Tiger Oil Injection Work Plan
1808 North 1st Street
Yakima, Washington

May 9, 2022

Prepared for

City of Yakima
200 South 3rd Street
Yakima, Washington

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Tiger Oil Injection Work Plan
1808 North 1st Street
Yakima, Washington

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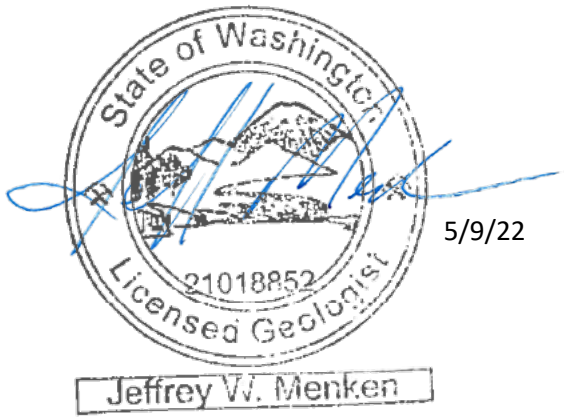

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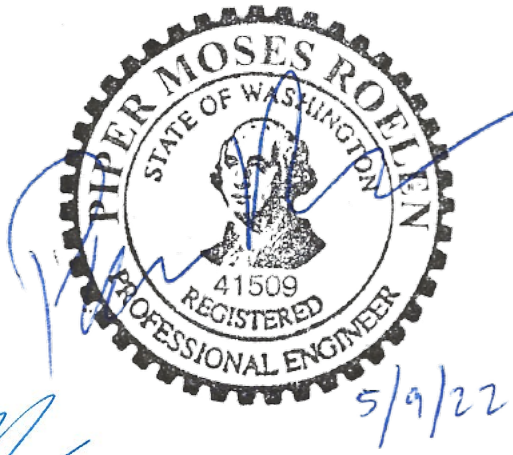

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LIST OF ABBREVIATIONS AND ACRONYMS

AO ..... Agreed Order
bgs ..... below ground surface
BTEX ..... benzene/toluene/ethylbenzene/xylenes
City ..... City of Yakima
CUL ..... Cleanup Level
DO ..... dissolved oxygen
DRO ..... diesel-range organics
Ecology ..... Washington State Department of Ecology
EPA ..... US Environmental Protection Agency
ft ..... foot/feet
GRO ..... gasoline-range organics
HASP ..... Health and Safety Plan
IDW ..... investigation-derived waste
ISCO ..... *in situ* chemical oxidation
Landau ..... Landau Associates, Inc.
MNA ..... monitored natural attenuation \
MTCA ..... Model Toxics Control Act
ORP ..... oxidation-reduction potential
Site ..... 1808 North 1st Street in Yakima, Washington
PID ..... photoionization detector
psi ..... pounds per square inch
RI ..... remedial investigation
TPH ..... total petroleum hydrocarbon
TPH-D ..... diesel-range total petroleum hydrocarbons
TPH-G ..... gasoline-range total petroleum hydrocarbons
TPH-O ..... oil-range total petroleum hydrocarbons
UST ..... underground storage tank

1.0 INTRODUCTION

This document was prepared on behalf of the City of Yakima (City) by Landau Associates, Inc. (Landau) and presents a work plan for implementing *in situ* chemical oxidation (ISCO) at the former Tiger Oil gas station property located at 1808 North 1st Street in Yakima, Washington (Site). This work is being conducted in accordance with Agreed Order (AO) No. DE19882 between the City and the Washington State Department of Ecology (Ecology) and is consistent with the revised Scope of Work for the AO provided by Ecology in December 2021. The purpose of the ISCO treatment is to remediate gasoline- and diesel-range organics (GRO and DRO) contamination in groundwater and smear zone soils remaining from historical releases from underground storage tanks (USTs) associated with former Site operations.

1.1 Site Description/Background

The Site property is owned by the City but is under a Lease-to-Own agreement between the City and the current Lessee. The Site is currently occupied by a former convenience store building in the southwest corner and a drive-through coffee kiosk in the east central portion of the Site. The Site is located at the northern end of the City proximate to the south of the confluence of the Yakima and Naches Rivers. The Site includes a 0.65-acre parcel that was used as a gasoline station and convenience store between 1979 and 2001. Gasoline, diesel, waste oil, and heating oil were stored in USTs at the property. Three gasoline tanks (20,000-, 8,000-, and 10,000-gallon), one 6,000-gallon diesel tank, and associated fueling islands/piping were removed in 2005. The heating and waste oil tanks were removed in 2019. No other USTs are known to have been present at the Site.

A remedial investigation (RI) report completed in 2017 documented the presence of petroleum-contaminated vadose zone and smear zone soils associated with the gasoline and UST systems (GeoEngineers 2017[1]). A UST assessment report in 2019 documented one sidewall sample from the heating oil UST excavation pit and one bottom sample from the waste oil UST excavation pit that contained elevated petroleum concentrations (Fulcrum 2019[2]). Data from the RI and Tank Assessment report indicated total petroleum hydrocarbon (TPH) concentrations in Site soils were above the applicable Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs) and exceedances of groundwater CULs were present in the vicinity of the former gasoline and diesel USTs and dispenser islands.

1.2 Supplemental Investigation

A supplemental investigation was conducted by Landau in October 2021 to evaluate current Site conditions prior to proceeding with remedy planning. The investigation included drilling and sampling soil from eight soil borings (HSB-1 through HSB-5; N1MW-6R, N1MW-7R, and N1MW-9) and installing

[1] GeoEngineers. 2017. Remedial Investigation, Tiger Oil, 1808 North 1st Street, Yakima, Washington. May 22.
[2] Fulcrum. 2019. Technical Memorandum: RE: Preliminary Results - Underground Storage Tank Site Assessment, Former Tiger Oil Site, 1808 North 1st Street, Yakima, Washington. Fulcrum Environmental Consulting, Inc. October 22.

monitoring wells in three of the borings (N1MW-6R, N1MW-7R, and N1MW-9). Monitoring wells N1MW-6R and N1MW-7R were replacement wells for former monitoring wells N1MW-6 and N1MW-7 that appear to have been destroyed or paved over during redevelopment of the Site with a coffee kiosk. N1MW-9 was installed to provide monitoring near the eastern property boundary between N1MW-6R and N1MW-7R. Groundwater was also sampled from these three new/replacement monitoring wells, other existing monitoring wells on the Site (i.e., N1MW-2, N1MW-3, N1MW-4, N1MW-5, N1MW-6), and soil borings HSB-1, HSB-2, and HSB-3.

Soil and groundwater samples were analyzed for TPH in the gasoline-range (TPH-G), diesel-range (TPH-D), and oil-range (TPH-O), as well as benzene, toluene, ethylbenzene, and xylenes (BTEX). The results of the supplemental investigation indicate that soil TPH concentrations appear to have declined since the RI but remain above CULs in the smear zone in the northeastern portion of the Site; however, no CUL exceedances were identified in soil at the former heating or waste oil UST locations (see Figure 1 and Table 1). Groundwater concentrations in the northeastern portion of the Site also continue to exceed TPH and BTEX CULs, but contaminants were not detected further downgradient across 1st Street (see Figure 2 and Table 2). Laboratory analytical reports from the supplemental investigation are included in Appendix A. Boring logs from the investigation are provided in Appendix B.

1.3 Remedial Approach

The ISCO remedy for groundwater and smear zone soil around the former gasoline and diesel USTs will consist of installation of up to 18 injection wells in the northern portion of the Site that will serve as the points for oxidant delivery to the subsurface. A target treatment area has been defined using photoionization detector (PID) readings, as well as groundwater and soil concentrations data from both the RI and supplemental investigation (Tables 1 and 2, Figure 3, and Appendix C). Injection well locations have been selected within this target treatment area to treat as much of the accessible area of petroleum contamination as practicable. To ensure adequate overlap of each radius of influence, a nominal well spacing of approximately 20 feet (ft) in the direction of groundwater flow, and approximately 17 ft perpendicular to flow, has been used in this design. Some injection well locations have been further adjusted to maintain a minimal distance of 10 ft from existing monitor wells, to provide adequate horizontal clearance distance from site utilities for safe drilling, or to locate a well in a more accessible drilling location. Proposed injection well locations are shown on Figure 4.

Data from the RI and supplemental investigation indicate that the water table has been encountered at a depth of just over 10 ft to a maximum of 14 ft below ground surface (bgs; Table 3) and that the residual petroleum contamination is primarily located in the smear zone at or near the water table, generally at a depth of over 12 ft and declining sharply with depth, with PID readings indicating minimal impact present below approximately 18 ft (Tables 4 and 5). The injection wells have been designed to target both the uppermost portion of the water column, where these low-density

petroleum compounds are at their highest concentrations, and the vertical extent of the contamination based on results of the RI and supplemental investigations.

Following installation, the injection wells will be developed and half of the wells will be sampled to provide a higher resolution characterization of the contaminant distribution in the target treatment area. This data will be used to adjust the volumes and/or concentrations of injectate to optimize treatment for different portions of the plume, minimizing waste and focusing treatment in the most impacted areas (primary sources of groundwater contamination). Treatment will include at least two injection events, over a 1- to 2-year period, of a chemical oxidant (activated persulfate) into both the subsurface smear zone and the shallow saturated zone at the Site (approximately 10 to 20 ft bgs). This work may also include a single follow-up injection of Oxygen Release Compound (ORC®) to provide long-term (6 months to more than a year) treatment if the persulfate reduces concentrations to near, but not below, CULs.

These activities are expected to generate declining concentration trends in the groundwater as the source of the contamination is treated, thereby allowing use of a monitored natural attenuation (MNA) remedy for any mass that may remain offsite after completion of ISCO.

In addition to ISCO, the AO Scope of Work indicated that excavation of petroleum-contaminated soil should be conducted where the 2019 UST assessment identified residual impacts at the former heating oil and waste oil tank locations. However, no CUL exceedances were reported in soil at these former UST locations during the 2021 supplemental investigation. This data, combined with the lack of groundwater contamination identified in these areas during the RI, and the presence of numerous utilities, does not support the need or practicability for excavation of these shallow soils.

2.0 FIELD ACTIVITIES

This section describes the field activities related to ISCO implementation, including well installation, baseline sampling, oxidant injection, groundwater monitoring, equipment decontamination, and management of residual wastes. Field activities will be performed in accordance with the Site-specific Health and Safety Plan (HASP), which applies to injection activities and any future sampling. The HASP is included with this work plan as Appendix D.

2.1 Well Installation

Well installation will be completed as detailed below.

1. At each location, a continuous soil core will be collected to 20 ft bgs using sonic drilling techniques. Sonic drilling methods are recommended based on the subsurface conditions encountered during prior Site work.
2. Soil will be logged in the field in accordance with the Unified Soil Classification System.
3. Soils will be field screened for contamination using visual, olfactory, sheen, and headspace testing.
4. Each new 20-ft injection well will be constructed of 2-inch-diameter, Schedule 40 PVC well casing with 10 ft of 0.020-inch slot screen placed from 10 to 20 ft bgs. Additional well construction details are provided on Figure 5.
5. Injection wells will be completed with a flush-mount monument. A threaded PVC adapter and coupler will be installed such that the adapter is permanently attached to the casing, and the coupler is removable.
6. The new injection wells will be developed by surging and pumping using a centrifugal portable pump. Development will occur no sooner than 24 hours after completion of well construction. Development water will be drummed for later offsite disposal.

2.2 Baseline Sampling

Baseline groundwater samples will be collected to characterize initial conditions within and downgradient of the source zone. Groundwater samples will be collected from up to 12 of the injection wells and from existing monitoring wells N1MW-6R, N1MW-7R, N1MW-8, and N1MW-9. Samples will be analyzed for TPH-G by Method NWTPH-Gx (Northwest gasoline-range total petroleum hydrocarbon extended). During sampling, field parameters, including dissolved oxygen (DO), oxidation-reduction potential (ORP), conductivity, temperature, and pH will be collected. All sample will be collected using low-flow sampling techniques. Laboratory services will be provided by Eurofins Environmental Testing in Spokane, Washington.

2.3 Oxidant Injection

The injection approach is designed to treat groundwater and potentially residual smear zone soil contamination in the source area near where the gasoline and diesel USTs were located. Klozur® One has been selected as the recommended persulfate product for use at the Site. Klozur® One is a

soluble, activated persulfate that will provide a long-lasting oxidant with a treatment duration of about 3 months. This will allow it to be distributed further by groundwater flow, resulting in a larger treatment area. This work will include permitting with the Ecology Underground Injection Control (UIC) program per Chapter 173-218 of the Washington Administrative Code.

2.3.1 Solution Mixing and Injection Procedures

The solid Klozur® One powder will be mixed with tap water to create the injection solution. This approach includes the use a relatively large volume of dilute persulfate in tap water (approximately 4,000 gallons per well point). A large (approximately 4,500-gallon) poly tank will be used on site to mix batches of injection solution. Persulfate powder will be pre-mixed with tap water in 55-gallon drums, with a power drill and a paddle attachment, before being pumped into one of the poly tanks using a gasoline-powered, centrifugal injection pump. The pump will also be used to mix the contents of the tank before and during injection and to deliver the injection solution to each of the selected wells at a rate of approximately 40 gallons per minute. Injections are expected to take approximately 2 hours per well. The target injection solution concentration will be approximately 67 grams of Klozur® One per liter. As described above, adjustments to the volume and/or concentration of injectate may be made for some locations based on results of the baseline sampling.

Injection solution will be pumped from each poly tank using a hose with a minimum pressure rating of 100 pounds per square inch (psi). The pressure hose will be connected to the injection well using a manifold and camlock fittings. The manifold will be attached to the well casing using a threaded PVC adapter. A pressure gauge will be integrated into the manifold and injection pressures will be maintained below 10 to 20 psi during pumping to prevent short-circuiting of fluid to the surface or nearby storm drains. Post-injection performance monitoring results will be used to re-evaluate the dosing and injection volumes for future injections, if necessary.

Each well will also be injected with 100 gallons of clean tap water before injecting to test injection piping connections (to avoid potential oxidant releases during implementation) and identify potential injection rates. Wells will be injected with another 100 gallons of clean tap water after injecting to push injection solution into the aquifer matrix and prevent clogging of injection well screens. As previously noted, the number/location of wells and volume injected may be adjusted after each injection event based on the injection potential of each well and on performance monitoring results.

It is anticipated that injecting solution near and within the former excavation will cause groundwater to “mound,” or temporarily rise above its natural level due to fluid being forced into the subsurface. In extreme cases, this mounding can result in short-circuiting of the injected fluid to the surface. In addition, persulfate can react with nylon, aluminum, and non-stainless steel. Therefore, water levels in wells in the vicinity of the former excavation will be monitored prior to and during injection to prevent contact of the injected fluids with nearby utilities and to assess the apparent radius of influence achieved at each location. If necessary to prevent contact of mounded water with utilities,

the injection rates will be decreased, or the injection will be stopped temporarily to reduce the mounding if mounding of greater than 5 five ft occurs.

Spill prevention measures will be used during injection activities to prevent the accidental release of injection fluid. Poly tanks, mixing drums, injection pumps, and major hose connections will be placed in containment berms. Pumps and hoses will be attended and monitored during injection. All hose connections will be secured with zip ties. A wet-dry vacuum will be kept on site during injection activities to immediately collect spilled fluid.

2.4 Performance Groundwater Monitoring

Performance groundwater monitoring will be performed approximately three months after the injection to determine the effectiveness of the persulfate to remediate the groundwater contaminants. Samples will be collected from the 12 injection points used for baseline monitoring, as well as the four Site monitoring wells (MW-6R, MW-7R, MW-8, and MW-9). Sampling will include collection of field parameters, including DO, ORP, conductivity, temperature, and pH. Groundwater samples from each well will be submitted for laboratory analysis for TPH-G. Data collected from the wells will be used to determine the changes in groundwater concentrations resulting from the treatment and whether additional treatment may be necessary.

2.5 Equipment Decontamination

All non-dedicated sampling and drilling equipment will be decontaminated according to the procedures described in the HASP (Appendix D). This includes downhole drilling equipment, sample tubing, and any other equipment that comes into contact with Site soil or groundwater. Equipment will be dedicated when possible to reduce the potential for cross-contamination.

2.6 Residual Waste Management

Investigation derived waste (IDW) will consist of soil cuttings from drilling and sampling, well development water, water used for decontamination, rinsate from tanks and drums used for mixing injection solution, and purge water from sampling of monitoring wells. IDW will be stored in 55-gallon drums on site until it can be removed and disposed of by a specialized environmental waste handling company.

2.7 Material Storage and Site Security

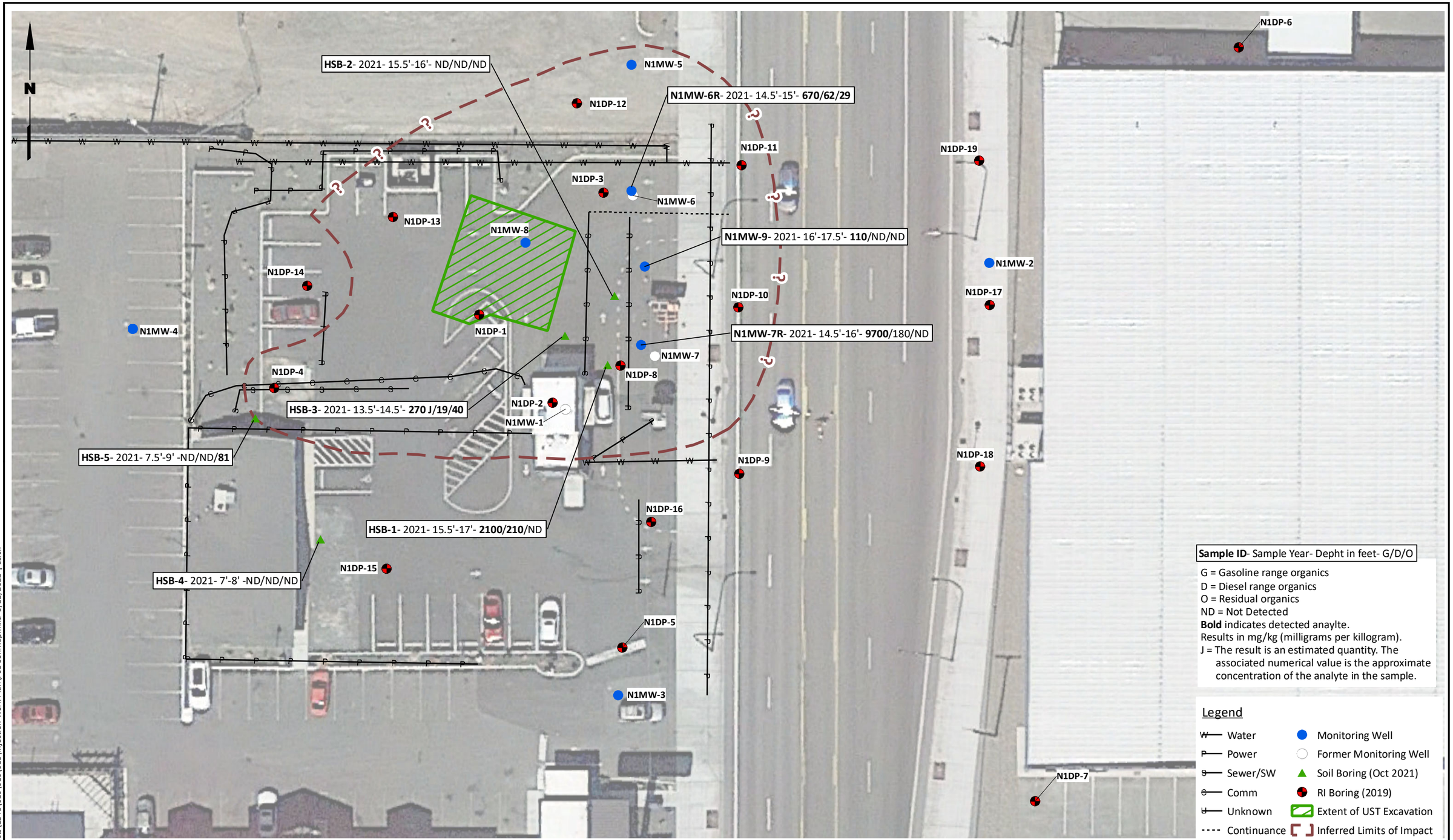
To prevent public exposure to the persulfate material while personnel are not on-site, the dry chemical will be locked inside a locked shipping container at the end of each day's activities. Equipment used for mixing will either be stored within the shipping container or secured and transported off-site with a Landau vehicle.

3.0 DATA EVALUATION AND REPORTING

After ISCO (and MNA, if necessary) and associated groundwater monitoring has been completed, Landau will prepare an interim action report documenting the injection activities and summarizing results of the interim action and associated monitoring described above. The report will include a description of field activities completed, comparisons of final soil and groundwater confirmation sample results to applicable MTCA cleanup levels, discussion of data validation and data quality, well logs, site plans and maps (including excavation, monitoring well, and injection point location maps and potentiometric groundwater contour maps), copies of laboratory reports and tabulated data, groundwater quality trends, and field sampling forms.

4.0 USE OF THIS WORK PLAN

This Work Plan has been prepared for the exclusive use of The City of Yakima and applicable regulatory agencies for specific application to the Site. No other party is entitled to rely on the information, conclusions, and recommendations included in this document without the express written consent of Landau. Further, the reuse of information, conclusions, and recommendations provided herein for extensions of the project or for any other project, without review and authorization by Landau, shall be at the user's sole risk. Landau warrants that within the limitations of scope, schedule, and budget, our services have been provided in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions as this project. We make no other warranty, either express or implied.



Sample ID- Sample Year- Depht in feet- G/D/O

G = Gasoline range organics
D = Diesel range organics
O = Residual organics
ND = Not Detected
Bold indicates detected anaylte.
Results in mg/kg (milligrams per killogram).
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

Legend

- Water
- Power
- Sewer/SW
- Comm
- Unknown
- Continuance
- Monitoring Well
- Former Monitoring Well
- Soil Boring (Oct 2021)
- RI Boring (2019)
- Extent of UST Excavation
- Inferred Limits of Impact

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 30 60
Scale in Feet

Source: Google Earth Pro, 2021; GeoEngineers, 2017

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Tiger Oil
1808 North 1st Street
Yakima, Washington

October 2021 Soil Petroleum Concentration Map

Figure 1

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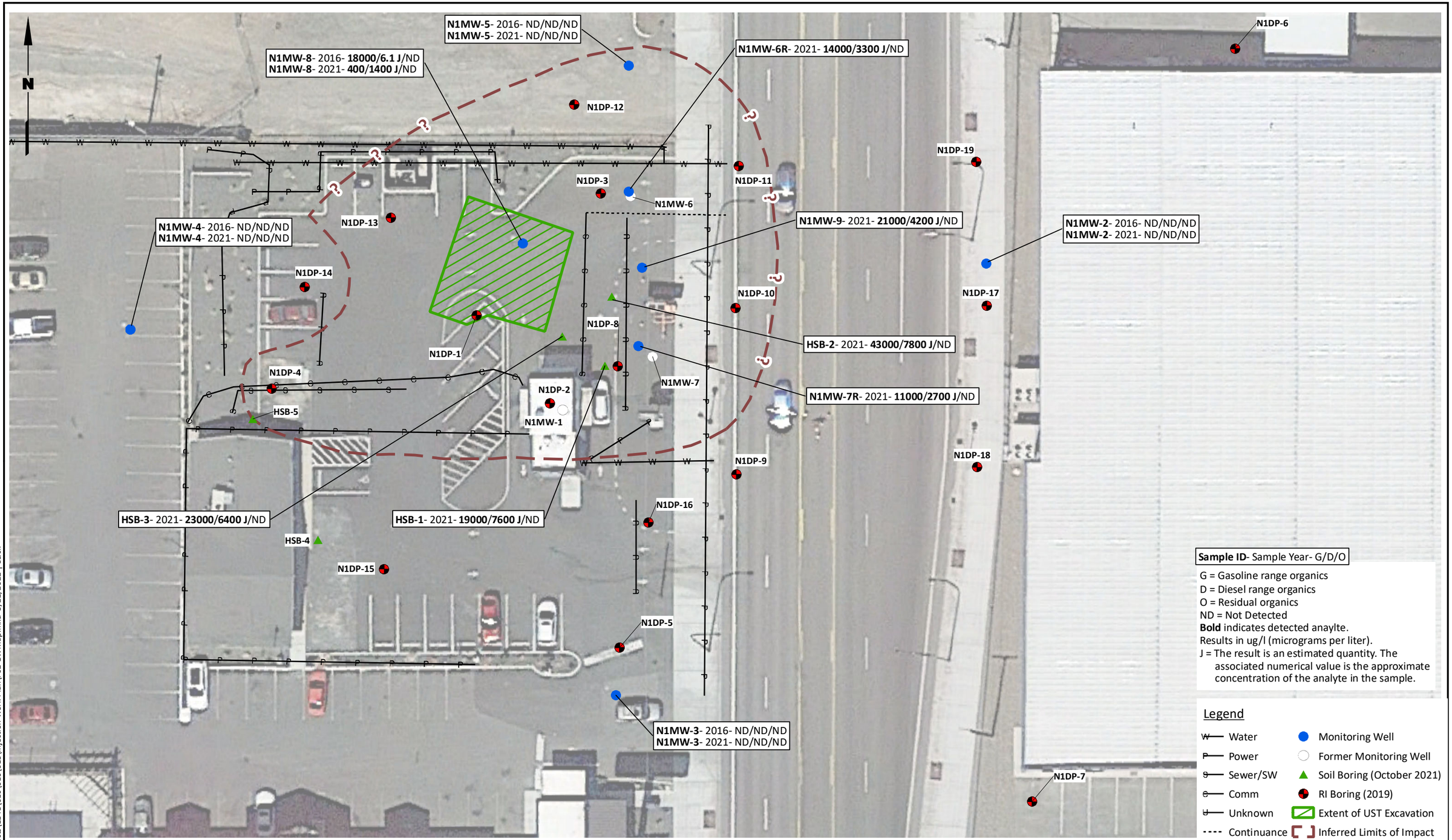

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Note

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0 30 60

Scale in Feet

Source: Google Earth Pro, 2021; GeoEngineers, 2017

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Tiger Oil 1808 North 1st Street Yakima, Washington	**October 2021 Groundwater Petroleum Concentration Map**	Figure 2

N

N1DP-11-S-2016-14.5'-15'-**150**/16J/ND
N1DP-11-G-2016-14.5'-15'-190/ND/NS

N1DP-3-S-2014-14.5'-**4,170**/544/**0.166**
N1DP-3-G-2014-14.5'-**11,000/5,400**/NS

N1DP-13-S-2016-14.5'-15'-**3,800**/700J/ND
N1DP-13-G-2016-14.5'-15'-660/400J/NS

N1MW-6R-S-2021-14.5'-15'-**670**/62/ND
N1MW-6R-G-2021-14.5'-15'**14,000/3,300J**/0.85

N1MW-6-S-2016-12.5'-13'-**940**/25/ND
N1MW-6-G-2016-12.5'-13'-**9,400/1.5J**/ND

N1MW-8-S-2016-15'-15.5'-**1,200**/210/0.025
N1MW-8-G-2016-15'-15.5'-**18,000/6.1J/43**

HSB-2-S-2021-15.5'-16'-ND/ND/ND
HSB-2-G-2021-15.5'-16'-**43,000/7,800J/9.2**

N1DP-14-S-2016-14.5'-15'-23/12/ND
N1DP-14-G-2016-14.5'-15'-650/**950J**/NS

N1MW-9-S-2021-16'-17.5'-**110**/ND/ND
N1MW-9-G-2021-16'-17.5'-**21,000/4,200J/6.2**

HSB-3-S-2021-13.5'-14.5'-**270J**/19/ND
HSB-3-G-2021-13.5'-14.5'-**23,000/6,400J**/4.1

N1DP-10-S-2016-14.5'-15'-**90**/ND/ND
N1DP-10-G-2016-14.5'-15'-800/**880J**/NS

N1DP-1-S-2014-12'-**6,200**/728/**0.220**
N1DP-1-G-2014-12'-**1,000/1,000**/NS

N1MW-7R-S-2021-14.5'-16'-**9,700**/180/ND
N1MW-7R-G-2021-14.5'-16'-**11,000/2,700J**/2.0

N1MW-7-S-2016-15'-15.5'-**1,900**/ND/ND
N1MW-7-G-2016-15'-15.5'-**27,000/3.7J/5.6**

HSB-1-S-2021-15.5'-17'-**2,100**/210/ND
HSB-1-G-2021-15.5'-17'-**19,000/7,600J**/ND

N1DP-8-S-2014-16.5'-**29,400**/748/**3.19**
N1DP-8-G-2014-16.5'-**5,100/2,100**/NS

N1DP-4-S-2014-16'-16/**415**/107
N1DP-4-G-2014-16'-ND/**790**/NS

N1DP-2-S-2014-14.5'-**613**/ND/0.0140
N1DP-2-G-2014-14.5'-ND/ND/NS

N1MW-1-S-2014-14'-15'-ND/ND/ND
N1MW-1-G-2014-14'-15'-**256**/ND/ND

HSB-5-S-2021-7.5'-9'-ND/ND/ND
HSB-3-G-2021-7.5'-9'-NS/NS/NS

N1DP-9-S-2016-14.5'-15'-ND/16J/ND
N1DP-9-G-2016-14.5'-15'-ND/ND/NS

N1DP-16-S-2016-14.5'-15'-ND/ND/ND
N1DP-16-G-2016-14.5'-15'-ND/ND/NS

Sample ID-Sample Type-Sample Year-Depth in feet-Gasoline/Diesel/Benzene

G = Groundwater Sample
S = Soil Sample
ND = Not Detected
NS = Not Sampled
Soil results in milligrams per kilogram (mg/kg).
Groundwater results in micrograms per liter (µg/L).
Bold indicates analyte exceedance.
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

Legend

- Water
- Power
- Sewer/SW
- Comm
- Unknown
- Continuance
- Monitoring Well
- Former Monitoring Well
- Soil Boring (Oct 2021)
- RI Boring (2019)
- Extent of UST Excavation
- Inferred Limits of Impact
- Target Treatment Area

Note
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Source: Google Earth Pro, 2021; GeoEngineers, 2017

0 15 30
Scale in Feet

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Tiger Oil
1808 North 1st Street
Yakima, Washington

Historical Gas, Diesel, and Benzene Concentrations

Figure 3

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N

N1DP-6
N1MW-5
N1DP-12
N1MW-6R
N1DP-3
N1DP-11
N1DP-19
N1MW-6
N1DP-13
N1MW-8
N1MW-1R
N1MW-2
N1DP-14
HSB-2
N1DP-10
N1DP-17
N1MW-4
N1MW-7R
N1DP-1
N1DP-8
N1DP-4
HSB-3
HSB-1
HSB-5
N1DP-2
N1MW-1
N1DP-18
N1DP-9
N1DP-16
HSB-4
N1DP-15
N1DP-5
N1MW-3
N1DP-7

Legend

- Water
- Power
- Sewer/SW
- Comm
- Unknown
- Continuance
- Extent of UST Excavation
- Inferred Limits of Impact
- Target Treatment Area
- 10' Radius of Influence

G:\Projects\1148\010\010\013\Injection Work Plan\F04 ProposedInjectionWellLocations.mxd 5/5/2022 | ezick

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Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

G = Gasoline range organics
D = Diesel range organics
ND = Not Detected
Bold indicates detected anaylte.
Green indicates exceedance above detection limit.

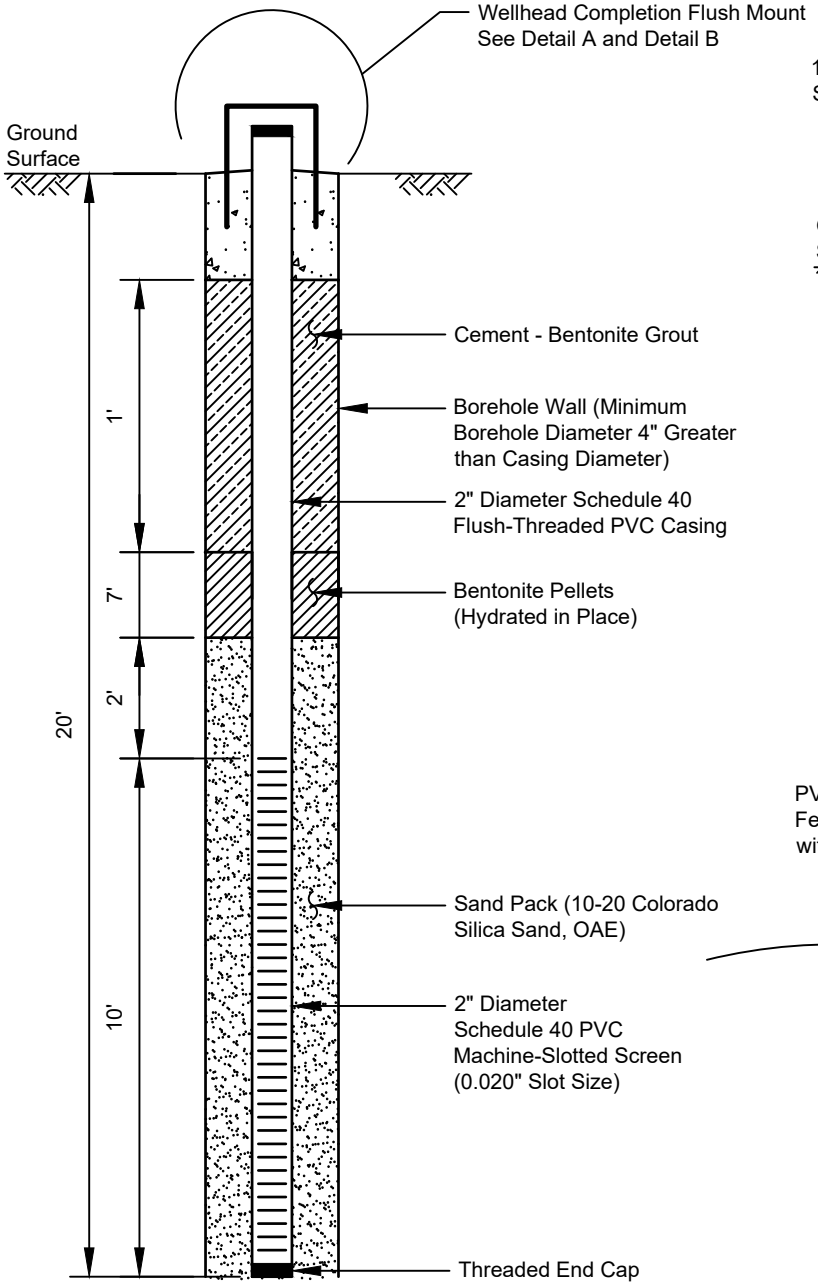
0 30 60
Scale in Feet

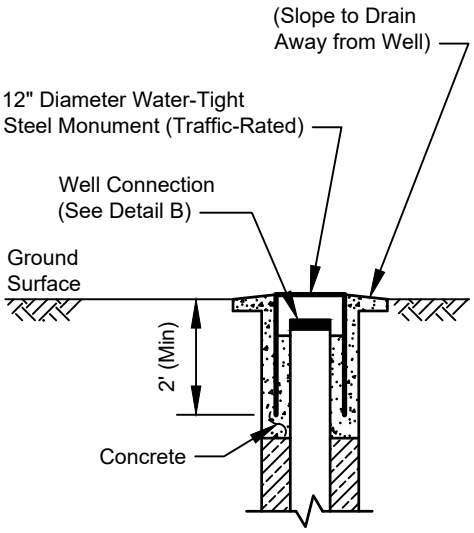
Source: Google Earth Pro, 2021; GeoEngineers, 2017

Tiger Oil
1808 North 1st Street
Yakima, Washington

Proposed Injection Well Locations

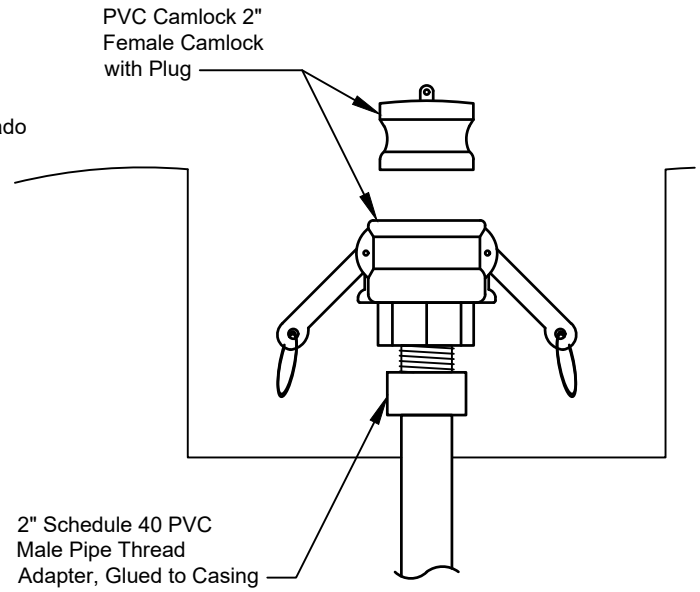
Figure 4





Detail A

Flush-Mount
Wellhead Completion



Detail B

Well Casing Connection

Notes

1. OAE = Or Approved Equal
2. Actual well design specifications may vary.

Not to Scale

Landau Associates Inc. | G:\Projects\1148\010\010\013\F02 TypicalInjectionWellConstruction.dwg (A) "Figure 2" 1/24/2022

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Tiger Oil 1808 North 1st Street Yakima, Washington	**Typical Injection Well Construction**	Figure 5

Table 1
Former Tiger Oil Site
1808 North 1st Street, Yakima, WA
Soil Analytical Results
October 2021

Analyte	MTCA Method A CUL	Sample Location, Sample Depth Interval, Sample Date, Sample Type, Laboratory SDG				
		HSB-1 15.5-17 10/5/2021 N 590-16086-1	HSB-2 15.5-16 10/5/2021 N 590-16086-1	HSB-3 13.5-14.5 10/6/2021 N 590-16086-1	HSB-3 13.5-14.5 10/6/2021 FD 590-16086-1	HSB-4 7-8 10/6/2021 N 590-16086-1
Petroleum Hydrocarbons (mg/kg; NWTPH-Gx, NWTPH-Dx)						
Gasoline Range Organics	30/100	**2100**	9.9 U	**270 J**	**26 J**	12 U
Diesel Range Organics	2,000	**210**	10 U	**19**	**24**	12 U
Residual Range Organics	2,000	26 U	26 U	**40**	**49**	29 U
Volatile Organic Compounds (mg/kg; SW-846 8260D)						
Benzene	0.03	0.047 U	0.040 U	0.037 U	0.057 U	0.049 U
Ethylbenzene	6	**33**	**0.035 J**	**3.2 J**	**0.090 J**	0.25 U
m-&p-Xylenes	N/A	**180**	**0.14 J**	**11 J**	**0.32 J**	0.99 U
o-Xylene	N/A	**57**	**0.052 J**	**3.6 J**	**0.13 J**	0.49 U
Toluene	7	**9.3**	**0.030 J**	0.19 U	0.28 U	0.25 U
Xylenes, Total	9	**230**	**0.19 J**	**15 J**	**0.45 J**	1.5 U

Notes:

* = This sample was initially identified as N1MW-1R in field and lab reports but was renamed per Ecology request.

Bold text indicates detected analyte

Green shading indicates detected analyte exceeds applicable cleanup level

U = The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

Acronyms/Abbreviations:

mg/kg = milligrams per kilogram

NWTPH = Northwest Total Petroleum Hydrocarbon

Table 1
Former Tiger Oil Site
1808 North 1st Street, Yakima, WA
Soil Analytical Results
October 2021

Analyte	MTCA Method A CUL	Sample Location, Sample Depth Interval, Sample Date, Sample Type, Laboratory SDG				
		HSB-4 11-12 10/6/2021 N 590-16086-1	HSB-5 7.5-9 10/6/2021 N 590-16086-1	N1MW-6R 14.5-15 10/4/2021 N 590-16086-1	N1MW-7R 14.5-16 10/4/2021 N 590-16086-1	N1MW-9* 16-17.5 10/5/2021 N 590-16086-1
Petroleum Hydrocarbons (mg/kg; NWTPH-Gx, NWTPH-Dx)						
Gasoline Range Organics	30/100	12 U	11 U	**670**	**9700**	**110**
Diesel Range Organics	2,000	10 U	10 U	**62**	**180**	11 U
Residual Range Organics	2,000	25 U	**81**	**29**	27 U	27 U
Volatile Organic Compounds (mg/kg; SW-846 8260D)						
Benzene	0.03	0.047 U	0.045 U	0.042 U	0.039 U	0.039 U
Ethylbenzene	6	0.23 U	0.22 U	**3.4**	**110 J**	**2.1**
m-&p-Xylenes	N/A	0.93 U	0.90 U	**12**	**550 J**	**7.7**
o-Xylene	N/A	0.47 U	0.45 U	**0.43**	**160 J**	**2.6**
Toluene	7	0.23 U	0.22 U	0.21 U	**1.6**	**0.37**
Xylenes, Total	9	1.4 U	1.3 U	**12 J**	**710 J**	**10**

Notes:

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Bold text indicates detected analyte

Green shading indicates detected analyte exceeds applicable cleanup level

U = The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

Acronyms/Abbreviations:

mg/kg = milligrams per kilogram

NWTPH = Northwest Total Petroleum Hydrocarbon

Table 2
Former Tiger Oil Site
1808 North 1st Street, Yakima, WA
Groundwater Analytical Results
October 2021

Analyte	MTCA Method A CUL	Sample Location, Sample Date, Sample Type, Laboratory SDG					
		HSB-1 10/5/2021 N 590-16086-1	HSB-2 10/5/2021 N 590-16086-1	HSB-3 10/6/2021 N 590-16086-1	HSB-3 10/6/2021 FD 590-16086-1	N1MW-2 10/4/2021 N 590-16086-1	N1MW-3 10/4/2021 N 590-16086-1
Petroleum Hydrocarbons (ug/l; NWTPH-Gx, NWTPH-Dx							
Gasoline Range Organics	800/1000	**19000**	**43000**	**23000**	**24000**	150 U	150 U
Diesel Range Organics	500	**7600 J**	**7800 J**	**6400 J**	**6000 J**	240 U	230 U
Residual Range Organics	500	380 U	380 U	380 U	380 U	390 U	390 U
Volatile Organic Compounds (ug/l; SW-846 8260D)							
Benzene	5	2.0 U	**9.2**	**4.1**	**4.0**	0.40 U	0.40 U
Ethylbenzene	700	**940**	**2900**	**1600**	**1500**	1.0 U	1.0 U
m-&p-Xylenes	N/A	**380**	**8700**	**4500**	**4300**	2.0 U	2.0 U
o-Xylene	N/A	**150**	**3600**	**1800**	**1700**	1.0 U	1.0 U
Toluene	1000	**550**	**180**	**22**	**22**	1.0 U	1.0 U
Xylenes, Total	1000	**530**	**12000**	**6300**	**6000**	3.0 U	3.0 U

Notes:

* = This sample was initially identified as N1MW-1R in field and lab reports but was renamed per Ecology request.

Bold text indicates detected analyte

Green shading indicates detected analyte exceeds applicable cleanup level

U = The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

Acronyms/Abbreviations:

ug/l = micrograms per liter

NWTPH = Northwest Total Petroleum Hydrocarbon

Table 2
Former Tiger Oil Site
1808 North 1st Street, Yakima, WA
Groundwater Analytical Results
October 2021

Analyte	MTCA Method A CUL	Sample Location, Sample Date, Sample Type, Laboratory SDG					
		N1MW-4 10/4/2021 N 590-16086-1	N1MW-5 10/4/2021 N 590-16086-1	N1MW-6R 10/6/2021 N 590-16086-1	N1MW-7R 10/6/2021 N 590-16086-1	N1MW-8 10/4/2021 N 590-16086-1	N1MW-9* 10/6/2021 N 590-16086-1
Petroleum Hydrocarbons (ug/l; NWTPH-Gx, NWTPH-Dx							
Gasoline Range Organics	800/1000	150 U	150 U	**14000**	**11000**	**400**	**21000**
Diesel Range Organics	500	240 U	240 U	**3300 J**	**2700 J**	**1400 J**	**4200 J**
Residual Range Organics	500	390 U	390 U	380 U	380 U	390 U	380 U
Volatile Organic Compounds (ug/l; SW-846 8260D)							
Benzene	5	0.40 U	0.40 U	**0.85**	**2.0**	**8.1**	**6.2**
Ethylbenzene	700	1.0 U	1.0 U	**550**	**640**	**7.2**	**1800**
m-&p-Xylenes	N/A	2.0 U	2.0 U	**2100**	**2700**	**23**	**6200**
o-Xylene	N/A	1.0 U	1.0 U	**170**	**1000**	**14**	**2700**
Toluene	1000	1.0 U	1.0 U	**1.8**	**380**	**2.5**	**660**
Xylenes, Total	1000	3.0 U	3.0 U	**2200**	**3700**	**37**	**8900**

Notes:

* = This sample was initially identified as N1MW-1R in field and lab reports but was renamed per Ecology request.

Bold text indicates detected analyte

Green shading indicates detected analyte exceeds applicable cleanup level

U = The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

Acronyms/Abbreviations:

ug/l = micrograms per liter

NWTPH = Northwest Total Petroleum Hydrocarbon

TABLE 3
Former Tiger Oil Site
1808 North 1st Street, Yakima, WA
Groundwater Level Data

Location	Date Measured	Depth to Groundwater
NW1MW-1	9/18/2014	13.78
	12/11/2014	13.65
	3/10/2015	14.05
	8/22/2016	13.59
	11/17/2016	13.2
NW1MW-2	9/18/2014	13.31
	12/11/2014	13.01
	3/10/2015	13.3
	8/22/2016	13.01
	11/17/2016	12.57
	10/4/2021	13.71
NW1MW-3	9/18/2014	13.75
	12/11/2014	13.56
	3/10/2015	13.86
	8/22/2016	13.41
	11/17/2016	13
	10/4/2021	14.7
NW1MW-4	9/18/2014	11.1
	12/11/2014	10.91
	3/10/2015	11.26
	8/22/2016	10.59
	11/17/2016	10.26
	10/4/2021	11.5
NW1MW-5	9/18/2014	12.48
	12/11/2014	12.27
	3/10/2015	12.56
	8/22/2016	12.09
	11/17/2016	11.78
	10/4/2021	12.69
NW1MW-6	11/17/2016	11.9
NW1MW-7	11/17/2016	13.24
NW1MW-8	11/17/2016	12.83
	10/4/2021	13.91
HSB-1	10/5/2021	16.5
HSB-2	10/5/2021	17.5
HSB-3	10/6/2021	15
HSB-4	10/6/2021	15
HSB-5	10/6/2021	15.5
NIMW-6R	10/4/2021	15
NIMW-7R	10/4/2021	16
NIMW-9	10/5/2021	16.5

TABLE 4
Former Tiger Oil Site
1808 North 1st Street, Yakima, WA
Historical PID Readings

Completed By: GeoEngineers

Well/Bore #	NIDP-9	NIDP-10	NIDP-11	NIDP-12	NIDP-13	NIDP-14	NIDP-15	NIDP-16	NIDP-17	NIDP-18	NIDP-19	N1MW-6	N1MW-7	N1MW-8
Sample Date	8/3/2016	8/3/2016	8/3/2016	8/4/2016	8/4/2016	8/4/2016	8/4/2016	8/4/2016	8/3/2016	8/3/2016	8/3/2016	10/17/2016	10/18/2016	10/17/2016
GW Level	13.5	13.5	14	15.5	13	13	15	14	13	13.5	13.5	13.5	14	12
PID Sample Depths														
1	<1	<1	<1	<1	<1		<1		<1	<1	<1			
1.5						<1		<1						
3		<1	<1						<1					
4	<1						<1			<1	<1			
4.5				<1	<1			<1						
5													<1	<1
5.5						<1			<1			<1		
6		<1								<1				
6.5	<1													
7.5			<1						<1					
8							<1			<1				
8.5	<1													
9											<1			
9.5					3.2	<1		<1						
10	<1	<1		1.4					<1			<1	<1	<1
11.5									<1					
12					50.2							1435	33.7	380
13		<1	<1											
14				51.4				<1		<1				
14.5	<1				106.4						<1			
15						22	<1						161.2	664
15.5		2.4		10.4										
16			<1						<1			506		
16.5		64.1												
17						2.3		<1						
18			<1											
19		<1			12.7							2.8		
20	<1													81.8

TABLE 5
Former Tiger Oil Site
1808 North 1st Street, Yakima, WA
October 2021 PID Readings

Completed By: Landau Associates

Well/Bore #	HSB-1	HSB-2	HSB-3	HSB-4	HSB-5	NIMW-6R	NIMW-7R	NIMW-9
Sample Date	10/5/2021	10/5/2021	10/6/2021	10/6/2021	10/6/2021	10/4/2021	10/4/2021	10/5/2021
GW Level	16.5	17.5	15	15	15.5	15	16	16.5
PID Sample Depths								
2			0					
2.5					0			
3.5					0			
4			0					
5			0					
5.5					0			
6	0	0		0				
7		0	0	0	0			
7.5							0	
8			0		0			
9		0.1					0	
9.5					0		0	
10		0		0		0	0	
11					0			0
11.5				0				
12			0			0		
13		0		0		68.5		0
14	0		29.1		0			
14.5								82.5
15						1.5	165	
15.5			8.5				94	
16	69.9	6.7			0			
16.5				0		6.1	5.5	
17		0.3	8.6				1.5	4.2
18	4.5							0.9
18.5			1.6				0.8	
19	0.7	0				0		0.6

APPENDIX A

Laboratory Analytical Reports

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Spokane
11922 East 1st Ave
Spokane, WA 99206
Tel: (509)924-9200

Laboratory Job ID: 590-16086-1
Client Project/Site: Tiger Oil/1148010.010.012
Revision: 1

For:
Landau & Associates, Inc.
10 North Post Street, Suite 218
Spokane, Washington 99201

Attn: Shane Kostka

Authorized for release by:
10/26/2021 11:36:32 AM

Randee Arrington, Lab Director
(509)924-9200
Randee.Arrington@Eurofinset.com

Table of Contents

Client: Landau & Associates, Inc.
Project/Site: Tiger Oil/1148010.010.012

Job ID: 590-16086-1

Job ID: 590-16086-1

Laboratory: Eurofins TestAmerica, Spokane

Narrative

Revision
The report being provided is a revision of the original report sent on 10/22/2021. The report (revision 1) is being revised due to: Client sample IDs were revised per the client's request..

Receipt
The samples were received on 10/8/2021 8:55 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.6º C.

GC/MS VOA
Method 8260D: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with analytical batch 590-33521.

Method 8260D: Surrogate recovery for the following sample was outside the upper control limit: (MB 590-33556/1-A). This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Method 8260D: Surrogate recovery for the following sample was outside control limits: NIMW-7R-14.5-16-100421 (590-16086-1). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

Method 8260D: Surrogate recovery for the following sample was outside the upper control limit. Client sample was ND for the affected analytes, therefore the data was reported. (LCS 590-33556/2-A)

Method NWTPH-Gx: Insufficient sample volume was available to perform a sample duplicate (DUP) associated with analytical batch 590-33520.

Method NWTPH-Gx: The continuing calibration verification (CCV) associated with batch 590-33509 recovered above the upper control limit for Gasoline. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated samples are impacted: NIMW-5-100421 (590-16086-3), NIMW-3-100421 (590-16086-5), NIMW-2-100421 (590-16086-6), NIMW-4-100421 (590-16086-7), RB-55-100521 (590-16086-10) and (CCV 590-33509/4).

Method NWTPH-Gx: The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for analytical batch 590-33509 recovered outside control limits for the following analytes: Gasoline. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC Semi VOA
Method NWTPH-Dx: Detected hydrocarbons in the diesel range appear to be due to gasoline overlap as well as heavily weathered diesel and/or biogenic interference in the following sample: NINW-8-100421 (590-16086-2).

Method NWTPH-Dx: Detected hydrocarbons in the diesel range appear to be due to gasoline overlap in the following samples: HSB-1-100521 (590-16086-11), HSB-2-100521 (590-16086-13), HSB-3-100621 (590-16086-15), DUP-GW-100621 (590-16086-17), NIMW-6R-100621 (590-16086-22), NIMW-7R-100621 (590-16086-23) and NIMW-1R-100621 (590-16086-24).

Method NWTPH-Dx: Detected hydrocarbons in the diesel range appear to be due to a heavy gas/light diesel range component in the following samples: NIMW-7R-14.5-16-100421 (590-16086-1), NIMW-6R-14.5-15-100421 (590-16086-4), HSB-1-15.5-17-100521 (590-16086-9), HSB-3-13.5-14.5-100621 (590-16086-14) and DUP-5-100621 (590-16086-16).

Method NWTPH-Dx: Detected hydrocarbons in the diesel range appear to be due to oil overlap in the following sample: WASTE-100621 (590-16086-25).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals
Method 6010D: The low level initial calibration verification (ICVL) associated with batch 590-33528 recovered above the upper control limit

Job ID: 590-16086-1 (Continued)

Laboratory: Eurofins TestAmerica, Spokane (Continued)

for Chromium. The samples associated with this ICV were either 10x or non-detects for the affected analytes; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Definitions/Glossary

Client: Landau & Associates, Inc.
Project/Site: Tiger Oil/1148010.010.012

Job ID: 590-16086-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
E	Result exceeded calibration range.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
S1-	Surrogate recovery exceeds control limits, low biased.
S1+	Surrogate recovery exceeds control limits, high biased.

Metals

Qualifier	Qualifier Description
^1+	Initial Calibration Verification (ICV) is outside acceptance limits, high biased.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Sample Summary

Client: Landau & Associates, Inc.
Project/Site: Tiger Oil/1148010.010.012

Job ID: 590-16086-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
590-16086-1	N1MW-7R-14.5-16-100421	Solid	10/04/21 12:30	10/08/21 08:55
590-16086-2	N1MW-8-100421	Water	10/04/21 13:45	10/08/21 08:55
590-16086-3	N1MW-5-100421	Water	10/04/21 14:55	10/08/21 08:55
590-16086-4	N1MW-6R-14.5-15-100421	Solid	10/04/21 15:30	10/08/21 08:55
590-16086-5	N1MW-3-100421	Water	10/04/21 16:15	10/08/21 08:55
590-16086-6	N1MW-2-100421	Water	10/04/21 17:05	10/08/21 08:55
590-16086-7	N1MW-4-100421	Water	10/04/21 17:50	10/08/21 08:55
590-16086-8	N1MW-1R-16-17.5-100521	Solid	10/05/21 09:45	10/08/21 08:55
590-16086-9	HSB-1-15.5-17-100521	Solid	10/05/21 13:00	10/08/21 08:55
590-16086-10	RB-55-100521	Water	10/05/21 13:20	10/08/21 08:55
590-16086-11	HSB-1-100521	Water	10/05/21 14:25	10/08/21 08:55
590-16086-12	HSB-2-15.5-16-100521	Solid	10/05/21 14:50	10/08/21 08:55
590-16086-13	HSB-2-100521	Water	10/05/21 16:20	10/08/21 08:55
590-16086-14	HSB-3-13.5-14.5-100621	Solid	10/06/21 10:00	10/08/21 08:55
590-16086-15	HSB-3-100621	Water	10/06/21 11:30	10/08/21 08:55
590-16086-16	DUP-5-100621	Solid	10/06/21 08:30	10/08/21 08:55
590-16086-17	DUP-GW-100621	Water	10/06/21 09:00	10/08/21 08:55
590-16086-18	HSB-4-7-8-100621	Solid	10/06/21 11:50	10/08/21 08:55
590-16086-19	HSB-4-11-12-100621	Solid	10/06/21 12:15	10/08/21 08:55
590-16086-20	HSB-5-7.5-9-100621	Solid	10/06/21 14:20	10/08/21 08:55
590-16086-22	N1MW-6R-100621	Water	10/06/21 15:05	10/08/21 08:55
590-16086-23	N1MW-7R-100621	Water	10/06/21 15:55	10/08/21 08:55
590-16086-24	N1MW-1R-100621	Water	10/06/21 16:20	10/08/21 08:55
590-16086-25	WASTE-100621	Solid	10/06/21 17:00	10/08/21 08:55
590-16086-26	Trip Blank	Solid	10/06/21 08:00	10/08/21 08:55
590-16086-27	Trip Blank	Water	10/06/21 08:00	10/08/21 08:55

LANDAU ASSOCIATES — Chain-of-Custody Record

North Seattle (206) 631-8660 | Tacoma (253) 926-2493 | Olympia (360) 791-3178
Spokane (509) 327-9737 | Portland (503) 542-1080

Date 10/4/21 Page 1 of 2

Turnaround Time: Standard X Accelerated

Project Name: Tiger Oil
Project No.: 1148010.010.012
Project Location/Event: Task 2 - Drilling Exploration
Sampler's Name: Jered Newcomb
Project Contact: Jeffrey Menken
Send Results To: Jeffrey Menken, Shane Kostka

Special Handling Requirements:
Shipment Method: Drop off
Stored on ice: (Yes) / No

Sample I.D.	Date	Time	Matrix	No. of Containers	NWTPH-Dx	NWTPH-Gx	BTEX - 8260D	Observations/Comments
NMW-7R-14.5-16-100421	10/4/21	1230	Soil	3	X	X	X	
NMW-8-100421		1345	AQ	3	X	X	X	
NMW-5-100421		1455	AQ	3	X	X	X	
NMW-6R-14.5-15-100421		1530	Soil	3	X	X	X	
NMW-3-100421		1615	AQ	3	X	X	X	
NMW-2-100421		1705	AQ	3	X	X	X	
NMW-4-100421	↓	1750	AQ	3	X	X	X	
~~NMW-1R-100521~~								
MW-1R-16-17.5-100521	10/5/21	945	Soil	3	X	X	X	
HSB-1-15.5-17-100521		1300	Soil	3	X	X	X	
RB-5-100521		1320	AQ	3	X	X	X	
HSB-1-100521		1425	AQ	3	X	X	X	
HSB-2-15.5-16-100521		1450	Soil	3	X	X	X	
HSB-2-100521	↓	1620	AQ	3	X	X	X	
HSB-3-13.5-14.5-100621	10/6/21	1000	Soil	3	X	X	X	
HSB-3-100621		1130	AQ	3	X	X	X	
DUP-5-100621		830	Soil	3	X	X	X	
DUP-GW-100621		900	AQ	3	X	X	X	
HSB-4-7-8-100621		1150	Soil	3	X	X	X	
HSB-4-11-12-100621		1215	Soil	3	X	X	X	
HSB-5-7.5-9-100621		1420	Soil	3	X	X	X	
HSB-5-13.5-14.5-100621*	↓	1430	Soil	3	X	X	X	

Testing Parameters

__ Allow water samples to settle, collect aliquot from clear portion ☐
__ NWTPH-Dx - Acid wash cleanup ☐
- Silica gel cleanup ☐
__ Dissolved metal samples were field filtered

Other * Place sample on hold for analysis

590-16086 Chain of Custody

Relinquished by	Received by	Relinquished by	Received by
Signature: [signature]	Signature: [signature]	Signature:	Signature:
Printed Name: Jered Newcomb	Printed Name: Madison	Printed Name:	Printed Name:
Company: LAE	Company: ETA SPO	Company:	Company:
Date: 10/8/21 Time: 8:55	Date: 10/8/21 Time: 8:55	Date: Time:	Date: Time:

WHITE COPY - Laboratory YELLOW COPY - Project File PINK COPY - Client Representative 10/2018

2.5 2.6 1R006

LANDAU ASSOCIATES

Chain-of-Custody Record

☐ North Seattle (206) 631-8660 ☐ Spokane (509) 327-9737
☐ Tacoma (253) 926-2493 ☐ Portland (503) 542-1080
☐ Olympia (360) 791-3178 ☐ _____

Date 10/4/21
Page 2 of 2

Turnaround Time:
Standard X
Accelerated _____

Project Name Tiger Oil
Project No. 1148010.010.012
Project Location/Event Task 2 - Drilling Exploration
Sampler's Name Jered Newcomb
Project Contact Jeffrey Menken
Send Results To Jeffrey Menken, Shane Kastka

Special Handling Requirements: _____
Shipment Method: Dropoff
Stored on ice: (Yes) / No

Sample I.D.	Date	Time	Matrix	No. of Containers	NWTPH-Dx	NWTPH-Gx	BTEX - 8260D	RCRA Metals	Observations/Comments
NIMW-6R-100621	10/6/21	1505	AQ	3	X	X	X		
NIMW-7R-100621	↓	1555	AQ	3	X	X	X		
NIMW-1R-100621	↓	1620	AQ	3	X	X	X		
WASTE-100621	10/6/21	1700	Soil	4	X	X	X	X	
Trip Blanks	—	—	Soil	1		X	X		
Trip Blank	—	—	AQ	1		X	X		

Testing Parameters

___ Allow water samples to settle, collect aliquot from clear portion ☐

___ NWTPH-Dx - Acid wash cleanup ☐
- Silica gel cleanup ☐

___ Dissolved metal samples were field filtered

Other _____

Relinquished by	Received by	Relinquished by	Received by
Signature	Signature	Signature	Signature
Printed Name Jered Newcomb	Printed Name Madison	Printed Name	Printed Name
Company LAI	Company ESA SBO	Company	Company
Date 10/8/21 Time 8:55	Date 10/9/21 Time 8:55	Date Time	Date Time

WHITE COPY - Laboratory YELLOW COPY - Project File PINK COPY - Client Representative 10/2018

2.5 2.6 1 Rock

Login Sample Receipt Checklist

Client: Landau & Associates, Inc.

Job Number: 590-16086-1

Login Number: 16086
List Number: 1
Creator: Vaughan, Madison 1

List Source: Eurofins TestAmerica, Spokane

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Method: 8260D - Volatile Organic Compounds by GC/MS

Client Sample ID: N1MW-7R-14.5-16-100421
Date Collected: 10/04/21 12:30
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-1
Matrix: Solid
Percent Solids: 91.8

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.039	0.020	mg/Kg	☼	10/14/21 11:11	10/14/21 13:03	1
Ethylbenzene	**110**		20	3.2	mg/Kg	☼	10/14/21 11:11	10/18/21 12:37	100
m,p-Xylene	**550**		79	5.6	mg/Kg	☼	10/14/21 11:11	10/18/21 12:37	100
o-Xylene	**160**		39	4.5	mg/Kg	☼	10/14/21 11:11	10/18/21 12:37	100
Toluene	**1.6**		0.20	0.026	mg/Kg	☼	10/14/21 11:11	10/14/21 13:03	1
Xylenes, Total	**710**		120	10	mg/Kg	☼	10/14/21 11:11	10/18/21 12:37	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 129*	*10/14/21 11:11*	*10/14/21 13:03*	*1*
1,2-Dichloroethane-d4 (Surr)	*96*		*75 - 129*	*10/14/21 11:11*	*10/18/21 12:37*	*100*
4-Bromofluorobenzene (Surr)	*71*	*S1-*	*76 - 122*	*10/14/21 11:11*	*10/14/21 13:03*	*1*
4-Bromofluorobenzene (Surr)	*102*		*76 - 122*	*10/14/21 11:11*	*10/18/21 12:37*	*100*
Dibromofluoromethane (Surr)	*92*		*80 - 120*	*10/14/21 11:11*	*10/14/21 13:03*	*1*
Dibromofluoromethane (Surr)	*93*		*80 - 120*	*10/14/21 11:11*	*10/18/21 12:37*	*100*
Toluene-d8 (Surr)	*95*		*80 - 120*	*10/14/21 11:11*	*10/14/21 13:03*	*1*
Toluene-d8 (Surr)	*101*		*80 - 120*	*10/14/21 11:11*	*10/18/21 12:37*	*100*

Client Sample ID: N1MW-8-100421
Date Collected: 10/04/21 13:45
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**8.1**		0.40		ug/L			10/12/21 11:56	1
Ethylbenzene	**7.2**		1.0		ug/L			10/12/21 11:56	1
m,p-Xylene	**23**		2.0		ug/L			10/12/21 11:56	1
o-Xylene	**14**		1.0		ug/L			10/12/21 11:56	1
Toluene	**2.5**		1.0		ug/L			10/12/21 11:56	1
Xylenes, Total	**37**		3.0		ug/L			10/12/21 11:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*80 - 120*		*10/12/21 01:25*	*1*
1,2-Dichloroethane-d4 (Surr)	*100*		*80 - 120*		*10/12/21 11:56*	*1*
4-Bromofluorobenzene (Surr)	*109*		*80 - 120*		*10/12/21 01:25*	*1*
4-Bromofluorobenzene (Surr)	*97*		*80 - 120*		*10/12/21 11:56*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 120*		*10/12/21 01:25*	*1*
Dibromofluoromethane (Surr)	*104*		*80 - 120*		*10/12/21 11:56*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*10/12/21 01:25*	*1*
Toluene-d8 (Surr)	*101*		*80 - 120*		*10/12/21 11:56*	*1*

Client Sample ID: N1MW-5-100421
Date Collected: 10/04/21 14:55
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.40		ug/L			10/12/21 02:06	1
Ethylbenzene	ND		1.0		ug/L			10/12/21 02:06	1
m,p-Xylene	ND		2.0		ug/L			10/12/21 02:06	1
o-Xylene	ND		1.0		ug/L			10/12/21 02:06	1
Toluene	ND		1.0		ug/L			10/12/21 02:06	1
Xylenes, Total	ND		3.0		ug/L			10/12/21 02:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*80 - 120*		*10/12/21 02:06*	*1*

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Client Sample ID: N1MW-5-100421
Date Collected: 10/04/21 14:55
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-3
Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*108*		*80 - 120*		*10/12/21 02:06*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 120*		*10/12/21 02:06*	*1*
Toluene-d8 (Surr)	*101*		*80 - 120*		*10/12/21 02:06*	*1*

Client Sample ID: N1MW-6R-14.5-15-100421
Date Collected: 10/04/21 15:30
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-4
Matrix: Solid
Percent Solids: 91.8

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.042	0.021	mg/Kg	☼	10/14/21 11:11	10/14/21 13:44	1
Ethylbenzene	**3.4**		0.21	0.034	mg/Kg	☼	10/14/21 11:11	10/14/21 13:44	1
m,p-Xylene	**12**		8.4	0.60	mg/Kg	☼	10/14/21 11:11	10/18/21 12:58	10
o-Xylene	**0.43**		0.42	0.048	mg/Kg	☼	10/14/21 11:11	10/14/21 13:44	1
Toluene	ND		0.21	0.028	mg/Kg	☼	10/14/21 11:11	10/14/21 13:44	1
Xylenes, Total	**12**	**J**	13	1.1	mg/Kg	☼	10/14/21 11:11	10/18/21 12:58	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 129*	*10/14/21 11:11*	*10/14/21 13:44*	*1*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 129*	*10/14/21 11:11*	*10/18/21 12:58*	*10*
4-Bromofluorobenzene (Surr)	*92*		*76 - 122*	*10/14/21 11:11*	*10/14/21 13:44*	*1*
4-Bromofluorobenzene (Surr)	*101*		*76 - 122*	*10/14/21 11:11*	*10/18/21 12:58*	*10*
Dibromofluoromethane (Surr)	*89*		*80 - 120*	*10/14/21 11:11*	*10/14/21 13:44*	*1*
Dibromofluoromethane (Surr)	*89*		*80 - 120*	*10/14/21 11:11*	*10/18/21 12:58*	*10*
Toluene-d8 (Surr)	*99*		*80 - 120*	*10/14/21 11:11*	*10/14/21 13:44*	*1*
Toluene-d8 (Surr)	*105*		*80 - 120*	*10/14/21 11:11*	*10/18/21 12:58*	*10*

Client Sample ID: N1MW-3-100421
Date Collected: 10/04/21 16:15
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.40		ug/L			10/12/21 02:27	1
Ethylbenzene	ND		1.0		ug/L			10/12/21 02:27	1
m,p-Xylene	ND		2.0		ug/L			10/12/21 02:27	1
o-Xylene	ND		1.0		ug/L			10/12/21 02:27	1
Toluene	ND		1.0		ug/L			10/12/21 02:27	1
Xylenes, Total	ND		3.0		ug/L			10/12/21 02:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*80 - 120*		*10/12/21 02:27*	*1*
4-Bromofluorobenzene (Surr)	*92*		*80 - 120*		*10/12/21 02:27*	*1*
Dibromofluoromethane (Surr)	*107*		*80 - 120*		*10/12/21 02:27*	*1*
Toluene-d8 (Surr)	*101*		*80 - 120*		*10/12/21 02:27*	*1*

Client Sample ID: N1MW-2-100421
Date Collected: 10/04/21 17:05
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.40		ug/L			10/12/21 02:47	1
Ethylbenzene	ND		1.0		ug/L			10/12/21 02:47	1
m,p-Xylene	ND		2.0		ug/L			10/12/21 02:47	1
o-Xylene	ND		1.0		ug/L			10/12/21 02:47	1

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Client Sample ID: N1MW-2-100421
Date Collected: 10/04/21 17:05
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toluene	ND		1.0		ug/L			10/12/21 02:47	1
Xylenes, Total	ND		3.0		ug/L			10/12/21 02:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*80 - 120*		*10/12/21 02:47*	*1*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*		*10/12/21 02:47*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 120*		*10/12/21 02:47*	*1*
Toluene-d8 (Surr)	*105*		*80 - 120*		*10/12/21 02:47*	*1*

Client Sample ID: N1MW-4-100421
Date Collected: 10/04/21 17:50
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.40		ug/L			10/12/21 03:08	1
Ethylbenzene	ND		1.0		ug/L			10/12/21 03:08	1
m,p-Xylene	ND		2.0		ug/L			10/12/21 03:08	1
o-Xylene	ND		1.0		ug/L			10/12/21 03:08	1
Toluene	ND		1.0		ug/L			10/12/21 03:08	1
Xylenes, Total	ND		3.0		ug/L			10/12/21 03:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*80 - 120*		*10/12/21 03:08*	*1*
4-Bromofluorobenzene (Surr)	*104*		*80 - 120*		*10/12/21 03:08*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 120*		*10/12/21 03:08*	*1*
Toluene-d8 (Surr)	*101*		*80 - 120*		*10/12/21 03:08*	*1*

Client Sample ID: N1MW-1R-16-17.5-100521
Date Collected: 10/05/21 09:45
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-8
Matrix: Solid
Percent Solids: 90.2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.039	0.019	mg/Kg	☼	10/14/21 11:11	10/14/21 15:08	1
Ethylbenzene	**2.1**		0.19	0.031	mg/Kg	☼	10/14/21 11:11	10/14/21 15:08	1
m,p-Xylene	**7.7**		0.77	0.056	mg/Kg	☼	10/14/21 11:11	10/14/21 15:08	1
o-Xylene	**2.6**		0.39	0.045	mg/Kg	☼	10/14/21 11:11	10/14/21 15:08	1
Toluene	**0.37**		0.19	0.026	mg/Kg	☼	10/14/21 11:11	10/14/21 15:08	1
Xylenes, Total	**10**		1.2	0.10	mg/Kg	☼	10/14/21 11:11	10/14/21 15:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 129*	*10/14/21 11:11*	*10/14/21 15:08*	*1*
4-Bromofluorobenzene (Surr)	*104*		*76 - 122*	*10/14/21 11:11*	*10/14/21 15:08*	*1*
Dibromofluoromethane (Surr)	*102*		*80 - 120*	*10/14/21 11:11*	*10/14/21 15:08*	*1*
Toluene-d8 (Surr)	*94*		*80 - 120*	*10/14/21 11:11*	*10/14/21 15:08*	*1*

Client Sample ID: HSB-1-15.5-17-100521
Date Collected: 10/05/21 13:00
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-9
Matrix: Solid
Percent Solids: 95.0

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.047	0.024	mg/Kg	☼	10/14/21 11:11	10/14/21 15:28	1
Ethylbenzene	**33**		2.4	0.38	mg/Kg	☼	10/14/21 11:11	10/18/21 13:19	10
m,p-Xylene	**180**		95	6.8	mg/Kg	☼	10/14/21 11:11	10/18/21 14:43	100
o-Xylene	**57**		47	5.4	mg/Kg	☼	10/14/21 11:11	10/18/21 14:43	100

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Client Sample ID: HSB-1-15.5-17-100521
Date Collected: 10/05/21 13:00
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-9
Matrix: Solid
Percent Solids: 95.0

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toluene	**9.3**		0.24	0.031	mg/Kg	☼	10/14/21 11:11	10/14/21 15:28	1
Xylenes, Total	**230**		140	12	mg/Kg	☼	10/14/21 11:11	10/18/21 14:43	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 129*	*10/14/21 11:11*	*10/14/21 15:28*	*1*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 129*	*10/14/21 11:11*	*10/18/21 13:19*	*10*
1,2-Dichloroethane-d4 (Surr)	*95*		*75 - 129*	*10/14/21 11:11*	*10/18/21 14:43*	*100*
4-Bromofluorobenzene (Surr)	*97*		*76 - 122*	*10/14/21 11:11*	*10/14/21 15:28*	*1*
4-Bromofluorobenzene (Surr)	*105*		*76 - 122*	*10/14/21 11:11*	*10/18/21 13:19*	*10*
4-Bromofluorobenzene (Surr)	*94*		*76 - 122*	*10/14/21 11:11*	*10/18/21 14:43*	*100*
Dibromofluoromethane (Surr)	*83*		*80 - 120*	*10/14/21 11:11*	*10/14/21 15:28*	*1*
Dibromofluoromethane (Surr)	*86*		*80 - 120*	*10/14/21 11:11*	*10/18/21 13:19*	*10*
Dibromofluoromethane (Surr)	*90*		*80 - 120*	*10/14/21 11:11*	*10/18/21 14:43*	*100*
Toluene-d8 (Surr)	*102*		*80 - 120*	*10/14/21 11:11*	*10/14/21 15:28*	*1*
Toluene-d8 (Surr)	*103*		*80 - 120*	*10/14/21 11:11*	*10/18/21 13:19*	*10*
Toluene-d8 (Surr)	*110*		*80 - 120*	*10/14/21 11:11*	*10/18/21 14:43*	*100*

Client Sample ID: RB-55-100521
Date Collected: 10/05/21 13:20
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-10
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.40		ug/L			10/12/21 03:28	1
Ethylbenzene	ND		1.0		ug/L			10/12/21 03:28	1
m,p-Xylene	ND		2.0		ug/L			10/12/21 03:28	1
o-Xylene	ND		1.0		ug/L			10/12/21 03:28	1
Toluene	ND		1.0		ug/L			10/12/21 03:28	1
Xylenes, Total	ND		3.0		ug/L			10/12/21 03:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*80 - 120*		*10/12/21 03:28*	*1*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*		*10/12/21 03:28*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 120*		*10/12/21 03:28*	*1*
Toluene-d8 (Surr)	*104*		*80 - 120*		*10/12/21 03:28*	*1*

Client Sample ID: HSB-1-100521
Date Collected: 10/05/21 14:25
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-11
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		2.0		ug/L			10/12/21 03:49	5
Ethylbenzene	**940**		10		ug/L			10/12/21 12:17	10
m,p-Xylene	**380**		20		ug/L			10/12/21 16:29	10
o-Xylene	**150**		10		ug/L			10/12/21 16:29	10
Toluene	**550**		10		ug/L			10/12/21 12:17	10
Xylenes, Total	**530**		30		ug/L			10/12/21 16:29	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*80 - 120*		*10/12/21 03:49*	*5*
1,2-Dichloroethane-d4 (Surr)	*100*		*80 - 120*		*10/12/21 12:17*	*10*
1,2-Dichloroethane-d4 (Surr)	*105*		*80 - 120*		*10/12/21 16:29*	*10*
4-Bromofluorobenzene (Surr)	*104*		*80 - 120*		*10/12/21 03:49*	*5*
4-Bromofluorobenzene (Surr)	*104*		*80 - 120*		*10/12/21 12:17*	*10*

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Client Sample ID: HSB-1-100521
Date Collected: 10/05/21 14:25
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-11
Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*104*		*80 - 120*		*10/12/21 16:29*	*10*
Dibromofluoromethane (Surr)	*94*		*80 - 120*		*10/12/21 03:49*	*5*
Dibromofluoromethane (Surr)	*99*		*80 - 120*		*10/12/21 12:17*	*10*
Dibromofluoromethane (Surr)	*103*		*80 - 120*		*10/12/21 16:29*	*10*
Toluene-d8 (Surr)	*97*		*80 - 120*		*10/12/21 03:49*	*5*
Toluene-d8 (Surr)	*98*		*80 - 120*		*10/12/21 12:17*	*10*
Toluene-d8 (Surr)	*103*		*80 - 120*		*10/12/21 16:29*	*10*

Client Sample ID: HSB-2-15.5-16-100521
Date Collected: 10/05/21 14:50
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-12
Matrix: Solid
Percent Solids: 95.2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.040	0.020	mg/Kg	☼	10/14/21 11:11	10/14/21 15:49	1
Ethylbenzene	**0.035**	**J**	0.20	0.032	mg/Kg	☼	10/14/21 11:11	10/14/21 15:49	1
m,p-Xylene	**0.14**	**J**	0.79	0.057	mg/Kg	☼	10/14/21 11:11	10/14/21 15:49	1
o-Xylene	**0.052**	**J**	0.40	0.045	mg/Kg	☼	10/14/21 11:11	10/14/21 15:49	1
Toluene	**0.030**	**J**	0.20	0.026	mg/Kg	☼	10/14/21 11:11	10/14/21 15:49	1
Xylenes, Total	**0.19**	**J**	1.2	0.10	mg/Kg	☼	10/14/21 11:11	10/14/21 15:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 129*	*10/14/21 11:11*	*10/14/21 15:49*	*1*
4-Bromofluorobenzene (Surr)	*104*		*76 - 122*	*10/14/21 11:11*	*10/14/21 15:49*	*1*
Dibromofluoromethane (Surr)	*104*		*80 - 120*	*10/14/21 11:11*	*10/14/21 15:49*	*1*
Toluene-d8 (Surr)	*105*		*80 - 120*	*10/14/21 11:11*	*10/14/21 15:49*	*1*

Client Sample ID: HSB-2-100521
Date Collected: 10/05/21 16:20
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-13
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**9.2**		0.40		ug/L			10/12/21 04:09	1
Ethylbenzene	**2900**		100		ug/L			10/12/21 12:59	100
m,p-Xylene	**8700**		200		ug/L			10/12/21 12:59	100
o-Xylene	**3600**		100		ug/L			10/12/21 12:59	100
Toluene	**180**		100		ug/L			10/12/21 12:59	100
Xylenes, Total	**12000**		300		ug/L			10/12/21 12:59	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*80 - 120*		*10/12/21 04:09*	*1*
1,2-Dichloroethane-d4 (Surr)	*98*		*80 - 120*		*10/12/21 12:59*	*100*
4-Bromofluorobenzene (Surr)	*110*		*80 - 120*		*10/12/21 04:09*	*1*
4-Bromofluorobenzene (Surr)	*104*		*80 - 120*		*10/12/21 12:59*	*100*
Dibromofluoromethane (Surr)	*97*		*80 - 120*		*10/12/21 04:09*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 120*		*10/12/21 12:59*	*100*
Toluene-d8 (Surr)	*109*		*80 - 120*		*10/12/21 04:09*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*10/12/21 12:59*	*100*

Method: 8260D - Volatile Organic Compounds by GC/MS

Client Sample ID: HSB-3-13.5-14.5-100621
Date Collected: 10/06/21 10:00
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-14
Matrix: Solid
Percent Solids: 93.8

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.037	0.019	mg/Kg	☼	10/14/21 11:11	10/14/21 16:10	1
Ethylbenzene	**3.2**		0.19	0.030	mg/Kg	☼	10/14/21 11:11	10/14/21 16:10	1
m,p-Xylene	**11**		7.4	0.53	mg/Kg	☼	10/14/21 11:11	10/18/21 13:40	10
o-Xylene	**3.6**		0.37	0.043	mg/Kg	☼	10/14/21 11:11	10/14/21 16:10	1
Toluene	ND		0.19	0.025	mg/Kg	☼	10/14/21 11:11	10/14/21 16:10	1
Xylenes, Total	**15**		11	0.96	mg/Kg	☼	10/14/21 11:11	10/18/21 13:40	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*75 - 129*	*10/14/21 11:11*	*10/14/21 16:10*	*1*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 129*	*10/14/21 11:11*	*10/18/21 13:40*	*10*
4-Bromofluorobenzene (Surr)	*91*		*76 - 122*	*10/14/21 11:11*	*10/14/21 16:10*	*1*
4-Bromofluorobenzene (Surr)	*105*		*76 - 122*	*10/14/21 11:11*	*10/18/21 13:40*	*10*
Dibromofluoromethane (Surr)	*103*		*80 - 120*	*10/14/21 11:11*	*10/14/21 16:10*	*1*
Dibromofluoromethane (Surr)	*95*		*80 - 120*	*10/14/21 11:11*	*10/18/21 13:40*	*10*
Toluene-d8 (Surr)	*105*		*80 - 120*	*10/14/21 11:11*	*10/14/21 16:10*	*1*
Toluene-d8 (Surr)	*104*		*80 - 120*	*10/14/21 11:11*	*10/18/21 13:40*	*10*

Client Sample ID: HSB-3-100621
Date Collected: 10/06/21 11:30
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-15
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**4.1**		0.40		ug/L			10/12/21 04:30	1
Ethylbenzene	**1600**		100		ug/L			10/12/21 13:41	100
m,p-Xylene	**4500**		200		ug/L			10/12/21 13:41	100
o-Xylene	**1800**		100		ug/L			10/12/21 13:41	100
Toluene	**22**		1.0		ug/L			10/12/21 04:30	1
Xylenes, Total	**6300**		300		ug/L			10/12/21 13:41	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*80 - 120*		*10/12/21 04:30*	*1*
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 120*		*10/12/21 13:20*	*10*
1,2-Dichloroethane-d4 (Surr)	*106*		*80 - 120*		*10/12/21 13:41*	*100*
4-Bromofluorobenzene (Surr)	*102*		*80 - 120*		*10/12/21 04:30*	*1*
4-Bromofluorobenzene (Surr)	*104*		*80 - 120*		*10/12/21 13:20*	*10*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*		*10/12/21 13:41*	*100*
Dibromofluoromethane (Surr)	*93*		*80 - 120*		*10/12/21 04:30*	*1*
Dibromofluoromethane (Surr)	*96*		*80 - 120*		*10/12/21 13:20*	*10*
Dibromofluoromethane (Surr)	*104*		*80 - 120*		*10/12/21 13:41*	*100*
Toluene-d8 (Surr)	*103*		*80 - 120*		*10/12/21 04:30*	*1*
Toluene-d8 (Surr)	*101*		*80 - 120*		*10/12/21 13:20*	*10*
Toluene-d8 (Surr)	*106*		*80 - 120*		*10/12/21 13:41*	*100*

Client Sample ID: DUP-5-100621
Date Collected: 10/06/21 08:30
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-16
Matrix: Solid
Percent Solids: 92.9

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.057	0.028	mg/Kg	☼	10/14/21 11:11	10/14/21 16:31	1
Ethylbenzene	**0.090**	**J**	0.28	0.046	mg/Kg	☼	10/14/21 11:11	10/14/21 16:31	1
m,p-Xylene	**0.32**	**J**	1.1	0.081	mg/Kg	☼	10/14/21 11:11	10/14/21 16:31	1
o-Xylene	**0.13**	**J**	0.57	0.065	mg/Kg	☼	10/14/21 11:11	10/14/21 16:31	1

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Client Sample ID: DUP-5-100621
Date Collected: 10/06/21 08:30
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-16
Matrix: Solid
Percent Solids: 92.9

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toluene	ND		0.28	0.038	mg/Kg	☼	10/14/21 11:11	10/14/21 16:31	1
Xylenes, Total	**0.45**	**J**	1.7	0.15	mg/Kg	☼	10/14/21 11:11	10/14/21 16:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*75 - 129*	*10/14/21 11:11*	*10/14/21 16:31*	*1*
4-Bromofluorobenzene (Surr)	*100*		*76 - 122*	*10/14/21 11:11*	*10/14/21 16:31*	*1*
Dibromofluoromethane (Surr)	*103*		*80 - 120*	*10/14/21 11:11*	*10/14/21 16:31*	*1*
Toluene-d8 (Surr)	*102*		*80 - 120*	*10/14/21 11:11*	*10/14/21 16:31*	*1*

Client Sample ID: DUP-GW-100621
Date Collected: 10/06/21 09:00
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-17
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**4.0**		0.40		ug/L			10/12/21 04:51	1
Ethylbenzene	**1500**		100		ug/L			10/12/21 14:02	100
m,p-Xylene	**4300**		200		ug/L			10/12/21 14:02	100
o-Xylene	**1700**		100		ug/L			10/12/21 14:02	100
Toluene	**22**		1.0		ug/L			10/12/21 04:51	1
Xylenes, Total	**6000**		300		ug/L			10/12/21 14:02	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*80 - 120*		*10/12/21 04:51*	*1*
1,2-Dichloroethane-d4 (Surr)	*104*		*80 - 120*		*10/12/21 14:02*	*100*
4-Bromofluorobenzene (Surr)	*104*		*80 - 120*		*10/12/21 04:51*	*1*
4-Bromofluorobenzene (Surr)	*104*		*80 - 120*		*10/12/21 14:02*	*100*
Dibromofluoromethane (Surr)	*94*		*80 - 120*		*10/12/21 04:51*	*1*
Dibromofluoromethane (Surr)	*104*		*80 - 120*		*10/12/21 14:02*	*100*
Toluene-d8 (Surr)	*104*		*80 - 120*		*10/12/21 04:51*	*1*
Toluene-d8 (Surr)	*101*		*80 - 120*		*10/12/21 14:02*	*100*

Client Sample ID: HSB-4-7-8-100621
Date Collected: 10/06/21 11:50
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-18
Matrix: Solid
Percent Solids: 82.6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.049	0.025	mg/Kg	☼	10/14/21 11:11	10/14/21 16:52	1
Ethylbenzene	ND		0.25	0.040	mg/Kg	☼	10/14/21 11:11	10/14/21 16:52	1
m,p-Xylene	ND		0.99	0.071	mg/Kg	☼	10/14/21 11:11	10/14/21 16:52	1
o-Xylene	ND		0.49	0.057	mg/Kg	☼	10/14/21 11:11	10/14/21 16:52	1
Toluene	ND		0.25	0.033	mg/Kg	☼	10/14/21 11:11	10/14/21 16:52	1
Xylenes, Total	ND		1.5	0.13	mg/Kg	☼	10/14/21 11:11	10/14/21 16:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*75 - 129*	*10/14/21 11:11*	*10/14/21 16:52*	*1*
4-Bromofluorobenzene (Surr)	*80*		*76 - 122*	*10/14/21 11:11*	*10/14/21 16:52*	*1*
Dibromofluoromethane (Surr)	*112*		*80 - 120*	*10/14/21 11:11*	*10/14/21 16:52*	*1*
Toluene-d8 (Surr)	*95*		*80 - 120*	*10/14/21 11:11*	*10/14/21 16:52*	*1*

Method: 8260D - Volatile Organic Compounds by GC/MS

Client Sample ID: HSB-4-11-12-100621
Date Collected: 10/06/21 12:15
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-19
Matrix: Solid
Percent Solids: 94.5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.047	0.023	mg/Kg	☼	10/14/21 11:11	10/14/21 17:12	1
Ethylbenzene	ND		0.23	0.038	mg/Kg	☼	10/14/21 11:11	10/14/21 17:12	1
m,p-Xylene	ND		0.93	0.067	mg/Kg	☼	10/14/21 11:11	10/14/21 17:12	1
o-Xylene	ND		0.47	0.053	mg/Kg	☼	10/14/21 11:11	10/14/21 17:12	1
Toluene	ND		0.23	0.031	mg/Kg	☼	10/14/21 11:11	10/14/21 17:12	1
Xylenes, Total	ND		1.4	0.12	mg/Kg	☼	10/14/21 11:11	10/14/21 17:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 129*	*10/14/21 11:11*	*10/14/21 17:12*	*1*
4-Bromofluorobenzene (Surr)	*131*	*S1+*	*76 - 122*	*10/14/21 11:11*	*10/14/21 17:12*	*1*
Dibromofluoromethane (Surr)	*105*		*80 - 120*	*10/14/21 11:11*	*10/14/21 17:12*	*1*
Toluene-d8 (Surr)	*93*		*80 - 120*	*10/14/21 11:11*	*10/14/21 17:12*	*1*

Client Sample ID: HSB-5-7.5-9-100621
Date Collected: 10/06/21 14:20
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-20
Matrix: Solid
Percent Solids: 92.3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.045	0.022	mg/Kg	☼	10/14/21 11:11	10/14/21 17:33	1
Ethylbenzene	ND		0.22	0.036	mg/Kg	☼	10/14/21 11:11	10/14/21 17:33	1
m,p-Xylene	ND		0.90	0.065	mg/Kg	☼	10/14/21 11:11	10/14/21 17:33	1
o-Xylene	ND		0.45	0.052	mg/Kg	☼	10/14/21 11:11	10/14/21 17:33	1
Toluene	ND		0.22	0.030	mg/Kg	☼	10/14/21 11:11	10/14/21 17:33	1
Xylenes, Total	ND		1.3	0.12	mg/Kg	☼	10/14/21 11:11	10/14/21 17:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 129*	*10/14/21 11:11*	*10/14/21 17:33*	*1*
4-Bromofluorobenzene (Surr)	*79*		*76 - 122*	*10/14/21 11:11*	*10/14/21 17:33*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 120*	*10/14/21 11:11*	*10/14/21 17:33*	*1*
Toluene-d8 (Surr)	*100*		*80 - 120*	*10/14/21 11:11*	*10/14/21 17:33*	*1*

Client Sample ID: N1MW-6R-100621
Date Collected: 10/06/21 15:05
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-22
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**0.85**		0.40		ug/L			10/12/21 05:11	1
Ethylbenzene	**550**		10		ug/L			10/12/21 14:23	10
m,p-Xylene	**2100**		200		ug/L			10/12/21 16:51	100
o-Xylene	**170**		100		ug/L			10/12/21 16:51	100
Toluene	**1.8**		1.0		ug/L			10/12/21 05:11	1
Xylenes, Total	**2200**		300		ug/L			10/12/21 16:51	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*80 - 120*		*10/12/21 05:11*	*1*
1,2-Dichloroethane-d4 (Surr)	*98*		*80 - 120*		*10/12/21 14:23*	*10*
1,2-Dichloroethane-d4 (Surr)	*103*		*80 - 120*		*10/12/21 16:51*	*100*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*10/12/21 05:11*	*1*
4-Bromofluorobenzene (Surr)	*104*		*80 - 120*		*10/12/21 14:23*	*10*
4-Bromofluorobenzene (Surr)	*102*		*80 - 120*		*10/12/21 16:51*	*100*
Dibromofluoromethane (Surr)	*91*		*80 - 120*		*10/12/21 05:11*	*1*
Dibromofluoromethane (Surr)	*93*		*80 - 120*		*10/12/21 14:23*	*10*
Dibromofluoromethane (Surr)	*106*		*80 - 120*		*10/12/21 16:51*	*100*

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Client Sample ID: N1MW-6R-100621
Date Collected: 10/06/21 15:05
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-22
Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*10/12/21 05:11*	*1*
Toluene-d8 (Surr)	*100*		*80 - 120*		*10/12/21 14:23*	*10*
Toluene-d8 (Surr)	*96*		*80 - 120*		*10/12/21 16:51*	*100*

Client Sample ID: N1MW-7R-100621
Date Collected: 10/06/21 15:55
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-23
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**2.0**		0.40		ug/L			10/12/21 05:52	1
Ethylbenzene	**640**		10		ug/L			10/12/21 15:05	10
m,p-Xylene	**2700**		200		ug/L			10/12/21 17:12	100
o-Xylene	**1000**		100		ug/L			10/12/21 17:12	100
Toluene	**380**		10		ug/L			10/12/21 15:05	10
Xylenes, Total	**3700**		300		ug/L			10/12/21 17:12	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 120*		*10/12/21 05:52*	*1*
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 120*		*10/12/21 15:05*	*10*
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 120*		*10/12/21 17:12*	*100*
4-Bromofluorobenzene (Surr)	*101*		*80 - 120*		*10/12/21 05:52*	*1*
4-Bromofluorobenzene (Surr)	*104*		*80 - 120*		*10/12/21 15:05*	*10*
4-Bromofluorobenzene (Surr)	*101*		*80 - 120*		*10/12/21 17:12*	*100*
Dibromofluoromethane (Surr)	*97*		*80 - 120*		*10/12/21 05:52*	*1*
Dibromofluoromethane (Surr)	*99*		*80 - 120*		*10/12/21 15:05*	*10*
Dibromofluoromethane (Surr)	*103*		*80 - 120*		*10/12/21 17:12*	*100*
Toluene-d8 (Surr)	*105*		*80 - 120*		*10/12/21 05:52*	*1*
Toluene-d8 (Surr)	*99*		*80 - 120*		*10/12/21 15:05*	*10*
Toluene-d8 (Surr)	*103*		*80 - 120*		*10/12/21 17:12*	*100*

Client Sample ID: N1MW-1R-100621
Date Collected: 10/06/21 16:20
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-24
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**6.2**		0.40		ug/L			10/12/21 06:13	1
Ethylbenzene	**1800**		100		ug/L			10/12/21 15:47	100
m,p-Xylene	**6200**		200		ug/L			10/12/21 15:47	100
o-Xylene	**2700**		100		ug/L			10/12/21 15:47	100
Toluene	**660**		10		ug/L			10/12/21 15:26	10
Xylenes, Total	**8900**		300		ug/L			10/12/21 15:47	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*80 - 120*		*10/12/21 06:13*	*1*
1,2-Dichloroethane-d4 (Surr)	*99*		*80 - 120*		*10/12/21 15:26*	*10*
1,2-Dichloroethane-d4 (Surr)	*107*		*80 - 120*		*10/12/21 15:47*	*100*
4-Bromofluorobenzene (Surr)	*101*		*80 - 120*		*10/12/21 06:13*	*1*
4-Bromofluorobenzene (Surr)	*103*		*80 - 120*		*10/12/21 15:26*	*10*
4-Bromofluorobenzene (Surr)	*103*		*80 - 120*		*10/12/21 15:47*	*100*
Dibromofluoromethane (Surr)	*104*		*80 - 120*		*10/12/21 06:13*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 120*		*10/12/21 15:26*	*10*
Dibromofluoromethane (Surr)	*103*		*80 - 120*		*10/12/21 15:47*	*100*

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Client Sample ID: N1MW-1R-100621
Date Collected: 10/06/21 16:20
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-24
Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*108*		*80 - 120*		*10/12/21 06:13*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*10/12/21 15:26*	*10*
Toluene-d8 (Surr)	*103*		*80 - 120*		*10/12/21 15:47*	*100*

Client Sample ID: WASTE-100621
Date Collected: 10/06/21 17:00
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-25
Matrix: Solid
Percent Solids: 91.5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.048	0.024	mg/Kg	☼	10/14/21 11:11	10/14/21 17:54	1
Ethylbenzene	ND		0.24	0.039	mg/Kg	☼	10/14/21 11:11	10/14/21 17:54	1
m,p-Xylene	**0.087**	**J**	0.96	0.069	mg/Kg	☼	10/14/21 11:11	10/14/21 17:54	1
o-Xylene	ND		0.48	0.055	mg/Kg	☼	10/14/21 11:11	10/14/21 17:54	1
Toluene	ND		0.24	0.032	mg/Kg	☼	10/14/21 11:11	10/14/21 17:54	1
Xylenes, Total	**0.12**	**J**	1.4	0.12	mg/Kg	☼	10/14/21 11:11	10/14/21 17:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*75 - 129*	*10/14/21 11:11*	*10/14/21 17:54*	*1*
4-Bromofluorobenzene (Surr)	*80*		*76 - 122*	*10/14/21 11:11*	*10/14/21 17:54*	*1*
Dibromofluoromethane (Surr)	*120*		*80 - 120*	*10/14/21 11:11*	*10/14/21 17:54*	*1*
Toluene-d8 (Surr)	*91*		*80 - 120*	*10/14/21 11:11*	*10/14/21 17:54*	*1*

Client Sample ID: Trip Blank
Date Collected: 10/06/21 08:00
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-26
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.020	0.010	mg/Kg		10/14/21 11:11	10/14/21 18:15	1
Ethylbenzene	ND		0.10	0.016	mg/Kg		10/14/21 11:11	10/14/21 18:15	1
m,p-Xylene	ND		0.40	0.029	mg/Kg		10/14/21 11:11	10/14/21 18:15	1
o-Xylene	ND		0.20	0.023	mg/Kg		10/14/21 11:11	10/14/21 18:15	1
Toluene	ND		0.10	0.013	mg/Kg		10/14/21 11:11	10/14/21 18:15	1
Xylenes, Total	ND		0.60	0.052	mg/Kg		10/14/21 11:11	10/14/21 18:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*75 - 129*	*10/14/21 11:11*	*10/14/21 18:15*	*1*
4-Bromofluorobenzene (Surr)	*118*		*76 - 122*	*10/14/21 11:11*	*10/14/21 18:15*	*1*
Dibromofluoromethane (Surr)	*112*		*80 - 120*	*10/14/21 11:11*	*10/14/21 18:15*	*1*
Toluene-d8 (Surr)	*80*		*80 - 120*	*10/14/21 11:11*	*10/14/21 18:15*	*1*

Client Sample ID: Trip Blank
Date Collected: 10/06/21 08:00
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-27
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.40		ug/L			10/12/21 16:08	1
Ethylbenzene	ND		1.0		ug/L			10/12/21 16:08	1
m,p-Xylene	ND		2.0		ug/L			10/12/21 16:08	1
o-Xylene	ND		1.0		ug/L			10/12/21 16:08	1
Toluene	ND		1.0		ug/L			10/12/21 16:08	1
Xylenes, Total	ND		3.0		ug/L			10/12/21 16:08	1

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	103		80 - 120		10/12/21 16:08	1
4-Bromofluorobenzene (Surr)	107		80 - 120		10/12/21 16:08	1
Dibromofluoromethane (Surr)	102		80 - 120		10/12/21 16:08	1
Toluene-d8 (Surr)	100		80 - 120		10/12/21 16:08	1

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)

Client Sample ID: N1MW-7R-14.5-16-100421 — **Lab Sample ID: 590-16086-1**
Date Collected: 10/04/21 12:30 — **Matrix: Solid**
Date Received: 10/08/21 08:55 — **Percent Solids: 91.8**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	9700		980		mg/Kg	☼	10/14/21 11:11	10/18/21 12:37	100

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	102		41.5 - 162	10/14/21 11:11	10/18/21 12:37	100

Client Sample ID: N1MW-8-100421 — **Lab Sample ID: 590-16086-2**
Date Collected: 10/04/21 13:45 — **Matrix: Water**
Date Received: 10/08/21 08:55

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	400		150		ug/L			10/12/21 11:56	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	109		68.7 - 141		10/12/21 01:25	1
4-Bromofluorobenzene (Surr)	97		68.7 - 141		10/12/21 11:56	1

Client Sample ID: N1MW-5-100421 — **Lab Sample ID: 590-16086-3**
Date Collected: 10/04/21 14:55 — **Matrix: Water**
Date Received: 10/08/21 08:55

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND	*+	150		ug/L			10/12/21 02:06	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	108		68.7 - 141		10/12/21 02:06	1

Client Sample ID: N1MW-6R-14.5-15-100421 — **Lab Sample ID: 590-16086-4**
Date Collected: 10/04/21 15:30 — **Matrix: Solid**
Date Received: 10/08/21 08:55 — **Percent Solids: 91.8**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	670		100		mg/Kg	☼	10/14/21 11:11	10/18/21 12:58	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	101		41.5 - 162	10/14/21 11:11	10/18/21 12:58	10

Client Sample ID: N1MW-3-100421 — **Lab Sample ID: 590-16086-5**
Date Collected: 10/04/21 16:15 — **Matrix: Water**
Date Received: 10/08/21 08:55

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND	*+	150		ug/L			10/12/21 02:27	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	92		68.7 - 141		10/12/21 02:27	1

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)

Client Sample ID: N1MW-2-100421
Date Collected: 10/04/21 17:05
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND	*+	150		ug/L			10/12/21 02:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*105*		*68.7 - 141*		*10/12/21 02:47*	*1*

Client Sample ID: N1MW-4-100421
Date Collected: 10/04/21 17:50
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND	*+	150		ug/L			10/12/21 03:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*104*		*68.7 - 141*		*10/12/21 03:08*	*1*

Client Sample ID: N1MW-1R-16-17.5-100521
Date Collected: 10/05/21 09:45
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-8
Matrix: Solid
Percent Solids: 90.2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	**110**		9.7		mg/Kg	☼	10/14/21 11:11	10/14/21 15:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*104*		*41.5 - 162*	*10/14/21 11:11*	*10/14/21 15:08*	*1*

Client Sample ID: HSB-1-15.5-17-100521
Date Collected: 10/05/21 13:00
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-9
Matrix: Solid
Percent Solids: 95.0

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	**2100**		120		mg/Kg	☼	10/14/21 11:11	10/18/21 13:19	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*105*		*41.5 - 162*	*10/14/21 11:11*	*10/18/21 13:19*	*10*

Client Sample ID: RB-55-100521
Date Collected: 10/05/21 13:20
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-10
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND	*+	150		ug/L			10/12/21 03:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*105*		*68.7 - 141*		*10/12/21 03:28*	*1*

Client Sample ID: HSB-1-100521
Date Collected: 10/05/21 14:25
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-11
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	**19000**		1500		ug/L			10/12/21 12:17	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*104*		*68.7 - 141*		*10/12/21 12:17*	*10*
4-Bromofluorobenzene (Surr)	*104*		*68.7 - 141*		*10/12/21 16:29*	*10*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)

Client Sample ID: HSB-2-15.5-16-100521
Date Collected: 10/05/21 14:50
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-12
Matrix: Solid
Percent Solids: 95.2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		9.9		mg/Kg	☼	10/14/21 11:11	10/14/21 15:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*104*		*41.5 - 162*	*10/14/21 11:11*	*10/14/21 15:49*	*1*

Client Sample ID: HSB-2-100521
Date Collected: 10/05/21 16:20
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-13
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	**43000**		15000		ug/L			10/12/21 12:59	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*104*		*68.7 - 141*		*10/12/21 12:59*	*100*

Client Sample ID: HSB-3-13.5-14.5-100621
Date Collected: 10/06/21 10:00
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-14
Matrix: Solid
Percent Solids: 93.8

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	**270**		9.3		mg/Kg	☼	10/14/21 11:11	10/14/21 16:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*91*		*41.5 - 162*	*10/14/21 11:11*	*10/14/21 16:10*	*1*

Client Sample ID: HSB-3-100621
Date Collected: 10/06/21 11:30
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-15
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	**23000**		15000		ug/L			10/12/21 13:41	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*105*		*68.7 - 141*		*10/12/21 13:41*	*100*

Client Sample ID: DUP-5-100621
Date Collected: 10/06/21 08:30
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-16
Matrix: Solid
Percent Solids: 92.9

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	**26**		14		mg/Kg	☼	10/14/21 11:11	10/14/21 16:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*100*		*41.5 - 162*	*10/14/21 11:11*	*10/14/21 16:31*	*1*

Client Sample ID: DUP-GW-100621
Date Collected: 10/06/21 09:00
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-17
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	**24000**		15000		ug/L			10/12/21 14:02	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*104*		*68.7 - 141*		*10/12/21 14:02*	*100*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)

Client Sample ID: HSB-4-7-8-100621
Date Collected: 10/06/21 11:50
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-18
Matrix: Solid
Percent Solids: 82.6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		12		mg/Kg	☼	10/14/21 11:11	10/14/21 16:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*80*		*41.5 - 162*	*10/14/21 11:11*	*10/14/21 16:52*	*1*

Client Sample ID: HSB-4-11-12-100621
Date Collected: 10/06/21 12:15
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-19
Matrix: Solid
Percent Solids: 94.5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		12		mg/Kg	☼	10/14/21 11:11	10/14/21 17:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*131*		*41.5 - 162*	*10/14/21 11:11*	*10/14/21 17:12*	*1*

Client Sample ID: HSB-5-7.5-9-100621
Date Collected: 10/06/21 14:20
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-20
Matrix: Solid
Percent Solids: 92.3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		11		mg/Kg	☼	10/14/21 11:11	10/14/21 17:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*79*		*41.5 - 162*	*10/14/21 11:11*	*10/14/21 17:33*	*1*

Client Sample ID: N1MW-6R-100621
Date Collected: 10/06/21 15:05
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-22
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	**14000**		1500		ug/L			10/12/21 14:23	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*104*		*68.7 - 141*		*10/12/21 14:23*	*10*
4-Bromofluorobenzene (Surr)	*102*		*68.7 - 141*		*10/12/21 16:51*	*100*

Client Sample ID: N1MW-7R-100621
Date Collected: 10/06/21 15:55
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-23
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	**11000**		1500		ug/L			10/12/21 15:05	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*104*		*68.7 - 141*		*10/12/21 15:05*	*10*
4-Bromofluorobenzene (Surr)	*101*		*68.7 - 141*		*10/12/21 17:12*	*100*

Client Sample ID: N1MW-1R-100621
Date Collected: 10/06/21 16:20
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-24
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	**21000**		1500		ug/L			10/12/21 15:26	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*103*		*68.7 - 141*		*10/12/21 15:26*	*10*
4-Bromofluorobenzene (Surr)	*103*		*68.7 - 141*		*10/12/21 15:47*	*100*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)

Client Sample ID: WASTE-100621
Date Collected: 10/06/21 17:00
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-25
Matrix: Solid
Percent Solids: 91.5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		12		mg/Kg	☼	10/14/21 11:11	10/14/21 17:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*80*		*41.5 - 162*	*10/14/21 11:11*	*10/14/21 17:54*	*1*

Client Sample ID: Trip Blank
Date Collected: 10/06/21 08:00
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-26
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		5.0		mg/Kg		10/14/21 11:11	10/14/21 18:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*118*		*41.5 - 162*	*10/14/21 11:11*	*10/14/21 18:15*	*1*

Client Sample ID: Trip Blank
Date Collected: 10/06/21 08:00
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-27
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		150		ug/L			10/12/21 16:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*107*		*68.7 - 141*		*10/12/21 16:08*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Client Sample ID: N1MW-7R-14.5-16-100421
Date Collected: 10/04/21 12:30
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-1
Matrix: Solid
Percent Solids: 91.8

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	**180**		11		mg/Kg	☼	10/12/21 13:22	10/13/21 03:20	1
Residual Range Organics (RRO) (C25-C36)	ND		27		mg/Kg	☼	10/12/21 13:22	10/13/21 03:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*95*		*50 - 150*	*10/12/21 13:22*	*10/13/21 03:20*	*1*
n-Triacontane-d62	*94*		*50 - 150*	*10/12/21 13:22*	*10/13/21 03:20*	*1*

Client Sample ID: N1MW-8-100421
Date Collected: 10/04/21 13:45
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	**1.4**		0.24		mg/L		10/12/21 09:41	10/12/21 18:12	1
Residual Range Organics (RRO) (C25-C36)	ND		0.39		mg/L		10/12/21 09:41	10/12/21 18:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*95*		*50 - 150*	*10/12/21 09:41*	*10/12/21 18:12*	*1*
n-Triacontane-d62	*99*		*50 - 150*	*10/12/21 09:41*	*10/12/21 18:12*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Client Sample ID: N1MW-5-100421
Date Collected: 10/04/21 14:55
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.24		mg/L		10/12/21 09:41	10/12/21 18:33	1
Residual Range Organics (RRO) (C25-C36)	ND		0.39		mg/L		10/12/21 09:41	10/12/21 18:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*96*		*50 - 150*	*10/12/21 09:41*	*10/12/21 18:33*	*1*
n-Triacontane-d62	*99*		*50 - 150*	*10/12/21 09:41*	*10/12/21 18:33*	*1*

Client Sample ID: N1MW-6R-14.5-15-100421
Date Collected: 10/04/21 15:30
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-4
Matrix: Solid
Percent Solids: 91.8

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	**62**		10		mg/Kg	☼	10/12/21 13:22	10/13/21 03:40	1
Residual Range Organics (RRO) (C25-C36)	**29**		26		mg/Kg	☼	10/12/21 13:22	10/13/21 03:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*99*		*50 - 150*	*10/12/21 13:22*	*10/13/21 03:40*	*1*
n-Triacontane-d62	*105*		*50 - 150*	*10/12/21 13:22*	*10/13/21 03:40*	*1*

Client Sample ID: N1MW-3-100421
Date Collected: 10/04/21 16:15
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.23		mg/L		10/12/21 09:41	10/12/21 18:53	1
Residual Range Organics (RRO) (C25-C36)	ND		0.39		mg/L		10/12/21 09:41	10/12/21 18:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*92*		*50 - 150*	*10/12/21 09:41*	*10/12/21 18:53*	*1*
n-Triacontane-d62	*93*		*50 - 150*	*10/12/21 09:41*	*10/12/21 18:53*	*1*

Client Sample ID: N1MW-2-100421
Date Collected: 10/04/21 17:05
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.24		mg/L		10/12/21 09:41	10/12/21 19:14	1
Residual Range Organics (RRO) (C25-C36)	ND		0.39		mg/L		10/12/21 09:41	10/12/21 19:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*98*		*50 - 150*	*10/12/21 09:41*	*10/12/21 19:14*	*1*
n-Triacontane-d62	*100*		*50 - 150*	*10/12/21 09:41*	*10/12/21 19:14*	*1*

Client Sample ID: N1MW-4-100421
Date Collected: 10/04/21 17:50
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.24		mg/L		10/12/21 09:41	10/12/21 19:34	1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued)

Client Sample ID: N1MW-4-100421
Date Collected: 10/04/21 17:50
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Residual Range Organics (RRO) (C25-C36)	ND		0.39		mg/L		10/12/21 09:41	10/12/21 19:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*91*		*50 - 150*	*10/12/21 09:41*	*10/12/21 19:34*	*1*
n-Triacontane-d62	*94*		*50 - 150*	*10/12/21 09:41*	*10/12/21 19:34*	*1*

Client Sample ID: N1MW-1R-16-17.5-100521
Date Collected: 10/05/21 09:45
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-8
Matrix: Solid
Percent Solids: 90.2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		11		mg/Kg	☼	10/12/21 13:22	10/13/21 04:00	1
Residual Range Organics (RRO) (C25-C36)	ND		27		mg/Kg	☼	10/12/21 13:22	10/13/21 04:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*93*		*50 - 150*	*10/12/21 13:22*	*10/13/21 04:00*	*1*
n-Triacontane-d62	*98*		*50 - 150*	*10/12/21 13:22*	*10/13/21 04:00*	*1*

Client Sample ID: HSB-1-15.5-17-100521
Date Collected: 10/05/21 13:00
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-9
Matrix: Solid
Percent Solids: 95.0

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	**210**		10		mg/Kg	☼	10/12/21 13:22	10/13/21 04:20	1
Residual Range Organics (RRO) (C25-C36)	ND		26		mg/Kg	☼	10/12/21 13:22	10/13/21 04:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*101*		*50 - 150*	*10/12/21 13:22*	*10/13/21 04:20*	*1*
n-Triacontane-d62	*101*		*50 - 150*	*10/12/21 13:22*	*10/13/21 04:20*	*1*

Client Sample ID: RB-55-100521
Date Collected: 10/05/21 13:20
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-10
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.23		mg/L		10/12/21 09:41	10/12/21 19:54	1
Residual Range Organics (RRO) (C25-C36)	ND		0.39		mg/L		10/12/21 09:41	10/12/21 19:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*90*		*50 - 150*	*10/12/21 09:41*	*10/12/21 19:54*	*1*
n-Triacontane-d62	*92*		*50 - 150*	*10/12/21 09:41*	*10/12/21 19:54*	*1*

Client Sample ID: HSB-1-100521
Date Collected: 10/05/21 14:25
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-11
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	**7.6**		0.23		mg/L		10/12/21 09:41	10/12/21 20:35	1
Residual Range Organics (RRO) (C25-C36)	ND		0.38		mg/L		10/12/21 09:41	10/12/21 20:35	1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	*92*		*50 - 150*	*10/12/21 09:41*	*10/12/21 20:35*	*1*
n-Triacontane-d62	*97*		*50 - 150*	*10/12/21 09:41*	*10/12/21 20:35*	*1*

Client Sample ID: HSB-2-15.5-16-100521
Date Collected: 10/05/21 14:50
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-12
Matrix: Solid
Percent Solids: 95.2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		10		mg/Kg	☼	10/12/21 13:22	10/13/21 04:40	1
Residual Range Organics (RRO) (C25-C36)	ND		26		mg/Kg	☼	10/12/21 13:22	10/13/21 04:40	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	*88*		*50 - 150*	*10/12/21 13:22*	*10/13/21 04:40*	*1*
n-Triacontane-d62	*93*		*50 - 150*	*10/12/21 13:22*	*10/13/21 04:40*	*1*

Client Sample ID: HSB-2-100521
Date Collected: 10/05/21 16:20
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-13
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	**7.8**		0.23		mg/L		10/12/21 09:41	10/12/21 20:55	1
Residual Range Organics (RRO) (C25-C36)	ND		0.38		mg/L		10/12/21 09:41	10/12/21 20:55	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	*88*		*50 - 150*	*10/12/21 09:41*	*10/12/21 20:55*	*1*
n-Triacontane-d62	*94*		*50 - 150*	*10/12/21 09:41*	*10/12/21 20:55*	*1*

Client Sample ID: HSB-3-13.5-14.5-100621
Date Collected: 10/06/21 10:00
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-14
Matrix: Solid
Percent Solids: 93.8

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	**19**		10		mg/Kg	☼	10/12/21 13:22	10/13/21 05:00	1
Residual Range Organics (RRO) (C25-C36)	**40**		26		mg/Kg	☼	10/12/21 13:22	10/13/21 05:00	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	*96*		*50 - 150*	*10/12/21 13:22*	*10/13/21 05:00*	*1*
n-Triacontane-d62	*107*		*50 - 150*	*10/12/21 13:22*	*10/13/21 05:00*	*1*

Client Sample ID: HSB-3-100621
Date Collected: 10/06/21 11:30
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-15
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	**6.4**		0.23		mg/L		10/12/21 09:41	10/12/21 21:16	1
Residual Range Organics (RRO) (C25-C36)	ND		0.38		mg/L		10/12/21 09:41	10/12/21 21:16	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	*92*		*50 - 150*	*10/12/21 09:41*	*10/12/21 21:16*	*1*
n-Triacontane-d62	*98*		*50 - 150*	*10/12/21 09:41*	*10/12/21 21:16*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Client Sample ID: DUP-5-100621
Date Collected: 10/06/21 08:30
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-16
Matrix: Solid
Percent Solids: 92.9

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	**24**		10		mg/Kg	☼	10/12/21 13:22	10/13/21 05:20	1
Residual Range Organics (RRO) (C25-C36)	**49**		26		mg/Kg	☼	10/12/21 13:22	10/13/21 05:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*93*		*50 - 150*	*10/12/21 13:22*	*10/13/21 05:20*	*1*
n-Triacontane-d62	*103*		*50 - 150*	*10/12/21 13:22*	*10/13/21 05:20*	*1*

Client Sample ID: DUP-GW-100621
Date Collected: 10/06/21 09:00
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-17
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	**6.0**		0.23		mg/L		10/12/21 09:41	10/12/21 21:36	1
Residual Range Organics (RRO) (C25-C36)	ND		0.38		mg/L		10/12/21 09:41	10/12/21 21:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*89*		*50 - 150*	*10/12/21 09:41*	*10/12/21 21:36*	*1*
n-Triacontane-d62	*95*		*50 - 150*	*10/12/21 09:41*	*10/12/21 21:36*	*1*

Client Sample ID: HSB-4-7-8-100621
Date Collected: 10/06/21 11:50
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-18
Matrix: Solid
Percent Solids: 82.6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		12		mg/Kg	☼	10/12/21 13:22	10/13/21 05:41	1
Residual Range Organics (RRO) (C25-C36)	ND		29		mg/Kg	☼	10/12/21 13:22	10/13/21 05:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*81*		*50 - 150*	*10/12/21 13:22*	*10/13/21 05:41*	*1*
n-Triacontane-d62	*94*		*50 - 150*	*10/12/21 13:22*	*10/13/21 05:41*	*1*

Client Sample ID: HSB-4-11-12-100621
Date Collected: 10/06/21 12:15
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-19
Matrix: Solid
Percent Solids: 94.5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		10		mg/Kg	☼	10/12/21 13:22	10/13/21 06:01	1
Residual Range Organics (RRO) (C25-C36)	ND		25		mg/Kg	☼	10/12/21 13:22	10/13/21 06:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*89*		*50 - 150*	*10/12/21 13:22*	*10/13/21 06:01*	*1*
n-Triacontane-d62	*96*		*50 - 150*	*10/12/21 13:22*	*10/13/21 06:01*	*1*

Client Sample ID: HSB-5-7.5-9-100621
Date Collected: 10/06/21 14:20
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-20
Matrix: Solid
Percent Solids: 92.3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		10		mg/Kg	☼	10/12/21 13:22	10/13/21 06:41	1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued)

Client Sample ID: HSB-5-7.5-9-100621
Date Collected: 10/06/21 14:20
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-20
Matrix: Solid
Percent Solids: 92.3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Residual Range Organics (RRO) (C25-C36)	**81**		26		mg/Kg	☼	10/12/21 13:22	10/13/21 06:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*92*		*50 - 150*	*10/12/21 13:22*	*10/13/21 06:41*	*1*
n-Triacontane-d62	*98*		*50 - 150*	*10/12/21 13:22*	*10/13/21 06:41*	*1*

Client Sample ID: N1MW-6R-100621
Date Collected: 10/06/21 15:05
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-22
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	**3.3**		0.23		mg/L		10/12/21 09:41	10/13/21 11:55	1
Residual Range Organics (RRO) (C25-C36)	ND		0.38		mg/L		10/12/21 09:41	10/13/21 11:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*90*		*50 - 150*	*10/12/21 09:41*	*10/13/21 11:55*	*1*
n-Triacontane-d62	*97*		*50 - 150*	*10/12/21 09:41*	*10/13/21 11:55*	*1*

Client Sample ID: N1MW-7R-100621
Date Collected: 10/06/21 15:55
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-23
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	**2.7**		0.23		mg/L		10/12/21 09:41	10/12/21 22:17	1
Residual Range Organics (RRO) (C25-C36)	ND		0.38		mg/L		10/12/21 09:41	10/12/21 22:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*91*		*50 - 150*	*10/12/21 09:41*	*10/12/21 22:17*	*1*
n-Triacontane-d62	*95*		*50 - 150*	*10/12/21 09:41*	*10/12/21 22:17*	*1*

Client Sample ID: N1MW-1R-100621
Date Collected: 10/06/21 16:20
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-24
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	**4.2**		0.23		mg/L		10/12/21 09:41	10/12/21 22:37	1
Residual Range Organics (RRO) (C25-C36)	ND		0.38		mg/L		10/12/21 09:41	10/12/21 22:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*95*		*50 - 150*	*10/12/21 09:41*	*10/12/21 22:37*	*1*
n-Triacontane-d62	*99*		*50 - 150*	*10/12/21 09:41*	*10/12/21 22:37*	*1*

Client Sample ID: WASTE-100621
Date Collected: 10/06/21 17:00
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-25
Matrix: Solid
Percent Solids: 91.5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	**30**		11		mg/Kg	☼	10/12/21 13:22	10/13/21 07:01	1
Residual Range Organics (RRO) (C25-C36)	**350**		27		mg/Kg	☼	10/12/21 13:22	10/13/21 07:01	1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*88*		*50 - 150*	*10/12/21 13:22*	*10/13/21 07:01*	*1*
n-Triacontane-d62	*116*		*50 - 150*	*10/12/21 13:22*	*10/13/21 07:01*	*1*

Method: 6010D - Metals (ICP)

Client Sample ID: WASTE-100621
Date Collected: 10/06/21 17:00
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-25
Matrix: Solid
Percent Solids: 91.5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**9.0**		0.97		mg/Kg	☼	10/11/21 10:04	10/12/21 13:59	1
Barium	**98**		0.97		mg/Kg	☼	10/11/21 10:04	10/12/21 13:59	1
Cadmium	ND		0.77		mg/Kg	☼	10/11/21 10:04	10/12/21 13:59	1
Chromium	**17**	**^1+**	0.97		mg/Kg	☼	10/11/21 10:04	10/12/21 13:59	1
Lead	**24**		2.3		mg/Kg	☼	10/11/21 10:04	10/12/21 13:59	1
Selenium	ND		3.9		mg/Kg	☼	10/11/21 10:04	10/12/21 13:59	1
Silver	ND		0.97		mg/Kg	☼	10/11/21 10:04	10/12/21 13:59	1

Method: 7471B - Mercury (CVAA)

Client Sample ID: WASTE-100621
Date Collected: 10/06/21 17:00
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-25
Matrix: Solid
Percent Solids: 91.5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		48		ug/Kg	☼	10/11/21 10:02	10/11/21 17:16	1

Method: 8260D - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 590-33510/5
Matrix: Water
Analysis Batch: 33510

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.40		ug/L			10/11/21 22:19	1
Ethylbenzene	ND		1.0		ug/L			10/11/21 22:19	1
m,p-Xylene	ND		2.0		ug/L			10/11/21 22:19	1
o-Xylene	ND		1.0		ug/L			10/11/21 22:19	1
Toluene	ND		1.0		ug/L			10/11/21 22:19	1
Xylenes, Total	ND		3.0		ug/L			10/11/21 22:19	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*80 - 120*		*10/11/21 22:19*	*1*
4-Bromofluorobenzene (Surr)	*104*		*80 - 120*		*10/11/21 22:19*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 120*		*10/11/21 22:19*	*1*
Toluene-d8 (Surr)	*101*		*80 - 120*		*10/11/21 22:19*	*1*

Lab Sample ID: LCS 590-33510/1002
Matrix: Water
Analysis Batch: 33510

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Benzene			10.0	11.0		ug/L		110	80 - 126		
Ethylbenzene			10.0	10.7		ug/L		107	80 - 128		
m,p-Xylene			10.0	10.5		ug/L		105	80 - 127		
o-Xylene			10.0	11.1		ug/L		111	80 - 126		
Toluene			10.0	10.6		ug/L		106	80 - 129		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*80 - 120*
4-Bromofluorobenzene (Surr)	*103*		*80 - 120*
Dibromofluoromethane (Surr)	*95*		*80 - 120*
Toluene-d8 (Surr)	*95*		*80 - 120*

Lab Sample ID: LCSD 590-33510/3
Matrix: Water
Analysis Batch: 33510

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene			10.0	11.2		ug/L		112	80 - 126	2	18
Ethylbenzene			10.0	10.8		ug/L		108	80 - 128	1	18
m,p-Xylene			10.0	11.1		ug/L		111	80 - 127	5	18
o-Xylene			10.0	11.5		ug/L		115	80 - 126	3	17
Toluene			10.0	11.0		ug/L		110	80 - 129	4	18

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*80 - 120*
4-Bromofluorobenzene (Surr)	*104*		*80 - 120*
Dibromofluoromethane (Surr)	*96*		*80 - 120*
Toluene-d8 (Surr)	*98*		*80 - 120*

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 590-33521/6
Matrix: Water
Analysis Batch: 33521

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.40		ug/L			10/12/21 11:13	1
Ethylbenzene	ND		1.0		ug/L			10/12/21 11:13	1
m,p-Xylene	ND		2.0		ug/L			10/12/21 11:13	1
o-Xylene	ND		1.0		ug/L			10/12/21 11:13	1
Toluene	ND		1.0		ug/L			10/12/21 11:13	1
Xylenes, Total	ND		3.0		ug/L			10/12/21 11:13	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*80 - 120*		*10/12/21 11:13*	*1*
4-Bromofluorobenzene (Surr)	*103*		*80 - 120*		*10/12/21 11:13*	*1*
Dibromofluoromethane (Surr)	*103*		*80 - 120*		*10/12/21 11:13*	*1*
Toluene-d8 (Surr)	*100*		*80 - 120*		*10/12/21 11:13*	*1*

Lab Sample ID: LCS 590-33521/1003
Matrix: Water
Analysis Batch: 33521

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	10.0	11.1		ug/L		111	80 - 126
Ethylbenzene	10.0	10.6		ug/L		106	80 - 128
m,p-Xylene	10.0	11.0		ug/L		110	80 - 127
o-Xylene	10.0	11.0		ug/L		110	80 - 126
Toluene	10.0	10.5		ug/L		105	80 - 129

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*105*		*80 - 120*
4-Bromofluorobenzene (Surr)	*109*		*80 - 120*
Dibromofluoromethane (Surr)	*104*		*80 - 120*
Toluene-d8 (Surr)	*96*		*80 - 120*

Lab Sample ID: LCSD 590-33521/4
Matrix: Water
Analysis Batch: 33521

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	10.0	11.1		ug/L		111	80 - 126	0	18
Ethylbenzene	10.0	10.4		ug/L		104	80 - 128	2	18
m,p-Xylene	10.0	11.0		ug/L		110	80 - 127	1	18
o-Xylene	10.0	11.9		ug/L		119	80 - 126	8	17
Toluene	10.0	10.8		ug/L		108	80 - 129	3	18

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*107*		*80 - 120*
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*
Dibromofluoromethane (Surr)	*102*		*80 - 120*
Toluene-d8 (Surr)	*98*		*80 - 120*

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 590-33556/1-A
Matrix: Solid
Analysis Batch: 33552

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 33556

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.020	0.010	mg/Kg		10/14/21 11:11	10/14/21 11:39	1
Ethylbenzene	ND		0.10	0.016	mg/Kg		10/14/21 11:11	10/14/21 11:39	1
m,p-Xylene	ND		0.40	0.029	mg/Kg		10/14/21 11:11	10/14/21 11:39	1
o-Xylene	ND		0.20	0.023	mg/Kg		10/14/21 11:11	10/14/21 11:39	1
Toluene	ND		0.10	0.013	mg/Kg		10/14/21 11:11	10/14/21 11:39	1
Xylenes, Total	ND		0.60	0.052	mg/Kg		10/14/21 11:11	10/14/21 11:39	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 129*	*10/14/21 11:11*	*10/14/21 11:39*	*1*
4-Bromofluorobenzene (Surr)	*89*		*76 - 122*	*10/14/21 11:11*	*10/14/21 11:39*	*1*
Dibromofluoromethane (Surr)	*121*	*S1+*	*80 - 120*	*10/14/21 11:11*	*10/14/21 11:39*	*1*
Toluene-d8 (Surr)	*112*		*80 - 120*	*10/14/21 11:11*	*10/14/21 11:39*	*1*

Lab Sample ID: LCS 590-33556/2-A
Matrix: Solid
Analysis Batch: 33552

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 33556

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	0.500	0.544		mg/Kg		109	76 - 129
Ethylbenzene	0.500	0.542		mg/Kg		108	77 - 126
m,p-Xylene	0.500	0.509		mg/Kg		102	78 - 130
o-Xylene	0.500	0.452		mg/Kg		90	77 - 129
Toluene	0.500	0.421		mg/Kg		84	77 - 131

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*107*		*75 - 129*
4-Bromofluorobenzene (Surr)	*144*	*S1+*	*76 - 122*
Dibromofluoromethane (Surr)	*102*		*80 - 120*
Toluene-d8 (Surr)	*80*		*80 - 120*

Lab Sample ID: 590-16086-4 MS
Matrix: Solid
Analysis Batch: 33552

Client Sample ID: N1MW-6R-14.5-15-100421
Prep Type: Total/NA
Prep Batch: 33556

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	ND		1.05	1.01		mg/Kg	☼	96	76 - 129
Ethylbenzene	3.4		1.05	4.51		mg/Kg	☼	110	77 - 126
m,p-Xylene	12	E	1.05	12.8	E 4	mg/Kg	☼	96	78 - 130
o-Xylene	0.43		1.05	1.53		mg/Kg	☼	106	77 - 129
Toluene	ND		1.05	1.10		mg/Kg	☼	105	77 - 131

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 129*
4-Bromofluorobenzene (Surr)	*86*		*76 - 122*
Dibromofluoromethane (Surr)	*85*		*80 - 120*
Toluene-d8 (Surr)	*94*		*80 - 120*

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: 590-16086-4 MSD
Matrix: Solid
Analysis Batch: 33552

Client Sample ID: N1MW-6R-14.5-15-100421
Prep Type: Total/NA
Prep Batch: 33556

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	ND		1.05	0.926		mg/Kg	☼	88	76 - 129	8	25
Ethylbenzene	3.4		1.05	4.45		mg/Kg	☼	104	77 - 126	1	25
m,p-Xylene	12	E	1.05	12.8	E 4	mg/Kg	☼	91	78 - 130	0	23
o-Xylene	0.43		1.05	1.53		mg/Kg	☼	106	77 - 129	0	25
Toluene	ND		1.05	1.04		mg/Kg	☼	100	77 - 131	5	25

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 129*
4-Bromofluorobenzene (Surr)	*94*		*76 - 122*
Dibromofluoromethane (Surr)	*83*		*80 - 120*
Toluene-d8 (Surr)	*101*		*80 - 120*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS)

Lab Sample ID: MB 590-33509/5
Matrix: Water
Analysis Batch: 33509

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		150		ug/L			10/11/21 22:19	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*104*		*68.7 - 141*		*10/11/21 22:19*	*1*

Lab Sample ID: LCS 590-33509/1004
Matrix: Water
Analysis Batch: 33509

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Gasoline			1000	1270	*+	ug/L		127	80 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*106*		*68.7 - 141*

Lab Sample ID: LCSD 590-33509/1015
Matrix: Water
Analysis Batch: 33509

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline			1000	1280	*+	ug/L		128	80 - 120	1	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*108*		*68.7 - 141*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC/MS) (Continued)

Lab Sample ID: MB 590-33520/6
Matrix: Water
Analysis Batch: 33520

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		150		ug/L			10/12/21 11:13	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*103*		*68.7 - 141*		*10/12/21 11:13*	*1*

Lab Sample ID: LCS 590-33520/1005
Matrix: Water
Analysis Batch: 33520

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Gasoline			1000	1040		ug/L		104	80 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*109*		*68.7 - 141*

Lab Sample ID: LCSD 590-33520/1016
Matrix: Water
Analysis Batch: 33520

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline			1000	1010		ug/L		101	80 - 120	2	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*106*		*68.7 - 141*

Lab Sample ID: MB 590-33556/1-A
Matrix: Solid
Analysis Batch: 33551

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 33556

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		5.0		mg/Kg		10/14/21 11:11	10/14/21 11:39	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*89*		*41.5 - 162*	*10/14/21 11:11*	*10/14/21 11:39*	*1*

Lab Sample ID: LCS 590-33556/3-A
Matrix: Solid
Analysis Batch: 33551

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 33556

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Gasoline			50.2	50.2		mg/Kg		100	74.4 - 124		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*94*		*41.5 - 162*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Lab Sample ID: MB 590-33516/1-A
Matrix: Water
Analysis Batch: 33518

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 33516

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.24		mg/L		10/12/21 09:41	10/12/21 16:49	1
Residual Range Organics (RRO) (C25-C36)	ND		0.40		mg/L		10/12/21 09:41	10/12/21 16:49	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*90*		*50 - 150*	*10/12/21 09:41*	*10/12/21 16:49*	*1*
n-Triacontane-d62	*90*		*50 - 150*	*10/12/21 09:41*	*10/12/21 16:49*	*1*

Lab Sample ID: LCS 590-33516/2-A
Matrix: Water
Analysis Batch: 33518

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 33516

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Diesel Range Organics (DRO) (C10-C25)	1.60	1.25		mg/L		78	50 - 150
Residual Range Organics (RRO) (C25-C36)	1.60	1.65		mg/L		103	50 - 150

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl	*96*		*50 - 150*
n-Triacontane-d62	*100*		*50 - 150*

Lab Sample ID: LCSD 590-33516/3-A
Matrix: Water
Analysis Batch: 33518

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 33516

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Diesel Range Organics (DRO) (C10-C25)	1.60	1.19		mg/L		75	50 - 150	4	25
Residual Range Organics (RRO) (C25-C36)	1.60	1.59		mg/L		100	50 - 150	4	25

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o-Terphenyl	*96*		*50 - 150*
n-Triacontane-d62	*101*		*50 - 150*

Lab Sample ID: MB 590-33527/1-A
Matrix: Solid
Analysis Batch: 33518

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 33527

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		10		mg/Kg		10/12/21 13:22	10/12/21 23:18	1
Residual Range Organics (RRO) (C25-C36)	ND		25		mg/Kg		10/12/21 13:22	10/12/21 23:18	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*95*		*50 - 150*	*10/12/21 13:22*	*10/12/21 23:18*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued)

Lab Sample ID: MB 590-33527/1-A
Matrix: Solid
Analysis Batch: 33518

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 33527

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
n-Triacontane-d62	97		50 - 150	10/12/21 13:22	10/12/21 23:18	1

Lab Sample ID: LCS 590-33527/2-A
Matrix: Solid
Analysis Batch: 33518

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 33527

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Diesel Range Organics (DRO) (C10-C25)			66.7	66.0		mg/Kg		99	50 - 150		
Residual Range Organics (RRO) (C25-C36)			66.7	69.3		mg/Kg		104	50 - 150		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
o-Terphenyl	106		50 - 150
n-Triacontane-d62	110		50 - 150

Lab Sample ID: LCSD 590-33527/3-A
Matrix: Solid
Analysis Batch: 33518

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 33527

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Diesel Range Organics (DRO) (C10-C25)			66.7	70.4		mg/Kg		106	50 - 150	6	25
Residual Range Organics (RRO) (C25-C36)			66.7	73.4		mg/Kg		110	50 - 150	6	25

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
o-Terphenyl	110		50 - 150
n-Triacontane-d62	120		50 - 150

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 590-33499/2-A
Matrix: Solid
Analysis Batch: 33528

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 33499

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.3		mg/Kg		10/11/21 10:04	10/12/21 11:29	1
Barium	ND		1.3		mg/Kg		10/11/21 10:04	10/12/21 11:29	1
Cadmium	ND		1.0		mg/Kg		10/11/21 10:04	10/12/21 11:29	1
Chromium	ND	^1+	1.3		mg/Kg		10/11/21 10:04	10/12/21 11:29	1
Lead	ND		3.0		mg/Kg		10/11/21 10:04	10/12/21 11:29	1
Selenium	ND		5.0		mg/Kg		10/11/21 10:04	10/12/21 11:29	1
Silver	ND		1.3		mg/Kg		10/11/21 10:04	10/12/21 11:29	1

Method: 6010D - Metals (ICP) (Continued)

Lab Sample ID: LCS 590-33499/1-A
Matrix: Solid
Analysis Batch: 33528

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 33499

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	100	100		mg/Kg		100	80 - 120
Barium	100	97.8		mg/Kg		98	80 - 120
Cadmium	50.0	48.9		mg/Kg		98	80 - 120
Chromium	50.0	49.5	^1+	mg/Kg		99	80 - 120
Lead	50.0	53.6		mg/Kg		107	80 - 120
Selenium	100	101		mg/Kg		101	80 - 120
Silver	5.00	4.53		mg/Kg		91	80 - 120

Method: 7471B - Mercury (CVAA)

Lab Sample ID: MB 590-33498/9-A
Matrix: Solid
Analysis Batch: 33511

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 33498

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		50	3.6	ug/Kg		10/11/21 10:01	10/11/21 16:32	1

Lab Sample ID: LCS 590-33498/8-A
Matrix: Solid
Analysis Batch: 33511

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 33498

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Hg	200	199		ug/Kg		100	80 - 120

Client Sample ID: N1MW-7R-14.5-16-100421
Date Collected: 10/04/21 12:30
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-1
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	33507	10/11/21 14:11	KBZ	TAL SPK

Client Sample ID: N1MW-7R-14.5-16-100421
Date Collected: 10/04/21 12:30
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-1
Matrix: Solid
Percent Solids: 91.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			33556	10/14/21 11:11	JSP	TAL SPK
Total/NA	Analysis	8260D		1	33552	10/14/21 13:03	JSP	TAL SPK
Total/NA	Prep	5035			33556	10/14/21 11:11	JSP	TAL SPK
Total/NA	Analysis	8260D		100	33603	10/18/21 12:37	JSP	TAL SPK
Total/NA	Prep	5035			33556	10/14/21 11:11	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		100	33602	10/18/21 12:37	JSP	TAL SPK
Total/NA	Prep	3550C			33527	10/12/21 13:22	KBZ	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	33518	10/13/21 03:20	NMI	TAL SPK

Client Sample ID: N1MW-8-100421
Date Collected: 10/04/21 13:45
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	33510	10/12/21 01:25	JSP	TAL SPK
Total/NA	Analysis	8260D		1	33521	10/12/21 11:56	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	33509	10/12/21 01:25	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	33520	10/12/21 11:56	JSP	TAL SPK
Total/NA	Prep	3510C			33516	10/12/21 09:41	KBZ	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	33518	10/12/21 18:12	NMI	TAL SPK

Client Sample ID: N1MW-5-100421
Date Collected: 10/04/21 14:55
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	33510	10/12/21 02:06	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	33509	10/12/21 02:06	JSP	TAL SPK
Total/NA	Prep	3510C			33516	10/12/21 09:41	KBZ	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	33518	10/12/21 18:33	NMI	TAL SPK

Client Sample ID: N1MW-6R-14.5-15-100421
Date Collected: 10/04/21 15:30
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-4
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	33507	10/11/21 14:11	KBZ	TAL SPK

Client Sample ID: N1MW-6R-14.5-15-100421

Lab Sample ID: 590-16086-4
Date Collected: 10/04/21 15:30
Matrix: Solid
Date Received: 10/08/21 08:55
Percent Solids: 91.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			33556	10/14/21 11:11	JSP	TAL SPK
Total/NA	Analysis	8260D		1	33552	10/14/21 13:44	JSP	TAL SPK
Total/NA	Prep	5035			33556	10/14/21 11:11	JSP	TAL SPK
Total/NA	Analysis	8260D		10	33603	10/18/21 12:58	JSP	TAL SPK
Total/NA	Prep	5035			33556	10/14/21 11:11	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		10	33602	10/18/21 12:58	JSP	TAL SPK
Total/NA	Prep	3550C			33527	10/12/21 13:22	KBZ	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	33518	10/13/21 03:40	NMI	TAL SPK

Client Sample ID: N1MW-3-100421

Lab Sample ID: 590-16086-5
Date Collected: 10/04/21 16:15
Matrix: Water
Date Received: 10/08/21 08:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	33510	10/12/21 02:27	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	33509	10/12/21 02:27	JSP	TAL SPK
Total/NA	Prep	3510C			33516	10/12/21 09:41	KBZ	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	33518	10/12/21 18:53	NMI	TAL SPK

Client Sample ID: N1MW-2-100421

Lab Sample ID: 590-16086-6
Date Collected: 10/04/21 17:05
Matrix: Water
Date Received: 10/08/21 08:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	33510	10/12/21 02:47	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	33509	10/12/21 02:47	JSP	TAL SPK
Total/NA	Prep	3510C			33516	10/12/21 09:41	KBZ	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	33518	10/12/21 19:14	NMI	TAL SPK

Client Sample ID: N1MW-4-100421

Lab Sample ID: 590-16086-7
Date Collected: 10/04/21 17:50
Matrix: Water
Date Received: 10/08/21 08:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	33510	10/12/21 03:08	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	33509	10/12/21 03:08	JSP	TAL SPK
Total/NA	Prep	3510C			33516	10/12/21 09:41	KBZ	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	33518	10/12/21 19:34	NMI	TAL SPK

Client Sample ID: N1MW-1R-16-17.5-100521

Lab Sample ID: 590-16086-8
Date Collected: 10/05/21 09:45
Matrix: Solid
Date Received: 10/08/21 08:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	33507	10/11/21 14:11	KBZ	TAL SPK

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: Tiger Oil/1148010.010.012

Job ID: 590-16086-1

Client Sample ID: N1MW-1R-16-17.5-100521

Lab Sample ID: 590-16086-8
Date Collected: 10/05/21 09:45
Matrix: Solid
Date Received: 10/08/21 08:55
Percent Solids: 90.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			33556	10/14/21 11:11	JSP	TAL SPK
Total/NA	Analysis	8260D		1	33552	10/14/21 15:08	JSP	TAL SPK
Total/NA	Prep	5035			33556	10/14/21 11:11	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	33551	10/14/21 15:08	JSP	TAL SPK
Total/NA	Prep	3550C			33527	10/12/21 13:22	KBZ	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	33518	10/13/21 04:00	NMI	TAL SPK

Client Sample ID: HSB-1-15.5-17-100521

Lab Sample ID: 590-16086-9
Date Collected: 10/05/21 13:00
Matrix: Solid
Date Received: 10/08/21 08:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	33507	10/11/21 14:11	KBZ	TAL SPK

Client Sample ID: HSB-1-15.5-17-100521

Lab Sample ID: 590-16086-9
Date Collected: 10/05/21 13:00
Matrix: Solid
Date Received: 10/08/21 08:55
Percent Solids: 95.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			33556	10/14/21 11:11	JSP	TAL SPK
Total/NA	Analysis	8260D		1	33552	10/14/21 15:28	JSP	TAL SPK
Total/NA	Prep	5035			33556	10/14/21 11:11	JSP	TAL SPK
Total/NA	Analysis	8260D		10	33603	10/18/21 13:19	JSP	TAL SPK
Total/NA	Prep	5035			33556	10/14/21 11:11	JSP	TAL SPK
Total/NA	Analysis	8260D		100	33603	10/18/21 14:43	JSP	TAL SPK
Total/NA	Prep	5035			33556	10/14/21 11:11	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		10	33602	10/18/21 13:19	JSP	TAL SPK
Total/NA	Prep	3550C			33527	10/12/21 13:22	KBZ	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	33518	10/13/21 04:20	NMI	TAL SPK

Client Sample ID: RB-55-100521

Lab Sample ID: 590-16086-10
Date Collected: 10/05/21 13:20
Matrix: Water
Date Received: 10/08/21 08:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	33510	10/12/21 03:28	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	33509	10/12/21 03:28	JSP	TAL SPK
Total/NA	Prep	3510C			33516	10/12/21 09:41	KBZ	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	33518	10/12/21 19:54	NMI	TAL SPK

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: Tiger Oil/1148010.010.012

Job ID: 590-16086-1

Client Sample ID: HSB-1-100521
Date Collected: 10/05/21 14:25
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-11
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		5	33510	10/12/21 03:49	JSP	TAL SPK
Total/NA	Analysis	8260D		10	33521	10/12/21 12:17	JSP	TAL SPK
Total/NA	Analysis	8260D		10	33521	10/12/21 16:29	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		10	33520	10/12/21 12:17	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		10	33520	10/12/21 16:29	JSP	TAL SPK
Total/NA	Prep	3510C			33516	10/12/21 09:41	KBZ	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	33518	10/12/21 20:35	NMI	TAL SPK

Client Sample ID: HSB-2-15.5-16-100521
Date Collected: 10/05/21 14:50
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-12
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	33507	10/11/21 14:11	KBZ	TAL SPK

Client Sample ID: HSB-2-15.5-16-100521
Date Collected: 10/05/21 14:50
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-12
Matrix: Solid
Percent Solids: 95.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			33556	10/14/21 11:11	JSP	TAL SPK
Total/NA	Analysis	8260D		1	33552	10/14/21 15:49	JSP	TAL SPK
Total/NA	Prep	5035			33556	10/14/21 11:11	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	33551	10/14/21 15:49	JSP	TAL SPK
Total/NA	Prep	3550C			33527	10/12/21 13:22	KBZ	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	33518	10/13/21 04:40	NMI	TAL SPK

Client Sample ID: HSB-2-100521
Date Collected: 10/05/21 16:20
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-13
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	33510	10/12/21 04:09	JSP	TAL SPK
Total/NA	Analysis	8260D		100	33521	10/12/21 12:59	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		100	33520	10/12/21 12:59	JSP	TAL SPK
Total/NA	Prep	3510C			33516	10/12/21 09:41	KBZ	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	33518	10/12/21 20:55	NMI	TAL SPK

Client Sample ID: HSB-3-13.5-14.5-100621
Date Collected: 10/06/21 10:00
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-14
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	33507	10/11/21 14:11	KBZ	TAL SPK

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: Tiger Oil/1148010.010.012

Job ID: 590-16086-1

Client Sample ID: HSB-3-13.5-14.5-100621

Lab Sample ID: 590-16086-14
Date Collected: 10/06/21 10:00
Matrix: Solid
Date Received: 10/08/21 08:55
Percent Solids: 93.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			33556	10/14/21 11:11	JSP	TAL SPK
Total/NA	Analysis	8260D		1	33552	10/14/21 16:10	JSP	TAL SPK
Total/NA	Prep	5035			33556	10/14/21 11:11	JSP	TAL SPK
Total/NA	Analysis	8260D		10	33603	10/18/21 13:40	JSP	TAL SPK
Total/NA	Prep	5035			33556	10/14/21 11:11	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	33551	10/14/21 16:10	JSP	TAL SPK
Total/NA	Prep	3550C			33527	10/12/21 13:22	KBZ	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	33518	10/13/21 05:00	NMI	TAL SPK

Client Sample ID: HSB-3-100621

Lab Sample ID: 590-16086-15
Date Collected: 10/06/21 11:30
Matrix: Water
Date Received: 10/08/21 08:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	33510	10/12/21 04:30	JSP	TAL SPK
Total/NA	Analysis	8260D		10	33521	10/12/21 13:20	JSP	TAL SPK
Total/NA	Analysis	8260D		100	33521	10/12/21 13:41	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		100	33520	10/12/21 13:41	JSP	TAL SPK
Total/NA	Prep	3510C			33516	10/12/21 09:41	KBZ	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	33518	10/12/21 21:16	NMI	TAL SPK

Client Sample ID: DUP-5-100621

Lab Sample ID: 590-16086-16
Date Collected: 10/06/21 08:30
Matrix: Solid
Date Received: 10/08/21 08:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	33507	10/11/21 14:11	KBZ	TAL SPK

Client Sample ID: DUP-5-100621

Lab Sample ID: 590-16086-16
Date Collected: 10/06/21 08:30
Matrix: Solid
Date Received: 10/08/21 08:55
Percent Solids: 92.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			33556	10/14/21 11:11	JSP	TAL SPK
Total/NA	Analysis	8260D		1	33552	10/14/21 16:31	JSP	TAL SPK
Total/NA	Prep	5035			33556	10/14/21 11:11	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	33551	10/14/21 16:31	JSP	TAL SPK
Total/NA	Prep	3550C			33527	10/12/21 13:22	KBZ	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	33518	10/13/21 05:20	NMI	TAL SPK

Client Sample ID: DUP-GW-100621

Lab Sample ID: 590-16086-17

Date Collected: 10/06/21 09:00

Matrix: Water

Date Received: 10/08/21 08:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	33510	10/12/21 04:51	JSP	TAL SPK
Total/NA	Analysis	8260D		100	33521	10/12/21 14:02	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		100	33520	10/12/21 14:02	JSP	TAL SPK
Total/NA	Prep	3510C			33516	10/12/21 09:41	KBZ	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	33518	10/12/21 21:36	NMI	TAL SPK

Client Sample ID: HSB-4-7-8-100621

Lab Sample ID: 590-16086-18

Date Collected: 10/06/21 11:50

Matrix: Solid

Date Received: 10/08/21 08:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	33507	10/11/21 14:11	KBZ	TAL SPK

Client Sample ID: HSB-4-7-8-100621

Lab Sample ID: 590-16086-18

Date Collected: 10/06/21 11:50

Matrix: Solid

Date Received: 10/08/21 08:55

Percent Solids: 82.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			33556	10/14/21 11:11	JSP	TAL SPK
Total/NA	Analysis	8260D		1	33552	10/14/21 16:52	JSP	TAL SPK
Total/NA	Prep	5035			33556	10/14/21 11:11	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	33551	10/14/21 16:52	JSP	TAL SPK
Total/NA	Prep	3550C			33527	10/12/21 13:22	KBZ	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	33518	10/13/21 05:41	NMI	TAL SPK

Client Sample ID: HSB-4-11-12-100621

Lab Sample ID: 590-16086-19

Date Collected: 10/06/21 12:15

Matrix: Solid

Date Received: 10/08/21 08:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	33507	10/11/21 14:11	KBZ	TAL SPK

Client Sample ID: HSB-4-11-12-100621

Lab Sample ID: 590-16086-19

Date Collected: 10/06/21 12:15

Matrix: Solid

Date Received: 10/08/21 08:55

Percent Solids: 94.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			33556	10/14/21 11:11	JSP	TAL SPK
Total/NA	Analysis	8260D		1	33552	10/14/21 17:12	JSP	TAL SPK
Total/NA	Prep	5035			33556	10/14/21 11:11	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	33551	10/14/21 17:12	JSP	TAL SPK
Total/NA	Prep	3550C			33527	10/12/21 13:22	KBZ	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	33518	10/13/21 06:01	NMI	TAL SPK

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: Tiger Oil/1148010.010.012

Job ID: 590-16086-1

Client Sample ID: HSB-5-7.5-9-100621
Date Collected: 10/06/21 14:20
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-20
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	33507	10/11/21 14:11	KBZ	TAL SPK

Client Sample ID: HSB-5-7.5-9-100621
Date Collected: 10/06/21 14:20
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-20
Matrix: Solid
Percent Solids: 92.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			33556	10/14/21 11:11	JSP	TAL SPK
Total/NA	Analysis	8260D		1	33552	10/14/21 17:33	JSP	TAL SPK
Total/NA	Prep	5035			33556	10/14/21 11:11	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	33551	10/14/21 17:33	JSP	TAL SPK
Total/NA	Prep	3550C			33527	10/12/21 13:22	KBZ	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	33518	10/13/21 06:41	NMI	TAL SPK

Client Sample ID: N1MW-6R-100621
Date Collected: 10/06/21 15:05
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-22
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	33510	10/12/21 05:11	JSP	TAL SPK
Total/NA	Analysis	8260D		10	33521	10/12/21 14:23	JSP	TAL SPK
Total/NA	Analysis	8260D		100	33521	10/12/21 16:51	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		10	33520	10/12/21 14:23	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		100	33520	10/12/21 16:51	JSP	TAL SPK
Total/NA	Prep	3510C			33516	10/12/21 09:41	KBZ	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	33518	10/13/21 11:55	NMI	TAL SPK

Client Sample ID: N1MW-7R-100621
Date Collected: 10/06/21 15:55
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-23
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	33510	10/12/21 05:52	JSP	TAL SPK
Total/NA	Analysis	8260D		10	33521	10/12/21 15:05	JSP	TAL SPK
Total/NA	Analysis	8260D		100	33521	10/12/21 17:12	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		10	33520	10/12/21 15:05	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		100	33520	10/12/21 17:12	JSP	TAL SPK
Total/NA	Prep	3510C			33516	10/12/21 09:41	KBZ	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	33518	10/12/21 22:17	NMI	TAL SPK

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: Tiger Oil/1148010.010.012

Job ID: 590-16086-1

Client Sample ID: N1MW-1R-100621

Lab Sample ID: 590-16086-24
Matrix: Water
Date Collected: 10/06/21 16:20
Date Received: 10/08/21 08:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	33510	10/12/21 06:13	JSP	TAL SPK
Total/NA	Analysis	8260D		10	33521	10/12/21 15:26	JSP	TAL SPK
Total/NA	Analysis	8260D		100	33521	10/12/21 15:47	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		10	33520	10/12/21 15:26	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		100	33520	10/12/21 15:47	JSP	TAL SPK
Total/NA	Prep	3510C			33516	10/12/21 09:41	KBZ	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	33518	10/12/21 22:37	NMI	TAL SPK

Client Sample ID: WASTE-100621

Lab Sample ID: 590-16086-25
Matrix: Solid
Date Collected: 10/06/21 17:00
Date Received: 10/08/21 08:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	33507	10/11/21 14:11	KBZ	TAL SPK

Client Sample ID: WASTE-100621

Lab Sample ID: 590-16086-25
Matrix: Solid
Date Collected: 10/06/21 17:00
Date Received: 10/08/21 08:55
Percent Solids: 91.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			33556	10/14/21 11:11	JSP	TAL SPK
Total/NA	Analysis	8260D		1	33552	10/14/21 17:54	JSP	TAL SPK
Total/NA	Prep	5035			33556	10/14/21 11:11	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	33551	10/14/21 17:54	JSP	TAL SPK
Total/NA	Prep	3550C			33527	10/12/21 13:22	KBZ	TAL SPK
Total/NA	Analysis	NWTPH-Dx		1	33518	10/13/21 07:01	NMI	TAL SPK
Total/NA	Prep	3050B			33499	10/11/21 10:04	AMB	TAL SPK
Total/NA	Analysis	6010D		1	33528	10/12/21 13:59	AMB	TAL SPK
Total/NA	Prep	7471B			33498	10/11/21 10:02	AMB	TAL SPK
Total/NA	Analysis	7471B		1	33512	10/11/21 17:16	AMB	TAL SPK

Client Sample ID: Trip Blank

Lab Sample ID: 590-16086-26
Matrix: Solid
Date Collected: 10/06/21 08:00
Date Received: 10/08/21 08:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			33556	10/14/21 11:11	JSP	TAL SPK
Total/NA	Analysis	8260D		1	33552	10/14/21 18:15	JSP	TAL SPK
Total/NA	Prep	5035			33556	10/14/21 11:11	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	33551	10/14/21 18:15	JSP	TAL SPK

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: Tiger Oil/1148010.010.012

Job ID: 590-16086-1

Client Sample ID: Trip Blank

Date Collected: 10/06/21 08:00
Date Received: 10/08/21 08:55

Lab Sample ID: 590-16086-27

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	33521	10/12/21 16:08	JSP	TAL SPK
Total/NA	Analysis	NWTPH-Gx		1	33520	10/12/21 16:08	JSP	TAL SPK

Laboratory References:

TAL SPK = Eurofins TestAmerica, Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

Accreditation/Certification Summary

Client: Landau & Associates, Inc.
Job ID: 590-16086-1
Project/Site: Tiger Oil/1148010.010.012

Laboratory: Eurofins TestAmerica, Spokane

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Washington	State	C569	01-06-22

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids
NWTPH-Dx	3510C	Water	Residual Range Organics (RRO) (C25-C36)
NWTPH-Dx	3550C	Solid	Residual Range Organics (RRO) (C25-C36)

Method Summary

Client: Landau & Associates, Inc.
Project/Site: Tiger Oil/1148010.010.012

Job ID: 590-16086-1

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds by GC/MS	SW846	TAL SPK
NWTPH-Gx	Northwest - Volatile Petroleum Products (GC/MS)	NWTPH	TAL SPK
NWTPH-Dx	Northwest - Semi-Volatile Petroleum Products (GC)	NWTPH	TAL SPK
6010D	Metals (ICP)	SW846	TAL SPK
7471B	Mercury (CVAA)	SW846	TAL SPK
Moisture	Percent Moisture	EPA	TAL SPK
3050B	Preparation, Metals	SW846	TAL SPK
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL SPK
3550C	Ultrasonic Extraction	SW846	TAL SPK
5030C	Purge and Trap	SW846	TAL SPK
5035	Closed System Purge and Trap	SW846	TAL SPK
7471B	Preparation, Mercury	SW846	TAL SPK

Protocol References:

EPA = US Environmental Protection Agency

NWTPH = Northwest Total Petroleum Hydrocarbon

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SPK = Eurofins TestAmerica, Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

APPENDIX B

Boring Logs from Supplemental Investigation

Soil Classification System

MAJOR DIVISIONS			GRAPHIC SYMBOL	USCS LETTER SYMBOL[1]	TYPICAL DESCRIPTIONS [2][3]
COARSE-GRAINED SOIL (More than 50% of material is larger than No. 200 sieve size)	GRAVEL AND GRAVELLY SOIL (More than 50% of coarse fraction retained on No. 4 sieve)	CLEAN GRAVEL (Little or no fines)		GW	Well-graded gravel; gravel/sand mixture(s); little or no fines
				GP	Poorly graded gravel; gravel/sand mixture(s); little or no fines
		GRAVEL WITH FINES (Appreciable amount of fines)		GM	Silty gravel; gravel/sand/silt mixture(s)
				GC	Clayey gravel; gravel/sand/clay mixture(s)
	SAND AND SANDY SOIL (More than 50% of coarse fraction passed through No. 4 sieve)	CLEAN SAND (Little or no fines)		SW	Well-graded sand; gravelly sand; little or no fines
				SP	Poorly graded sand; gravelly sand; little or no fines
		SAND WITH FINES (Appreciable amount of fines)		SM	Silty sand; sand/silt mixture(s)
				SC	Clayey sand; sand/clay mixture(s)
FINE-GRAINED SOIL (More than 50% of material is smaller than No. 200 sieve size)	SILT AND CLAY (Liquid limit less than 50)			ML	Inorganic silt and very fine sand; rock flour; silty or clayey fine sand or clayey silt with slight plasticity
				CL	Inorganic clay of low to medium plasticity; gravelly clay; sandy clay; silty clay; lean clay
				OL	Organic silt; organic, silty clay of low plasticity
	SILT AND CLAY (Liquid limit greater than 50)			MH	Inorganic silt; micaceous or diatomaceous fine sand
				CH	Inorganic clay of high plasticity; fat clay
				OH	Organic clay of medium to high plasticity; organic silt
	HIGHLY ORGANIC SOIL			PT	Peat; humus; swamp soil with high organic content

OTHER MATERIALS	GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
PAVEMENT		AC or PC	Asphalt concrete pavement or Portland cement pavement
ROCK		RK	Rock (See Rock Classification)
WOOD		WD	Wood, lumber, wood chips
DEBRIS		DB	Construction debris, garbage

Notes:
1. USCS letter symbols correspond to symbols used by the Unified Soil Classification System and ASTM classification methods. Dual letter symbols (e.g., SP-SM for sand or gravel) indicate soil with an estimated 5-15% fines. Multiple letter symbols (e.g., ML/CL) indicate borderline or multiple soil classifications.
2. Soil descriptions are based on the general approach presented in the Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), outlined in ASTM D 2488. Where laboratory index testing has been conducted, soil classifications are based on the Standard Test Method for Classification of Soils for Engineering Purposes, as outlined in ASTM D 2487.
3. Soil description terminology is based on visual estimates (in the absence of laboratory test data) of the percentages of each soil type and is defined as follows:

Primary Constituent:	> 50%	- "GRAVEL," "SAND," "SILT," "CLAY," etc.
Secondary Constituents:	> 30% and ≤ 50%	- "very gravelly," "very sandy," "very silty," etc.
	> 15% and ≤ 30%	- "gravelly," "sandy," "silty," etc.
Additional Constituents:	> 5% and ≤ 15%	- "with gravel," "with sand," "with silt," etc.
	≤ 5%	- "with trace gravel," "with trace sand," "with trace silt," etc., or not noted.

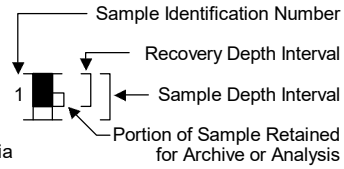
4. Soil density or consistency descriptions are based on judgement using a combination of sampler penetration blow counts, drilling or excavating conditions, field tests, and laboratory tests, as appropriate.

Drilling and Sampling Key

SAMPLER TYPE

Code	Description
a	3.25-inch O.D., 2.42-inch I.D. Split Spoon
b	2.00-inch O.D., 1.50-inch I.D. Split Spoon
c	Shelby Tube
d	Grab Sample
e	Single-Tube Core Barrel
f	Double-Tube Core Barrel
g	2.50-inch O.D., 2.00-inch I.D. WSDOT
h	3.00-inch O.D., 2.375-inch I.D. Mod. California
i	Other - See text if applicable
1	300-lb Hammer, 30-inch Drop
2	140-lb Hammer, 30-inch Drop
3	Pushed
4	Vibrocore (Rotosonic/Geoprobe)
5	Other - See text if applicable

SAMPLE NUMBER & INTERVAL



Field and Lab Test Data

Code	Description
PP = 1.0	Pocket Penetrometer, tsf
TV = 0.5	Torvane, tsf
PID = 100	Photoionization Detector VOC screening, ppm
W = 10	Moisture Content, %
D = 120	Dry Density, pcf
-200 = 60	Material smaller than No. 200 sieve, %
GS	Grain Size - See separate figure for data
AL	Atterberg Limits - See separate figure for data
GT	Other Geotechnical Testing
CA	Chemical Analysis

Groundwater

▽ Approximate water level at time of drilling (ATD)

▼ Approximate water level at time after drilling/excavation/well

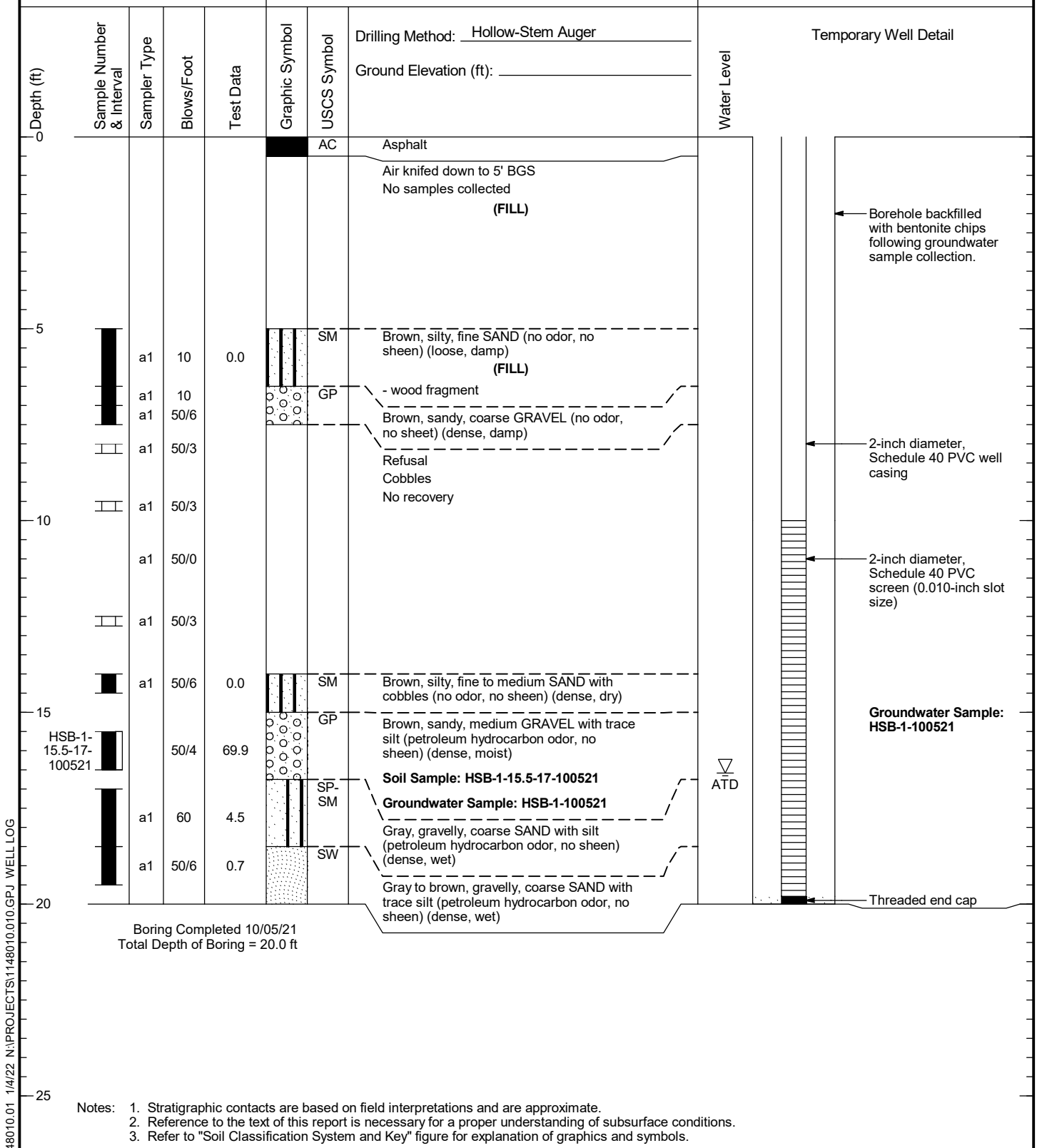
LANDAU ASSOCIATES

Tiger Oil
Yakima, WA

Soil Classification System and Key

Figure
A-1

HSB-1



Boring Completed 10/05/21
Total Depth of Boring = 20.0 ft

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

1148010.01 1/4/22 N:\PROJECTS\1148010.010.GPJ WELL LOG

LANDAU ASSOCIATES

Tiger Oil
Yakima, WA

Log of Temporary Well HSB-1

Figure
A-2

HSB-2

SAMPLE DATA				SOIL PROFILE			GROUNDWATER	
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	Test Data	Graphic Symbol	USCS Symbol	Drilling Method: Hollow-Stem Auger Ground Elevation (ft):	Water Level
0						AC	Asphalt	
							Air knifed down to 5' BGS No samples collected	
							(FILL)	
5		a1	4	0.0		SM	Brown, silty, fine to medium SAND with cobbles (no odor, no sheen) (loose, dry)	
							(FILL)	
		a1	50/6	0.0		SP-SM	Brown to gray, gravelly, fine SAND with silt (no odor, no sheen) (dense, dry)	
		a1	50/6	0.1				
10		a1	55	0.0				
		a1	50/5					
		a1	50/6	0.0		SW	Gray, gravelly, medium SAND with trace silt (no odor, no sheen) (dense, dry)	
		a1	50/0			SP-SM	Brown, fine to medium SAND with silt and cobbles (slight petroleum hydrocarbon odor, no sheen) (dense, damp)	
15	HSB-2-15.5-16-100521	a1	50/6	6.7			**Soil Sample: HSB-1-15.5-16-100521**	
		a1	50/6	0.3		SW	Gray, gravelly, medium to coarse SAND (no odor, no sheen) (dense, wet)	▽ ATD
							Groundwater Sample: HSB-2-100521	
		a1	50/6	0.0		SM	Brown, silty, medium to coarse SAND with gravel (no odor, no sheen) (dense, wet)	
20								
25								

Temporary Well Detail

- Borehole backfilled with bentonite chips following groundwater sample collection.
- 2-inch diameter, Schedule 40 PVC well casing
- 2-inch diameter, Schedule 40 PVC screen (0.010-inch slot size)
- **Groundwater Sample: HSB-2-100521**
- Threaded end cap

Boring Completed 10/05/21
Total Depth of Boring = 20.0 ft

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

1148010.01 1/4/22 N:\PROJECTS\1148010.010.GPJ WELL LOG

LANDAU ASSOCIATES

Tiger Oil
Yakima, WA

Log of Temporary Well HSB-2

Figure
A-3

HSB-3

SAMPLE DATA				SOIL PROFILE			GROUNDWATER	
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	Test Data	Graphic Symbol	USCS Symbol	Drilling Method: Hollow-Stem Auger Ground Elevation (ft):	Water Level
0						AC	Asphalt	
						SM	Brown, silty, fine SAND (no odor, no sheen) (loose, damp) **(FILL)**	
		a1	6	0.0				
		a1	8	0.0				
5		a1	9	0.0				
		a1	73	0.0				
		a1	50/6	0.0		SW-SM	Brown, gravelly, fine to medium SAND with silt (no odor, no sheen) (dense, damp)	
		a1					Refusal Cobbles No recovery	
10		a1						
		a1	50/6	0.0		SW-SM	Brown to gray, gravelly, fine to medium SAND with silt (no odor, no sheen) (dense, damp)	
	HSB-3-13.5-14.5-100621	a1	50/6	29.1		SP-SM	Brown, fine to medium SAND with silt and cobbles (petroleum hydrocarbon odor, no sheen) (dense, dry)	
15		a1	50/5	8.5		SW-SM	**Soil Sample: HSB-3-13.5-14.5-100621** Brown, gravelly, medium to coarse SAND with silt (light petroleum hydrocarbon odor, no sheen) (dense, wet)	ATD
		a1	50/6	8.6		SW	Gray, gravelly, medium to coarse SAND with trace silt (slight petroleum hydrocarbon odor, no sheen) (dense, wet)	
		a1	50/6	1.6				
20								
25								

Temporary Well Detail

- Borehole backfilled with bentonite chips following groundwater sample collection.
- 2-inch diameter, Schedule 40 PVC well casing
- 2-inch diameter, Schedule 40 PVC screen (0.010-inch slot size)
- **Groundwater Sample: HSB-3-100621**
- Threaded end cap

Boring Completed 10/06/21
Total Depth of Boring = 19.5 ft

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

1148010.01 1/4/22 N:\PROJECTS\1148010.010.GPJ WELL LOG

LANDAU ASSOCIATES

Tiger Oil
Yakima, WA

Log of Temporary Well HSB-3

Figure
A-4

HSB-4

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	Test Data	Graphic Symbol	USCS Symbol	Drilling Method: Hollow-Stem Auger Ground Elevation (ft):	Water Level
0						GM	Gravel	
						SM	Brown, silty, fine SAND with cobbles (no odor, no sheen) (loose to medium dense, damp) **(FILL)**	
5		a1	14	0.0				
	HSB-4-7-8-100621	a1	50	0.0		SP-SM	Brown, fine to medium SAND with silt and cobbles (no odor, no sheen) (dense, dry) **Soil Sample: HSB-4-7-8-100621**	
10		a1	50/6	0.0				
	HSB-4-11-12-100621		50/6	0.0			**Soil Sample: HSB-4-11-12-100621**	
		a1	50/6	0.0				
		a1	50/6			SP-SM	Brown, gravelly, medium to coarse SAND with silt (no odor, no sheen) (dense, wet)	
15								ATD
		a1	60	0.0				
20								
25								

Boring Completed 10/06/21
Total Depth of Boring = 17.0 ft

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

1148010.01 1/4/22 N:\PROJECTS\1148010.010.GPJ SOIL BORING LOG

LANDAU ASSOCIATES

Tiger Oil Yakima, WA	Log of Boring HSB-4	Figure A-5

HSB-5

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	Test Data	Graphic Symbol	USCS Symbol	Drilling Method: Hollow-Stem Auger Ground Elevation (ft):	Water Level
0						GM	Coarse gravel	
		a1	4	0.0		SM	Brown, silty, fine to medium SAND (no odor, no sheen) (loose, damp) **(FILL)**	
		a1	6	0.0				
5		a1	4	0.0				
		a1	4	0.0				
	HSB-5-7.5-9-100621		50/6	0.0			- with gravel	
						SP-SM	Brown to gray, medium SAND with silt and cobbles (no odor, no sheen) (dense, dry) **Soil Sample: HSB-5-7.5-9-100621**	
10		a1	50/6	0.0				
		a1	50/4	0.0				
		a1	50/0					
	HSB-5-13.5-14.5-100621		57	0.0		SW	Brown to light brown, gravelly, medium to coarse SAND with trace silt (no odor, no sheen) (dense, dry) **Soil Sample: HSB-5-13.5-14.5-100621**	
15		a1	60	0.0				ATD
20								
25								

Boring Completed 10/06/21
Total Depth of Boring = 16.5 ft

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

1148010.01 1/4/22 N:\PROJECTS\1148010.010.GPJ SOIL BORING LOG

LANDAU ASSOCIATES

Tiger Oil Yakima, WA	Log of Boring HSB-5	Figure A-6

NIMW-6R

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	Test Data	Graphic Symbol	USCS Symbol	Drilling Method: Hollow-Stem Auger Ground Elevation (ft):	Water Level	Monitoring Well Detail (DOE#: BMM-919)
0						AC	Asphalt		Flush-mounted monument with locking cap Concrete Seal
							Air knifed down to 5' BGS No samples collected **(FILL)**		
5							Refusal - No lithologic data collected due to hard drilling		Bentonite chips 2-inch diameter, Schedule 40 PVC well casing 2/12 silica sand pack
10		a1	50/6	0.0		SP-SM	Gray, fine to medium SAND with silt and cobbles (no odor) (loose, dry)		
		a1	50/6	0.0		SP	Brown, gravelly, coarse SAND with trace silt (no odor) (loose, dry)		
		a1	50/6	68.5					
	NIMW-6R-14.5-15-100421	a1	45	1.5		GW	**Soil Sample: NIMW-6R-14.5-15-100421**	ATD	2-inch diameter, Schedule 40 PVC screen (0.010-inch slot size)
15		a1	50/6	6.1			Brown, sandy, coarse GRAVEL (petroleum hydrocarbon odor, no sheen) (loose, wet)		
						SP	Brown, gravelly, coarse SAND (no odor, no sheen) (loose, wet)		
						SP-SM	Brown, medium to coarse SAND with silt and cobbles (no odor, no sheen) (loose, wet)		
		a1	50/6	0.0					
20									Threaded end cap Native Backfill
25									

Boring Completed 10/04/21
Total Depth of Boring = 20.5 ft

Monitoring Well Completed 10/04/21
Total Depth of Monitoring Well = 20.0 ft

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

1148010.01 1/4/22 N:\PROJECTS\1148010.010.GPJ WELL LOG

LANDAU ASSOCIATES

Tiger Oil
Yakima, WA

Log of Monitoring Well NIMW-6R

Figure
A-7

NIMW-7R

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	Test Data	Graphic Symbol	USCS Symbol	Drilling Method: Hollow-Stem Auger Ground Elevation (ft):	Water Level
0						AC	Asphalt	
							Air knifed down to 5' BGS No samples collected **(FILL)**	
5		a1	50	0.0		GW	Brown to gray, coarse sandy GRAVEL (no odor, no sheen) (dense, dry)	
			80	0.0				
			50/6	0.0				
10			30	0.0				
			50/6				Refusal	
						SP	Gray to brown, coarse gravelly SAND (petroleum hydrocarbon odor, no sheen) (dense, wet)	
15	NIMW-7R-14.5-16-100421			165 94			**Soil Sample: NIMW-7R-14.5-6-100421**	▽ ATD
			30	5.5		SM	Gray, silty, coarse SAND with cobbles (slight petroleum hydrocarbon odor, no sheen) (dense, wet)	
			50/5	1.5				
			30					
			50/6	0.8			- becomes gravelly without cobbles	
20			50/6			SP	Brown, gravelly, coarse SAND (slight odor) (dense, wet)	
25								

Monitoring Well Detail
(DOE#: BMM-918)

- Flush-mounted monument with locking cap
- Concrete Seal
- Bentonite chips
- 2-inch diameter, Schedule 40 PVC well casing
- 2/12 silica sand pack
- 2-inch diameter, Schedule 40 PVC screen (0.010-inch slot size)
- Threaded end cap
- Native Backfill

Boring Completed 10/04/21
Total Depth of Boring = 20.5 ft

Monitoring Well Completed 10/04/21
Total Depth of Monitoring Well = 20.0 ft

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

1148010.01 1/4/22 N:\PROJECTS\1148010.010.GPJ WELL LOG

LANDAU ASSOCIATES

Tiger Oil
Yakima, WA

Log of Monitoring Well NIMW-7R

Figure
A-8

NIMW-9

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	Test Data	Graphic Symbol	USCS Symbol	Drilling Method: Hollow-Stem Auger Ground Elevation (ft):	Water Level	Monitoring Well Detail (DOE#: BMM-920)
0						AC	Asphalt		Flush-mounted monument with locking cap Concrete Seal
							Air knifed down to 5' BGS No samples collected **(FILL)**		
5							Refusal - No lithologic data collected due to hard drilling		Bentonite chips 2-inch diameter, Schedule 40 PVC well casing 2/12 silica sand pack
10		a1	44	0.0		SM	Brown, silty, medium SAND with gravel (medium dense, damp)		
		a1	50/0			GW	Brown, sandy, coarse GRAVEL with trace silt (dense, damp)		
		a1	50/3	0.0					
15		a1	50/5	82.5			-petroleum hydrocarbon odor		2-inch diameter, Schedule 40 PVC screen (0.010-inch slot size)
						SP	Dark gray, gravelly, coarse SAND (medium dense to dense, wet)		
	NIMW-1R-16-17.5-100521	a1	45	4.2			**Soil Sample: NIMW-1R-16-17.5-100521** **(Boring NIMW-1R renamed NIMW-9 after sampling)**	▽ ATD	
		a1	43	0.9					
		a1	50/6	0.6					
20									Threaded end cap Native Backfill
25									

Boring Completed 10/05/21
Total Depth of Boring = 20.5 ft

Monitoring Well Completed 10/05/21
Total Depth of Monitoring Well = 20.0 ft

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

1148010.01 1/4/22 N:\PROJECTS\1148010.010.GPJ WELL LOG

LANDAU ASSOCIATES

Tiger Oil
Yakima, WA

Log of Monitoring Well NIMW-9

Figure
A-9

APPENDIX C

Soil and Groundwater Results from May 2017 Remedial Investigation

Table 1

Soil Chemical Analytical Results - TPH, VOCs, EDB and Metals[1]

Tiger Oil North 1st Street

Yakima, Washington

Sample Location	Sample Name	Sample Date	Approximate Sample Depth Interval (feet)	TPH[2]			Volatile Organic Compounds - BETX, MTBE, EDC[3]								EDB[4]	Metals[5]
				GRPH mg/kg	DRPH mg/kg	ORPH mg/kg	Benzene mg/kg	Ethylbenzene mg/kg	Toluene mg/kg	Xylene, m-,p- mg/kg	Xylene, o- mg/kg	Total Xylenes mg/kg	MTBE mg/kg	EDC mg/kg	EDB µg/kg	Lead mg/kg
N1DP-1	N1DP-1:12	4/16/2014	12	**6,200**	**728**	58.3 U	**0.220**	**67.6**	1.05 U	**299**	**84.8**	**384**	0.0630 U	1.05 U	1.04 U	**4.25**
N1DP-2	N1DP-2:14.5	4/16/2014	14.5	**613**	19.7 U	49.3 U	**0.0140**	**0.693**	0.0936 U	**1.02**	0.187 U	**1.02**	0.00561 U	0.936 U	0.936 U	**4.14**
N1DP-3	N1DP-3:14.5	4/16/2014	14.5	**4,170**	**544**	52.0 U	**0.166**	**59.1**	**3.94**	**256**	**99.5**	**356**	0.0475 U	0.791 U	0.992 U	**5.15**
N1DP-3	N1DP-3:15	4/16/2014	15	**904**	**365**	**255**	**0.0392**	**14.4**	**2.28**	**59.0**	**21.8**	**80.8**	0.00673 U	0.112 U	0.998 U	**4.12**
N1DP-4	N1DP-4:16	4/16/2014	16	**415**	**107**	**277**	**0.0111**	**0.592**	0.0886 U	**0.728**	0.177 U	**0.742**	0.00532 U	0.0886 U	0.931 U	**3.51**
N1DP-8	N1DP-8:16.5	4/16/2014	16.5	**29,400**	**748**	47.9 U	**3.19**	**386**	**378**	**1,990**	**678**	**2,660**	0.555 U	9.25 U	0.976 U	**4.92**
N1MW-1	N1MW-1(14-15')	4/16/2014	14-15	5.56 U	10.5 U	26.2 U	0.0167 U	0.111 U	0.111 U	0.445 U	0.222 U	0.667 U	0.0334 U	0.111 U	1.03 U	**5.31**
N1MW-1	DUPLICATE 3 (N1MW-1)	4/16/2014	14-15	6.51 U	9.33 U	23.3 U	0.0195 U	0.130 U	0.130 U	0.520 U	0.260 U	0.781 U	0.0390 U	0.130 U	1.06 U	**3.55**
N1MW-2	N1MW-2(14-15')	4/16/2014	14-15	4.94 U	10.1 U	25.3 U	0.0148 U	0.0988 U	0.0988 U	0.395 U	0.198 U	0.593 U	0.0296 U	0.0988 U	1.05 U	**5.86**
N1MW-3	N1MW-3(12-13')	4/16/2014	12-13	5.9 U	**17.0** U	**81.1**	0.0177 U	0.118 U	0.118 U	0.472 U	0.236 U	0.708 U	0.0354 U	0.118 U	1.05 U	**4.80**
N1MW-4	N1MW-4(10-11')	4/16/2014	10-11	**5.35**	9.85	24.6 U	0.0153 U	0.102 U	0.102 U	0.409 U	0.205 U	0.614 U	0.0307 U	0.102 U	1.09 U	**4.55**
N1MW-5	N1MW-5(11-12')	4/16/2014	11-12	6.19 U	**18.6** U	**126**	0.0186 U	0.124 U	0.124 U	0.495 U	0.248 U	0.743 U	0.0371 U	0.124 U	1.13 U	**3.22**
N1DP-9	NIDP-9(14.5-15)	8/3/2016	14.5 - 15 ft	5.4 U	**16** J	**180**	0.022 U	0.11 U	0.11 U	0.43 U	0.22 U	0.65 U	--	--	--	5 U
N1DP-10	NIDP-10(14.5-15)	8/3/2016	14.5 - 15 ft	**90**	10 U	26 U	0.02 U	0.1 U	0.1 U	0.4 U	0.2 U	0.6 U	--	--	--	4.6 U
N1DP-11	NIDP-11(14.5-15)	8/3/2016	14.5 - 15 ft	**150**	**16** J	27 U	0.022 U	**1**	0.11 U	**4.9**	**1.1**	**6**	--	--	--	4.4 U
N1DP-12	NIDP-12(14.5-15)	8/4/2016	14.5 - 15 ft	**2,900**	**160** J	26 U	0.026 U	0.13 U	0.13 U	**0.55**	0.26 U	0.78 U	--	--	--	4.3 U
N1DP-13	NIDP-13(14.5-15)	8/4/2016	14.5 - 15 ft	**3,800**	**700** J	29 U	0.23 U	**48**	1.1 U	**170**	**44**	**210**	--	--	--	**7.8**
N1DP-14	NIDP-14(14.5-15)	8/4/2016	14.5 - 15 ft	**23**	**12**	26 U	0.026 U	0.13 U	0.13 U	0.52 U	0.26 U	0.78 U	--	--	--	7.6 U
N1DP-15	NIDP-15(14.5-15)	8/4/2016	14.5 - 15 ft	6 U	10 U	26 U	0.024 U	0.12 U	0.12 U	0.48 U	0.24 U	0.72 U	--	--	--	4.9 U
N1DP-16	NIDP-16(14.5-15)	8/4/2016	14.5 - 15 ft	6.7 U	11 U	26 U	0.027 U	0.13 U	0.13 U	0.54 U	0.27 U	0.81 U	--	--	--	5.2 U
N1DP-17	NIDP-17(14.5-15)	8/3/2016	14.5 - 15 ft	6.2 U	11 U	26 U	0.025 U	0.12 U	0.12 U	0.49 U	0.25 U	0.74 U	--	--	--	4.3 U
N1DP-18	NIDP-18(14.5-15)	8/3/2016	14.5 - 15 ft	5.8 U	11 U	26 U	0.023 U	0.12 U	0.12 U	0.46 U	0.23 U	0.69 U	--	--	--	4.9 U
N1DP-19	NIDP-19(14.5-15)	8/3/2016	14.5 - 15 ft	4.6 U	11 U	27 U	0.018 U	0.091 U	0.091 U	0.36 U	0.18 U	0.55 U	--	--	--	5.4 U
N1MW-6	NIMW-6(12.5-13)	10/17/2016	12.5 - 13 ft	**940**	**25**	27 U	0.019 U	**4.7**	0.096 U	**25**	1.9 U	**25**	--	--	--	6.6 U
N1MW-7	NIMW-7(15-15.5)	10/18/2016	15 - 15.5 ft	**1,900**	11 U	27 U	0.019 U	**25**	**3.5**	**100**	**31**	**130**	--	--	--	6.6 U
N1MW-8	NIMW-8(12-12.5)	10/17/2016	12 - 12.5 ft	**170**	**150**	26 U	0.017 U	**0.24**	0.084 U	**1.4**	**0.53**	**1.9**	--	--	--	6.2 U
N1MW-8	NIMW-8(15-15.5)	10/17/2016	15 - 15.5 ft	**1,200**	**210**	28 U	**0.025**	**11**	**1.3**	**58**	**21**	**80**	--	--	--	6.8 U
MTCA Method A CULs[6]				30[7]	2,000	2,000	0.03	6	7	9[8]			0.1	NE	5	250

Notes

[1]Chemical analyses conducted by TestAmerica of Spokane, Washington.

[2]Diesel-, gasoline and lube oil-range petroleum hydrocarbons were analyzed using Northwest Methods NWTPH-Dx and NWTPH-Gx.

[3]Benzene, Ethylbenzene, Toluene, and Xylenes (BETX), methyl tert-butyl ether (MTBE), 1,2-dichloroethane (EDC) analyzed using Environmental Protection Agency (EPA) Method 8260C.

[4]1,2-dibromoethane (EDB) analyzed using EPA Method 8011.

[5]Metals analyzed using EPA Method 6010C.

[6]Model Toxics Control Act (MTCA) Method A unrestricted land use cleanup levels (CULs) for soil.

[7]If benzene is present, the Gasoline-range petroleum hydrocarbon (GRPH) cleanup level is 30 mg/kg. If benzene is not present and the total of ethylbenzene, toluene and xylenes is less than 1% of the gasoline mixture the GRPH cleanup level is 100 mg/kg.

[8]Cleanup level based on protection of groundwater for drinking water use, using the procedures described in WAC 173-340-747(4). This is a total value for all xylenes.

GRPH = Gasoline-range Petroleum Hydrocarbons; DRPH = Diesel-range Petroleum Hydrocarbons; ORPH = Oil-range Petroleum Hydrocarbons; µg/kg = milligrams per kilogram; mg/kg = milligrams per kilogram; U = analyte was not detected greater than the laboratory reporting limit; NE = Not Established; -- = not analyzed.

Bold indicates analyte concentration exceeds laboratory reporting limit.

Bold and shading indicate that the analyte was detected greater than the MTCA Method A CUL.

Table 2

Soil Chemical Analytical Results - PAHs and cPAHs[1]

Tiger Oil North 1st Street

Yakima, Washington

Sample Location	Sample Name	Sample Date	Sample Depth Interval (feet)	Carcinogenic PAHs[2]								PAHs[2]										
				Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-c,d)pyrene	cPAH TEQ[3]	Naphthalene	1-Methylnaphthalene	2-Methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(g,h,i)perylene	Fluoranthene	Fluorene	Phenanthrene	Pyrene
				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
N1DP-1	N1DP-1:12	4/16/2014	12	--	--	--	--	--	--	--	--	**9,180**	**8,970**	**18,600**	--	--	--	--	--	--	--	--
N1DP-2	N1DP-2:14.5	4/16/2014	14.5	--	--	--	--	--	--	--	--	19.3 U	**242**	**466**	--	--	--	--	--	--	--	--
N1DP-3	N1DP-3:14.5	4/16/2014	14.5	--	--	--	--	--	--	--	--	**17,600**	**11,700**	**24,600**	--	--	--	--	--	--	--	--
N1DP-3	N1DP-3:15	4/16/2014	15	--	--	--	--	--	--	--	--	**10,100**	**6,890**	**14,600**	--	--	--	--	--	--	--	--
N1DP-4	N1DP-4:16	4/16/2014	16	--	--	--	--	--	--	--	--	409 U	**710**	**1,610**	--	--	--	--	--	--	--	--
N1DP-8	N1DP-8:16.5	4/16/2014	16.5	--	--	--	--	--	--	--	--	**30,300**	**20,900**	**46,100**	--	--	--	--	--	--	--	--
N1MW-1	N1MW-1(14-15')	4/16/2014	14-15	--	--	--	--	--	--	--	--	20.8 U	20.8 U	20.8 U	--	--	--	--	--	--	--	--
N1MW-1	(N1MW-1)	4/16/2014	14-15	--	--	--	--	--	--	--	--	21.6 U	21.6 U	21.6 U	--	--	--	--	--	--	--	--
N1MW-2	N1MW-2(14-15')	4/16/2014	14-15	--	--	--	--	--	--	--	--	20.3 U	20.3 U	20.3 U	--	--	--	--	--	--	--	--
N1MW-3	N1MW-3(12-13')	4/16/2014	12-13	--	--	--	--	--	--	--	--	22.0 U	22.0 U	22.0 U	--	--	--	--	--	--	--	--
N1MW-4	N1MW-4(10-11')	4/16/2014	10-11	--	--	--	--	--	--	--	--	21.4 U	21.4 U	21.4 U	--	--	--	--	--	--	--	--
N1MW-5	N1MW-5(11-12')	4/16/2014	11-12	--	--	--	--	--	--	--	--	22.2 U	22.2 U	22.2 U	--	--	--	--	--	--	--	--
N1DP-9	NIDP-9(14.5-15)	8/3/2016	14.5 - 15 ft	10 U	10 U	10 U	10 U	10 U	10 U	10 U	7.6	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
N1DP-10	NIDP-10(14.5-15)	8/3/2016	14.5 - 15 ft	10 U	10 U	10 U	10 U	10 U	10 U	10 U	7.6	10 U	**25**	**44**	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
N1DP-11	NIDP-11(14.5-15)	8/3/2016	14.5 - 15 ft	11 U	11 U	11 U	11 U	11 U	11 U	11 U	8.3	**80**	**200**	**370**	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
N1DP-12	NIDP-12(14.5-15)	8/4/2016	14.5 - 15 ft	10 U	10 U	10 U	10 U	10 U	10 U	10 U	7.6	**510**	**2,400**	**5,700**	**12**	10 U	10 U	10 U	10 U	**15**	**38**	10 U
N1DP-13	NIDP-13(14.5-15)	8/4/2016	14.5 - 15 ft	11 U	11 U	11 U	11 U	11 U	11 U	11 U	8.3	**19,000**	**22,000**	**42,000**	**110**	**57**	**20**	11 U	**18**	**200**	**350**	**17**
N1DP-14	NIDP-14(14.5-15)	8/4/2016	14.5 - 15 ft	10 U	10 U	10 U	10 U	10 U	10 U	10 U	7.6	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
N1DP-15	NIDP-15(14.5-15)	8/4/2016	14.5 - 15 ft	10 U	10 U	10 U	10 U	10 U	10 U	10 U	7.6	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
N1DP-16	NIDP-16(14.5-15)	8/4/2016	14.5 - 15 ft	11 U	11 U	11 U	11 U	11 U	11 U	11 U	8.3	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
N1DP-17	NIDP-17(14.5-15)	8/3/2016	14.5 - 15 ft	11 U	11 U	11 U	11 U	11 U	11 U	11 U	8.3	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
N1DP-18	NIDP-18(14.5-15)	8/3/2016	14.5 - 15 ft	10 U	10 U	10 U	10 U	10 U	10 U	10 U	7.6	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
N1DP-19	NIDP-19(14.5-15)	8/3/2016	14.5 - 15 ft	11 U	11 U	11 U	11 U	11 U	11 U	11 U	8.3	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
N1MW-6	NIMW-8(12.5-13)	10/17/2016	12.5 - 13 ft	11 U	11 U	11 U	11 U	11 U	11 U	11 U	8.3	**350**	**1,100**	**2,100**	11 U	11 U	11 U	11 U	11 U	**11**	**18**	11 U
N1MW-7	NIMW-7(15-15.5)	10/18/2016	15 - 15.5 ft	11 U	11 U	11 U	11 U	11 U	11 U	11 U	8.3	**12**	**28**	**52**	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
N1MW-8	NIMW-8(12-12.5)	10/17/2016	12 - 12.5 ft	11 U	11 U	11 U	11 U	11 U	11 U	11 U	8.3	**54**	**390**	**670**	**12**	11 U	11 U	11 U	11 U	**17**	**23**	11 U
N1MW-8	NIMW-8(15-15.5)	10/17/2016	15 - 15.5 ft	11 U	11 U	11 U	11 U	11 U	11 U	11 U	8.3	**880**	**2,800**	**5,600**	**72**	**17**	**36**	11 U	**11**	**83**	**150**	**13**
MTCA Method A CULs[4]				NE	100	NE	NE	NE	NE	NE	100	5,000			NE	NE	NE	NE	NE	NE	NE	NE

Notes

[1]Chemical analyses conducted by TestAmerica of Spokane, Washington.

[2]Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs) and PAHs (Polycyclic Aromatic Hydrocarbons) were analyzed using Environmental Protection Agency (EPA) Method 8270D.

[3]Carcinogenic PAHs toxic equivalency factor (TEQ) calculated using toxicity equivalency factors (TEF) from MTCA Table 708-2. One half the reporting limit was used to calculate the TEQ for results less than reporting limits.

[4]Model Toxics Control Act (MTCA) Method A unrestricted land use cleanup levels (CULs) for soil.

µg/kg = micrograms per kilogram; -- = not analyzed; U = analyte was not detected greater than the laboratory reporting limit, NE = Not Established.

Bold indicates analyte concentration exceeds laboratory reporting limit.

Bold and shading indicate that the analyte was detected greater than the MTCA Method A CUL.

Table 3

Groundwater Chemical Analytical Results - Direct-Push Temporary Well Samples

Northwest HCID[1]

Tiger Oil North 1st Street

Yakima, Washington

Sample Location	Sample Name	Sample Date	TPH - HCID[2]		
			Gasoline-range Petroleum Hydrocarbons mg/L	Diesel-range Petroleum Hydrocarbons mg/L	Oil-range Petroleum Hydrocarbons mg/L
N1DP-1	041614:N1DP-1:GW	4/16/2014	**1.0**	**1.0**	0.62 U
N1DP-2	041614:N1DP-2:GW	4/16/2014	0.62 U	0.62 U	**0.67**
N1DP-3	041614:N1DP-3:GW	4/16/2014	**11.0**	**5.4**	**7.2**
N1DP-4	041614:N1DP-4:GW	4/16/2014	0.61 U	**0.79**	0.61 U
N1DP-5	041614:N1DP-5:GW	4/16/2014	0.62 U	0.62 U	**1.7**
N1DP-6	041614:N1DP-6:GW	4/16/2014	0.61 U	0.61 U	0.61 U
N1DP-7	041614:N1DP-7:GW	4/16/2014	0.61 U	0.61 U	0.61 U
N1DP-8	041614:N1DP-8:GW	4/16/2014	**5.1**	**2.1**	**1.0**
N1DP-9	NIDP-9:080316	8/3/2016	0.13 U	0.34 U	0.34 U
N1DP-10	NIDP-10:080316	8/3/2016	**0.80**	**0.88** J	0.32 U
N1DP-11	NIDP-11:080316	8/3/2016	**0.19**	0.33 U	0.33 U
N1DP-12	NIDP-12:080416	8/4/2016	**1.5**	**1.2** J	**0.37**
N1DP-13	NIDP-13:080416	8/4/2016	**0.66**	**0.40** J	0.34 U
N1DP-14	NIDP-14:080416	8/4/2016	**0.65**	**0.95** J	0.32 U
N1DP-15	NIDP-15:080416	8/4/2016	0.14 U	0.35 U	0.35 U
N1DP-16	NIDP-16:080416	8/4/2016	0.13 U	0.32 U	**1.8**
N1DP-17	NIDP-17:080316	8/3/2016	0.13 U	0.33 U	0.33 U
N1DP-18	NIDP-18:080316	8/3/2016	0.13 U	0.33 U	0.33 U
N1DP-19	NIDP-19:080316	8/3/2016	0.13 U	0.34 U	0.34 U
MTCA Method A CULs[3]			0.8/1[4]	0.5	0.5

Notes

[1]Chemical analyses conducted by TestAmerica of Spokane, Washington.

[2]Diesel-, gasoline and oil-range petroleum hydrocarbons were analyzed using Northwest Method Hydrocarbon Identification (NWTPH - HCID).

[3]Model Toxics Control Act (MTCA) Method A cleanup levels (CUL) for groundwater. However, the HCID analysis method is considered qualitative and should not be used to determine compliance with cleanup levels.

[4]Cleanup level for gasoline is 0.8 mg/L when benzene is present and 1 mg/L when there is no detectable benzene in groundwater.

mg/L = milligrams per liter; -- = not analyzed; U = analyte was not detected above the laboratory reporting limit

Bold indicates analyte concentration exceeds laboratory reporting limit.

Bold and shading indicate that the analyte was detected greater than the MTCA Method A CUL.

and should not be used to consider cleanup actions.

Table 4

Summary of Groundwater Level Measurements

Tiger Oil North 1st Street

Yakima, Washington

Well Number	Grid Northing[1] (feet)	Grid Easting[1] (feet)	Top of Casing Elevation[2] (feet)	Screen Elevation[2] (feet)	Date Measured	Depth to Groundwater[3] (feet)	Groundwater Elevation[2] (feet)	Change in Groundwater Elevation[4] (feet)
N1MW-1	470569.0	1637341.4	1,084.85	1075.4 to 1065.4	09/18/14	13.78	1,071.07	NA
					12/11/14	13.65	1,071.20	0.13
					03/10/15	14.05	1,070.80	-0.40
					08/22/16	13.59	1,071.26	0.06
					11/17/16	13.20	1,071.65	0.39
N1MW-2	470616.9	1637480.0	1,083.81	1073.8 to 1063.8	09/18/14	13.31	1,070.50	NA
					12/11/14	13.01	1,070.80	0.30
					03/10/15	13.30	1,070.51	-0.29
					08/22/16	13.01	1,070.80	0.00
					11/17/16	12.57	1,071.24	0.44
N1MW-3	470475.5	1637358.7	1,084.61	1074.6 to 1064.6	09/18/14	13.75	1,070.86	NA
					12/11/14	13.56	1,071.05	0.19
					03/10/15	13.86	1,070.75	-0.30
					08/22/16	13.41	1,071.20	0.15
					11/17/16	13.00	1,071.61	0.41
N1MW-4	470595.3	1637199.9	1,082.13	1075.1 to 1065.1	09/18/14	11.10	1,071.03	NA
					12/11/14	10.91	1,071.22	0.19
					03/10/15	11.26	1,070.87	-0.35
					08/22/16	10.59	1,071.54	0.32
					11/17/16	10.26	1,071.87	0.33
N1MW-5	470681.7	1637363.0	1,083.43	1074.4 to 1064.4	09/18/14	12.48	1,070.95	NA
					12/11/14	12.27	1,071.16	0.21
					03/10/15	12.56	1,070.87	-0.29
					08/22/16	12.09	1,071.34	0.18
					11/17/16	11.78	1,071.65	0.31
N1MW-6	470639.0	1637363.5	1,083.54	1073.1 to 1063.1	11/17/16	11.90	1,071.64	NA
N1MW-7	470586.4	1637370.7	1,084.84	1076.0 to 1066.0	11/17/16	13.24	1,071.60	NA
M1MW-8	470623.5	1637328.3	1,084.51	1074.5 to 1064.5	11/17/16	12.83	1,071.68	NA

Notes:

[1]Grid northing and easting are referenced to NAD83, Washington State Plane Coordinate System, South Zone.

[2]Elevations are referenced to the North American Vertical Datum of 1988 (NAVD88).

[3]Depth to water measurements obtained from the north side of the top of PVC well casing.

[4]Represents change in groundwater elevation from previous monitoring event, as measured in monitoring wells.

NA = Not Applicable

Table 5

Summary of Groundwater Field Parameters[1]

Tiger Oil North 1st Street

Yakima, Washington

Well Number	Date Collected	pH	Temperature (°C)	Specific Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP - Field[2] (mV)	Turbidity (NTU)	Soluble Ferrous Iron (mg/L)	Monitoring Well Headspace[3] (ppm)
N1MW-1	09/18/14	6.57	17.03	0.25	2.46	54	16.31	1.3	1.5
	12/11/14	6.59	16.99	0.23	1.04	13	1.15	1.0	1.5
	03/10/15	6.76	15.29	0.24	4.33	519	2.42	--	0.3
	08/22/16	6.52	17.56	0.44	4.23	244	16.23	--	1.8
	11/17/16	6.56	17.46	0.38	1.83	59.9	1.01	0	--
N1MW-2	09/18/14	6.69	17.46	0.27	0.05	-143	1.03	0	0.0
	12/11/14	6.49	16.50	0.25	0.14	-90	4.13	0	0.0
	03/10/15	6.72	13.17	0.23	0.06	44	4.54	--	13.2
	08/22/16	6.62	18.47	0.36	0.88	-230	13.61	--	0.0
	11/17/16	6.58	17.46	0.44	0.46	58	0.75	2	--
N1MW-3	09/18/14	6.75	16.25	0.26	5.69	-148	0.07	0	0.3
	12/11/14	6.65	16.32	0.24	6.32	142	0.86	0	0.3
	03/10/15	6.82	14.08	0.22	8.07	230	0.34	--	0.0
	08/22/16	6.70	17.72	0.37	4.64	-133	0.00	--	1.9
	11/17/16	6.72	16.33	0.33	2.77	121	0.18	<0.5	--
N1MW-4	09/18/14	6.68	16.77	0.24	5.82	90	4.48	0	0.1
	12/11/14	6.65	15.83	0.21	6.77	135	0.59	0	0.1
	03/10/15	6.82	13.83	0.21	8.63	267	4.90	--	0.0
	08/22/16	6.53	16.9	0.32	5.91	-99	43.22	--	0.0
	11/17/16	6.73	16.6	0.27	4.87	68.3	0.17	0	--
N1MW-5	09/18/14	6.49	18.25	0.25	0.98	-25	0.12	1.5	0.1
	12/11/14	6.53	17.01	0.23	0.90	-24	2.35	2.0	0.1
	03/10/15	6.61	13.95	0.23	0.42	132	2.17	--	0.4
	08/22/16	6.40	19.60	0.36	0.11	-326	11.61	--	0.0
	11/17/16	6.57	17.58	0.30	0.17	75	0.30	0.5	--
N1MW-6	11/17/16	6.58	16.71	0.33	0.15	9	4.23	2.8	--
N1MW-7	11/17/16	6.87	17.72	0.51	0.38	-13	16.1	2.3	--
M1MW-8	11/17/16	6.61	16.90	0.60	0.74	-7	3.65	4.0	--

Notes:

[1]Reported water quality parameters reflect stabilized conditions at the conclusion of well purging during low-flow sampling.

[2]Field ORP values are relative to the reference electrode associated with the multi-parameter meter.

[3]Well headspace measurements were obtained using a photoionization detector immediately upon removal of the well's compression cap.

- = not recorded

ORP = Oxidation reduction potential; °C = degrees Celsius; mS/cm = millisiemens per centimeter; mg/L = milligrams per liter; mV = millivolts; NTU = nephelometric turbidity units; ppm = parts per million

Table 6

Summary of Groundwater Chemical Analytical Results[1]

Monitoring Well Samples - TPH, VOCs, Lead, Conventionals

Tiger Oil North 1st Street

Yakima, Washington

Method and Analytes	Units	Location and Sample Date																
		Regulatory Levels[2]	N1MW-1					Duplicate (N1MW-1)	N1MW-2					N1MW-3				
			09/18/14	12/11/14	03/10/15	08/22/16	11/17/16	11/17/16	09/18/14	12/11/14	03/10/15	08/22/16	11/17/16	09/18/14	12/11/14	03/10/15	08/22/16	11/17/16
TPH by Northwest Method NWTPH-Gx																		
Gasoline-range hydrocarbons	µg/L	800[3]	**256**	<100	**120**	<100	< 100	< 100	**506**	**372**	**340**	<100	< 100	<100	<100	<100	<100	< 100
TPH by Northwest Method NWTPH-Dx																		
Diesel-range hydrocarbons	mg/L	0.500	<0.234	<0.233	<0.230	<0.13	< 0.13	< 0.14	**0.459**	**0.269 J**	**0.280**	<0.13	< 0.13	<0.231	<0.234	<0.240	<0.13	< 0.13
Heavy oil-range hydrocarbons	mg/L	0.500	<0.389	<0.388	<0.380	<0.21	< 0.22	< 0.24	<0.382	<0.383	<0.390	<0.21	< 0.22	<0.386	<0.389	<0.390	<0.21	< 0.21
VOCs by Method EPA 8260C																		
Benzene	µg/L	5	<0.200	<0.200	<0.20	<0.20	< 0.20	< 0.20	<0.200	<0.200	<0.20	<0.20	< 0.20	<0.200	<0.200	<0.20	<0.20	< 0.20
Ethylbenzene	µg/L	700	<1.00	<1.00	<1.0	<1.0	a	< 1.0	**5.17**	<1.00	<1.0	<1.0	< 1.0	<1.00	<1.00	<1.0	<1.0	< 1.0
Methyl t-butyl ether (MTBE)	µg/L	20	<1.00	<1.00	<1.0	--	--	--	<1.00	<1.00	<1.0	--	--	<1.00	<1.00	<1.0	--	--
Toluene	µg/L	1,000	<1.00	<1.00	<1.0	<1.0	< 1.0	< 1.0	<1.00	<1.00	<1.0	<1.0	< 1.0	<1.00	<1.00	<1.0	<1.0	< 1.0
Xylene, m-,p-	µg/L	1,000[4]	<2.00	<2.00	<2.0	<2.0	< 2.0	< 2.0	<2.00	<2.00	<2.0	<2.0	< 2.0	<2.00	<2.00	<2.0	<2.0	< 2.0
Xylene, o-	µg/L		<1.00	<1.00	<1.0	<1.0	< 1.0	< 1.0	<1.00	<1.00	<1.0	<1.0	< 1.0	<1.00	<1.00	<1.0	<1.0	< 1.0
Xylene, total	µg/L		<3.00	<3.00	<3.0	<3.0	< 3.0	< 3.0	<3.00	<3.00	<3.0	<3.0	< 3.0	<3.00	<3.00	<3.0	<3.0	< 3.0
Metals by EPA Method 200.7																		
Lead	mg/L	0.015	--	<0.0140	<0.014	<0.014	< 0.014	< 0.014	--	<0.0140	<0.014	<0.014	< 0.014	--	<0.0140	<0.014	<0.014	< 0.014
Anions by EPA Method 300.0																		
Nitrate-nitrogen	mg/L	10[5]	**0.84**	**0.610**	**0.78**	**5.7**	**5.3**	**5.2**	<0.200	<0.200	<0.20	**0.43**	**0.85**	**1.24**	**0.740**	**0.86**	**3.5**	**1.9**
Sulfate	mg/L	250[6]	**9.69**	**7.90**	**8.8**	**17**	**16**	**16**	**5.25**	**5.50**	**5.7**	**17**	**16**	**10.1**	**8.25**	**8.5**	**15**	**10**
General Chemistry by EPA Method 5310C																		
Total organic carbon	mg/L	NE	**1.55**	**1.05**	**1.0**	**1.1**	**1.2**	**1.0**	**1.66**	**1.41**	**1.1**	**1.0**	**1.0**	**1.22**	<1.00	<1.0	<1.0	**1.0**

Method and Analytes	Units	Regulatory Levels[2]	Location and Sample Date												
			N1MW-4					N1MW-5					N1MW-6	N1MW-7	N1MW-8
			09/18/14	12/11/14	03/10/15	08/22/16	11/17/16	09/18/14	12/11/14	03/10/15	08/22/16	11/17/16	11/17/16	11/17/16	11/17/16
TPH by Northwest Method NWTPH-Gx															
Gasoline-range hydrocarbons	µg/L	800[3]	<100	<100	<100	<100	< 100	<100	<100	<100	<100	< 100	**9,400**	**27,000**	**18,000**
TPH by Northwest Method NWTPH-Dx															
Diesel-range hydrocarbons	mg/L	0.500	<0.232	<0.232	<0.240	<0.13	< 0.14	**0.238**	<0.234	<0.230	<0.13	< 0.13	**1.5 J**	**3.7 J**	**6.1 J**
Heavy oil-range hydrocarbons	mg/L	0.500	<0.386	<0.387	<0.390	<0.22	< 0.23	<0.384	<0.391	<0.380	<0.22	< 0.22	< 0.23	< 0.22	< 0.21
VOCs by Method EPA 8260C															
Benzene	µg/L	5	<0.200	<0.200	<0.20	<0.20	< 0.20	<0.200	<0.200	<0.20	<0.20	< 0.20	< 4.0	**5.6**	**43**
Ethylbenzene	µg/L	700	<1.00	<1.00	<1.0	<1.0	< 1.0	<1.00	<1.00	<1.0	<1.0	< 1.0	**300**	**1,400**	**480**
Methyl t-butyl ether (MTBE)	µg/L	20	<1.00	<1.00	<1.0	--	--	<1.00	<1.00	<1.0	--	--	--	--	--
Toluene	µg/L	1,000	<1.00	<1.00	<1.0	<1.0	< 1.0	<1.00	<1.00	<1.0	<1.0	< 1.0	< 20	**180**	**26**
Xylene, m-,p-	µg/L	1,000[4]	<2.00	<2.00	<2.0	<2.0	< 2.0	<2.00	<2.00	<2.0	<2.0	< 2.0	**950**	**5,300**	**1,600**
Xylene, o-	µg/L		<1.00	<1.00	<1.0	<1.0	< 1.0	<1.00	<1.00	<1.0	<1.0	< 1.0	**270**	**2,000**	**1,100**
Xylene, total	µg/L		<3.00	<3.00	<3.0	<3.0	< 3.0	<3.00	<3.00	<3.0	<3.0	< 3.0	**1,200**	**7,300**	**2,700**
Metals by EPA Method 200.7															
Lead	mg/L	0.015	--	<0.0140	<0.014	<0.014	< 0.014	--	<0.0140	<0.014	<0.014	< 0.014	< 0.014	< 0.014	< 0.014
Anions by EPA Method 300.0															
Nitrate-nitrogen	mg/L	10[5]	**0.95**	**0.620**	**1.1**	**3.0**	**1.5**	**0.49**	**0.350**	**0.51**	**5.4**	**0.38**	**0.48**	**0.75**	**0.96**
Sulfate	mg/L	250[6]	**8.49**	**6.92**	**8.2**	**13**	**8.1**	**9.68**	**9.25**	**13**	**16**	**19**	**17**	**14**	**31**
General Chemistry by EPA Method 5310C															
Total organic carbon	mg/L	NE	**1.19**	<1.00	**1.0**	<1.0	< 1.0	**1.36**	**1.09**	**1.1**	**1.2**	**1.2**	**4.1**	**7.3**	**10**

Notes:

[1]Chemical analyses conducted by TestAmerica of Spokane, Washington.

[2]Regulatory level refers to Washington State Model Toxics Control Act (MTCA) Method A cleanup level unless otherwise footnoted.

[3]Cleanup level for Gasoline-range petroleum hydrocarbons (GRPH) is 800 µg/L as a result of benzene detections in N1MW-7 and N1MW-8.

[4]Cleanup level for total xylenes.

[5]Regulatory level based on maximum contaminant level established by Title 40 Code of Federal Regulations, Part 141.

[6]Regulatory level based on secondary maximum contaminant level recommended by the Environmental Protection Agency.

-- = not analyzed; EPA = Environmental Protection Agency; J = result was estimated; NE = not established; mg/L = milligrams per liter; µg/L = micrograms per liter; TPH = total petroleum hydrocarbons; VOC = volatile organic compounds;

Bold indicates analyte concentration exceeds laboratory reporting limit.

Bold and shading indicates analyte was detected greater than the applicable regulatory level.

Table 7

Summary of Chemical Analytical Results - Groundwater PAHs[1]

Tiger Oil North 1st Street

Yakima, Washington

		Carcinogenic PAHs																			
		Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	cPAH TEQ[2]	Naphthalene	2-Methylnaphthalene	1-Methylnaphthalene	Naphthalene (Total)	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(ghi)perylene
	TEF[2]	0.1	1.0	0.1	0.1	0.01	0.1	0.1													
Sample ID	**Date Collected**	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
N1MW-1	09/18/14	<0.0858	<0.0858	<0.0858	<0.0858	<0.0858	<0.0858	<0.0858	0.06	**0.242**	**0.487**	**0.400**	**1.129**	<0.0858	<0.0858	<0.0858	<0.0858	<0.0858	<0.0858	<0.0858	<0.0858
Duplicate (N1MW-1)	09/18/14	<0.0893	<0.0893	<0.0893	<0.0893	<0.0893	<0.0893	<0.0893	0.07	**0.331**	**0.629**	**0.503**	**1.463**	<0.0893	<0.0893	<0.0893	<0.0893	<0.0893	<0.0893	<0.0893	<0.0893
N1MW-2	09/18/14	<0.0847	<0.0847	<0.0847	<0.0847	<0.0847	<0.0847	<0.0847	0.06	**3.24**	<0.0847	**10.1**	**<13.4**	<0.0847	<0.0847	<0.0847	<0.0847	<0.0847	<0.0847	<0.0847	<0.0847
N1MW-3	09/18/14	<0.0850	<0.0850	<0.0850	<0.0850	<0.0850	<0.0850	<0.0850	0.06	<0.0850	<0.0850	<0.0850	<0.2550	<0.0850	<0.0850	<0.0850	<0.0850	<0.0850	<0.0850	<0.0850	<0.0850
N1MW-4	09/18/14	<0.0854	<0.0854	<0.0854	<0.0854	<0.0854	<0.0854	<0.0854	0.06	<0.0854	<0.0854	<0.0854	<0.2562	<0.0854	<0.0854	<0.0854	<0.0854	<0.0854	<0.0854	<0.0854	<0.0854
N1MW-5	09/18/14	<0.0847	<0.0847	<0.0847	<0.0847	<0.0847	<0.0847	<0.0847	0.06	**0.550**	<0.0847	**0.410**	**<1.045**	<0.0847	<0.0847	<0.0847	<0.0847	<0.0847	<0.0847	<0.0847	<0.0847
MTCA Method A Unrestricted Land Use CUL[3]		NE	0.1	NE	NE	NE	NE	NE	0.1[4]	NE	NE	NE	160[5]	NE	NE	NE	NE	NE	NE	NE	NE

Notes:

[1]Polycyclic aromatic hydrocarbons (PAHs) analyzed using EPA Method 8270D by TestAmerica Laboratories, Inc., in Spokane, Washington.

[2]Carcinogenic PAH (cPAH) toxic equivalency (TEQ) calculated using toxicity equivalency factors (TEF) from MTCA Table 708-2, based on methodology described in MTCA Cleanup Regulation WAC 173-340-708. One half the reporting limit was used to calculate the TEQ.

[3]Model Toxics Control Act (MTCA) Method A unrestricted land use cleanup levels.

[4]MTCA Method A cleanup level for benzo(a)pyrene

[5]Cleanup level for total naphthalenes

µg/L = micrograms per liter; NE = Not Established.

Bold indicates analyte concentration exceeds laboratory reporting limit.

Table 8

Summary of Groundwater Chemical Analytical Results[1] - Vapor Intrusion Screening Evaluation

Tiger Oil North 1st
Yakima, Washington

Method and Analytes	Units	Location and Sample Date															
		Vapor Intrusion Screening Levels[2]	N1MW-1					Duplicate (N1MW-1)	N1MW-2					N1MW-3				
			09/18/14	12/11/14	03/10/15	08/22/16	11/17/16	11/17/16	09/18/14	12/11/14	03/10/15	08/22/16	11/17/16	09/18/14	12/11/14	03/10/15	08/22/16	11/17/16
TPH by Northwest Method NWTPH-Gx																		
Gasoline-range hydrocarbons	µg/L	NE	**256**	<100	**120**	<100	< 100	< 100	**506**	**372**	**340**	<100	< 100	<100	<100	<100	<100	< 100
TPH by Northwest Method NWTPH-Dx																		
Diesel-range hydrocarbons	mg/L	NE	<0.234	<0.233	<0.230	<0.13	< 0.13	< 0.14	**0.459**	**0.269 J**	**0.280**	<0.13	< 0.13	<0.231	<0.234	<0.240	<0.13	< 0.13
Heavy oil-range hydrocarbons	mg/L	NE	<0.389	<0.388	<0.380	<0.21	< 0.22	< 0.24	<0.382	<0.383	<0.390	<0.21	< 0.22	<0.386	<0.389	<0.390	<0.21	< 0.21
VOCs by Method EPA 8260C																		
Benzene	µg/L	103	<0.200	<0.200	<0.20	<0.20	< 0.20	< 0.20	<0.200	<0.200	<0.20	<0.20	< 0.20	<0.200	<0.200	<0.20	<0.20	< 0.20
Ethylbenzene	µg/L	2,780	<1.00	<1.00	<1.0	<1.0	< 1.0	< 1.0	**5.17**	<1.00	<1.0	<1.0	< 1.0	<1.00	<1.00	<1.0	<1.0	< 1.0
Methyl t-butyl ether (MTBE)	µg/L	87,000	<1.00	<1.00	<1.0	--	--	--	<1.00	<1.00	<1.0	--	--	<1.00	<1.00	<1.0	--	--
Toluene	µg/L	15,600	<1.00	<1.00	<1.0	<1.0	< 1.0	< 1.0	<1.00	<1.00	<1.0	<1.0	< 1.0	<1.00	<1.00	<1.0	<1.0	< 1.0
Xylene, m-,p-	µg/L	310	<2.00	<2.00	<2.0	<2.0	< 2.0	< 2.0	<2.00	<2.00	<2.0	<2.0	< 2.0	<2.00	<2.00	<2.0	<2.0	< 2.0
Xylene, o-	µg/L	440	<1.00	<1.00	<1.0	<1.0	< 1.0	< 1.0	<1.00	<1.00	<1.0	<1.0	< 1.0	<1.00	<1.00	<1.0	<1.0	< 1.0
Xylene, total	µg/L	NE	<3.00	<3.00	<3.0	<3.0	< 3.0	< 3.0	<3.00	<3.00	<3.0	<3.0	< 3.0	<3.00	<3.00	<3.0	<3.0	< 3.0

Method and Analytes	Units	Location and Sample Date												
		Vapor Intrusion Screening Levels[2]	N1MW-4					N1MW-5					N1MW-6	N1MW-7	N1MW-8
			09/18/14	12/11/14	03/10/15	08/22/16	11/17/16	09/18/14	12/11/14	03/10/15	08/22/16	11/17/16	11/17/16	11/17/16	11/17/16
TPH by Northwest Method NWTPH-Gx															
Gasoline-range hydrocarbons	µg/L	NE	<100	<100	<100	<100	< 100	<100	<100	<100	<100	< 100	**9,400**	**27,000**	**18,000**
TPH by Northwest Method NWTPH-Dx															
Diesel-range hydrocarbons	mg/L	NE	<0.232	<0.232	<0.240	<0.13	< 0.14	**0.238**	<0.234	<0.230	<0.13	< 0.13	**1.5 J**	**3.7 J**	**6.1 J**
Heavy oil-range hydrocarbons	mg/L	NE	<0.386	<0.387	<0.390	<0.22	< 0.23	<0.384	<0.391	<0.380	<0.22	< 0.22	< 0.23	< 0.22	< 0.21
VOCs by Method EPA 8260C															
Benzene	µg/L	103	<0.200	<0.200	<0.20	<0.20	< 0.20	<0.200	<0.200	<0.20	<0.20	< 0.20	< 4.0	**5.6**	**43**
Ethylbenzene	µg/L	2,780	<1.00	<1.00	<1.0	<1.0	< 1.0	<1.00	<1.00	<1.0	<1.0	< 1.0	**300**	**1,400**	**480**
Methyl t-butyl ether (MTBE)	µg/L	87,000	<1.00	<1.00	<1.0	--	--	<1.00	<1.00	<1.0	--	--	--	--	--
Toluene	µg/L	15,600	<1.00	<1.00	<1.0	<1.0	< 1.0	<1.00	<1.00	<1.0	<1.0	< 1.0	< 20	**180**	**26**
Xylene, m-,p-	µg/L	310	<2.00	<2.00	<2.0	<2.0	< 2.0	<2.00	<2.00	<2.0	<2.0	< 2.0	**950**	**5,300**	**1,600**
Xylene, o-	µg/L	440	<1.00	<1.00	<1.0	<1.0	< 1.0	<1.00	<1.00	<1.0	<1.0	< 1.0	**270**	**2,000**	**1,100**
Xylene, total	µg/L	NE	<3.00	<3.00	<3.0	<3.0	< 3.0	<3.00	<3.00	<3.0	<3.0	< 3.0	**1,200**	**7,300**	**2,700**

Notes:

[1]Chemical analyses conducted by TestAmerica of Spokane, Washington.

[2]Vapor intrusion screening level Method B Noncancer from Table B-1 of Ecology Draft Guidance (updated April 2016).

-- = not analyzed; EPA = Environmental Protection Agency; J = result was estimated; NE = not established; mg/L = milligrams per liter; µg/L = micrograms per liter; TPH = total petroleum hydrocarbons; VOC = volatile organic compounds

Bold indicates analyte concentration exceeds laboratory reporting limit.

Bold and shading indicates analyte was detected greater than the applicable regulatory level.

APPENDIX D

Site-Specific Health and Safety Plan

LANDAU ASSOCIATES

WORK LOCATION PERSONNEL PROTECTION AND SAFETY EVALUATION FORM

Job No.:	1148010.010		
Prepared by:	Jered Newcomb/Jeff Menken	Reviewed by:	Christine Kimmel
Date:	January 12, 2022	Date:	January 18, 2022

A. WORK LOCATION DESCRIPTION

1. **Project Name:** City of Yakima Tiger Oil 1st Street Site Remediation
2. **Location:** 1808 North 1st Street, Yakima Washington
3. **Anticipated Activities:** Drilling using hollow-auger or sonic methods, installation of monitoring and injection wells, soil and/or groundwater sampling. Persulfate and oxygen release compound (ORC) injections. Landau field staff will provide onsite health and safety monitoring.
4. **Size:** The site is approximately 0.65 acres.
5. **Surrounding Population:** Highway 12 and Interstate 82 approximately 950 feet to the north. Crave Coffee stand is located inside the property.
6. **Buildings/Homes/Industry:** Site is surrounded westward and southward by the Hotel Y and located westward across 1st Street from a Harley-Davidson dealership.
7. **Topography:** Site gently slopes to the north with an average elevation of approximately 1,080 ft above MSL.
8. **Anticipated Weather:** 10 °F to 90 °F (year-round outdoor work)
9. **Unusual Features:** None.
10. **Site History:** The Site property is owned by the City of Yakima but is under a Lease-to-Own agreement between the City and a Lessee. The Site is located at the northern end of the City approximately 0.5 miles south of the confluence of the Yakima and Naches Rivers. The Site includes a 0.65-acre parcel that was used as a gasoline station and convenience store between 1979 and 2001. Gasoline, diesel, waste oil, and heating oil were stored in underground storage tanks (USTs) at the property. Three gasoline tanks (20,000-, 8,000-, and 10,000-gallon), one 6,000-gallon diesel tank, and associated fueling islands/piping were removed in 2005. One heating oil UST and one waste oil UST were removed in 2019. No other USTs are known to be present at the Site. Remedial investigation (RI) report completed in 2017 documented the presence of petroleum-contaminated vadose zone and saturated smear zone soils associated

with the gasoline and UST systems. A UST assessment report in 2019 documented the presence of additional petroleum-contaminated soil remaining in the sidewall and bottom of the heating oil UST and waste oil UST excavation pits, respectively.

B. HAZARD DESCRIPTION

1. Background Review: ☒ Complete ☐ Partial

If partial, why?

2. Hazardous Level: ☐ B ☐ C ☒ D ☐ Unknown

Justification: Limited exposure and precaution.

3. Types of Hazards: (Attach additional sheets as necessary)

A. ☒ Chemical ☒ Inhalation ☒ Explosive
☒ Biological ☒ Ingestion ☒ O2 Def. ☒ Skin Contact

Describe: Exposure to chemical hazards. Nitrile gloves will be worn for soil or groundwater sampling. Neoprene, Polyvinylchloride, or natural rubber gloves and safety goggles will be worn for handling persulfate (compound may react with nitrile). Dust masks and respirators will be kept onsite and will be worn, if necessary (as described below). If exposed to impacted media, then upgrade to Level C PPE including Tyvek suit (as described below). Conduct air monitoring of ambient conditions to potential explosive or oxygen depletion.

Work to be conducted during a national Coronavirus-19 (COVID-19) Pandemic with needed protective measures: maintain daily health checks, wear face mask in public, maintain 6-ft separation from other individuals, no large group gatherings, drive separate vehicles, do not share field equipment or supplies.

(See product SDS in Attachment C.)

B. ☒ Physical ☒ Cold Stress ☒ Noise ☒ Heat Stress ☒ Other

Describe: Hazards associated with working around heavy machinery; reflective orange safety vests will be worn at all times. Noise hazards associated with the heavy equipment; ear protection will be used. Steel-toed boots will be worn at all times due to heavy object hazards. Potential trip and fall and puncture hazards. Potential exposure to weather extremes. Potential hazard of encountering an existing subsurface utility when drilling or excavating.

C. ☐ Radiation

Describe:

4. Nature of Hazards:

☒ Air	Describe: Exposure to hydrocarbons including oil, gasoline, and diesel is possible. Breathing zone air will be monitored with a photoionization detector (PID) for volatile organic compounds (VOCs) when performing subsurface investigations.
☒ Soil	Describe: Exposure to hydrocarbons including oil, gasoline, and diesel is possible. Nitrile gloves will be worn when handling soil and equipment. Conduct screening with PID and visual indication for impacted soil conditions.
☐ Surface Water	Describe:
☒ Groundwater	Describe: Exposure to hydrocarbons including oil, gasoline, and diesel is possible. Nitrile gloves will be worn when handling water samples and sampling equipment.
☒ Other	Describe: Standard physical slip, trip, fall hazards, as well as hazards presented by vicinity heavy equipment activities. The site contains a coffee kiosk, which may be operating during field activities. Hazards associated with vehicle traffic in the vicinity of the coffee kiosk.

5. Chemical Contaminants of Concern ☐ N/A

Product/Contaminant	PEL/TWA	I.D.L.H.	Source/Quantity Characteristics	Route of Exposure	Symptoms of Acute Exposure	Instruments Used to Monitor Contaminant
Total Petroleum Hydrocarbons (petroleum distillates)	100 ppm	400 ppm	Free product may be present in groundwater and/ or soil.	Inhalation, ingestion, dermal contact, eye contact	Irritation of eyes, nose, throat; nausea; dizziness; headache; dry cracked skin	Visual, PID meter
Benzene, toluene, ethylbenzene, xylenes (protective to benzene)	0.1 ppm	500 ppm	Free product may be present in groundwater and/ or soil.	Inhalation, ingestion, dermal contact, eye contact	Irritation of eyes, skin, nose, respiratory system; dizziness; headache, nausea, staggered gait; anorexia, lassitude (weakness, exhaustion); dermatitis; bone marrow depression; [potential occupational carcinogen].	PID meter
Sodium Persulfate	0.1mg/m^3 (TLV)	Not Available	Controlled application for remediation purposes.	Inhalation, ingestion, dermal contact, eye contact	Irritation of eyes, skin, and respiratory tract. Inhalation of dust may cause asthma-like reactions.	N/A

6. Physical Hazards of Concern ☐ N/A

Hazard	Description	Location	Procedures Used to Monitor Hazard
Moving parts of drill rig/ excavator, falling and flying objects	Hollow-stem auger drill rig, excavator	Near drill rig/ excavator	Alert observation of surroundings; minimize time spent near drill rig/ excavator; no loose clothing; use of safety glasses, hard hat, and steel-toed boots. Obtain operator's permission to advance upon machinery and stay outside of any equipment swing radius or pinch points. No entry into excavations greater than 4 ft without engineered devices or adequate sloping, remove overhang material from top of excavations.
Vehicles and heavy equipment used or entering the site	Cars, Trucks, Trailers, Excavators, Loaders, Dozers, and Backhoes	Work area	Alert observation of surroundings; use of brightly colored safety vest. Make eye contact with operator prior to entering work zone. Give all equipment the right of way. Place cones and or caution tape to delineate work areas.
Slips, trips, and falls	Uneven ground, wet surfaces in groundwater treatment building	Work area	Alert observation of surroundings. Minimize water release when performing operation and maintenance activities. Use proper caution when climbing ladders in treatment system, maintain three points of contact with ladder. Keep hands free of equipment by using packs.
Encountering subsurface utilities	Utilities (high-voltage power, water main, conveyor system) are located within the work area	North of retaining wall	Air-knife upper sections of explorations to identify utilities, contract with public and private utility locate services, review client-provided maps. Ground all equipment working in the direct vicinity of the utilities to avoid sparks. Have an ABC fire extinguisher in the vehicle and next to the drill rig. Maintain minimum of 20 ft (horizontal and vertical) from high-voltage power lines.

Explosion	Spark from non-grounded equipment conducting work in the subsurface	Near drill rig	If vapors accumulate in subsurface, the potential exists for a spark from non-grounded equipment to cause an explosion. Drill rig will be properly grounded. Use intrinsically safe equipment when working in areas of free product (no cell phones).
Heavy lifting above head level	Oil-water separator (OWS) lids at head level	Treatment building	Lids on OWS are at head level and could extend past walls of OWS during servicing. Always wear hardhat and safety glasses and exercise extreme caution during OWS servicing.
Weather stress	Exposure to hot or cold temperatures	Throughout area	Have drinking water accessible, wear appropriate clothing (light layers for heat, warm layers for cold), avoid caffeine, and take short breaks as needed.
Travel to and from site	Operating motor vehicle in traffic on highways and rural roads	Route to and from site	Operate motor vehicle while well rested and physically able to drive safely, conduct pre-trip vehicle inspection, all vehicles to be maintained and in good working order, obey all traffic laws including no cell phone use while driving, secure all cargo properly to avoid shifting, allow sufficient time to travel to site at safe speeds, engage emergency brake when parking vehicles, and establish planned route prior to departure.

7. Work Location Instrument Readings PID monitoring see Attachment A for action levels for respiratory protection.

8. Hazards Expected in Preparation for Work Assignment ☒ N/A

Describe:

C. PERSONAL PROTECTIVE EQUIPMENT

1. Level of Protection

☐ A ☐ B ☐ C ☒ D

Location/Activity: During planned site activities.

☐ A ☐ B ☒ C ☐ D

Location/Activity. Based on monitoring results at all locations. See Attachment A for action levels for upgrade in PPE.

2. Protective Equipment (specify probable quantity required)

Respirator ☐ N/A

- ☐ SCBA, Airline
- ☐ Full-Face Respirator
- ☒ Half-Face Respirator (Particulate cart. organic vapor) (Only if upgrade to Level C)
- ☐ Escape mask
- ☐ None
- ☒ Other: COVID-19 face mask
- ☐ Other:

Clothing ☐ N/A

- ☐ Fully Encapsulating Suit
- ☐ Chemically Resistant Splash Suit
- ☐ Apron, Specify:
- ☒ Tyvek Coverall (Only if upgrade to Level C)
- ☐ Saranex Coverall
- ☐ Coverall, Specify
- ☒ Other: High-visibility vest or safety shirt

Head & Eye ☐ N/A

- ☒ Hard Hat
- ☐ Goggles
- ☐ Face Shield
- ☒ Safety Eyeglasses
- ☒ Other: Hearing protection

Hand Protection ☐ N/A

- ☐ Undergloves; Type: nitrile
- ☒ Gloves; Type: Nitrile
- ☒ Overgloves; Type: Neoprene, Polyvinylchloride, or natural rubber for handling persulfate
- ☐ None
- ☐ Other: \

Foot Protection ☐ N/A

☐ Neoprene Safety Boots with Steel Toe/Shank

☐ Disposable Overboots

☒ Other: Steel-toed boots

☐ Other:

3. Monitoring Equipment ☐ N/A

☐ CGI ☒ PID

☐ O^2 Meter ☐ FID

☐ Rad Survey ☐ Particulate-Handheld Air Meter (HAM)

☐ Detector Tubes (optional)

Type:

D. PERSONAL DECONTAMINATION

☒ Required ☐ Not Required

Personnel should decontaminate by washing with soap and water prior to eating and departing from the Site. Disposal gloves will be discarded after each sampling interval. Disposable PPE will be discarded as solid waste. If possible, work from clean area of the Site toward the dirty areas.

EQUIPMENT DECONTAMINATION

☒ Required ☐ Not Required

If required, describe:

All sampling equipment will be decontaminated using wet decontamination procedures:

- Use paper towels or oil-absorbent pads to remove gross contamination. If gross contamination persists, use hexane.
- Wash and scrub equipment with Liquinox/tap water solution.
- Rinse with tap water.
- Rinse with de-ionized water.
- Repeat entire procedure or any parts of the procedure, as necessary.

In addition to the wet decontamination procedures, other measures will be taken to prevent cross-contamination. These measures include changing out disposable gloves between each sampling location, using fresh paper towels at each sampling location, maintaining a clean work area, and by working from known or suspected “clean” areas of the Site toward more environmentally impacted areas.

E. PERSONNEL

	Name	Work Location Title/Task	Medical Current	Fit Test Current
1.	**Jered Newcomb**	**Senior Staff EIT**	☒	☒
3.	**Stephanie Renando**	**Project Scientist**	☐	☐
4.	**Shane Kostka**	**Project Geologist**	☒	☒
5.			☐	☐
6.			☐	☐
7.				

Site Safety Coordinator: **Shane Kostka**

F. ACTIVITIES COVERED UNDER THIS PLAN

Task No.	Description	Preliminary Schedule
1	Drilling /soil sampling investigations/monitor and injection well installations	Ongoing as Required
2	Well sampling	Quarterly
3	Oxidant injections	Spring 2022

G. CONTRACTOR'S HEALTH AND SAFETY PROGRAM EVALUATION

☐ N/A

Name and Address of Contractor: Cascade Drilling 1920 97th St. East, Tacoma, WA 98445

EVALUATION CRITERIA

Item	Adequate	Inadequate	Comments
Medical Surveillance Program	☒	☐	
Personal Protective Equipment Availability	☒	☐	
Onsite Monitoring Equipment Availability	☒	☐	
Safe Working Procedures Specification	☒	☐	
Training Protocols	☒	☐	
Ancillary Support Procedures (if any)	☒	☐	
Emergency Procedures	☒	☐	
Evacuation Procedures Contingency Plan	☒	☐	
Decontamination Procedures Equipment	☒	☐	
Decontamination Procedures Personnel	☒	☐	

GENERAL HEALTH AND SAFETY PROGRAM EVALUATION: ☒ Adequate ☐ Inadequate

Additional Comments: Approved per Basic Agreement

Evaluation Conducted By: Christine Kimmel Date: September 30, 2021

EMERGENCY FACILITIES AND NUMBERS

Hospital: **Yakima Valley Memorial Emergency Room**
2811 Tieton Dr.
Yakima, Washington 98902
Telephone: (509) 575-8100

Directions:

1. Head north on N 1st street (0.1 miles)
2. Use the right lane to take the ramp to US-12 W (400 ft)
3. Keep right at the fork, follow signs for US-12 W/Naches (0.2 miles)
4. Continue onto US-12 W (0.7 miles)
5. Take the N 16th Ave exit (0.3 miles)
6. Turn left onto N 16th Ave exit (2.2 miles)
7. Turn right onto W Tieton Dr (0.7 miles)
8. Turn right onto S 28th Ave (161 ft)
9. Hospital is on the right.

Emergency Transportation Systems (Fire, Police, Ambulance) – 911

Emergency Routes – Map (Attachment B)

Emergency Contacts:

	Mobile	Office
Jeff Menken	(217) 553-0729	(503) 542-1091
Chris Kimmel	(206) 786-3801	(425) 329-0254
Piper Roelen	(425) 503-6784	(425) 329-0319

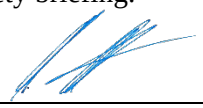
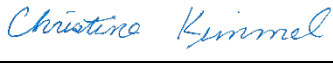
In the event of an emergency, do the following:

1. Call for help as soon as possible (911). Give the following information:
   - WHERE the emergency is – use cross streets or landmarks
   - PHONE NUMBER you are calling from
   - WHAT HAPPENED – type of injury
   - WHAT is being done for the victim(s)
   - YOU HANG UP LAST – let the person you called hang up first.

2. If the victim can be moved, paramedics will transport to the hospital. If the injury or exposure is not life threatening, decontaminate the individual first. If decontamination is not feasible, wrap the individual in a blanket or sheet of plastic prior to transport.

HEALTH AND SAFETY PLAN
APPROVAL/SIGN OFF FORMAT

I have read, understood, and agreed with the information set forth in this Health and Safety Plan (and attachments) and discussed in the Personnel Health and Safety briefing.

Name	Signature	Date
Shane Kostka		1/12/2022
Shane Kostka		1/12/2022
Site Safety Coordinator		
Christine Kimmel		1/18/2022
Landau Associates Health and Safety Manager		
Jeffrey Menken		1/12/2022
Project Manager		

Personnel Health and Safety Briefing Conducted By:

Name	Signature	Date

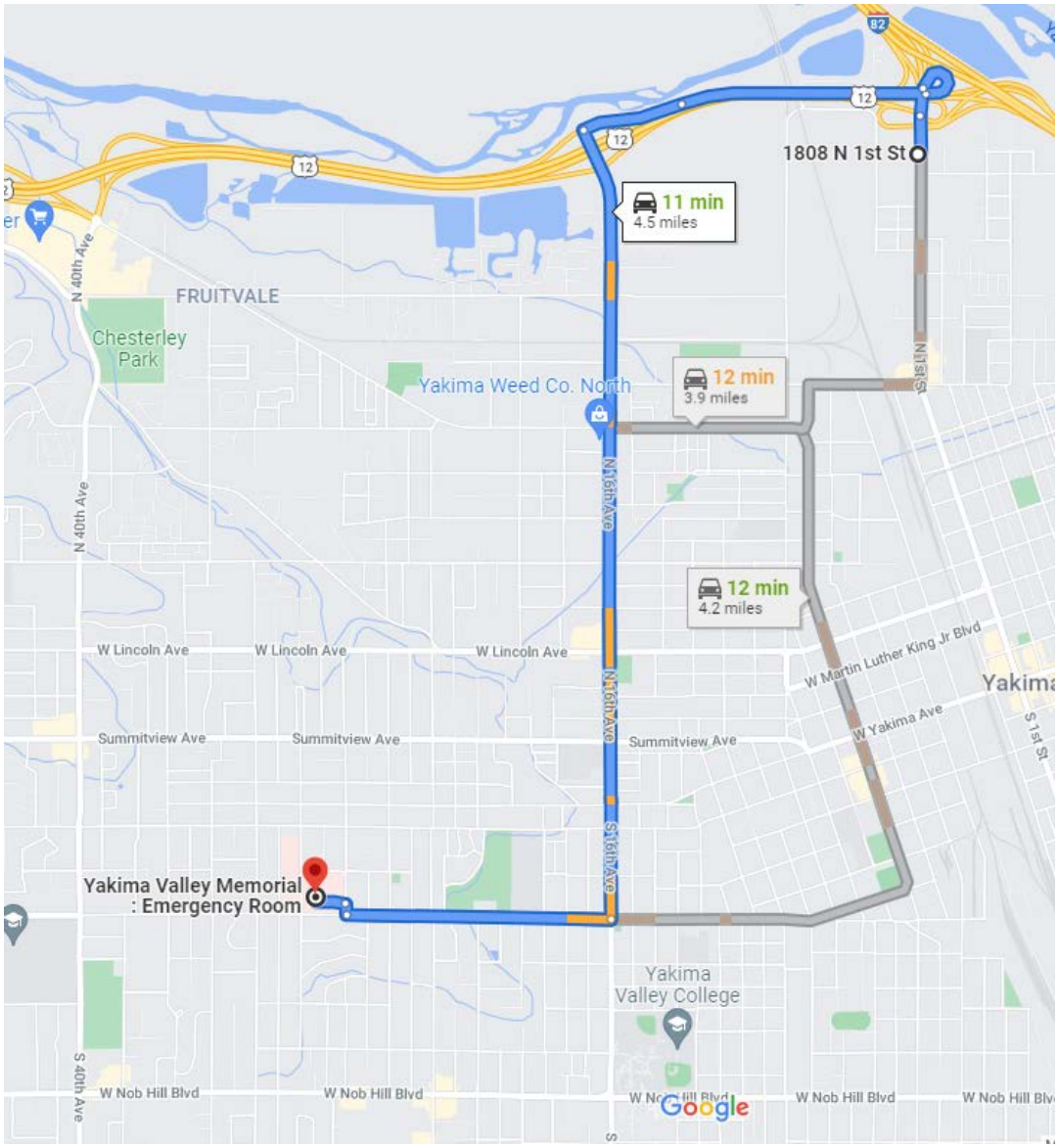
ATTACHMENT A

ACTION LEVELS FOR RESPIRATORY PROTECTION

Monitoring Parameter	Reading	Level of Protection
VOCs	PID reading >10 ppm in breathing zone for more than 15 minutes or >35 ppm for momentary peak.	Evacuate the area or upgrade to Level C - half-face respirator with organic vapor / HEPA cartridge and tyvex suit.
VOCs	PID reading >10 ppm and <100 ppm	Upgrade to Level C and temporarily stop work to allow vapors to decrease to below background before proceeding work in Level C
VOCs	PID reading >100 ppm	Stop Work, contact Health & Safety Manager
Explosively	LEL >10% Or <19.5% Oxygen>23%	Stop Work, verify proper grounding of equipment prior to contacting Health & Safety Manager.

ATTACHMENT B

EMERGENCY ROUTE



Directions:

1. Head north on N 1st street (0.1 miles)
2. Use the right lane to take the ramp to US-12 W (400 ft)
3. Keep right at the fork, follow signs for US-12 W/Naches (0.2 miles)
4. Continue onto US-12 W (0.7 miles)
5. Take the N 16th Ave exit (0.3 miles)
6. Turn left onto N 16th Ave exit (2.2 miles)
7. Turn right onto W Tieton Dr (0.7 miles)
8. Turn right onto S 28th Ave (161 ft)
9. Hospital is on the right.

Attachment C

SAFETY DATA SHEET
KLOZUR® ONE

SDS # : 7775-27-1-3
Revision date: 2021-10-13
Version 1.02

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product Identifier

Product Name KLOZUR® ONE

1.2. Relevant identified uses of the substance or mixture and uses advised against

Recommended Use: In situ and ex situ chemical oxidation of contaminants and compounds of concern for environmental remediation applications.

Restrictions on Use No uses to be advised against were identified

1.3. Details of the supplier of the safety data sheet

Manufacturer

Evonik Active Oxygens, LLC
2005 Market Street
Suite 3200
Philadelphia, PA 19103
Phone: +1 267/ 422-2400 (General Information)
E-Mail: Product-regulatory-services@evonik.com

Manufacturer/Supplier

Evonik Active Oxygens, LLC
2005 Market Street
Suite 3200
Philadelphia, PA 19103
Phone: +1 267/ 422-2400 (General Information)
E-Mail: Product-regulatory-services@evonik.com

Responsible Persons

Evonik Operations GmbH
Rellinghauser Str. 1-11
45128 Essen
Germany
Tel: +49 6181 59 4787
E-mail: sds-hu@evonik.com

1.4. Emergency telephone numbers

24-Hour Health Emergency: +49 2365 49 2232

2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Regulation (EC) No 1272/2008

Acute oral toxicity	Category 4
Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2
Respiratory sensitization	Category 1
Skin sensitization	Category 1
Specific target organ systemic toxicity (single exposure)	Category 3
Oxidizing Solids	Category 3

For the full text of the H- and EUH- phrases mentioned in this Section, see Section 16.

2.2. Label Elements

Signal word: WARNING

Hazard Statements
H302 - Harmful if swallowed
H315 - Causes skin irritation
H319 - Causes serious eye irritation
H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled
H317 - May cause an allergic skin reaction
H335 - May cause respiratory irritation
H272 - May intensify fire; oxidizer

Precautionary statements
P220 - Keep/Store away from clothing/ combustible materials
P280 - Wear protective gloves/ protective clothing/ eye protection/ face protection
P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing
P405 - Store locked up

2.3. OTHER INFORMATION

General Hazards
Risk of decomposition by heat or by contact with incompatible materials

3. COMPOSITION/INFORMATION ON INGREDIENTS

Mixture

Chemical name	EC-No	CAS-No	Weight %	Classification according to Regulation (EC) No. 1272/2008 [CLP]	REACH registration number
Sodium Persulfate	231-892-1	7775-27-1	95	Acute Tox. 4 (H302) Skin Irrit. 2 (H315) Eye Irrit. 2 (H319) Resp. Sens. 1 (H334) Skin Sens. 1 (H317) STOT SE 3 (H335) Ox. Sol. 3 (H272)	01-2119495975-15-0001
inorganic salt	Listed	-	< 1	Acute Tox. 4 (H302) Repr. 2 (H361d) Aquatic Acute 1 (H400) Aquatic Chronic 1 (H410) Ox. Sol. 2 (H272)	-
organic salt	Not Listed	-	< 5		-

Occupational exposure limits, if available, are listed in section 8.
For the full text of the H- and EUH- phrases mentioned in this Section, see Section 16

4. FIRST AID MEASURES

4.1. Description of first-aid measures

General Advice Remove from exposure, lie down. Show this material safety data sheet to the doctor in attendance.

Skin Contact Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Get medical attention if irritation develops and persists.

Eye Contact Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids intermittently. Consult a physician.

Inhalation Remove from exposure, lie down. If breathing is irregular or stopped, administer artificial respiration. Call a physician immediately.

Ingestion Do NOT induce vomiting. Call a physician or poison control center immediately. Rinse mouth. Drink 1 or 2 glasses of water.

4.2. Most important symptoms and effects, both acute and delayed

Itching; Redness; Coughing and/ or wheezing.

4.3. Indication of immediate medical attention and special treatment needed, if necessary

Indication of immediate medical attention and special treatment needed, if necessary Treat symptomatically.

5. FIRE-FIGHTING MEASURES

5.1. Extinguishing media

Suitable Extinguishing Media
Water. Cool containers with flooding quantities of water until well after fire is out.

Extinguishing media which shall not be used for safety reasons
Do NOT use water jet.

5.2. Special hazards arising from the substance or mixture

Special exposure hazards arising from the substance or preparation itself, combustion products, resulting gases
In case of fire, formation of sulphur oxides, nitrogen oxides, toxic pyrolysis products.

5.3. Advice for firefighters

Special protective equipment for fire-fighters
As in any fire, wear self-contained breathing apparatus and full protective gear.

OTHER INFORMATION
The product is not combustible. Contact with combustible materials may intensify fires. Adjust fire fighting measures to surrounding fire, if possible. Cool endangered containers with water spray and move out of danger area. Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Keep off any unprotected persons. Avoid contact with the skin and the eyes. Avoid breathing dust. Wear personal protective equipment.

6.2. Environmental Precautions

Local authorities should be advised if significant spillages cannot be contained. Try to prevent the material from entering drains or water courses.

6.3. Methods and materials for containment and cleaning up

Vacuum, shovel or pump waste into a drum and label contents for disposal. Avoid dust formation. Store in closed container. Clean up spill area and treat as special waste Dispose of waste as indicated in Section 13

Never add other substances or combustible waste to product residues.

6.4. Reference to other sections.

For personal protection see Section 8. Dispose of waste as indicated in Section 13

7. HANDLING AND STORAGE

7.1. Precautions for Safe Handling

Wear personal protective equipment. Use only in area provided with appropriate exhaust ventilation. Avoid dust formation. Handle product only in closed system or provide appropriate exhaust ventilation at machinery. Avoid contact with skin and eyes. Avoid breathing dust. Remove and wash contaminated clothing before re-use. Reference to other sections.

Additional information
Use clean plastic or stainless steel scoops only

7.2. Conditions for safe storage, including any incompatibilities

Storage
Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat. Do not store near combustible materials. Avoid contamination of opened product. Keep away from food, drink and animal feedingstuffs. Avoid formation and deposition of dust.

Materials to avoid
Acids, alkalis, halides (fluorides, chlorides, bromides), combustible materials, reducing agents and organic compounds.

7.3. Specific end uses

Refer to Section 1 and the Annex.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Exposure Limits Ingredients with workplace control parameters

Chemical name	**European Union**	**The United Kingdom**	**Ireland**
Sodium Persulfate 7775-27-1			TWA 0.1 mg/m ^{3} STEL 0.3 mg/m ^{3} Sensitizer
Chemical name	**France**	**Spain**	**Portugal**
Sodium Persulfate 7775-27-1		TWA 0.1 mg/m ^{3}	
Chemical name	**Denmark**	**Finland**	**Norway**
Sodium Persulfate 7775-27-1	TWA 2 mg/m ^{3}		
Chemical name	**Slovakia**	**Switzerland**	**Belgium**
Sodium Persulfate 7775-27-1			TWA 0.1 mg/m ^{3}
Chemical name	**Greece**	**Hungary**	**Croatia**
inorganic salt			TWA 5 mg/m ^{3}

Derived No Effect Level (DNEL)

DNELs - General Population				
Sodium Persulfate (7775-27-1)				
Exposure pattern	Route of Exposure	Description	DNEL/DMEL	Most Sensitive Endpoint
Acute - systemic	dermal	LD0	200 mg/kg bw	Acute toxicity
Acute - systemic	Inhalation	LC0	295 mg/m³	Acute toxicity
Acute - systemic	oral	LD0	30 mg/kg bw	Acute toxicity
Acute - local	dermal	LD0	1.124 mg/cm3	Acute toxicity
Acute - local	Inhalation	LC0	295 mg/m³	Acute toxicity
Long term - systemic	dermal	NOAEL	91 mg/kg bw/day	repeated dose toxicity
Long term - systemic	Inhalation	NOAEC	1.03 mg/m³	repeated dose toxicity
Long term - systemic	oral	NOAEL	9.1 mg/kg bw/day	repeated dose toxicity
Long term - local	dermal	NOAEL	0.051 mg/cm3	repeated dose toxicity
Long term - local	Inhalation	NOAEC	1.03 mg/m³	repeated dose toxicity

Predicted No Effect Concentration (PNEC)

8.2. Exposure Controls

Engineering measures Provide local exhaust or general ventilation adequate to maintain exposures below permissable exposure limits.

Personal protective equipment

General information	Protective engineering solutions should be implemented and in use before personal protective equipment is considered.
Respiratory Protection	P2 Dust mask when airborne dust concentrations elevated.
Eye/Face Protection	Eye protection recommended. Chemical goggles consistent with EN 166 or equivalent.
Skin and Body Protection	Wear suitable protective clothing.
Hand Protection	Protective gloves: Neoprene gloves, Polyvinylchloride, Natural Rubber.

Hygiene measures Keep away from food, drink and animal feeding stuffs. Do not eat, drink or smoke when using this product. Wash hands before breaks and after shifts. Keep work clothes separate, remove contaminated clothing - launder after open handling of product.

Environmental exposure controls The product should not be allowed to enter drains, water courses or the soil.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance	Crystalline solid
Color	Light tan
Physical State	Solid
Odor	odorless
Odor threshold	Not applicable
pH	No information available 6.6 (1% solution)
Flash point	Not flammable
Melting Point/Range	Decomposes on heating 180 °C
Freezing Point	Not applicable
Boiling Point/Range	No information available Decomposes upon heating
Autoignition temperature	No evidence of combustion up to 600°C
Explosive properties	Not explosive
Oxidizing properties	oxidizer
Vapor pressure	6.07E-30 mm Hg at 25ºC
Vapor density	No information available
Density	2.59 g/cm³ (crystal density) 1.68
Partition coefficient	No information available (inorganic)
Water solubility	575 g/l @ 25 °C
Viscosity	(Solid)
Evaporation Rate	No information available
Decomposition temperature	81 °C (SADT)

9.2. OTHER INFORMATION

Bulk Density	1.12 No information available
Molecular weight	mixture
VOC content (%)	Not applicable

10. STABILITY AND REACTIVITY

10.1. Reactivity

None under normal use condtions

10.2. Chemical Stability

Stable under recommended storage conditions. Unstable if heated. Unstable on exposure to moisture. Unstable in presence of contamination.

10.3. Possibility of Hazardous Reactions

None under normal processing.

10.4. Conditions to avoid

Heat. Moisture.

10.5. incompatible materials

Acids, alkalis, halides (fluorides, chlorides, bromides), combustible materials, reducing agents and organic compounds. .

10.6. Hazardous Decomposition Products

Oxygen which supports combustion

11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Acute toxicity
Product Information.

LD50 Dermal	Sodium Persulfate: > 10 g/kg
LD50 Oral	Sodium Persulfate: 895 mg/kg (rat)
LC50 Inhalation	Sodium Persulfate: >5.10 mg/L (4h) (rat)
Skin Contact	Irritating to skin. Persulfates in general, specifically diammonium persulfate and dipotassium persulfate, exhibited skin irritation properties in human case reports, following occupational exposure and consumer use. Slightly or non-irritating (rabbit).
Eye Contact	Irritating to eyes. Has been shown to exhibit eye irritation properties in human case reports following occupational exposure and consumer use. Non-irritating (rabbit).
Inhalation	Respiratory sensitizer: May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause irritation of respiratory tract. Respiratory irritation has been seen in workers exposed to persulfates. In animals, diammonium persulfate, produced pathological respiratory irritation in a subchronic study.
Ingestion	May be harmful if swallowed.

Chronic toxicity

Sensitization	Sodium Persulfate:. May cause sensitization by inhalation and skin contact.
Neurological effects	Not neurotoxic.
Target organ effects	Eyes. Lungs.
Carcinogenicity	Contains no ingredient listed as a carcinogen.
Mutagenicity	Did not show mutagenic effects in animal experiments
Reproductive toxicity	Diammonium persulfate did not affect fertility or the developing fetus in animal studies (NOAEL: 250 mg/kg bw).
Developmental toxicity	None known.
Teratogenicity	Not teratogenic in animal studies.

12. ECOLOGICAL INFORMATION

12.1. Toxicity

Ecotoxicity effects

Ecotoxicity effects of component substances.

Sodium Persulfate (7775-27-1)				
Active Ingredient(s)	Duration	Species	Value	Units
Sodium Persulfate	96 h LC50	Rainbow trout	163	mg/L
Sodium Persulfate	48 h LC50	Daphnia magna	133	mg/L
Sodium Persulfate	96 h LC50	Grass shrimp	519	mg/L
Sodium Persulfate	72 h EC50	Algae Selenastrum capricornutum	116	mg/L

Chemical name	Toxicity to algae	Toxicity to fish	Toxicity to Microorganisms	Toxicity to daphnia and other aquatic invertebrates
Trade secret	72 h EC50: 0.43-0.80 mg/L	96 h LC50: 2.97 - 3.11 mg/L (Cyprinus carpio) 96 h LC50: 3.16 - 3.77 mg/L (Cyprinus carpio) 96 h LC50: = 2.3 mg/L (Lepomis macrochirus) flow-through 96 h LC50: 1.8 - 5.6 mg/L (Lepomis macrochirus) static 96 h LC50: = 2.7 mg/L (Lepomis macrochirus) 96 h LC50: 1.08 - 1.38 mg/L (Oncorhynchus mykiss) 96 h LC50: 0.769 - 1.27 mg/L (Oncorhynchus mykiss) static 96 h LC50: 3.3 - 3.93 mg/L (Carassius auratus) static		48 h EC50: 0.06 mg/L (daphnia magna)

12.2. Persistence and degradability

Biodegradability does not pertain to inorganic substances. The organic components are biodegradable and can be expected to contribute to BOD.

12.3. Bioaccumulative potential

Does not bioaccumulate.

12.4. Mobility in soil

Dissociates into ions.

12.5. Results of PBT and vPvB assessment

PBT/vPvB assessment is not required for inorganic substances.

12.6. Other Adverse Effects

None known.

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Waste from residues / unused products Where possible recycling is preferred to disposal or incineration. If recycling is not practicable, dispose of in compliance with local regulations.

Product / Packaging disposal Dispose of as hazardous waste in compliance with local and national regulations.

Contaminated Packaging Empty remaining contents. Dispose of in accordance with local regulations.

14. TRANSPORT INFORMATION

ADR/RID

UN/ID no	UN 1505
Proper Shipping Name	Sodium Persulfate Mixture
Hazard class	5.1
Packing Group	III

IMDG/IMO

UN/ID no	UN 1505
Proper Shipping Name	Sodium Persulfate Mixture
Hazard class	5.1
Packing Group	III

ICAO/IATA

UN/ID no	UN 1505
Proper Shipping Name	Sodium Persulfate Mixture
Hazard class	5.1
Packing Group	III

Transport Symbol

Special Precautions for users According to United Nations "Recommendations on the transport of dangerous goods"

Transport in bulk according to MARPOL 73/78 and the IBC Code See IMDG above

15. REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

International Inventories

Chemical name	TSCA (United States)	DSL (Canada)	EINECS/ELINCS (Europe)	ENCS (Japan)	China (IECSC)	KECL (Korea)	PICCS (Philippines)	AICS (Australia)	NZIoC (New Zealand)
Sodium Persulfate 7775-27-1	X	X	231-892-1	X	X	X	X	X	X
inorganic salt	X	X	231-760-3	X	X	X	X	X	X

organic salt	-	-	H	X	X	H	X	X	X

Directive 2008/98/EC on waste
Applicable
Major Accidents (Directive 2012/18/EU)
Included for storage of quantities exceeding 50 Tm
CWC (Chemical Weapons Convention) - Annex on Chemicals
Not applicable

15.2. Chemical Safety Report

A Chemical Safety Assessment has been carried out for this substance.

16. OTHER INFORMATION

Full text of H-phrases referred to in sections 2 and 3
H272 - May intensify fire; oxidizer
H302 - Harmful if swallowed
H315 - Causes skin irritation
H319 - Causes serious eye irritation
H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled
H317 - May cause an allergic skin reaction
H335 - May cause respiratory irritation
H412 - Harmful to aquatic life with long lasting effects

Issuing Date: 2021-02-09
Restrictions on Use
This product's foreseen or recommended applications are: In situ and ex situ chemical oxidation of contaminants and compounds of concern for environmental remediation applications.

Sources of key data used to compile the datasheet
Evonik

Revision date: 2021-10-13
Revision note Manufacturer name changed.

List of Abbreviations and Acronyms
ATE Acute Toxicity Estimate
ADR European Agreement concerning the International Carriage of Dangerous Goods by Road
AND European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
CE50 Concentración Efectiva MediaCEN European Committee for Standardisation
C&L Classification and Labelling
CLP Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
CLV Ceiling Limit Value Par CAS# Chemical Abstracts Service number
CMR Carcinogen, Mutagen, or Reproductive Toxicant
CSA Chemical Safety Assessment
CSR Chemical Safety Report
DNEL Derived No Effect Level
DOT Department of Transportation
DPD Dangerous Preparations Directive 1999/45/EC
DSD Dangerous Substances Directive 67/548/EEC
DU Downstream User
EC European Community
ECHA European Chemicals Agency
EC-Number EINECS and ELINCS Number (see also EINECS and ELINCS)
EEA European Economic Area (EU + Iceland, Liechtenstein and Norway)
EEC European Economic Community
EINECS European Inventory of Existing Commercial Substances

ELINCS European List of notified Chemical Substances
EN European Standard
EQS Environmental Quality Standard
EU European Union
Euphrac European Phrase Catalogue EWC
European Waste Catalogue (replaced by LoW –see below)
FDS Ficha de Datos de Seguridad
GES Generic Exposure Scenario
GHS Globally Harmonized System
IATA International Air Transport Association
ICAO-TI Technical Instructions for the Safe Transport of Dangerous Goods by Air
IMDG International Maritime Dangerous Goods
IMO International Maritime Organization
IMSBC International Maritime Solid Bulk Cargoes
IT Information Technology
IUCLID International Uniform Chemical Information Database
IUPAC International Union for Pure Applied Chemistry
JRC Joint Research Centre
Kow octanol-water partition coefficient
LC50 Lethal Concentration to 50 % of a test population Lethal Dose to 50% of a test population (Median Lethal Dose)
LE Legal Entity
LLV Level Limit Value
LoW List of Wastes (see http://ec.europa.eu/environment/waste/framework/list.htm)
LR Lead RegistrantM/I Manufacturer / Importer MS Member States
MSDS Material Safety Data Sheet
NOEC No observed effect concentration
OC Operational Conditions
OECD Organization for Economic Co-operation and Development
OEL Occupational Exposure Limit
OJ Official Journal
OR Only Representative
OSHA European Agency for Safety and Health at work
PBT Persistent, Bioaccumulative and Toxic substance
PEC Predicted Effect Concentration
PNEC(s) Predicted No Effect Concentration(s)
PPE Personal Protection Equipment
(Q)SAR Qualitative Structure Activity Relationship
RCR Risk Characterization ratio
REACH Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006
RID Regulations concerning the International Carriage of Dangerous Goods by Rail
RIP REACH Implementation Project
RMM Risk Management Measure
SADT Self-accelerating decomposition temperature
SCBA Self-Contained Breathing Apparatus
SDS Safety data sheet
SIEF Substance Information Exchange Forum
SME Small and Medium sized Enterprises
STEL Short-term exposure limit
STOT Specific Target Organ Toxicity (STOT)
RE Repeated Exposure(STOT)
SE Single Exposure Par SVHC Substances of Very High Concern
TSCA Toxic Substances Control Act
TWA Time Weighed Average
UN United Nations
vPvB Very Persistent and Very Bioaccumulative / mPmB Muy Persistente y Muy Bioacumulativo
WGK Wassergefährdungsklassen

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Prepared By:

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End of Safety Data Sheet