesate	ND	0.060 ug/L	
4/12/23	4/14/23	Ethoprop	ND	0.060 ug/L	
4/12/23	4/14/23	Etoxazole	ND	0.060 ug/L	
4/12/23	4/14/23	Etridiazole	ND	0.060 ug/L	
4/12/23	4/14/23	Fenarimol	ND	0.060 ug/L	
4/12/23	4/14/23	Fenitrothion	ND	0.060 ug/L	
4/12/23	4/14/23	Fenoxaprop-ethyl	ND	0.060 ug/L	
4/12/23	4/14/23	Fenthion	ND	0.060 ug/L	
4/12/23	4/14/23	Fenvalerate	ND	0.060 ug/L	
4/12/23	4/14/23	Fipronil	ND	0.060 ug/L	
4/12/23	4/14/23	Fluazifop-p-butyl	ND	0.060 ug/L	
4/12/23	4/14/23	Fludioxonil	ND	0.060 ug/L	
4/12/23	4/14/23	Fluroxypyr-meptyl	ND	0.060 ug/L	
4/12/23	4/14/23	Flutolanil	ND	0.060 ug/L	

Kara Greer, Project Manager

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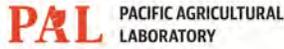
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Matrix: water

PAL Sample ID: P230409-03  
Sample Date: 4/6/23  
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Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/12/23	4/14/23	g-BHC	ND	0.060 ug/L	
4/12/23	4/14/23	Heptachlor	ND	0.060 ug/L	
4/12/23	4/14/23	Heptachlor epoxide	ND	0.060 ug/L	
4/12/23	4/14/23	Hexachlorobenzene	ND	0.060 ug/L	
4/12/23	4/14/23	Kresoxim-methyl	ND	0.060 ug/L	
4/12/23	4/14/23	lambda-Cyhalothrin	ND	0.060 ug/L	
4/12/23	4/14/23	Leptophos	ND	0.060 ug/L	
4/12/23	4/14/23	Malathion	ND	0.060 ug/L	
4/12/23	4/14/23	Mefenoxam	ND	0.060 ug/L	
4/12/23	4/14/23	Methoxychlor	ND	0.060 ug/L	
4/12/23	4/14/23	Metolachlor	ND	0.060 ug/L	
4/12/23	4/14/23	MGK-264	ND	0.060 ug/L	
4/12/23	4/14/23	Myclobutanil	ND	0.060 ug/L	
4/12/23	4/14/23	Napropamide	ND	0.060 ug/L	
4/12/23	4/14/23	o-Phenylphenol	ND	0.060 ug/L	
4/12/23	4/14/23	Ovex	ND	0.060 ug/L	
4/12/23	4/14/23	Oxadiazon	ND	0.060 ug/L	
4/12/23	4/14/23	Oxyfluorfen	ND	0.060 ug/L	
4/12/23	4/14/23	p,p'-DDD	ND	0.060 ug/L	
4/12/23	4/14/23	p,p'-DDE	ND	0.060 ug/L	
4/12/23	4/14/23	p,p'-DDT	ND	0.060 ug/L	
4/12/23	4/14/23	Paclobutrazol	ND	0.060 ug/L	
4/12/23	4/14/23	Parathion	ND	0.060 ug/L	
4/12/23	4/14/23	Parathion-methyl	ND	0.060 ug/L	
4/12/23	4/14/23	PCA	ND	0.060 ug/L	
4/12/23	4/14/23	PCB	ND	0.060 ug/L	
4/12/23	4/14/23	PCNB	ND	0.060 ug/L	
4/12/23	4/14/23	Pendimethalin	ND	0.060 ug/L	
4/12/23	4/14/23	Pentachlorothioanisole	ND	0.060 ug/L	
4/12/23	4/14/23	Permethrin	ND	0.12 ug/L	
4/12/23	4/14/23	Phorate	ND	0.060 ug/L	
4/12/23	4/14/23	Procymidone	ND	0.060 ug/L	
4/12/23	4/14/23	Prodiamine	ND	0.060 ug/L	

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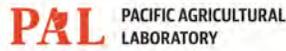
Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/12/23	4/14/23	Pronamide	ND	0.060 ug/L	
4/12/23	4/14/23	Propachlor	ND	0.060 ug/L	
4/12/23	4/14/23	Pyriproxyfen	ND	0.060 ug/L	
4/12/23	4/14/23	Quinoxifen	ND	0.060 ug/L	
4/12/23	4/14/23	Ronnel	ND	0.060 ug/L	
4/12/23	4/14/23	Spirodiclofen	ND	0.060 ug/L	
4/12/23	4/14/23	Sulfotep	ND	0.060 ug/L	
4/12/23	4/14/23	Tefluthrin	ND	0.060 ug/L	
4/12/23	4/14/23	Terbufos	ND	0.060 ug/L	
4/12/23	4/14/23	Tetraconazole	ND	0.060 ug/L	
4/12/23	4/14/23	Tetradifon	ND	0.060 ug/L	
4/12/23	4/14/23	Thionazin	ND	0.060 ug/L	
4/12/23	4/14/23	Tokuthion	ND	0.060 ug/L	
4/12/23	4/14/23	trans-Nonachlor	ND	0.060 ug/L	
4/12/23	4/14/23	Trichloronate	ND	0.060 ug/L	
4/12/23	4/14/23	Trifluralin	ND	0.060 ug/L	
4/12/23	4/14/23	Vinclozalin	ND	0.060 ug/L	

Surrogate Recovery: 109 %  
Surrogate Recovery Range: 60-141  
(TPP-d15 used as Surrogate)

Method: Modified EPA 8321B (LC-MS/MS)

4/12/23	4/12/23	Abamectin	ND	0.060 ug/L	
4/12/23	4/12/23	Acetamiprid	ND	0.060 ug/L	
4/12/23	4/12/23	Acibenzolar-S-methyl	ND	0.12 ug/L	
4/12/23	4/12/23	Afidopyropen	ND	0.060 ug/L	
4/12/23	4/12/23	Aldicarb	ND	0.060 ug/L	
4/12/23	4/12/23	Allethrin	ND	0.060 ug/L	
4/12/23	4/12/23	Ametoctradin	ND	0.060 ug/L	
4/12/23	4/12/23	Atrazine	ND	0.060 ug/L	
4/12/23	4/12/23	Azinphos-ethyl	ND	0.060 ug/L	
4/12/23	4/12/23	Azinphos-methyl	ND	0.12 ug/L	
4/12/23	4/12/23	Azoxystrobin	ND	0.060 ug/L	
4/12/23	4/12/23	Bendiocarb	ND	0.060 ug/L	

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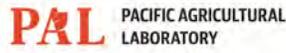
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Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/12/23	4/12/23	Bensulide	ND	0.060 ug/L	
4/12/23	4/12/23	Bicyclopyrone	ND	0.060 ug/L	
4/12/23	4/12/23	Bitertanol	ND	0.060 ug/L	
4/12/23	4/12/23	Boscalid	ND	0.060 ug/L	
4/12/23	4/12/23	Bromacil	ND	0.060 ug/L	
4/12/23	4/12/23	Carbaryl	ND	0.060 ug/L	
4/12/23	4/12/23	Carbendazim	ND	0.060 ug/L	
4/12/23	4/12/23	Carbofuran	ND	0.060 ug/L	
4/12/23	4/12/23	Carfentrazone-ethyl	ND	0.060 ug/L	
4/12/23	4/12/23	Chlorantraniliprole	ND	0.060 ug/L	
4/12/23	4/12/23	Clethodim	ND	0.12 ug/L	
4/12/23	4/12/23	Clofentezine	ND	0.060 ug/L	
4/12/23	4/12/23	Clomazone	ND	0.060 ug/L	
4/12/23	4/12/23	Cyanazine	ND	0.060 ug/L	
4/12/23	4/12/23	Cyantraniliprole	ND	0.060 ug/L	
4/12/23	4/12/23	Cyazofamid	ND	0.060 ug/L	
4/12/23	4/12/23	Cyclaniliprole	ND	0.060 ug/L	
4/12/23	4/12/23	Cycloate	ND	0.12 ug/L	
4/12/23	4/12/23	Cyflufenamid	ND	0.060 ug/L	
4/12/23	4/12/23	Cyflumetofen	ND	0.060 ug/L	
4/12/23	4/12/23	Cyhalofop-butyl	ND	0.12 ug/L	
4/12/23	4/12/23	Cymoxanil	ND	0.060 ug/L	
4/12/23	4/12/23	Cyprodinil	ND	0.060 ug/L	
4/12/23	4/12/23	Cyprosulfamide	ND	0.060 ug/L	
4/12/23	4/12/23	DCPMU	ND	0.060 ug/L	
4/12/23	4/12/23	Diazoxon	ND	0.060 ug/L	
4/12/23	4/12/23	Difenoconazole	ND	0.060 ug/L	
4/12/23	4/12/23	Diflubenzuron	ND	0.060 ug/L	
4/12/23	4/12/23	Diflufenican	ND	0.060 ug/L	
4/12/23	4/12/23	Dimethoate	ND	0.060 ug/L	
4/12/23	4/12/23	Dimethomorph	ND	0.060 ug/L	
4/12/23	4/12/23	Dioxathion	ND	0.060 ug/L	
4/12/23	4/12/23	Disulfoton sulfone	ND	0.060 ug/L	

*Kara Greer*

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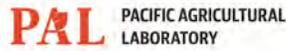
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Sample Date: 4/6/23  
Received Date: 4/11/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/12/23	4/12/23	Diuron	ND	0.060 ug/L	
4/12/23	4/12/23	d-Phenothrin	ND	0.060 ug/L	
4/12/23	4/12/23	Ethion	ND	0.060 ug/L	
4/12/23	4/12/23	Etofenprox	ND	0.060 ug/L	
4/12/23	4/12/23	Famoxadone	ND	0.060 ug/L	
4/12/23	4/12/23	Famphur	ND	0.060 ug/L	
4/12/23	4/12/23	Fenamidone	ND	0.060 ug/L	
4/12/23	4/12/23	Fenamiphos sulfone	ND	0.060 ug/L	
4/12/23	4/12/23	Fenamiphos sulfoxide	ND	0.060 ug/L	
4/12/23	4/12/23	Fenazaquin	ND	0.060 ug/L	
4/12/23	4/12/23	Fenbuconazole	ND	0.060 ug/L	
4/12/23	4/12/23	Fenbutatin oxide	ND	0.060 ug/L	
4/12/23	4/12/23	Fenhexamid	ND	0.060 ug/L	
4/12/23	4/12/23	Fenobucarb	ND	0.060 ug/L	
4/12/23	4/12/23	Fenoxycarb	ND	0.060 ug/L	
4/12/23	4/12/23	Fenpropathrin	ND	0.060 ug/L	
4/12/23	4/12/23	Fenpyroximate	ND	0.060 ug/L	
4/12/23	4/12/23	Fenuron	ND	0.060 ug/L	
4/12/23	4/12/23	Fluazinam	ND	0.060 ug/L	
4/12/23	4/12/23	Flubendiamide	ND	0.12 ug/L	
4/12/23	4/12/23	Flufenacet	ND	0.060 ug/L	
4/12/23	4/12/23	Flumioxazin	ND	0.060 ug/L	
4/12/23	4/12/23	Fluometuron	ND	0.060 ug/L	
4/12/23	4/12/23	Fluopicolide	ND	0.060 ug/L	
4/12/23	4/12/23	Fluopyram	ND	0.060 ug/L	
4/12/23	4/12/23	Fluoxastrobin	ND	0.060 ug/L	
4/12/23	4/12/23	Flupyradifurone	ND	0.060 ug/L	
4/12/23	4/12/23	Fluridone	ND	0.060 ug/L	
4/12/23	4/12/23	Flutianil	ND	0.060 ug/L	
4/12/23	4/12/23	Flutriafol	ND	0.060 ug/L	
4/12/23	4/12/23	Fluvalinate	ND	0.060 ug/L	
4/12/23	4/12/23	Fluxapyroxad	ND	0.060 ug/L	
4/12/23	4/12/23	Fonofos	ND	0.12 ug/L	

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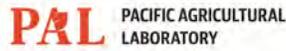
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Received Date: 4/11/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/12/23	4/12/23	Hexaconazole	ND	0.060 ug/L	
4/12/23	4/12/23	Hexazinone	ND	0.060 ug/L	
4/12/23	4/12/23	Hexythiazox	ND	0.060 ug/L	
4/12/23	4/12/23	Imazalil	ND	0.060 ug/L	
4/12/23	4/12/23	Imidacloprid	ND	0.060 ug/L	
4/12/23	4/12/23	Indaziflam	ND	0.060 ug/L	
4/12/23	4/12/23	Indoxacarb	ND	0.060 ug/L	
4/12/23	4/12/23	Iodosulfuron-methyl	ND	0.060 ug/L	
4/12/23	4/12/23	Ipconazole	ND	0.060 ug/L	
4/12/23	4/12/23	Iprodione	ND	0.30 ug/L	
4/12/23	4/12/23	Isofetamid	ND	0.060 ug/L	
4/12/23	4/12/23	Isoxaben	ND	0.060 ug/L	
4/12/23	4/12/23	Isoxadifen-ethyl	ND	0.060 ug/L	
4/12/23	4/12/23	Lactofen	ND	0.060 ug/L	
4/12/23	4/12/23	Linuron	ND	0.060 ug/L	
4/12/23	4/12/23	Malaoxon	ND	0.060 ug/L	
4/12/23	4/12/23	Mandipropamid	ND	0.060 ug/L	
4/12/23	4/12/23	Metconazole	ND	0.060 ug/L	
4/12/23	4/12/23	Methidathion	ND	0.060 ug/L	
4/12/23	4/12/23	Methiocarb	ND	0.060 ug/L	
4/12/23	4/12/23	Methomyl	ND	0.060 ug/L	
4/12/23	4/12/23	Methoxyfenozide	ND	0.060 ug/L	
4/12/23	4/12/23	Metrafenone	ND	0.060 ug/L	
4/12/23	4/12/23	Metribuzin	ND	0.060 ug/L	
4/12/23	4/12/23	Mevinphos	ND	0.060 ug/L	
4/12/23	4/12/23	Monuron	ND	0.060 ug/L	
4/12/23	4/12/23	Neburon	ND	0.060 ug/L	
4/12/23	4/12/23	Norflurazon	ND	0.060 ug/L	
4/12/23	4/12/23	Novaluron	ND	0.060 ug/L	
4/12/23	4/13/23	Oryzalin	ND	0.060 ug/L	
4/12/23	4/12/23	Oxadixyl	ND	0.060 ug/L	
4/12/23	4/12/23	Oxamyl	ND	0.060 ug/L	
4/12/23	4/12/23	Penoxsulam	ND	0.060 ug/L	

Kara Greer, Project Manager

This analytical report complies with the ISO/IEC 17025:2017 Quality Standard.



GSI Water Solutions, Inc.  
650 NE Holladay Street Suite 900  
Portland, OR 97232

Report Number: P230409  
Report Date: April 25, 2023  
Client Project ID: 913.001.002.002

### Analytical Report

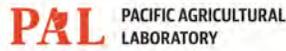
Client Sample ID: 4-166-BUGNO-04062023  
Matrix: water

PAL Sample ID: P230409-03  
Sample Date: 4/6/23  
Received Date: 4/11/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/12/23	4/12/23	Penthiopyrad	ND	0.060 ug/L	
4/12/23	4/12/23	Phorate Sulfone	ND	0.060 ug/L	
4/12/23	4/12/23	Phorate Sulfoxide	ND	0.060 ug/L	
4/12/23	4/12/23	Phosalone	ND	0.060 ug/L	
4/12/23	4/12/23	Phosmet	ND	0.060 ug/L	
4/12/23	4/12/23	Phosphamidon	ND	0.060 ug/L	
4/12/23	4/12/23	Picoxystrobin	ND	0.060 ug/L	
4/12/23	4/12/23	Piperonyl Butoxide	ND	0.060 ug/L	
4/12/23	4/12/23	Pirimicarb	ND	0.060 ug/L	
4/12/23	4/12/23	Pirimiphos-methyl	ND	0.060 ug/L	
4/12/23	4/12/23	Prallethrin	ND	0.060 ug/L	
4/12/23	4/12/23	Prometon	ND	0.060 ug/L	
4/12/23	4/12/23	Prometryn	ND	0.060 ug/L	
4/12/23	4/12/23	Propanil	ND	0.060 ug/L	
4/12/23	4/12/23	Propargite	ND	0.060 ug/L	
4/12/23	4/12/23	Propazine	ND	0.060 ug/L	
4/12/23	4/12/23	Propiconazole	ND	0.12 ug/L	
4/12/23	4/12/23	Propoxur	ND	0.060 ug/L	
4/12/23	4/12/23	Pyraclostrobin	ND	0.060 ug/L	
4/12/23	4/12/23	Pyraflufen-ethyl	ND	0.060 ug/L	
4/12/23	4/12/23	Pyrethrin	ND	0.30 ug/L	
4/12/23	4/12/23	Pyridaben	ND	0.060 ug/L	
4/12/23	4/12/23	Pyridalyl	ND	0.060 ug/L	
4/12/23	4/12/23	Pyrimethanil	ND	0.060 ug/L	
4/12/23	4/12/23	Pyroxasulfone	ND	0.060 ug/L	
4/12/23	4/12/23	Quizalofop-p-ethyl	ND	0.060 ug/L	
4/12/23	4/12/23	Rotenone	ND	0.060 ug/L	
4/12/23	4/12/23	Saflufenacil	ND	0.060 ug/L	
4/12/23	4/12/23	Sethoxydim	ND	0.12 ug/L	
4/12/23	4/12/23	Siduron	ND	0.060 ug/L	
4/12/23	4/12/23	Simazine	ND	0.060 ug/L	
4/12/23	4/12/23	Simetryn	ND	0.060 ug/L	
4/12/23	4/12/23	Spinetoram	ND	0.060 ug/L	

Kara Greer, Project Manager

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GSI Water Solutions, Inc.  
650 NE Holladay Street Suite 900  
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Report Number: P230409  
Report Date: April 25, 2023  
Client Project ID: 913.001.002.002

### Analytical Report

Client Sample ID: 4-166-BUGNO-04062023  
Matrix: water

PAL Sample ID: P230409-03  
Sample Date: 4/6/23  
Received Date: 4/11/23

Extraction Date	Analysis Date	Analyte	Amount Detected	Limit of Quantitation	Notes
4/12/23	4/12/23	Spinosad	ND	0.060 ug/L	
4/12/23	4/12/23	Spiromesifen	ND	0.12 ug/L	
4/12/23	4/12/23	Spirotetramat	ND	0.060 ug/L	
4/12/23	4/12/23	Spiroxamine	ND	0.060 ug/L	
4/12/23	4/12/23	Sulfentrazone	ND	0.060 ug/L	
4/12/23	4/12/23	Sulfoxaflo	ND	0.060 ug/L	
4/12/23	4/12/23	Tebuconazole	ND	0.060 ug/L	
4/12/23	4/12/23	Tebufenozide	ND	0.060 ug/L	
4/12/23	4/12/23	Tebuthiuron	ND	0.060 ug/L	
4/12/23	4/12/23	Terbacil	ND	0.060 ug/L	
4/12/23	4/12/23	Terbutylazine	ND	0.060 ug/L	
4/12/23	4/12/23	Terbutryn	ND	0.060 ug/L	
4/12/23	4/12/23	Thiabendazole	ND	0.060 ug/L	
4/12/23	4/12/23	Thiacloprid	ND	0.060 ug/L	
4/12/23	4/12/23	Thiamethoxam	ND	0.060 ug/L	
4/12/23	4/12/23	Thiencarbazone-methyl	ND	0.060 ug/L	
4/12/23	4/12/23	Thiobencarb	ND	0.060 ug/L	
4/12/23	4/12/23	Thiodicarb	ND	0.060 ug/L	
4/12/23	4/12/23	Tolfenpyrad	ND	0.060 ug/L	
4/12/23	4/12/23	Triadimefon	ND	0.060 ug/L	
4/12/23	4/12/23	Triadimenol	ND	0.12 ug/L	
4/12/23	4/12/23	Triallate	ND	0.060 ug/L	
4/12/23	4/12/23	Trifloxystrobin	ND	0.060 ug/L	
4/12/23	4/12/23	Trifloxysulfuron-sodium	ND	0.060 ug/L	
4/12/23	4/12/23	Triflumizole	ND	0.060 ug/L	
4/12/23	4/12/23	Trinexapac-ethyl	ND	0.060 ug/L	
4/12/23	4/12/23	Triticonazole	ND	0.060 ug/L	

Surrogate Recovery: 97 %  
Surrogate Recovery Range: 69-120  
(TPP-d15 used as Surrogate)

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Quality Standard.

GSI Water Solutions, Inc.  
650 NE Holladay Street Suite 900  
Portland, OR 97232

Report Number: P230409  
Report Date: April 25, 2023  
Client Project ID: 913.001.002.002

## Quality Assurance

**Method Blank Data** Matrix: water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/11/23	4/12/23	23D1102-BLK1	AMPA	Not Detected	< 10 ug/L	
4/11/23	4/12/23	23D1102-BLK1	Glyphosate	Not Detected	< 10 ug/L	

**Method Blank Data** Matrix: water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/12/23	4/18/23	23D1201-BLK1	Picloram	Not Detected	< 0.080 ug/L	

**Method Blank Data** Matrix: water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/12/23	4/12/23	23D1202-BLK1	Abamectin	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	a-BHC	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Acetamiprid	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Acetochlor	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Acibenzolar-S-methyl	Not Detected	< 0.12 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Afidopyropen	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Alachlor	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Aldicarb	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Aldrin	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Allethrin	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Ametoctradin	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Ametryn	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Aspon	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Atrazine	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Azinphos-ethyl	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Azinphos-methyl	Not Detected	< 0.12 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Azoxystrobin	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	b-BHC	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Bendiocarb	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Benfluralin	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Bensulide	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Bicyclopyrone	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Bifenthrin	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Bitertanol	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Bolstar	Not Detected	< 0.060 ug/L	

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**Report Number:** P230409  
**Report Date:** April 25, 2023  
**Client Project ID:** 913.001.002.002

**Method Blank Data**      **Matrix:** water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/12/23	4/12/23	23D1202-BLK1	Boscalid	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Bromacil	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Bromopropylate	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Buprofezin	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Captan	Not Detected	< 0.60 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Carbaryl	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Carbendazim	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Carbofuran	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Carfentrazone-ethyl	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Chlorantraniliprole	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Chlordane	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Chlorfenapyr	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Chlorfenvinphos	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Chlorobenzilate	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Chloroneb	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Chlorpropham	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Chlorpyrifos	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Chlorpyrifos-methyl	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	cis-Nonachlor	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Clethodim	Not Detected	< 0.12 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Clofentezine	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Clomazone	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Cyanazine	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Cyantraniliprole	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Cyazofamid	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Cyclaniliprole	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Cycloate	Not Detected	< 0.12 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Cyflufenamid	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Cyflumetofen	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Cyfluthrin	Not Detected	< 0.30 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Cyhalofop-butyl	Not Detected	< 0.12 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Cymoxanil	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Cypermethrin	Not Detected	< 0.30 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Cyprodinil	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Cyprosulfamide	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Dacthal	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	d-BHC	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	DCPMU	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Deltamethrin	Not Detected	< 0.30 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Demeton	Not Detected	< 0.060 ug/L	

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**Method Blank Data**      **Matrix:** water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/12/23	4/14/23	23D1202-BLK1	Diazinon	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Diazoxon	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Dichlobenil	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Dichlorofenthion	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Dichlorvos	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Diclofop-methyl	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Dicloran	Not Detected	< 0.30 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Dicofol	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Dieldrin	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Difenoconazole	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Diflubenzuron	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Diflufenican	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Dimethenamid	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Dimethoate	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Dimethomorph	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Dioxathion	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Diphenamid	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Diphenylamine	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Disulfoton	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Disulfoton sulfone	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Dithiopyr	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Diuron	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	d-Phenothrin	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Endosulfan I	Not Detected	< 0.12 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Endosulfan II	Not Detected	< 0.12 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Endosulfan sulfate	Not Detected	< 0.12 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Endrin	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Endrin ketone	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	EPN	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	EPTC	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Esfenvalerate	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Ethalfuralin	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Ethion	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Ethofumesate	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Ethoprop	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Etofenprox	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Etoxazole	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Etridiazole	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Famoxadone	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Famphur	Not Detected	< 0.060 ug/L	

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**Method Blank Data** Matrix: water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/12/23	4/12/23	23D1202-BLK1	Fenamidone	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Fenamiphos sulfone	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Fenamiphos sulfoxide	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Fenarimol	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Fenazaquin	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Fenbuconazole	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Fenbutatin oxide	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Fenhexamid	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Fenitrothion	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Fenobucarb	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Fenoxaprop-ethyl	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Fenoxycarb	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Fenpropathrin	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Fenpyroximate	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Fenthion	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Fenuron	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Fenvalerate	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Fipronil	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Fluazifop-p-butyl	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Fluazinam	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Flubendiamide	Not Detected	< 0.12 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Fludioxonil	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Flufenacet	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Flumioxazin	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Fluometuron	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Fluopicolide	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Fluopyram	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Fluoxastrobin	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Flupyradifurone	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Fluridone	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Fluroxypyr-meptyl	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Flutianil	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Flutolanil	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Flutriafol	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Fluvalinate	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Fluxapyroxad	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Fonofos	Not Detected	< 0.12 ug/L	
4/12/23	4/14/23	23D1202-BLK1	g-BHC	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Heptachlor	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Heptachlor epoxide	Not Detected	< 0.060 ug/L	



Kara Greer, Project Manager

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**GSI Water Solutions, Inc.**  
650 NE Holladay Street Suite 900  
Portland, OR 97232

**Report Number:** P230409  
**Report Date:** April 25, 2023  
**Client Project ID:** 913.001.002.002

**Method Blank Data** Matrix: water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/12/23	4/14/23	23D1202-BLK1	Hexachlorobenzene	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Hexaconazole	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Hexazinone	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Hexythiazox	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Imazalil	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Imidacloprid	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Indaziflam	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Indoxacarb	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Iodosulfuron-methyl	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Ipconazole	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Iprodione	Not Detected	< 0.30 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Isofetamid	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Isoxaben	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Isoxadifen-ethyl	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Kresoxim-methyl	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Lactofen	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	lambda-Cyhalothrin	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Leptophos	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Linuron	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Malaoxon	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Malathion	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Mandipropamid	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Mefenoxam	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Metconazole	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Methidathion	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Methiocarb	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Methomyl	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Methoxychlor	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Methoxyfenozide	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Metolachlor	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Metrafenone	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Metribuzin	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Mevinphos	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	MGK-264	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Monuron	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Myclobutanil	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Napropamide	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Neburon	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Norflurazon	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Novaluron	Not Detected	< 0.060 ug/L	



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**Report Date:** April 25, 2023  
**Client Project ID:** 913.001.002.002

**Method Blank Data**      **Matrix:** water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/12/23	4/14/23	23D1202-BLK1	o-Phenylphenol	Not Detected	< 0.060 ug/L	
4/12/23	4/13/23	23D1202-BLK1	Oryzalin	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Ovex	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Oxadiazon	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Oxadixyl	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Oxamyl	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Oxyfluorfen	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	p,p'-DDD	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	p,p'-DDE	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	p,p'-DDT	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Paclobutrazol	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Parathion	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Parathion-methyl	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	PCA	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	PCB	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	PCNB	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Pendimethalin	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Penoxsulam	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Pentachlorothioanisole	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Penthiopyrad	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Permethrin	Not Detected	< 0.12 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Phorate	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Phorate Sulfone	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Phorate Sulfoxide	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Phosalone	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Phosmet	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Phosphamidon	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Picoxystrobin	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Piperonyl Butoxide	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Pirimicarb	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Pirimiphos-methyl	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Prallethrin	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Procymidone	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Prodiamine	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Prometon	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Prometryn	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Pronamide	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Propachlor	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Propanil	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Propargite	Not Detected	< 0.060 ug/L	



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**Report Number:** P230409  
**Report Date:** April 25, 2023  
**Client Project ID:** 913.001.002.002

**Method Blank Data** Matrix: water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/12/23	4/12/23	23D1202-BLK1	Propazine	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Propiconazole	Not Detected	< 0.12 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Propoxur	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Pyraclostrobin	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Pyraflufen-ethyl	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Pyrethrin	Not Detected	< 0.30 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Pyridaben	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Pyridalyl	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Pyrimethanil	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Pyriproxyfen	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Pyroxasulfone	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Quinoxifen	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Quizalofop-p-ethyl	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Ronnel	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Rotenone	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Saflufenacil	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Sethoxydim	Not Detected	< 0.12 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Siduron	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Simazine	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Simetryn	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Spinetoram	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Spinosad	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Spirodiclofen	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Spiromesifen	Not Detected	< 0.12 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Spirotetramat	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Spiroxamine	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Sulfentrazone	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Sulfotep	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Sulfoxaflor	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Tebuconazole	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Tebufenozide	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Tebuthiuron	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Tefluthrin	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Terbacil	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Terbufos	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Terbutylazine	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Terbutryn	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Tetraconazole	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Tetradifon	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Thiabendazole	Not Detected	< 0.060 ug/L	

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Report Number: P230409  
Report Date: April 25, 2023  
Client Project ID: 913.001.002.002

Method Blank Data Matrix: water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/12/23	4/12/23	23D1202-BLK1	Thiacloprid	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Thiamethoxam	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Thiencarbazone-methyl	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Thiobencarb	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Thiodicarb	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Thionazin	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Tokuthion	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Tolfenpyrad	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	trans-Nonachlor	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Triadimefon	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Triadimenol	Not Detected	< 0.12 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Triallate	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Trichloronate	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Trifloxystrobin	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Trifloxysulfuron-sodium	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Triflumizole	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Trifluralin	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Trinexapac-ethyl	Not Detected	< 0.060 ug/L	
4/12/23	4/12/23	23D1202-BLK1	Triticonazole	Not Detected	< 0.060 ug/L	
4/12/23	4/14/23	23D1202-BLK1	Vinclozalin	Not Detected	< 0.060 ug/L	



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**Report Date:** April 25, 2023  
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**Blank Spike Data** Matrix: water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/11/23	4/12/23	23D1102-BS1	AMPA	87	78-121	
4/11/23	4/12/23	23D1102-BSD1	AMPA	94	78-121	
4/11/23	4/12/23	23D1102-BS1	Glyphosate	92	78-123	
4/11/23	4/12/23	23D1102-BSD1	Glyphosate	95	78-123	

**Blank Spike Data** Matrix: water

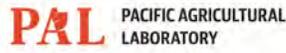
Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/12/23	4/18/23	23D1201-BS1	Picloram	109	67-135	
4/12/23	4/18/23	23D1201-BSD1	Picloram	103	67-135	

**Blank Spike Data** Matrix: water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/12/23	4/14/23	23D1202-BS1	Acetochlor	87	67-129	
4/12/23	4/14/23	23D1202-BSD1	Acetochlor	89	67-129	
4/12/23	4/14/23	23D1202-BS1	Ametryn	93	60-134	
4/12/23	4/14/23	23D1202-BSD1	Ametryn	92	60-134	
4/12/23	4/14/23	23D1202-BS1	Aspon	86	60-140	
4/12/23	4/14/23	23D1202-BSD1	Aspon	92	60-140	
4/12/23	4/14/23	23D1202-BS1	Bifenthrin	87	63-142	
4/12/23	4/14/23	23D1202-BSD1	Bifenthrin	91	63-142	
4/12/23	4/14/23	23D1202-BS1	Bolstar	82	60-140	
4/12/23	4/14/23	23D1202-BSD1	Bolstar	86	60-140	
4/12/23	4/14/23	23D1202-BS1	Buprofezin	94	70-134	
4/12/23	4/14/23	23D1202-BSD1	Buprofezin	95	70-134	
4/12/23	4/14/23	23D1202-BS1	Captan	76	25-143	
4/12/23	4/14/23	23D1202-BSD1	Captan	75	25-143	
4/12/23	4/12/23	23D1202-BS1	Carbaryl	96	80-109	
4/12/23	4/12/23	23D1202-BSD1	Carbaryl	102	80-109	
4/12/23	4/14/23	23D1202-BS1	Chlorfenvinphos	90	60-140	
4/12/23	4/14/23	23D1202-BSD1	Chlorfenvinphos	93	60-140	
4/12/23	4/14/23	23D1202-BS1	Chlorpropham	90	67-127	
4/12/23	4/14/23	23D1202-BSD1	Chlorpropham	87	67-127	
4/12/23	4/14/23	23D1202-BS1	Chlorpyrifos	97	69-128	
4/12/23	4/14/23	23D1202-BSD1	Chlorpyrifos	96	69-128	
4/12/23	4/14/23	23D1202-BS1	Chlorpyrifos-methyl	81	61-131	
4/12/23	4/14/23	23D1202-BSD1	Chlorpyrifos-methyl	84	61-131	
4/12/23	4/14/23	23D1202-BS1	cis-Nonachlor	66	57-130	

*This analytical report complies with the ISO/IEC 17025:2017 Quality Standard.*





GSI Water Solutions, Inc.  
650 NE Holladay Street Suite 900  
Portland, OR 97232

Report Number: P230409  
Report Date: April 25, 2023  
Client Project ID: 913.001.002.002

Blank Spike Data Matrix: water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/12/23	4/14/23	23D1202-BSD1	cis-Nonachlor	89	57-130	
4/12/23	4/14/23	23D1202-BS1	Cyfluthrin	99	50-158	
4/12/23	4/14/23	23D1202-BSD1	Cyfluthrin	98	50-158	
4/12/23	4/14/23	23D1202-BS1	Cypermethrin	95	48-163	
4/12/23	4/14/23	23D1202-BSD1	Cypermethrin	90	48-163	
4/12/23	4/14/23	23D1202-BS1	Dacthal	88	72-120	
4/12/23	4/14/23	23D1202-BSD1	Dacthal	91	72-120	
4/12/23	4/14/23	23D1202-BS1	Deltamethrin	90	59-148	
4/12/23	4/14/23	23D1202-BSD1	Deltamethrin	106	59-148	
4/12/23	4/14/23	23D1202-BS1	Demeton	74	60-140	
4/12/23	4/14/23	23D1202-BSD1	Demeton	69	60-140	
4/12/23	4/14/23	23D1202-BS1	Diazinon	82	67-136	
4/12/23	4/14/23	23D1202-BSD1	Diazinon	82	67-136	
4/12/23	4/14/23	23D1202-BS1	Dichlobenil	85	60-111	
4/12/23	4/14/23	23D1202-BSD1	Dichlobenil	81	60-111	
4/12/23	4/14/23	23D1202-BS1	Dichlorofenthion	85	64-124	
4/12/23	4/14/23	23D1202-BSD1	Dichlorofenthion	83	64-124	
4/12/23	4/14/23	23D1202-BS1	Dichlorvos	80	43-125	
4/12/23	4/14/23	23D1202-BSD1	Dichlorvos	79	43-125	
4/12/23	4/14/23	23D1202-BS1	Dicloran	87	63-128	
4/12/23	4/14/23	23D1202-BSD1	Dicloran	86	63-128	
4/12/23	4/14/23	23D1202-BS1	Dicofol	93	70-129	
4/12/23	4/14/23	23D1202-BSD1	Dicofol	99	70-129	
4/12/23	4/14/23	23D1202-BS1	Dimethenamid	88	68-128	
4/12/23	4/14/23	23D1202-BSD1	Dimethenamid	91	68-128	
4/12/23	4/14/23	23D1202-BS1	Diphenamid	88	70-128	
4/12/23	4/14/23	23D1202-BSD1	Diphenamid	93	70-128	
4/12/23	4/14/23	23D1202-BS1	Diphenylamine	89	67-120	
4/12/23	4/14/23	23D1202-BSD1	Diphenylamine	84	67-120	
4/12/23	4/14/23	23D1202-BS1	Disulfoton	66	64-128	
4/12/23	4/14/23	23D1202-BSD1	Disulfoton	74	64-128	
4/12/23	4/14/23	23D1202-BS1	Endosulfan I	90	72-117	
4/12/23	4/14/23	23D1202-BSD1	Endosulfan I	89	72-117	
4/12/23	4/14/23	23D1202-BS1	Endosulfan II	88	59-119	
4/12/23	4/14/23	23D1202-BSD1	Endosulfan II	95	59-119	
4/12/23	4/14/23	23D1202-BS1	Endosulfan sulfate	84	68-128	
4/12/23	4/14/23	23D1202-BSD1	Endosulfan sulfate	90	68-128	
4/12/23	4/14/23	23D1202-BS1	EPN	89	60-140	
4/12/23	4/14/23	23D1202-BSD1	EPN	88	60-140	
4/12/23	4/14/23	23D1202-BS1	Esfenvalerate	96	36-154	
4/12/23	4/14/23	23D1202-BSD1	Esfenvalerate	112	36-154	
4/12/23	4/14/23	23D1202-BS1	Ethofumesate	97	69-130	
4/12/23	4/14/23	23D1202-BSD1	Ethofumesate	95	69-130	

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**GSI Water Solutions, Inc.**  
650 NE Holladay Street Suite 900  
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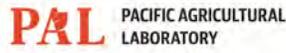
**Report Number:** P230409  
**Report Date:** April 25, 2023  
**Client Project ID:** 913.001.002.002

**Blank Spike Data**                      **Matrix:** water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/12/23	4/14/23	23D1202-BS1	Ethoprop	85	65-126	
4/12/23	4/14/23	23D1202-BSD1	Ethoprop	82	65-126	
4/12/23	4/14/23	23D1202-BS1	Ettoxazole	90	64-137	
4/12/23	4/14/23	23D1202-BSD1	Ettoxazole	101	64-137	
4/12/23	4/14/23	23D1202-BS1	Fenarimol	93	70-125	
4/12/23	4/14/23	23D1202-BSD1	Fenarimol	96	70-125	
4/12/23	4/14/23	23D1202-BS1	Fenitrothion	87	60-140	
4/12/23	4/14/23	23D1202-BSD1	Fenitrothion	89	60-140	
4/12/23	4/14/23	23D1202-BS1	Fenthion	95	60-140	
4/12/23	4/14/23	23D1202-BSD1	Fenthion	87	60-140	
4/12/23	4/14/23	23D1202-BS1	Fenvalerate	88	52-161	
4/12/23	4/14/23	23D1202-BSD1	Fenvalerate	97	52-161	
4/12/23	4/14/23	23D1202-BS1	Fipronil	96	51-146	
4/12/23	4/14/23	23D1202-BSD1	Fipronil	92	51-146	
4/12/23	4/14/23	23D1202-BS1	Fluazifop-p-butyl	90	61-152	
4/12/23	4/14/23	23D1202-BSD1	Fluazifop-p-butyl	92	61-152	
4/12/23	4/14/23	23D1202-BS1	Fludioxonil	77	49-143	
4/12/23	4/14/23	23D1202-BSD1	Fludioxonil	91	49-143	
4/12/23	4/14/23	23D1202-BS1	Fluroxypyr-meptyl	90	53-145	
4/12/23	4/14/23	23D1202-BSD1	Fluroxypyr-meptyl	107	53-145	
4/12/23	4/14/23	23D1202-BS1	Flutolanil	94	57-152	
4/12/23	4/14/23	23D1202-BSD1	Flutolanil	98	57-152	
4/12/23	4/14/23	23D1202-BS1	Hexachlorobenzene	90	38-118	
4/12/23	4/14/23	23D1202-BSD1	Hexachlorobenzene	81	38-118	
4/12/23	4/12/23	23D1202-BS1	Imidacloprid	98	61-115	
4/12/23	4/12/23	23D1202-BSD1	Imidacloprid	103	61-115	
4/12/23	4/14/23	23D1202-BS1	Kresoxim-methyl	89	70-131	
4/12/23	4/14/23	23D1202-BSD1	Kresoxim-methyl	99	70-131	
4/12/23	4/14/23	23D1202-BS1	lambda-Cyhalothrin	87	61-141	
4/12/23	4/14/23	23D1202-BSD1	lambda-Cyhalothrin	94	61-141	
4/12/23	4/14/23	23D1202-BS1	Leptophos	88	60-140	
4/12/23	4/14/23	23D1202-BSD1	Leptophos	92	60-140	
4/12/23	4/12/23	23D1202-BS1	Linuron	93	76-114	
4/12/23	4/12/23	23D1202-BSD1	Linuron	101	76-114	
4/12/23	4/14/23	23D1202-BS1	Malathion	96	45-157	
4/12/23	4/14/23	23D1202-BSD1	Malathion	97	45-157	
4/12/23	4/14/23	23D1202-BS1	Mefenoxam	94	69-130	
4/12/23	4/14/23	23D1202-BSD1	Mefenoxam	93	69-130	
4/12/23	4/14/23	23D1202-BS1	Metolachlor	97	71-128	
4/12/23	4/14/23	23D1202-BSD1	Metolachlor	97	71-128	
4/12/23	4/12/23	23D1202-BS1	Metribuzin	93	63-123	
4/12/23	4/12/23	23D1202-BSD1	Metribuzin	101	63-123	
4/12/23	4/14/23	23D1202-BS1	MGK-264	91	70-124	

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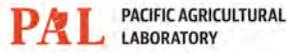
GSI Water Solutions, Inc.  
650 NE Holladay Street Suite 900  
Portland, OR 97232

Report Number: P230409  
Report Date: April 25, 2023  
Client Project ID: 913.001.002.002

Blank Spike Data Matrix: water

Extraction Date	Analysis Date	Batch QC Sample #	Analyte	% Recovery	Expected % Recovery	Notes
4/12/23	4/14/23	23D1202-BSD1	MGK-264	90	70-124	
4/12/23	4/14/23	23D1202-BS1	Myclobutanil	86	61-141	
4/12/23	4/14/23	23D1202-BSD1	Myclobutanil	95	61-141	
4/12/23	4/14/23	23D1202-BS1	Napropamide	90	65-138	
4/12/23	4/14/23	23D1202-BSD1	Napropamide	95	65-138	
4/12/23	4/14/23	23D1202-BS1	Oxyfluorfen	89	63-140	
4/12/23	4/14/23	23D1202-BSD1	Oxyfluorfen	93	63-140	
4/12/23	4/14/23	23D1202-BS1	Parathion	96	60-140	
4/12/23	4/14/23	23D1202-BSD1	Parathion	89	60-140	
4/12/23	4/14/23	23D1202-BS1	Parathion-methyl	86	49-149	
4/12/23	4/14/23	23D1202-BSD1	Parathion-methyl	84	49-149	
4/12/23	4/14/23	23D1202-BS1	PCA	90	66-112	
4/12/23	4/14/23	23D1202-BSD1	PCA	87	66-112	
4/12/23	4/14/23	23D1202-BS1	PCB	64	19-117	
4/12/23	4/14/23	23D1202-BSD1	PCB	57	19-117	
4/12/23	4/14/23	23D1202-BS1	PCNB	84	61-114	
4/12/23	4/14/23	23D1202-BSD1	PCNB	78	61-114	
4/12/23	4/14/23	23D1202-BS1	Pendimethalin	95	65-131	
4/12/23	4/14/23	23D1202-BSD1	Pendimethalin	98	65-131	
4/12/23	4/14/23	23D1202-BS1	Pentachlorothioanisole	110	61-125	
4/12/23	4/14/23	23D1202-BSD1	Pentachlorothioanisole	95	61-125	
4/12/23	4/14/23	23D1202-BS1	Permethrin	94	62-146	
4/12/23	4/14/23	23D1202-BSD1	Permethrin	97	62-146	
4/12/23	4/14/23	23D1202-BS1	Phorate	82	60-140	
4/12/23	4/14/23	23D1202-BSD1	Phorate	78	60-140	
4/12/23	4/14/23	23D1202-BS1	Procymidone	87	74-123	
4/12/23	4/14/23	23D1202-BSD1	Procymidone	95	74-123	
4/12/23	4/14/23	23D1202-BS1	Pronamide	86	70-133	
4/12/23	4/14/23	23D1202-BSD1	Pronamide	86	70-133	
4/12/23	4/12/23	23D1202-BS1	Pyraclostrobin	95	81-104	
4/12/23	4/12/23	23D1202-BSD1	Pyraclostrobin	97	81-104	
4/12/23	4/14/23	23D1202-BS1	Pyriproxyfen	91	50-149	
4/12/23	4/14/23	23D1202-BSD1	Pyriproxyfen	95	50-149	
4/12/23	4/14/23	23D1202-BS1	Quinoxifen	95	63-132	
4/12/23	4/14/23	23D1202-BSD1	Quinoxifen	96	63-132	
4/12/23	4/14/23	23D1202-BS1	Spirodiclofen	101	57-136	
4/12/23	4/14/23	23D1202-BSD1	Spirodiclofen	110	57-136	
4/12/23	4/12/23	23D1202-BS1	Spirotetramat	91	76-107	
4/12/23	4/12/23	23D1202-BSD1	Spirotetramat	96	76-107	
4/12/23	4/14/23	23D1202-BS1	Tetraconazole	97	58-143	
4/12/23	4/14/23	23D1202-BSD1	Tetraconazole	94	58-143	
4/12/23	4/12/23	23D1202-BS1	Thiabendazole	88	67-103	
4/12/23	4/12/23	23D1202-BSD1	Thiabendazole	88	67-103	

This analytical report complies with the ISO/IEC 17025:2017 Quality Standard.



**PACAGLAB.COM**

503.626.7943  
21830 S.W. Alexander Ln  
Sherwood, OR 97140

**GSI Water Solutions, Inc.**  
650 NE Holladay Street Suite 900  
Portland, OR 97232

**Report Number:** P230409  
**Report Date:** April 25, 2023  
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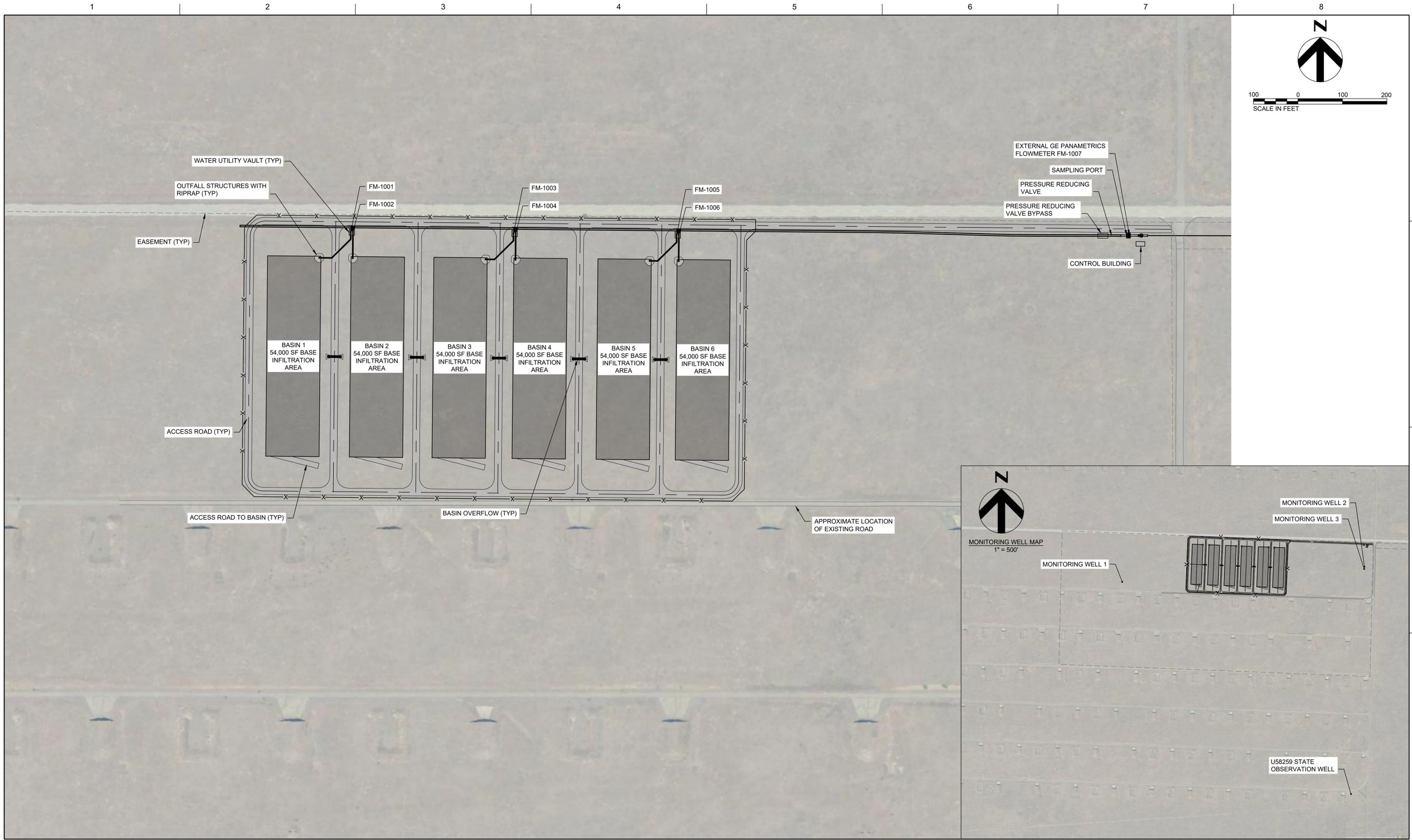
A handwritten signature in black ink, appearing to read "Kara Greer", is positioned above a horizontal line.

Kara Greer, Project Manager

*This analytical report complies with the ISO/IEC 17025:2017  
Quality Standard.*

## ATTACHMENT H

Preliminary Infiltration Basin Design



ISSUE	DATE	DESCRIPTION
1	MAY 2023	LIMITED LICENSE SET

PROJECT MANAGER	J. LERARIS
CIVIL LEAD	J. LERARIS
MECHANICAL LEAD	M. KETTNER
DESIGNER	D. BRANDS
DESIGNER	L. GLAUSER
DESIGNER	H. WHITE
DRAWN BY	D. BRANDS
CHECKED BY	M. BOECK
PROJECT NUMBER	10366044

**PRELIMINARY  
NOT FOR  
CONSTRUCTION  
OR  
RECORDING**

**UMATILLA COUNTY  
ORDNANCE PROJECT  
PHASE 3 RECHARGE**

**OVERALL SITE PLAN**



FILENAME | LIMITED LICENSE.DWG  
SCALE | AS NOTED

SHEET  
**001**



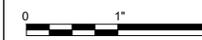
ISSUE	DATE	DESCRIPTION
1	MAY 2023	LIMITED LICENSE SET

PROJECT MANAGER	J. LERARIS
CIVIL LEAD	J. LERARIS
MECHANICAL LEAD	M. KETTNER
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DESIGNER	H. WHITE
DRAWN BY	D. BRANDS
CHECKED BY	M. BOECK
PROJECT NUMBER	10366044

**PRELIMINARY  
NOT FOR  
CONSTRUCTION  
OR  
RECORDING**

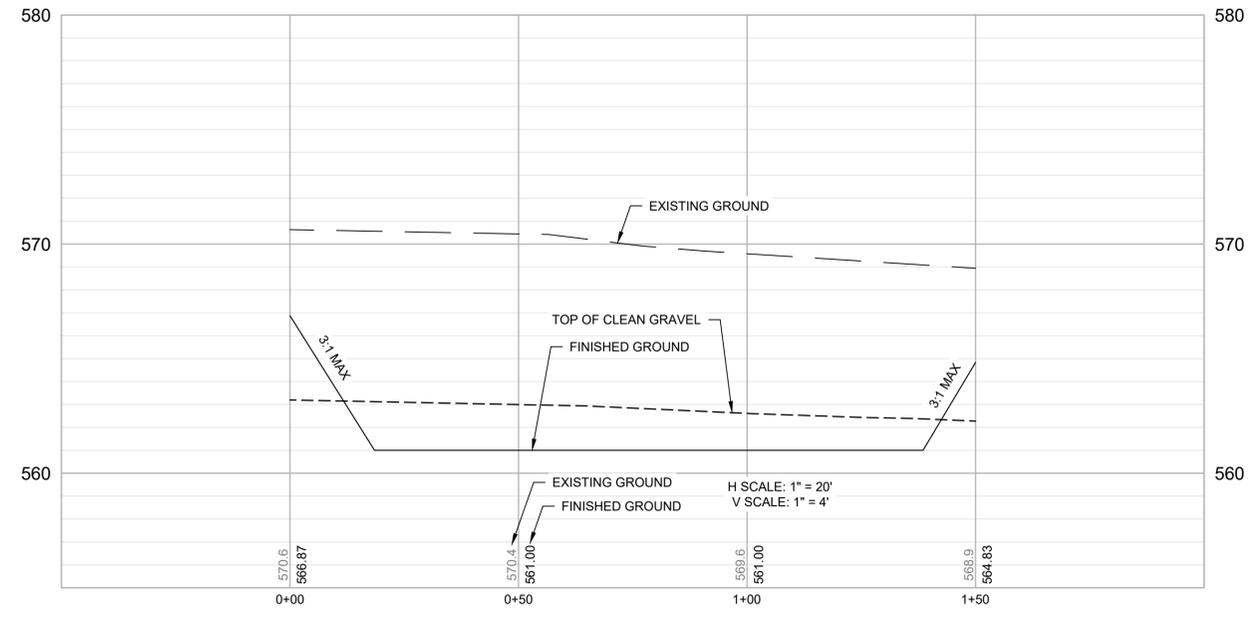
**UMATILLA COUNTY  
ORDNANCE PROJECT  
PHASE 3 RECHARGE**

**OVERALL SITE GRADING**

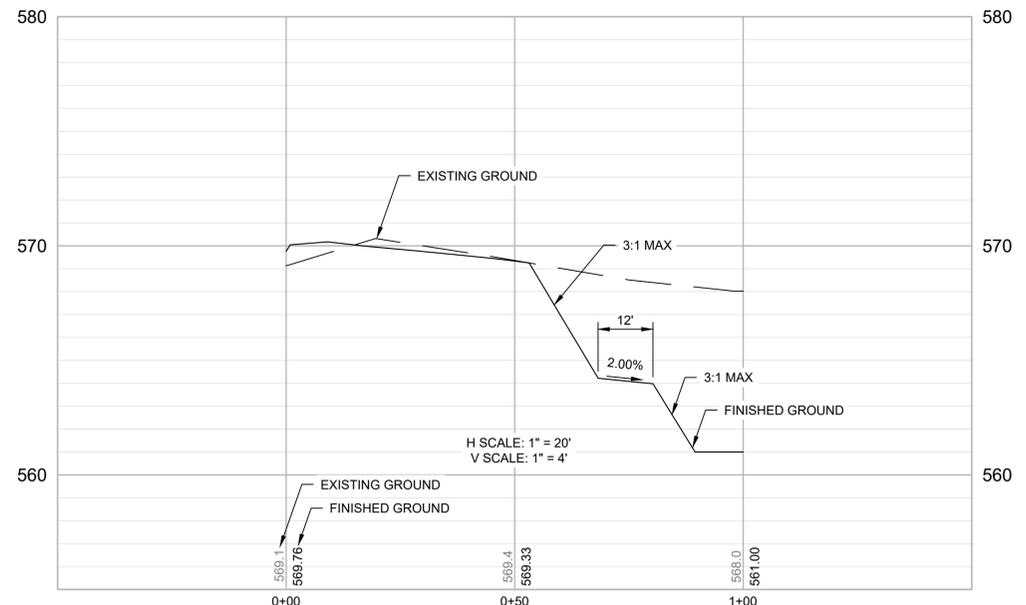


FILENAME	LIMITED LICENSE.DWG
SCALE	AS NOTED

SHEET  
**002**



SECTION A



SECTION B



ISSUE	DATE	DESCRIPTION
1	MAY 2023	LIMITED LICENSE SET

PROJECT MANAGER	J. LERARIS
CIVIL LEAD	J. LERARIS
MECHANICAL LEAD	M. KETTNER
DESIGNER	D. BRANDS
DESIGNER	L. GLAUSER
DESIGNER	H. WHITE
DRAWN BY	D. BRANDS
CHECKED BY	M. BOECK
PROJECT NUMBER	10366044

**PRELIMINARY  
NOT FOR  
CONSTRUCTION  
OR  
RECORDING**

**UMATILLA COUNTY  
ORDNANCE PROJECT  
PHASE 3 RECHARGE**



**SECTIONS**

FILENAME | LIMITED LICENSE.DWG  
SCALE | AS NOTED

SHEET  
**003**

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<b>PRIMARY ELEMENT SYMBOLOGY</b> THERMOWELL THERMAL DISPERSION ELEMENT MAGNETIC FLOWMETER SONIC OR ULTRASONIC FLOWMETER MASS DISPERSION FLOWMETER DIAPHRAGM OPERATOR PRESSURE GAUGE FLOAT SWITCH ULTRASONIC LEVEL SENSOR RADAR LEVEL SENSOR	<b>INSTRUMENT SYMBOLOGY</b> XXX FIELD MOUNTED XXX MOUNTED ON PANEL FACE XXX MOUNTED BEHIND PANEL XXX MOUNTED ON AUXILIARY PANEL XXX MOUNTED BEHIND AUXILIARY PANEL XXX INDICATOR LIGHT XXX SHARED DISPLAY, SHARED CONTROL, PRIMARY LOCATION - NORMALLY ACCESSIBLE TO OPERATOR XXX PROGRAMMABLE LOGIC CONTROL, PRIMARY LOCATION - NORMALLY ACCESSIBLE TO OPERATOR	<b>MISCELLANEOUS SYMBOLS</b> REDUCER STRAINER CALIBRATION COLUMN FLEXIBLE HOSE ACCUMULATOR RUPTURE DISK HEAT EXCHANGER HEAT TRACE BUBBLER LEVEL TUBE CHEMICAL INJECTOR MIXER STATIC MIXER/ PIPELINE FLASH REACTOR FLOW STRAIGHTENER MUD VALVE DRAIN DRAIN SUPPRESSOR FLUSHING CONNECTION PULSATION DAMPER SAMPLE PORT COARSE BUBBLE DIFFUSER EMERGENCY EYE WASH/SHOWER FILTER DIAPHRAGM SEAL ANNULAR SEAL OFFGAS DEMISTER INJECTION QUILL WITH CORPORATION STOP INJECTION QUILL WITH INTEGRAL CHECK VALVE	<b>VALVES</b> BALL VALVE BUTTERFLY VALVE CONE VALVE CHECK VALVE DOUBLE-DISK CHECK VALVE BALL CHECK VALVE DIAPHRAGM VALVE GATE VALVE GLOBE VALVE KNIFE GATE VALVE NEEDLE VALVE PINCH VALVE PLUG VALVE THREE-WAY BALL VALVE THREE-WAY PLUG VALVE ENERGY DISSIPATING VALVE SOLENOID VALVE PRESSURE-REDUCING VALVE BACK PRESSURE VALVE, SELF-CONTAINED PRESSURE-REGULATING VALVE THREE-WAY CONTROL VALVE PRESSURE-RELIEF VALVE AIR-RELEASE VACUUM VALVE SURGE VALVE	<b>CONTROL SWITCH NOTATION ABBREVIATIONS</b> XXX ACK XXX ESTOP XXX FAIL FOR XXX FAIL FR XXX FS XXX HOA XXX HOR XXX LOR XXX LR XXX LS XXX MA XXX OAC XXX OC XXX OSC XXX SIL XXX SS XXX TSN	<b>INSTRUMENT IDENTIFICATION LETTERS</b> <table border="1"> <thead> <tr> <th rowspan="2">FIRST LETTER</th> <th colspan="4">SUCCEEDING LETTERS</th> </tr> <tr> <th>MEASURED OR INITIATING VARIABLE</th> <th>MODIFIER</th> <th>READOUT OR PASSIVE FUNCTION</th> <th>OUTPUT FUNCTION</th> <th>MODIFIER</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>ANALYSIS</td> <td></td> <td>ALARM</td> <td></td> <td></td> </tr> <tr> <td>B</td> <td>BURNER, COMBUSTION</td> <td></td> <td>USER'S CHOICE</td> <td>USER'S CHOICE</td> <td>USER'S CHOICE</td> </tr> <tr> <td>C</td> <td>USERS CHOICE</td> <td></td> <td></td> <td>CONTROL</td> <td>CLOSED</td> </tr> <tr> <td>D</td> <td>USERS CHOICE</td> <td>DIFFERENTIAL</td> <td></td> <td></td> <td></td> </tr> <tr> <td>E</td> <td>VOLTAGE</td> <td></td> <td>SENSOR (PRIMARY ELEMENT)</td> <td></td> <td></td> </tr> <tr> <td>F</td> <td>FLOW RATE</td> <td>RATIO (FRACTION)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>G</td> <td>USER'S CHOICE</td> <td></td> <td>GLASS, VIEWING DEVICE</td> <td></td> <td></td> </tr> <tr> <td>H</td> <td>HAND</td> <td></td> <td></td> <td></td> <td>HIGH</td> </tr> <tr> <td>I</td> <td>CURRENT (ELECTRICAL)</td> <td></td> <td>INDICATE</td> <td></td> <td></td> </tr> <tr> <td>J</td> <td>POWER</td> <td>SCAN</td> <td></td> <td></td> <td></td> </tr> <tr> <td>K</td> <td>TIME, TIME SCHEDULE</td> <td>TIME, RATE OF CHANGE</td> <td></td> <td>CONTROL STATION</td> <td></td> </tr> <tr> <td>L</td> <td>LEVEL</td> <td></td> <td>LIGHT</td> <td></td> <td>LOW</td> </tr> <tr> <td>M</td> <td>USER'S CHOICE</td> <td>MOMENTARY</td> <td></td> <td></td> <td>MIDDLE, INTERMEDIATE</td> </tr> <tr> <td>N</td> <td>USER'S CHOICE</td> <td></td> <td>USER'S CHOICE</td> <td>USER'S CHOICE</td> <td>USER'S CHOICE</td> </tr> <tr> <td>O</td> <td>USER'S CHOICE</td> <td></td> <td>ORIFICE, RESTRICTION</td> <td></td> <td>OPEN</td> </tr> <tr> <td>P</td> <td>PRESSURE, VACUUM</td> <td></td> <td>POINT (TEST) CONNECTION</td> <td></td> <td></td> </tr> <tr> <td>Q</td> <td>QUANTITY</td> <td>INTEGRATE, TOTALIZE</td> <td></td> <td></td> <td></td> </tr> <tr> <td>R</td> <td>RADIATION</td> <td></td> <td>RECORD</td> <td></td> <td></td> </tr> <tr> <td>S</td> <td>SPEED, FREQUENCY</td> <td>SAFETY</td> <td></td> <td>SWITCH</td> <td></td> </tr> <tr> <td>T</td> <td>TEMPERATURE</td> <td></td> <td></td> <td>TRANSMIT</td> <td></td> </tr> <tr> <td>U</td> <td>MULTIVARIABLE</td> <td></td> <td>MULTIFUNCTION</td> <td>MULTIFUNCTION</td> <td>MULTIFUNCTION</td> </tr> <tr> <td>V</td> <td>VIBRATION, MECH. 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THIS IS A STANDARD INSTRUMENTATION SYMBOLOGY AND ABBREVIATIONS SHEET. LISTING OF SYMBOLS AND ABBREVIATIONS DOES NOT IMPLY ALL SYMBOLS AND ABBREVIATIONS HAVE BEEN USED ON THIS PROJECT. 2. SEE PROCESS, MECHANICAL AND PLUMBING LEGEND SHEET FOR MISCELLANEOUS PIPING SYMBOLS. 3. SCREENING OR SHADING OF WORK IS USED TO INDICATE EXISTING COMPONENTS OR TO DE-EMPHASIZE PROPOSED IMPROVEMENTS TO HIGHLIGHT SELECTED TRADE WORK. REFER TO CONTEXT OF EACH SHEET FOR USAGE. 4. VALVE SYMBOLS SHOWN HERE ARE APPLICABLE ONLY TO INSTRUMENTATION DIAGRAMS. SEE PROCESS, MECHANICAL AND PLUMBING LEGEND SHEET FOR VALVE SYMBOLS USED ELSEWHERE ON THE SHEETS.
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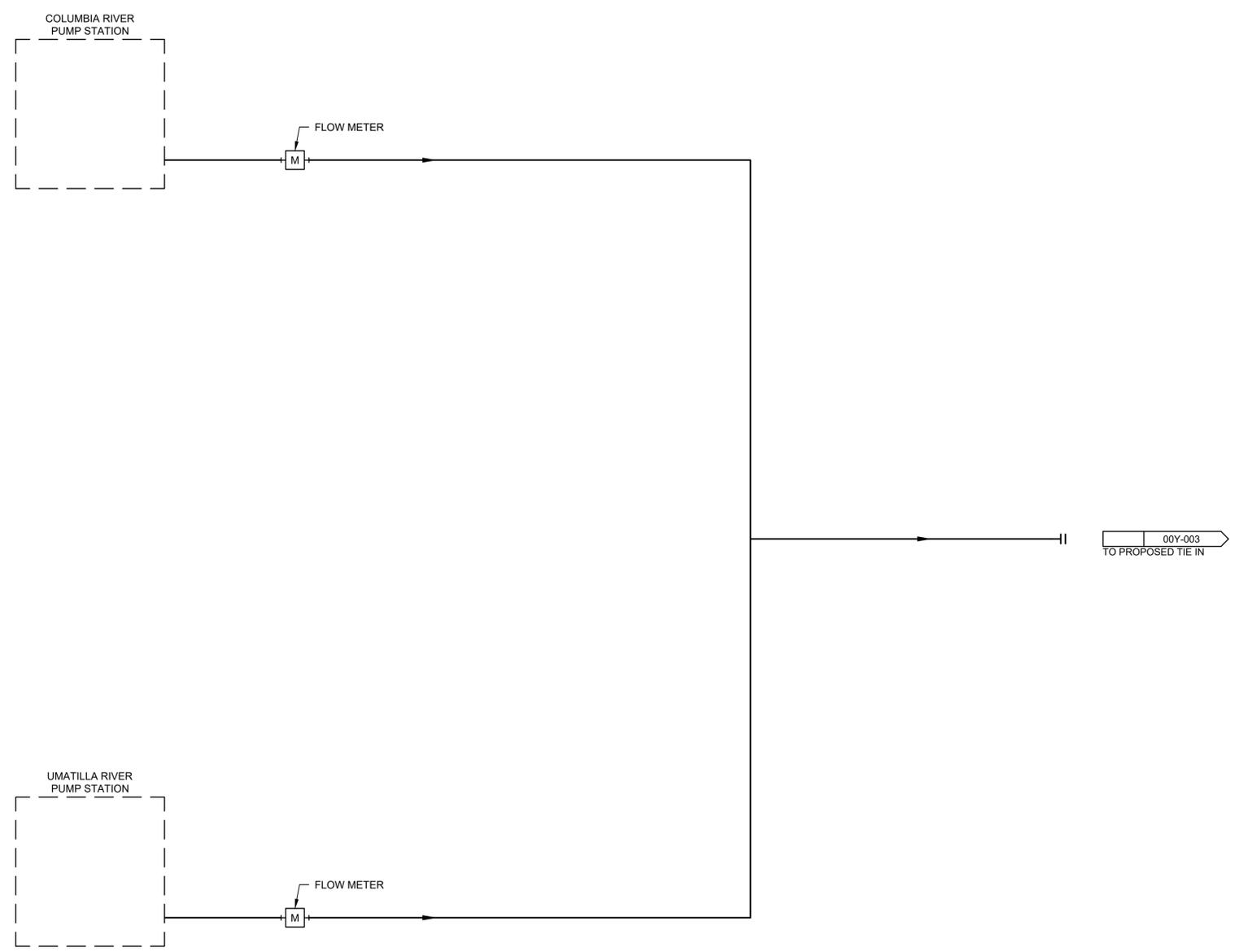
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MECHANICAL LEAD	M. KETTNER
DESIGNER	D. BRANDS
DESIGNER	L. GLAUSER
DESIGNER	H. WHITE
DRAWN BY	D. BRANDS
CHECKED BY	M. BOECK
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**UMATILLA COUNTY  
ORDNANCE PROJECT  
PHASE 3 RECHARGE**

**INSTRUMENTATION & CONTROLS  
LEGEND**

0	1"	2"	FILENAME	P&IDS.DWG	SHEET	00Y-001
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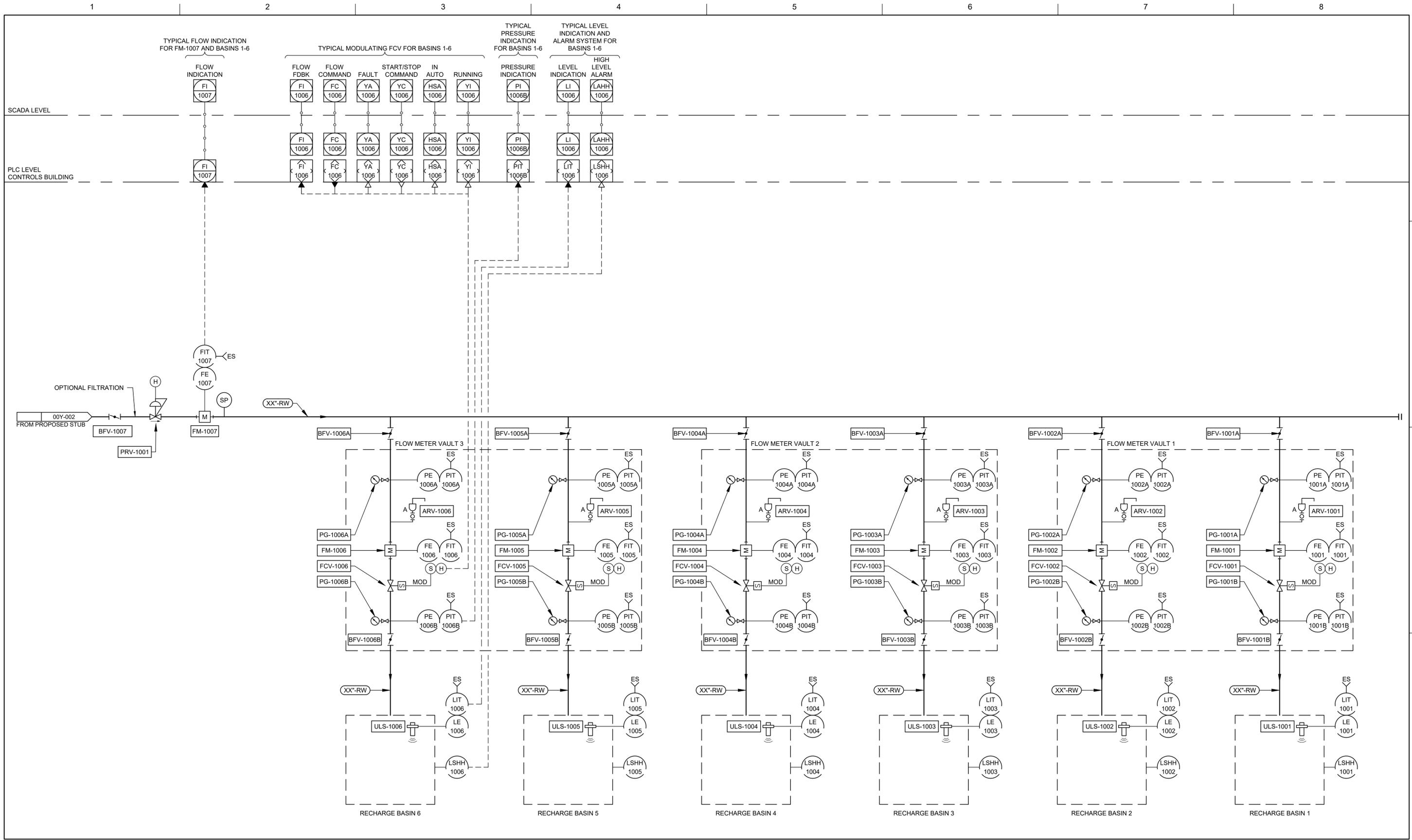
**UMATILLA COUNTY  
ORDNANCE PROJECT  
PHASE 3 RECHARGE**

**INSTRUMENTATION & CONTROLS  
PIPING & INSTRUMENTATION DIAGRAM**



FILENAME | P&IDS.DWG  
SCALE | AS NOTED

SHEET  
**00Y-002**



ISSUE	DATE	DESCRIPTION
1	MAY 2023	LIMITED LICENSE SET

PROJECT MANAGER	J. LERARIS
CIVIL LEAD	J. LERARIS
MECHANICAL LEAD	M. KETTNER
DESIGNER	D. BRANDS
DESIGNER	L. GLAUSER
DESIGNER	H. WHITE
DRAWN BY	D. BRANDS
CHECKED BY	M. BOECK
PROJECT NUMBER	10366044

**PRELIMINARY  
NOT FOR  
CONSTRUCTION  
OR  
RECORDING**

**UMATILLA COUNTY  
ORDNANCE PROJECT  
PHASE 3 RECHARGE**

**INSTRUMENTATION & CONTROLS  
PIPING & INSTRUMENTATION DIAGRAM**



FILENAME | P&IDS.DWG  
SCALE | AS NOTED

SHEET  
**00Y-003**