Shane C. DeGross
Manager Environmental
Remediation

BNSF Railway Company
605 Puyallup Avenue
Tacoma, WA 98421

Phone: (253) 591-2567
E-mail: Shane.DeGross@bnsf.com

May 25, 2021

Tanner Bushnell
Toxics Cleanup Program
Dept. of Ecology
3190 160th Ave SE
Bellevue, WA 98008-5452

RE: Final 2020 Annual Hydraulic Control and Containment System Operations Report Transmittal
Consent Decree No. 07-2-33672-9 SEA:
Site Name: BNSF Former Maintenance and Fueling Facility
Site Address: Skykomish, WA
Facility/Site ID No.: 2104
Cleanup Site ID No.: 34

Dear Mr. Bushnell:

Enclosed is the Final 2020 Annual Hydraulic Control and Containment System Operations Report for Ecology's records.

Sincerely,

Shane C. DeGross
Manager Environmental Remediation, BNSF Railway

cc: Ms. Amy Essig Desai, Farallon Consulting

FARALLON CONSULTING

Washington
Issaquah | Bellingham | Seattle
Oregon
Portland | Baker City
California
Oakland | Irvine

2020 ANNUAL HYDRAULIC CONTROL AND CONTAINMENT SYSTEM OPERATIONS REPORT

BNSF FORMER MAINTENANCE AND FUELING FACILITY SKYKOMISH, WASHINGTON CONSENT DECREE NO. 07-2-33672-9 SEA

Submitted by:
Farallon Consulting, L.L.C.
975 5th Avenue Northwest
Issaquah, Washington 98027

Farallon PN: 683-071

For:
BNSF Railway Company
Tacoma, Washington

May 25, 2021

Prepared by:

Matthew Bowser, P.E.
Project Engineer

Reviewed by:

Amanda Meugniot, L.G.
Associate Geologist

Amy Essig Desai
Principal Scientist

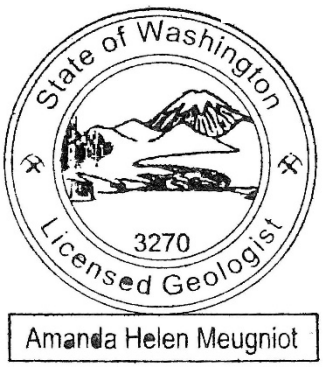


TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

ACRONYMS AND ABBREVIATIONS

AECOM	AECOM Environment
BNSF	BNSF Railway Company
DRO	total petroleum hydrocarbons as diesel-range organics
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
Farallon	Farallon Consulting, L.L.C.
GAC	granulated activated carbon
HCC	Hydraulic Control and Containment
LNAPL	light non-aqueous phase liquid
NWTPH-Dx	the sum of diesel- and oil-range organics analyzed using Ecology Method NWTPH-Dx
NPDES	National Pollutant Discharge Elimination System
µg/l	micrograms per liter
O&M	operations and maintenance
ORO	total petroleum hydrocarbons as oil-range organics
OWS	oil-water separator
RL	remediation level

EXECUTIVE SUMMARY

The 2020 Annual Hydraulic Control and Containment (HCC) System Operations Report describes the HCC system operation and the performance monitoring conducted during 2020 at the BNSF Railway Company's (BNSF) Former Maintenance and Fueling Facility in Skykomish, Washington (herein referred to as the Site). The HCC system was under a Passive Operation Pilot Study from 2019 through 2020, and during 2020 the HCC system was operated for approximately 4 hours bimonthly. In total, the HCC system operated for approximately 24 hours. Bimonthly HCC operations were conducted to ensure all components of the HCC system could be activated, if necessary. Approximately 45,000 gallons of groundwater were extracted and treated in 2020. No measurable light non-aqueous phase liquid (LNAPL) was recovered by the recovery well oil-skimmer storage tanks in 2020, as measurable LNAPL (greater than 0.01 foot thick) was not present.

Liquid level gauging and groundwater sampling were performed to assess passive operation of the HCC system in March, June, and September 2020. North of the HCC system barrier wall, groundwater flows toward the west and roughly parallel to the Skykomish River. South of the barrier wall, groundwater generally flows toward the west and northwest. The interpreted groundwater gradient and direction in 2020 was consistent with prior years since construction of the barrier wall. Site-wide groundwater monitoring and sampling events were conducted in March and June 2020 in accordance with the 2010 Compliance Monitoring Plan Update (AECOM Environment 2010a). Site-wide monitoring transitioned to semiannual monitoring in accordance with the Long-Term Monitoring Plan (Farallon 2020) beginning in September 2020, which requires monitoring and sampling in March and September.

The HCC system operated in conformance with National Pollutant Discharge Elimination System Permit No. WA0032123. Discharge occurred only during bimonthly operations and maintenance events and was a result of periodically operating the HCC system to ensure system readiness. The reported concentrations of lead, arsenic, and total petroleum hydrocarbons (quantified as NWTPH-Dx, defined herein as the sum of total petroleum hydrocarbons as diesel- and oil-range organics) in HCC water treatment system effluent samples were less than the respective discharge limits specified in National Pollutant Discharge Elimination System Permit No. WA0032123.

LNAPL was observed in monitoring wells and piezometers up-gradient of and adjacent to the HCC system barrier wall, between the West Gate and Center Gate, which is consistent with previous years; measured LNAPL observations ranged from a light trace (i.e., less than 0.01 foot thick and thin coating of LNAPL and/or a sheen observed on the oil-water interface probe) to 4.35 feet thick. Over the lifecycle of the data record, LNAPL observations and thickness measurements in monitoring wells and piezometers up-gradient of and adjacent to the HCC system barrier wall have exhibited an overall decreasing or stable trend.

Reported concentrations of NWTPH-Dx in groundwater samples collected from monitoring wells immediately north of the HCC system barrier wall were less than the Site-specific groundwater remediation level (RL) of 477 micrograms per liter (µg/l) and absent of sheen, with the exception of the March 2020 sample collected from HCC system gate well GW-3, which had a reported concentration of 780 µg/l without silica gel cleanup and 130 µg/l following silica gel cleanup. Gate

well GW-3 is immediately north and down-gradient of the blocked Center Gate, where substantial biofouling by iron bacteria slime has been observed. To evaluate whether the concentrations reported in gate well GW-3 were the result of interference from biogenic substances or petroleum metabolites, groundwater samples collected from this well were analyzed by Washington State Department of Ecology Method NWTPH-Dx both with and without a silica gel cleanup preparation process. The reported NWTPH-Dx concentrations in all the silica gel-prepared samples were less than the Site-specific groundwater RL, and significantly less than the reported NWTPH-Dx concentrations in the non-silica gel–prepared samples (Appendix C). The lower NWTPH-Dx concentrations reported in the silica gel-prepared samples from gate well GW-3 suggest that the NWTPH-Dx results for the non-silica gel–prepared samples are biased high due to biogenic or petroleum metabolite interferences.

This HCC System Operations Report includes a summary of the Passive Operation Pilot Study that concluded in December 2020. The purpose of the Passive Operation Pilot Study was to assess and confirm the HCC system's ability to meet the cleanup objective through passive operation. The Passive Operation Pilot Study included evaluation of an alternative HCC operational approach using the HCC system barrier wall and passive groundwater flow through granular activated carbon (GAC)-filled treatment gates as the primary means of meeting the cleanup objective. Under passive operation, active pumping from the recovery wells up-gradient of the HCC is a safeguard for preventing impacted groundwater on the BNSF railyard property from migrating off the Site prior to treatment, should breakthrough occur at the treatment gates. The Passive Operation Pilot Study was initiated on January 18, 2019 and concluded at the end of December 2020.

The cleanup objective for the HCC system is to prevent LNAPL and groundwater with total petroleum hydrocarbon concentrations exceeding the Site-specific groundwater RL of 477 µg/l from migrating from the BNSF railyard to the Skykomish River. The HCC monitoring results from 2020 and the Passive Operation Pilot Study results confirm that passive operation of the HCC system is effective in meeting the cleanup objective, and that the LNAPL and NWTPH-Dx concentrations in groundwater exceeding the Site-specific groundwater RL do not migrate past the HCC barrier wall during passive operation of the HCC system. These results demonstrate the effectiveness of the barrier wall and GAC-filled treatment gates in meeting the cleanup objective during passive operation. Therefore, passive operation of the HCC system is recommended for future operation of the HCC system.

1.0 INTRODUCTION

The 2020 Annual Hydraulic Control and Containment (HCC) System Operations Report describes the HCC system operation and performance monitoring conducted during 2020 at the BNSF Railway Company (BNSF) Former Maintenance and Fueling Facility in Skykomish, Washington (herein referred to as the Site). The Site includes BNSF property and public and private properties within the Town of Skykomish in King County, Washington, and it encompasses an area of approximately 40 acres (Figure 1). The HCC System Operations Report also includes a summary of the HCC System Passive Operation Pilot Study (Passive Operation Pilot Study – Appendix A) that concluded in December 2020.

The HCC system was designed to meet the cleanup objective, as defined in the Cleanup Action Plan prepared by the Washington State Department of Ecology (Ecology), of preventing light nonaqueous-phase liquid (LNAPL) and groundwater with total petroleum hydrocarbon concentrations (quantified as the sum of diesel- and oil-range organics analyzed using Ecology Method NWTPH-Dx [NWTPH-Dx]) exceeding the Site-specific remediation level (RL) of 477 micrograms per liter (µg/l) from migrating from the BNSF railyard to the Skykomish River (Ecology 2007). NWTPH-Dx is defined herein as the sum of total petroleum hydrocarbons as diesel-range organics (DRO) and as oil-range organics (ORO) based on analysis using Ecology Method NWTPH-Dx.

Site-wide groundwater monitoring and sampling events were conducted in March and June 2020 in accordance with the 2010 Compliance Monitoring Plan Update prepared by AECOM Environment (AECOM) (2010a), and in September 2020 in accordance with the Long-Term Monitoring Plan (Farallon 2020); which was conditionally approved by Ecology in September 2020 (Ecology 2020c). The Site transitioned to semiannual monitoring in September 2020, and under the Long-Term Monitoring Plan (Farallon 2020), the monitoring requirements are semiannual monitoring and sampling in March and September.

1.1 BACKGROUND

The HCC system is part of an integrated and comprehensive cleanup action and is operated and maintained in accordance with the requirements of the Cleanup Action Plan (Ecology 2007). The HCC system design is documented in the Special Design Report (ENSR Corporation 2008b) and the 2008 Construction Plans and Specifications (ENSR Corporation 2008a). The HCC system was constructed as described in the 2008 As-Built Completion Report (AECOM 2009) and the 2009 As-Built Completion Report (AECOM 2010b). Compliance monitoring is described in the 2010 Compliance Monitoring Plan Update (AECOM 2010a) and Long-Term Monitoring Report (Farallon 2020). HCC system operations monitoring is conducted in accordance with the HCC Operation and Maintenance (O&M) Manual (AECOM 2011) and 2014 Addendum (Farallon 2014).

The HCC system operated in passive mode from January 18, 2019 through December 2020 to evaluate the HCC system's ability to meet the cleanup objective through passive operation (Farallon 2018b; Ecology 2020a, 2020b). During the Passive Operation Pilot Study, system start-up and shut-down, and sampling of treatment system effluent were conducted monthly in 2019

and bimonthly in 2020. System start-up and shut-down, and effluent sampling were performed in accordance with the procedures described in the HCC O&M Manual (AECOM 2011) and the 2014 Addendum (Farallon 2014).

1.2 REPORT ORGANIZATION

The remainder of this report is organized as follows:

- **Section 2, HCC System Description and Performance Monitoring**, provides a general description of the HCC system and a summary of the performance monitoring activities conducted during 2020, including the monitoring parameters, schedule, and results;
- **Section 3, Conclusions**, presents conclusions based on the HCC system operations and groundwater monitoring activities;
- **Section 4, Proposed Passive Operations and Monitoring**, describes HCC system operation, maintenance, and monitoring activities planned for 2021; and
- **Section 5, References**, provides a list of the documents used in preparing this report.

2.0 HCC SYSTEM DESCRIPTION AND PERFORMANCE MONITORING

This section provides a general description of the HCC system and a summary of the performance monitoring activities conducted during 2020, including the monitoring parameters, schedule, and results. HCC system performance monitoring is conducted to facilitate system performance, assess performance relative to the cleanup objective, and document compliance with the discharge limits specified in National Pollutant Discharge Elimination System (NPDES) Permit No. WA0032123 (NPDES Permit). The primary components of the HCC system are summarized in Section 2.1. The Passive Operation Pilot Study of the HCC System is summarized in Section 2.2. The HCC system performance monitoring activities and results are described in Sections 2.3 through 2.6.

2.1 HCC SYSTEM DESCRIPTION

A detailed description of the HCC system, and figures showing the HCC system layout and process and instrumentation diagrams, are provided in the HCC O&M Manual (AECOM 2011).

The HCC system comprises the following primary components:

- A 1,183-foot-long groundwater barrier wall and interception trench with four flow-through treatment gates, which contain oil-water separators (OWS) and a mixture of granular activated carbon (GAC) and pea gravel media, along the northern boundary of the BNSF railyard;
- Nine groundwater extraction/LNAPL recovery wells;
- Fourteen piezometers;
- Twenty sentry wells;
- Eleven HCC system monitoring wells;
- Two groundwater injection wells;
- A water treatment system, which includes aboveground and underground water conveyance piping, an OWS, a hydrogen peroxide disinfectant system, sand filters, GAC vessels, a pH adjustment system, and influent and effluent water storage tanks; and
- A computer-based programmable logic controller that collects system operational data and is used to monitor, control, and adjust system operating parameters.

The groundwater injection wells were used intermittently in 2009 and 2010 to inject treated groundwater into the BNSF railyard subsurface. In September 2010, the discharge of treated groundwater to the injection wells ceased, and the discharge at one of the injection wells was rerouted to an up-gradient OWS chamber in the East Gate of the barrier wall. The discharge of treated groundwater to the East Gate OWS chamber was discontinued at the end of 2012. Since the end of 2012, all groundwater treated by the HCC system has been discharged to the municipal storm sewer system (per the NPDES Permit), which discharges to the Skykomish River (Farallon 2018a).

HCC system optimization pilot testing conducted in October 2014 (Phase I – low-water conditions) and March and May 2015 (Phase II – high-water conditions) evaluated groundwater flow through the flow-through treatment gates. The pilot test data indicated that groundwater flow through the Center Gate is restricted due to biofouling and that most of the groundwater flowing through the HCC barrier wall treatment gates passes through the West Gate (Farallon 2017).

2.2 PASSIVE OPERATION PILOT STUDY

A Passive Operation Pilot Study was initiated on January 18, 2019 and was conducted through December 2020 in accordance with the 2018 Pilot Study Work Plan and subsequent Ecology-approved amendments and extensions (Farallon 2018b; Ecology 2020a, 2020b). The Passive Operation Pilot Study is discussed in detail in the 2020 Hydraulic Control and Containment System Passive Operation Pilot Study Report included in Appendix A and summarized below.

2.2.1 Passive Operation Pilot Study Activities

The Passive Operation Pilot Study included the following activities:

- Collecting baseline groundwater samples on December 11 and 12, 2018 at select monitoring locations near the western end of the HCC barrier wall, prior to turning off the recovery well pumps, for laboratory analysis for NWTPH-Dx;
- Turning off the recovery well pumps to initiate passive operation of the HCC system on January 18, 2019;
- Conducting groundwater sampling and liquid level gauging at the monitoring locations sampled during the baseline sampling event on a monthly basis between January and December 2019 and a bimonthly basis between February and December 2020;
- Evaluating the monitoring results to assess the effectiveness of passive operation; and
- Operating the recovery well pumps and groundwater treatment system for approximately 4 hours on a monthly basis in 2019 and on a bimonthly basis in 2020 to ensure all components of the redundant HCC system can be activated, if needed.

2.2.2 Passive Operation Pilot Study Results

The 2018 Pilot Study Work Plan (Farallon 2018b) defined groundwater NWTPH-Dx target concentration objectives for the Passive Operation Pilot Study of one-half the Site-specific groundwater RL (238 µg/l) in down-gradient sentry wells S2-AD and S2-BD, and the Site-specific groundwater RL (477 µg/l) and the absence of sheen in monitoring wells EW-1, 5-W-43, GW-1, and GW-2, and piezometers PZ-7S and PZ-8.

The eight monitoring locations met their respective target concentration objectives throughout the entirety of the Passive Operations Pilot Study. NWTPH-Dx was not detected at concentrations exceeding the laboratory reporting limit in any of the monthly (2019) or bimonthly (2020) groundwater samples collected from down-gradient sentry wells S2-AD and S2-BD. NWTPH-Dx ranged from not detected at concentrations exceeding the laboratory reporting limit to 320 µg/l, which was less than the Site-specific groundwater RL, in monthly (2019) or bimonthly (2020)

groundwater samples collected from monitoring wells EW-1, 5-W-43, GW-1, GW-2, and piezometers PZ-7S and PZ-8.

Piezometer PZ-6S was the only Passive Operation Pilot Study monitoring location with measurable thickness of LNAPL, with the thickest LNAPL measurement of 1.86 feet observed during the July 2019 monitoring event, which coincided with a seasonal low groundwater elevation. The LNAPL thicknesses measured within piezometer PZ-6S during the Passive Operation Pilot Study were similar to or less than the typical range previously measured in this piezometer. Only light traces (i.e., less than 0.01 foot thick and thin coating of LNAPL and/or a sheen observed on the oil-water interface probe) of LNAPL were periodically measured at recovery wells RW-05 and RW-06 during the Passive Operation Pilot Study, which is less than historical observations of light to heavy traces (i.e., less than 0.01 foot thick and thick coating of LNAPL observed on the oil-water interface probe) of LNAPL at these locations.

Piezometer PZ-5S, which was not included in the Passive Operation Pilot Study, also had measurable thicknesses of LNAPL as described in Section 2.6.5 below.

2.2.3 Passive Operation Pilot Study Conclusion

The Passive Operation Pilot Study results confirm that passive operation of the HCC system is effective in meeting the cleanup objective. LNAPL and NWTPH-Dx in groundwater exceeding the Site-specific groundwater RL do not migrate past the HCC barrier wall during passive operation of the HCC system. These results demonstrate the effectiveness of the barrier wall and GAC-filled treatment gates in passively meeting the cleanup objective.

2.3 HCC SYSTEM OPERATIONS MONITORING

HCC system operations monitoring was conducted in accordance with the HCC O&M Manual (AECOM 2011) and 2014 Addendum (Farallon 2014) prior to initiating the Passive Operation Pilot Study on January 18, 2019. Upon initiating the Passive Operation Pilot Study, HCC system operations monitoring was conducted in accordance with the 2018 Pilot Study Work Plan (Farallon 2018b).

HCC system operations monitoring during the Passive Operation Pilot Study consisted of monitoring the following operational parameters and conducting inspections and sampling at the frequencies noted:

- System run-time (daily).
- Groundwater extraction and treated water discharge flow (daily).
- Influent equalization tank water level (daily).
- Effluent equalization tank water level (daily).
- Backwash-water holding tank water level (daily).
- Visual inspection of the effluent equalization tank for sheen (bimonthly).

- Visual inspection of the recovery wells and recovery well oil-skimmer storage tanks for accumulation of LNAPL (bimonthly).
- Water treatment system influent monitoring, which included sampling of primary and secondary GAC vessel influent (bimonthly). (Note: secondary GAC vessel influent samples were collected to assess petroleum hydrocarbon loading of primary GAC vessel and are not discussed further in this report).
- Water treatment system effluent monitoring (bimonthly):
    - Sampling of treatment system effluent and analysis by Ecology Method NWTPH-Dx; monitoring of treatment system effluent pH; and sampling of treatment system effluent and analysis for total lead and total arsenic by U.S. Environmental Protection Agency (EPA) Method 200.8.
    - Groundwater elevations in piezometers and recovery wells (recorded daily by in-well pressure transducers and gauged by field personnel bimonthly).

2.4 HCC SYSTEM GROUNDWATER MONITORING

The performance of the HCC system is assessed by monitoring the following wells, piezometers, and barrier wall gate OWS chamber vaults (Figures 1 and 2):

- The 11 HCC system monitoring wells, which include:
    - Gate wells GW-1 through GW-4, installed immediately north of the barrier wall gates;
    - End wells EW-1 and EW-2A, installed near the western and eastern ends of the barrier wall, respectively; and
    - Monitoring wells 5-W-43, 2A-W-40, 2A-W-41, 1B-W-23, and 2A-W-42, installed along Railroad Avenue on the northern (down-gradient) side of the barrier wall;
    - The 20 sentry wells (well groups S1 through S4, containing four to six wells each) installed in the GAC and pea gravel chambers of the barrier wall treatment gates;
    - The six piezometer pairs (piezometers PZ-2S/PZ-2N through PZ-7S/PZ-7N) installed along the barrier wall and the two piezometers (piezometers PZ-1 and PZ-8) installed at the western and eastern ends of the barrier wall;
    - The nine groundwater extraction/LNAPL recovery wells (wells RW-01 through RW-09) installed on the southern (up-gradient) side of the barrier wall; and
    - The OWS chamber vaults in each vault of each barrier wall gate (Figure 2).

The HCC system monitoring wells were gauged and sampled during the March, June, and September 2020 events. The sentry wells were sampled in March 2020. The recovery wells were gauged during the March, June, and September events and the piezometers and barrier wall gate OWS chambers were gauged in March and June. The recovery wells, piezometers, and barrier wall gate OWS chamber vaults serve as gauging stations for the presence or absence of LNAPL or sheen and are not sampled.

In addition to the monitoring activities described above, the following locations were monitored bimonthly in February, April, June, August, October, and December as part of the Passive Operation Pilot Study:

- Piezometers PZ-7S and PZ-8.
- Monitoring wells EW-1, 5-W-43, GW-1, and GW-2.
- West Gate sentry wells S2-AU, S2-AD, S2-BU, and S2-BD.
- The west and east vault OWS chambers of the West Gate and Far West Gate (locations WG-WV, WG-EV, FWG-WV, and FWG-EV).
- The groundwater samples collected from the OWS chambers were obtained from the northern (down-gradient) side of the baffle walls in the OWS chambers.

Results from the Passive Operation Pilot Study are provided in Appendix A.

2.5 RESULTS OF HCC SYSTEM OPERATIONS MONITORING

2.5.1 System Run-Time

The HCC system operated for approximately 4 hours bimonthly for 2020. In total, the HCC system operated for approximately 24 hours.

2.5.2 Groundwater Extraction and Treated Water Discharge Flow

Approximately 45,000 gallons of groundwater were extracted and treated in 2020. All HCC system groundwater extracted and treated in 2020 was pumped from recovery wells RW-02, RW-03, RW-04, RW-06, RW-07, and RW-08. HCC system discharge flow rate data are summarized in Table 1.

2.5.3 Tank Water Levels

Influent equalization tank, effluent equalization tank, and backwash-water holding tank water levels were maintained within normal operating ranges.

2.5.4 Visual Inspection of Effluent Equalization Tank for Sheen

Water treatment system effluent water was monitored for the presence of sheen by visually observing the water in the effluent equalization tank, either during Site visits or via a remote video camera (i.e., web cam). No sheen was observed on the water in the effluent equalization tank.

2.5.5 Visual Inspection of Recovery Wells and Recovery Well Oil-Skimmer Tanks for Accumulation of LNAPL

Recovery wells and recovery well oil-skimmer storage tanks were inspected bimonthly for accumulation of LNAPL. The recovery well oil-skimmer storage tanks were pumped out as required (see Section 2.5.8, Recovered Light Nonaqueous-Phase Liquid Volumes).

2.5.6 Water Treatment System Influent Monitoring

Water treatment system influent was sampled bimonthly at the inlet to the primary GAC vessel and analyzed for NWTPH-Dx. Reported influent NWTPH-Dx concentrations ranged from 480 to 770 µg/l; the average reported influent NWTPH-Dx concentration was 590 µg/l. Influent NWTPH-Dx data are summarized in Table 2; laboratory analytical reports are provided in Appendix B.

2.5.7 Water Treatment System Effluent Monitoring

Water treatment system effluent was sampled bimonthly at the outlet of the secondary GAC vessel. The effluent samples were analyzed for NWTPH-Dx; one effluent sample collected during each sampling event also was analyzed for total lead and total arsenic. In addition, the pH of the treatment system effluent was monitored bimonthly using a digital pH meter. The results of the effluent monitoring are summarized below:

- **NWTPH-Dx:** NWTPH-Dx was not detected at concentrations exceeding the laboratory reporting limit in the bimonthly treatment system effluent samples; the laboratory reporting limit was less than the NPDES Permit discharge limit of 208 µg/l. Effluent NWTPH-Dx data are summarized in Table 2; laboratory analytical reports are provided in Appendix B.
- **pH:** Measured effluent pH ranged from 7.50 to 7.70 standard units; the average measured effluent pH was 7.59. The NPDES Permit discharge limit for pH is 6.5 to 8.5. Effluent pH data are summarized in Table 3.
- **Lead and Arsenic:** Total lead and total arsenic were not detected at concentrations exceeding their respective laboratory reporting limits in the treatment system effluent samples; the laboratory reporting limits were less than the respective NPDES Permit discharge limits for total lead and total arsenic of 17.5 and 360 µg/l, respectively. Effluent lead and arsenic data are summarized in Table 4; laboratory analytical reports are provided in Appendix B.

2.5.8 Recovered Light Nonaqueous-Phase Liquid Volumes

The belt-type oil skimmers in recovery wells RW-04, RW-07, and RW-08 were operated with approximate 2-minute run-times four to six times per day. No measurable LNAPL was recovered by the recovery well oil-skimmer storage tanks in 2020, and measurable LNAPL (greater than 0.01 foot thick) was not present within the oil-skimmer storage tanks.

2.5.9 Differential Groundwater Elevations Across Barrier Wall

Six piezometer pairs installed along the barrier wall (piezometer pairs PZ-2S/PZ-2N through PZ-7S/PZ-7N) and two single piezometers, one at each end of the barrier wall (piezometers PZ-1 and PZ-8) (Figure 1), are used to monitor groundwater elevations adjacent to the barrier wall and near the flow-through treatment gates. One piezometer of each piezometer pair is on the southern (up-gradient) side of the barrier wall (designated PZ-2S, PZ-3S, etc.), and the other piezometer is on the northern (down-gradient) side of the barrier wall (designated PZ-2N, PZ-3N, etc.). Pressure transducers are installed within the piezometers and record groundwater elevation daily.

Daily groundwater elevation differentials across the barrier wall at each piezometer pair location were calculated by subtracting the groundwater elevation measured in the northern piezometer from the groundwater elevation measured in the southern piezometer. Barrier wall groundwater elevation data for the 2020 reporting period, including calculated elevation differentials at piezometer pairs, are presented in Table 5.

The largest differential elevations between piezometer pairs occurred during winter and (generally between November and January) during periods of higher groundwater elevations, and smaller differential elevations between piezometer pairs occurred during summer months (August and September). The differential elevations recorded during periods of high groundwater indicate that groundwater mounding is occurring on the southern (up-gradient) side of the barrier wall, which is expected and consistent with historic data. The differential groundwater elevation data demonstrate that the barrier wall effectively directed groundwater flow through the East Gate, West Gate, and Far West Gate during 2020. Previous pilot testing has shown that the Center Gate is blocked to groundwater flow due to the presence of iron bacteria biofouling in the up-gradient portions of the GAC and pea gravel media in this gate (Farallon 2017).

Passive operation of the HCC system in 2020 resulted in slight increases in the average groundwater elevation differential measured along the barrier wall compared to previous years when the system was active. The average differential in 2020 was slightly greater across all piezometer pairs by an average of 0.19 foot compared to 2018.

2.5.10 Service Interruptions

There were no service interruptions during the 4-hour bimonthly tests conducted during the Passive Operation Pilot Study.

2.6 RESULTS OF HCC SYSTEM GROUNDWATER MONITORING

The overall results of Site-wide groundwater monitoring conducted in 2020 are presented in the 2020 Site-Wide Groundwater Monitoring Report (Farallon 2021). The results of Site-wide groundwater monitoring conducted in 2020 to assess HCC system performance are summarized below.

North of the HCC system barrier wall, groundwater flows toward the west and roughly parallel to the Skykomish River. South of the barrier wall, groundwater flows toward the west and northwest. The groundwater flow directions in 2020 were consistent with previous years after construction of the barrier wall. Based on groundwater elevations and previous HCC system pilot testing near the flow-through treatment gates in the barrier wall, groundwater flows from south to north through three of the four gates. Groundwater elevation contours and interpreted groundwater flow directions derived from the groundwater monitoring data also are shown on Figures 3 through 5.

The groundwater monitoring results for the locations used to monitor HCC system performance are summarized below. Groundwater field parameter data are summarized in Table 6. Groundwater analytical results for DRO, ORO, and NWTPH-Dx (i.e., the sum of DRO and ORO) are summarized in Table 7. Groundwater elevation and LNAPL thickness data from the quarterly and semiannual monitoring events are summarized in Table 8. Figures 3 through 5 show reported

groundwater NWTPH-Dx concentrations and measured LNAPL thicknesses at the monitoring locations used to assess HCC system performance as described above in Section 2.3. The results from the Passive Operation Pilot Study are included in Appendix A.

2.6.1 Sentry Wells

The 20 sentry wells (wells S1-AU, S2-BD, etc.) were sampled during the March semiannual groundwater monitoring event, and sentry wells S2-AU, S2-AD, S2-BU, and S2-BD were sampled bimonthly during the Passive Operation Pilot Study monitoring events. NWTPH-Dx was not detected above the reporting limit in 18 of 20 wells sampled. The two sentry wells (S2-B2 and S4-CU) with reported detections during 2020 are described below:

- NWTPH-Dx was detected at a concentration of 400 µg/l in the March groundwater sample collected from up-gradient sentry well S2-BU in the east vault of the West Gate (Table 7; Figure 3). NWTPH-Dx concentrations ranged from 121 to 370 µg/l in the samples collected from S2-BU during the bimonthly Passive Operations Pilot Study monitoring events (Appendix A; Table 1).

- NWTPH-Dx was detected at a concentration of 108 µg/l in the March 2020 groundwater sample collected from up-gradient sentry well S4-CU in the east vault of the East Gate (Table 7; Figure 3).

The two sentry wells noted above are in the up-gradient GAC and pea gravel chamber within their respective vaults. All up-gradient sentry wells are paired with a down-gradient sentry well located in the down-gradient GAC and pea gravel chamber in the same vault to evaluate the effectiveness of groundwater treatment. NWTPH-Dx was not detected in any of the down-gradient sentry wells from S2-BU and S4-CU (S2-BD and S4-CD, respectively) in March 2020 or in any samples collected during the Passive Operations Pilot Study (Appendix A). This data demonstrates the effectiveness of the GAC in treating groundwater under passive operation of the HCC system.

2.6.2 Gate Wells

All four gate wells (wells GW-1 through GW-4) were gauged and sampled during the Site-wide events in June, March, and September 2020, and gate wells GW-1 and GW-2 were sampled bimonthly during the Passive Operations Pilot Study monitoring events. NWTPH-Dx was detected at concentrations less than the Site-specific groundwater RL in groundwater samples collected from the gate wells, with the exception of one sample collected in March 2020 from gate well GW-3. NWTPH-Dx was detected at a concentration of 780 µg/l, which exceeds the Site-specific groundwater RL of 477 µg/l (Table 7; Figure 3; Appendix A). The March 2020 GW-3 groundwater sample was also analyzed following a silica gel cleanup preparation process with a reported concentration of 130 µg/l. LNAPL or sheen was not observed in any of the gate wells (Table 8; Figures 3 through 5).

Gate well GW-3 is immediately north and down-gradient of the Center Gate, where substantial biofouling by iron bacteria has been observed with some degree of seasonality. Between June 2014 and December 2018, NWTPH-Dx concentrations ranged between 63 and 780 µg/l. Historically (between April 2009 and June 2014), NWTPH-Dx concentrations fluctuated over a smaller range of 34 to 184 µg/l. Increased concentration ranges in gate well GW-3 since June 2014 are the result

of interference from biogenic substances or petroleum metabolites as evidenced by split sampling with and without silica gel cleanup. NWTPH-Dx concentrations in all the silica gel-prepared samples were significantly less than the NWTPH-Dx concentrations in the non-silica gel–prepared samples as shown on the trend plot included as Appendix C. These data demonstrate that the NWTPH-Dx results for the non-silica gel–prepared samples are biased high due to biogenic or petroleum metabolite interferences originating from the biofouled gate.

2.6.3 End Wells

The two end wells (wells EW-1 and EW-2A) were gauged and sampled during the March and June (EW-1 only) groundwater monitoring events, and EW-1 was gauged and sampled bimonthly during the Passive Operation Pilot Study monitoring events. NWTPH-Dx was not detected at concentrations exceeding the laboratory reporting limit in groundwater samples collected from the end wells. LNAPL and sheen were not observed in either of the end wells (Table 7; Appendix A).

2.6.4 Monitoring Wells 5-W-43, 2A-W-40, 2A-W-41, 1B-W-23, and 2A-W-42

Monitoring wells 5-W-43, 2A-W-40, 2A-W-41, 1B-W-23, and 2A-W-42 were sampled during the March, June, and September 2020 events, and 5-W-43 was sampled bimonthly during the Passive Operation Pilot Study monitoring events. NWTPH-Dx was detected at concentrations less than the Site-specific groundwater RL in the groundwater samples collected from these wells in 2020 (Table 7; Figures 3, 4, and 5; Appendix A). LNAPL and sheen were not observed in any of these monitoring wells.

2.6.5 Piezometers

The 14 piezometers were gauged for the presence or absence of LNAPL and sheen during March and June groundwater monitoring events, with one exception, and piezometer PZ-6S was gauged bimonthly during the Passive Operation Pilot Study monitoring events. Piezometer PZ-4N could not be accessed and gauged during the June groundwater monitoring event. LNAPL was observed in piezometers PZ-5S and PZ-6S on the southern (up-gradient) side of the barrier wall during both monitoring events as expected (Table 8; Appendix A):

- **PZ-5S.** Measurable LNAPL was recorded in March (2.27 feet) and June (4.35 feet). The measured LNAPL thicknesses in March and June 2020 were an overall slight increase in LNAPL thickness compared to 2019 and corresponded with decreases in groundwater elevation as measured with the in-well pressure transducers. LNAPL was not observed in the down-gradient piezometer (PZ-5N) paired with PZ-5S.
- **PZ-6S.** A heavy trace of LNAPL was observed in March 2020 and measurable LNAPL was recorded in June (0.05 foot), and during the bimonthly Passive Operation Pilot Study monitoring events LNAPL ranged from 0.01 to 0.05 foot thick, which was a decrease in LNAPL thickness compared to 2019. LNAPL was not observed in the down-gradient piezometer (PZ-6N) paired with PZ-6S.

LNAPL thickness trend plots for HCC system monitoring locations that historically have contained measurable LNAPL are included in Appendix D.

Additionally, piezometers PZ-7S and PZ-8 (located downgradient of the west and far west gates) were gauged and sampled bimonthly during the Passive Operation Pilot Study monitoring events (Appendix A). LNAPL and sheen were not observed, and NWTPH-Dx was not detected in either of these piezometers during the monitoring events.

2.6.6 Recovery Wells

The nine recovery wells were gauged for the presence or absence of LNAPL and sheen during the March, June, and September groundwater monitoring events. Additionally, recovery wells RW-05 and RW-06 were gauged bimonthly during the Passive Operation Pilot Study monitoring events. RW-06 could not be accessed and gauged in June and August. There was no measurable LNAPL in recovery wells RW-02 through RW-09, and LNAPL was observed only as a light to heavy trace during 2020 (Table 8; Appendix A). LNAPL was not observed in recovery well RW-01 during any of the 2020 monitoring events. LNAPL thickness trend plots for HCC system monitoring locations that historically have contained measurable LNAPL are included in Appendix C.

2.6.7 Barrier Wall Gate Oil-Water Separator Chambers

Each flow-through treatment gate in the HCC system barrier wall consists of two or three concrete vaults. Each gate contains an OWS chamber on the upgradient side of the gate (as shown on Figure 6, which shows typical construction of a treatment gate). During the March and June 2020 monitoring events, all 10 gate OWS vaults shown on Figure 2 were monitored for LNAPL and sheen (Table 8). Additionally, the OWS chambers, west and east vaults of the West Gate, and Far West Gate (locations WG-WV, WG-EV, FWG-WV, and FWG-EV) were gauged and sampled routinely during the Passive Operation Pilot Study monitoring events (Appendix A).

A light trace of LNAPL was observed in March and June 2020 in the south (up-gradient) chamber of the east vault OWS of the West Gate (location WG-EV-South Chamber). A light trace of LNAPL was observed in WG-EV-South Chamber in August and December 2020 (Appendix A).

No measurable thickness of LNAPL requiring removal was present in any of the gate vault OWS chambers in 2020.

3.0 CONCLUSIONS

The groundwater monitoring results from 2020, and the results from the 2-year-long Passive Operation Pilot Study, demonstrate that passive operation of the HCC system is effective in meeting the cleanup objective.

LNAPL was observed in monitoring wells and piezometers up-gradient of and adjacent to the HCC system barrier wall, between the West Gate and Center Gate. LNAPL was generally observed as a light to heavy trace. As expected, and consistent with prior years, only two locations (piezometers PZ-5S and PZ-6S) had measurable thicknesses of LNAPL. Measured LNAPL thicknesses increased slightly in piezometer PZ-5S in 2020; however, LNAPL thicknesses across the Site exhibited an overall decreasing to stable trend, and LNAPL was not observed at any monitoring locations down-gradient of the barrier wall.

In general, the groundwater monitoring data indicate that LNAPL thicknesses and NWTPH-Dx concentrations in groundwater remained stable or decreased in 2020.

4.0 PROPOSED PASSIVE OPERATIONS AND MONITORING

Based on the groundwater monitoring results from 2020 and the results of the Passive Operation Pilot Study completed between January 2019 and December 2020, it is recommended that the HCC system be operated in a passive mode with groundwater monitoring conducted in accordance with the Long-Term Monitoring Plan (Farallon 2020). The Long-Term Monitoring Plan specifies that locations down-gradient of the HCC system gates and barrier wall (gate wells GW-1 through GW-4 and monitoring well 5-W-43) be gauged and sampled for NWTPH-Dx semiannually for 2 years and annually thereafter. No changes to the Long-Term Monitoring Plan would be required to implement passive operation of the HCC system.

4.1 PROPOSED GAC MEDIA TESTING AND CHANGEOUT

GAC life expectancy in the east vault of the West Gate was calculated to need replacement in the fall of 2021, at the earliest, assuming passive (non-pumping) operation of the HCC system, or later under active pumping (Farallon 2017). The GAC media will be sampled before the fall of 2021 and replaced if required. If the results of the GAC media analysis indicate a remaining lifespan greater than 1 year, replacement may be postponed, and the GAC media will be sampled and analyzed ahead of the newly calculated life expectancy date.

Following replacement of the GAC media, the media will be sampled 5 years after replacement. Subsequent sampling and analysis will be scheduled according to the estimated remaining capacity determined from the initial sampling results.

Additionally, the GAC media may be sampled if an exceedance of the Site-specific groundwater RL from down-gradient monitoring well 5-W-43 or gate wells GW-1 through GW-4 occurs, and investigation into the root cause indicates that the exceedance may be due to breakthrough.

GAC media replacement (when warranted) would be scheduled for summer or early fall during low-water conditions to minimize the volume of groundwater that would need to be managed. Active pumping and groundwater treatment would be used prior to and during replacement of the GAC media. Operation would switch back to passive mode once the GAC media was replaced.

4.2 BENEFITS OF PASSIVE HCC SYSTEM OPERATION

The proposed passive operation of the HCC system will provide several benefits while continuing to effectively meet the cleanup objectives. The overall impact to the community will be reduced through a decrease in truck traffic through the Town of Skykomish (including transport of waste products and chemicals used to maintain the treatment system) and reduction in noise proximate to the water treatment building. Passive operation provides equivalent containment of groundwater with NWPTH-Dx concentrations as active operation of the system, while decreasing overall environmental impacts through reduced emissions. The results of the Passive Operation Pilot Study demonstrated that the barrier wall and treatment gate system are effective at passively containing and treating groundwater. Furthermore, the removal rates of TPH have declined significantly through active operation of the pumping and treatment components of the HCC system between January 2012, when mass removal tracking was started, and December 2018.

Annual TPH removal rates declined from approximately 165 pounds per year in 2012 and 2013 to 140 pounds in 2014, 80 pounds in 2015, 60 pounds in 2016, and 50 pounds per year in 2017 and 2018. Additionally, passive operation will reduce the environmental impact by reducing energy inputs and waste. Passive operation will reduce the annual energy inputs by more than 65 tons of carbon dioxide equivalents assuming an approximate average usage of 7,800 kilowatt hours per month (based on an average of kilowatt hours used during active operation of the HCC system during 2018) (EPA 2018). Under active operations, the treatment system GAC is changed approximately every 3 months (approximate average of 2 million gallons based on 2018 active operation data) and generates approximately 4,000 pounds of waste per changeout (approximately 16,000 pounds of waste GAC per year). Under passive operations, the HCC system would be operated periodically to ensure backup capabilities. Assuming a maximum of 10 days of active treatment system operation in a year (approximately 225,000 gallons), the GAC in the treatment system tanks would require replacement approximately every 9 years, resulting in approximately 444 pounds of waste GAC per year), which is approximately 97 percent less than GAC waste generated under active treatment.

5.0 REFERENCES

AECOM Environment (AECOM). 2009. *2008 Skykomish Remediation – As-Built Completion Report, Former Maintenance and Fueling Facility.* Prepared for BNSF Railway Company. August.

———. 2010a. *2010 Compliance Monitoring Plan Update, BNSF Former Maintenance and Fueling Facility, Skykomish, Washington*. Prepared for BNSF Railway Company. April 30.

———. 2010b. *2009 Skykomish Remediation – As-Built Completion Report, BNSF Former Maintenance and Fueling Facility, Skykomish, Washington.* Prepared for BNSF Railway Company. June 10.

———. 2011. *2011 Operation and Maintenance Manual for the Hydraulic Control and Containment System*, *Former Maintenance and Fueling Facility – Skykomish, WA.* Prepared for BNSF Railway Company. April 8.

ENSR Corporation. 2008a. Plans and Specifications for 2008 Remediation. Prepared for BNSF Railway Company. Addenda Added March 11, March 14, and March 20, 2008. March.

———. 2008b. *Hydraulic Control and Containment System Special Design Report, BNSF Former Maintenance and Fueling Facility – Skykomish, WA.* Prepared for BNSF Railway Company. August.

Farallon Consulting, L.L.C. (Farallon). 2014. *2014 Addendum to the Operation and Maintenance Manual for the Hydraulic Control and Containment, BNSF Former Maintenance and Fueling Facility, Skykomish, Washington.* Prepared for BNSF Railway Company. September 10.

———. 2017. *Hydraulic Control and Containment System Optimization and Pilot Testing Report, BNSF Former Maintenance and Fueling Facility, Skykomish, Washington.* Prepared for BNSF Railway Company. February 21.

———. 2018a. *2017 Annual Hydraulic Control and Containment System Operations Report, BNSF Former Maintenance and Fueling Facility, Skykomish, Washington*. Prepared for BNSF Railway Company. July 9.

———. 2018b. *HCC System Passive Operation Pilot Study Work Plan, BNSF Former Maintenance and Fueling Facility, Skykomish, Washington*. Prepared for BNSF Railway Company. November 29.

———. 2020. *Final Long-Term Monitoring Plan BNSF Former Maintenance and Fueling Facility, Skykomish, Washington, Consent Decree NO. 07-2-33672-9 SEA.* November 26.

———. 2021a. Draft *2020 Site-Wide Groundwater Monitoring Report BNSF Former Maintenance and Fueling Facility, Skykomish, Washington, Consent Decree NO. 07-2-33672-9 SEA.* March 30.

United States Environmental Protection Agency (EPA). Greenhouse Gas Equivalencies Calculator Widget. September 6, 2018. < https://developer.epa.gov/greenhouse-gas-equivalencies-calculator-widget/>. (January 28, 2021.)

Washington State Department of Ecology (Ecology). 2007. *Cleanup Action Plan for BNSF Former Maintenance and Fueling Facility, Skykomish, Washington.* Exhibit B of Consent Decree No. 07-2-33672-9 SEA between the Washington State Department of Ecology and BNSF Railway Company. October.

———. 2020a. Email Regarding Skykomish – HCC Operations. From Ronald Timm. To Shane DeGross, BNSF Railway Company, and Amy Essig Desai and Peter Kingston, Farallon. January 24.

———. 2020b. Email Regarding Skykomish – HCC Operations. From Ronald Timm. To Shane DeGross, BNSF Railway Company. June 25.

———. 2020c. Email Regarding RE: Skykomish - Revised Draft Long-Term Monitoring Plan. From Tanner Bushnell. To Shane DeGross, BNSF Railway Company. September 15.

FIGURES

2020 ANNUAL HYDRAULIC CONTROL AND CONTAINMENT SYSTEM OPERATIONS REPORT
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Consent Decree No. 07-2-33672-9 SEA

Farallon PN: 683-071

HIGHWAY-2

SKYKOMISH RIVER

SKYKOMISH RIVER

FIFTH STREET

FOURTH STREET

THIRD STREET

SIXTH STREET

RAILROAD AVENUE

OLD CASCADE HIGHWAY

MALONEY CREEK

FAR WEST GATE

WEST GATE

CENTER GATE

EAST GATE

HCC TREATMENT BUILDING

5-W-43

EW-1

PZ-8

PZ-7N

PZ-7S

GW-1

GW-2

PZ-6N

PZ-6S

RW-06

RW-05

2A-W-40

PZ-5N

PZ-5S

RW-04

2A-W-41

IW-02

RW-08

PZ-4N

PZ-4S

RW-07

1B-W-23

GW-3

RW-03

RW-02

PZ-3N

PZ-3S

RW-01

2A-W-42

PZ-2N

PZ-2S

GW-4

IW-01

EW-2A

PZ-1

RW-09

N

0

160

SCALE IN FEET

LEGEND

2A-W-41	MONITORING WELL (SAMPLED SEMIANNUALLY)
RW-04	RECOVERY WELL
PZ-5S	PIEZOMETER
IW-02	INJECTION WELL

HYDRAULIC CONTROL AND CONTAINMENT SYSTEM SHEET PILE BARRIER WALL AND GATES

BNSF RAILYARD BOUNDARY

MECHANICALLY STABILIZED EARTH WALL

★SKYKOMISH

NOTE
HYDRAULIC CONTROL AND CONTAINMENT SYSTEM (HCC) SENTRY WELLS AND BARRIER WALL GATE VAULT LOCATIONS NOT SHOWN. SEE FIGURE 2 FOR BARRIER WALL GATE DETAILS.
IMAGERY SOURCE: KING COUNTY PICTOMETRY 2015.

FARALLON CONSULTING
Your Challenges. Our Priority. | farallonconsulting.com

Washington
Issaquah | Bellingham | Seattle

Oregon
Portland | Baker City

California
Oakland | Irvine

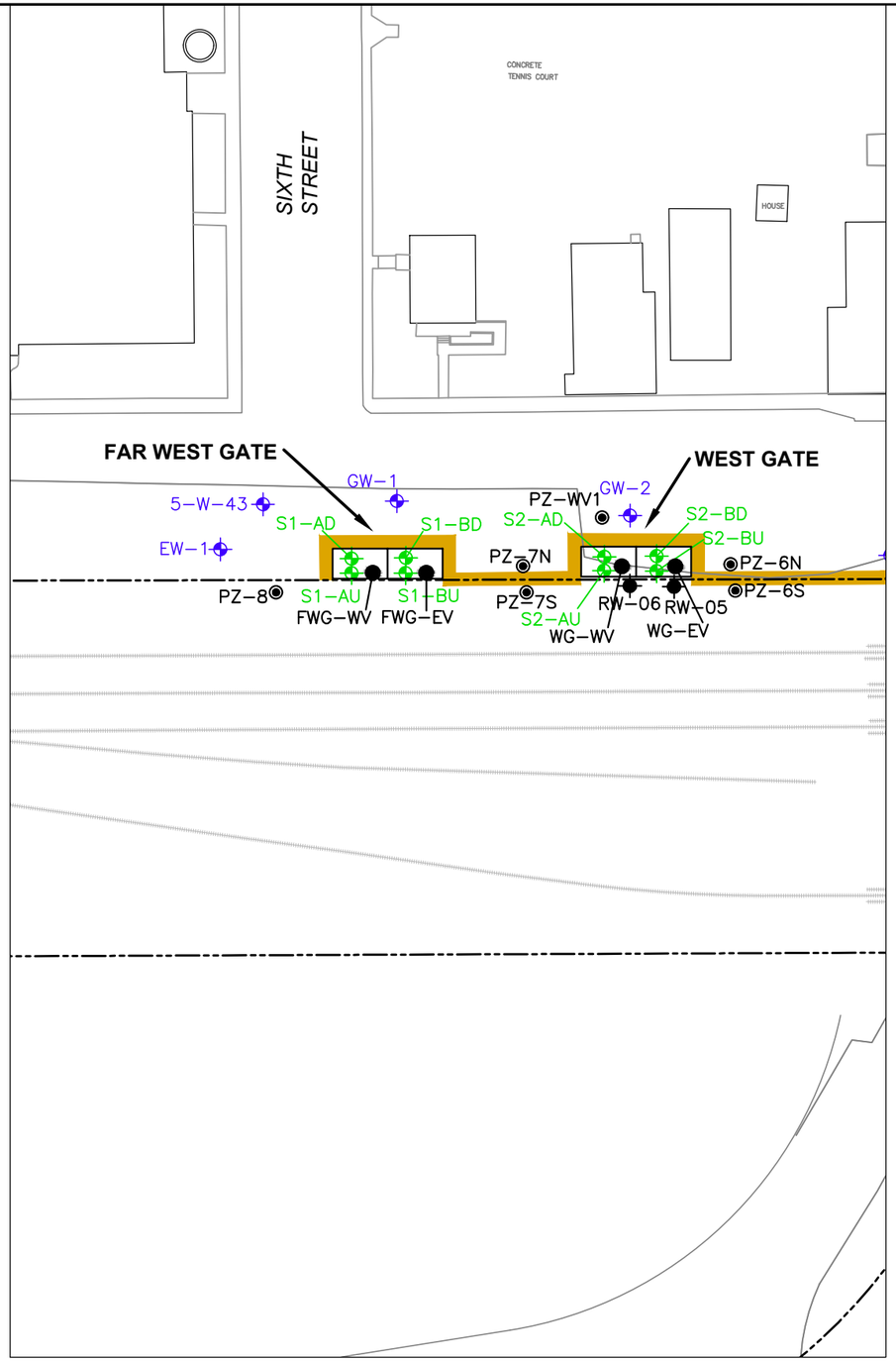
FIGURE 1

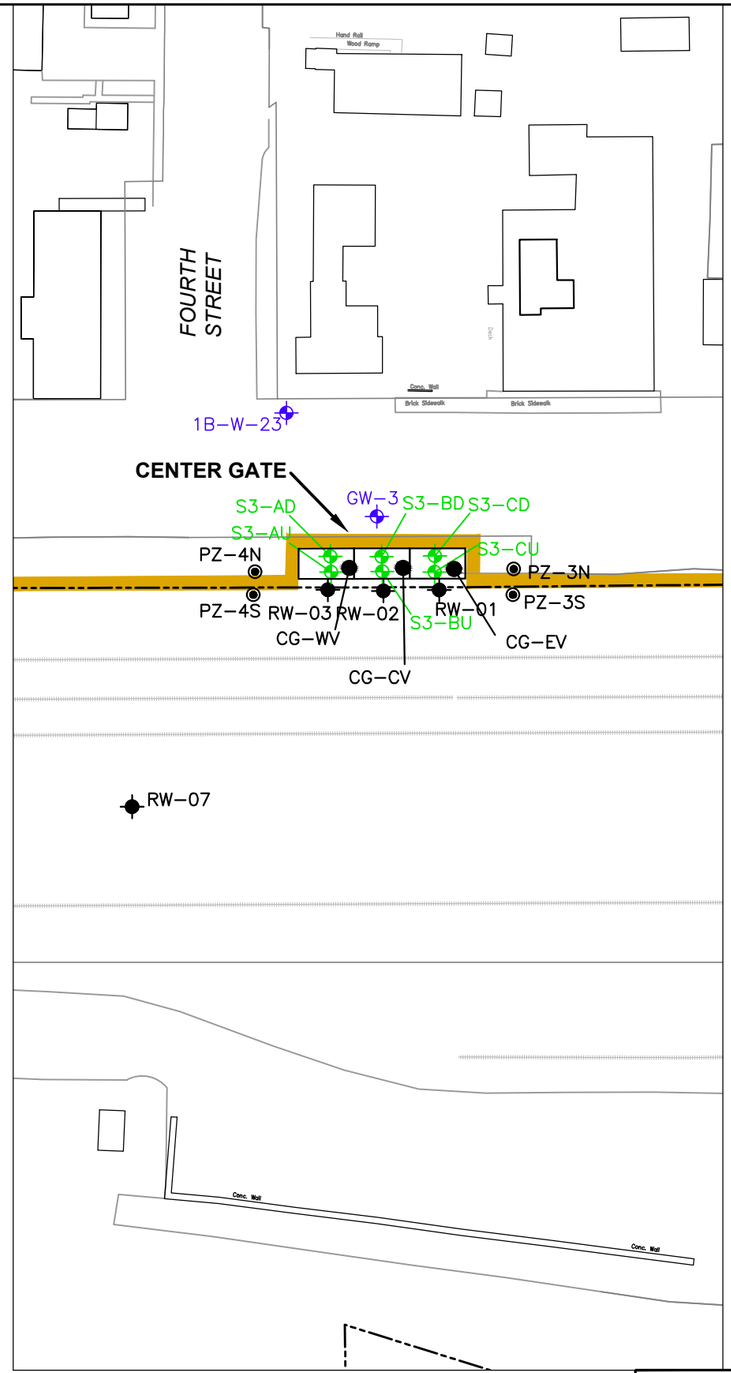
SITE PLAN SHOWING 2020
HCC SYSTEM MONITORING NETWORK
BNSF FORMER MAINTENANCE
AND FUELING FACILITY
SKYKOMISH, WASHINGTON

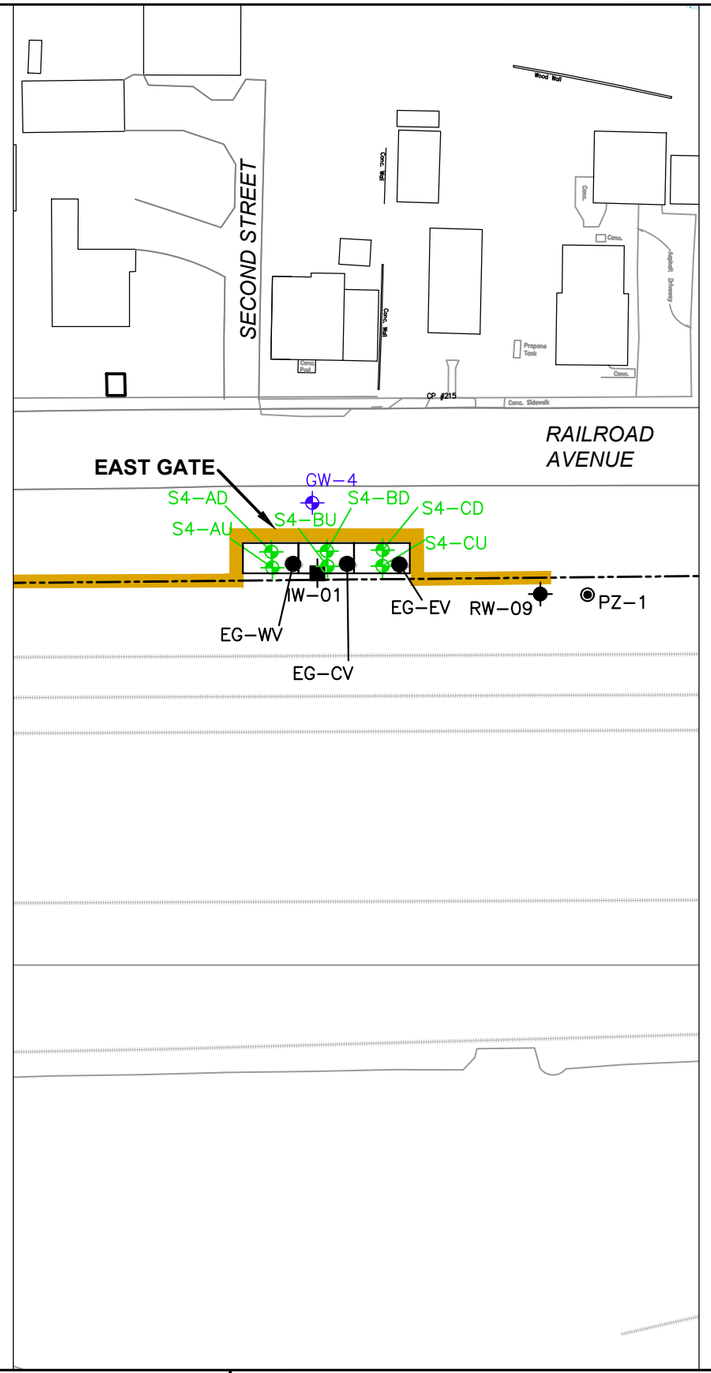
FARALLON PN: 683-071

Drawn By: tperrin | Checked By: RL | Date: 1/30/2020 | Disc Reference:

Document Path: Q:\Projects\683 BNSF\067 GROUNDWATER_HCC\Mapfiles\HCC_Report_2019\HCC FIGURE 01_TPH-GW_2019.mxd







LEGEND

- RW-04 — RECOVERY WELL
- PZ-5S — PIEZOMETER
- IW-02 — TREATED-WATER REINJECTION WELL
- WG-WV — BARRIER WALL GATE VAULT
- GW-2 — MONITORING WELL
- S1-AU — SENTRY WELL
- HYDRAULIC CONTROL AND CONTAINMENT SYSTEM SHEET PILE BARRIER WALL AND GATE SYSTEM
- BNSF RAILYARD BOUNDARY

30 0 60

SCALE IN FEET

FARALLON CONSULTING
Your Challenges. Our Priority. | farallonconsulting.com

Washington
Issaquah | Bellingham | Seattle

Oregon
Portland | Baker City

California
Oakland | Irvine

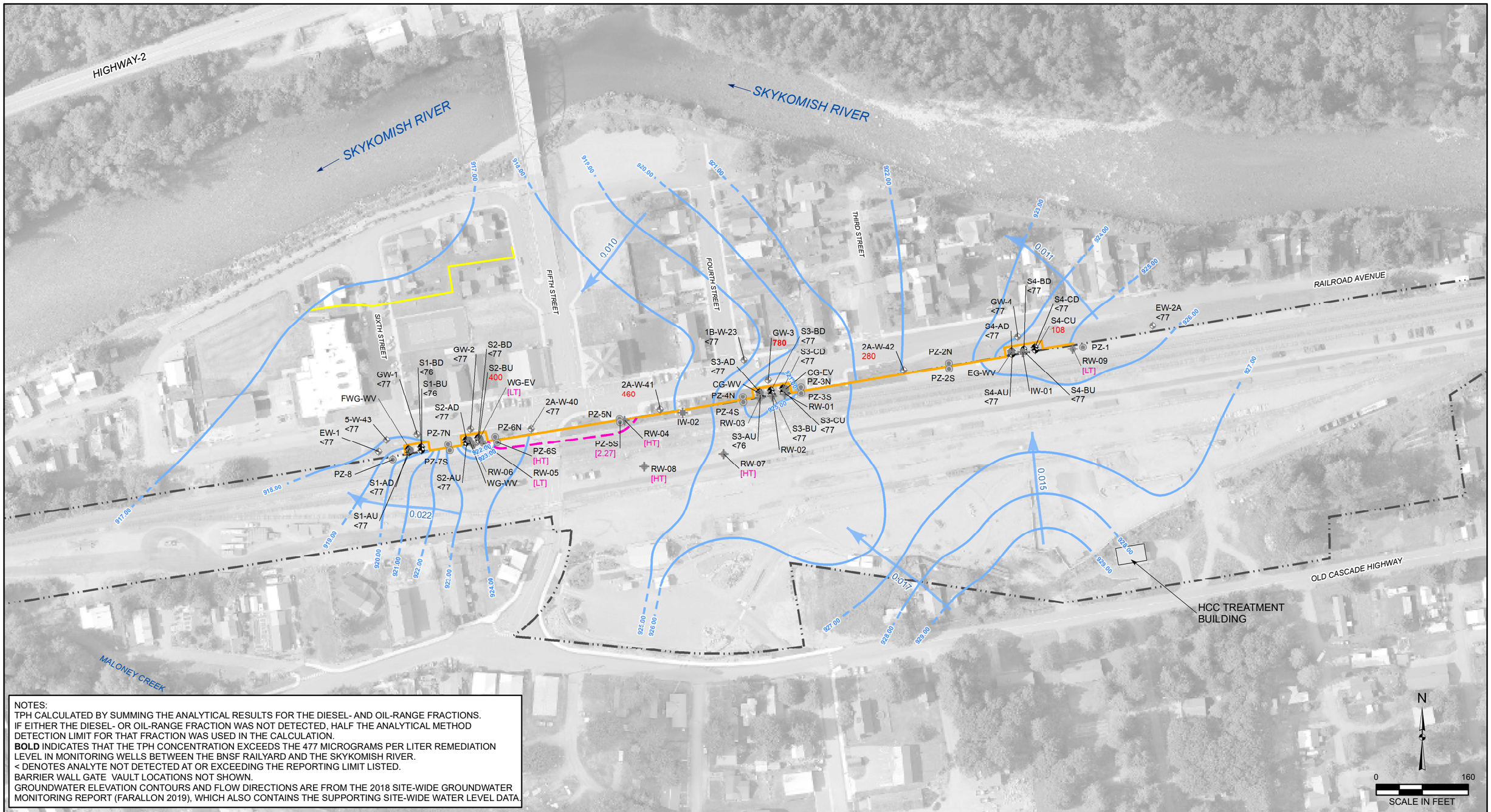
FIGURE 2

HYDRAULIC CONTROL AND CONTAINMENT SYSTEM
BARRIER WALL GATE DETAIL
BNSF FORMER MAINTENANCE
AND FUELING FACILITY
SKYKOMISH, WASHINGTON

FARALLON PN: 683-071

Drawn By: MB Checked By: PK Date: 1/28/2020 Disk Reference: 683-067-2019-HCC

R:\Projects\683-067\CAD\2019 Annual HCC Rpt\683-067-2019-HCC.dwg, 1/28/2020 1:52:11 PM, DWG To PDF.pc3



NOTES:
TPH CALCULATED BY SUMMING THE ANALYTICAL RESULTS FOR THE DIESEL- AND OIL-RANGE FRACTIONS.
IF EITHER THE DIESEL- OR OIL-RANGE FRACTION WAS NOT DETECTED, HALF THE ANALYTICAL METHOD DETECTION LIMIT FOR THAT FRACTION WAS USED IN THE CALCULATION.
BOLD INDICATES THAT THE TPH CONCENTRATION EXCEEDS THE 477 MICROGRAMS PER LITER REMEDIATION LEVEL IN MONITORING WELLS BETWEEN THE BNSF RAILYARD AND THE SKYKOMISH RIVER.
< DENOTES ANALYTE NOT DETECTED AT OR EXCEEDING THE REPORTING LIMIT LISTED.
BARRIER WALL GATE VAULT LOCATIONS NOT SHOWN.
GROUNDWATER ELEVATION CONTOURS AND FLOW DIRECTIONS ARE FROM THE 2018 SITE-WIDE GROUNDWATER MONITORING REPORT (FARALLON 2019), WHICH ALSO CONTAINS THE SUPPORTING SITE-WIDE WATER LEVEL DATA.

LEGEND

2A-W-41 MONITORING WELL
RW-04 RECOVERY WELL
PZ-5S PIEZOMETER
IW-02 INJECTION WELL

927.00 INTERPRETED GROUNDWATER ELEVATION CONTOUR FEET NAVD88 (INFERRED WHERE DASHED)
0.011 INTERPRETED DIRECTION OF GROUNDWATER FLOW AND GRADIENT (UNITS IN FOOT PER FOOT)
HYDRAULIC CONTROL AND CONTAINMENT SYSTEM SHEET PILE BARRIER WALL AND GATES
BNSF RAILYARD BOUNDARY
MECHANICALLY STABILIZED EARTH WALL

LOCATIONS SHOWN IN GRAY NOT GAUGED IN MARCH 2020.
IMAGERY SOURCE: KING COUNTY PICTOMETRY 2015

117 TOTAL PETROLEUM HYDROCARBONS (TPH) IN MICROGRAMS PER LITER
<77 TPH NOT DETECTED AT OR EXCEEDING THE GIVEN REPORTING LIMIT
ESTIMATED EXTENT OF LNAPL AS INDICATED BY MEASURABLE LNAPL THICKNESS ON GROUNDWATER SURFACE
[HT] HEAVY TRACE - OBSERVED ON INTERFACE PROBE BY FIELD STAFF; NO MEASURABLE LNAPL THICKNESS GREATER THAN 0.01 FOOT
[LT] LIGHT TRACE - OBSERVED ON INTERFACE PROBE BY FIELD STAFF; NO MEASURABLE LNAPL THICKNESS GREATER THAN 0.01 FOOT
[1.15'] MEASURABLE LNAPL THICKNESS IN FEET
LNAPL LIGHT NONAQUEOUS-PHASE LIQUID
NAVD88 NORTH AMERICAN VERTICAL DATUM OF 1988

FARALLON CONSULTING
Your Challenges. Our Priority. | farallonconsulting.com
Washington
Issaquah | Bellingham | Seattle
Oregon
Portland | Baker City
California
Oakland | Irvine

FIGURE 3

MARCH 2020 TOTAL PETROLEUM HYDROCARBONS IN GROUNDWATER
BNSF FORMER MAINTENANCE AND FUELING FACILITY
SKYKOMISH, WASHINGTON

FARALLON PN: 683-071

Drawn By: TPerrin
Checked By: AM
Date: 3/1/2021
Disc Reference:
Document Path: Q:\Projects\683 BNSF\071 Groundwater_HCC 2020\Mapfiles\HCC_2020\HCC_Figure-03_06_TPH-GW_2020.mxd

HIGHWAY-2

SKYKOMISH RIVER

SKYKOMISH RIVER

SIXTH STREET

FIFTH STREET

FOURTH STREET

THIRD STREET

RAILROAD AVENUE

OLD CASCADE HIGHWAY

MALONEY CREEK

HCC TREATMENT BUILDING

S1-AD
S1-AU
5-W-43 <77
EW-1 <77
PZ-8 <77
FWG-WV <77
GW-1 <77
WG-WV 233
S2-AD <77
S2-AU <77
PZ-7N
PZ-7S 141
S1-BD
S1-BU
GW-2 <77
S2-BD <77
WG-EV 730 [LT]
PZ-6N
RW-06
PZ-6S [0.05]
RW-05 [LT]
S2-BU 121
2A-W-40 <76
PZ-5N
PZ-5S [4.35]
2A-W-41 230
RW-04 [HT]
RW-08 [HT]
IW-02
PZ-4N
PZ-4S
S3-AD
CG-WV
S3-AU
1B-W-23 <77
GW-3 <77
S3-BD
S3-BU
S3-CD
S3-CU
PZ-3N
PZ-3S
CG-EV
RW-01
RW-03
RW-02
RW-07 [HT]
2A-W-42 240
PZ-2N
PZ-2S
GW-4 <77
S4-AD
EG-WV
S4-AU
S4-BD
S4-BU
S4-CD
S4-CU
IW-01
PZ-1
RW-09
EW-2A <77

0.016
0.011
0.011
0.010
0.017

NOTES:
TPH CALCULATED BY SUMMING THE ANALYTICAL RESULTS FOR THE DIESEL- AND OIL-RANGE FRACTIONS.
IF EITHER THE DIESEL- OR OIL-RANGE FRACTION WAS NOT DETECTED, HALF THE ANALYTICAL METHOD DETECTION LIMIT FOR THAT FRACTION WAS USED IN THE CALCULATION.
BOLD INDICATES THAT THE TPH CONCENTRATION EXCEEDS THE 477 MICROGRAMS PER LITER REMEDIATION LEVEL IN MONITORING WELLS BETWEEN THE BNSF RAILYARD AND THE SKYKOMISH RIVER.
< DENOTES ANALYTE NOT DETECTED AT OR EXCEEDING THE REPORTING LIMIT LISTED.
BARRIER WALL GATE VAULT LOCATIONS NOT SHOWN.
GROUNDWATER ELEVATION CONTOURS AND FLOW DIRECTIONS ARE FROM THE 2018 SITE-WIDE GROUNDWATER MONITORING REPORT (FARALLON 2019), WHICH ALSO CONTAINS THE SUPPORTING SITE-WIDE WATER LEVEL DATA.

N

0 160

SCALE IN FEET

LEGEND

2A-W-41 MONITORING WELL
RW-04 RECOVERY WELL
PZ-5S PIEZOMETER
IW-02 INJECTION WELL

927.00 INTERPRETED GROUNDWATER ELEVATION CONTOUR FEET NAVD88 (INFERRED WHERE DASHED)
0.011 INTERPRETED DIRECTION OF GROUNDWATER FLOW AND GRADIENT (UNITS IN FOOT PER FOOT)
HYDRAULIC CONTROL AND CONTAINMENT SYSTEM SHEET PILE BARRIER WALL AND GATES
BNSF RAILYARD BOUNDARY
MECHANICALLY STABILIZED EARTH WALL

LOCATIONS SHOWN IN GRAY NOT GAUGED IN JUNE 2020.
IMAGERY SOURCE: KING COUNTY PICTOMETRY 2015

117 TOTAL PETROLEUM HYDROCARBONS (TPH) IN MICROGRAMS PER LITER
<77 TPH NOT DETECTED AT OR EXCEEDING THE GIVEN REPORTING LIMIT
ESTIMATED EXTENT OF LNAPL AS INDICATED BY MEASURABLE LNAPL THICKNESS ON GROUNDWATER SURFACE
[HT] HEAVY TRACE - OBSERVED ON INTERFACE PROBE BY FIELD STAFF; NO MEASURABLE LNAPL THICKNESS GREATER THAN 0.01 FOOT
[LT] LIGHT TRACE - OBSERVED ON INTERFACE PROBE BY FIELD STAFF; NO MEASURABLE LNAPL THICKNESS GREATER THAN 0.01 FOOT
[1.15'] MEASURABLE LNAPL THICKNESS IN FEET
LNAPL LIGHT NONAQUEOUS-PHASE LIQUID
NAVD88 NORTH AMERICAN VERTICAL DATUM OF 1988

FARALLON CONSULTING
Your Challenges. Our Priority. | farallonconsulting.com

Washington
Issaquah | Bellingham | Seattle

Oregon
Portland | Baker City

California
Oakland | Irvine

FIGURE 4

JUNE 2020 TOTAL PETROLEUM HYDROCARBONS IN GROUNDWATER
BNSF FORMER MAINTENANCE AND FUELING FACILITY
SKYKOMISH, WASHINGTON

FARALLON PN: 683-071

Drawn By: TPerrin
Checked By: AM
Date: 3/17/2021
Disc Reference:
Document Path: Q:\Projects\683 BNSF\071 Groundwater_HCC 2020\Mapfiles\HCC_2020\HCC_Figure-03_06_TPH-GW_2020.mxd

HIGHWAY-2

SKYKOMISH RIVER

SKYKOMISH RIVER

SIXTH STREET

FIFTH STREET

FOURTH STREET

THIRD STREET

RAILROAD AVENUE

OLD CASCADE HIGHWAY

MALONEY CREEK

HCC TREATMENT BUILDING

GW-1 <77
GW-2 <77
GW-3 330
GW-4 <77
1B-W-23 <225
2A-W-40 <77
2A-W-41 336
2A-W-42 156
5-W-43 <77
EW-1
EW-2A
FWG-WV
IW-01
IW-02
PZ-0
PZ-1
PZ-2N
PZ-2S
PZ-3N
PZ-3S
PZ-4N
PZ-4S
PZ-5N
PZ-5S
PZ-6N
PZ-6S
PZ-7N
PZ-7S
RW 09
RW-01 [LT]
RW-02 [LT]
RW-03 [LT]
RW-04 [LT]
RW-05 [LT]
RW-06 [LT]
RW-07 [LT]
RW-08 [LT]
S1-AD
S1-AU
S1-BD
S1-BU
S2-AD
S2-AU
S2-BD
S2-BU
S3-AD
S3-AU
S3-BD
S3-BU
S3-CD
S3-CU
S4-AD
S4-AU
S4-CD
S4-CU
S4 BU
S4-BD
CG-EV
CG-WV
EG-WV
WG-EV
WG-WV

0.010
0.012
0.007
0.005
0.012

916.00
917.00
918.00
919.00
920.00
921.00
922.00
923.00
924.00

NOTES:
TPH CALCULATED BY SUMMING THE ANALYTICAL RESULTS FOR THE DIESEL- AND OIL-RANGE FRACTIONS.
IF EITHER THE DIESEL- OR OIL-RANGE FRACTION WAS NOT DETECTED, HALF THE ANALYTICAL METHOD DETECTION LIMIT FOR THAT FRACTION WAS USED IN THE CALCULATION.
BOLD INDICATES THAT THE TPH CONCENTRATION EXCEEDS THE 477 MICROGRAMS PER LITER REMEDIATION LEVEL IN MONITORING WELLS BETWEEN THE BNSF RAILYARD AND THE SKYKOMISH RIVER.
< DENOTES ANALYTE NOT DETECTED AT OR EXCEEDING THE REPORTING LIMIT LISTED.
BARRIER WALL GATE VAULT LOCATIONS NOT SHOWN.
GROUNDWATER ELEVATION CONTOURS AND FLOW DIRECTIONS ARE FROM THE 2018 SITE-WIDE GROUNDWATER MONITORING REPORT (FARALLON 2019), WHICH ALSO CONTAINS THE SUPPORTING SITE-WIDE WATER LEVEL DATA.

N

0 160
SCALE IN FEET

LEGEND

2A-W-41 MONITORING WELL
RW-04 RECOVERY WELL
PZ-5S PIEZOMETER
IW-02 INJECTION WELL

927.00 INTERPRETED GROUNDWATER ELEVATION CONTOUR FEET NAVD88 (INFERRED WHERE DASHED)
0.011 INTERPRETED DIRECTION OF GROUNDWATER FLOW AND GRADIENT (UNITS IN FOOT PER FOOT)
HYDRAULIC CONTROL AND CONTAINMENT SYSTEM SHEET PILE BARRIER WALL AND GATES
BNSF RAILYARD BOUNDARY
MECHANICALLY STABILIZED EARTH WALL

LOCATIONS SHOWN IN GRAY NOT GAUGED IN SEPTEMBER 2020.
IMAGERY SOURCE: KING COUNTY PICTOMETRY 2015

117 TOTAL PETROLEUM HYDROCARBONS (TPH) IN MICROGRAMS PER LITER
<77 TPH NOT DETECTED AT OR EXCEEDING THE GIVEN REPORTING LIMIT
ESTIMATED EXTENT OF LNAPL AS INDICATED BY MEASURABLE LNAPL THICKNESS ON GROUNDWATER SURFACE
[HT] HEAVY TRACE - OBSERVED ON INTERFACE PROBE BY FIELD STAFF; NO MEASURABLE LNAPL THICKNESS GREATER THAN 0.01 FOOT
[LT] LIGHT TRACE - OBSERVED ON INTERFACE PROBE BY FIELD STAFF; NO MEASURABLE LNAPL THICKNESS GREATER THAN 0.01 FOOT
[1.15'] MEASURABLE LNAPL THICKNESS IN FEET
LNAPL LIGHT NONAQUEOUS-PHASE LIQUID
NAVD88 NORTH AMERICAN VERTICAL DATUM OF 1988

FARALLON CONSULTING
Your Challenges. Our Priority. | farallonconsulting.com

Washington
Issaquah | Bellingham | Seattle

Oregon
Portland | Baker City

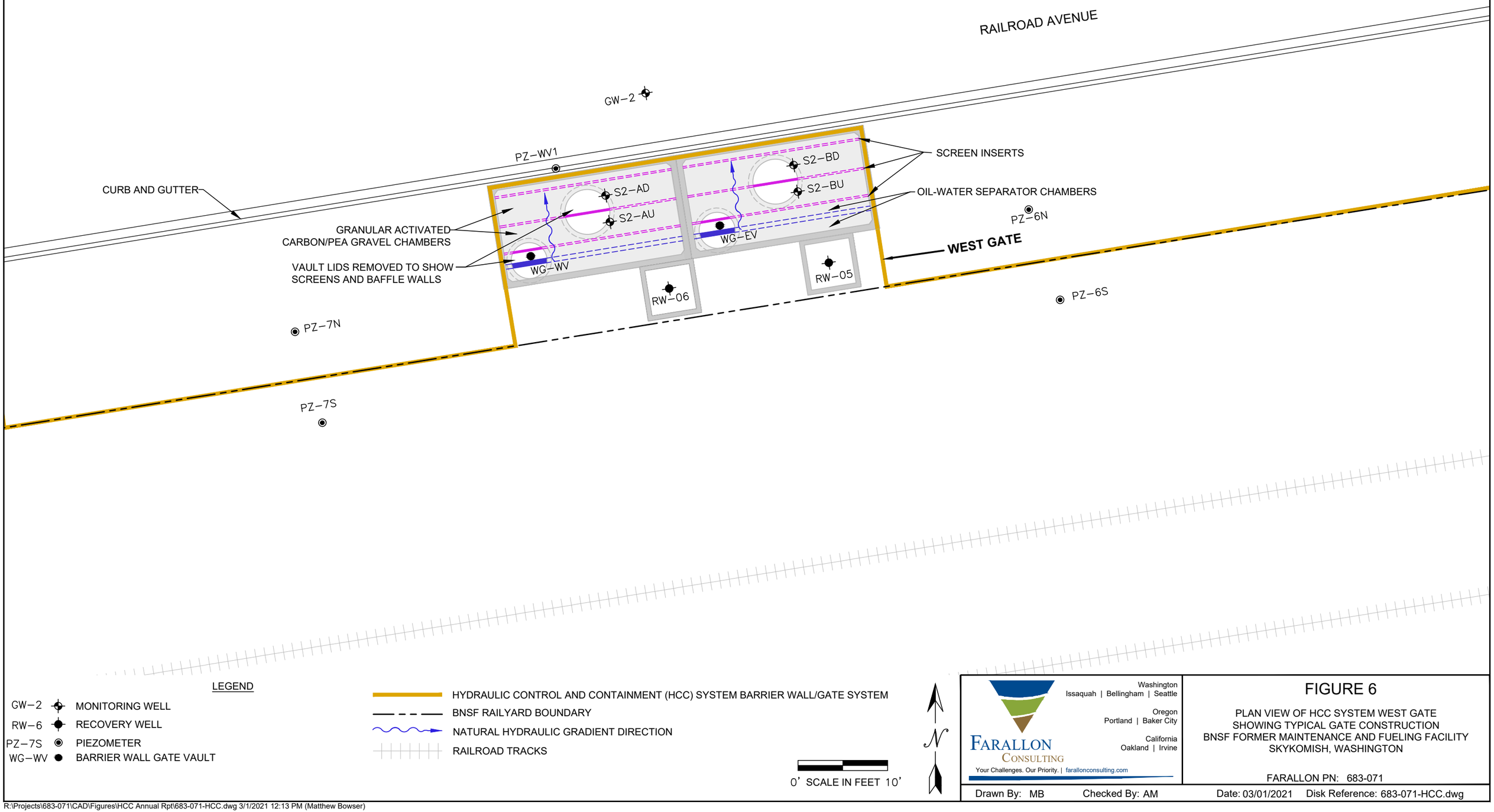
California
Oakland | Irvine

FIGURE 5

SEPTEMBER 2020 TOTAL PETROLEUM HYDROCARBONS IN GROUNDWATER
BNSF FORMER MAINTENANCE AND FUELING FACILITY
SKYKOMISH, WASHINGTON

FARALLON PN: 683-071

Drawn By: TPerrin
Checked By: AM
Date: 3/3/2021
Disc Reference:
Document Path: Q:\Projects\683 BNSF\071 Groundwater_HCC 2020\Mapfiles\HCC_2020\HCC_Figure-03_06_TPH-GW_2020.mxd



FARALLON CONSULTING
Your Challenges. Our Priority. | farallonconsulting.com

Washington
Issaquah | Bellingham | Seattle

Oregon
Portland | Baker City

California
Oakland | Irvine

FIGURE 6

PLAN VIEW OF HCC SYSTEM WEST GATE
SHOWING TYPICAL GATE CONSTRUCTION
BNSF FORMER MAINTENANCE AND FUELING FACILITY
SKYKOMISH, WASHINGTON

FARALLON PN: 683-071

Drawn By: MB Checked By: AM Date: 03/01/2021 Disk Reference: 683-071-HCC.dwg

R:\Projects\683-071\CAD\Figures\HCC Annual Rpt\683-071-HCC.dwg 3/1/2021 12:13 PM (Matthew Bowser)

TABLES

2020 ANNUAL HYDRAULIC CONTROL AND CONTAINMENT SYSTEM OPERATIONS REPORT
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Consent Decree No. 07-2-33672-9 SEA

Farallon PN: 683-071

Table 1
HCC Water Treatment System Discharge Flow Rates
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Date	Cumulative Discharge Volume Since Water Treatment System Start-Up (gallons)	Calculated Average Daily Flow Rate[1] (gallons per minute)
2/21/2020	135,855,771	3
4/23/2020	135,865,443	6
6/26/2020	135,869,991	3
8/29/2020	135,881,379	5
10/31/2020	135,884,675	2
12/17/2020	135,891,267	5
NPDES Permit Discharge Limit[1]		**100**

NOTES:

[1]Discharge limit specified in NPDES Permit No. WA0032123, applicable when the Skykomish River level is less than 928.56 feet NAVD88. Discharge is not allowed when the river level exceeds 928.56 feet NAVD88.

HCC = Hydraulic Control and Containment

NAVD88 = North American Vertical Datum of 1988

NPDES = National Pollutant Discharge Elimination System

Table 2
Total Petroleum Hydrocarbon Concentrations in HCC Water Treatment System Influent and Effluent
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Sample Location	Sample Date	Sample Identification	DRO[1] (micrograms per liter)			ORO[1] (micrograms per liter)			Calculated NWTPH-Dx[2] (micrograms per liter)
			Result	MDL	MRL	Result	MDL	MRL	
Treatment System Influent (Primary GAC Vessel Influent)	2/21/2020	BEFORE GAC-22120	520	63	63	250	93	93	770
	4/23/2020	BEFORE GAC-42320	400	61	61	200	91	91	600
	6/26/2020	BEFORE GAC-62620	350	62	62	200 J	91	91	550
	8/29/2020	BEFORE GAC-82920	300	62	62	180	91	91	480
	10/31/2020	BEFORE GAC - 103120	370	62	62	270	91	91	640
	12/17/2020	BEFORE GAC-121720	260	62	62	240	91	91	500
Treatment System Effluent (Secondary GAC Vessel Effluent)	2/21/2020	HCC EFF-22120	< 62	62	62	< 91	91	91	< 77
	4/23/2020	HCC EFF-42320	< 62	62	62	< 91	91	91	< 77
	6/26/2020	HCC EFF-62620	< 62	62	62	< 91	91	91	< 77
	8/29/2020	HCC EFF-82920	< 62	62	62	< 91	91	91	< 77
	10/31/2020	HCC EFF - 103120	< 62	62	62	< 91	91	91	< 77
	12/17/2020	HCC EFF-121720	< 62	62	62	< 91	91	91	< 77
NPDES Permit Discharge Limit[3]									**208**

NOTES:

"<" denotes analyte not detected at or exceeding the reported concentration.

[1]Analyzed by Washington State Department of Ecology Method NWTPH-Dx.

[2]Sum of DRO and ORO, using half the method detection limit for non-detect results. Data reported previously in NPDES Discharge Monitoring Reports pursuant to NPDES Permit No. WA0032123.

[3]Discharge limit specified in NPDES Permit No. WA0032123.

DRO = total petroleum hydrocarbons as diesel-range organics

HCC = Hydraulic Control and Containment

J = result is an estimate

MDL = method detection limit

MRL = method reporting limit

NPDES = National Pollutant Discharge Elimination System

ORO = total petroleum hydrocarbons as oil-range organics

Table 3
pH in HCC Water Treatment System Effluent
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Sample Date	pH[1] (Standard Units)
2/21/2020	7.54
4/23/2020	7.5
6/26/2020	7.61
8/29/2020	7.57
10/31/2020	7.7
12/17/2020	7.6
NPDES Permit Discharge Limit[2]	**6.5-8.5**

NOTES:

[1]Data reported previously in NPDES Discharge Monitoring Reports pursuant to NPDES Permit No. WA0032123.

[2]Discharge limit specified in NPDES Permit No. WA0032123.

HCC = Hydraulic Control and Containment

NPDES = National Pollutant Discharge Elimination System

Table 4
Metal Concentrations in HCC Water Treatment System Effluent
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Sample Date	Sample Identification	Analytical Results (micrograms per liter)	
		Total Lead[1]	Total Arsenic[1]
02/21/2020	HCC EFF-22120	< 0.80	< 1.0
04/23/2020	HCC EFF-42320	< 0.80	< 1.0
06/26/2020	HCC EFF-62620	< 0.80	< 1.0
08/29/2020	HCC EFF-82920	< 0.80	< 1.0
10/31/2020	HCC EFF - 103120	< 0.80	< 1.0
12/17/2020	HCC EFF-121720	< 0.80	< 1.0
NPDES Permit Discharge Limit[2]		**17.5**	**360**

NOTES:
"<" denotes analyte not detected at or exceeding the method reporting limit listed.
[1]Analyzed by U.S. Environmental Protection Agency Method 200.8. Data reported previously in NPDES Discharge Monitoring Reports pursuant to NPDES Permit No. WA0032123.
[2]Discharge limit specified in NPDES Permit No. WA0032123.

HCC = Hydraulic Control and Containment
NPDES = National Pollutant Discharge Elimination System

Table 5
HCC System Barrier Wall Groundwater Elevations
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Groundwater Elevations at Piezometers (feet NAVD88) and Elevation Differentials at Piezometer Pairs (feet)																			
Date	PZ-1	PZ-2S	PZ-2N	Elevation Differential at PZ-2S/PZ-2N	PZ-3S	PZ-3N	Elevation Differential at PZ-3S/PZ-3N	PZ-4S	PZ-4N	Elevation Differential at PZ-4S/PZ-4N	PZ-5S	PZ-5N	Elevation Differential at PZ-5S/PZ-5N	PZ-6S	PZ-6N	Elevation Differential at PZ-6S/PZ-6N	PZ-7S	PZ-7N	Elevation Differential at PZ-7S/PZ-7N	PZ-8
1/1/2020	927.43	927.36	925.02	2.34	927.60	921.2	6.40	927.24	921.31	5.93	924.03	920.85	3.18	925.89	919.72	6.17	924.91	919.85	5.06	921.05
1/2/2020	927.44	928.03	925.21	2.82	927.80	921.18	6.62	927.35	921.30	6.05	924.15	920.73	3.42	926.15	919.44	6.71	925.30	919.73	5.57	921.22
1/3/2020	927.35	928.16	924.93	3.23	927.75	921.17	6.58	927.3	921.31	5.99	924.10	920.43	3.67	926.12	919.35	6.77	925.22	919.46	5.76	921.04
1/4/2020	927.46	928.23	925.05	3.18	927.95	921.18	6.77	927.48	921.31	6.17	924.21	920.55	3.66	926.25	919.44	6.81	925.35	919.56	5.79	921.18
1/5/2020	927.30	928.10	924.72	3.38	927.61	921.16	6.45	927.17	921.31	5.86	924.02	920.22	3.80	926.01	919.22	6.79	925.08	919.24	5.84	920.91
1/6/2020	927.76	928.33	924.95	3.38	928.70	921.17	7.53	927.85	921.34	6.51	924.47	920.25	4.22	926.40	919.12	7.28	925.49	919.97	5.52	921.35
1/7/2020	929.23	929.08	927.02	2.06	929.47	922.52	6.95	928.42	922.91	5.51	925.13	923.53	1.60	927.57	922.23	5.34	926.75	922.52	4.23	923.32
1/8/2020	928.81	929.12	926.56	2.56	929.11	921.36	7.75	928.2	921.67	6.53	924.88	922.28	2.60	927.32	921.08	6.24	926.50	921.31	5.19	922.55
1/9/2020	927.88	928.81	925.73	3.08	928.42	921.16	7.26	927.71	921.33	6.38	924.44	921.05	3.39	926.68	920.07	6.61	925.84	920.10	5.74	921.59
1/10/2020	927.45	928.42	924.93	3.49	927.90	921.16	6.74	927.35	921.33	6.02	924.12	920.31	3.81	926.17	918.88	7.29	925.28	919.38	5.90	921.01
1/11/2020	927.34	928.30	924.73	3.57	927.74	921.17	6.57	927.24	921.34	5.90	924.02	920.17	3.85	926.03	919.08	6.95	925.13	919.24	5.89	920.88
1/12/2020 - 2/20/2020: No data available*.																				
2/21/2020	926.44	926.90	923.67	3.23	926.51	921.19	5.32	925.99	921.32	4.67	923.33	919.36	3.97	925.06	918.35	6.71	924.05	918.28	5.77	920.00
2/22/2020	926.33	926.68	923.57	3.11	926.37	921.19	5.18	925.93	921.32	4.61	923.24	919.34	3.90	924.98	918.37	6.61	923.89	918.25	5.64	919.91
2/23/2020	926.48	926.58	923.55	3.03	926.48	921.19	5.29	925.99	921.33	4.66	923.30	919.33	3.97	924.88	918.29	6.59	923.82	918.26	5.56	919.93
2/24/2020	926.37	926.69	923.66	3.03	926.56	921.2	5.36	926.24	921.32	4.92	923.39	919.38	4.01	925.04	917.98	7.06	924.05	918.32	5.73	920.03
2/25/2020	926.31	926.60	923.66	2.94	926.43	921.19	5.24	926.06	921.32	4.74	923.32	919.37	3.95	925.06	918.38	6.68	923.99	918.26	5.73	919.96
2/26/2020	926.24	926.49	923.57	2.92	926.29	921.2	5.09	925.90	921.32	4.58	923.22	919.32	3.90	924.73	917.95	6.78	923.86	918.24	5.62	919.89
2/27/2020	926.19	926.41	923.53	2.88	926.19	921.19	5.00	925.78	921.33	4.45	923.15	919.31	3.84	924.85	918.32	6.53	923.77	918.22	5.55	919.83
2/28/2020	926.16	926.33	923.50	2.83	926.11	921.18	4.93	925.71	921.32	4.39	923.10	919.29	3.81	924.71	918.16	6.55	923.69	918.20	5.49	919.81
2/29/2020	926.26	926.35	923.56	2.79	926.33	921.18	5.15	925.99	921.33	4.66	923.25	919.34	3.91	924.86	917.92	6.94	923.82	918.30	5.52	919.93
3/1/2020	926.23	926.40	923.60	2.80	926.27	921.18	5.09	925.92	921.34	4.58	923.21	919.35	3.86	924.88	918.21	6.67	923.86	918.28	5.58	919.93
3/2/2020	926.19	926.38	923.56	2.82	926.2	921.16	5.04	925.80	921.33	4.47	923.16	919.32	3.84	924.78	917.85	6.93	923.79	918.25	5.54	919.88
3/3/2020	926.32	926.53	923.67	2.86	926.47	921.19	5.28	926.14	921.33	4.81	923.36	919.39	3.97	925.01	918.36	6.65	924.01	918.34	5.67	920.04
3/4/2020	926.55	926.95	923.92	3.03	926.96	921.16	5.80	926.68	921.35	5.33	923.65	919.53	4.12	925.37	918.45	6.92	924.42	918.54	5.88	920.34
3/5/2020	926.56	927.04	923.91	3.13	926.84	921.18	5.66	926.46	921.34	5.12	923.56	919.50	4.06	925.33	918.47	6.86	924.43	918.47	5.96	920.28
3/6/2020	926.48	926.93	923.78	3.15	926.66	921.17	5.49	926.25	921.34	4.91	923.44	919.46	3.98	925.19	918.29	6.90	924.26	918.40	5.86	920.16
3/7/2020	926.39	926.78	923.69	3.09	926.5	921.18	5.32	926.09	921.34	4.75	923.36	919.43	3.93	925.06	918.33	6.73	924.10	918.38	5.72	920.07
3/8/2020	926.33	926.64	923.61	3.03	926.39	921.18	5.21	925.95	921.33	4.62	923.25	919.39	3.86	924.96	917.97	6.99	923.98	918.31	5.67	919.99
3/9/2020	926.24	926.50	923.54	2.96	926.25	921.17	5.08	925.81	921.34	4.47	923.18	919.34	3.84	924.84	917.97	6.87	923.86	918.26	5.60	919.90
3/10/2020	926.15	926.37	923.47	2.90	926.12	921.17	4.95	925.69	921.31	4.38	923.09	919.32	3.77	924.73	918.03	6.70	923.72	918.20	5.52	919.83
3/11/2020	926.07	926.22	923.42	2.80	926	921.18	4.82	925.58	921.32	4.26	923.04	919.28	3.76	924.63	917.81	6.82	923.61	918.20	5.41	919.77
3/12/2020	926.00	926.12	923.37	2.75	925.89	921.16	4.73	925.47	921.32	4.15	922.97	919.26	3.71	924.54	918.21	6.33	923.51	918.15	5.36	919.72
3/13/2020	925.95	926.04	923.35	2.69	925.81	921.16	4.65	925.40	921.32	4.08	922.93	919.24	3.69	924.47	918.09	6.38	923.44	918.15	5.29	919.68
3/14/2020	925.90	925.93	923.30	2.63	925.7	921.17	4.53	925.30	921.31	3.99	922.87	919.21	3.66	924.39	917.84	6.55	923.36	918.11	5.25	919.62
3/15/2020	925.84	925.84	923.26	2.58	925.65	921.16	4.49	925.23	921.32	3.91	922.83	919.17	3.66	924.32	918.11	6.21	923.25	918.06	5.19	919.58
3/16/2020	925.78	925.74	923.23	2.51	925.55	921.16	4.39	925.13	921.31	3.82	922.77	919.14	3.63	924.24	918.05	6.19	923.16	918.01	5.15	919.53
3/17/2020	925.74	925.67	923.21	2.46	925.48	921.16	4.32	925.06	921.31	3.75	922.73	919.13	3.60	924.20	918.07	6.13	923.04	918.01	5.03	919.49
3/18/2020	925.71	925.60	923.19	2.41	925.42	921.17	4.25	924.99	921.31	3.68	922.68	919.12	3.56	924.01	917.77	6.24	922.93	917.98	4.95	919.46
3/19/2020	925.67	925.53	923.16	2.37	925.35	921.17	4.18	924.94	921.31	3.63	922.64	919.11	3.53	923.95	917.73	6.22	922.87	917.98	4.89	919.43
3/20/2020	925.67	925.47	923.14	2.33	925.31	921.16	4.15	924.89	921.31	3.58	922.60	919.11	3.49	923.93	917.79	6.14	922.80	918.00	4.80	919.40
3/21/2020	925.68	925.44	923.14	2.30	925.29	921.16	4.13	924.85	921.31	3.54	922.59	919.15	3.44	923.86	918.13	5.73	922.78	918.04	4.74	919.41
3/22/2020	925.70	925.44	923.15	2.29	925.28	921.16	4.12	924.85	921.31	3.54	922.58	919.17	3.41	923.86	917.96	5.90	922.80	918.07	4.73	919.42
3/23/2020	925.72	925.45	923.15	2.30	925.28	921.17	4.11	924.85	921.31	3.54	922.58	919.20	3.38	923.85	918.13	5.72	922.76	918.08	4.68	919.44
3/24/2020	925.76	925.50	923.19	2.31	925.37	921.16	4.21	924.95	921.31	3.64	922.64	919.23	3.41	923.95	917.80	6.15	922.87	918.13	4.74	919.50

Table 5
HCC System Barrier Wall Groundwater Elevations
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Groundwater Elevations at Piezometers (feet NAVD88) and Elevation Differentials at Piezometer Pairs (feet)																			
Date	PZ-1	PZ-2S	PZ-2N	Elevation Differential at PZ-2S/PZ-2N	PZ-3S	PZ-3N	Elevation Differential at PZ-3S/PZ-3N	PZ-4S	PZ-4N	Elevation Differential at PZ-4S/PZ-4N	PZ-5S	PZ-5N	Elevation Differential at PZ-5S/PZ-5N	PZ-6S	PZ-6N	Elevation Differential at PZ-6S/PZ-6N	PZ-7S	PZ-7N	Elevation Differential at PZ-7S/PZ-7N	PZ-8
3/25/2020	925.79	925.52	923.22	2.30	925.39	921.17	4.22	924.97	921.31	3.66	922.66	919.24	3.42	923.98	918.22	5.76	922.90	918.11	4.79	919.52
3/26/2020	925.75	925.54	923.22	2.32	925.39	921.17	4.22	924.97	921.32	3.65	922.66	919.22	3.44	923.98	917.83	6.15	922.90	918.10	4.80	919.50
3/27/2020	925.74	925.52	923.20	2.32	925.37	921.17	4.20	924.95	921.31	3.64	922.66	919.20	3.46	923.97	917.98	5.99	922.88	918.09	4.79	919.49
3/28/2020	925.75	925.52	923.20	2.32	925.37	921.17	4.20	924.95	921.31	3.64	922.65	919.19	3.46	923.97	917.74	6.23	922.89	918.07	4.82	919.50
3/29/2020	926.00	925.80	923.36	2.44	925.88	921.18	4.70	925.55	921.31	4.24	922.98	919.30	3.68	924.29	918.07	6.22	923.23	918.27	4.96	919.74
3/30/2020	926.40	926.37	923.69	2.68	926.53	921.17	5.36	926.17	921.31	4.86	923.40	919.47	3.93	924.83	918.10	6.73	923.83	918.50	5.33	920.15
3/31/2020	926.52	926.89	924.02	2.87	926.87	921.16	5.71	926.58	921.30	5.28	923.64	919.57	4.07	925.31	918.18	7.13	924.46	918.50	5.96	920.40
4/1/2020	926.52	927.06	923.94	3.12	926.84	921.16	5.68	926.50	921.30	5.20	923.60	919.52	4.08	925.33	918.28	7.05	924.52	918.47	6.05	920.37
4/2/2020	926.39	926.91	923.80	3.11	926.65	921.16	5.49	926.30	921.30	5.00	923.48	919.45	4.03	925.16	918.01	7.15	924.33	918.37	5.96	920.21
4/3/2020	926.28	926.74	923.66	3.08	926.46	921.16	5.30	926.08	921.30	4.78	923.36	919.38	3.98	924.98	918.15	6.83	924.13	918.28	5.85	920.07
4/4/2020	926.20	926.55	923.56	2.99	926.31	921.16	5.15	925.92	921.30	4.62	923.26	919.34	3.92	924.85	918.15	6.70	923.97	918.22	5.75	919.98
4/5/2020	926.10	926.36	923.48	2.88	926.11	921.16	4.95	925.75	921.31	4.44	923.16	919.31	3.85	924.71	918.30	6.41	923.80	918.20	5.60	919.87
4/6/2020	926.01	926.19	923.41	2.78	925.99	921.17	4.82	925.60	921.30	4.30	923.07	919.27	3.80	924.56	918.20	6.36	923.65	918.13	5.52	919.79
4/7/2020	925.93	926.03	923.33	2.70	925.85	921.16	4.69	925.45	921.30	4.15	922.97	919.25	3.72	924.43	917.89	6.54	923.53	918.12	5.41	919.73
4/8/2020	925.89	925.93	923.30	2.63	925.78	921.17	4.61	925.34	921.30	4.04	922.90	919.24	3.66	924.34	917.94	6.40	923.40	918.10	5.30	919.69
4/9/2020	925.87	925.85	923.28	2.57	925.68	921.16	4.52	925.27	921.31	3.96	922.84	919.25	3.59	924.26	917.79	6.47	923.30	918.10	5.20	919.65
4/10/2020	925.94	925.81	923.29	2.52	925.63	921.17	4.46	925.22	921.31	3.91	922.81	919.33	3.48	924.09	917.93	6.16	923.26	918.21	5.05	919.68
4/11/2020	926.02	925.82	923.30	2.52	925.65	921.17	4.48	925.22	921.31	3.91	922.80	919.40	3.40	924.06	917.97	6.09	923.25	918.29	4.96	919.72
4/12/2020	926.06	925.85	923.31	2.54	925.66	921.16	4.50	925.24	921.30	3.94	922.81	919.44	3.37	924.15	917.98	6.17	923.27	918.34	4.93	919.76
4/13/2020	926.03	925.85	923.32	2.53	925.67	921.18	4.49	925.23	921.31	3.92	922.82	919.41	3.41	924.29	918.41	5.88	923.28	918.31	4.97	919.75
4/14/2020	926.00	925.81	923.31	2.50	925.6	921.18	4.42	925.19	921.30	3.89	922.80	919.40	3.40	924.15	917.93	6.22	923.25	918.27	4.98	919.71
4/15/2020	925.97	925.79	923.29	2.50	925.58	921.17	4.41	925.18	921.31	3.87	922.78	919.41	3.37	924.18	918.02	6.16	923.24	918.28	4.96	919.71
4/16/2020	926.03	925.78	923.31	2.47	925.59	921.17	4.42	925.17	921.30	3.87	922.77	919.45	3.32	924.16	918.02	6.14	923.21	918.33	4.88	919.74
4/17/2020	926.05	925.81	923.33	2.48	925.63	921.17	4.46	925.19	921.31	3.88	922.79	919.47	3.32	924.16	918.18	5.98	923.24	918.35	4.89	919.76
4/18/2020	926.10	925.81	923.34	2.47	925.62	921.17	4.45	925.19	921.31	3.88	922.79	919.52	3.27	924.21	918.17	6.04	923.26	918.43	4.83	919.79
4/19/2020	926.17	925.85	923.39	2.46	925.66	921.18	4.48	925.22	921.31	3.91	922.82	919.59	3.23	924.16	918.41	5.75	923.29	918.49	4.80	919.84
4/20/2020	926.19	925.90	923.42	2.48	925.67	921.17	4.50	925.25	921.32	3.93	922.83	919.60	3.23	924.30	918.57	5.73	923.33	918.51	4.82	919.86
4/21/2020	926.27	925.93	923.47	2.46	925.74	921.17	4.57	925.29	921.30	3.99	922.85	919.69	3.16	924.20	918.45	5.75	923.37	918.62	4.75	919.91
4/22/2020	926.32	925.99	923.52	2.47	925.77	921.18	4.59	925.33	921.32	4.01	922.87	919.74	3.13	924.32	918.27	6.05	923.40	918.67	4.73	919.98
4/23/2020	926.63	926.12	923.93	2.19	926.04	921.18	4.86	925.58	921.31	4.27	923.09	920.25	2.84	924.61	919.26	5.35	923.71	919.19	4.52	920.30
4/24/2020	926.75	926.40	924.19	2.21	926.26	921.18	5.08	925.83	921.31	4.52	923.18	920.35	2.83	924.74	918.90	5.84	923.91	919.28	4.63	920.47
4/25/2020	926.71	926.55	924.11	2.44	926.34	921.17	5.17	925.88	921.31	4.57	923.23	920.23	3.00	924.85	919.16	5.69	923.99	919.17	4.82	920.42
4/26/2020	926.73	926.60	924.10	2.50	926.35	921.18	5.17	925.90	921.31	4.59	923.24	920.24	3.00	924.90	919.10	5.80	924.02	919.17	4.85	920.42
4/27/2020	926.82	926.77	924.19	2.58	926.55	921.18	5.37	926.17	921.31	4.86	923.46	920.29	3.17	925.11	918.99	6.12	924.20	919.24	4.96	920.53
4/28/2020	926.87	926.83	924.35	2.48	926.61	921.19	5.42	926.19	921.32	4.87	923.43	920.44	2.99	925.14	919.11	6.03	924.31	919.39	4.92	920.63
4/29/2020 - 6/25/2020: No data available*.																				
6/26/2020	926.54	926.29	923.98	2.31	925.86	921.15	4.71	925.30	921.33	3.97	922.96	920.16	2.80	924.48	919.02	5.46	923.64	919.07	4.57	920.16
6/27/2020	926.50	926.23	923.92	2.31	925.86	921.16	4.70	925.38	921.33	4.05	922.97	920.10	2.87	924.51	919.06	5.45	923.61	919.03	4.58	920.12
6/28/2020	926.40	926.18	923.82	2.36	925.81	921.16	4.65	925.34	921.33	4.01	922.95	919.98	2.97	924.40	918.77	5.63	923.56	918.89	4.67	920.05
6/29/2020	926.27	926.12	923.68	2.44	925.74	921.16	4.58	925.27	921.33	3.94	922.91	919.79	3.12	924.37	918.67	5.70	923.48	918.70	4.78	919.95
6/30/2020	926.19	926.01	923.60	2.41	925.66	921.15	4.51	925.21	921.34	3.87	922.87	919.73	3.14	924.35	918.60	5.75	923.38	918.63	4.75	919.87
7/1/2020	926.16	925.93	923.57	2.36	925.61	921.16	4.45	925.15	921.34	3.81	922.83	919.71	3.12	924.23	918.69	5.54	923.31	918.61	4.70	919.92
7/2/2020	926.14	925.86	923.54	2.32	925.55	921.16	4.39	925.09	921.35	3.74	922.79	919.69	3.10	924.17	918.31	5.86	923.24	918.60	4.64	920.08
7/3/2020	926.07	925.82	923.49	2.33	925.51	921.16	4.35	925.05	921.34	3.71	922.76	919.64	3.12	924.02	918.16	5.86	923.19	918.53	4.66	919.75
7/4/2020	925.99	925.74	923.42	2.32	925.45	921.17	4.28	924.99	921.34	3.65	922.74	919.54	3.20	923.96	918.13	5.83	923.09	918.43	4.66	919.68

Table 5
HCC System Barrier Wall Groundwater Elevations
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Groundwater Elevations at Piezometers (feet NAVD88) and Elevation Differentials at Piezometer Pairs (feet)																				
Date	PZ-1	PZ-2S	PZ-2N	Elevation Differential at PZ-2S/PZ-2N	PZ-3S	PZ-3N	Elevation Differential at PZ-3S/PZ-3N	PZ-4S	PZ-4N	Elevation Differential at PZ-4S/PZ-4N	PZ-5S	PZ-5N	Elevation Differential at PZ-5S/PZ-5N	PZ-6S	PZ-6N	Elevation Differential at PZ-6S/PZ-6N	PZ-7S	PZ-7N	Elevation Differential at PZ-7S/PZ-7N	PZ-8
7/5/2020	925.93	925.68	923.38	2.30	925.4	921.14	4.26	924.95	921.34	3.61	922.70	919.51	3.19	924.11	918.47	5.64	923.03	918.40	4.63	919.65
7/6/2020	925.93	925.63	923.35	2.28	925.37	921.15	4.22	924.92	921.35	3.57	922.69	919.52	3.17	923.99	918.32	5.67	922.97	918.40	4.57	919.63
7/7/2020	925.92	925.59	923.32	2.27	925.32	921.17	4.15	924.87	921.34	3.53	922.64	919.49	3.15	924.08	918.44	5.64	922.93	918.38	4.55	919.71
7/8/2020	925.89	925.56	923.31	2.25	925.3	921.16	4.14	924.84	921.34	3.50	922.63	919.46	3.17	923.96	918.44	5.52	922.90	918.35	4.55	919.36
7/9/2020	925.87	925.53	923.29	2.24	925.28	921.18	4.10	924.82	921.34	3.48	922.61	919.43	3.18	923.94	918.07	5.87	922.85	918.30	4.55	919.57
7/10/2020	925.82	925.50	923.27	2.23	925.23	921.16	4.07	924.79	921.32	3.47	922.59	919.40	3.19	923.93	917.94	5.99	922.83	918.26	4.57	919.31
7/11/2020	925.81	925.46	923.23	2.23	925.21	921.17	4.04	924.77	921.32	3.45	922.60	919.38	3.22	923.88	917.92	5.96	922.79	918.25	4.54	919.29
7/12/2020	925.80	925.43	923.22	2.21	925.19	921.16	4.03	924.75	921.31	3.44	922.57	919.37	3.20	923.86	918.25	5.61	922.77	918.25	4.52	919.24
7/13/2020	925.79	925.42	923.21	2.21	925.16	921.17	3.99	924.73	921.31	3.42	922.56	919.36	3.20	923.89	918.20	5.69	922.76	918.23	4.53	919.34
7/14/2020	925.74	925.38	923.20	2.18	925.15	921.17	3.98	924.70	921.31	3.39	922.56	919.34	3.22	923.82	918.30	5.52	922.72	918.19	4.53	919.65
7/15/2020	925.70	925.35	923.17	2.18	925.09	921.16	3.93	924.68	921.30	3.38	922.54	919.30	3.24	923.78	918.16	5.62	922.68	918.15	4.53	919.44
7/16/2020	925.69	925.31	923.14	2.17	925.08	921.16	3.92	924.65	921.30	3.35	922.52	919.30	3.22	923.79	918.24	5.55	922.65	918.17	4.48	919.42
7/17/2020	925.69	925.29	923.18	2.11	925.04	921.17	3.87	924.62	921.31	3.31	922.50	919.30	3.20	923.78	918.23	5.55	922.61	918.15	4.46	919.17
7/18/2020	925.67	925.28	923.15	2.13	925.03	921.17	3.86	924.60	921.31	3.29	922.49	919.29	3.20	923.79	918.07	5.72	922.59	918.14	4.45	919.18
7/19/2020	925.65	925.26	923.14	2.12	925.02	921.18	3.84	924.59	921.30	3.29	922.48	919.28	3.20	923.69	918.11	5.58	922.56	918.11	4.45	919.48
7/20/2020	925.63	925.22	923.13	2.09	924.99	921.18	3.81	924.55	921.31	3.24	922.46	919.26	3.20	923.69	918.16	5.53	922.52	918.08	4.44	919.39
7/21/2020	925.63	925.21	923.12	2.09	924.97	921.17	3.80	924.53	921.31	3.22	922.45	919.26	3.19	923.65	917.88	5.77	922.49	918.08	4.41	919.37
7/22/2020	925.59	925.18	923.10	2.08	924.94	921.17	3.77	924.52	921.32	3.20	922.44	919.25	3.19	923.68	918.15	5.53	922.48	918.07	4.41	919.32
7/23/2020	925.57	925.16	923.09	2.07	924.93	921.18	3.75	924.51	921.32	3.19	922.41	919.22	3.19	923.61	917.94	5.67	922.43	918.03	4.40	919.34
7/24/2020	925.54	925.13	923.06	2.07	924.89	921.18	3.71	924.48	921.30	3.18	922.41	919.18	3.23	923.60	918.04	5.56	922.42	917.99	4.43	919.29
7/25/2020	925.50	925.09	923.05	2.04	924.86	921.18	3.68	924.44	921.30	3.14	922.39	919.16	3.23	923.58	918.06	5.52	922.38	917.95	4.43	919.26
7/26/2020	925.46	925.04	923.03	2.01	924.81	921.17	3.64	924.38	921.30	3.08	922.37	919.09	3.28	923.54	917.66	5.88	922.33	917.90	4.43	919.24
7/27/2020	925.43	925.00	923.02	1.98	924.79	921.17	3.62	924.35	921.31	3.04	922.34	919.09	3.25	923.49	917.81	5.68	922.28	917.91	4.37	919.20
7/28/2020	925.41	924.96	923.01	1.95	924.74	921.17	3.57	924.31	921.32	2.99	922.32	919.08	3.24	923.55	917.91	5.64	922.24	917.89	4.35	919.17
7/29/2020	925.37	924.91	923.00	1.91	924.7	921.18	3.52	924.27	921.32	2.95	922.30	919.08	3.22	923.42	917.96	5.46	922.19	917.89	4.30	919.14
7/30/2020	925.33	924.85	922.98	1.87	924.64	921.18	3.46	924.22	921.31	2.91	922.26	919.05	3.21	923.37	917.95	5.42	922.12	917.85	4.27	919.10
7/31/2020	925.29	924.80	922.96	1.84	924.59	921.18	3.41	924.17	921.32	2.85	922.23	919.04	3.19	923.31	917.92	5.39	922.07	917.86	4.21	919.07
8/1/2020	925.25	924.74	922.94	1.80	924.52	921.19	3.33	924.10	921.32	2.78	922.18	919.03	3.15	923.26	917.94	5.32	922.00	917.83	4.17	919.04
8/2/2020	925.19	924.67	922.92	1.75	924.46	921.18	3.28	924.03	921.33	2.70	922.13	919.11	3.02	923.18	917.69	5.49	921.92	917.80	4.12	918.99
8/3/2020	925.14	924.61	922.90	1.71	924.41	921.19	3.22	923.96	921.32	2.64	922.10	919.11	2.99	923.13	917.77	5.36	921.86	917.76	4.10	918.98
8/4/2020	925.09	924.55	922.89	1.66	924.35	921.19	3.16	923.92	921.32	2.60	922.06	919.13	2.93	923.06	917.84	5.22	921.78	917.73	4.05	918.94
8/5/2020	925.07	924.49	922.85	1.64	924.29	921.2	3.09	923.85	921.30	2.55	921.98	919.11	2.87	922.98	917.50	5.48	921.67	917.71	3.96	918.90
8/6/2020	925.02	924.42	922.83	1.59	924.23	921.19	3.04	923.78	921.30	2.48	921.96	919.12	2.84	922.85	917.67	5.18	921.62	917.69	3.93	918.86
8/7/2020	925.03	924.38	922.81	1.57	924.21	921.19	3.02	923.76	921.33	2.43	921.92	919.12	2.80	922.84	917.55	5.29	921.56	917.70	3.86	918.85
8/8/2020	925.02	924.38	922.80	1.58	924.18	921.18	3.00	923.73	921.32	2.41	921.93	919.11	2.82	922.82	917.76	5.06	921.55	917.68	3.87	918.83
8/9/2020	924.97	924.35	922.77	1.58	924.15	921.18	2.97	923.69	921.31	2.38	921.90	919.12	2.78	922.78	917.58	5.20	921.51	917.66	3.85	918.80
8/10/2020	924.93	924.31	922.77	1.54	924.11	921.19	2.92	923.67	921.33	2.34	921.88	919.10	2.78	922.76	917.72	5.04	921.46	917.64	3.82	918.78
8/11/2020	924.90	924.26	922.75	1.51	924.06	921.19	2.87	923.62	921.33	2.29	921.84	919.12	2.72	922.71	917.71	5.00	921.38	917.62	3.76	918.74
8/12/2020	924.85	924.20	922.73	1.47	924	921.16	2.84	923.56	921.33	2.23	921.80	919.12	2.68	922.62	917.43	5.19	921.30	917.58	3.72	918.70
8/13/2020	924.76	924.14	922.71	1.43	923.94	921.17	2.77	923.50	921.33	2.17	921.76	919.11	2.65	922.56	917.52	5.04	921.23	917.55	3.68	918.65
8/14/2020	924.74	924.07	922.67	1.40	923.88	921.18	2.70	923.43	921.32	2.11	921.70	919.10	2.60	922.49	917.59	4.90	921.14	917.52	3.62	918.61
8/15/2020	924.71	924.02	922.65	1.37	923.83	921.17	2.66	923.37	921.32	2.05	921.65	919.10	2.55	922.40	917.44	4.96	921.04	917.50	3.54	918.56
8/16/2020	924.67	923.98	922.63	1.35	923.77	921.18	2.59	923.32	921.31	2.01	921.61	919.10	2.51	922.31	917.30	5.01	920.93	917.47	3.46	918.51
8/17/2020	924.65	923.92	922.59	1.33	923.71	921.16	2.55	923.25	921.32	1.93	921.55	919.11	2.44	922.23	917.49	4.74	920.85	917.49	3.36	918.46
8/18/2020	924.63	923.87	922.58	1.29	923.67	921.17	2.50	923.18	921.32	1.86	921.52	919.11	2.41	922.15	917.32	4.83	920.75	917.45	3.30	918.44

Table 5
HCC System Barrier Wall Groundwater Elevations
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Groundwater Elevations at Piezometers (feet NAVD88) and Elevation Differentials at Piezometer Pairs (feet)																				
Date	PZ-1	PZ-2S	PZ-2N	Elevation Differential at PZ-2S/PZ-2N	PZ-3S	PZ-3N	Elevation Differential at PZ-3S/PZ-3N	PZ-4S	PZ-4N	Elevation Differential at PZ-4S/PZ-4N	PZ-5S	PZ-5N	Elevation Differential at PZ-5S/PZ-5N	PZ-6S	PZ-6N	Elevation Differential at PZ-6S/PZ-6N	PZ-7S	PZ-7N	Elevation Differential at PZ-7S/PZ-7N	PZ-8
8/19/2020	924.60	923.84	922.56	1.28	923.61	921.15	2.46	923.15	921.32	1.83	921.49	919.11	2.38	922.08	917.44	4.64	920.68	917.45	3.23	918.38
8/20/2020	924.56	923.78	922.53	1.25	923.55	921.16	2.39	923.09	921.29	1.80	921.42	919.12	2.30	922.01	917.35	4.66	920.58	917.43	3.15	918.32
8/21/2020	924.54	923.77	922.53	1.24	923.52	921.16	2.36	923.05	921.32	1.73	921.39	919.12	2.27	921.95	917.43	4.52	920.54	917.42	3.12	918.30
8/22/2020	924.57	923.73	922.51	1.22	923.51	921.13	2.38	923.00	921.31	1.69	921.35	919.12	2.23	921.89	917.44	4.45	920.50	917.46	3.04	918.30
8/23/2020	924.58	923.77	922.51	1.26	923.5	921.16	2.34	923.04	921.30	1.74	921.33	919.12	2.21	921.90	917.48	4.42	920.44	917.45	2.99	918.29
8/24/2020	924.54	923.69	922.50	1.19	923.47	921.17	2.30	922.99	921.29	1.70	921.32	919.11	2.21	921.85	917.24	4.61	920.42	917.40	3.02	918.26
8/25/2020	924.51	923.67	922.48	1.19	923.44	921.17	2.27	922.95	921.29	1.66	921.31	919.12	2.19	921.83	917.32	4.51	920.39	917.36	3.03	918.21
8/26/2020	924.46	923.63	922.48	1.15	923.4	921.16	2.24	922.91	921.30	1.61	921.28	919.11	2.17	921.94	917.34	4.60	920.32	917.34	2.98	918.18
8/27/2020	924.41	923.60	922.46	1.14	923.34	921.17	2.17	922.87	921.29	1.58	921.24	919.12	2.12	921.76	917.23	4.53	920.25	917.30	2.95	918.15
8/28/2020	924.38	923.57	922.44	1.13	923.29	921.17	2.12	922.83	921.30	1.53	921.20	919.12	2.08	921.65	917.23	4.42	920.15	917.28	2.87	918.10
8/29/2020	924.34	923.48	922.41	1.07	923.14	921.17	1.97	922.59	921.30	1.29	921.12	919.12	2.00	921.58	917.21	4.37	920.06	917.26	2.80	918.03
8/30/2020	924.32	923.45	922.38	1.07	923.16	921.17	1.99	922.69	921.29	1.40	921.09	919.13	1.96	921.41	917.22	4.19	920.01	917.25	2.76	918.00
8/31/2020	924.28	923.40	922.37	1.03	923.12	921.17	1.95	922.64	921.30	1.34	921.06	919.12	1.94	921.55	917.24	4.31	919.95	917.23	2.72	917.95
9/1/2020	924.24	923.36	922.34	1.02	923.07	921.16	1.91	922.60	921.31	1.29	921.02	919.14	1.88	921.36	917.20	4.16	919.86	917.23	2.63	917.91
9/2/2020	924.23	923.31	922.31	1.00	923.03	921.18	1.85	922.56	921.31	1.25	920.98	919.14	1.84	921.19	917.17	4.02	919.75	917.22	2.53	917.87
9/3/2020	924.21	923.29	922.30	0.99	923	921.18	1.82	922.52	921.31	1.21	920.95	919.14	1.81	921.23	917.17	4.06	919.69	917.22	2.47	917.85
9/4/2020	924.18	923.26	922.27	0.99	922.94	921.18	1.76	922.49	921.30	1.19	920.91	919.12	1.79	921.19	917.16	4.03	919.58	917.21	2.37	917.76
9/5/2020	924.15	923.22	922.25	0.97	922.91	921.17	1.74	922.44	921.30	1.14	920.86	919.13	1.73	920.98	917.10	3.88	919.48	917.25	2.23	917.65
9/6/2020	924.13	923.17	922.22	0.95	922.87	921.17	1.70	922.39	921.29	1.10	920.83	919.14	1.69	920.99	917.13	3.86	919.42	917.25	2.17	917.62
9/7/2020	924.09	923.15	922.24	0.91	922.84	921.2	1.64	922.35	921.30	1.05	920.80	919.14	1.66	920.86	917.17	3.69	919.34	917.23	2.11	917.57
9/8/2020	924.07	923.11	922.19	0.92	922.79	921.18	1.61	922.29	921.30	0.99	920.76	919.14	1.62	921.07	917.16	3.91	919.28	917.23	2.05	917.53
9/9/2020	924.04	923.07	922.17	0.90	922.75	921.17	1.58	922.26	921.30	0.96	920.73	919.14	1.59	920.76	917.16	3.60	919.21	917.23	1.98	917.49
9/10/2020	924.01	923.03	922.16	0.87	922.71	921.19	1.52	922.21	921.29	0.92	920.70	919.13	1.57	920.72	917.17	3.55	919.14	917.21	1.93	917.46
9/11/2020	923.98	923.00	922.15	0.85	922.66	921.19	1.47	922.17	921.31	0.86	920.66	919.15	1.51	920.62	917.17	3.45	919.06	917.24	1.82	917.40
9/12/2020	923.96	922.95	922.11	0.84	922.62	921.19	1.43	922.09	921.30	0.79	920.63	919.14	1.49	920.77	917.18	3.59	919.01	917.23	1.78	917.33
9/13/2020	923.94	922.92	922.10	0.82	922.58	921.19	1.39	922.07	921.31	0.76	920.59	919.14	1.45	920.82	917.19	3.63	918.95	917.22	1.73	917.31
9/14/2020	923.91	922.89	922.08	0.81	922.55	921.18	1.37	922.03	921.30	0.73	920.56	919.12	1.44	920.75	917.18	3.57	918.89	917.22	1.67	917.30
9/15/2020	923.91	922.87	922.07	0.80	922.54	921.19	1.35	922.03	921.31	0.72	920.53	919.14	1.39	920.45	917.18	3.27	918.85	917.22	1.63	917.27
9/16/2020	923.92	922.84	922.05	0.79	922.5	921.21	1.29	921.97	921.31	0.66	920.53	919.12	1.41	920.69	917.19	3.50	918.83	917.21	1.62	917.28
9/17/2020	923.89	922.82	922.05	0.77	922.49	921.19	1.30	921.95	921.31	0.64	920.49	919.12	1.37	920.51	917.18	3.33	918.78	917.22	1.56	917.26
9/18/2020	923.88	922.81	922.03	0.78	922.47	921.2	1.27	921.92	921.29	0.63	920.47	919.15	1.32	920.46	917.19	3.27	918.76	917.23	1.53	917.22
9/19/2020	923.93	922.79	922.04	0.75	922.47	921.2	1.27	921.93	921.30	0.63	920.48	919.12	1.36	920.46	917.19	3.27	918.79	917.24	1.55	917.26
9/20/2020	924.08	922.90	922.10	0.80	922.61	921.18	1.43	922.05	921.32	0.73	920.52	919.11	1.41	920.52	917.18	3.34	918.92	917.23	1.69	917.36
9/21/2020	924.11	923.02	922.11	0.91	922.69	921.19	1.50	922.15	921.30	0.85	920.61	919.13	1.48	920.60	917.19	3.41	919.01	917.23	1.78	917.40
9/22/2020	924.08	923.05	922.13	0.92	922.73	921.19	1.54	922.18	921.32	0.86	920.67	919.12	1.55	920.91	917.17	3.74	919.07	917.23	1.84	917.43
9/23/2020	924.07	923.05	922.15	0.90	922.74	921.18	1.56	922.22	921.31	0.91	920.70	919.13	1.57	920.99	917.20	3.79	919.09	917.23	1.86	917.45
9/24/2020	925.02	923.72	922.70	1.02	924.12	921.17	2.95	923.84	921.29	2.55	921.76	919.14	2.62	922.27	917.49	4.78	920.50	917.87	2.63	918.17
9/25/2020	925.97	924.96	923.23	1.73	925.04	921.18	3.86	924.60	921.30	3.30	922.60	919.24	3.36	923.29	917.97	5.32	921.56	918.28	3.28	918.84
9/26/2020	926.37	926.18	923.80	2.38	926.01	921.19	4.82	925.57	921.30	4.27	923.04	919.76	3.28	924.40	918.33	6.07	923.19	918.72	4.47	919.95
9/27/2020	926.59	926.86	924.06	2.80	926.63	921.21	5.42	926.25	921.30	4.95	923.54	919.80	3.74	925.12	918.68	6.44	924.13	918.78	5.35	920.02
9/28/2020	926.39	926.85	923.83	3.02	926.45	921.18	5.27	926.03	921.28	4.75	923.48	919.43	4.05	925.13	918.36	6.77	924.16	918.39	5.77	919.74
9/29/2020	926.19	926.61	923.63	2.98	926.24	921.19	5.05	925.82	921.30	4.52	923.36	919.24	4.12	924.97	918.20	6.77	923.93	918.17	5.76	919.86
9/30/2020	925.98	926.34	923.47	2.87	925.97	921.2	4.77	925.61	921.31	4.30	923.23	919.12	4.11	924.80	917.66	7.14	923.68	918.02	5.66	919.71
10/1/2020	925.82	926.09	923.34	2.75	925.79	921.2	4.59	925.40	921.30	4.10	923.11	919.13	3.98	924.61	917.71	6.90	923.46	917.94	5.52	919.12
10/2/2020	925.68	925.88	923.23	2.65	925.58	921.2	4.38	925.22	921.30	3.92	922.99	919.12	3.87	924.45	917.58	6.87	923.23	917.88	5.35	919.63

Table 5
HCC System Barrier Wall Groundwater Elevations
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Groundwater Elevations at Piezometers (feet NAVD88) and Elevation Differentials at Piezometer Pairs (feet)																				
Date	PZ-1	PZ-2S	PZ-2N	Elevation Differential at PZ-2S/PZ-2N	PZ-3S	PZ-3N	Elevation Differential at PZ-3S/PZ-3N	PZ-4S	PZ-4N	Elevation Differential at PZ-4S/PZ-4N	PZ-5S	PZ-5N	Elevation Differential at PZ-5S/PZ-5N	PZ-6S	PZ-6N	Elevation Differential at PZ-6S/PZ-6N	PZ-7S	PZ-7N	Elevation Differential at PZ-7S/PZ-7N	PZ-8
10/3/2020	925.55	925.70	923.17	2.53	925.42	921.19	4.23	925.05	921.30	3.75	922.89	919.14	3.75	924.29	917.93	6.36	922.96	917.83	5.13	918.95
10/4/2020	925.45	925.53	923.11	2.42	925.28	921.19	4.09	924.88	921.30	3.58	922.79	919.13	3.66	924.14	917.74	6.40	922.73	917.77	4.96	919.08
10/5/2020	925.37	925.37	923.05	2.32	925.14	921.19	3.95	924.74	921.31	3.43	922.69	919.13	3.56	924.01	917.41	6.60	922.55	917.73	4.82	919.14
10/6/2020	925.29	925.23	923.00	2.23	924.98	921.19	3.79	924.60	921.30	3.30	922.61	919.13	3.48	923.88	917.71	6.17	922.37	917.69	4.68	918.91
10/7/2020	925.19	925.09	922.96	2.13	924.83	921.19	3.64	924.45	921.30	3.15	922.51	919.13	3.38	923.73	917.61	6.12	922.21	917.66	4.55	919.32
10/8/2020	925.11	924.91	922.91	2.00	924.7	921.19	3.51	924.32	921.30	3.02	922.41	919.13	3.28	923.58	917.43	6.15	922.05	917.63	4.42	919.10
10/9/2020	925.05	924.80	922.87	1.93	924.56	921.19	3.37	924.18	921.30	2.88	922.32	919.13	3.19	923.45	917.36	6.09	921.90	917.60	4.30	918.59
10/10/2020	925.29	924.77	922.94	1.83	924.76	921.19	3.57	924.39	921.29	3.10	922.46	919.14	3.32	923.61	917.51	6.10	922.04	917.78	4.26	918.62
10/11/2020	926.14	925.77	923.47	2.30	925.74	921.19	4.55	925.41	921.30	4.11	923.02	919.47	3.55	924.38	918.18	6.20	923.10	918.41	4.69	919.73
10/12/2020	927.09	927.16	924.70	2.46	926.98	921.2	5.78	926.64	921.30	5.34	923.78	920.78	3.00	925.48	919.60	5.88	924.57	919.67	4.90	920.80
10/13/2020	927.32	927.73	924.85	2.88	927.57	921.18	6.39	927.16	921.31	5.85	924.15	920.73	3.42	925.97	919.38	6.59	925.08	919.66	5.42	921.05
10/14/2020	928.02	928.34	925.88	2.46	928.2	921.19	7.01	927.62	921.31	6.31	924.47	921.93	2.54	926.58	920.68	5.90	925.83	920.79	5.04	921.99
10/15/2020	927.57	928.29	925.25	3.04	927.77	921.19	6.58	927.30	921.29	6.01	924.18	920.94	3.24	926.22	919.72	6.50	925.45	919.85	5.60	921.30
10/16/2020	927.22	928.02	924.47	3.55	927.45	921.18	6.27	927.03	921.28	5.75	924.01	920.23	3.78	925.91	919.13	6.78	925.07	919.16	5.91	920.82
10/17/2020	927.37	927.91	924.73	3.18	927.41	921.19	6.22	927.01	921.29	5.72	924.00	920.76	3.24	925.90	919.44	6.46	925.05	919.66	5.39	921.00
10/18/2020	927.35	927.87	924.59	3.28	927.5	921.19	6.31	927.09	921.28	5.81	924.11	920.55	3.56	925.97	919.32	6.65	925.06	919.50	5.56	920.98
10/19/2020	927.33	927.83	924.68	3.15	927.35	921.19	6.16	926.95	921.29	5.66	923.96	920.63	3.33	925.83	919.23	6.60	924.99	919.57	5.42	920.96
10/20/2020	927.20	927.72	924.44	3.28	927.24	921.18	6.06	926.86	921.28	5.58	923.89	920.36	3.53	925.74	918.85	6.89	924.88	919.31	5.57	920.80
10/21/2020	927.11	927.62	924.25	3.37	927.19	921.19	6.00	926.80	921.28	5.52	923.94	920.11	3.83	925.76	918.78	6.98	924.81	919.09	5.72	920.73
10/22/2020	926.97	927.52	924.17	3.35	927.08	921.18	5.90	926.69	921.29	5.40	923.83	919.98	3.85	925.60	918.79	6.81	924.71	918.93	5.78	920.59
10/23/2020	926.88	927.36	923.98	3.38	926.88	921.18	5.70	926.51	921.27	5.24	923.72	919.76	3.96	925.48	918.50	6.98	924.53	918.72	5.81	920.44
10/24/2020	927.04	927.53	924.30	3.23	927.17	921.18	5.99	926.83	921.30	5.53	923.90	920.18	3.72	925.71	918.86	6.85	924.82	919.12	5.70	920.70
10/25/2020	926.87	927.35	924.08	3.27	926.92	921.17	5.75	926.55	921.29	5.26	923.72	919.90	3.82	925.49	918.61	6.88	924.56	918.84	5.72	920.49
10/26/2020	926.70	927.16	923.88	3.28	926.71	921.17	5.54	926.31	921.26	5.05	923.59	919.70	3.89	925.29	918.41	6.88	924.32	918.65	5.67	920.32
10/27/2020	926.53	926.92	923.71	3.21	926.49	921.17	5.32	926.08	921.27	4.81	923.45	919.56	3.89	925.09	918.24	6.85	924.07	918.50	5.57	920.17
10/28/2020	926.39	926.68	923.59	3.09	926.26	921.18	5.08	925.87	921.29	4.58	923.32	919.51	3.81	924.92	918.22	6.70	923.86	918.42	5.44	920.03
10/29/2020	926.27	926.47	923.54	2.93	926.09	921.17	4.92	925.67	921.30	4.37	923.21	919.48	3.73	924.74	918.15	6.59	923.68	918.39	5.29	919.94
10/30/2020	926.36	926.31	923.52	2.79	926.1	921.19	4.91	925.67	921.31	4.36	923.29	919.47	3.82	924.81	918.15	6.66	923.63	918.41	5.22	919.96
10/31/2020	926.38	926.42	923.60	2.82	926.1	921.19	4.91	925.68	921.29	4.39	923.25	919.63	3.62	924.79	918.37	6.42	923.72	918.55	5.17	920.05
11/1/2020	926.27	926.35	923.55	2.80	926.02	921.19	4.83	925.61	921.31	4.30	923.17	919.51	3.66	924.71	918.18	6.53	923.61	918.41	5.20	919.93
11/2/2020	926.17	926.27	923.47	2.80	925.92	921.2	4.72	925.51	921.30	4.21	923.11	919.46	3.65	924.61	918.21	6.40	923.50	918.34	5.16	919.84
11/3/2020	926.39	926.17	923.47	2.70	925.92	921.19	4.73	925.50	921.30	4.20	923.19	919.44	3.75	924.63	918.23	6.40	923.43	918.30	5.13	919.85
11/4/2020	927.32	927.42	925.06	2.36	927.53	921.17	6.36	927.19	921.28	5.91	924.13	920.94	3.19	925.97	919.73	6.24	925.10	919.89	5.21	921.14
11/5/2020	928.84	928.48	926.65	1.83	928.64	922.39	6.25	927.90	922.85	5.05	924.81	923.66	1.15	927.03	922.39	4.64	926.26	922.51	3.75	922.91
11/6/2020	928.13	928.65	926.09	2.56	928.21	921.19	7.02	927.57	921.35	6.22	924.43	921.96	2.47	926.63	920.72	5.91	925.89	920.92	4.97	922.03
11/7/2020	927.53	928.37	925.23	3.14	927.81	921.19	6.62	927.28	921.32	5.96	924.16	920.89	3.27	926.21	919.64	6.57	925.38	919.84	5.54	921.25
11/8/2020	927.15	928.03	924.55	3.48	927.42	921.18	6.24	926.95	921.33	5.62	923.94	920.31	3.63	925.82	919.03	6.79	924.95	919.27	5.68	920.81
11/9/2020	926.92	927.70	924.21	3.49	927.13	921.2	5.93	926.70	921.33	5.37	923.80	920.01	3.79	925.58	918.74	6.84	924.67	918.98	5.69	920.57
11/10/2020	926.81	927.31	923.97	3.34	926.85	921.2	5.65	926.41	921.33	5.08	923.67	919.83	3.84	925.41	918.54	6.87	924.39	918.79	5.60	920.41
11/11/2020	926.58	927.09	923.88	3.21	926.71	921.19	5.52	926.32	921.32	5.00	923.59	919.71	3.88	925.29	918.45	6.84	924.29	918.66	5.63	920.30
11/12/2020	926.45	926.87	923.76	3.11	926.51	921.19	5.32	926.10	921.31	4.79	923.45	919.60	3.85	925.10	918.32	6.78	924.07	918.52	5.55	920.16
11/13/2020	926.79	927.04	923.93	3.11	926.97	921.18	5.79	926.61	921.32	5.29	923.89	919.65	4.24	925.58	918.38	7.20	924.49	918.64	5.85	920.49
11/14/2020	926.90	927.56	924.39	3.17	927.41	921.19	6.22	927.10	921.33	5.77	924.08	919.83	4.25	925.99	918.57	7.42	925.09	918.80	6.29	920.76
11/15/2020	927.03	927.74	924.40	3.34	927.55	921.19	6.36	927.19	921.32	5.87	924.15	919.83	4.32	926.09	918.58	7.51	925.18	918.82	6.36	920.82
11/16/2020	926.99	927.81	924.36	3.45	927.41	921.19	6.22	927.01	921.33	5.68	924.00	919.89	4.11	925.91	918.63	7.28	925.01	918.86	6.15	920.71

Table 5
HCC System Barrier Wall Groundwater Elevations
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Groundwater Elevations at Piezometers (feet NAVD88) and Elevation Differentials at Piezometer Pairs (feet)																			
Date	PZ-1	PZ-2S	PZ-2N	Elevation Differential at PZ-2S/PZ-2N	PZ-3S	PZ-3N	Elevation Differential at PZ-3S/PZ-3N	PZ-4S	PZ-4N	Elevation Differential at PZ-4S/PZ-4N	PZ-5S	PZ-5N	Elevation Differential at PZ-5S/PZ-5N	PZ-6S	PZ-6N	Elevation Differential at PZ-6S/PZ-6N	PZ-7S	PZ-7N	Elevation Differential at PZ-7S/PZ-7N	PZ-8
11/17/2020	926.95	927.67	924.24	3.43	927.26	921.18	6.08	926.84	921.33	5.51	923.90	919.90	4.00	925.73	918.62	7.11	924.83	918.89	5.94	920.62
11/18/2020	927.10	927.65	924.35	3.30	927.29	921.18	6.11	926.89	921.33	5.56	923.91	920.14	3.77	925.75	918.88	6.87	924.84	919.14	5.70	920.74
11/19/2020	927.10	927.70	924.38	3.32	927.35	921.19	6.16	926.95	921.32	5.63	923.97	920.11	3.86	925.85	918.83	7.02	924.95	919.10	5.85	920.79
11/20/2020	927.01	927.76	924.36	3.40	927.37	921.18	6.19	926.99	921.31	5.68	923.94	920.00	3.94	925.82	918.71	7.11	924.92	918.97	5.95	920.73
11/21/2020	926.87	927.58	924.18	3.40	927.14	921.17	5.97	926.75	921.31	5.44	923.81	919.88	3.93	925.61	918.57	7.04	924.67	918.82	5.85	920.54
11/22/2020	926.74	927.38	924.02	3.36	926.93	921.17	5.76	926.53	921.31	5.22	923.67	919.75	3.92	925.42	918.47	6.95	924.46	918.67	5.79	920.40
11/23/2020	926.59	927.14	923.87	3.27	926.71	921.17	5.54	926.29	921.31	4.98	923.53	919.64	3.89	925.23	918.40	6.83	924.21	918.57	5.64	920.27
11/24/2020	926.48	926.92	923.77	3.15	926.52	921.18	5.34	926.10	921.31	4.79	923.42	919.59	3.83	925.09	918.35	6.74	924.04	918.49	5.55	920.16
11/25/2020	926.70	927.13	923.98	3.15	926.99	921.17	5.82	926.64	921.31	5.33	923.82	919.74	4.08	925.56	918.50	7.06	924.52	918.71	5.81	920.50
11/26/2020	926.62	927.16	924.00	3.16	926.85	921.17	5.68	926.48	921.31	5.17	923.66	919.70	3.96	925.39	918.45	6.94	924.45	918.60	5.85	920.39
11/27/2020	926.53	927.01	923.86	3.15	926.66	921.16	5.50	926.25	921.31	4.94	923.51	919.61	3.90	925.22	918.34	6.88	924.21	918.49	5.72	920.24
11/28/2020	926.45	926.83	923.73	3.10	926.51	921.16	5.35	926.09	921.31	4.78	923.42	919.57	3.85	925.08	918.31	6.77	924.02	918.44	5.58	920.14
11/29/2020	926.35	926.69	923.66	3.03	926.37	921.17	5.20	925.94	921.31	4.63	923.32	919.51	3.81	924.96	918.24	6.72	923.92	918.38	5.54	920.06
11/30/2020	926.43	926.58	923.62	2.96	926.34	921.18	5.16	925.93	921.33	4.60	923.40	919.48	3.92	925.00	918.21	6.79	923.85	918.35	5.50	920.07
12/1/2020	926.31	926.58	923.64	2.94	926.35	921.18	5.17	925.96	921.33	4.63	923.32	919.48	3.84	924.96	918.21	6.75	923.89	918.36	5.53	920.07
12/2/2020	926.24	926.52	923.59	2.93	926.23	921.16	5.07	925.81	921.33	4.48	923.24	919.42	3.82	924.84	918.16	6.68	923.79	918.30	5.49	919.96
12/3/2020	926.16	926.40	923.52	2.88	926.09	921.19	4.90	925.66	921.34	4.32	923.16	919.37	3.79	924.72	918.11	6.61	923.63	918.23	5.40	919.88
12/4/2020	926.05	926.25	923.44	2.81	925.93	921.18	4.75	925.52	921.33	4.19	923.07	919.32	3.75	924.60	918.05	6.55	923.53	918.17	5.36	919.81
12/5/2020	925.96	926.12	923.37	2.75	925.81	921.16	4.65	925.38	921.32	4.06	922.98	919.27	3.71	924.48	918.00	6.48	923.38	918.14	5.24	919.73
12/6/2020	925.89	925.98	923.32	2.66	925.67	921.18	4.49	925.25	921.32	3.93	922.90	919.23	3.67	924.36	917.97	6.39	923.24	918.11	5.13	919.68
12/7/2020	925.84	925.86	923.28	2.58	925.57	921.18	4.39	925.15	921.31	3.84	922.84	919.22	3.62	924.27	917.94	6.33	923.12	918.07	5.05	919.63
12/8/2020	925.85	925.78	923.26	2.52	925.54	921.18	4.36	925.11	921.32	3.79	922.82	919.23	3.59	924.24	917.86	6.38	923.04	918.14	4.90	919.63
12/9/2020	926.32	925.97	923.57	2.40	925.85	921.18	4.67	925.42	921.32	4.10	923.01	919.73	3.28	924.51	918.48	6.03	923.43	918.70	4.73	920.02
12/10/2020	926.37	926.27	923.69	2.58	926.01	921.17	4.84	925.59	921.31	4.28	923.08	919.73	3.35	924.63	918.50	6.13	923.59	918.69	4.90	920.11
12/11/2020	926.30	926.31	923.62	2.69	926.02	921.18	4.84	925.61	921.31	4.30	923.09	919.59	3.50	924.64	918.30	6.34	923.59	918.52	5.07	920.05
12/12/2020	926.21	926.27	923.55	2.72	925.96	921.18	4.78	925.54	921.31	4.23	923.07	919.49	3.58	924.61	918.21	6.40	923.56	918.41	5.15	919.95
12/13/2020	926.13	926.19	923.48	2.71	925.86	921.18	4.68	925.43	921.31	4.12	923.01	919.43	3.58	924.52	918.13	6.39	923.46	918.34	5.12	919.88
12/14/2020	926.04	926.08	923.42	2.66	925.76	921.18	4.58	925.34	921.31	4.03	922.96	919.39	3.57	924.45	918.02	6.43	923.35	918.29	5.06	919.81
12/15/2020	926.28	926.02	923.42	2.60	925.79	921.17	4.62	925.38	921.29	4.09	923.02	919.38	3.64	924.56	918.24	6.32	923.41	918.28	5.13	919.85
12/16/2020	926.30	926.44	923.70	2.74	926.26	921.17	5.09	925.95	921.30	4.65	923.33	919.48	3.85	924.95	918.17	6.78	923.89	918.43	5.46	920.12
12/17/2020	926.88	926.99	924.03	2.96	926.86	921.17	5.69	926.50	921.30	5.20	923.87	919.64	4.23	925.53	918.51	7.02	924.52	918.67	5.85	920.54
12/18/2020	926.82	927.34	924.18	3.16	927.09	921.17	5.92	926.76	921.31	5.45	923.85	919.69	4.16	925.73	918.28	7.45	924.80	918.66	6.14	920.62
12/19/2020	926.95	927.75	924.55	3.20	927.59	921.16	6.43	927.22	921.31	5.91	924.11	919.98	4.13	926.02	918.95	7.07	925.19	919.03	6.16	920.91
12/20/2020	927.34	928.18	925.18	3.00	927.96	921.16	6.80	927.46	921.33	6.13	924.28	920.65	3.63	926.35	919.66	6.69	925.55	919.66	5.89	921.29
12/21/2020	927.34	928.12	924.82	3.30	927.77	921.17	6.60	927.29	921.32	5.97	924.20	920.39	3.81	926.20	919.34	6.86	925.36	919.43	5.93	921.13
12/22/2020	927.54	928.31	925.47	2.84	927.98	921.15	6.83	927.45	921.32	6.13	924.31	921.05	3.26	926.42	919.76	6.66	925.61	920.03	5.58	921.44
12/23/2020	927.21	928.12	924.81	3.31	927.65	921.18	6.47	927.21	921.32	5.89	924.06	920.38	3.68	926.04	919.15	6.89	925.24	919.36	5.88	921.00
12/24/2020	926.99	927.85	924.36	3.49	927.36	921.18	6.18	926.93	921.32	5.61	923.88	919.99	3.89	925.75	918.77	6.98	924.90	918.96	5.94	920.69
12/25/2020	926.78	927.52	924.04	3.48	927.05	921.15	5.90	926.64	921.31	5.33	923.69	919.76	3.93	925.46	918.54	6.92	924.58	918.73	5.85	920.46
12/26/2020	926.79	927.16	923.83	3.33	926.76	921.18	5.58	926.33	921.32	5.01	923.56	919.63	3.93	925.31	918.42	6.89	924.32	918.58	5.74	920.33
12/27/2020	926.51	926.94	923.76	3.18	926.61	921.18	5.43	926.24	921.32	4.92	923.48	919.57	3.91	925.20	918.37	6.83	924.22	918.49	5.73	920.26
12/28/2020	926.37	926.73	923.67	3.06	926.43	921.18	5.25	926.02	921.32	4.70	923.35	919.50	3.85	925.00	918.28	6.72	924.02	918.40	5.62	920.13
12/29/2020	926.26	926.53	923.57	2.96	926.24	921.18	5.06	925.82	921.31	4.51	923.23	919.43	3.80	924.84	918.22	6.62	923.83	918.31	5.52	920.02
12/30/2020	926.17	926.38	923.51	2.87	926.1	921.18	4.92	925.67	921.32	4.35	923.15	919.40	3.75	924.72	918.17	6.55	923.69	918.28	5.41	919.94
12/31/2020	926.66	926.44	923.73	2.71	926.29	921.18	5.11	925.88	921.32	4.56	923.31	919.43	3.88	924.95	918.22	6.73	923.87	918.38	5.49	920.18

Table 5
HCC System Barrier Wall Groundwater Elevations
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Groundwater Elevations at Piezometers (feet NAVD88) and Elevation Differentials at Piezometer Pairs (feet)																		
Date	**PZ-1**	**PZ-2S**	**PZ-2N**	**Elevation Differential at PZ-2S/PZ-2N**	**PZ-3S**	**PZ-3N**	**Elevation Differential at PZ-3S/PZ-3N**	**PZ-4S**	**PZ-4N**	**Elevation Differential at PZ-4S/PZ-4N**	**PZ-5S**	**PZ-5N**	**Elevation Differential at PZ-5S/PZ-5N**	**PZ-6S**	**PZ-6N**	**Elevation Differential at PZ-6S/PZ-6N**	**PZ-7S**	**PZ-7N**	**Elevation Differential at PZ-7S/PZ-7N**	**PZ-8**
Average Elevation Differential				2.40			4.46			3.88			3.26			5.96			4.71	
Maximum Elevation Differential				3.57			7.75			6.53			4.32			7.51			6.36	

NOTES:
Groundwater elevations are measured using dedicated water-level transducers installed in the piezometers and are referenced to North American Vertical Datum of 1988 (NAVD88).
*Data not available due to power outage that shut down the computer and its datalogging capabilities. The computer was restarted during the subsequent operations and maintenance events.

HCC = Hydraulic Control and Containment

Table 6
Stabilized Field Parameter Values at HCC System Monitoring Wells
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Monitoring Well	Sample Date	Sample Identification	Dissolved Oxygen (milligrams per liter)	Oxidation-Reduction Potential (millivolts)	pH (Standard Units)	Specific Conductivity (mS/cm)	Temperature (degrees Celsius)
GW-1	3/18/2020	GW-1-031820	3.41	126.9	6.13	0.092	6.4
	6/23/2020	GW-1-062320	0.77	142.4	6.16	0.0829	12.0
	9/15/2020	GW-1-091520	0.39	-13.5	6.28	0.107	13.2
GW-2	3/18/2020	GW-2-031820	1.10	-80.9	6.06	0.096	6.5
	6/23/2020	GW-2-062320	1.14	134.3	6.17	0.083	10.6
	9/15/2020	GW-2-091520	0.81	36.3	6.07	0.093	13.2
GW-3	3/18/2020	GW-3-031820	2.54	155.0	5.62	0.076	6.4
	6/24/2020	GW-3-062420	2.72	157.1	3.91	0.071	11.2
	9/16/2020	GW-3-091620	1.91	48.0	6.00	0.096	12.4
GW-4	3/18/2020	GW-4-031820	IE	11.9	6.49	0.136	6.0
	6/24/2020	GW-4-062420	2.35	61.4	6.45	0.119	9.4
	9/16/2020	GW-4-091620	3.42	-26.0	6.34	0.096	10.9
EW-1	3/18/2020	EW-1-031820	2.95	165.5	6.13	0.065	5.8
	6/23/2020	EW-1-062320	1.67	143.2	4.35	0.070	9.8
EW-2A	3/17/2020	EW-2A-031720	7.31	33.0	5.70	0.054	6.0
	6/24/2020	EW-2A-062420	5.94	239.5	5.72	0.051	8.5
5-W-43	3/18/2020	5-W-43-031820	3.40	175.4	6.15	0.064	5.5
	6/23/2020	5-W-43-062320	1.93	200.0	6.00	0.0733	8.9
	9/15/2020	5-W-43-091520	2.13	146.1	5.89	0.075	12.3
2A-W-40	3/18/2020	2A-W-40-031820	9.14	158.4	6.51	0.051	6.9
	6/23/2020	2A-W-40-062320	7.90	207.9	6.34	53.8	9.8
	9/16/2020	2A-W-40-091620	6.14	65.1	6.62	0.059	9.7
2A-W-41	3/18/2020	2A-W-41-031820	5.80	7.8	6.21	0.135	7.5
	6/24/2020	2A-W-41-062420	7.02	27.0	7.01	0.111	11.4
	9/16/2020	2A-W-41-091620	2.80	6.5	6.13	0.113	10.8
1B-W-23	3/18/2020	1B-W-23-031820	11.54	-20.1	6.12	0.070	8.3
	6/24/2020	1B-W-23-062420	9.54	198.5	6.06	0.075	13.9
	9/16/2020	1B-W-23-091620	5.70	95.7	6.15	0.112	13.1

Table 6
Stabilized Field Parameter Values at HCC System Monitoring Wells
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Monitoring Well	Sample Date	Sample Identification	Dissolved Oxygen (milligrams per liter)	Oxidation-Reduction Potential (millivolts)	pH (Standard Units)	Specific Conductivity (mS/cm)	Temperature (degrees Celsius)
2A-W-42	3/18/2020	2A-W-42-031820	2.93	13.6	5.84	0.149	7.6
	6/24/2020	2A-W-42-062420	2.97	4.4	7.00	0.098	11.6
	9/16/2020	2A-W-42-091620	2.69	107.7	5.71	0.116	12.3
PZ-7S	6/23/2020	PZ-7S-062320	3.35	130.5	4.51	0.071	11.0
PZ-8	6/23/2020	PZ-8-062320	2.65	217.0	5.95	0.0748	11.3

NOTES:
HCC = Hydraulic Control and Containment
IE = instrument error
mS/cm = milliSiemens per centimeter

Table 7
Total Petroleum Hydrocarbon Concentrations in Groundwater
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Well	Date	Sample Identification	DRO (µg/l)[1]			ORO (µg/l)[1]			Calculated NWTPH-Dx[2] (µg/l)
			Result	MDL	MRL	Result	MDL	MRL	
Sentry Wells									
S1-AD	3/17/2020	S1-AD-031720	< 62	62	62	< 91	91	91	< 77
S1-AU	3/17/2020	S1-AU-031720	< 62	62	62	< 91	91	91	< 77
S1-BD	3/17/2020	S1-BD-031720	< 61	61	61	< 91	91	91	< 76
S1-BU	3/17/2020	S1-BU-031720	< 61	61	61	< 91	91	91	< 76
S2-AD	3/16/2020	S2-AD-031620	< 62	62	62	< 91	91	91	< 77
S2-AU	3/16/2020	S2-AU-031620	< 62	62	62	< 91	91	91	< 77
S2-BD	3/16/2020	S2-BD-031620	< 62	62	62	< 91	91	91	< 77
S2-BU	3/16/2020	S2-BU-031620	240	62	62	160	91	91	400
S3-AD	3/17/2020	S3-AD-031720	< 62	62	62	< 91	91	91	< 77
S3-AU	3/17/2020	S3-AU-031720	< 61	61	61	< 91	91	91	< 76
S3-BD	3/17/2020	S3-BD-031720	< 62	62	62	< 91	91	91	< 77
S3-BU	3/17/2020	S3-BU-031720	< 62	62	62	< 92	92	92	< 77
S3-CD	3/17/2020	S3-CD-031720	< 62	62	62	< 91	91	91	< 77
S3-CU	3/17/2020	S3-CU-031720	< 62	62	62	< 91	91	91	< 77
S4-AD	3/17/2020	S4-AD-031720	< 62	62	62	< 91	91	91	< 77
S4-AU	3/17/2020	S4-AU-031720	< 62	62	62	< 91	91	91	< 77
S4-BD	3/17/2020	S4-BD-031720	< 62	62	62	< 91	91	91	< 77
S4-BU	3/17/2020	S4-BU-031720	< 62	62	62	< 91	91	91	< 77
S4-CD	3/17/2020	S4-CD-031720	< 62	62	62	< 91	91	91	< 77
S4-CU	3/17/2020	S4-CU-031720	62	62	62	< 91	91	91	108
Up-Gradient Monitoring Locations (Within West Gate and Far West Gate)									
WG-WV	6/23/2020	WG-WV-062320	83 J	62	62	150 J	91	91	233 J
WG-EV	6/23/2020	WG-EV-062320	390 J	62	62	340 J	91	91	730 J
FWG-WV	6/23/2020	FWG-WV-062320	< 62 UJ	62	62	< 91 UJ	91	91	< 77 UJ
FWG-EV	6/23/2020	FWG-EV-062320	< 62 UJ	62	62	< 91 UJ	91	91	< 77 UJ

Table 7
Total Petroleum Hydrocarbon Concentrations in Groundwater
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Well	Date	Sample Identification	DRO (µg/l)[1]			ORO (µg/l)[1]			Calculated NWTPH-Dx[2] (µg/l)
			Result	MDL	MRL	Result	MDL	MRL	
Hydraulic Control and Containment System Monitoring Wells									
GW-1	3/18/2020	GW-1-031820	< 62	62	62	< 91	91	91	< 77
	6/23/2020	GW-1-062320	< 62 UJ	62	62	< 91 UJ	91	91	< 77 UJ
	9/15/2020	GW-1-091520	< 62	62	62	< 92	92	92	< 77
GW-2	3/18/2020	GW-2-031820	< 62	62	62	< 91	91	91	< 77
	6/23/2020	GW-2-062320	< 62 UJ	62	62	< 91 UJ	91	91	< 77 UJ
	9/15/2020	GW-2-091520	< 62	62	62	< 91	91	91	< 77
GW-3	3/18/2020	GW-3-031820	460 J 84 J[3]	62 62	62 62	320 J < 91 UJ[3]	91 91	91 91	**780** J 130 J[3]
	6/24/2020	GW-3-062420	< 62 UJ < 62[3] UJ	62 62	62 62	< 91 UJ < 91[3] UJ	91 91	91 91	<77 UJ < 77[3] UJ
	9/16/2020	GW-3-091620	210 76[3]	61 61	61 61	120 < 91[3]	91 91	91 91	330 122[3]
GW-4	3/18/2020	GW-4-031820	< 62	62	62	< 91	91	91	< 77
	6/24/2020	GW-4-062420	< 62 UJ	62	62	< 91 UJ	91	91	< 77 UJ
	9/16/2020	GW-4-091620	< 62	62	62	< 91	91	91	< 77
PZ-7S	6/23/2020	PZ-7S-062320	< 62 UJ	62	62	110 J	91	91	141 J
PZ-8	6/23/2020	PZ-8-062320	< 62 UJ	62	62	< 91 UJ	91	91	< 77 UJ
EW-1	3/18/2020	EW-1-031820	< 62	62	62	< 91	91	91	< 77
	6/23/2020	EW-1-062320	< 62 UJ	62	62	< 91 UJ	91	91	< 77 UJ
EW-2A	3/17/2020	EW-2A-031720	< 62	62	62	< 91	91	91	< 77
	6/24/2020	EW-2A-062420	< 62 UJ	62	62	< 91 UJ	91	91	< 77 UJ
5-W-43	3/18/2020	5-W-43-031820	< 62	62	62	< 91	91	91	< 77
	6/23/2020	5-W-43-062320	< 62 UJ	62	62	< 91 UJ	91	91	< 77 UJ
	9/15/2020	5-W-43-091520	< 62	62	62	< 91	91	91	< 77
2A-W-40	3/18/2020	2A-W-40-031820	< 62	62	62	< 91	91	91	< 77
	6/23/2020	2A-W-40-062320	< 61 UJ	61	61	< 91 UJ	91	91	< 76 UJ
	9/16/2020	2A-W-40-091620	< 62	62	62	< 91	91	91	< 77
Site-Specific Remediation Level									**477**

Table 7
Total Petroleum Hydrocarbon Concentrations in Groundwater
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Well	Date	Sample Identification	DRO (µg/l)[1]			ORO (µg/l)[1]			Calculated NWTPH-Dx[2] (µg/l)
			Result	MDL	MRL	Result	MDL	MRL	
2A-W-41	3/18/2020	2A-W-41-031820	290 73[3]	62 62	62 62	170 < 91[3]	91 91	91 91	460 119[3]
	6/24/2020	2A-W-41-062420	130 J < 62[3] UJ	62 62	62 62	100 J < 91[3] UJ	92 91	92 91	230 J < 77[3] UJ
	9/16/2020	2A-W-41-091620	290	62	62	< 91	91	91	336
1B-W-23	3/18/2020	1B-W-23-031820	< 62 UJ	62	62	< 91 UJ	91	91	< 77 UJ
	6/24/2020	1B-W-23-062420	< 62 UJ	62	62	< 92 UJ	92	92	< 77 UJ
	9/16/2020	1B-W-23-091620	< 180	180	180	< 270	270	270	< 225
2A-W-42	3/18/2020	2A-W-42-031820	150	62	62	130	91	91	280
	6/24/2020	2A-W-42-062420	120 J	62	62	120 J	91	91	240 J
	9/16/2020	2A-W-42-091620	110	61	61	< 91	91	91	156
Site-Specific Remediation Level									**477**

NOTES:

Bold denotes the reported concentration exceeds the Site-specific remediation level. The remediation level is not applicable to the sentry wells or vaults in the barrier wall treatment gates.

"<" denotes analyte not reported as detected at or exceeding the listed laboratory MRL.

[1]Analyzed by Washington State Department of Ecology (Ecology) Method NWTPH-Dx without silica gel cleanup unless otherwise noted.

[2]Sum of DRO and ORO, using half the MDL for non-detect results.

[3]Sample analyzed by Ecology Method NWTPH-Dx with silica gel cleanup.

DRO = total petroleum hydrocarbons as diesel-range organics

J = reported concentration is an estimated value

MDL = method detection limit

MRL = method reporting limit

µg/l = micrograms per liter

ORO = total petroleum hydrocarbons as oil-range organics

UJ = analyte was not detected and reporting limit is an estimate

Table 8
Groundwater Elevations and LNAPL Thicknesses
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Location	Measuring Point Elevation[1] (feet NAVD88)	Date	Depth to Water[2] (feet)	Water Elevation[1] (feet NAVD88)	LNAPL Thickness (feet)
GW-1	928.24	3/16/2020	10.70	917.54	—
		6/23/2020	9.45	918.79	—
		9/15/2020	11.60	916.64	—
GW-2	930.29	3/16/2020	12.60	917.69	—
		6/23/2020	11.63	918.66	—
		9/15/2020	13.50	916.79	—
GW-3	935.82	3/16/2020	14.23	921.59	—
		6/23/2020	14.27	921.55	—
		9/15/2020	14.98	920.84	—
GW-4	934.68	3/16/2020	10.73	923.95	—
		6/23/2020	9.95	924.73	—
		9/15/2020	12.13	922.55	—
EW-1	928.72	3/16/2020	10.49	918.23	—
		6/23/2020	9.58	919.14	—
		9/15/2020	11.78	916.94	—
EW-2A	936.20	3/16/2020	10.39	925.81	—
		6/23/2020	9.35	926.85	—
5-W-43	926.18	3/16/2020	8.15	918.03	—
		6/23/2020	7.27	918.91	—
		9/15/2020	9.42	916.76	—
2A-W-40	933.34	3/16/2020	12.35	920.99	—
		6/23/2020	11.40	921.94	—
		9/15/2020	14.23	919.11	—
2A-W-41	935.22	3/16/2020	17.41	917.81	—
		6/23/2020	16.45	918.77	—
		9/15/2020	18.35	916.87	—
1B-W-23	936.25	3/16/2020	17.48	918.77	—
		6/23/2020	17.26	918.99	—
		9/15/2020	17.78	918.47	—

Table 8
Groundwater Elevations and LNAPL Thicknesses
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Location	Measuring Point Elevation[1] (feet NAVD88)	Date	Depth to Water[2] (feet)	Water Elevation[1] (feet NAVD88)	LNAPL Thickness (feet)
2A-W-42	935.37	3/16/2020	13.35	922.02	—
		6/23/2020	12.89	922.48	—
		9/15/2020	14.27	921.10	—
PZ-1	935.38	3/16/2020	9.80	925.58	—
		6/23/2020	8.92	926.46	—
PZ-2N	934.35	3/16/2020	12.00	922.35	—
		6/23/2020	11.50	922.85	—
PZ-2S	934.94	3/16/2020	8.52	926.42	—
		6/23/2020	8.25	926.69	—
PZ-3N	934.41	3/16/2020	14.00	920.41	—
		6/23/2020	14.00	920.41	—
PZ-3S	934.45	3/16/2020	8.89	925.56	—
		6/23/2020	8.47	925.98	—
PZ-4N	935.27	3/16/2020	14.63	920.64	—
		6/23/2020	Not Measured - Inaccessible		
PZ-4S	935.31	3/16/2020	10.18	925.13	—
		6/23/2020	10.85	924.46	—
PZ-5N	933.15	3/16/2020	15.35	917.80	—
		6/23/2020	14.39	918.76	—
PZ-5S	933.46	3/16/2020	11.13	922.33	2.27
		6/23/2020	12.80	920.66	4.35
PZ-6N	931.17	3/16/2020	13.48	917.69	—
		6/23/2020	12.46	918.71	—
PZ-6S	931.41	3/16/2020	12.27	919.14	Heavy Trace
		6/23/2020	6.93	924.48	0.05
PZ-7N	930.37	3/16/2020	12.60	917.77	—
		6/23/2020	11.61	918.76	—
PZ-7S	930.4	3/16/2020	7.22	923.18	—
		6/23/2020	6.98	923.42	—
PZ-8	929.48	3/16/2020	9.74	919.74	—
		6/23/2020	9.13	920.35	—

Table 8
Groundwater Elevations and LNAPL Thicknesses
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Location	Measuring Point Elevation[1] (feet NAVD88)	Date	Depth to Water[2] (feet)	Water Elevation[1] (feet NAVD88)	LNAPL Thickness (feet)
RW-01	932.84	3/16/2020	8.75	924.09	—
		6/23/2020	8.48	924.36	—
		9/15/2020	11.46	921.38	—
RW-02	933.84	3/16/2020	9.75	924.09	—
		6/23/2020	9.50	924.34	—
		9/15/2020	12.50	921.34	Light Trace
RW-03	933.80	3/16/2020	10.31	923.49	—
		6/23/2020	9.47	924.33	—
		9/15/2020	12.51	921.29	Light Trace
RW-04	931.86	3/16/2020	7.05	924.81	Heavy Trace
		6/23/2020	6.83	925.03	Heavy Trace
		9/15/2020	5.75	926.11	Light Trace
RW-05	928.53	3/16/2020	7.30	921.23	Light Trace
		6/23/2020	6.69	921.84	Light Trace
		9/15/2020	9.73	918.80	Light Trace
RW-06	928.53	3/16/2020	7.27	921.26	—
		6/23/2020	Not Measured - Inaccessible		
		9/15/2020	9.56	918.97	Light Trace
RW-07	933.06	3/16/2020	7.92	925.14	Heavy Trace
		6/23/2020	7.96	925.10	Heavy Trace
		9/15/2020	11.03	922.03	Light Trace
RW-08	931.85	3/16/2020	7.05	924.80	Heavy Trace
		6/23/2020	6.69	925.16	Heavy Trace
		9/15/2020	10.45	921.40	Light Trace
RW-09	933.96	3/16/2020	8.78	925.18	Light Trace
		6/23/2020	8.13	925.83	—
		9/15/2020	10.59	923.37	—
EG-EV-South Chamber[3]	NA	3/16/2020	9.59	NA	—
		6/23/2020	8.90	NA	—
EG-EV-North Chamber[3]	NA	3/16/2020	9.59	NA	—
		6/23/2020	8.90	NA	—

Table 8
Groundwater Elevations and LNAPL Thicknesses
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Location	Measuring Point Elevation[1] (feet NAVD88)	Date	Depth to Water[2] (feet)	Water Elevation[1] (feet NAVD88)	LNAPL Thickness (feet)
EG-CV-South Chamber[3]	NA	3/16/2020	10.11	NA	—
		6/23/2020	9.35	NA	—
EG-CV-North Chamber[3]	NA	3/16/2020	10.11	NA	—
		6/23/2020	9.35	NA	—
EG-WV-South Chamber (formerly EG-WV or EV)	934.31	3/16/2020	10.21	924.10	—
		6/23/2020	9.45	924.86	—
EG-WV-North Chamber	934.31	3/16/2020	10.21	924.10	—
		6/23/2020	9.42	924.89	—
CG-EV-South Chamber[3]	NA	3/16/2020	8.60	NA	—
		6/23/2020	7.32	NA	—
CG-EV-North Chamber[3]	NA	3/16/2020	8.60	NA	—
		6/23/2020	7.32	NA	—
CG-CV-South Chamber[3]	NA	3/16/2020	8.60	NA	—
		6/23/2020	8.37	NA	—
CG-CV-North Chamber[3]	NA	3/16/2020	8.60	NA	—
		6/23/2020	8.37	NA	—
CG-WV-South Chamber (formerly CG-WV or CV)	937.09	3/16/2020	8.60	928.49	—
		6/23/2020	8.35	928.74	—
CG-WV-North Chamber	937.09	3/16/2020	8.60	928.49	—
		6/23/2020	8.35	928.74	—
WG-EV-South Chamber (formerly WG-EV or WV)	931.84	3/16/2020	7.30	924.54	Light Trace
		6/23/2020	6.78	925.06	Light Trace
WG-EV-North Chamber	931.84	3/16/2020	7.30	924.54	—
		6/23/2020	6.78	925.06	—
WG-WV-South Chamber[3]	NA	3/16/2020	7.51	NA	—
		6/23/2020	6.77	NA	—
WG-WV-North Chamber[3]	NA	3/16/2020	7.51	NA	—
		6/23/2020	6.77	NA	—
FWG-EV-South Chamber[3]	NA	3/16/2020	4.85	NA	—
		6/23/2020	4.80	NA	—

Table 8
Groundwater Elevations and LNAPL Thicknesses
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Location	Measuring Point Elevation[1] (feet NAVD88)	Date	Depth to Water[2] (feet)	Water Elevation[1] (feet NAVD88)	LNAPL Thickness (feet)
FWG-EV-North Chamber[3]	NA	3/16/2020	4.85	NA	—
		6/23/2020	4.81	NA	—
FWG-WV-South Chamber (formerly FWG-WV or FWV)	930.76	3/16/2020	4.90	925.86	—
		6/23/2020	4.76	926.00	—
FWG-WV-North Chamber	930.76	3/16/2020	4.90	925.86	—
		6/23/2020	4.76	926.00	—

NOTES:

— denotes LNAPL was not observed.

LNAPL = light nonaqueous-phase liquid

Light Trace = LNAPL less than 0.01 foot thick and thin coating of LNAPL and/or a sheen observed on the oil-water interface probe

Heavy Trace = LNAPL less than 0.01 foot thick and thick coating of LNAPL observed on the oil-water interface probe

[1]Elevations referenced to North American Vertical Datum of 1988 (NAVD88).

NA = not applicable

[2]Depths referenced to measuring point (e.g., top of well casing, top of vault).

[3]Vault oil-water separator chamber is visually inspected for presence of LNAPL during monitoring events. LNAPL thickness measured only if measurable LNAPL is present.

APPENDIX A
HYDRAULIC CONTROL AND CONTAINMENT SYSTEM PASSIVE OPERATION PILOT STUDY REPORT

2020 ANNUAL HYDRAULIC CONTROL AND CONTAINMENT SYSTEM OPERATIONS REPORT
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Consent Decree No. 07-2-33672-9 SEA

Farallon PN: 683-071

FARALLON CONSULTING

Washington
Issaquah | Bellingham | Seattle
Oregon
Portland | Baker City
California
Oakland | Irvine

HYDRAULIC CONTROL AND CONTAINMENT SYSTEM PASSIVE OPERATION PILOT STUDY REPORT

BNSF FORMER MAINTENANCE AND FUELING FACILITY SKYKOMISH, WASHINGTON CONSENT DECREE NO. 07-2-33672-9 SEA

Submitted by:
Farallon Consulting, L.L.C.
975 5th Avenue Northwest
Issaquah, Washington 98027

Farallon PN: 683-071

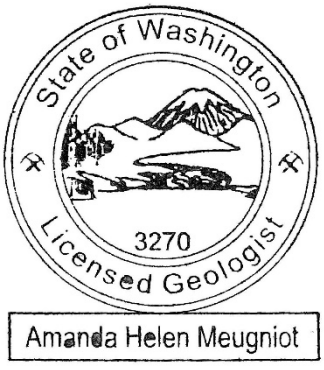
For:
BNSF Railway Company
605 Puyallup Avenue
Tacoma, Washington 98421

May 24, 2021

Prepared by:

Amanda M. Meugniot

Amanda Meugniot, L.G.
Associate Geologist



Reviewed by:

Amy Essig Desai

Amy Essig Desai
Principal Scientist

TABLE OF CONTENTS

FIGURES

TABLES

ATTACHMENTS

ACRONYMS AND ABBREVIATIONS

µg/l	micrograms per liter
AECOM	AECOM Environment
BNSF	BNSF Railway Company
DRO	total petroleum hydrocarbons as diesel-range organics
Ecology	Washington State Department of Ecology
Farallon	Farallon Consulting, L.L.C.
GAC	granulated activated carbon
Glacier	Glacier Environmental Services, Inc.
gpm	gallons per minute
HCC	Hydraulic Control and Containment
LNAPL	light non-aqueous phase liquid
NWTPH-Dx	the sum of diesel- and oil-range organics analyzed using Ecology Method NWTPH-Dx
O&M	operations and maintenance
ORO	total petroleum hydrocarbons as oil-range organics
OWS	oil-water separator
RL	reporting limit
TPH	total petroleum hydrocarbons
WG-EV	east vault of the West Gate

1.0 INTRODUCTION

This report provides the results for the Hydraulic Control and Containment (HCC) System Passive Operation Pilot Study (herein referred to as the study) conducted between January 2019 and December 2020 at the BNSF Railway Company (BNSF) Former Maintenance and Fueling Facility in Skykomish, Washington (herein referred to as the Site) (Figure 1). As discussed herein, the results of the study confirm that passive operation of the HCC system is effective in meeting the Site cleanup objective as defined in the Cleanup Action Plan prepared by the Washington State Department of Ecology (Ecology) (Ecology 2007a). The cleanup objective for the HCC system is to prevent light non-aqueous phase liquid (LNAPL) and groundwater with total petroleum hydrocarbon (TPH) concentrations exceeding the Site-specific groundwater remediation level (RL) of 477 micrograms per liter (µg/l) from migrating from the BNSF railyard to the Skykomish River. This report also provides recommendations for continuing passive operation of the HCC system.

The purpose of the study was to evaluate the HCC system's ability to meet the cleanup objective through passive operation. The study was originally scheduled to be conducted between January 2019 and December 2019; however, Ecology (2020a, 2020b) approved an extension of the study through December 2020 to continue to evaluate passive operation. Passive operation of the HCC system uses the HCC barrier wall and passive groundwater flow through the granular activated carbon (GAC)-filled treatment gates as the primary means of meeting the cleanup objective. A detailed description of the HCC system is provided in the 2018 Pilot Study Work Plan (Farallon 2018).

1.1 PASSIVE OPERATION PILOT STUDY ACTIVITIES

Passive operation of the HCC System was conducted between January 2019 and December 2020. The study was conducted in accordance with the 2018 Pilot Study Work Plan (Farallon 2018); discussions held at the January 14, 2020 meeting with BNSF, Ecology, and Farallon; and Ecology approvals on January 24, 2020 (Ecology 2020a) and June 25, 2020 (Ecology 2020b).

1.2 REPORT ORGANIZATION

The remainder of this report is organized into the following sections:

- **Section 2**, **Background**, describes the background of HCC System operations.
- **Section 3, Maintenance and Testing of Treatment System**, describes the maintenance and testing of recovery well pumps and the groundwater treatment system during the study.
- **Section 4**, **Groundwater Monitoring**, describes the groundwater monitoring conducted during the study.
- **Section 5**, **Results and Discussion**, describes the groundwater analytical and liquid-level gauging measurement results.

- **Section 6**, **Conclusions and Recommendations**, provides conclusions for the study and recommendations for future operation of the HCC system.
- **Section 7, References,** presents a list of documents cited in this report.

2.0 BACKGROUND

The HCC system was designed to meet the cleanup objective primarily by pumping sufficient volumes of groundwater from the groundwater recovery wells to reverse the hydraulic gradient in proximity to the GAC-filled treatment gates in the HCC barrier wall, thereby preventing groundwater from flowing northward through the gates. The GAC-filled treatment gates were designed as a redundant component of the system that would provide for treatment of groundwater that might flow through the gates.

The GAC and pea gravel treatment media in the east vault of the West Gate (WG-EV) was replaced in September 2016 based on the results from manufacturer analysis of the adsorptive capacity of the sampled media (Farallon 2017a, 2017b).

Based on historical groundwater monitoring and flux data from the previous pilot testing conducted at the West Gate, the minimum effective lifespan of the new GAC installed in the WG-EV in September 2016 was estimated to be 5 years (Farallon 2018). This minimum lifespan estimate was based on an assumed average groundwater flow rate through the east vault of 6 gallons per minute (gpm) under normal HCC pumping conditions, an assumed average east vault influent TPH concentration (quantified as the sum of diesel- and oil-range organics analyzed using Ecology Method NWTPH-Dx) of 860 µg/l (i.e., the average of the results for three samples collected from the east vault oil-water separator (OWS) chamber between September 2014 and April 2015), and an assumed GAC loading factor of 4.62 milligrams of NWTPH-Dx per gram of carbon (conservative estimate from a prior bench-scale isotherm study (Farallon 2017b, 2018). Accordingly, it was anticipated that under normal HCC pumping conditions, the earliest that breakthrough of NWTPH-Dx concentrations exceeding the Site-specific groundwater RL might occur at the WG-EV was the fall of 2021. Assuming an average groundwater flow rate through the east vault of 7.5 gpm during the study (i.e., the estimated average flow rate under non-pumping conditions), it was estimated that no more than 68 percent of the adsorptive capacity of the GAC in the east vault would be used by the end of the initial 12 months of the study (Farallon 2018). The WG-EV is the only location that groundwater containing TPH concentrations exceeding the Site-specific groundwater RL flows into (Farallon 2018), and as such is the location where adsorptive capacity of the GAC would be depleted first.

The GAC lifespan estimates presented above are conservative estimates. Empirical evidence from prior testing and analysis (Farallon 2017b) suggests that the GAC in the HCC barrier wall gates has a greater GAC loading factor (i.e., adsorptive capacity) than assumed.

The HCC System Optimization and Pilot Testing Report (Farallon 2017b) concluded that the HCC system operation can be optimized by utilizing the HCC barrier wall and GAC-filled treatment gates as a primary means of treating groundwater.

3.0 MAINTENANCE AND TESTING OF TREATMENT SYSTEM

Glacier Environmental Services, Inc. (Glacier) of Mukilteo, Washington performed the inspection and maintenance of the recovery well pumps and groundwater treatment system in accordance with the procedures described in the 2018 Pilot Study Work Plan (Farallon 2018); the HCC O&M Manual prepared by AECOM Environment (AECOM) (2011); and the 2014 Addendum (Farallon 2014). Glacier performed the inspection and maintenance events monthly in 2019 and bimonthly in 2020. The inspection and maintenance activities included operating the recovery well pumps and groundwater treatment equipment for approximately 4 hours during each event to prevent the buildup of biofouling and to ensure the system remained operational and could be activated to reverse the hydraulic gradient across the West Gate, if needed. Glacier inspected the treatment system during each event, including a visual check of components such as the piping, instrumentation, equalization tanks, OWS, sand filters, GAC vessels, and building temperature controls. In addition, Glacier conducted compliance monitoring of the HCC treatment system in accordance with the National Pollutant Discharge Elimination System Permit No. WA0032123 issued by Ecology. Compliance monitoring results were provided to Ecology under separate cover.

4.0 GROUNDWATER MONITORING

The monitoring well network utilized during the study consisted of 17 locations near the western end of the HCC barrier wall (Figure 2). Groundwater levels and LNAPL thicknesses were gauged at 17 locations, including 14 locations identified below for groundwater monitoring and at 3 additional locations where LNAPL has been observed historically: piezometer PZ-6S and recovery wells RW-05 and RW-06 (Figures 2 and 3).

Groundwater samples were collected monthly between January and December 2019 and bimonthly between February and December 2020 from 14 locations including:

- Piezometers PZ-7S and PZ-8.
- Monitoring wells EW-1, 5-W-43, GW-1, and GW-2.
- West Gate sentry wells S2-AU, S2-AD, S2-BU, and S2-BD.
- The west and east vault OWS chambers of the West Gate and Far West Gate (locations WG-WV, WG-EV, FWG-WV, and FWG-EV). The groundwater samples collected from the OWS chambers were obtained from the northern (down-gradient) side of the baffle walls in the OWS chambers.

Additionally, Site-wide groundwater monitoring and sampling events were conducted in March and June 2020 in accordance with the 2010 Compliance Monitoring Plan Update (AECOM 2010), and in September 2020 in accordance with the Long-Term Monitoring Plan (Farallon 2020). The Site-wide events included gauging and sampling of the HCC System monitoring wells (gate wells GW-1 through GW-4; end wells EW-1 and EW-2A; and monitoring wells 5-W-43, 2A-W-40, 2A-W-41, 1B-W-23, and 2A-W-42) and gauging of sentry wells, recovery wells (RW-01 through RW-09), and vaults of the gate OWS chambers.

Groundwater samples were analyzed by TestAmerica Laboratories, Inc. in Tacoma, Washington. Laboratory analytical reports are provided in Attachment A. The groundwater analytical results were independently validated by Sayler Data Solutions, Inc. of Kirkland, Washington. The data validation results indicate that the groundwater analytical data are suitable for the intended use of assessing Site groundwater quality. Data validation reports are provided in Attachment B.

5.0 RESULTS AND DISCUSSION

Baseline groundwater samples and liquid-level gauging measurements were collected at select monitoring locations near the western end of the HCC barrier wall prior to initiating the study. The baseline groundwater monitoring event was conducted on December 11 and 12, 2018 and passive operation of the HCC system was initiated on January 18, 2019. The results of the study activities performed in 2019 and 2020 are summarized below. The results from activities in 2019 were also reported in the draft 2019 Pilot Study Report (Farallon 2020), submitted to Ecology on June 11, 2020.

5.1 NWTPH-DX RESULTS

The NWTPH-Dx analytical results are reported as TPH as diesel-range organics (DRO) and as oil-range organics (ORO) fractions, which are summed to give the total NWTPH-Dx concentration. If both DRO and ORO fractions were detected, the total NWTPH-Dx concentration was calculated as the sum of the reported DRO and ORO concentrations. If either the DRO or ORO fraction was not detected, half the method detection limit was used for the non-detected fraction in the NWTPH-Dx calculation. The laboratory analytical reports and data validation reports are provided in Attachments A and B, respectively.

The 2018 Pilot Study Work Plan (Farallon 2018) defined two different Site-specific groundwater NWTPH-Dx target concentration objectives for the study:

- Reported concentrations in monitoring wells EW-1, 5-W-43, GW-1, and GW-2, and piezometers PZ-7S and PZ-8 were not to exceed the Site-specific groundwater RL (477 µg/l and absence of sheen); and
- Reported concentrations in down-gradient sentry wells S2-AD and S2-BD were not to exceed one-half the Site-specific groundwater RL or 238 µg/l.

All eight monitoring locations met their respective target concentration objectives throughout the entirety of the study. NWTPH-Dx was not detected at concentrations exceeding the laboratory reporting limits (ranging from 61 to 68 µg/l for DRO and 91 to 10 µg/l for ORO) in any of the groundwater samples collected from down-gradient sentry wells S2-AD and S2-BD (Figures 1 and 2; Table 1). Additionally, NWTPH-Dx ranged from non-detect to 320 µg/l in groundwater samples collected from monitoring wells EW-1, 5-W-43, GW-1, GW-2, and piezometers PZ-7S and PZ-8 (Figure 2; Table 1).

NWTPH-Dx concentrations in up-gradient monitoring locations within the West Gate and Far West Gate were generally similar to, or less than, baseline conditions with the exception of sentry well S2-BU and the OWS chamber of the WG-EV. Reported concentrations in S2-BU and WG-EV samples collected during the study were greater than those reported for the baseline samples; however, they were within the historic ranges of concentrations at these locations as described below:

- NWTPH-Dx concentrations in samples from S2-BU historically fluctuated between 30 and 820 µg/l between 2013 and 2018, and concentrations reported during the study were within this range (121 to 760 µg/l).

- NWTPH-Dx concentrations for the OWS chamber of the WG-EV during the study ranged from 390 to 1,010 µg/l. Comparatively these results were within the range previously reported for three groundwater samples collected from the OWS chamber of the WG-EV between September 2014 and April 2015 (520 to 1,130 µg/l).

The reported concentrations greater than baseline concentrations at S2-BU and WG-EV were anticipated as it is the first chamber behind the OWS of the WG-EV (i.e., the first chamber receiving groundwater as it migrates from east to west along the wall). The study results for down-gradient locations (e.g., sentry well S2-BU and the OWS chamber of WG-EV) demonstrate that the OWS and GAC-filled treatment gates are effective in meeting the cleanup objective and the Site-specific groundwater RL during passive operation of the HCC system. As noted in the 2018 Pilot Study Work Plan (Farallon 2018), only groundwater flowing into the WG-EV contains TPH concentrations exceeding the Site-specific groundwater RL. Each treatment gate includes an up-gradient OWS followed by two down-gradient GAC-filled treatment chambers (Figure 3). Monitoring locations down-gradient of the WG-EV OWS chamber indicated a decreasing trend in NWTPH-Dx concentrations when correlated with distance from the WG-EV OWS chamber. NWTPH-Dx was not detected in any of the groundwater samples collected from sentry well S2-BD, which is down-gradient of the WG-EV OWS chamber and sentry well S2-BU. The study results confirm the effectiveness of passive treatment in meeting the cleanup objective.

The NWTPH-Dx analytical results for the HCC System monitoring locations sampled during the Site-wide monitoring events are discussed in detail in Section 2.6 and Table 7 of the 2020 HCC System Operations Report (Farallon 2021).

5.2 LNAPL MONITORING

LNAPL measurements were evaluated during each event conducted between January 2019 and December 2020 (Table 2). LNAPL was not observed in monitoring locations west and north of the West Gate (sentry wells S2-AD and S2-BD; monitoring wells EW-1, 5-W-43, GW-1, and GW-2; and piezometers PZ-7S and PZ-8), indicating the HCC barrier wall effectively contained the limited LNAPL, the OWS chambers within the West Gate effectively removed the LNAPL, and the extent of LNAPL remained stable south of the West Gate during the study.

LNAPL is removed within the OWS chambers in each gate vault prior to groundwater migrating through and being treated by the GAC chambers. Only piezometer PZ-6S contained measurable LNAPL during the study, ranging from a heavy trace (i.e., less than 0.01 foot thick and thick coating of LNAPL observed on the oil-water interface probe) to 1.86 feet thick (measured in July 2019). The July 2019 LNAPL measurement coincided with a seasonal low groundwater elevation. Historical (2012 through 2018) LNAPL thickness measurements at PZ-6S ranged from a heavy

trace to 2.95 feet. The LNAPL thicknesses measured within piezometer PZ-6S during the study were similar to or less than the typical range previously measured in this piezometer.

Piezometer PZ-5S, which was not included in the study, also had measurable thicknesses of LNAPL as described in Section 2.6.5 and Table 8 of the 2020 HCC System Operations Report (Farallon 2021).

LNAPL was observed as a light trace (i.e., less than 0.01 foot thick and thin coating of LNAPL and/or a sheen observed on the oil-water interface probe) in recovery wells RW-05 and RW-06 and a heavy trace at WG-EV (North and South Chambers). The light trace of LNAPL observed at recovery wells RW-05 and RW-06 is less than historical observations of light to heavy traces of LNAPL at these locations. The LNAPL measurements indicate the thickness and extent of LNAPL continues to decrease near the West Gate and is not migrating to the west or north during passive operation of the HCC system. LNAPL was observed as a light to heavy trace at recovery wells RW-04, RW-07, and RW-08, which were not included in the study, during the Site-wide monitoring events as described in Section 2.6.6 and Table 8 of the 2020 HCC System Operations Report (Farallon 2021).

6.0 CONCLUSIONS AND RECOMMENDATIONS

The study results confirm that passive operation of the HCC system is effective in meeting the cleanup objective, and that the LNAPL and NWTPH-Dx concentrations in groundwater exceeding the Site-specific groundwater RL do not migrate past the HCC barrier wall during passive operation of the HCC system. These results demonstrate the effectiveness of the barrier wall and GAC-filled treatment gates in meeting the cleanup objective. Based on these observations and data, it is recommended that the HCC system continue to be operated in a passive-mode with groundwater monitoring conducted in accordance with the Consent Decree (Ecology 2007b) and the Long-Term Monitoring Plan (Farallon 2020).

6.1 PROPOSED HCC SYSTEM PASSIVE OPERATION

Per the Long-Term Monitoring Plan (Farallon 2020), locations down-gradient of the HCC system gates and barrier wall (gate wells GW-1 through GW-4 and monitoring well 5-W-43) will be gauged and sampled for NWTPH-Dx semiannually for 2 years and annually thereafter (Figure 1). In addition to the monitoring required under the Long-Term Monitoring Plan, West Gate sentry wells S2-AU, S2-AD, S2-BU, and S2-BD wells will be sampled with the same frequency. GAC life expectancy in the WG-EV is estimated to result in the need for replacement in the fall of 2021, at the earliest, assuming passive (non-pumping) operation of the HCC system. It is recommended that the GAC media be sampled before the fall of 2021 and replaced if necessary. Additional details regarding the schedule, triggers, and process for sampling and replacement of the GAC media are presented in Section 4 of the 2020 HCC System Operations Report (Farallon 2021).

7.0 REFERENCES

AECOM Environment (AECOM). 2010. *2010 Compliance Monitoring Plan Update, BNSF Former Maintenance and Fueling Facility, Skykomish, Washington*. Prepared for BNSF Railway Company. April 30.

———. 2011. *Operation and Maintenance Manual for the Hydraulic Control and Containment System, Former Maintenance and Fueling Facility – Skykomish, Washington.* Prepared for BNSF Railway Company. April 8.

Farallon Consulting, L.L.C. (Farallon). 2014. *Addendum to the Operation and Maintenance Manual for the Hydraulic Control and Containment System, BNSF Former Maintenance and Fueling Facility, Skykomish, Washington.* Prepared for BNSF Railway Company. September 10.

———. 2017a. Technical Memorandum Regarding Carbon Replacement in East Vault of West Gate of HCC System, BNSF Former Maintenance and Fueling Facility, Skykomish, Washington. From Gerald Portele and Jason Shrope. To Brian Sato, Ecology. January 4.

———. 2017b. *Hydraulic Control and Containment System Optimization and Pilot Testing Report, BNSF Former Maintenance and Fueling Facility, Skykomish, Washington*. Prepared for BNSF Railway Company. February 21.

———. 2018. *HCC System Passive Operation Pilot Study Work Plan, BNSF Former Maintenance and Fueling Facility, Skykomish, Washington*. Prepared for BNSF Railway Company. November 29.

———. 2020. *Final Long-Term Monitoring Plan BNSF Former Maintenance and Fueling Facility, Skykomish, Washington, Consent Decree NO. 07-2-33672-9 SEA.* November 26.

———. 2021. Draft *2020 Hydraulic Control and Containment System Operations Report, BNSF Former Maintenance and Fueling Facility, Skykomish, Washington, Consent Decree NO. 07-2-33672-9 SEA.* March 26.

Washington State Department of Ecology (Ecology). 2007a. *Cleanup Action Plan for BNSF Former Maintenance and Fueling Facility, Skykomish, Washington.* Prepared for BNSF Railway Company. October.

———. 2007b. *Final Consent Decree for BNSF Railway, Former Maintenance and Fueling Facility, Skykomish, Washington.* October.

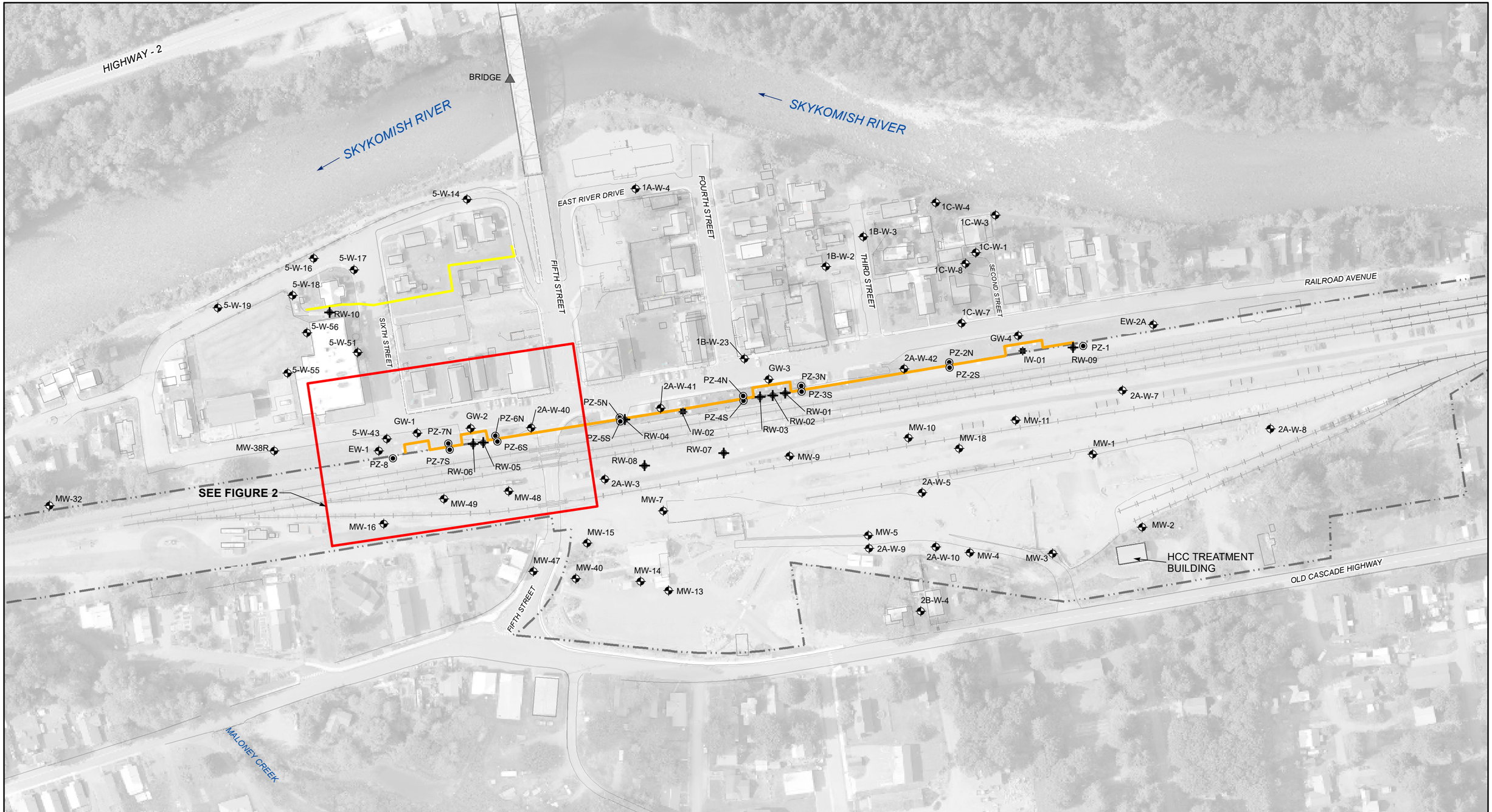
———. 2020a. Email Regarding Skykomish – HCC Operations. From Ronald W Timm, Ecology. To Shane DeGross, BNSF. January 24.

———. 2020b. Email Regarding Skykomish – HCC Operations. From Ronald W Timm, Ecology. To Shane DeGross, BNSF. June 25.

FIGURES

HYDRAULIC CONTROL AND CONTAINMENT SYSTEM
PASSIVE OPERATION PILOT STUDY REPORT
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Consent Decree No. 07-2-33672-9 SEA

Farallon PN: 683-071



LEGEND

2A-W-41	MONITORING WELL
RW-4	RECOVERY WELL
PZ-5S	PIEZOMETER
IW-02	INJECTION WELL
BRIDGE	BRIDGE MEASURING POINT

- HYDRAULIC CONTROL AND CONTAINMENT SYSTEM SHEET PILE BARRIER WALL AND GATES
- BNSF RAILYARD BOUNDARY
- MECHANICALLY STABILIZED EARTH WALL

NOTE
HYDRAULIC CONTROL AND CONTAINMENT SYSTEM BARRIER WALL SENTRY WELLS NOT SHOWN

IMAGERY SOURCE: KING COUNTY PICTOMETRY 2015

N

0 160
SCALE IN FEET

FARALLON CONSULTING
Your Challenges. Our Priority.
farallonconsulting.com

Washington
Issaquah | Bellingham | Seattle

Oregon
Portland | Baker City

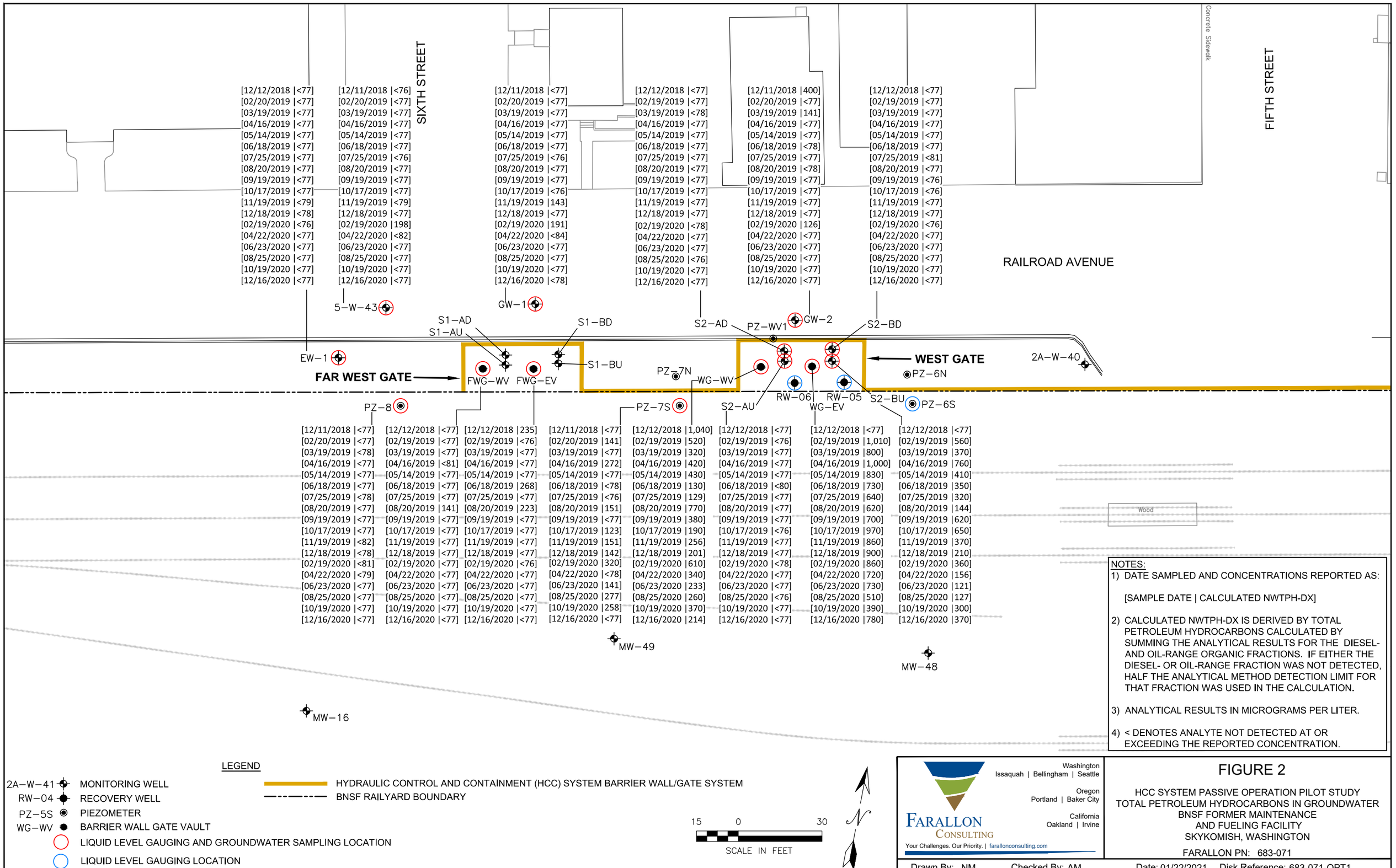
California
Oakland | Irvine

FIGURE 1

SITE PLAN
BNSF FORMER MAINTENANCE AND FUELING FACILITY
SKYKOMISH, WASHINGTON

FARALLON PN: 683-071

Drawn By: jjones | Checked By: PK | Date: 12/15/2020 | Disc Reference:
Document Path: Q:\Projects\683 BNSF\067 GROUNDWATER_HCC\Mapfiles\GW_TPH_2019\Figure-01_Siteplan_2019_w_Figure2_Ref.mxd



NOTES:

1) DATE SAMPLED AND CONCENTRATIONS REPORTED AS:

   [SAMPLE DATE | CALCULATED NWTPH-DX]

2) CALCULATED NWTPH-DX IS DERIVED BY TOTAL PETROLEUM HYDROCARBONS CALCULATED BY SUMMING THE ANALYTICAL RESULTS FOR THE DIESEL- AND OIL-RANGE ORGANIC FRACTIONS. IF EITHER THE DIESEL- OR OIL-RANGE FRACTION WAS NOT DETECTED, HALF THE ANALYTICAL METHOD DETECTION LIMIT FOR THAT FRACTION WAS USED IN THE CALCULATION.

3) ANALYTICAL RESULTS IN MICROGRAMS PER LITER.

4) < DENOTES ANALYTE NOT DETECTED AT OR EXCEEDING THE REPORTED CONCENTRATION.

LEGEND

- 2A-W-41 — MONITORING WELL
- RW-04 — RECOVERY WELL
- PZ-5S — PIEZOMETER
- WG-WV — BARRIER WALL GATE VAULT
- LIQUID LEVEL GAUGING AND GROUNDWATER SAMPLING LOCATION
- LIQUID LEVEL GAUGING LOCATION
- HYDRAULIC CONTROL AND CONTAINMENT (HCC) SYSTEM BARRIER WALL/GATE SYSTEM
- BNSF RAILYARD BOUNDARY

15 0 30

SCALE IN FEET

FARALLON CONSULTING
Your Challenges. Our Priority. | farallonconsulting.com

Washington
Issaquah | Bellingham | Seattle

Oregon
Portland | Baker City

California
Oakland | Irvine

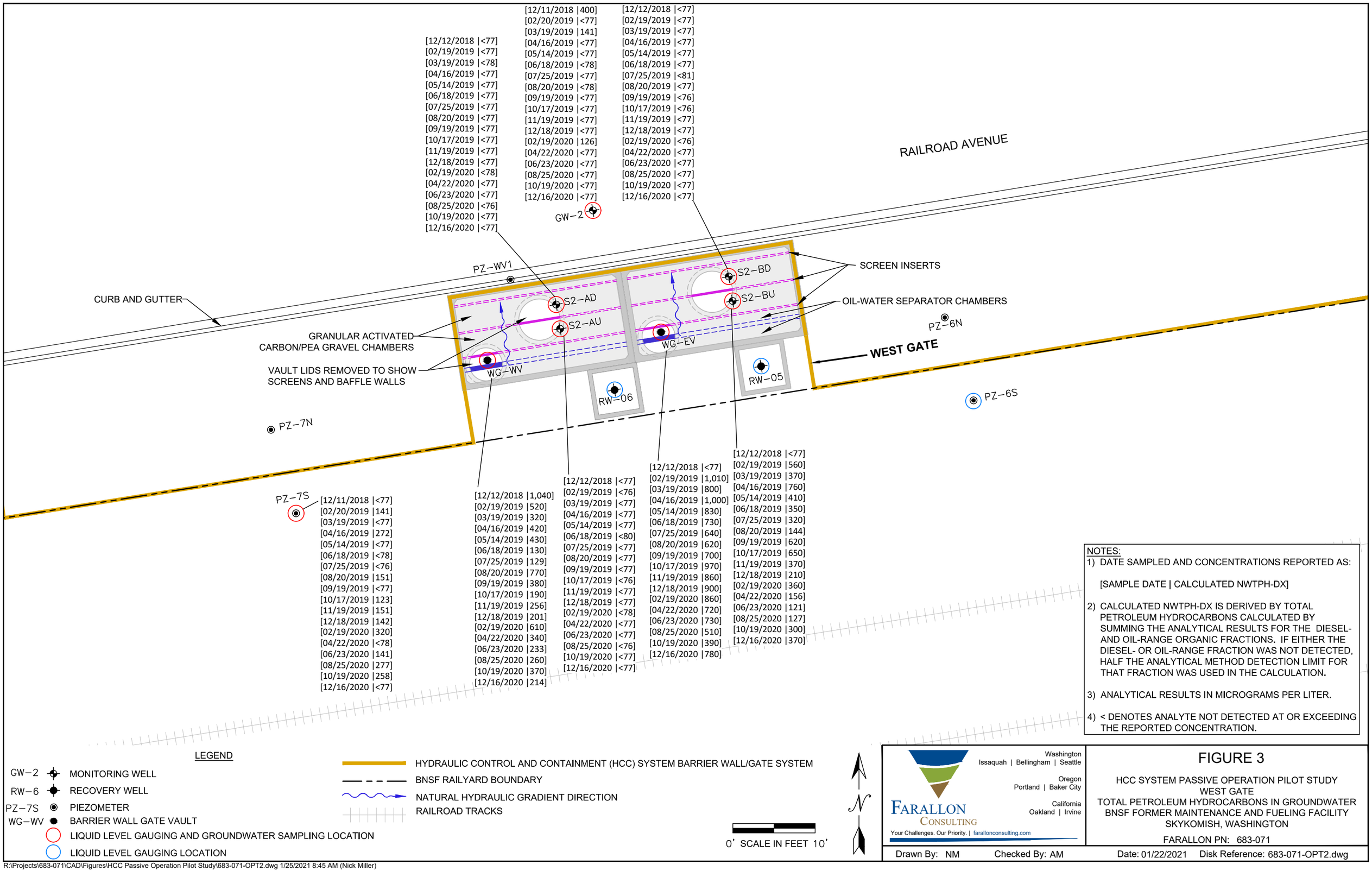
FIGURE 2

HCC SYSTEM PASSIVE OPERATION PILOT STUDY
TOTAL PETROLEUM HYDROCARBONS IN GROUNDWATER
BNSF FORMER MAINTENANCE
AND FUELING FACILITY
SKYKOMISH, WASHINGTON

FARALLON PN: 683-071

Drawn By: NM Checked By: AM Date: 01/22/2021 Disk Reference: 683-071-OPT1

R:\Projects\683-071\CAD\Figures\HCC Passive Operation Pilot Study\683-071-OPT1.dwg 1/25/2021 8:47 AM (Nick Miller)



NOTES:

1) DATE SAMPLED AND CONCENTRATIONS REPORTED AS:

   [SAMPLE DATE | CALCULATED NWTPH-DX]

2) CALCULATED NWTPH-DX IS DERIVED BY TOTAL PETROLEUM HYDROCARBONS CALCULATED BY SUMMING THE ANALYTICAL RESULTS FOR THE DIESEL- AND OIL-RANGE ORGANIC FRACTIONS. IF EITHER THE DIESEL- OR OIL-RANGE FRACTION WAS NOT DETECTED, HALF THE ANALYTICAL METHOD DETECTION LIMIT FOR THAT FRACTION WAS USED IN THE CALCULATION.

3) ANALYTICAL RESULTS IN MICROGRAMS PER LITER.

4) < DENOTES ANALYTE NOT DETECTED AT OR EXCEEDING THE REPORTED CONCENTRATION.

LEGEND

- GW-2 — MONITORING WELL
- RW-6 — RECOVERY WELL
- PZ-7S — PIEZOMETER
- WG-WV — BARRIER WALL GATE VAULT
- LIQUID LEVEL GAUGING AND GROUNDWATER SAMPLING LOCATION
- LIQUID LEVEL GAUGING LOCATION
- HYDRAULIC CONTROL AND CONTAINMENT (HCC) SYSTEM BARRIER WALL/GATE SYSTEM
- BNSF RAILYARD BOUNDARY
- NATURAL HYDRAULIC GRADIENT DIRECTION
- RAILROAD TRACKS

0' SCALE IN FEET 10'

N

FARALLON CONSULTING
Your Challenges. Our Priority. | farallonconsulting.com
Washington
Issaquah | Bellingham | Seattle
Oregon
Portland | Baker City
California
Oakland | Irvine

FIGURE 3

HCC SYSTEM PASSIVE OPERATION PILOT STUDY
WEST GATE
TOTAL PETROLEUM HYDROCARBONS IN GROUNDWATER
BNSF FORMER MAINTENANCE AND FUELING FACILITY
SKYKOMISH, WASHINGTON

FARALLON PN: 683-071

Drawn By: NM Checked By: AM Date: 01/22/2021 Disk Reference: 683-071-OPT2.dwg

R:\Projects\683-071\CAD\Figures\HCC Passive Operation Pilot Study\683-071-OPT2.dwg 1/25/2021 8:45 AM (Nick Miller)

TABLES

HYDRAULIC CONTROL AND CONTAINMENT SYSTEM
PASSIVE OPERATION PILOT STUDY REPORT
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Consent Decree No. 07-2-33672-9 SEA

Farallon PN: 683-071

Table 1
HCC System Passive Operation Pilot Study
Total Petroleum Hydrocarbon Concentrations in Groundwater
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Well	Date	Sample Identification	DRO (µg/l)[1]			ORO (µg/l)[1]			Calculated NWTPH-Dx[2] (µg/l)
			Result	MDL	MRL	Result	MDL	MRL	
Down-Gradient Sentry Wells (West Gate)									
S2-AD	12/12/2018	S2-AD-121218	< 62	62	62	< 92	92	92	< 77
	2/19/2019	S2-AD-021919	< 62	62	62	< 91	91	91	< 77
	3/19/2019	S2-AD-031919	< 63	63	63	< 93	93	93	< 78
	4/16/2019	S2-AD-041619	< 62	62	62	< 92	92	92	< 77
	5/14/2019	S2-AD-051419	< 62	62	62	< 91	91	91	< 77
	6/18/2019	S2-AD-061819	< 62	62	62	< 92	92	92	< 77
	7/25/2019	S2-AD-072519	< 62	62	62	< 92	92	92	< 77
	8/20/2019	S2-AD-082019	< 62	62	62	< 91	91	91	< 77
	9/19/2019	S2-AD-091919	< 62	62	62	< 91	91	91	< 77
	10/17/2019	S2-AD-101719	< 62	62	62	< 91	91	91	< 77
	11/19/2019	S2-AD-111919	< 62	62	62	< 91	91	91	< 77
	12/18/2019	S2-AD-121819	< 62	62	62	< 91	91	91	< 77
	2/19/2020	S2-AD-021920	< 63	63	63	< 93	93	93	< 78
	4/22/2020	S2-AD-042220	< 62	62	62	< 91	91	91	< 77
	6/23/2020	S2-AD-062320	< 62	62	62	< 91	91	91	< 77
	8/25/2020	S2-AD-082520	< 61	61	61	< 91	91	91	< 76
	10/19/2020	S2-AD-101920	< 62	62	62	< 91	91	91	< 77
	12/16/2020	S2-AD-121620	< 62	62	62	< 92	92	92	< 77
S2-BD	12/12/2018	S2-BD-121218	< 62	62	62	< 92	92	92	< 77
	2/19/2019	S2-BD-021919	< 62	62	62	< 91	91	91	< 77
	3/19/2019	S2-BD-031919	< 62	62	62	< 91	91	91	< 77
	4/16/2019	S2-BD-041619	< 62	62	62	< 92	92	92	< 77
	5/14/2019	S2-BD-051419	< 62	62	62	< 91	91	91	< 77
	6/18/2019	S2-BD-061819	< 62	62	62	< 91	91	91	< 77
	7/25/2019	S2-BD-072519	< 65	65	65	< 96	96	96	< 81
	8/20/2019	S2-BD-082019	< 62	62	62	< 91	91	91	< 77
	9/19/2019	S2-BD-091919	< 61	61	61	< 91	91	91	< 76
	10/17/2019	S2-BD-101719	< 61	61	61	< 91	91	91	< 76
	11/19/2019	S2-BD-111919	< 62	62	62	< 92	92	92	< 77
	12/18/2019	S2-BD-121819	< 62	62	62	< 91	91	91	< 77
	2/19/2020	S2-BD-021920	< 61	61	61	< 91	91	91	< 76
	4/22/2020	S2-BD-042220	< 62	62	62	< 91	91	91	< 77
	6/23/2020	S2-BD-062320	< 62	62	62	< 91	91	91	< 77
	8/25/2020	S2-BD-082520	< 62	62	62	< 91	91	91	< 77
	10/19/2020	S2-BD-101920	< 62	62	62	< 91	91	91	< 77
	12/16/2020	S2-BD-121620	< 62	62	62	< 91	91	91	< 77
Site-Specific Groundwater Target Level (1/2 the Remediation Level)									**238**

Table 1
HCC System Passive Operation Pilot Study
Total Petroleum Hydrocarbon Concentrations in Groundwater
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Well	Date	Sample Identification	DRO (µg/l)[1]			ORO (µg/l)[1]			Calculated NWTPH-Dx[2] (µg/l)
			Result	MDL	MRL	Result	MDL	MRL	
Down-Gradient Monitoring Locations (North and West of West Gate)									
PZ-7S	12/11/2018	PZ-7S-12118	< 62	62	62	< 91	91	91	< 77
	2/20/2019	PZ-7S-022019	< 62	62	62	110	91	91	141
	3/19/2019	PZ-75-031919	< 62	62	62	< 91	91	91	< 77
	4/16/2019	PZ-7S-041619	92	62	62	180	91	91	272
	5/14/2019	P2-7S-051419	< 62	62	62	< 91	91	91	< 77
	6/18/2019	PZ-7S-061819	< 63	63	63	< 92	92	92	< 78
	7/25/2019	PZ-7S-072519	< 61	61	61	< 91	91	91	< 76
	8/20/2019	PZ-7S-082019	< 62	62	62	120	91	91	151
	9/19/2019	PZ-75-091919	< 62	62	62	< 91	91	91	< 77
	10/17/2019	PZ-7S-101719	< 62	62	62	92	91	91	123
	11/19/2019	PZ-7S-111919	< 62	62	62	120	92	92	151
	12/18/2019	PZ-7S-121819	< 63	63	63	110	92	92	142
	2/19/2020	PZ-7S-021920	150	63	63	170	93	93	320
	4/22/2020	PZ-7S-042220	< 63	63	63	< 93	93	93	< 78
	6/23/2020	PZ-7S-062320	< 62	62	62	110	91	91	141
	8/25/2020	P2-75-082520	67	62	62	210	92	92	277
	10/19/2020	P2-75-101920	98	62	62	160	91	91	258
	12/16/2020	P2-7S-121620	< 62	62	62	< 91	91	91	< 77
PZ-8	12/11/2018	PZ-8-121118	< 62	62	62	< 91	91	91	< 77
	2/20/2019	PZ-8-022019	< 62	62	62	< 91	91	91	< 77
	3/19/2019	PZ-8-031919	< 63	63	63	< 92	92	92	< 78
	4/16/2019	PZ-8-041619	< 62	62	62	< 91	91	91	< 77
	5/14/2019	P2-8-051419	< 62	62	62	< 91	91	91	< 77
	6/18/2019	PZ-8-061819	< 62	62	62	< 91	91	91	< 77
	7/25/2019	PZ-8-072519	< 63	63	63	< 92	92	92	< 78
	8/20/2019	PZ-8-082019	< 62	62	62	< 91	91	91	< 77
	9/19/2019	PZ-8-091919	< 62	62	62	< 91	91	91	< 77
	10/17/2019	PZ-8-101719	< 62	62	62	< 91	91	91	< 77
	11/19/2019	PZ-8-111919	< 66	66	66	< 97	97	97	< 82
	12/18/2019	PZ-80-121819	< 63	63	63	< 93	93	93	< 78
	2/19/2020	PZ-8-021920	< 65	65	65	< 96	96	96	< 81
	4/22/2020	PZ-8-042220	< 63	63	63	< 94	94	94	< 79
	6/23/2020	PZ-8-062320	< 62	62	62	< 91	91	91	< 77
	8/25/2020	P2-8-082520	< 62	62	62	< 91	91	91	< 77
	10/19/2020	P2-8-101920	< 62	62	62	< 91	91	91	< 77
	12/16/2020	P2-8-121620	< 62	62	62	< 91	91	91	< 77
Site-Specific Groundwater Remediation Level									**477**

Table 1
HCC System Passive Operation Pilot Study
Total Petroleum Hydrocarbon Concentrations in Groundwater
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Well	Date	Sample Identification	DRO (µg/l)[1]			ORO (µg/l)[1]			Calculated NWTPH-Dx[2] (µg/l)
			Result	MDL	MRL	Result	MDL	MRL	
Down-Gradient Monitoring Locations (North and West of West Gate)									
EW-1	12/12/2018	EW-1-121218	< 62	62	62	< 91	91	91	< 77
	2/20/2019	EW-1-022019	< 62	62	62	< 91	91	91	< 77
	3/19/2019	EW-1-031919	< 62	62	62	< 92	92	92	< 77
	4/16/2019	EW-1-041619	< 62	62	62	< 91	91	91	< 77
	5/14/2019	EW-1-051419	< 62	62	62	< 91	91	91	< 77
	6/18/2019	EW-1-061819	< 62	62	62	< 91	91	91	< 77
	7/25/2019	EW-1-072519	< 62	62	62	< 92	92	92	< 77
	8/20/2019	EW1-082019	< 62	62	62	< 91	91	91	< 77
	9/19/2019	EW-1-091919	< 62	62	62	< 91	91	91	< 77
	10/17/2019	EW-1-101719	< 62	62	62	< 91	91	91	< 77
	11/19/2019	EW-1-111919	< 63	63	63	< 94	94	94	< 79
	12/18/2019	EW-1-121819	< 63	63	63	< 93	93	93	< 78
	2/19/2020	EW-1-021920	< 61	61	61	< 91	91	91	< 76
	4/22/2020	EW-1-042220	< 62	62	62	< 91	91	91	< 77
	6/23/2020	EW-1-062320	< 62	62	62	< 91	91	91	< 77
	8/25/2020	EW-1-082520	< 62	62	62	< 91	91	91	< 77
	10/19/2020	EW-1-101920	< 62	62	62	< 91	91	91	< 77
	12/16/2020	EW-1-121620	< 62	62	62	< 91	91	91	< 77
5-W-43	12/11/2018	5-W-43-121118	< 61	61	61	< 90	90	90	< 76
	2/20/2019	5-W-43-022019	< 62	62	62	< 91	91	91	< 77
	3/19/2019	5-W-43-031919	< 62	62	62	< 92	92	92	< 77
	4/16/2019	5-W-43-041619	< 62	62	62	< 91	91	91	< 77
	5/14/2019	5-W-43-051419	< 62	62	62	< 91	91	91	< 77
	6/18/2019	S-W-43-061819	< 62	62	62	< 91	91	91	< 77
	7/25/2019	S-W-43-072519	< 61	61	61	< 90	90	90	< 76
	8/20/2019	5-W-43-082019	< 62	62	62	< 91	91	91	< 77
	9/19/2019	5-W-43-091919	< 62	62	62	< 92	92	92	< 77
	10/17/2019	5-W-43-101719	< 62	62	62	< 91	91	91	< 77
	11/19/2019	5-W-43-111919	< 64	64	64	< 94	94	94	< 79
	12/18/2019	5-W-43-121819	< 62	62	62	< 92	92	92	< 77
	2/19/2020	5-W-43-021920	78	61	61	120	91	91	198
	4/22/2020	5-W-43-042220	< 66	66	66	< 97	97	97	< 82
	6/23/2020	5-W-43-062320	< 62	62	62	< 91	91	91	< 77
	8/25/2020	5-W-43-082520	< 62	62	62	< 91	91	91	< 77
	10/19/2020	5-W-43-101920	< 62	62	62	< 91	91	91	< 77
	12/16/2020	5-W-43-121620	< 62	62	62	< 91	91	91	< 77
Site-Specific Groundwater Remediation Level									**477**

Table 1
HCC System Passive Operation Pilot Study
Total Petroleum Hydrocarbon Concentrations in Groundwater
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Well	Date	Sample Identification	DRO (µg/l)[1]			ORO (µg/l)[1]			Calculated NWTPH-Dx[2] (µg/l)
			Result	MDL	MRL	Result	MDL	MRL	
Down-Gradient Monitoring Locations (North and West of West Gate)									
GW-1	12/11/2018	GW-1-121118	< 62	62	62	< 92	92	92	< 77
	2/20/2019	GW-1-022019	< 62	62	62	< 91	91	91	< 77
	3/19/2019	GW-1-031919	< 62	62	62	< 91	91	91	< 77
	4/16/2019	GW-1-041619	< 62	62	62	< 91	91	91	< 77
	5/14/2019	GW-1-051419	< 62	62	62	< 91	91	91	< 77
	6/18/2019	GW-1-061819	< 62	62	62	< 91	91	91	< 77
	7/25/2019	GW-1-072519	< 61	61	61	< 91	91	91	< 76
	8/20/2019	GW-1-082019	< 62	62	62	< 91	91	91	< 77
	9/19/2019	GW-1-091919	< 62	62	62	< 91	91	91	< 77
	10/17/2019	GW-1-101719	< 61	61	61	< 91	91	91	< 76
	11/19/2019	GW-1-111919	< 65	65	65	110	95	95	143
	12/18/2019	GW-1-121819	< 62	62	62	< 92	92	92	< 77
	2/19/2020	GW-1-021920	71	61	61	120	91	91	191
	4/22/2020	GW-1-042220	< 68	68	68	< 100	100	100	< 84
	6/23/2020	GW-1-062320	< 62	62	62	< 91	91	91	< 77
	8/25/2020	GW-1-082520	< 62	62	62	< 91	91	91	< 77
	10/19/2020	GW-1-101920	< 62	62	62	< 91	91	91	< 77
	12/16/2020	GW-1-121620	< 63	63	63	< 93	93	93	< 78
GW-2	12/11/2018	GW-2-121118	130 J	62	62	270 J	91	91	400 J
	2/20/2019	GW-2-022019	< 62	62	62	< 91	91	91	< 77
	3/19/2019	GW-2-031919	< 62	62	62	110	91	91	141
	4/16/2019	GW-2-041619	< 62	62	62	< 91	91	91	< 77
	5/14/2019	GW-2-051419	< 62	62	62	< 91	91	91	< 77
	6/18/2019	GW-2-061819	< 63	63	63	< 93	93	93	< 78
	7/25/2019	GW-2-072519	< 62	62	62	< 91	91	91	< 77
	8/20/2019	GW-2-082019	< 63	63	63	< 93	93	93	< 78
	9/19/2019	GW-2-091919	< 62	62	62	< 91	91	91	< 77
	10/17/2019	GW-2-101719	< 62	62	62	< 91	91	91	< 77
	11/19/2019	GW-2-111919	< 62	62	62	< 91	91	91	< 77
	12/18/2019	GW-2-121819	< 62	62	62	< 91	91	91	< 77
	2/19/2020	GW-2-021920	< 64	64	64	94	94	94	126
	4/22/2020	GW-2-042220	< 62	62	62	< 91	91	91	< 77
	6/23/2020	GW-2-062320	< 62	62	62	< 91	91	91	< 77
	6/23/2020	GW-20-062320	< 62	62	62	< 91	91	91	< 77
	8/25/2020	GW-2-082520	< 62	62	62	< 91	91	91	< 77
	10/19/2020	GW-2-101920	< 62	62	62	< 91	91	91	< 77
	12/16/2020	GW-2-121620	< 62	62	62	< 92	92	92	< 77
Site-Specific Groundwater Remediation Level									**477**

Table 1
HCC System Passive Operation Pilot Study
Total Petroleum Hydrocarbon Concentrations in Groundwater
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Well	Date	Sample Identification	DRO (µg/l)[1]			ORO (µg/l)[1]			Calculated NWTPH-Dx[2] (µg/l)
			Result	MDL	MRL	Result	MDL	MRL	
Up-Gradient Monitoring Locations (Within West Gate and Far West Gate)									
S2-AU	12/12/2018	S2-AU-121218	< 62	62	62	< 91	91	91	< 77
	2/19/2019	S2-AU-021919	< 61	61	61	< 91	91	91	< 76
	3/19/2019	S2-AU-031919	< 62	62	62	< 92	92	92	< 77
	4/16/2019	S2-AU-041619	< 62	62	62	< 91	91	91	< 77
	5/14/2019	S2-AU-051419	< 62	62	62	< 91	91	91	< 77
	6/18/2019	S2-AU-061819	< 64	64	64	< 95	95	95	< 80
	7/25/2019	S2-AU-072519	< 62	62	62	< 91	91	91	< 77
	8/20/2019	S2-AU-082019	< 62	62	62	< 91	91	91	< 77
	9/19/2019	S2-AU-091919	< 62	62	62	< 91	91	91	< 77
	10/17/2019	S2-2-AU-101719	< 61	61	61	< 91	91	91	< 76
	11/19/2019	S2-AU-111919	< 62	62	62	< 91	91	91	< 77
	12/18/2019	S2-AU-121819	< 62	62	62	< 91	91	91	< 77
	2/19/2020	S2-AU-021920	< 63	63	63	< 92	92	92	< 78
	4/22/2020	S2-AU-042220	< 62	62	62	< 91	91	91	< 77
	6/23/2020	S2-AU-062320	< 62	62	62	< 92	92	92	< 77
	8/25/2020	S2-AU-082520	< 61	61	61	< 91	91	91	< 76
	10/19/2020	S2-AU-101920	< 62	62	62	< 91	91	91	< 77
	12/16/2020	S2-AU-121620	< 62	62	62	< 91	91	91	< 77
S2-BU	12/12/2018	S2-BU-121218	< 62	62	62	< 91	91	91	< 77
	2/19/2019	S2-BU-021919	290	61	61	270	91	91	560
	3/19/2019	S2-BU-031919	250	62	62	120	91	91	370
	4/16/2019	S2-BU-041619	380	62	62	380	91	91	760
	5/14/2019	S2-BU-051419	280	61	61	130	91	91	410
	6/18/2019	S2-BU-061819	190	62	62	160	91	91	350
	7/25/2019	S2-BU-072519	190	62	62	130	92	92	320
	8/20/2019	S2-BU-082019	98	62	62	< 91	91	91	144
	9/19/2019	S2-BU-091919	420	62	62	200	91	91	620
	10/17/2019	S2-BU-101719	390	61	61	260	91	91	650
	11/19/2019	S2-BU-111919	200	62	62	170	92	92	370
	12/18/2019	S2-BU-121819	110	62	62	100	91	91	210
	2/19/2020	S2-BU-021920	230	62	62	130	91	91	360
	4/22/2020	S2-BU-042220	110	62	62	< 91	91	91	156
	6/23/2020	S2-BU-062320	75	62	62	< 91	91	91	121
	8/25/2020	S2-BU-082520	81	62	62	< 91	91	91	127
	10/19/2020	S2-BU-101920	200	62	62	100	91	91	300
	12/16/2020	S2-BU-121620	190	62	62	180	91	91	370

Table 1
HCC System Passive Operation Pilot Study
Total Petroleum Hydrocarbon Concentrations in Groundwater
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Well	Date	Sample Identification	DRO (µg/l)[1]			ORO (µg/l)[1]			Calculated NWTPH-Dx[2] (µg/l)
			Result	MDL	MRL	Result	MDL	MRL	
Up-Gradient Monitoring Locations (Within West Gate and Far West Gate)									
WG-WV	12/12/2018	WG-WV-121218	570	63	63	470	92	92	1,040
	2/19/2019	WG-WV-021919	220	62	62	300	91	91	520
	3/19/2019	WG-WV-031919	190	62	62	130	91	91	320
	4/16/2019	WG-WV-041619	170	62	62	250	92	92	420
	5/14/2019	WG-WV-051419	220	62	62	210	91	91	430
	6/18/2019	WG-WV-061819	< 62	62	62	99	91	91	130
	7/25/2019	WG-WV-072519	< 62	62	62	98	91	91	129
	8/20/2019	WG-WV-082019	270	62	62	500	91	91	770
	9/19/2019	WG-WV-091919	240	62	62	140	91	91	380
	10/17/2019	WG-WV-101719	70	62	62	120	91	91	190
	11/19/2019	WG-WV-111919	76	62	62	180	92	92	256
	12/18/2019	WG-WV-121819	< 61	61	61	170	91	91	201
	2/19/2020	WG-WV-021920	340	63	63	270	93	93	610
	4/22/2020	WG-WV-042220	160	63	63	180	93	93	340
	6/23/2020	WG-WV-062320	83	62	62	150	91	91	233
	8/25/2020	WG-WV-082520	130	62	62	130	91	91	260
	10/19/2020	WG-WV-101920	180	62	62	190	91	91	370
	12/16/2020	WG-WV-121620	< 68	68	68	180	100	100	214
WG-EV	12/12/2018	WG-EV-121218	< 62	62	62	< 92	92	92	< 77
	2/19/2019	WG-EV-021919	520	62	62	490	91	91	1,010
	3/19/2019	WG-EV-031919	520	62	62	280	92	92	800
	4/16/2019	WG-EV-041619	500	62	62	500	92	92	1,000
	5/14/2019	WG-EV-051419	520	62	62	310	91	91	830
	6/18/2019	WG-EV-061819	390	63	63	340	92	92	730
	7/25/2019	WG-EV-072519	380	62	62	260	91	91	640
	8/20/2019	WG-EV-082019	390	62	62	230	91	91	620
	9/19/2019	WG-EV-091919	470	62	62	230	91	91	700
	10/17/2019	WG-EV-101719	580	61	61	390	91	91	970
	11/19/2019	WG-EV-111919	450	62	62	410	92	92	860
	12/18/2019	WG-EV-121819	450	61	61	450	91	91	900
	2/19/2020	WG-EV-021920	520	62	62	340	91	91	860
	4/22/2020	WG-EV-042220	430	62	62	290	91	91	720
	6/23/2020	WG-EV-062320	390	62	62	340	91	91	730
	8/25/2020	WG-EV-082520	310	62	62	200	91	91	510
	10/19/2020	WG-EV-101920	240	62	62	150	91	91	390
	12/16/2020	WG-EV-121620	370	62	62	410	91	91	780

Table 1
HCC System Passive Operation Pilot Study
Total Petroleum Hydrocarbon Concentrations in Groundwater
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Well	Date	Sample Identification	DRO (µg/l)[1]			ORO (µg/l)[1]			Calculated NWTPH-Dx[2] (µg/l)
			Result	MDL	MRL	Result	MDL	MRL	
Up-Gradient Monitoring Locations (Within West Gate and Far West Gate)									
FWG-WV	12/12/2018	FWG-WV-121218	< 62	62	62	< 91	91	91	< 77
	2/19/2019	FWG-WV-021919	< 62	62	62	< 91	91	91	< 77
	3/19/2019	FGW-WV-031919	< 62	62	62	< 92	92	92	< 77
	4/16/2019	FWG-WV-041619	< 65	65	65	< 96	96	96	< 81
	5/14/2019	FWG-WV-051419	< 62	62	62	< 91	91	91	< 77
	6/18/2019	FWG-WV-061819	< 62	62	62	< 92	92	92	< 77
	7/25/2019	FWG-WV-072519	< 62	62	62	< 92	92	92	< 77
	8/20/2019	FWG-WV-082019	< 62	62	62	110	91	91	141
	9/19/2019	FWG-WV-091919	< 62	62	62	< 91	91	91	< 77
	10/17/2019	FWG-WV-101719	< 62	62	62	< 91	91	91	< 77
	11/19/2019	FWG-WV-111919	< 62	62	62	< 92	92	92	< 77
	12/18/2019	FWG-WV-121819	< 62	62	62	< 91	91	91	< 77
	2/19/2020	FWG-WV-021920	< 62	62	62	< 91	91	91	< 77
	4/22/2020	FWG-WV-042220	< 62	62	62	< 91	91	91	< 77
	6/23/2020	FWG-WV-062320	< 62	62	62	< 91	91	91	< 77
	8/25/2020	FWG-WV-082520	< 62	62	62	< 91	91	91	< 77
	10/19/2020	FWG-WV-101920	< 62	62	62	< 91	91	91	< 77
	12/16/2020	FWG-WV-121620	< 62	62	62	< 91	91	91	< 77

Table 1
HCC System Passive Operation Pilot Study
Total Petroleum Hydrocarbon Concentrations in Groundwater
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Well	Date	Sample Identification	DRO (µg/l)[1]			ORO (µg/l)[1]			Calculated NWTPH-Dx[2] (µg/l)
			Result	MDL	MRL	Result	MDL	MRL	
Up-Gradient Monitoring Locations (Within West Gate and Far West Gate)									
FWG-EV	12/12/2018	FWG-EV-121218	85	62	62	150	91	91	235
	2/19/2019	FWG-EV-021919	< 61	61	61	< 91	91	91	< 76
	3/19/2019	FWG-EV-031919	< 62	62	62	< 91	91	91	< 77
	4/16/2019	FWG-EV-041619	< 62	62	62	< 91	91	91	< 77
	5/14/2019	FWG-EV-051419	< 62	62	62	< 91	91	91	< 77
	6/18/2019	FWG-EV-061819	68	62	62	200	92	92	268
	7/25/2019	FWG-EV-072519	< 62	62	62	< 92	92	92	< 77
	8/20/2019	FWG-EV-082019	73	62	62	150	91	91	223
	9/19/2019	FWG-EV-091919	< 62	62	62	< 91	91	91	< 77
	10/17/2019	FWG-EV-101719	< 62	62	62	< 91	91	91	< 77
	11/19/2019	FWG-EV-111919	< 62	62	62	< 91	91	91	< 77
	12/18/2019	FWG-EV-121819	< 62	62	62	< 91	91	91	< 77
	2/19/2020	FWG-EV-021920	< 61	61	61	< 91	91	91	< 76
	4/22/2020	FWG-EV-042220	< 62	62	62	< 91	91	91	< 77
	6/23/2020	FWG-EV-062320	< 62	62	62	< 91	91	91	< 77
	8/25/2020	FWG-EV-082520	< 62	62	62	< 91	91	91	< 77
	10/19/2020	FWG-EV-101920	< 62	62	62	< 91	91	91	< 77
	12/16/2020	FWG-EV-121620	< 62	62	62	< 91	91	91	< 77

NOTES:

Results in **bold** denote concentrations exceeding the applicable target level for the specific down-gradient location (one-half the Remediation Level or the Remediation Level).

Green highlighted rows indicate baseline conditions before the start of HCC passive operations.

< denotes analyte not detected at or exceeding the reported concentration.

[1]Analyzed by Washington State Department of Ecology (Ecology) Method NWTPH-Dx without silica gel cleanup.

[2]Sum of DRO and ORO, using half the MDL for non-detect results.

DRO = total petroleum hydrocarbons as diesel-range organics

HCC = Hydraulic Control and Containment

J = reported concentration is an estimated value

MDL = method detection limit

MRL = method reporting limit

µg/l = micrograms per liter

ORO = total petroleum hydrocarbons as oil-range organics

Table 2
HCC System Passive Operation Pilot Study
Water-Level Elevations and LNAPL Thicknesses
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Location	Measuring Point Elevation[1] (feet NAVD88)	Date	Depth to Water[2] (feet)	Water Elevation[1] (feet NAVD88)	LNAPL Thickness (feet)
Down-Gradient Locations (North and West of West Gate)					
S2-AD	930	12/10/2018	13.19	916.81	—
		2/19/2019	13.96	916.04	—
		3/19/2019	13.82	916.18	—
		4/16/2019	13.28	916.72	—
		5/14/2019	12.87	917.13	—
		6/17/2019	13.59	916.41	—
		7/25/2019	14.02	915.98	—
		8/20/2019	14.39	915.61	—
		9/16/2019	14.23	915.77	—
		10/17/2019	13.81	916.19	—
		11/19/2019	13.32	916.68	—
		12/16/2019	13.56	916.44	—
		2/19/2020	13.29	916.71	—
		4/22/2020	13.11	916.89	—
		6/23/2020	12.73	917.27	—
		8/25/2020	14.31	915.69	—
		10/19/2020	12.20	917.80	—
		12/16/2020	13.43	916.57	—
S2-BD	930	12/10/2018	13.31	916.69	—
		2/19/2019	12.41	917.59	—
		3/19/2019	12.24	917.76	—
		4/16/2019	11.87	918.13	—
		5/14/2019	11.61	918.39	—
		6/17/2019	12.48	917.52	—
		7/25/2019	12.84	917.16	—
		8/20/2019	13.33	916.67	—
		9/16/2019	13.23	916.77	—
		10/17/2019	12.66	917.34	—
		11/19/2019	12.28	917.72	—
		12/16/2019	12.27	917.73	—
		2/19/2020	12.31	917.69	—
		4/22/2020	11.64	918.36	—
		6/23/2020	11.51	918.49	—
		8/25/2020	13.27	916.73	—
		10/19/2020	11.61	918.39	—
		12/16/2020	12.13	917.87	—

Table 2
HCC System Passive Operation Pilot Study
Water-Level Elevations and LNAPL Thicknesses
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Location	Measuring Point Elevation[1] (feet NAVD88)	Date	Depth to Water[2] (feet)	Water Elevation[1] (feet NAVD88)	LNAPL Thickness (feet)
Down-Gradient Locations (North and West of West Gate)					
PZ-7S	930.4	12/10/2018	7.83	922.57	—
		2/19/2019	7.86	922.54	—
		3/19/2019	7.43	922.97	—
		4/16/2019	5.99	924.41	—
		5/14/2019	6.90	923.50	—
		6/17/2019	7.60	922.80	—
		7/25/2019	8.19	922.21	—
		8/20/2019	10.16	920.24	—
		9/16/2019	10.73	919.67	—
		10/17/2019	7.65	922.75	—
		11/19/2019	6.54	923.86	—
		12/16/2019	6.65	923.75	—
		2/19/2020	5.82	924.58	—
		4/22/2020	6.99	923.41	—
		6/23/2020	6.98	923.42	—
		8/25/2020	10.01	920.39	—
		10/19/2020	5.38	925.02	—
		12/16/2020	7.50	922.90	—
PZ-8	929.48	12/10/2018	10.05	919.43	—
		2/19/2019	10.05	919.43	—
		3/19/2019	9.73	919.75	—
		4/16/2019	9.00	920.48	—
		5/14/2019	9.17	920.31	—
		6/17/2019	9.81	919.67	—
		7/25/2019	10.19	919.29	—
		8/20/2019	11.24	918.24	—
		9/16/2019	11.51	917.97	—
		10/17/2019	9.97	919.51	—
		11/19/2019	9.31	920.17	—
		12/16/2019	9.40	920.08	—
		2/19/2020	9.04	920.44	—
		4/22/2020	9.32	920.16	—
		6/23/2020	9.13	920.35	—
		8/25/2020	11.13	918.35	—
		10/19/2020	8.37	921.11	—
		12/16/2020	9.23	920.25	—

Table 2
HCC System Passive Operation Pilot Study
Water-Level Elevations and LNAPL Thicknesses
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Location	Measuring Point Elevation[1] (feet NAVD88)	Date	Depth to Water[2] (feet)	Water Elevation[1] (feet NAVD88)	LNAPL Thickness (feet)
Down-Gradient Locations (North and West of West Gate)					
EW-1	928.72	12/10/2018	10.42	918.30	—
		2/19/2019	10.61	918.11	—
		3/19/2019	9.35	919.37	—
		4/16/2019	9.90	918.82	—
		5/14/2019	9.63	919.09	—
		6/17/2019	10.30	918.42	—
		7/25/2019	10.68	918.04	—
		8/20/2019	11.40	917.32	—
		9/16/2019	11.42	917.30	—
		10/17/2019	10.36	918.36	—
		11/19/2019	9.81	918.91	—
		12/16/2019	10.10	918.62	—
		2/19/2020	9.83	918.89	—
		4/22/2020	9.82	918.90	—
		6/23/2020	9.58	919.14	—
		8/25/2020	11.30	917.42	—
		10/19/2020	8.98	919.74	—
		12/16/2020	9.89	918.83	—
5-W-43	926.18	12/10/2018	8.19	917.99	—
		2/19/2019	8.38	917.80	—
		3/19/2019	8.14	918.04	—
		4/16/2019	7.53	918.65	—
		5/14/2019	7.35	918.83	—
		6/17/2019	8.04	918.14	—
		7/25/2019	8.45	917.73	—
		8/20/2019	9.09	917.09	—
		9/16/2019	9.08	917.10	—
		10/17/2019	8.12	918.06	—
		11/19/2019	7.57	918.61	—
		12/16/2019	7.89	918.29	—
		2/19/2020	7.61	918.57	—
		4/22/2020	7.62	918.56	—
		6/23/2020	7.27	918.91	—
		8/25/2020	8.95	917.23	—
		10/19/2020	6.45	919.73	—
		12/16/2020	7.68	918.50	—

Table 2
HCC System Passive Operation Pilot Study
Water-Level Elevations and LNAPL Thicknesses
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Location	Measuring Point Elevation[1] (feet NAVD88)	Date	Depth to Water[2] (feet)	Water Elevation[1] (feet NAVD88)	LNAPL Thickness (feet)
Down-Gradient Locations (North and West of West Gate)					
GW-1	928.24	12/10/2018	10.73	917.51	—
		2/19/2019	11.01	917.23	—
		3/19/2019	6.71	921.53	—
		4/16/2019	10.05	918.19	—
		5/14/2019	9.61	918.63	—
		6/17/2019	10.51	917.73	—
		7/25/2019	11.03	917.21	—
		8/20/2019	11.45	916.79	—
		9/16/2019	11.33	916.91	—
		10/17/2019	10.72	917.52	—
		11/19/2019	10.04	918.20	—
		12/16/2019	10.45	917.79	—
		2/19/2020	10.17	918.07	—
		4/22/2020	9.86	918.38	—
		6/23/2020	9.45	918.79	—
		8/25/2020	11.33	916.91	—
		10/19/2020	8.92	919.32	—
		12/16/2020	12.33	915.91	—
GW-2	930.29	12/10/2018	12.81	917.48	—
		2/19/2019	12.93	917.36	—
		3/19/2019	12.74	917.55	—
		4/16/2019	12.21	918.08	—
		5/14/2019	11.78	918.51	—
		6/17/2019	12.51	917.78	—
		7/25/2019	12.95	917.34	—
		8/20/2019	13.30	916.99	—
		9/16/2019	13.24	917.05	—
		10/17/2019	12.73	917.56	—
		11/19/2019	12.23	918.06	—
		12/16/2019	12.45	917.84	—
		2/19/2020	12.28	918.01	—
		4/22/2020	12.01	918.28	—
		6/23/2020	11.63	918.66	—
		8/25/2020	13.21	917.08	—
		10/19/2020	11.12	919.17	—
		12/16/2020	10.22	920.07	—

Table 2
HCC System Passive Operation Pilot Study
Water-Level Elevations and LNAPL Thicknesses
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Location	Measuring Point Elevation[1] (feet NAVD88)	Date	Depth to Water[2] (feet)	Water Elevation[1] (feet NAVD88)	LNAPL Thickness (feet)
Up-Gradient Locations (South of, and within, West Gate and Far West Gate)					
PZ-6S	931.41	12/10/2018	8.40	923.01	Heavy Trace
		2/19/2019	7.69	923.72	0.23
		3/19/2019	7.34	924.07	0.05
		4/16/2019	6.18	925.23	0.05
		5/14/2019	6.98	924.43	0.20
		6/17/2019	7.65	923.76	1.06
		7/25/2019	7.96	923.45	1.86
		8/20/2019	10.25	921.16	0.64
		9/16/2019	10.23	921.18	0.06
		10/17/2019	7.32	924.09	0.04
		11/19/2019	6.57	924.84	0.03
		12/16/2019	6.93	924.48	0.06
		2/19/2020	6.08	925.33	0.02
		4/22/2020	7.16	924.25	0.03
		6/23/2020	6.93	924.48	0.05
		8/25/2020	9.59	921.82	0.01
		10/19/2020	5.69	925.72	0.04
		12/16/2020	6.56	924.85	0.04
RW-05	928.53	12/10/2018	8.92	919.61	0.01
		2/19/2019	9.24	919.29	Heavy Trace
		3/19/2019	8.98	919.55	—
		4/16/2019	7.13	921.40	—
		5/14/2019	7.15	921.38	Light Trace
		6/17/2019	7.83	920.70	Heavy Trace
		7/25/2019	8.68	919.85	Light Trace
		8/20/2019	9.01	919.52	Light Trace
		9/16/2019	10.36	918.17	Light Trace
		10/17/2019	7.96	920.57	Light Trace
		11/19/2019	8.57	919.96	Light Trace
		12/16/2019	7.52	921.01	Heavy Trace
		2/19/2020	6.75	921.78	Light Trace
		4/22/2020	6.95	921.58	Light Trace
		6/23/2020	6.69	921.84	Light Trace
		8/25/2020	11.18	917.35	Light Trace
		10/19/2020	5.90	922.63	Light Trace
		12/16/2020	7.29	921.24	Light Trace

Table 2
HCC System Passive Operation Pilot Study
Water-Level Elevations and LNAPL Thicknesses
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Location	Measuring Point Elevation[1] (feet NAVD88)	Date	Depth to Water[2] (feet)	Water Elevation[1] (feet NAVD88)	LNAPL Thickness (feet)
Up-Gradient Locations (South of, and within, West Gate and Far West Gate)					
RW-06	928.53	12/10/2018	8.84	919.69	Light Trace
		2/19/2019	9.18	919.35	Light Trace
		3/19/2019	8.97	919.56	—
		4/16/2019	7.15	921.38	—
		5/14/2019	7.15	921.38	Light Trace
		6/17/2019	8.03	920.50	—
		7/25/2019	8.69	919.84	Light Trace
		8/20/2019	9.04	919.49	Light Trace
		9/16/2019	10.27	918.26	Light Trace
		10/17/2019	7.92	920.61	Heavy Trace
		11/19/2019	8.53	920.00	Light Trace
		12/16/2019	7.53	921.00	—
		2/19/2020	6.76	921.77	Light Trace
		4/22/2020	6.97	921.56	Light Trace
		6/23/2020	Not Measured - Inaccessible		
		8/25/2020	Not Measured - Inaccessible		
		10/19/2020	5.89	922.64	—
		12/16/2020	7.24	921.29	—
S2-AU	930	12/10/2018	13.19	916.81	—
		2/19/2019	13.95	916.05	—
		3/19/2019	13.78	916.22	—
		4/16/2019	13.27	916.73	—
		5/14/2019	12.86	917.14	—
		6/17/2019	13.58	916.42	—
		7/25/2019	14.02	915.98	—
		8/20/2019	14.39	915.61	—
		9/16/2019	14.24	915.76	—
		10/17/2019	13.80	916.20	—
		11/19/2019	13.30	916.70	—
		12/16/2019	13.53	916.47	—
		2/19/2020	13.29	916.71	—
		4/22/2020	13.11	916.89	—
		6/23/2020	12.74	917.26	—
		8/25/2020	14.31	915.69	—
		10/19/2020	12.21	917.79	—
		12/16/2020	13.41	916.59	—

Table 2
HCC System Passive Operation Pilot Study
Water-Level Elevations and LNAPL Thicknesses
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Location	Measuring Point Elevation[1] (feet NAVD88)	Date	Depth to Water[2] (feet)	Water Elevation[1] (feet NAVD88)	LNAPL Thickness (feet)
Up-Gradient Locations (South of, and within, West Gate and Far West Gate)					
S2-BU	930	12/10/2018	13.3	916.70	—
		2/19/2019	12.41	917.59	—
		3/19/2019	12.24	917.76	—
		4/16/2019	11.85	918.15	—
		5/14/2019	11.61	918.39	—
		6/17/2019	12.48	917.52	—
		7/25/2019	12.85	917.15	—
		8/20/2019	13.33	916.67	—
		9/16/2019	13.09	916.91	—
		10/17/2019	12.65	917.35	—
		11/19/2019	12.26	917.74	—
		12/16/2019	12.27	917.73	—
		2/19/2020	12.31	917.69	—
		4/22/2020	11.84	918.16	—
		6/23/2020	11.51	918.49	—
		8/25/2020	13.27	916.73	—
		10/19/2020	11.62	918.38	—
		12/16/2020	12.15	917.85	—
WG-WV-North Chamber	NA	12/10/2018	8.78	NA	—
		2/19/2019	8.05	NA	—
		3/19/2019	7.85	NA	—
		4/16/2019	7.10	NA	—
		5/14/2019	7.18	NA	—
		6/17/2019	8.03	NA	—
		7/25/2019	8.35	NA	—
		8/20/2019	9.03	NA	—
		9/16/2019	9.11	NA	—
		10/17/2019	7.96	NA	—
		11/19/2019	7.34	NA	—
		12/16/2019	7.45	NA	—
		2/19/2020	6.75	NA	—
		4/22/2020	6.92	NA	—
		6/23/2020	6.77	NA	—
		8/25/2020	8.91	NA	—
		10/19/2020	5.89	NA	—
		12/16/2020	7.20	NA	—

Table 2
HCC System Passive Operation Pilot Study
Water-Level Elevations and LNAPL Thicknesses
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Location	Measuring Point Elevation[1] (feet NAVD88)	Date	Depth to Water[2] (feet)	Water Elevation[1] (feet NAVD88)	LNAPL Thickness (feet)
Up-Gradient Locations (South of, and within, West Gate and Far West Gate)					
WG-WV-South Chamber	NA	12/10/2018	8.79	NA	—
		2/19/2019	8.06	NA	—
		3/19/2019	7.85	NA	—
		4/16/2019	7.05	NA	—
		5/14/2019	7.18	NA	—
		6/17/2019	8.03	NA	—
		7/25/2019	8.35	NA	—
		8/20/2019	9.03	NA	—
		9/16/2019	9.11	NA	—
		10/17/2019	7.97	NA	—
		11/19/2019	7.34	NA	—
		12/16/2019	7.45	NA	—
		2/19/2020	6.75	NA	—
		4/22/2020	6.92	NA	—
		6/23/2020	6.77	NA	—
		8/25/2020	8.91	NA	—
		10/19/2020	5.89	NA	—
		12/16/2020	7.20	NA	—
WG-EV-North Chamber	931.84	12/10/2018	8.81	923.03	—
		2/19/2019	8.08	923.76	—
		3/19/2019	8.80	923.04	Light Trace
		4/16/2019	7.14	924.70	Light Trace
		5/14/2019	7.23	924.61	—
		6/17/2019	8.02	923.82	—
		7/25/2019	8.45	923.39	—
		8/20/2019	9.04	922.80	—
		9/16/2019	9.15	922.69	—
		10/17/2019	8.01	923.83	—
		11/19/2019	7.36	924.48	—
		12/16/2019	7.52	924.32	Light Trace
		2/19/2020	6.72	925.12	—
		4/22/2020	6.92	924.92	—
		6/23/2020	6.78	925.06	—
		8/25/2020	8.95	922.89	—
		10/19/2020	5.90	925.94	—
		12/16/2020	7.24	924.60	—

Table 2
HCC System Passive Operation Pilot Study
Water-Level Elevations and LNAPL Thicknesses
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Location	Measuring Point Elevation[1] (feet NAVD88)	Date	Depth to Water[2] (feet)	Water Elevation[1] (feet NAVD88)	LNAPL Thickness (feet)
Up-Gradient Locations (South of, and within, West Gate and Far West Gate)					
WG-EV-South Chamber	931.84	12/10/2018	8.81	923.03	Light Trace
		2/19/2019	8.05	923.79	Heavy Trace
		3/19/2019	8.80	923.04	Heavy Trace
		4/16/2019	7.12	924.72	Light Trace
		5/14/2019	7.23	924.61	Light Trace
		6/17/2019	8.02	923.82	Light Trace
		7/25/2019	8.45	923.39	Light Trace
		8/20/2019	9.04	922.80	Light Trace
		9/16/2019	9.13	922.71	0.02
		10/17/2019	8.01	923.83	Heavy Trace
		11/19/2019	7.39	924.45	Light Trace
		12/16/2019	7.52	924.32	Heavy Trace
		2/19/2020	6.72	925.12	—
		4/22/2020	6.92	924.92	—
		6/23/2020	6.78	925.06	Light Trace
		8/25/2020	8.95	922.89	Light Trace
		10/19/2020	5.90	925.94	—
		12/16/2020	7.24	924.60	Light Trace
FWG-WV-North Chamber	930.76	12/10/2018	5.08	925.68	—
		2/19/2019	5.40	925.36	—
		3/19/2019	4.87	925.89	—
		4/16/2019	4.80	925.96	—
		5/14/2019	4.84	925.92	—
		6/17/2019	5.23	925.53	—
		7/25/2019	5.85	924.91	—
		8/20/2019	6.88	923.88	—
		9/16/2019	7.56	923.20	—
		10/17/2019	5.15	925.61	—
		11/19/2019	4.68	926.08	—
		12/16/2019	4.72	926.04	—
		2/19/2020	4.71	926.05	—
		4/22/2020	4.88	925.88	—
		6/23/2020	4.76	926.00	—
		8/25/2020	6.80	923.96	—
		10/19/2020	4.72	926.04	—
		12/16/2020	4.70	926.06	—

Table 2
HCC System Passive Operation Pilot Study
Water-Level Elevations and LNAPL Thicknesses
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Location	Measuring Point Elevation[1] (feet NAVD88)	Date	Depth to Water[2] (feet)	Water Elevation[1] (feet NAVD88)	LNAPL Thickness (feet)
Up-Gradient Locations (South of, and within, West Gate and Far West Gate)					
FWG-WV-South Chamber	930.76	12/10/2018	5.08	925.68	—
		2/19/2019	5.40	925.36	—
		3/19/2019	4.87	925.89	—
		4/16/2019	4.82	925.94	—
		5/14/2019	4.84	925.92	—
		6/17/2019	5.23	925.53	—
		7/25/2019	5.85	924.91	—
		8/20/2019	6.88	923.88	—
		9/16/2019	7.56	923.20	—
		10/17/2019	5.17	925.59	—
		11/19/2019	4.68	926.08	—
		12/16/2019	4.72	926.04	—
		2/19/2020	4.71	926.05	—
		4/22/2020	4.88	925.88	—
		6/23/2020	4.76	926.00	—
		8/25/2020	6.80	923.96	—
		10/19/2020	4.72	926.04	—
		12/16/2020	4.70	926.06	—
FWG-EV-North Chamber	NA	12/10/2018	5.12	NA	—
		2/19/2019	5.40	NA	—
		3/19/2019	4.97	NA	—
		4/16/2019	4.88	NA	—
		5/14/2019	4.82	NA	—
		6/17/2019	5.25	NA	—
		7/25/2019	5.70	NA	—
		8/20/2019	6.84	NA	—
		9/16/2019	7.59	NA	—
		10/17/2019	5.21	NA	—
		11/19/2019	4.68	NA	—
		12/16/2019	4.76	NA	—
		2/19/2020	4.72	NA	—
		4/22/2020	4.89	NA	—
		6/23/2020	4.80	NA	—
		8/25/2020	6.80	NA	—
		10/19/2020	5.75	NA	—
		12/16/2020	4.72	NA	—

Table 2
HCC System Passive Operation Pilot Study
Water-Level Elevations and LNAPL Thicknesses
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

Location	Measuring Point Elevation[1] (feet NAVD88)	Date	Depth to Water[2] (feet)	Water Elevation[1] (feet NAVD88)	LNAPL Thickness (feet)
Up-Gradient Locations (South of, and within, West Gate and Far West Gate)					
FWG-EV-South Chamber	NA	12/10/2018	5.12	NA	—
		2/19/2019	5.50	NA	—
		3/19/2019	4.97	NA	—
		4/16/2019	4.89	NA	—
		5/14/2019	4.82	NA	—
		6/17/2019	5.25	NA	—
		7/25/2019	5.70	NA	—
		8/20/2019	6.84	NA	—
		9/16/2019	7.59	NA	—
		10/17/2019	5.24	NA	—
		11/19/2019	4.69	NA	—
		12/16/2019	4.76	NA	—
		2/19/2020	4.72	NA	—
		4/22/2020	4.89	NA	—
		6/23/2020	4.81	NA	—
		8/25/2020	6.80	NA	—
		10/19/2020	5.75	NA	—
		12/16/2020	4.72	NA	—

NOTES:

Green highlighted rows indicate baseline conditions before the start of HCC passive operations.

— denotes LNAPL was not observed.

Light Trace = LNAPL less than 0.01 foot thick and thin coating of LNAPL and/or a sheen observed on the oil-water interface probe

Heavy Trace = LNAPL less than 0.01 foot thick and thick coating of LNAPL observed on the oil-water interface probe

[1]Elevations referenced to North American Vertical Datum of 1988 (NAVD88).

[2]Depths referenced to measuring point (e.g., top of well casing, top of vault).

LNAPL = light nonaqueous-phase liquid

NA = not applicable

NM = not measured

ATTACHMENT A
LABORATORY ANALYTICAL REPORTS

HYDRAULIC CONTROL AND CONTAINMENT SYSTEM
PASSIVE OPERATION PILOT STUDY REPORT
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Consent Decree No. 07-2-33672-9 SEA

Farallon PN: 683-071

eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

Laboratory Job ID: 580-92927-1
Client Project/Site: BNSF Skykomish Ground Water

For:
Farallon Consulting LLC
975 5th Avenue NW
Suite 100
Issaquah, Washington 98027

Attn: Peter Kingston

Kristine D. Allen

Authorized for release by:
3/5/2020 3:12:44 PM

Kristine Allen, Client Service Manager
(253)248-4970
kristine.allen@testamericainc.com

Table of Contents

Job ID: 580-92927-1

Laboratory: Eurofins TestAmerica, Seattle

Narrative

Job Narrative
580-92927-1

Comments
No additional comments.

Receipt
The samples were received on 2/20/2020 2:20 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 4 coolers at receipt time were 0.9º C, 1.9º C, 2.0º C and 3.4º C.

GC Semi VOA
Method NWTPH-Dx: (CCV 580-324162/39) fails drift criteria for o-Terphenyl surrogate, but passes recovery criteria. Since surrogate recoveries of associated client samples are within control limits, the data is reported.

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

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

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
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)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
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)

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-92927-1

Client Sample ID: PZ-8-021920
Date Collected: 02/19/20 11:05
Date Received: 02/20/20 14:20

Lab Sample ID: 580-92927-1
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.065	0.065	mg/L		03/03/20 10:10	03/04/20 03:02	1
Motor Oil (>C24-C36)	ND		0.096	0.096	mg/L		03/03/20 10:10	03/04/20 03:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*80*		*50 - 150*	*03/03/20 10:10*	*03/04/20 03:02*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-92927-1

Client Sample ID: PZ-7S-021920
Date Collected: 02/19/20 12:05
Date Received: 02/20/20 14:20

Lab Sample ID: 580-92927-2
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.15		0.063	0.063	mg/L		03/03/20 10:10	03/04/20 03:22	1
Motor Oil (>C24-C36)	0.17		0.093	0.093	mg/L		03/03/20 10:10	03/04/20 03:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*83*		*50 - 150*	*03/03/20 10:10*	*03/04/20 03:22*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-92927-1

Client Sample ID: EW-1-021920
Date Collected: 02/19/20 11:00
Date Received: 02/20/20 14:20

Lab Sample ID: 580-92927-3
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.061	0.061	mg/L		03/03/20 10:10	03/04/20 04:02	1
Motor Oil (>C24-C36)	ND		0.091	0.091	mg/L		03/03/20 10:10	03/04/20 04:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*83*		*50 - 150*	*03/03/20 10:10*	*03/04/20 04:02*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-92927-1

Client Sample ID: GW-1-021920
Date Collected: 02/19/20 13:00
Date Received: 02/20/20 14:20

Lab Sample ID: 580-92927-4
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.071		0.061	0.061	mg/L		03/03/20 10:10	03/04/20 04:22	1
Motor Oil (>C24-C36)	0.12		0.091	0.091	mg/L		03/03/20 10:10	03/04/20 04:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*82*		*50 - 150*	*03/03/20 10:10*	*03/04/20 04:22*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-92927-1

Client Sample ID: GW-2-021920
Date Collected: 02/19/20 13:00
Date Received: 02/20/20 14:20

Lab Sample ID: 580-92927-5
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.064	0.064	mg/L		03/03/20 10:10	03/04/20 04:43	1
Motor Oil (>C24-C36)	**0.094**		0.094	0.094	mg/L		03/03/20 10:10	03/04/20 04:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*84*		*50 - 150*	*03/03/20 10:10*	*03/04/20 04:43*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-92927-1

Client Sample ID: 5-W-43-021920
Date Collected: 02/19/20 12:00
Date Received: 02/20/20 14:20

Lab Sample ID: 580-92927-6
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.078		0.061	0.061	mg/L		03/03/20 10:10	03/04/20 05:03	1
Motor Oil (>C24-C36)	0.12		0.091	0.091	mg/L		03/03/20 10:10	03/04/20 05:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*83*		*50 - 150*	*03/03/20 10:10*	*03/04/20 05:03*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-92927-1

Client Sample ID: S2-BU-021920
Date Collected: 02/19/20 14:08
Date Received: 02/20/20 14:20

Lab Sample ID: 580-92927-7
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.23		0.062	0.062	mg/L		03/03/20 10:10	03/04/20 05:23	1
Motor Oil (>C24-C36)	0.13		0.091	0.091	mg/L		03/03/20 10:10	03/04/20 05:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*81*		*50 - 150*	*03/03/20 10:10*	*03/04/20 05:23*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-92927-1

Client Sample ID: S2-BD-021920
Date Collected: 02/19/20 14:40
Date Received: 02/20/20 14:20

Lab Sample ID: 580-92927-8
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.061	0.061	mg/L		03/03/20 10:10	03/04/20 05:43	1
Motor Oil (>C24-C36)	ND		0.091	0.091	mg/L		03/03/20 10:10	03/04/20 05:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*80*		*50 - 150*	*03/03/20 10:10*	*03/04/20 05:43*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-92927-1

Client Sample ID: S2-AU-021920
Date Collected: 02/19/20 14:15
Date Received: 02/20/20 14:20

Lab Sample ID: 580-92927-9
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.063	0.063	mg/L		03/03/20 10:10	03/04/20 06:03	1
Motor Oil (>C24-C36)	ND		0.092	0.092	mg/L		03/03/20 10:10	03/04/20 06:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*81*		*50 - 150*	*03/03/20 10:10*	*03/04/20 06:03*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-92927-1

Client Sample ID: S2-AD-021920
Date Collected: 02/19/20 14:43
Date Received: 02/20/20 14:20

Lab Sample ID: 580-92927-10
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.063	0.063	mg/L		03/03/20 10:10	03/04/20 06:23	1
Motor Oil (>C24-C36)	ND		0.093	0.093	mg/L		03/03/20 10:10	03/04/20 06:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*77*		*50 - 150*	*03/03/20 10:10*	*03/04/20 06:23*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-92927-1

Client Sample ID: WG-EV-021920
Date Collected: 02/19/20 15:11
Date Received: 02/20/20 14:20

Lab Sample ID: 580-92927-11
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.52		0.062	0.062	mg/L		03/03/20 10:10	03/04/20 06:43	1
Motor Oil (>C24-C36)	0.34		0.091	0.091	mg/L		03/03/20 10:10	03/04/20 06:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*73*		*50 - 150*	*03/03/20 10:10*	*03/04/20 06:43*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-92927-1

Client Sample ID: WG-WV-021920
Date Collected: 02/19/20 15:15
Date Received: 02/20/20 14:20

Lab Sample ID: 580-92927-12
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.34		0.063	0.063	mg/L		03/03/20 10:10	03/04/20 07:04	1
Motor Oil (>C24-C36)	0.27		0.093	0.093	mg/L		03/03/20 10:10	03/04/20 07:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*78*		*50 - 150*	*03/03/20 10:10*	*03/04/20 07:04*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-92927-1

Client Sample ID: FWG-EV-021920
Date Collected: 02/19/20 15:45
Date Received: 02/20/20 14:20

Lab Sample ID: 580-92927-13
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.061	0.061	mg/L		03/03/20 10:10	03/04/20 07:44	1
Motor Oil (>C24-C36)	ND		0.091	0.091	mg/L		03/03/20 10:10	03/04/20 07:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*79*		*50 - 150*	*03/03/20 10:10*	*03/04/20 07:44*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-92927-1

Client Sample ID: FWG-WV-021920
Date Collected: 02/19/20 15:43
Date Received: 02/20/20 14:20

Lab Sample ID: 580-92927-14
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062	0.062	mg/L		03/03/20 10:10	03/04/20 08:04	1
Motor Oil (>C24-C36)	ND		0.091	0.091	mg/L		03/03/20 10:10	03/04/20 08:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*61*		*50 - 150*	*03/03/20 10:10*	*03/04/20 08:04*	*1*

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

Lab Sample ID: MB 580-324105/1-A
Matrix: Water
Analysis Batch: 324162

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 324105

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.065	0.065	mg/L		03/03/20 10:10	03/04/20 02:01	1
Motor Oil (>C24-C36)	ND		0.096	0.096	mg/L		03/03/20 10:10	03/04/20 02:01	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*91*		*50 - 150*	*03/03/20 10:10*	*03/04/20 02:01*	*1*

Lab Sample ID: LCS 580-324105/2-A
Matrix: Water
Analysis Batch: 324162

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 324105

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
#2 Diesel (C10-C24)			0.500	0.467		mg/L		93	50 - 120		
Motor Oil (>C24-C36)			0.500	0.506		mg/L		101	64 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl	*97*		*50 - 150*

Lab Sample ID: LCSD 580-324105/3-A
Matrix: Water
Analysis Batch: 324162

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 324105

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
#2 Diesel (C10-C24)			0.500	0.464		mg/L		93	50 - 120	1	26
Motor Oil (>C24-C36)			0.500	0.512		mg/L		102	64 - 120	1	24

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o-Terphenyl	*101*		*50 - 150*

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-92927-1

Client Sample ID: PZ-8-021920
Lab Sample ID: 580-92927-1
Date Collected: 02/19/20 11:05
Matrix: Water
Date Received: 02/20/20 14:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			324105	03/03/20 10:10	T1L	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	324162	03/04/20 03:02	JCM	TAL SEA

Client Sample ID: PZ-7S-021920
Lab Sample ID: 580-92927-2
Date Collected: 02/19/20 12:05
Matrix: Water
Date Received: 02/20/20 14:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			324105	03/03/20 10:10	T1L	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	324162	03/04/20 03:22	JCM	TAL SEA

Client Sample ID: EW-1-021920
Lab Sample ID: 580-92927-3
Date Collected: 02/19/20 11:00
Matrix: Water
Date Received: 02/20/20 14:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			324105	03/03/20 10:10	T1L	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	324162	03/04/20 04:02	JCM	TAL SEA

Client Sample ID: GW-1-021920
Lab Sample ID: 580-92927-4
Date Collected: 02/19/20 13:00
Matrix: Water
Date Received: 02/20/20 14:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			324105	03/03/20 10:10	T1L	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	324162	03/04/20 04:22	JCM	TAL SEA

Client Sample ID: GW-2-021920
Lab Sample ID: 580-92927-5
Date Collected: 02/19/20 13:00
Matrix: Water
Date Received: 02/20/20 14:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			324105	03/03/20 10:10	T1L	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	324162	03/04/20 04:43	JCM	TAL SEA

Client Sample ID: 5-W-43-021920
Lab Sample ID: 580-92927-6
Date Collected: 02/19/20 12:00
Matrix: Water
Date Received: 02/20/20 14:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			324105	03/03/20 10:10	T1L	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	324162	03/04/20 05:03	JCM	TAL SEA

Lab Chronicle

Client: Farallon Consulting LLC
Job ID: 580-92927-1
Project/Site: BNSF Skykomish Ground Water

Client Sample ID: S2-BU-021920
Lab Sample ID: 580-92927-7
Date Collected: 02/19/20 14:08
Matrix: Water
Date Received: 02/20/20 14:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			324105	03/03/20 10:10	T1L	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	324162	03/04/20 05:23	JCM	TAL SEA

Client Sample ID: S2-BD-021920
Lab Sample ID: 580-92927-8
Date Collected: 02/19/20 14:40
Matrix: Water
Date Received: 02/20/20 14:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			324105	03/03/20 10:10	T1L	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	324162	03/04/20 05:43	JCM	TAL SEA

Client Sample ID: S2-AU-021920
Lab Sample ID: 580-92927-9
Date Collected: 02/19/20 14:15
Matrix: Water
Date Received: 02/20/20 14:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			324105	03/03/20 10:10	T1L	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	324162	03/04/20 06:03	JCM	TAL SEA

Client Sample ID: S2-AD-021920
Lab Sample ID: 580-92927-10
Date Collected: 02/19/20 14:43
Matrix: Water
Date Received: 02/20/20 14:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			324105	03/03/20 10:10	T1L	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	324162	03/04/20 06:23	JCM	TAL SEA

Client Sample ID: WG-EV-021920
Lab Sample ID: 580-92927-11
Date Collected: 02/19/20 15:11
Matrix: Water
Date Received: 02/20/20 14:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			324105	03/03/20 10:10	T1L	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	324162	03/04/20 06:43	JCM	TAL SEA

Client Sample ID: WG-WV-021920
Lab Sample ID: 580-92927-12
Date Collected: 02/19/20 15:15
Matrix: Water
Date Received: 02/20/20 14:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			324105	03/03/20 10:10	T1L	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	324162	03/04/20 07:04	JCM	TAL SEA

Lab Chronicle

Client: Farallon Consulting LLC
Job ID: 580-92927-1
Project/Site: BNSF Skykomish Ground Water

Client Sample ID: FWG-EV-021920
Lab Sample ID: 580-92927-13

Date Collected: 02/19/20 15:45
Matrix: Water
Date Received: 02/20/20 14:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			324105	03/03/20 10:10	T1L	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	324162	03/04/20 07:44	JCM	TAL SEA

Client Sample ID: FWG-WV-021920
Lab Sample ID: 580-92927-14

Date Collected: 02/19/20 15:43
Matrix: Water
Date Received: 02/20/20 14:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			324105	03/03/20 10:10	T1L	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	324162	03/04/20 08:04	JCM	TAL SEA

Laboratory References:

TAL SEA = Eurofins TestAmerica, Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Farallon Consulting LLC
Job ID: 580-92927-1
Project/Site: BNSF Skykomish Ground Water

Laboratory: Eurofins TestAmerica, Seattle

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	17-024	01-14-22
ANAB	Dept. of Defense ELAP	L2236	01-19-22
ANAB	ISO/IEC 17025	L2236	01-20-23
California	State	2901	11-05-20
Montana (UST)	State	NA	04-13-21
Oregon	NELAP	WA100007	11-06-20
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	US Federal Programs	P330-20-00031	02-10-23
Washington	State	C553	02-18-21

Sample Summary

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-92927-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
580-92927-1	PZ-8-021920	Water	02/19/20 11:05	02/20/20 14:20	
580-92927-2	PZ-7S-021920	Water	02/19/20 12:05	02/20/20 14:20	
580-92927-3	EW-1-021920	Water	02/19/20 11:00	02/20/20 14:20	
580-92927-4	GW-1-021920	Water	02/19/20 13:00	02/20/20 14:20	
580-92927-5	GW-2-021920	Water	02/19/20 13:00	02/20/20 14:20	
580-92927-6	5-W-43-021920	Water	02/19/20 12:00	02/20/20 14:20	
580-92927-7	S2-BU-021920	Water	02/19/20 14:08	02/20/20 14:20	
580-92927-8	S2-BD-021920	Water	02/19/20 14:40	02/20/20 14:20	
580-92927-9	S2-AU-021920	Water	02/19/20 14:15	02/20/20 14:20	
580-92927-10	S2-AD-021920	Water	02/19/20 14:43	02/20/20 14:20	
580-92927-11	WG-EV-021920	Water	02/19/20 15:11	02/20/20 14:20	
580-92927-12	WG-WV-021920	Water	02/19/20 15:15	02/20/20 14:20	
580-92927-13	FWG-EV-021920	Water	02/19/20 15:45	02/20/20 14:20	
580-92927-14	FWG-WV-021920	Water	02/19/20 15:43	02/20/20 14:20	

Eurofins TestAmerica, Seattle
5755 8th Street East
Tacoma, WA 98424
Phone: 253-922-2310 Fax: 253-922-5047

Call w/ any QS Please

Chain of Custody Record

eurofins Environment Testing TestAmerica

Client Information	Sampler: C. Banfield	Lab PM: Allen, Kristine D	Carrier Tracking No(s):	COC No: 580-37694-12062.1
Client Contact: Peter Kingston	Phone: 206 406 6228	E-Mail: kristine.allen@testamericainc.com		Page: Page 1 of 2
Company: Farallon Consulting LLC				Job #:
Address: 975 5th Avenue NW Suite 100	Due Date Requested:			
City: Issaquah	TAT Requested (days): Standard			
State, Zip: WA, 98027				
Phone: (206) 406-6228	PO #: TT0100-Q12			
Email: pkingston@farallonconsulting.com	WO #: Tax Code 8800 BF10007215			
Project Name: BNSF Skykomish Ground Water	Project #: 58006391			
Site: Washington	SSOW#:			

Analysis Requested

Loc: 580
92927

Preservation Codes:
A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4-5
Z - other (specify)

580-92927 Chain of Custody

	Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	NWTPH_Dx - Standard reporting list for NWTPH-Dx	Total Number	Special Instructions/Note:
	Preservation Code:							A		
1	PZ-8-021920	02/19/20	1105	G	Water	N		X		
2	PZ-75-021920		1205		Water			X		
3	EW-1-021920		1100		Water			X		
4	GW-1-021920		1300		Water			X		
5	GW-2-021920		1300		Water			X		
6	5-W-43-021920		1200		Water			X		
7	S2-BU-021920		1408		Water			X		
8	S2-BD-021920		1440		Water			X		
9	S2-AU-021920		1415		Water			X		
10	S2-AD-021920		1443		Water			X		
11	WG-EV-021920	↓	1511	↓	Water	↓		X		

Therm. ID: IR6 Cor: 3.0 ° Unc: 1.6 °
Cooler Dsc: Lg Blue
Packing: Bub
Cust. Seal: Yes No
Blue Ice, Wet, Dry, None
FedEx:
UPS:
Lab Cour: L
Other:

Therm. ID: IR6 Cor: 3.4 ° Unc: 3.0 °
Cooler Dsc: Lg Blue
Packing: Bub
Cust. Seal: Yes No
Blue Ice, Wet, Dry, None
FedEx:
UPS:
Lab Cour:
Other:

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	Chantel Bafus	02/20/2020 1000	Farallon		2-20-2020 14:20	ET/TA
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks:

Eurofins TestAmerica, Seattle
5755 8th Street East
Tacoma, WA 98424
Phone: 253-922-2310 Fax: 253-922-5047

Chain of Custody Record

eurofins Environment Testing TestAmerica

Client Information	Sampler: Chantal Banfield	Lab PM: Allen, Kristine D	Carrier Tracking No(s):	COC No: 580-37694-12062.2
Client Contact: Peter Kingston	Phone: 206 406 6228	E-Mail: kristine.allen@testamericainc.com		Page: Page 2 of 2
Company: Farallon Consulting LLC				Job #:
Address: 975 5th Avenue NW Suite 100	Due Date Requested:			
City: Issaquah	TAT Requested (days): Standard			
State, Zip: WA, 98027	PO #: TT0100-Q12			
Phone: 206 406 6228	WO #: Tax Code 8800 BF10007215			
Email: pkingston@farallonconsulting.com	Project #: 58006391			
Project Name: BNSF Skykomish Ground Water	SSOW#:			
Site: Washington				

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	NWTPH_Dx - Standard reporting list for NWTPH-Dx	Total Number of containers	Special Instructions/Note:
Preservation Code:							A		
WG-WV-021920	02/19/20	1515	G	Water	N		X		
FWG-EV-021920		1545		Water			X		
FWG-WV-021920		1543		Water			X		
				Water					

13

Therm. ID: IR6 Cor: 0.9 ° Unc: 0.5 °
Cooler Dsc: Lg Green
Packing: Bub
Cust. Seal: Yes X No
Blue Ice, Wet Dry, None
FedEx:
UPS:
Lab Cour: X
Other:

Therm. ID: IR6 Cor: 1.9 ° Unc: 1.5 °
Cooler Dsc: Lg Blue
Packing: Bub
Cust. Seal: Yes X No
Blue Ice, Wet Dry, None
FedEx:
UPS:
Lab Cour: X
Other:

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:	
Relinquished by:	Date/Time: 02/20/20 1000	Company: Farallon	Received by:	Date/Time: 2-20-2020 14:20	Company: EF/TA		
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company		
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company		

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

3/5/2020

Login Sample Receipt Checklist

Client: Farallon Consulting LLC

Job Number: 580-92927-1

Login Number: 92927

List Source: Eurofins TestAmerica, Seattle

List Number: 1

Creator: Hobbs, Kenneth F

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.	True	
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.	True	
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").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

Laboratory Job ID: 580-94298-1
Client Project/Site: BNSF Skykomish Ground Water

For:
Farallon Consulting LLC
975 5th Avenue NW
Suite 100
Issaquah, Washington 98027

Attn: Peter Kingston

Kristine D. Allen

Authorized for release by:
4/27/2020 4:26:57 PM

Kristine Allen, Client Service Manager
(253)248-4970
kristine.allen@testamericainc.com

Table of Contents

Job ID: 580-94298-1

Laboratory: Eurofins TestAmerica, Seattle

Narrative

Job Narrative
580-94298-1

Comments
No additional comments.

Receipt
The samples were received on 4/24/2020 1:20 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 0.8º C, 1.0º C and 1.7º C.

Receipt Exceptions

The reference method requires samples to be preserved to a pH of <2. The following samples were received unpreserved: GW-1-042220 (580-94298-5), 5-W-43-042220 (580-94298-6), WG-WV-042220 (580-94298-7), FWG-EV-042220 (580-94298-8), FWG-WV-042220 (580-94298-9), EW-1-042220 (580-94298-10), PZ-8-042220 (580-94298-11), PZ-7S-042220 (580-94298-12) and GW-2-042220 (580-94298-13). The samples were preserved to the appropriate pH in the laboratory with hydrochloric acid from reagent 2589190..

GC Semi VOA
Methods NWTPH-Dx: (CCV 580-327307/14), (CCV 580-327307/25), (CCV 580-327307/27) and (CCVRT 580-327307/3) recovers outside drift limits for o-Terphenyl surrogate. All QC and associated client samples recover within control limits; therefore, the data is reported.

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

Organic Prep
Method 3510C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with preparation batch 580-327305. An LCS/LCSD have been prepared.

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

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
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)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
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)

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-94298-1

Client Sample ID: S2-BU-042220
Date Collected: 04/22/20 10:00
Date Received: 04/24/20 13:20

Lab Sample ID: 580-94298-1
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	**0.11**		0.062		mg/L		04/26/20 14:42	04/26/20 21:04	1
Motor Oil (>C24-C36)	ND		0.091		mg/L		04/26/20 14:42	04/26/20 21:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*71*		*50 - 150*	*04/26/20 14:42*	*04/26/20 21:04*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-94298-1

Client Sample ID: S2-BD-042220
Date Collected: 04/22/20 10:30
Date Received: 04/24/20 13:20

Lab Sample ID: 580-94298-2
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062		mg/L		04/26/20 14:42	04/26/20 21:24	1
Motor Oil (>C24-C36)	ND		0.091		mg/L		04/26/20 14:42	04/26/20 21:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*76*		*50 - 150*	*04/26/20 14:42*	*04/26/20 21:24*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-94298-1

Client Sample ID: WG-EV-042220
Date Collected: 04/22/20 10:57
Date Received: 04/24/20 13:20

Lab Sample ID: 580-94298-3
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.43		0.062		mg/L		04/26/20 14:42	04/26/20 21:44	1
Motor Oil (>C24-C36)	0.29		0.091		mg/L		04/26/20 14:42	04/26/20 21:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*61*		*50 - 150*	*04/26/20 14:42*	*04/26/20 21:44*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-94298-1

Client Sample ID: S2-AU-042220
Date Collected: 04/22/20 11:28
Date Received: 04/24/20 13:20

Lab Sample ID: 580-94298-4
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062		mg/L		04/26/20 14:42	04/26/20 22:24	1
Motor Oil (>C24-C36)	ND		0.091		mg/L		04/26/20 14:42	04/26/20 22:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*62*		*50 - 150*	*04/26/20 14:42*	*04/26/20 22:24*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-94298-1

Client Sample ID: GW-1-042220
Date Collected: 04/22/20 10:30
Date Received: 04/24/20 13:20

Lab Sample ID: 580-94298-5
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.068		mg/L		04/26/20 14:42	04/26/20 22:45	1
Motor Oil (>C24-C36)	ND		0.10		mg/L		04/26/20 14:42	04/26/20 22:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*71*		*50 - 150*	*04/26/20 14:42*	*04/26/20 22:45*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-94298-1

Client Sample ID: 5-W-43-042220
Date Collected: 04/22/20 11:25
Date Received: 04/24/20 13:20

Lab Sample ID: 580-94298-6
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.066		mg/L		04/26/20 14:42	04/26/20 23:05	1
Motor Oil (>C24-C36)	ND		0.097		mg/L		04/26/20 14:42	04/26/20 23:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*68*		*50 - 150*	*04/26/20 14:42*	*04/26/20 23:05*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-94298-1

Client Sample ID: WG-WV-042220
Date Collected: 04/22/20 12:30
Date Received: 04/24/20 13:20

Lab Sample ID: 580-94298-7
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.16		0.063		mg/L		04/26/20 14:42	04/26/20 23:25	1
Motor Oil (>C24-C36)	0.18		0.093		mg/L		04/26/20 14:42	04/26/20 23:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*65*		*50 - 150*	*04/26/20 14:42*	*04/26/20 23:25*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-94298-1

Client Sample ID: FWG-EV-042220
Date Collected: 04/22/20 13:10
Date Received: 04/24/20 13:20

Lab Sample ID: 580-94298-8
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062		mg/L		04/26/20 14:42	04/26/20 23:45	1
Motor Oil (>C24-C36)	ND		0.091		mg/L		04/26/20 14:42	04/26/20 23:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*69*		*50 - 150*	*04/26/20 14:42*	*04/26/20 23:45*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-94298-1

Client Sample ID: FWG-WV-042220
Date Collected: 04/22/20 13:45
Date Received: 04/24/20 13:20

Lab Sample ID: 580-94298-9
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062		mg/L		04/26/20 14:42	04/27/20 00:05	1
Motor Oil (>C24-C36)	ND		0.091		mg/L		04/26/20 14:42	04/27/20 00:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*67*		*50 - 150*	*04/26/20 14:42*	*04/27/20 00:05*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-94298-1

Client Sample ID: EW-1-042220
Date Collected: 04/22/20 12:22
Date Received: 04/24/20 13:20

Lab Sample ID: 580-94298-10
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062		mg/L		04/26/20 14:42	04/27/20 00:25	1
Motor Oil (>C24-C36)	ND		0.091		mg/L		04/26/20 14:42	04/27/20 00:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*68*		*50 - 150*	*04/26/20 14:42*	*04/27/20 00:25*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-94298-1

Client Sample ID: PZ-8-042220
Date Collected: 04/22/20 13:12
Date Received: 04/24/20 13:20

Lab Sample ID: 580-94298-11
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.063		mg/L		04/26/20 14:42	04/27/20 00:46	1
Motor Oil (>C24-C36)	ND		0.094		mg/L		04/26/20 14:42	04/27/20 00:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*68*		*50 - 150*	*04/26/20 14:42*	*04/27/20 00:46*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-94298-1

Client Sample ID: PZ-7S-042220
Date Collected: 04/22/20 14:05
Date Received: 04/24/20 13:20

Lab Sample ID: 580-94298-12
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.063		mg/L		04/26/20 14:42	04/27/20 01:06	1
Motor Oil (>C24-C36)	ND		0.093		mg/L		04/26/20 14:42	04/27/20 01:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*72*		*50 - 150*	*04/26/20 14:42*	*04/27/20 01:06*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-94298-1

Client Sample ID: GW-2-042220
Date Collected: 04/22/20 14:50
Date Received: 04/24/20 13:20

Lab Sample ID: 580-94298-13
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062		mg/L		04/26/20 14:42	04/27/20 01:26	1
Motor Oil (>C24-C36)	ND		0.091		mg/L		04/26/20 14:42	04/27/20 01:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*74*		*50 - 150*	*04/26/20 14:42*	*04/27/20 01:26*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-94298-1

Client Sample ID: S2-AD-042220
Date Collected: 04/22/20 11:57
Date Received: 04/24/20 13:20

Lab Sample ID: 580-94298-14
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062		mg/L		04/26/20 14:42	04/27/20 02:06	1
Motor Oil (>C24-C36)	ND		0.091		mg/L		04/26/20 14:42	04/27/20 02:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*76*		*50 - 150*	*04/26/20 14:42*	*04/27/20 02:06*	*1*

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

Lab Sample ID: MB 580-327305/1-A
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 327307
Prep Batch: 327305

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.065		mg/L		04/26/20 14:42	04/26/20 19:03	1
Motor Oil (>C24-C36)	ND		0.096		mg/L		04/26/20 14:42	04/26/20 19:03	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*71*		*50 - 150*	*04/26/20 14:42*	*04/26/20 19:03*	*1*

Lab Sample ID: LCS 580-327305/2-A
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 327307
Prep Batch: 327305

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
#2 Diesel (C10-C24)			0.500	0.486		mg/L		97	50 - 120		
Motor Oil (>C24-C36)			0.500	0.511		mg/L		102	64 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl	*69*		*50 - 150*

Lab Sample ID: LCSD 580-327305/3-A
Client Sample ID: Lab Control Sample Dup
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 327307
Prep Batch: 327305

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
#2 Diesel (C10-C24)			0.500	0.475		mg/L		95	50 - 120	2	26
Motor Oil (>C24-C36)			0.500	0.512		mg/L		102	64 - 120	0	24

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o-Terphenyl	*67*		*50 - 150*

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-94298-1

Client Sample ID: S2-BU-042220

Lab Sample ID: 580-94298-1

Date Collected: 04/22/20 10:00
Matrix: Water
Date Received: 04/24/20 13:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			327305	04/26/20 14:42	JCM	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	327307	04/26/20 21:04	JCM	TAL SEA

Client Sample ID: S2-BD-042220

Lab Sample ID: 580-94298-2

Date Collected: 04/22/20 10:30
Matrix: Water
Date Received: 04/24/20 13:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			327305	04/26/20 14:42	JCM	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	327307	04/26/20 21:24	JCM	TAL SEA

Client Sample ID: WG-EV-042220

Lab Sample ID: 580-94298-3

Date Collected: 04/22/20 10:57
Matrix: Water
Date Received: 04/24/20 13:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			327305	04/26/20 14:42	JCM	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	327307	04/26/20 21:44	JCM	TAL SEA

Client Sample ID: S2-AU-042220

Lab Sample ID: 580-94298-4

Date Collected: 04/22/20 11:28
Matrix: Water
Date Received: 04/24/20 13:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			327305	04/26/20 14:42	JCM	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	327307	04/26/20 22:24	JCM	TAL SEA

Client Sample ID: GW-1-042220

Lab Sample ID: 580-94298-5

Date Collected: 04/22/20 10:30
Matrix: Water
Date Received: 04/24/20 13:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			327305	04/26/20 14:42	JCM	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	327307	04/26/20 22:45	JCM	TAL SEA

Client Sample ID: 5-W-43-042220

Lab Sample ID: 580-94298-6

Date Collected: 04/22/20 11:25
Matrix: Water
Date Received: 04/24/20 13:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			327305	04/26/20 14:42	JCM	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	327307	04/26/20 23:05	JCM	TAL SEA

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Ground Water

Job ID: 580-94298-1

Client Sample ID: WG-WV-042220

Lab Sample ID: 580-94298-7

Date Collected: 04/22/20 12:30
Matrix: Water
Date Received: 04/24/20 13:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			327305	04/26/20 14:42	JCM	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	327307	04/26/20 23:25	JCM	TAL SEA

Client Sample ID: FWG-EV-042220

Lab Sample ID: 580-94298-8

Date Collected: 04/22/20 13:10
Matrix: Water
Date Received: 04/24/20 13:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			327305	04/26/20 14:42	JCM	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	327307	04/26/20 23:45	JCM	TAL SEA

Client Sample ID: FWG-WV-042220

Lab Sample ID: 580-94298-9

Date Collected: 04/22/20 13:45
Matrix: Water
Date Received: 04/24/20 13:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			327305	04/26/20 14:42	JCM	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	327307	04/27/20 00:05	JCM	TAL SEA

Client Sample ID: EW-1-042220

Lab Sample ID: 580-94298-10

Date Collected: 04/22/20 12:22
Matrix: Water
Date Received: 04/24/20 13:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			327305	04/26/20 14:42	JCM	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	327307	04/27/20 00:25	JCM	TAL SEA

Client Sample ID: PZ-8-042220

Lab Sample ID: 580-94298-11

Date Collected: 04/22/20 13:12
Matrix: Water
Date Received: 04/24/20 13:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			327305	04/26/20 14:42	JCM	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	327307	04/27/20 00:46	JCM	TAL SEA

Client Sample ID: PZ-7S-042220

Lab Sample ID: 580-94298-12

Date Collected: 04/22/20 14:05
Matrix: Water
Date Received: 04/24/20 13:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			327305	04/26/20 14:42	JCM	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	327307	04/27/20 01:06	JCM	TAL SEA

Lab Chronicle

Client: Farallon Consulting LLC
Job ID: 580-94298-1
Project/Site: BNSF Skykomish Ground Water

Client Sample ID: GW-2-042220
Lab Sample ID: 580-94298-13
Date Collected: 04/22/20 14:50
Matrix: Water
Date Received: 04/24/20 13:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			327305	04/26/20 14:42	JCM	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	327307	04/27/20 01:26	JCM	TAL SEA

Client Sample ID: S2-AD-042220
Lab Sample ID: 580-94298-14
Date Collected: 04/22/20 11:57
Matrix: Water
Date Received: 04/24/20 13:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			327305	04/26/20 14:42	JCM	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	327307	04/27/20 02:06	JCM	TAL SEA

Laboratory References:

TAL SEA = Eurofins TestAmerica, Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Farallon Consulting LLC
Job ID: 580-94298-1
Project/Site: BNSF Skykomish Ground Water

Laboratory: Eurofins TestAmerica, Seattle

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Washington	State	C553	02-18-21

Sample Summary

Client: Farallon Consulting LLC
Job ID: 580-94298-1
Project/Site: BNSF Skykomish Ground Water

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
580-94298-1	S2-BU-042220	Water	04/22/20 10:00	04/24/20 13:20	
580-94298-2	S2-BD-042220	Water	04/22/20 10:30	04/24/20 13:20	
580-94298-3	WG-EV-042220	Water	04/22/20 10:57	04/24/20 13:20	
580-94298-4	S2-AU-042220	Water	04/22/20 11:28	04/24/20 13:20	
580-94298-5	GW-1-042220	Water	04/22/20 10:30	04/24/20 13:20	
580-94298-6	5-W-43-042220	Water	04/22/20 11:25	04/24/20 13:20	
580-94298-7	WG-WV-042220	Water	04/22/20 12:30	04/24/20 13:20	
580-94298-8	FWG-EV-042220	Water	04/22/20 13:10	04/24/20 13:20	
580-94298-9	FWG-WV-042220	Water	04/22/20 13:45	04/24/20 13:20	
580-94298-10	EW-1-042220	Water	04/22/20 12:22	04/24/20 13:20	
580-94298-11	PZ-8-042220	Water	04/22/20 13:12	04/24/20 13:20	
580-94298-12	PZ-7S-042220	Water	04/22/20 14:05	04/24/20 13:20	
580-94298-13	GW-2-042220	Water	04/22/20 14:50	04/24/20 13:20	
580-94298-14	S2-AD-042220	Water	04/22/20 11:57	04/24/20 13:20	

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Seattle
5755 8th Street E.
Tacoma, WA 98424
Tel. 253-922-2310
Fax 253-922-5047
www.testamericainc.com

☐ Rush
☐ Short Hold

Chain of Custody Record

Client	Client Contact	Date	Chain of Custody Number
Farallon Consulting	Peter Kingston	4/22/2020	39240
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page**
975 5th AVE NW	(206)-200-2346	94298	Page 1 of 2
City / **State** / **Zip Code**	**Sampler**	**Lab Contact**	
Issaquah / WA / 98027	Greg Peters		
Project Name and Location (State)	**Billing Contact**		
BNSF - Bi Monthly, Skykomish, WA			
Contract/Purchase Order/Quote No.			
653-067			

580-94298 Chain of Custody

	Sample I.D. and Location/Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Analysis: NWTPH Dx
-1	S2-BU-042220	4/22/20	1000		X									X
	S2-BD-042220	4/22/20	1030		X									X
-3	WG-EV-042220	4/22/20	1057		X									X
	S2-AU-042220	4/22/20	1128		X									X
-5	GW-1-042220	4/22/20	1030		X									X
	S-W-43-042220	4/22/20	1125		X									X
-7	WG-WV-042220	4/22/20	1230		X									X
	FWG-EV-042220	4/22/20	1310		X									X
-9	FWG-WV-042220	4/22/20	1345		X									X
	EW-1-042220	4/22/20	1222		X									X
-11	PZ-8-042220	4/22/20	1312		X									X
	PZ-75-042220	4/22/20	1405		X									X

Therm. ID: IR6 Cor: 1.7 ° Unc: 2.1 °
Cooler Dsc: Lg Blue
Packing: Bub
Cust. Seal: Yes ___ No X
Blue Ice (Wet) Dry, None
FedEx: ___ UPS: ___ Lab Cour: X Other: ___

Therm. ID: IR6 Cor: 1.0 ° Unc: 0.6 °
Cooler Dsc: Lg Blue
Packing: Bub
Cust. Seal: Yes ___ No X
Blue Ice, (Wet) Dry, None
FedEx: ___ UPS: ___ Lab Cour: ___ Other: ___

Therm. ID: IR6 Cor: 0.8 ° Unc: 0.4 °
Cooler Dsc: Lg Blue
Packing: Bub
Cust. Seal: Yes ___ No X
Blue Ice, (Wet) Dry, None
FedEx: ___ UPS: ___ Lab Cour: ___ Other: ___

Cooler: ☒ Yes ☐ No Cooler Temp: ___

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☒ Disposal By Lab ☐ Archive For ___ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required (business days): ☐ 24 Hours ☐ 48 Hours ☐ ~~5 Days~~ ☐ 10 Days ☐ 15 Days ☒ Other 3-DAYS

QC Requirements (Specify):

	Date	Time
1. Relinquished By Sign/Print		
2. Relinquished By Sign/Print		
3. Relinquished By Sign/Print		

	Date	Time
1. Received By Sign/Print Tom Blankinship	4/24/20	1320
2. Received By Sign/Print		
3. Received By Sign/Print		

Comments

DISTRIBUTION: WHITE – Stays with the Samples; CANARY – Returned to Client with Report; PINK – Field Copy

TAL-8274-580 (0210)

4/27/2020

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Seattle
5755 8th Street E.
Tacoma, WA 98424
Tel. 253-922-2310
Fax 253-922-5047
www.testamericainc.com

☐ Rush
☐ Short Hold

Chain of Custody Record

Client: Farallon Consulting	Client Contact: Peter Kingston	Date: 4/22/2020	Chain of Custody Number: 39241
Address: 975 5th AVE NW	Telephone Number (Area Code)/Fax Number: (206)-200-2346	Lab Number: 94298	Page 2 of 2
City: Issaquah / State: WA / Zip Code: 98027	Sampler: Greg Peters	Lab Contact:	
Project Name and Location (State): BNSF-Bimonthly, Skykomish, WA	Billing Contact:		
Contract/Purchase Order/Quote No.: 683-067			

	Sample I.D. and Location/Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Analysis: NWTPH Dx	Special Instructions/ Conditions of Receipt
-13	GW-2-042220	4/22/20	1450		X									X	
	S2-AD-042220	4/22/20	1157		X									X	

Cooler: ☒ Yes ☐ No Cooler Temp: ____

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☒ Disposal By Lab ☐ Archive For ____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required (business days): ☐ 24 Hours ☐ 48 Hours ☐ 5 Days ☐ 10 Days ☐ 15 Days ☒ Other 3-DAYS

QC Requirements (Specify):

	Date	Time
1. Relinquished By Sign/Print		
2. Relinquished By Sign/Print		
3. Relinquished By Sign/Print		

	Date	Time
1. Received By Sign/Print: Tom Blankenship	4/24/20	1320
2. Received By Sign/Print		
3. Received By Sign/Print		

Comments:

DISTRIBUTION: WHITE – Stays with the Samples; CANARY – Returned to Client with Report; PINK – Field Copy

TAL-8274-580 (0210)

4/27/2020

Login Sample Receipt Checklist

Client: Farallon Consulting LLC

Job Number: 580-94298-1

Login Number: 94298

List Source: Eurofins TestAmerica, Seattle

List Number: 1

Creator: Blankinship, Tom X

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
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.	False	COC not relinquished.
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.	True	Refer to Job Narrative for details.
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").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

Laboratory Job ID: 580-95605-1
Client Project/Site: BNSF Skykomish NPDES

For:
Farallon Consulting LLC
975 5th Avenue NW
Suite 100
Issaquah, Washington 98027

Attn: Peter Kingston

Authorized for release by:
6/30/2020 11:31:33 AM

Nathan Lewis, Project Manager I
(253)922-2310
nathan.lewis@testamericainc.com

Table of Contents

Job ID: 580-95605-1

Laboratory: Eurofins TestAmerica, Seattle

Narrative

CASE NARRATIVE
Client: Farallon Consulting LLC
Project: BNSF Skykomish NPDES
Report Number: 580-95605-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

It should be noted that samples with elevated Reporting Limits (RLs) resulting from a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the RLs are an unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes within the calibration range of the instrument or that reduces the interferences thereby enabling the quantification of target analytes.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 06/25/2020; the samples arrived in good condition, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 7.1º C, 8.0º C and 9.2º C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

RECEIPT EXCEPTIONS
The following sample were received at the laboratory outside the required temperature criteria: GW-2-062320 (580-95605-1), GW-20-062320 (580-95605-2), S2-BD-062320 (580-95605-3), S2-BU-062320 (580-95605-4), W6-EV-062320 (580-95605-5), S2-AD-062320 (580-95605-6), S2-AU-062320 (580-95605-7), WG-WV-062320 (580-95605-8), FWG-EV-062320 (580-95605-9), FWG-WV-062320 (580-95605-10), PZ-75-062320 (580-95605-11), GW-1-062320 (580-95605-12), 5-W-43-062320 (580-95605-13), EW-1-062320 (580-95605-14) and PZ-8-062320 (580-95605-15). All coolers had melted ice and several of the sample containers in each cooler had their temperatures taken.

DIESEL AND MOTOR OIL RANGE ORGANICS
Samples GW-2-062320 (580-95605-1), GW-20-062320 (580-95605-2), S2-BD-062320 (580-95605-3), S2-BU-062320 (580-95605-4), W6-EV-062320 (580-95605-5), S2-AD-062320 (580-95605-6), S2-AU-062320 (580-95605-7), WG-WV-062320 (580-95605-8), FWG-EV-062320 (580-95605-9), FWG-WV-062320 (580-95605-10), PZ-75-062320 (580-95605-11), GW-1-062320 (580-95605-12), 5-W-43-062320 (580-95605-13), EW-1-062320 (580-95605-14) and PZ-8-062320 (580-95605-15) were analyzed for diesel and motor oil range organics in accordance with Method NWTPH-Dx. The samples were prepared on 06/26/2020 and analyzed on 06/27/2020.

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

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

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish NPDES

Job ID: 580-95605-1

Client Sample ID: GW-2-062320
Date Collected: 06/23/20 09:54
Date Received: 06/25/20 13:00

Lab Sample ID: 580-95605-1
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062		mg/L		06/26/20 09:46	06/27/20 01:19	1
Motor Oil (>C24-C36)	ND		0.091		mg/L		06/26/20 09:46	06/27/20 01:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*72*		*50 - 150*	*06/26/20 09:46*	*06/27/20 01:19*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish NPDES

Job ID: 580-95605-1

Client Sample ID: GW-20-062320
Date Collected: 06/23/20 10:00
Date Received: 06/25/20 13:00

Lab Sample ID: 580-95605-2
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062		mg/L		06/26/20 09:46	06/27/20 01:39	1
Motor Oil (>C24-C36)	ND		0.091		mg/L		06/26/20 09:46	06/27/20 01:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*79*		*50 - 150*	*06/26/20 09:46*	*06/27/20 01:39*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish NPDES

Job ID: 580-95605-1

Client Sample ID: S2-BD-062320
Date Collected: 06/23/20 09:36
Date Received: 06/25/20 13:00

Lab Sample ID: 580-95605-3
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062		mg/L		06/26/20 09:46	06/27/20 01:59	1
Motor Oil (>C24-C36)	ND		0.091		mg/L		06/26/20 09:46	06/27/20 01:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*74*		*50 - 150*	*06/26/20 09:46*	*06/27/20 01:59*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish NPDES

Job ID: 580-95605-1

Client Sample ID: S2-BU-062320
Date Collected: 06/23/20 09:36
Date Received: 06/25/20 13:00

Lab Sample ID: 580-95605-4
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	**0.075**		0.062		mg/L		06/26/20 09:46	06/27/20 02:19	1
Motor Oil (>C24-C36)	ND		0.091		mg/L		06/26/20 09:46	06/27/20 02:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*62*		*50 - 150*	*06/26/20 09:46*	*06/27/20 02:19*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish NPDES

Job ID: 580-95605-1

Client Sample ID: W6-EV-062320
Date Collected: 06/23/20 10:21
Date Received: 06/25/20 13:00

Lab Sample ID: 580-95605-5
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.39		0.062		mg/L		06/26/20 09:46	06/27/20 02:39	1
Motor Oil (>C24-C36)	0.34		0.091		mg/L		06/26/20 09:46	06/27/20 02:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*74*		*50 - 150*	*06/26/20 09:46*	*06/27/20 02:39*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish NPDES

Job ID: 580-95605-1

Client Sample ID: S2-AD-062320
Date Collected: 06/23/20 10:35
Date Received: 06/25/20 13:00

Lab Sample ID: 580-95605-6
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062		mg/L		06/26/20 09:46	06/27/20 02:59	1
Motor Oil (>C24-C36)	ND		0.091		mg/L		06/26/20 09:46	06/27/20 02:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*67*		*50 - 150*	*06/26/20 09:46*	*06/27/20 02:59*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish NPDES

Job ID: 580-95605-1

Client Sample ID: S2-AU-062320
Date Collected: 06/23/20 10:41
Date Received: 06/25/20 13:00

Lab Sample ID: 580-95605-7
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062		mg/L		06/26/20 09:46	06/27/20 03:40	1
Motor Oil (>C24-C36)	ND		0.092		mg/L		06/26/20 09:46	06/27/20 03:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*77*		*50 - 150*	*06/26/20 09:46*	*06/27/20 03:40*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish NPDES

Job ID: 580-95605-1

Client Sample ID: WG-WV-062320
Date Collected: 06/23/20 11:06
Date Received: 06/25/20 13:00

Lab Sample ID: 580-95605-8
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.083		0.062		mg/L		06/26/20 09:46	06/27/20 04:00	1
Motor Oil (>C24-C36)	0.15		0.091		mg/L		06/26/20 09:46	06/27/20 04:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*69*		*50 - 150*	*06/26/20 09:46*	*06/27/20 04:00*	*1*

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish NPDES

Job ID: 580-95605-1

Client Sample ID: FWG-EV-062320

Date Collected: 06/23/20 12:02
Date Received: 06/25/20 13:00

Lab Sample ID: 580-95605-9

Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062		mg/L		06/26/20 09:46	06/27/20 04:20	1
Motor Oil (>C24-C36)	ND		0.091		mg/L		06/26/20 09:46	06/27/20 04:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*69*		*50 - 150*	*06/26/20 09:46*	*06/27/20 04:20*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish NPDES

Job ID: 580-95605-1

Client Sample ID: FWG-WV-062320
Date Collected: 06/23/20 12:05
Date Received: 06/25/20 13:00

Lab Sample ID: 580-95605-10
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062		mg/L		06/26/20 09:46	06/27/20 04:40	1
Motor Oil (>C24-C36)	ND		0.091		mg/L		06/26/20 09:46	06/27/20 04:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*70*		*50 - 150*	*06/26/20 09:46*	*06/27/20 04:40*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish NPDES

Job ID: 580-95605-1

Client Sample ID: PZ-75-062320
Date Collected: 06/23/20 11:58
Date Received: 06/25/20 13:00

Lab Sample ID: 580-95605-11
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062		mg/L		06/26/20 09:46	06/27/20 05:00	1
Motor Oil (>C24-C36)	**0.11**		0.091		mg/L		06/26/20 09:46	06/27/20 05:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*66*		*50 - 150*	*06/26/20 09:46*	*06/27/20 05:00*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish NPDES

Job ID: 580-95605-1

Client Sample ID: GW-1-062320
Date Collected: 06/23/20 12:08
Date Received: 06/25/20 13:00

Lab Sample ID: 580-95605-12
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062		mg/L		06/26/20 09:46	06/27/20 05:20	1
Motor Oil (>C24-C36)	ND		0.091		mg/L		06/26/20 09:46	06/27/20 05:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*67*		*50 - 150*	*06/26/20 09:46*	*06/27/20 05:20*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish NPDES

Job ID: 580-95605-1

Client Sample ID: 5-W-43-062320
Date Collected: 06/23/20 14:22
Date Received: 06/25/20 13:00

Lab Sample ID: 580-95605-13
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062		mg/L		06/26/20 09:46	06/27/20 05:40	1
Motor Oil (>C24-C36)	ND		0.091		mg/L		06/26/20 09:46	06/27/20 05:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*72*		*50 - 150*	*06/26/20 09:46*	*06/27/20 05:40*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish NPDES

Job ID: 580-95605-1

Client Sample ID: EW-1-062320
Date Collected: 06/23/20 14:21
Date Received: 06/25/20 13:00

Lab Sample ID: 580-95605-14
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062		mg/L		06/26/20 09:46	06/27/20 06:00	1
Motor Oil (>C24-C36)	ND		0.091		mg/L		06/26/20 09:46	06/27/20 06:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*72*		*50 - 150*	*06/26/20 09:46*	*06/27/20 06:00*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish NPDES

Job ID: 580-95605-1

Client Sample ID: PZ-8-062320
Date Collected: 06/23/20 15:39
Date Received: 06/25/20 13:00

Lab Sample ID: 580-95605-15
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062		mg/L		06/26/20 09:46	06/27/20 06:20	1
Motor Oil (>C24-C36)	ND		0.091		mg/L		06/26/20 09:46	06/27/20 06:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*58*		*50 - 150*	*06/26/20 09:46*	*06/27/20 06:20*	*1*

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

Lab Sample ID: MB 580-331672/1-A
Matrix: Water
Analysis Batch: 331729

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 331672

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.065		mg/L		06/26/20 09:46	06/27/20 00:19	1
Motor Oil (>C24-C36)	ND		0.096		mg/L		06/26/20 09:46	06/27/20 00:19	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*77*		*50 - 150*	*06/26/20 09:46*	*06/27/20 00:19*	*1*

Lab Sample ID: LCS 580-331672/2-A
Matrix: Water
Analysis Batch: 331729

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 331672

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
#2 Diesel (C10-C24)			0.500	0.450		mg/L		90	50 - 120		
Motor Oil (>C24-C36)			0.500	0.556		mg/L		111	64 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl	*83*		*50 - 150*

Lab Sample ID: LCSD 580-331672/3-A
Matrix: Water
Analysis Batch: 331741

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 331672

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
#2 Diesel (C10-C24)			0.500	0.502		mg/L		100	50 - 120	11	26
Motor Oil (>C24-C36)			0.500	0.538		mg/L		108	64 - 120	3	24

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o-Terphenyl	*78*		*50 - 150*

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish NPDES

Job ID: 580-95605-1

Client Sample ID: GW-2-062320
Date Collected: 06/23/20 09:54
Date Received: 06/25/20 13:00

Lab Sample ID: 580-95605-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			331672	06/26/20 09:46	RJL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	331729	06/27/20 01:19	W1T	TAL SEA

Client Sample ID: GW-20-062320
Date Collected: 06/23/20 10:00
Date Received: 06/25/20 13:00

Lab Sample ID: 580-95605-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			331672	06/26/20 09:46	RJL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	331729	06/27/20 01:39	W1T	TAL SEA

Client Sample ID: S2-BD-062320
Date Collected: 06/23/20 09:36
Date Received: 06/25/20 13:00

Lab Sample ID: 580-95605-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			331672	06/26/20 09:46	RJL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	331729	06/27/20 01:59	W1T	TAL SEA

Client Sample ID: S2-BU-062320
Date Collected: 06/23/20 09:36
Date Received: 06/25/20 13:00

Lab Sample ID: 580-95605-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			331672	06/26/20 09:46	RJL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	331729	06/27/20 02:19	W1T	TAL SEA

Client Sample ID: W6-EV-062320
Date Collected: 06/23/20 10:21
Date Received: 06/25/20 13:00

Lab Sample ID: 580-95605-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			331672	06/26/20 09:46	RJL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	331729	06/27/20 02:39	W1T	TAL SEA

Client Sample ID: S2-AD-062320
Date Collected: 06/23/20 10:35
Date Received: 06/25/20 13:00

Lab Sample ID: 580-95605-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			331672	06/26/20 09:46	RJL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	331729	06/27/20 02:59	W1T	TAL SEA

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish NPDES

Job ID: 580-95605-1

Client Sample ID: S2-AU-062320
Lab Sample ID: 580-95605-7
Date Collected: 06/23/20 10:41
Matrix: Water
Date Received: 06/25/20 13:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			331672	06/26/20 09:46	RJL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	331729	06/27/20 03:40	W1T	TAL SEA

Client Sample ID: WG-WV-062320
Lab Sample ID: 580-95605-8
Date Collected: 06/23/20 11:06
Matrix: Water
Date Received: 06/25/20 13:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			331672	06/26/20 09:46	RJL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	331729	06/27/20 04:00	W1T	TAL SEA

Client Sample ID: FWG-EV-062320
Lab Sample ID: 580-95605-9
Date Collected: 06/23/20 12:02
Matrix: Water
Date Received: 06/25/20 13:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			331672	06/26/20 09:46	RJL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	331729	06/27/20 04:20	W1T	TAL SEA

Client Sample ID: FWG-WV-062320
Lab Sample ID: 580-95605-10
Date Collected: 06/23/20 12:05
Matrix: Water
Date Received: 06/25/20 13:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			331672	06/26/20 09:46	RJL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	331729	06/27/20 04:40	W1T	TAL SEA

Client Sample ID: PZ-75-062320
Lab Sample ID: 580-95605-11
Date Collected: 06/23/20 11:58
Matrix: Water
Date Received: 06/25/20 13:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			331672	06/26/20 09:46	RJL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	331729	06/27/20 05:00	W1T	TAL SEA

Client Sample ID: GW-1-062320
Lab Sample ID: 580-95605-12
Date Collected: 06/23/20 12:08
Matrix: Water
Date Received: 06/25/20 13:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			331672	06/26/20 09:46	RJL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	331729	06/27/20 05:20	W1T	TAL SEA

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish NPDES

Job ID: 580-95605-1

Client Sample ID: 5-W-43-062320

Lab Sample ID: 580-95605-13

Date Collected: 06/23/20 14:22

Matrix: Water

Date Received: 06/25/20 13:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			331672	06/26/20 09:46	RJL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	331729	06/27/20 05:40	W1T	TAL SEA

Client Sample ID: EW-1-062320

Lab Sample ID: 580-95605-14

Date Collected: 06/23/20 14:21

Matrix: Water

Date Received: 06/25/20 13:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			331672	06/26/20 09:46	RJL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	331729	06/27/20 06:00	W1T	TAL SEA

Client Sample ID: PZ-8-062320

Lab Sample ID: 580-95605-15

Date Collected: 06/23/20 15:39

Matrix: Water

Date Received: 06/25/20 13:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			331672	06/26/20 09:46	RJL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	331729	06/27/20 06:20	W1T	TAL SEA

Laboratory References:

TAL SEA = Eurofins TestAmerica, Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Farallon Consulting LLC
Job ID: 580-95605-1
Project/Site: BNSF Skykomish NPDES

Laboratory: Eurofins TestAmerica, Seattle

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Washington	State	C553	02-18-21

Sample Summary

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish NPDES

Job ID: 580-95605-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
580-95605-1	GW-2-062320	Water	06/23/20 09:54	06/25/20 13:00	
580-95605-2	GW-20-062320	Water	06/23/20 10:00	06/25/20 13:00	
580-95605-3	S2-BD-062320	Water	06/23/20 09:36	06/25/20 13:00	
580-95605-4	S2-BU-062320	Water	06/23/20 09:36	06/25/20 13:00	
580-95605-5	W6-EV-062320	Water	06/23/20 10:21	06/25/20 13:00	
580-95605-6	S2-AD-062320	Water	06/23/20 10:35	06/25/20 13:00	
580-95605-7	S2-AU-062320	Water	06/23/20 10:41	06/25/20 13:00	
580-95605-8	WG-WV-062320	Water	06/23/20 11:06	06/25/20 13:00	
580-95605-9	FWG-EV-062320	Water	06/23/20 12:02	06/25/20 13:00	
580-95605-10	FWG-WV-062320	Water	06/23/20 12:05	06/25/20 13:00	
580-95605-11	PZ-75-062320	Water	06/23/20 11:58	06/25/20 13:00	
580-95605-12	GW-1-062320	Water	06/23/20 12:08	06/25/20 13:00	
580-95605-13	5-W-43-062320	Water	06/23/20 14:22	06/25/20 13:00	
580-95605-14	EW-1-062320	Water	06/23/20 14:21	06/25/20 13:00	
580-95605-15	PZ-8-062320	Water	06/23/20 15:39	06/25/20 13:00	

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Seattle
5755 8th Street E.
Tacoma, WA 98424
Tel. 253-922-2310
Fax 253-922-5047
www.testamericainc.com

☒ Rush
☐ Short Hold

Chain of Custody Record

Client	Client Contact	Date	Chain of Custody Number
Farallon	Pete Kingston		39069
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page** 1 of 2
975 5th AVE NW	425-394-4146		
City / **State** / **Zip Code**	**Sampler**	**Lab Contact**	
Issaquah / WA / 98027	Greg Peters		
Project Name and Location (State)	**Billing Contact**		
BNSF Skykomish, Washington (Bi-Monthly)			
Contract/Purchase Order/Quote No.			
683-067			

Sample I.D. and Location/Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Analysis: NWTPH-Dx	Special Instructions/ Conditions of Receipt
GW-2-062320	6/23/20	0954		X						X			X	
GW-20-062320	6/23/20	1000											X	
S2-BD-062320		0936											X	
S2-BU-062320		0936											X	
WG-EV-062320		1021											X	
S2-AD-062320		1035											X	
S2-AO-062320		1041											X	
WG-WV-062320		1106											X	
FWG-EV-062320		1202											X	
FWG-WV-062320		1205											X	
PZ-75-062320		1158											X	
GW-1-062320		1208											X	

Cooler: ☐ Yes ☐ No Cooler Temp: _____

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
(A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required (business days)
☐ 24 Hours ☐ 48 Hours ☐ 5 Days ☐ 10 Days ☐ 15 Days ☒ Other 3-days

QC Requirements (Specify)

	Relinquished By Sign/Print	Date	Time	Received By Sign/Print	Date	Time
1.	Ryan Ostrom Ryan Ostrom	6/25/20	1000	Q. Powell	6/25/20	1000
2.	Q. Powell	6/25/20	100	R Peters	6/25/20	1300
3.						

Comments

580-95605 Chain of Custody

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Seattle
5755 8th Street E.
Tacoma, WA 98424
Tel. 253-922-2310
Fax 253-922-5047
www.testamericainc.com

☒ Rush
☐ Short Hold

Chain of Custody Record

Client	Client Contact	Date	Chain of Custody Number
Favallon	Pete Kingston		39068
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page 2 of 2**
975 5th AVE NW	425-394-4146		
City	**State / Zip Code**	**Sampler**	**Lab Contact**
Issaquah	WA 98027	Greg Peters	
Project Name and Location (State)	**Billing Contact**		
BNSF Skykomish, Washington (Bi Monthly)			
Contract/Purchase Order/Quote No.			
683-067			

Sample I.D. and Location/Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Analysis: NWTPH-Dx	Special Instructions/ Conditions of Receipt
5-W-43-062320	6/23/20	1422		X						X			X	
EW-1-062320	6/23/20	1421		X						X			X	
P2-B-062320	6/23/20	1539		X						X			X	

Cooler
☐ Yes ☐ No Cooler Temp: _____

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
(A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required (business days)
☐ 24 Hours ☐ 48 Hours ☐ 5 Days ☐ 10 Days ☐ 15 Days ☒ Other 3-days

QC Requirements (Specify)

	Relinquished By Sign/Print	Date	Time	Received By Sign/Print	Date	Time
1.	Ryan Ostrom Ryan Ostrom	6/25/20	1000	Q. Powell	6/25/20	1000
2.	Q. Powell	6/25/20	100	KPrest	6/25/20	1300
3.						

Comments

DISTRIBUTION: WHITE – Stays with the Samples; CANARY – Returned to Client with Report; PINK – Field Copy

Farallon

Therm. ID: IR6 Cor: 7.9 ° Unc: 7.9 °
Cooler Dsc: 5
Packing: Bub
Cust. Seal: Yes No X
Blue Ice, Wet, Dry, None
Melted Several temps taken
FedEx:
UPS:
Lab Cour: X
Other:

Therm. ID: A2 Cor: 10.4 ° Unc: 10.5 °
Cooler Dsc: 2
Packing: Bub
Cust. Seal: Yes No X
Blue Ice, Wet, Dry, None
Melted Several temps taken
FedEx:
UPS:
Lab Cour: X
Other:

Therm. ID: A2 Cor: 8.0 ° Unc: 8.1 °
Cooler Dsc: 4 Blue
Packing: Bub
Cust. Seal: Yes No X
Blue Ice, Wet, Dry, None
Several temps taken
FedEx:
UPS:
Lab Cour: X
Other:

Therm. ID: IR2 Cor: 7.1 ° Unc: 7.2 °
Cooler Dsc: 6
Packing: Bub
Cust. Seal: Yes No X
Blue Ice, Wet, Dry, None
Melted
FedEx:
UPS:
Lab Cour: X
Other:

Therm. ID: IR1 Cor: 9.2 ° Unc: 9.3 °
Cooler Dsc: 5a Blue
Packing: Bub
Cust. Seal: Yes No X
Blue Ice, Wet, Dry, None
Melted Several temps taken
FedEx:
UPS:
Lab Cour: X
Other:

Therm. ID: A2 Cor: 10.4 ° Unc: 10.5 °
Cooler Dsc: 1
Packing: Bub
Cust. Seal: Yes No X
Blue Ice, Wet, Dry, None
Melted Several taken
FedEx:
UPS:
Lab Cour: X
Other:

Therm. ID: IR6 Cor: 8.9 ° Unc: 8.9 °
Cooler Dsc: 4 Blue
Packing: Bub
Cust. Seal: Yes No X
Blue Ice, Wet, Dry, None
Melted Several temps taken
FedEx:
UPS:
Lab Cour: X
Other:

Therm. ID: IR6 Cor: 9.8 ° Unc: 9.8 °
Cooler Dsc: 4 Blue
Packing: Bub
Cust. Seal: Yes No X
Blue Ice, Wet, Dry, None
Melted Several temps taken
FedEx:
UPS:
Lab Cour: X
Other:

Login Sample Receipt Checklist

Client: Farallon Consulting LLC

Job Number: 580-95605-1

Login Number: 95605
List Number: 1
Creator: Presley, Kim A

List Source: Eurofins TestAmerica, Seattle

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.	True	
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.	False	Cooler temperature outside required temperature criteria.
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.	True	
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	

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

Laboratory Job ID: 580-97078-1
Client Project/Site: BNSF Skykomish-Bi Monthly

For:
Farallon Consulting LLC
975 5th Avenue NW
Suite 100
Issaquah, Washington 98027

Attn: Peter Kingston

Authorized for release by:
9/1/2020 3:39:37 PM

Nathan Lewis, Project Manager I
(253)922-2310
Nathan.Lewis@Eurofinset.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Job ID: 580-97078-1

Laboratory: Eurofins TestAmerica, Seattle

Narrative

CASE NARRATIVE
Client: Farallon Consulting LLC
Project: BNSF Skykomish-Bi Monthly
Report Number: 580-97078-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

It should be noted that samples with elevated Reporting Limits (RLs) resulting from a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the RLs are an unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes within the calibration range of the instrument or that reduces the interferences thereby enabling the quantification of target analytes.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 08/27/2020; the samples arrived in good condition, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.5º C and 0.6º C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

RECEIPT EXCEPTIONS
One of the containers for the following sample was received broken: P2-75-082520 (580-97078-9).

DIESEL AND MOTOR OIL RANGE ORGANICS
Samples GW-1-082520 (580-97078-1), 5-W-43-082520 (580-97078-2), EW-1-082520 (580-97078-3), FWG-WV-082520 (580-97078-4), FWG-EV-082520 (580-97078-5), P2-8-082520 (580-97078-6), WG-EV-082520 (580-97078-7), WG-WV-082520 (580-97078-8), P2-75-082520 (580-97078-9), S2-AU-082520 (580-97078-10), S2-AD-082520 (580-97078-11), GW-2-082520 (580-97078-12), S2-BD-082520 (580-97078-13) and S2-BU-082520 (580-97078-14) were analyzed for diesel and motor oil range organics in accordance with Method NWTPH-Dx. The samples were prepared on 08/28/2020 and analyzed on 08/30/2020 and 08/31/2020.

The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for preparation batch 580-336966 and analytical batch 580-337071 recovered outside control limits for the following analytes: #2 Diesel (C10-C24) and Motor Oil (>C24-C36).

The following samples contained a hydrocarbon pattern in the diesel range; however, the elution pattern was later than the typical diesel fuel pattern used by the laboratory for quantitative purposes: GW-1-082520 (580-97078-1), 5-W-43-082520 (580-97078-2), EW-1-082520 (580-97078-3), FWG-WV-082520 (580-97078-4), FWG-EV-082520 (580-97078-5), P2-8-082520 (580-97078-6), WG-EV-082520 (580-97078-7), WG-WV-082520 (580-97078-8), P2-75-082520 (580-97078-9) and S2-BU-082520 (580-97078-14).

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

Definitions/Glossary

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish-Bi Monthly

Job ID: 580-97078-1

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
*1	LCS/LCSD RPD exceeds control limits.

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

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish-Bi Monthly

Job ID: 580-97078-1

Client Sample ID: GW-1-082520
Date Collected: 08/25/20 09:09
Date Received: 08/27/20 14:25

Lab Sample ID: 580-97078-1
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND	*1	0.062		mg/L		08/28/20 10:43	08/30/20 23:43	1
Motor Oil (>C24-C36)	ND	*1	0.091		mg/L		08/28/20 10:43	08/30/20 23:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*78*		*50 - 150*	*08/28/20 10:43*	*08/30/20 23:43*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish-Bi Monthly

Job ID: 580-97078-1

Client Sample ID: 5-W-43-082520
Date Collected: 08/25/20 09:51
Date Received: 08/27/20 14:25

Lab Sample ID: 580-97078-2
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND	*1	0.062		mg/L		08/28/20 10:43	08/31/20 00:04	1
Motor Oil (>C24-C36)	ND	*1	0.091		mg/L		08/28/20 10:43	08/31/20 00:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*71*		*50 - 150*	*08/28/20 10:43*	*08/31/20 00:04*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish-Bi Monthly

Job ID: 580-97078-1

Client Sample ID: EW-1-082520
Date Collected: 08/25/20 10:34
Date Received: 08/27/20 14:25

Lab Sample ID: 580-97078-3
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND	*1	0.062		mg/L		08/28/20 10:43	08/31/20 00:24	1
Motor Oil (>C24-C36)	ND	*1	0.091		mg/L		08/28/20 10:43	08/31/20 00:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*80*		*50 - 150*	*08/28/20 10:43*	*08/31/20 00:24*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish-Bi Monthly

Job ID: 580-97078-1

Client Sample ID: FWG-WV-082520
Date Collected: 08/25/20 10:47
Date Received: 08/27/20 14:25

Lab Sample ID: 580-97078-4
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND	*1	0.062		mg/L		08/28/20 10:43	08/31/20 00:44	1
Motor Oil (>C24-C36)	ND	*1	0.091		mg/L		08/28/20 10:43	08/31/20 00:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*79*		*50 - 150*	*08/28/20 10:43*	*08/31/20 00:44*	*1*

Client Sample ID: FWG-EV-082520

Date Collected: 08/25/20 11:20
Date Received: 08/27/20 14:25

Lab Sample ID: 580-97078-5

Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND	*1	0.062		mg/L		08/28/20 10:43	08/31/20 01:04	1
Motor Oil (>C24-C36)	ND	*1	0.091		mg/L		08/28/20 10:43	08/31/20 01:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*75*		*50 - 150*	*08/28/20 10:43*	*08/31/20 01:04*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish-Bi Monthly

Job ID: 580-97078-1

Client Sample ID: P2-8-082520
Date Collected: 08/25/20 11:20
Date Received: 08/27/20 14:25

Lab Sample ID: 580-97078-6
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND	*1	0.062		mg/L		08/28/20 10:43	08/31/20 01:24	1
Motor Oil (>C24-C36)	ND	*1	0.091		mg/L		08/28/20 10:43	08/31/20 01:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*74*		*50 - 150*	*08/28/20 10:43*	*08/31/20 01:24*	*1*

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish-Bi Monthly

Job ID: 580-97078-1

Client Sample ID: WG-EV-082520
Date Collected: 08/25/20 12:04
Date Received: 08/27/20 14:25

Lab Sample ID: 580-97078-7
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.31	*1	0.062		mg/L		08/28/20 10:43	08/31/20 01:44	1
Motor Oil (>C24-C36)	0.20	*1	0.091		mg/L		08/28/20 10:43	08/31/20 01:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*76*		*50 - 150*	*08/28/20 10:43*	*08/31/20 01:44*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish-Bi Monthly

Job ID: 580-97078-1

Client Sample ID: WG-WV-082520
Date Collected: 08/25/20 12:04
Date Received: 08/27/20 14:25

Lab Sample ID: 580-97078-8
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.13	*1	0.062		mg/L		08/28/20 10:43	08/31/20 02:04	1
Motor Oil (>C24-C36)	0.13	*1	0.091		mg/L		08/28/20 10:43	08/31/20 02:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*70*		*50 - 150*	*08/28/20 10:43*	*08/31/20 02:04*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish-Bi Monthly

Job ID: 580-97078-1

Client Sample ID: P2-75-082520
Date Collected: 08/25/20 12:09
Date Received: 08/27/20 14:25

Lab Sample ID: 580-97078-9
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.067	*1	0.062		mg/L		08/28/20 10:43	08/31/20 02:44	1
Motor Oil (>C24-C36)	0.21	*1	0.092		mg/L		08/28/20 10:43	08/31/20 02:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*74*		*50 - 150*	*08/28/20 10:43*	*08/31/20 02:44*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish-Bi Monthly

Job ID: 580-97078-1

Client Sample ID: S2-AU-082520
Date Collected: 08/25/20 13:42
Date Received: 08/27/20 14:25

Lab Sample ID: 580-97078-10
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND	*1	0.061		mg/L		08/28/20 10:43	08/31/20 03:05	1
Motor Oil (>C24-C36)	ND	*1	0.091		mg/L		08/28/20 10:43	08/31/20 03:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*71*		*50 - 150*	*08/28/20 10:43*	*08/31/20 03:05*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish-Bi Monthly

Job ID: 580-97078-1

Client Sample ID: S2-AD-082520
Date Collected: 08/25/20 13:42
Date Received: 08/27/20 14:25

Lab Sample ID: 580-97078-11
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND	*1	0.061		mg/L		08/28/20 10:43	08/31/20 03:25	1
Motor Oil (>C24-C36)	ND	*1	0.091		mg/L		08/28/20 10:43	08/31/20 03:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*79*		*50 - 150*	*08/28/20 10:43*	*08/31/20 03:25*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish-Bi Monthly

Job ID: 580-97078-1

Client Sample ID: GW-2-082520
Date Collected: 08/25/20 13:55
Date Received: 08/27/20 14:25

Lab Sample ID: 580-97078-12
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND	*1	0.062		mg/L		08/28/20 10:43	08/31/20 03:45	1
Motor Oil (>C24-C36)	ND	*1	0.091		mg/L		08/28/20 10:43	08/31/20 03:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*82*		*50 - 150*	*08/28/20 10:43*	*08/31/20 03:45*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish-Bi Monthly

Job ID: 580-97078-1

Client Sample ID: S2-BD-082520
Date Collected: 08/25/20 14:18
Date Received: 08/27/20 14:25

Lab Sample ID: 580-97078-13
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND	*1	0.062		mg/L		08/28/20 10:43	08/31/20 04:05	1
Motor Oil (>C24-C36)	ND	*1	0.091		mg/L		08/28/20 10:43	08/31/20 04:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*83*		*50 - 150*	*08/28/20 10:43*	*08/31/20 04:05*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish-Bi Monthly

Job ID: 580-97078-1

Client Sample ID: S2-BU-082520
Date Collected: 08/25/20 14:18
Date Received: 08/27/20 14:25

Lab Sample ID: 580-97078-14
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	**0.081**	***1**	0.062		mg/L		08/28/20 10:43	08/31/20 04:25	1
Motor Oil (>C24-C36)	ND	*1	0.091		mg/L		08/28/20 10:43	08/31/20 04:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*81*		*50 - 150*	*08/28/20 10:43*	*08/31/20 04:25*	*1*

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

Lab Sample ID: MB 580-336966/1-A
Matrix: Water
Analysis Batch: 337071

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 336966

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.065		mg/L		08/28/20 10:43	08/30/20 20:02	1
Motor Oil (>C24-C36)	ND		0.096		mg/L		08/28/20 10:43	08/30/20 20:02	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*79*		*50 - 150*	*08/28/20 10:43*	*08/30/20 20:02*	*1*

Lab Sample ID: LCS 580-336966/2-A
Matrix: Water
Analysis Batch: 337071

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 336966

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
#2 Diesel (C10-C24)			0.500	0.341		mg/L		68	50 - 120		
Motor Oil (>C24-C36)			0.500	0.422		mg/L		84	64 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl	*84*		*50 - 150*

Lab Sample ID: LCSD 580-336966/3-A
Matrix: Water
Analysis Batch: 337071

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 336966

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
#2 Diesel (C10-C24)			0.500	0.457	*1	mg/L		91	50 - 120	29	26
Motor Oil (>C24-C36)			0.500	0.553	*1	mg/L		111	64 - 120	27	24

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o-Terphenyl	*104*		*50 - 150*

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish-Bi Monthly

Job ID: 580-97078-1

Client Sample ID: GW-1-082520
Lab Sample ID: 580-97078-1
Date Collected: 08/25/20 09:09
Matrix: Water
Date Received: 08/27/20 14:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			336966	08/28/20 10:43	LEL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	337071	08/30/20 23:43	ADB	TAL SEA

Client Sample ID: 5-W-43-082520
Lab Sample ID: 580-97078-2
Date Collected: 08/25/20 09:51
Matrix: Water
Date Received: 08/27/20 14:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			336966	08/28/20 10:43	LEL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	337071	08/31/20 00:04	ADB	TAL SEA

Client Sample ID: EW-1-082520
Lab Sample ID: 580-97078-3
Date Collected: 08/25/20 10:34
Matrix: Water
Date Received: 08/27/20 14:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			336966	08/28/20 10:43	LEL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	337071	08/31/20 00:24	ADB	TAL SEA

Client Sample ID: FWG-WV-082520
Lab Sample ID: 580-97078-4
Date Collected: 08/25/20 10:47
Matrix: Water
Date Received: 08/27/20 14:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			336966	08/28/20 10:43	LEL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	337071	08/31/20 00:44	ADB	TAL SEA

Client Sample ID: FWG-EV-082520
Lab Sample ID: 580-97078-5
Date Collected: 08/25/20 11:20
Matrix: Water
Date Received: 08/27/20 14:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			336966	08/28/20 10:43	LEL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	337071	08/31/20 01:04	ADB	TAL SEA

Client Sample ID: P2-8-082520
Lab Sample ID: 580-97078-6
Date Collected: 08/25/20 11:20
Matrix: Water
Date Received: 08/27/20 14:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			336966	08/28/20 10:43	LEL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	337071	08/31/20 01:24	ADB	TAL SEA

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish-Bi Monthly

Job ID: 580-97078-1

Client Sample ID: WG-EV-082520
Lab Sample ID: 580-97078-7
Date Collected: 08/25/20 12:04
Matrix: Water
Date Received: 08/27/20 14:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			336966	08/28/20 10:43	LEL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	337071	08/31/20 01:44	ADB	TAL SEA

Client Sample ID: WG-WV-082520
Lab Sample ID: 580-97078-8
Date Collected: 08/25/20 12:04
Matrix: Water
Date Received: 08/27/20 14:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			336966	08/28/20 10:43	LEL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	337071	08/31/20 02:04	ADB	TAL SEA

Client Sample ID: P2-75-082520
Lab Sample ID: 580-97078-9
Date Collected: 08/25/20 12:09
Matrix: Water
Date Received: 08/27/20 14:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			336966	08/28/20 10:43	LEL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	337071	08/31/20 02:44	ADB	TAL SEA

Client Sample ID: S2-AU-082520
Lab Sample ID: 580-97078-10
Date Collected: 08/25/20 13:42
Matrix: Water
Date Received: 08/27/20 14:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			336966	08/28/20 10:43	LEL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	337071	08/31/20 03:05	ADB	TAL SEA

Client Sample ID: S2-AD-082520
Lab Sample ID: 580-97078-11
Date Collected: 08/25/20 13:42
Matrix: Water
Date Received: 08/27/20 14:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			336966	08/28/20 10:43	LEL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	337071	08/31/20 03:25	ADB	TAL SEA

Client Sample ID: GW-2-082520
Lab Sample ID: 580-97078-12
Date Collected: 08/25/20 13:55
Matrix: Water
Date Received: 08/27/20 14:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			336966	08/28/20 10:43	LEL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	337071	08/31/20 03:45	ADB	TAL SEA

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish-Bi Monthly

Job ID: 580-97078-1

Client Sample ID: S2-BD-082520

Lab Sample ID: 580-97078-13

Date Collected: 08/25/20 14:18

Matrix: Water

Date Received: 08/27/20 14:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			336966	08/28/20 10:43	LEL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	337071	08/31/20 04:05	ADB	TAL SEA

Client Sample ID: S2-BU-082520

Lab Sample ID: 580-97078-14

Date Collected: 08/25/20 14:18

Matrix: Water

Date Received: 08/27/20 14:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			336966	08/28/20 10:43	LEL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	337071	08/31/20 04:25	ADB	TAL SEA

Laboratory References:

TAL SEA = Eurofins TestAmerica, Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Farallon Consulting LLC
Job ID: 580-97078-1
Project/Site: BNSF Skykomish-Bi Monthly

Laboratory: Eurofins TestAmerica, Seattle

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Washington	State	C553	02-18-21

Sample Summary

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish-Bi Monthly

Job ID: 580-97078-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
580-97078-1	GW-1-082520	Water	08/25/20 09:09	08/27/20 14:25	
580-97078-2	5-W-43-082520	Water	08/25/20 09:51	08/27/20 14:25	
580-97078-3	EW-1-082520	Water	08/25/20 10:34	08/27/20 14:25	
580-97078-4	FWG-WV-082520	Water	08/25/20 10:47	08/27/20 14:25	
580-97078-5	FWG-EV-082520	Water	08/25/20 11:20	08/27/20 14:25	
580-97078-6	P2-8-082520	Water	08/25/20 11:20	08/27/20 14:25	
580-97078-7	WG-EV-082520	Water	08/25/20 12:04	08/27/20 14:25	
580-97078-8	WG-WV-082520	Water	08/25/20 12:04	08/27/20 14:25	
580-97078-9	P2-75-082520	Water	08/25/20 12:09	08/27/20 14:25	
580-97078-10	S2-AU-082520	Water	08/25/20 13:42	08/27/20 14:25	
580-97078-11	S2-AD-082520	Water	08/25/20 13:42	08/27/20 14:25	
580-97078-12	GW-2-082520	Water	08/25/20 13:55	08/27/20 14:25	
580-97078-13	S2-BD-082520	Water	08/25/20 14:18	08/27/20 14:25	
580-97078-14	S2-BU-082520	Water	08/25/20 14:18	08/27/20 14:25	

BNSF RAILWAY

CHAIN OF CUSTODY

LABORATORY INFORMATION

Laboratory: | Project Manager:
Address: | Phone:
City/State/ZIP: | Fax:

LAB WORK ORDER:

SHIPMENT INFORMATION

Shipment Method:
Tracking Number:

BNSF PROJECT INFORMATION

BNSF Project Number: 683-067
Project State of Origin: WA
Project City: Stykomish
BNSF Project Name: BNSF Stykomish - Bi Monthly
BNSF Contact:
BNSF Work Order No.:

CONSULTANT INFORMATION

Company: Farallon
Address: 975 5th AVE NW
City/State/ZIP: Issaquah, WA 98027
Project Number: 683-067
Project Manager: Amanda M
Email: AMenagpoit@farallonconsulting.com
Phone: 425-295-0800 Fax:

TURNAROUND TIME

- [ ] 1-day Rush
- [ ] 5- to 8-day Rush
- [ ] 2-day Rush
- [ ] Standard 10-Day
- [x] 3-day Rush
- [ ] Other

DELIVERABLES

- [ ] BNSF Standard (Level II)
- [ ] Level III
- [ ] Level IV
- [ ] Other Deliverables?
- [ ] EDD Req. Format?

METHODS FOR ANALYSIS

NWTPH-DX

Loc: 580
97078

SAMPLE INFORMATION

	Sample Identification	Containers	Sample Collection Date	Time	Sampler	Filtered Y/N	Type (Comp/Grab)	Matrix		COMMENTS	LAB USE
1	GW-1-082520	2	8/25/20	909	CP	N	G	W	X		
2	S-W-43-082520			951					X		
3	EW-1-082520			1034					X		
4	FWG-WW-082520			1047					X		
5	FWG-EW-082520			1120					X		
6	PZ-B-082520			1120					X		
7	WG-EW-082520			1204					X		
8	WG-WW-082520			1204					X		
9	PZ-75-082520			1209					X		
10	S2-AW-082520			1342					X		
11	S2-AD-082520			1342					X		
12	GW-2-082520			1355					X		
13	S2-BD-082520			1418					X		
14	S2-BW-082520			1418					X		
15											

Therm. ID: IR8 Cor: 2.5 ° Unc: 1.0 °
Cooler Dsc: 1.6
Packing: None
Cust. Seal: Yes ___ No X
Blue Ice, (Wet) Dry, None
FedEx: ___
UPS: ___
Lab Cour: X
Other: ___

Therm. ID: IR8 Cor: 0.6 ° Unc: 1.1 °
Cooler Dsc: 1.6
Packing: None
Cust. Seal: Yes ___ No X
Blue Ice, (Wet) Dry, None
FedEx: ___
UPS: ___
Lab Cour: X
Other: ___

Relinquished By:	Date/Time: 8/25/20 @1800	Received By:	Date/Time: 8/27/20 1425	Comments and Special Analytical Requirements: Picked up in lobby, signed at lab JLS 8/27/20
Relinquished By:	Date/Time:	Received By:	Date/Time:	
Relinquished By:	Date/Time:	Received By	Date/Time:	
	Date/Time:	Lab Remarks:	Lab: Custody Intact? ☐ Yes ☐ No	Custody Seal No. / BNSF COC No

DUPLICATE - CONSULTANT

TAL-1001 (0912)

580-97078 Chain of Custody

9/1/2020

Login Sample Receipt Checklist

Client: Farallon Consulting LLC

Job Number: 580-97078-1

Login Number: 97078
List Number: 1
Creator: Hobbs, Kenneth F

List Source: Eurofins TestAmerica, Seattle

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.	True	
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.	False	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
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").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

Laboratory Job ID: 580-98374-1
Client Project/Site: BNSF - Bimonthly

For:
Farallon Consulting LLC
975 5th Avenue NW
Suite 100
Issaquah, Washington 98027

Attn: Peter Kingston

Authorized for release by:
10/26/2020 1:30:43 PM

Nathan Lewis, Project Manager I
(253)922-2310
Nathan.Lewis@Eurofinset.com

Table of Contents

Job ID: 580-98374-1

Laboratory: Eurofins TestAmerica, Seattle

Narrative

Job Narrative
580-98374-1

Comments
No additional comments.

Receipt
The samples were received on 10/20/2020 11:42 AM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.7º C and 1.4º C.

GC Semi VOA
Method NWTPH-Dx: The continuing calibration verification (CCV) associated with batch 580-341453 recovered above the upper control limit for Motor Oil. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

Method NWTPH-Dx: Surrogate recovery for the following samples were outside control limits: FWG-WV-101920 (580-98374-7) and WG-EV-101920 (580-98374-10). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

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

Organic Prep
Method 3510C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with preparation batch 580-341314. A LCS/LCSD were used instead.

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

Definitions/Glossary

Client: Farallon Consulting LLC
Project/Site: BNSF - Bimonthly

Job ID: 580-98374-1

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
X	Surrogate recovery exceeds control limits

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

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF - Bimonthly

Job ID: 580-98374-1

Client Sample ID: GW-2-101920
Date Collected: 10/19/20 09:18
Date Received: 10/20/20 11:42

Lab Sample ID: 580-98374-1
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062	0.062	mg/L		10/21/20 10:44	10/22/20 12:30	1
Motor Oil (>C24-C36)	ND		0.091	0.091	mg/L		10/21/20 10:44	10/22/20 12:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*70*		*50 - 150*	*10/21/20 10:44*	*10/22/20 12:30*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF - Bimonthly

Job ID: 580-98374-1

Client Sample ID: GW-1-101920
Date Collected: 10/19/20 10:09
Date Received: 10/20/20 11:42

Lab Sample ID: 580-98374-2
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062	0.062	mg/L		10/21/20 10:44	10/22/20 12:50	1
Motor Oil (>C24-C36)	ND		0.091	0.091	mg/L		10/21/20 10:44	10/22/20 12:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*60*		*50 - 150*	*10/21/20 10:44*	*10/22/20 12:50*	*1*

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF - Bimonthly

Job ID: 580-98374-1

Client Sample ID: 5-W-43-101920
Date Collected: 10/19/20 11:00
Date Received: 10/20/20 11:42

Lab Sample ID: 580-98374-3
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062	0.062	mg/L		10/21/20 10:44	10/22/20 13:10	1
Motor Oil (>C24-C36)	ND		0.091	0.091	mg/L		10/21/20 10:44	10/22/20 13:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*70*		*50 - 150*	*10/21/20 10:44*	*10/22/20 13:10*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF - Bimonthly

Job ID: 580-98374-1

Client Sample ID: EW-1-101920
Date Collected: 10/19/20 11:49
Date Received: 10/20/20 11:42

Lab Sample ID: 580-98374-4
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062	0.062	mg/L		10/21/20 10:44	10/22/20 13:30	1
Motor Oil (>C24-C36)	ND		0.091	0.091	mg/L		10/21/20 10:44	10/22/20 13:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*60*		*50 - 150*	*10/21/20 10:44*	*10/22/20 13:30*	*1*

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF - Bimonthly

Job ID: 580-98374-1

Client Sample ID: P2-8-101920
Date Collected: 10/19/20 12:40
Date Received: 10/20/20 11:42

Lab Sample ID: 580-98374-5
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062	0.062	mg/L		10/21/20 10:44	10/22/20 13:50	1
Motor Oil (>C24-C36)	ND		0.091	0.091	mg/L		10/21/20 10:44	10/22/20 13:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*71*		*50 - 150*	*10/21/20 10:44*	*10/22/20 13:50*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF - Bimonthly

Job ID: 580-98374-1

Client Sample ID: P2-75-101920
Date Collected: 10/19/20 13:41
Date Received: 10/20/20 11:42

Lab Sample ID: 580-98374-6
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.098		0.062	0.062	mg/L		10/21/20 10:44	10/22/20 14:36	1
Motor Oil (>C24-C36)	0.16		0.091	0.091	mg/L		10/21/20 10:44	10/23/20 11:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*68*		*50 - 150*	*10/21/20 10:44*	*10/22/20 14:36*	*1*
o-Terphenyl	*71*		*50 - 150*	*10/21/20 10:44*	*10/23/20 11:56*	*1*

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: BNSF - Bimonthly

Job ID: 580-98374-1

Client Sample ID: FWG-WV-101920

Date Collected: 10/19/20 14:15
Date Received: 10/20/20 11:42

Lab Sample ID: 580-98374-7

Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062	0.062	mg/L		10/21/20 10:44	10/22/20 14:56	1
Motor Oil (>C24-C36)	ND		0.091	0.091	mg/L		10/21/20 10:44	10/22/20 14:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*49*	*X*	*50 - 150*	*10/21/20 10:44*	*10/22/20 14:56*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF - Bimonthly

Job ID: 580-98374-1

Client Sample ID: FWG-EV-101920
Date Collected: 10/19/20 14:42
Date Received: 10/20/20 11:42

Lab Sample ID: 580-98374-8
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062	0.062	mg/L		10/21/20 10:44	10/22/20 15:16	1
Motor Oil (>C24-C36)	ND		0.091	0.091	mg/L		10/21/20 10:44	10/22/20 15:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*63*		*50 - 150*	*10/21/20 10:44*	*10/22/20 15:16*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF - Bimonthly

Job ID: 580-98374-1

Client Sample ID: WG-WV-101920
Date Collected: 10/19/20 15:13
Date Received: 10/20/20 11:42

Lab Sample ID: 580-98374-9
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.18		0.062	0.062	mg/L		10/21/20 10:44	10/22/20 15:35	1
Motor Oil (>C24-C36)	0.19		0.091	0.091	mg/L		10/21/20 10:44	10/23/20 11:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*89*		*50 - 150*	*10/21/20 10:44*	*10/22/20 15:35*	*1*
o-Terphenyl	*81*		*50 - 150*	*10/21/20 10:44*	*10/23/20 11:36*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF - Bimonthly

Job ID: 580-98374-1

Client Sample ID: WG-EV-101920
Date Collected: 10/19/20 15:40
Date Received: 10/20/20 11:42

Lab Sample ID: 580-98374-10
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.24		0.062	0.062	mg/L		10/21/20 10:44	10/22/20 15:55	1
Motor Oil (>C24-C36)	0.15		0.091	0.091	mg/L		10/21/20 10:44	10/23/20 11:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*36*	*X*	*50 - 150*	*10/21/20 10:44*	*10/22/20 15:55*	*1*
o-Terphenyl	*40*	*X*	*50 - 150*	*10/21/20 10:44*	*10/23/20 11:16*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF - Bimonthly

Job ID: 580-98374-1

Client Sample ID: S2-AU-101920
Date Collected: 10/19/20 16:08
Date Received: 10/20/20 11:42

Lab Sample ID: 580-98374-11
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062	0.062	mg/L		10/21/20 10:44	10/22/20 16:15	1
Motor Oil (>C24-C36)	ND		0.091	0.091	mg/L		10/21/20 10:44	10/22/20 16:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*86*		*50 - 150*	*10/21/20 10:44*	*10/22/20 16:15*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF - Bimonthly

Job ID: 580-98374-1

Client Sample ID: S2-AD-101920
Date Collected: 10/19/20 16:32
Date Received: 10/20/20 11:42

Lab Sample ID: 580-98374-12
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062	0.062	mg/L		10/21/20 10:44	10/22/20 16:35	1
Motor Oil (>C24-C36)	ND		0.091	0.091	mg/L		10/21/20 10:44	10/22/20 16:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*69*		*50 - 150*	*10/21/20 10:44*	*10/22/20 16:35*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF - Bimonthly

Job ID: 580-98374-1

Client Sample ID: S2-BU-101920
Date Collected: 10/19/20 17:00
Date Received: 10/20/20 11:42

Lab Sample ID: 580-98374-13
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.20		0.062	0.062	mg/L		10/21/20 10:44	10/22/20 16:55	1
Motor Oil (>C24-C36)	0.10		0.091	0.091	mg/L		10/21/20 10:44	10/23/20 10:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*70*		*50 - 150*	*10/21/20 10:44*	*10/22/20 16:55*	*1*
o-Terphenyl	*66*		*50 - 150*	*10/21/20 10:44*	*10/23/20 10:57*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF - Bimonthly

Job ID: 580-98374-1

Client Sample ID: S2-BD-101920
Date Collected: 10/19/20 17:15
Date Received: 10/20/20 11:42

Lab Sample ID: 580-98374-14
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062	0.062	mg/L		10/21/20 10:44	10/22/20 17:15	1
Motor Oil (>C24-C36)	ND		0.091	0.091	mg/L		10/21/20 10:44	10/22/20 17:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*65*		*50 - 150*	*10/21/20 10:44*	*10/22/20 17:15*	*1*

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

Lab Sample ID: MB 580-341314/1-A
Matrix: Water
Analysis Batch: 341453

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 341314

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.065	0.065	mg/L		10/21/20 10:44	10/22/20 10:51	1
Motor Oil (>C24-C36)	ND		0.096	0.096	mg/L		10/21/20 10:44	10/22/20 10:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*70*		*50 - 150*	*10/21/20 10:44*	*10/22/20 10:51*	*1*

Lab Sample ID: LCS 580-341314/2-A
Matrix: Water
Analysis Batch: 341453

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 341314

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
#2 Diesel (C10-C24)			0.500	0.315		mg/L		63	50 - 120		
Motor Oil (>C24-C36)			0.500	0.435		mg/L		87	64 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl	*88*		*50 - 150*

Lab Sample ID: LCSD 580-341314/3-A
Matrix: Water
Analysis Batch: 341453

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 341314

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
#2 Diesel (C10-C24)			0.500	0.288		mg/L		58	50 - 120	9	26
Motor Oil (>C24-C36)			0.500	0.424		mg/L		85	64 - 120	3	24

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o-Terphenyl	*79*		*50 - 150*

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: BNSF - Bimonthly

Job ID: 580-98374-1

Client Sample ID: GW-2-101920
Lab Sample ID: 580-98374-1
Date Collected: 10/19/20 09:18
Matrix: Water
Date Received: 10/20/20 11:42

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			341314	10/21/20 10:44	JBT	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	341453	10/22/20 12:30	W1T	TAL SEA

Client Sample ID: GW-1-101920
Lab Sample ID: 580-98374-2
Date Collected: 10/19/20 10:09
Matrix: Water
Date Received: 10/20/20 11:42

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			341314	10/21/20 10:44	JBT	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	341453	10/22/20 12:50	W1T	TAL SEA

Client Sample ID: 5-W-43-101920
Lab Sample ID: 580-98374-3
Date Collected: 10/19/20 11:00
Matrix: Water
Date Received: 10/20/20 11:42

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			341314	10/21/20 10:44	JBT	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	341453	10/22/20 13:10	W1T	TAL SEA

Client Sample ID: EW-1-101920
Lab Sample ID: 580-98374-4
Date Collected: 10/19/20 11:49
Matrix: Water
Date Received: 10/20/20 11:42

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			341314	10/21/20 10:44	JBT	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	341453	10/22/20 13:30	W1T	TAL SEA

Client Sample ID: P2-8-101920
Lab Sample ID: 580-98374-5
Date Collected: 10/19/20 12:40
Matrix: Water
Date Received: 10/20/20 11:42

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			341314	10/21/20 10:44	JBT	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	341453	10/22/20 13:50	W1T	TAL SEA

Client Sample ID: P2-75-101920
Lab Sample ID: 580-98374-6
Date Collected: 10/19/20 13:41
Matrix: Water
Date Received: 10/20/20 11:42

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			341314	10/21/20 10:44	JBT	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	341453	10/22/20 14:36	W1T	TAL SEA
Total/NA	Prep	3510C			341314	10/21/20 10:44	JBT	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	341492	10/23/20 11:56	NDB	TAL SEA

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: BNSF - Bimonthly

Job ID: 580-98374-1

Client Sample ID: FWG-WV-101920
Lab Sample ID: 580-98374-7
Date Collected: 10/19/20 14:15
Matrix: Water
Date Received: 10/20/20 11:42

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			341314	10/21/20 10:44	JBT	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	341453	10/22/20 14:56	W1T	TAL SEA

Client Sample ID: FWG-EV-101920
Lab Sample ID: 580-98374-8
Date Collected: 10/19/20 14:42
Matrix: Water
Date Received: 10/20/20 11:42

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			341314	10/21/20 10:44	JBT	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	341453	10/22/20 15:16	W1T	TAL SEA

Client Sample ID: WG-WV-101920
Lab Sample ID: 580-98374-9
Date Collected: 10/19/20 15:13
Matrix: Water
Date Received: 10/20/20 11:42

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			341314	10/21/20 10:44	JBT	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	341453	10/22/20 15:35	W1T	TAL SEA
Total/NA	Prep	3510C			341314	10/21/20 10:44	JBT	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	341492	10/23/20 11:36	NDB	TAL SEA

Client Sample ID: WG-EV-101920
Lab Sample ID: 580-98374-10
Date Collected: 10/19/20 15:40
Matrix: Water
Date Received: 10/20/20 11:42

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			341314	10/21/20 10:44	JBT	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	341453	10/22/20 15:55	W1T	TAL SEA
Total/NA	Prep	3510C			341314	10/21/20 10:44	JBT	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	341492	10/23/20 11:16	NDB	TAL SEA

Client Sample ID: S2-AU-101920
Lab Sample ID: 580-98374-11
Date Collected: 10/19/20 16:08
Matrix: Water
Date Received: 10/20/20 11:42

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			341314	10/21/20 10:44	JBT	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	341453	10/22/20 16:15	W1T	TAL SEA

Client Sample ID: S2-AD-101920
Lab Sample ID: 580-98374-12
Date Collected: 10/19/20 16:32
Matrix: Water
Date Received: 10/20/20 11:42

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			341314	10/21/20 10:44	JBT	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	341453	10/22/20 16:35	W1T	TAL SEA

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: BNSF - Bimonthly

Job ID: 580-98374-1

Client Sample ID: S2-BU-101920

Lab Sample ID: 580-98374-13

Date Collected: 10/19/20 17:00

Matrix: Water

Date Received: 10/20/20 11:42

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			341314	10/21/20 10:44	JBT	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	341453	10/22/20 16:55	W1T	TAL SEA
Total/NA	Prep	3510C			341314	10/21/20 10:44	JBT	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	341492	10/23/20 10:57	NDB	TAL SEA

Client Sample ID: S2-BD-101920

Lab Sample ID: 580-98374-14

Date Collected: 10/19/20 17:15

Matrix: Water

Date Received: 10/20/20 11:42

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			341314	10/21/20 10:44	JBT	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	341453	10/22/20 17:15	W1T	TAL SEA

Laboratory References:

TAL SEA = Eurofins TestAmerica, Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Farallon Consulting LLC
Project/Site: BNSF - Bimonthly

Job ID: 580-98374-1

Laboratory: Eurofins TestAmerica, Seattle

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Washington	State	C553	02-18-21

Sample Summary

Client: Farallon Consulting LLC
Project/Site: BNSF - Bimonthly

Job ID: 580-98374-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
580-98374-1	GW-2-101920	Water	10/19/20 09:18	10/20/20 11:42	
580-98374-2	GW-1-101920	Water	10/19/20 10:09	10/20/20 11:42	
580-98374-3	5-W-43-101920	Water	10/19/20 11:00	10/20/20 11:42	
580-98374-4	EW-1-101920	Water	10/19/20 11:49	10/20/20 11:42	
580-98374-5	P2-8-101920	Water	10/19/20 12:40	10/20/20 11:42	
580-98374-6	P2-75-101920	Water	10/19/20 13:41	10/20/20 11:42	
580-98374-7	FWG-WV-101920	Water	10/19/20 14:15	10/20/20 11:42	
580-98374-8	FWG-EV-101920	Water	10/19/20 14:42	10/20/20 11:42	
580-98374-9	WG-WV-101920	Water	10/19/20 15:13	10/20/20 11:42	
580-98374-10	WG-EV-101920	Water	10/19/20 15:40	10/20/20 11:42	
580-98374-11	S2-AU-101920	Water	10/19/20 16:08	10/20/20 11:42	
580-98374-12	S2-AD-101920	Water	10/19/20 16:32	10/20/20 11:42	
580-98374-13	S2-BU-101920	Water	10/19/20 17:00	10/20/20 11:42	
580-98374-14	S2-BD-101920	Water	10/19/20 17:15	10/20/20 11:42	

BNSF RAILWAY

CHAIN OF CUSTODY

LABORATORY INFORMATION

Laboratory: | Project Manager:
Address: | Phone:
City/State/ZIP: | Fax:

LAB WORK ORDER:

SHIPMENT INFORMATION

Shipment Method:
Tracking Number:

BNSF PROJECT INFORMATION

BNSF Project Number: 683-071
BNSF Project Name: BNSF - Bimonthly
BNSF Contact:
Project State of Origin:
Project City: Skykomish
BNSF Work Order No.:

CONSULTANT INFORMATION

Company: Farallon Consulting
Address: 975 5th AVE NW
City/State/ZIP: Issaquah, WA 98027
Project Number: 683-071
Project Manager: Amanda Meugnoit
Email: Ameugnoit@farallonconsulting.com
Phone: 425-295-0800 Fax:

TURNAROUND TIME

- [ ] 1-day Rush
- [ ] 5- to 8-day Rush
- [ ] 2-day Rush
- [ ] Standard 10-Day
- [x] 3-day Rush
- [ ] Other

DELIVERABLES

- [ ] BNSF Standard (Level II)
- [ ] Level III
- [ ] Level IV
- [ ] Other Deliverables?
- [ ] EDD Req. Format?

METHODS FOR ANALYSIS

SAMPLE INFORMATION

	Sample Identification	Containers	Sample Collection Date	Sample Collection Time	Sample Collection Sampler	Filtered Y/N	Type (Comp/Grab)	Matrix	NW TPH-Dx	COMMENTS	LAB USE
1	GW-2-101920	2	10/19/20	918	GP	N	G	Water	X		
2	GW-1-101920			1009					X		
3	S-W-43-101920			1100					X		
4	EW-1-101920			1149					X		
5	PZ-8-101920			1240					X		
6	PZ-75-101920			1341					X		
7	FWG-WV-101920			1415					X		
8	FWG-EV-101920			1442					X		
9	WG-WV-101920			1513					X		
10	WG-EV-101920			1540					X		
11	S2-AU-101920			1606					X		
12	S2-AD-101920			1632					X		
13	S2-BU-101920			1700					X		
14	S2-BD-101920			1715					X		
15											

Therm. ID: IR6 Cor: 0.4 °C Unc: 2.2 °C JCS 10/20/20
Cooler Dsc: LR
Packing: None
Cust. Seal: Yes ___ No X
Blue Ice, Wet, Dry, None
FedEx: ___
UPS: ___
Lab Cour: X
Other: ___

Therm. ID: IR6 Cor: 0.1 °C Unc: 1.6 °C JCS 10/20/20
Cooler Dsc: LR
Packing: None
Cust. Seal: Yes ___ No X
Blue Ice, Wet, Dry, None
FedEx: ___
UPS: ___
Lab Cour: X
Other: ___

580-98374 Chain of Custody

Relinquished By:	Date/Time: 10/19/20 1930	Received By:	Date/Time: 10/20/20 1142
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:
Received by Laboratory:	Date/Time:	Lab Remarks:	Lab: Custody Intact? ☐ Yes ☐ No

Comments and Special Analytical Requirements:

Custody Seal No. | BNSF COC No

ORIGINAL - RETURN TO LABORATORY WITH SAMPLES | DUPLICATE - CONSULTANT | TAL-1001 (0912)

Received in lobby JCS 10/20/20

Login Sample Receipt Checklist

Client: Farallon Consulting LLC

Job Number: 580-98374-1
SDG Number:

Login Number: 98374
List Number: 1
Creator: Vallelunga, Diana L

List Source: Eurofins TestAmerica, Seattle

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.	True	
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.	True	
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").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

ATTACHMENT B
DATA VALIDATION REPORTS

HYDRAULIC CONTROL AND CONTAINMENT SYSTEM
PASSIVE OPERATION PILOT STUDY REPORT
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Consent Decree No. 07-2-33672-9 SEA

Farallon PN: 683-071

Sayler Data Solutions, Inc.
14257 93rd Court NE Kirkland, Washington 98034 (425) 820-7504 cari.say@saylerdata.com

DATA VALIDATION REPORT

Skykomish Hydraulic Control and Containment Pilot Study February 2020 Data

Prepared for:
Farallon Consulting, LLC
975 5th Avenue NW
Issaquah, Washington 98027

March 10, 2020

1.0 Introduction

Data validation was performed on the following water samples:

Sample ID	Sample Date/Time	Lab ID	Analyses
PZ-8-021920	02/19/2020 11:05	580-92927-1	TPH-Dx
S2-AD-021920	02/19/2020 14:43	580-92927-10	TPH-Dx
WG-EV-021920	02/19/2020 15:11	580-92927-11	TPH-Dx
WG-WV-021920	02/19/2020 15:15	580-92927-12	TPH-Dx
FWG-EV-021920	02/19/2020 15:45	580-92927-13	TPH-Dx
FWG-WV-021920	02/19/2020 15:43	580-92927-14	TPH-Dx
PZ-7S-021920	02/19/2020 12:05	580-92927-2	TPH-Dx
EW-1-021920	02/19/2020 11:00	580-92927-3	TPH-Dx
GW-1-021920	02/19/2020 13:00	580-92927-4	TPH-Dx
GW-2-021920	02/19/2020 13:00	580-92927-5	TPH-Dx
5-W-43-021920	02/19/2020 12:00	580-92927-6	TPH-Dx
S2-BU-021920	02/19/2020 14:08	580-92927-7	TPH-Dx
S2-BD-021920	02/19/2020 14:40	580-92927-8	TPH-Dx
S2-AU-021920	02/19/2020 14:15	580-92927-9	TPH-Dx

Samples were analyzed by Test America, Tacoma, Washington.

A stage 2A summary validation was performed on the analytical results including both the hardcopy (portable document format) and electronic data deliverable, earning EPA OSWER validation label code S2AVEM. Validation was performed by Cari Sayler.

Data qualifiers are assigned based only on the criteria reviewed and do not include calibration or instrument performance issues unless noted in the laboratory narrative. No qualifiers were assigned based on this review.

2.0 Precision, Accuracy, Representativeness, Comparability, and Completeness

Sample analysis frequencies: 14 locations are sampled monthly. Samples were collected from required locations and the required analysis was completed by the laboratory for each collected sample.

Analysis methods: Each sample was analyzed by method NWTPH-Dx and prepared by method SW3510C. These methods are approved EPA methods and therefore meet comparability requirements.

Precision, accuracy and completeness: Accuracy and precision measurements were within control limits. A data completeness of 100% was calculated based on 14 of 14 intended sample analyses completed. This meets the project goal of 90%.

3.0 Diesel Range Petroleum Hydrocarbon Analysis

Quality control analysis frequencies: The method specifies that a method blank must be analyzed one per analytical batch or one per twenty samples, whichever is more frequent, and a laboratory duplicate must be analyzed one per ten samples. In addition, surrogate compounds must be measured in each field and quality control sample.

This batch included a method blank, laboratory control sample (LCS), and LCS duplicate (LCSD), as well as appropriate surrogates. Data qualifiers are not required due to a lack of laboratory duplicate results.

Holding times: Unpreserved water samples must be extracted within 7 days of collection. Preserved water samples must be extracted within 14 days of collection. Extracts must be analyzed within 40 days of extraction. Samples were extracted and analyzed within holding times.

Laboratory blank results: Criteria for blanks are that analyte concentrations must be below the PQL, or below 5% of the lowest associated sample concentration. No target compounds were detected in the method blanks.

Surrogate recoveries: Laboratory control limits were 50-150%. Surrogate recoveries were within limits.

LCS recoveries: Laboratory control limits were 50-120% and 64-120%. LCS recoveries were within limits.

LCS/LCSD RPDs: The laboratory control limits were <24 and <26%. LCS/LCSD RPD values were within limits.

Reporting limits: The reporting limit goals are 0.1 mg/L for both diesel range hydrocarbons and oil range hydrocarbons. These goals were met.

Laboratory narrative and flags: No qualifiers were added based on a review of the laboratory narrative or data flags.

Diesel and oil range petroleum hydrocarbon data are acceptable for use as reported.

4.0 Abbreviations and Definitions

DV Qualifier	Definition
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample reporting limit or the amount of contaminant detected in the sample.

DV Qualifier	Definition
J	The analyte was positively identified. The associated numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification.
UJ	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The sample result is rejected. The presence or absence of the analyte cannot be verified and data are not usable.
R1	The sample result has been replaced by a more reliable or more conservative result.
R2	The sample result has been replaced by a result from a different analysis method.

Abbreviation	Definition
DV	Data Validation
LCS	Laboratory control sample
LCSD	Laboratory control sample duplicate
MS	Matrix spike
MSD	Matrix spike duplicate
RL	Reporting limit
RPD	Relative percent difference
RSD	Relative standard deviation

5.0 References

USEPA National Functional Guidelines for Organic Superfund Methods Data Review, Office of Superfund Remediation and Technology Innovation, U.S. Environmental Protection Agency. January 2017, EPA-540-R-2017-002.

USEPA Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, January 2009, EPA 540-R-08-005.

Sayler Data Solutions, Inc.
14257 93rd Court NE Kirkland, Washington 98034 (425) 820-7504 cari.say@saylerdata.com

DATA VALIDATION REPORT

Skykomish Hydraulic Control and Containment Pilot Study April 2020 Data

Prepared for:
Farallon Consulting, LLC
975 5th Avenue NW
Issaquah, Washington 98027

May 6, 2020

1.0 Introduction

Data validation was performed on the following water samples:

Sample ID	Sample Date/Time	Lab ID	Analyses
S2-BU-042220	04/22/2020 10:00	580-94298-1	TPH-Dx
S2-BD-042220	04/22/2020 10:30	580-94298-2	TPH-Dx
WG-EV-042220	04/22/2020 10:57	580-94298-3	TPH-Dx
S2-AU-042220	04/22/2020 11:28	580-94298-4	TPH-Dx
GW-1-042220	04/22/2020 10:30	580-94298-5	TPH-Dx
5-W-43-042220	04/22/2020 11:25	580-94298-6	TPH-Dx
WG-WV-042220	04/22/2020 12:30	580-94298-7	TPH-Dx
FWG-EV-042220	04/22/2020 13:10	580-94298-8	TPH-Dx
FWG-WV-042220	04/22/2020 13:45	580-94298-9	TPH-Dx
EW-1-042220	04/22/2020 12:22	580-94298-10	TPH-Dx
PZ-8-042220	04/22/2020 13:12	580-94298-11	TPH-Dx
PZ-7S-042220	04/22/2020 14:05	580-94298-12	TPH-Dx
GW-2-042220	04/22/2020 14:50	580-94298-13	TPH-Dx
S2-AD-042220	04/22/2020 11:57	580-94298-14	TPH-Dx

Samples were analyzed by Test America, Tacoma, Washington.

A stage 2A summary validation was performed on the analytical results including both the hardcopy (portable document format) and electronic data deliverable, earning EPA OSWER validation label code S2AVEM. Validation was performed by Cari Sayler.

Data qualifiers are assigned based only on the criteria reviewed and do not include calibration or instrument performance issues unless noted in the laboratory narrative. No qualifiers were assigned based on this review.

2.0 Precision, Accuracy, Representativeness, Comparability, and Completeness

Sample analysis frequencies: 14 locations are sampled monthly. Samples were collected from required locations and the required analysis was completed by the laboratory for each collected sample.

Analysis methods: Each sample was analyzed by method NWTPH-Dx and prepared by method SW3510C. These methods are approved EPA methods and therefore meet comparability requirements.

Precision, accuracy and completeness: Accuracy and precision measurements were within control limits. A data completeness of 100% was calculated based on 14 of 14 intended sample analyses completed. This meets the project goal of 90%.

3.0 Diesel Range Petroleum Hydrocarbon Analysis

Quality control analysis frequencies: The method specifies that a method blank must be analyzed one per analytical batch or one per twenty samples, whichever is more frequent, and a laboratory duplicate must be analyzed one per ten samples. In addition, surrogate compounds must be measured in each field and quality control sample.

This batch included a method blank, laboratory control sample (LCS), and LCS duplicate (LCSD), as well as appropriate surrogates. Data qualifiers are not required due to a lack of laboratory duplicate results.

Holding times: Unpreserved water samples must be extracted within 7 days of collection. Preserved water samples must be extracted within 14 days of collection. Extracts must be analyzed within 40 days of extraction. Samples were extracted and analyzed within holding times.

Laboratory blank results: Criteria for blanks are that analyte concentrations must be below the PQL, or below 5% of the lowest associated sample concentration. No target compounds were detected in the method blanks.

Surrogate recoveries: Laboratory control limits were 50-150%. Surrogate recoveries were within limits.

LCS recoveries: Laboratory control limits were 50-120% and 64-120%. LCS recoveries were within limits.

LCS/LCSD RPDs: The laboratory control limits were <24 and <26%. LCS/LCSD RPD values were within limits.

Reporting limits: The reporting limit goals are 0.1 mg/L for both diesel range hydrocarbons and oil range hydrocarbons. These goals were met.

Laboratory narrative and flags: No qualifiers were added based on a review of the laboratory narrative or data flags.

Diesel and oil range petroleum hydrocarbon data are acceptable for use as reported.

4.0 Abbreviations and Definitions

DV Qualifier	Definition
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample reporting limit or the amount of contaminant detected in the sample.

DV Qualifier	Definition
J	The analyte was positively identified. The associated numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification.
UJ	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The sample result is rejected. The presence or absence of the analyte cannot be verified and data are not usable.
R1	The sample result has been replaced by a more reliable or more conservative result.
R2	The sample result has been replaced by a result from a different analysis method.

Abbreviation	Definition
DV	Data Validation
LCS	Laboratory control sample
LCSD	Laboratory control sample duplicate
MS	Matrix spike
MSD	Matrix spike duplicate
RL	Reporting limit
RPD	Relative percent difference
RSD	Relative standard deviation

5.0 References

USEPA National Functional Guidelines for Organic Superfund Methods Data Review, Office of Superfund Remediation and Technology Innovation, U.S. Environmental Protection Agency. January 2017, EPA-540-R-2017-002.

USEPA Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, January 2009, EPA 540-R-08-005.

Sayler Data Solutions, Inc.
14257 93rd Court NE Kirkland, Washington 98034 (425) 820-7504 cari.say@saylerdata.com

DATA VALIDATION REPORT

Skykomish Hydraulic Control and Containment Pilot Study June 2020 Data

Prepared for:
Farallon Consulting, LLC
975 5th Avenue NW
Issaquah, Washington 98027

July 19, 2020

1.0 Introduction

Data validation was performed on the following water samples:

Sample ID	Sample Date/Time	Lab ID	Analyses
GW-2-062320	06/23/2020 09:54	580-95605-1	TPH-Dx
GW-20-062320	06/23/2020 10:00	580-95605-2	TPH-Dx
S2-BD-062320	06/23/2020 09:36	580-95605-3	TPH-Dx
S2-BU-062320	06/23/2020 09:36	580-95605-4	TPH-Dx
W6-EV-062320	06/23/2020 10:21	580-95605-5	TPH-Dx
S2-AD-062320	06/23/2020 10:35	580-95605-6	TPH-Dx
S2-AU-062320	06/23/2020 10:41	580-95605-7	TPH-Dx
WG-WV-062320	06/23/2020 11:06	580-95605-8	TPH-Dx
FWG-EV-062320	06/23/2020 12:02	580-95605-9	TPH-Dx
FWG-WV-062320	06/23/2020 12:05	580-95605-10	TPH-Dx
PZ-75-062320	06/23/2020 11:58	580-95605-11	TPH-Dx
GW-1-062320	06/23/2020 12:08	580-95605-12	TPH-Dx
5-W-43-062320	06/23/2020 14:22	580-95605-13	TPH-Dx
EW-1-062320	06/23/2020 14:21	580-95605-14	TPH-Dx
PZ-8-062320	06/23/2020 15:39	580-95605-15	TPH-Dx

Samples were analyzed by Test America, Tacoma, Washington.

A stage 2A summary validation was performed on the analytical results including both the hardcopy (portable document format) and electronic data deliverable, earning EPA OSWER validation label code S2AVEM. Validation was performed by Cari Sayler.

Data qualifiers are assigned based only on the criteria reviewed and do not include calibration or instrument performance issues unless noted in the laboratory narrative. Validation qualifiers are summarized in section 4.0 of this report.

2.0 Precision, Accuracy, Representativeness, Comparability, and Completeness

Sample analysis frequencies: 14 locations are sampled monthly. Samples were collected from required locations and the required analysis was completed by the laboratory for each collected sample.

Analysis methods: Each sample was analyzed by method NWTPH-Dx and prepared by method SW3510C. These methods are approved EPA methods and therefore meet comparability requirements.

Precision, accuracy and completeness: Accuracy and precision measurements were within control limits. A data completeness of 100% was calculated based on 14 of 14 intended sample analyses completed. This meets the project goal of 90%.

3.0 Diesel Range Petroleum Hydrocarbon Analysis

Quality control analysis frequencies: The method specifies that a method blank must be analyzed one per analytical batch or one per twenty samples, whichever is more frequent, and a laboratory duplicate must be analyzed one per ten samples. In addition, surrogate compounds must be measured in each field and quality control sample.

This batch included a method blank, laboratory control sample (LCS), and LCS duplicate (LCSD), as well as appropriate surrogates. Data qualifiers are not required due to a lack of laboratory duplicate results.

Holding times: Unpreserved water samples must be extracted within 7 days of collection. Preserved water samples must be extracted within 14 days of collection. Extracts must be analyzed within 40 days of extraction. Samples were extracted and analyzed within holding times.

However, samples were received at the laboratory with temperature between 7.1 and 9.2 °C. Sample results are qualified as estimated.

Laboratory blank results: Criteria for blanks are that analyte concentrations must be below the PQL, or below 5% of the lowest associated sample concentration. No target compounds were detected in the method blanks.

Surrogate recoveries: Laboratory control limits were 50-150%. Surrogate recoveries were within limits.

LCS recoveries: Laboratory control limits were 50-120% and 64-120%. LCS recoveries were within limits.

LCS/LCSD RPDs: The laboratory control limits were <24 and <26%. LCS/LCSD RPD values were within limits.

Field duplicate results: No target analytes were detected in the sample or field duplicate, demonstrating good agreement.

Reporting limits: The reporting limit goals are 0.1 mg/L for both diesel range hydrocarbons and oil range hydrocarbons. These goals were met.

Laboratory narrative and flags: No qualifiers were added based on a review of the laboratory narrative or data flags.

Diesel and oil range petroleum hydrocarbon data are acceptable for use as qualified.

4.0 Validation Qualifiers

Client ID	Analyte(s)	Qualifier	Reason
5-W-43-062320	#2 Diesel (C10-C24), Motor Oil (>C24-C36)	UJ	High cooler receipt temperature
EW-1-062320	#2 Diesel (C10-C24), Motor Oil (>C24-C36)	UJ	High cooler receipt temperature
FWG-EV-062320	#2 Diesel (C10-C24), Motor Oil (>C24-C36)	UJ	High cooler receipt temperature
FWG-WV-062320	#2 Diesel (C10-C24), Motor Oil (>C24-C36)	UJ	High cooler receipt temperature
GW-1-062320	#2 Diesel (C10-C24), Motor Oil (>C24-C36)	UJ	High cooler receipt temperature
GW-20-062320	#2 Diesel (C10-C24), Motor Oil (>C24-C36)	UJ	High cooler receipt temperature
GW-2-062320	#2 Diesel (C10-C24), Motor Oil (>C24-C36)	UJ	High cooler receipt temperature
PZ-75-062320	Motor Oil (>C24-C36)	J	High cooler receipt temperature
PZ-75-062320	#2 Diesel (C10-C24)	UJ	High cooler receipt temperature
PZ-8-062320	#2 Diesel (C10-C24), Motor Oil (>C24-C36)	UJ	High cooler receipt temperature
S2-AD-062320	#2 Diesel (C10-C24), Motor Oil (>C24-C36)	UJ	High cooler receipt temperature
S2-AU-062320	#2 Diesel (C10-C24), Motor Oil (>C24-C36)	UJ	High cooler receipt temperature
S2-BD-062320	#2 Diesel (C10-C24), Motor Oil (>C24-C36)	UJ	High cooler receipt temperature
S2-BU-062320	#2 Diesel (C10-C24)	J	High cooler receipt temperature
S2-BU-062320	Motor Oil (>C24-C36)	UJ	High cooler receipt temperature
W6-EV-062320	#2 Diesel (C10-C24), Motor Oil (>C24-C36)	J	High cooler receipt temperature
WG-WV-062320	#2 Diesel (C10-C24), Motor Oil (>C24-C36)	J	High cooler receipt temperature

5.0 Abbreviations and Definitions

DV Qualifier	Definition
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample reporting limit or the amount of contaminant detected in the sample.
J	The analyte was positively identified. The associated numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification.
UJ	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The sample result is rejected. The presence or absence of the analyte cannot be verified and data are not usable.
R1	The sample result has been replaced by a more reliable or more conservative result.
R2	The sample result has been replaced by a result from a different analysis method.

Abbreviation	Definition
DV	Data Validation
LCS	Laboratory control sample
LCSD	Laboratory control sample duplicate
MS	Matrix spike
MSD	Matrix spike duplicate
RL	Reporting limit

Abbreviation	Definition
RPD	Relative percent difference
RSD	Relative standard deviation

6.0 References

USEPA National Functional Guidelines for Organic Superfund Methods Data Review, Office of Superfund Remediation and Technology Innovation, U.S. Environmental Protection Agency. January 2017, EPA-540-R-2017-002.

USEPA Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, January 2009, EPA 540-R-08-005.

Sayler Data Solutions, Inc.
14257 93rd Court NE Kirkland, Washington 98034 (425) 820-7504 cari.say@saylerdata.com

DATA VALIDATION REPORT

Skykomish Hydraulic Control and Containment Pilot Study August 2020 Data

Prepared for:
Farallon Consulting, LLC
975 5th Avenue NW
Issaquah, Washington 98027

October 2, 2020

1.0 Introduction

Data validation was performed on the following water samples:

Sample ID	Sample Date/Time	Lab ID	Analyses
5-W-43-082520	08/25/2020 09:51	580-97078-2	TPH-Dx
EW-1-082520	08/25/2020 10:34	580-97078-3	TPH-Dx
FWG-EV-082520	08/25/2020 11:20	580-97078-5	TPH-Dx
FWG-WV-082520	08/25/2020 10:47	580-97078-4	TPH-Dx
GW-1-082520	08/25/2020 09:09	580-97078-1	TPH-Dx
GW-2-082520	08/25/2020 13:55	580-97078-12	TPH-Dx
P2-75-082520	08/25/2020 12:09	580-97078-9	TPH-Dx
P2-8-082520	08/25/2020 11:20	580-97078-6	TPH-Dx
S2-AD-082520	08/25/2020 13:42	580-97078-11	TPH-Dx
S2-AU-082520	08/25/2020 13:42	580-97078-10	TPH-Dx
S2-BD-082520	08/25/2020 14:18	580-97078-13	TPH-Dx
S2-BU-082520	08/25/2020 14:18	580-97078-14	TPH-Dx
WG-EV-082520	08/25/2020 12:04	580-97078-7	TPH-Dx
WG-WV-082520	08/25/2020 12:04	580-97078-8	TPH-Dx

Samples were analyzed by Eurofins TestAmerica Seattle in Tacoma, Washington.

A stage 2A summary validation was performed on the analytical results including both the hardcopy (portable document format) and electronic data deliverable, earning EPA OSWER validation label code S2AVEM. Validation was performed by Cari Sayler.

Data qualifiers are assigned based only on the criteria reviewed and do not include calibration or instrument performance issues unless noted in the laboratory narrative. Validation qualifiers are summarized in section 4.0 of this report.

2.0 Precision, Accuracy, Representativeness, Comparability, and Completeness

Sample analysis frequencies: 14 locations are sampled monthly. Samples were collected from required locations and the required analysis was completed by the laboratory for each collected sample.

Analysis methods: Each sample was analyzed by method NWTPH-Dx and prepared by method SW3510C. These methods are approved EPA methods and therefore meet comparability requirements.

Precision, accuracy and completeness: Accuracy measurements were within control limits. Precision measurements were outside of control limits resulting in some estimated data. A data completeness of 100% was calculated based on 14 of 14 intended sample analyses completed. This meets the project goal of 90%.

3.0 Diesel Range Petroleum Hydrocarbon Analysis

Quality control analysis frequencies: The method specifies that a method blank must be analyzed one per analytical batch or one per twenty samples, whichever is more frequent, and a laboratory duplicate must be analyzed one per ten samples. In addition, surrogate compounds must be measured in each field and quality control sample.

This batch included a method blank, laboratory control sample (LCS), and LCS duplicate (LCSD), as well as appropriate surrogates. Data qualifiers are not required due to a lack of laboratory duplicate results.

Holding times: Unpreserved water samples must be extracted within 7 days of collection. Preserved water samples must be extracted within 14 days of collection. Extracts must be analyzed within 40 days of extraction. Samples were extracted and analyzed within holding times.

Laboratory blank results: Criteria for blanks are that analyte concentrations must be below the PQL, or below 5% of the lowest associated sample concentration. No target compounds were detected in the method blanks.

Surrogate recoveries: Laboratory control limits were 50-150%. Surrogate recoveries were within limits.

LCS recoveries: Laboratory control limits were 50-120% and 64-120%. LCS recoveries were within limits.

LCS/LCSD RPDs: The laboratory control limits were <24 and <26%. LCS/LCSD RPD values exceeded laboratory control limits as follows:

QC ID	Analyte	RPD	Lab Control Limit
LCSD 580-336966/3-A	#2 Diesel (C10-C24)	29	26
LCSD 580-336966/3-A	Motor Oil (>C24-C36)	27	24

Associated detected results are qualified as estimated, and non-detect results are considered unaffected.

Reporting limits: The reporting limit goals are 0.1 mg/L for both diesel range hydrocarbons and oil range hydrocarbons. These goals were met.

Laboratory narrative and flags: No additional qualifiers were added based on a review of the laboratory narrative or data flags.

Diesel and oil range petroleum hydrocarbon data are acceptable for use as qualified.

4.0 Validation Qualifiers

Client ID	Analyte(s)	Qualifier	Reason
P2-75-082520	#2 Diesel (C10-C24), Motor Oil (>C24-C36)	J	High LCS/LCSD RPD
S2-BU-082520	#2 Diesel (C10-C24)	J	High LCS/LCSD RPD
WG-EV-082520	#2 Diesel (C10-C24), Motor Oil (>C24-C36)	J	High LCS/LCSD RPD
WG-WV-082520	#2 Diesel (C10-C24), Motor Oil (>C24-C36)	J	High LCS/LCSD RPD

5.0 Abbreviations and Definitions

DV Qualifier	Definition
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample reporting limit or the amount of contaminant detected in the sample.
J	The analyte was positively identified. The associated numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification.
UJ	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The sample result is rejected. The presence or absence of the analyte cannot be verified and data are not usable.
R1	The sample result has been replaced by a more reliable or more conservative result.
R2	The sample result has been replaced by a result from a different analysis method.

Abbreviation	Definition
DV	Data Validation
LCS	Laboratory control sample
LCSD	Laboratory control sample duplicate
MS	Matrix spike
MSD	Matrix spike duplicate
RL	Reporting limit
RPD	Relative percent difference
RSD	Relative standard deviation

6.0 References

USEPA National Functional Guidelines for Organic Superfund Methods Data Review, Office of Superfund Remediation and Technology Innovation, U.S. Environmental Protection Agency. January 2017, EPA-540-R-2017-002.

USEPA Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, January 2009, EPA 540-R-08-005.

Sayler Data Solutions, Inc.
14257 93rd Court NE Kirkland, Washington 98034 (425) 820-7504 cari.say@saylerdata.com

DATA VALIDATION REPORT

Skykomish Hydraulic Control and Containment Pilot Study October 2020 Data

Prepared for:
Farallon Consulting, LLC
975 5th Avenue NW
Issaquah, Washington 98027

November 19, 2020

1.0 Introduction

Data validation was performed on the following water samples:

Sample ID	Sample Date/Time	Lab ID	Analyses
GW-2-101920	10/19/2020 09:18	580-98374-1	TPH-Dx
GW-1-101920	10/19/2020 10:09	580-98374-2	TPH-Dx
5-W-43-101920	10/19/2020 11:00	580-98374-3	TPH-Dx
EW-1-101920	10/19/2020 11:49	580-98374-4	TPH-Dx
P2-8-101920	10/19/2020 12:40	580-98374-5	TPH-Dx
P2-75-101920	10/19/2020 13:41	580-98374-6	TPH-Dx
FWG-WV-101920	10/19/2020 14:15	580-98374-7	TPH-Dx
FWG-EV-101920	10/19/2020 14:42	580-98374-8	TPH-Dx
WG-WV-101920	10/19/2020 15:13	580-98374-9	TPH-Dx
WG-EV-101920	10/19/2020 15:40	580-98374-10	TPH-Dx
S2-AU-101920	10/19/2020 16:08	580-98374-11	TPH-Dx
S2-AD-101920	10/19/2020 16:32	580-98374-12	TPH-Dx
S2-BU-101920	10/19/2020 17:00	580-98374-13	TPH-Dx
S2-BD-101920	10/19/2020 17:15	580-98374-14	TPH-Dx

Samples were analyzed by Eurofins TestAmerica Seattle in Tacoma, Washington.

A stage 2A summary validation was performed on the analytical results including both the hardcopy (portable document format) and electronic data deliverable, earning EPA OSWER validation label code S2AVEM. Validation was performed by Cari Sayler.

Data qualifiers are assigned based only on the criteria reviewed and do not include calibration or instrument performance issues unless noted in the laboratory narrative. Validation qualifiers are summarized in section 4.0 of this report.

2.0 Precision, Accuracy, Representativeness, Comparability, and Completeness

Sample analysis frequencies: 14 locations are sampled monthly. Samples were collected from required locations and the required analysis was completed by the laboratory for each collected sample.

Analysis methods: Each sample was analyzed by method NWTPH-Dx and prepared by method SW3510C. These methods are approved EPA methods and therefore meet comparability requirements.

Precision, accuracy and completeness: Accuracy measurements were within control limits. Precision measurements were outside of control limits resulting in some estimated data. A data completeness of 100% was calculated based on 14 of 14 intended sample analyses completed. This meets the project goal of 90%.

3.0 Diesel Range Petroleum Hydrocarbon Analysis

Quality control analysis frequencies: The method specifies that a method blank must be analyzed one per analytical batch or one per twenty samples, whichever is more frequent, and a laboratory duplicate must be analyzed one per ten samples. In addition, surrogate compounds must be measured in each field and quality control sample.

This batch included a method blank, laboratory control sample (LCS), and LCS duplicate (LCSD), as well as appropriate surrogates. Data qualifiers are not required due to a lack of laboratory duplicate results.

Holding times: Unpreserved water samples must be extracted within 7 days of collection. Preserved water samples must be extracted within 14 days of collection. Extracts must be analyzed within 40 days of extraction. Samples were extracted and analyzed within holding times.

Laboratory blank results: Criteria for blanks are that analyte concentrations must be below the PQL, or below 5% of the lowest associated sample concentration. No target compounds were detected in the method blanks.

Surrogate recoveries: Laboratory control limits were 50-150%. Surrogate recoveries were within limits with the following exceptions:

Sample ID	Surrogate	% Recovery	Lab Control Limit
FWG-WV-101920	o-Terphenyl	49	50 - 150
WG-EV-101920	o-Terphenyl	36	50 - 150
WG-EV-101920 RE	o-Terphenyl	40	50 - 150

Positive and non-detect results in these two samples are qualified as estimated.

LCS recoveries: Laboratory control limits were 50-120% and 64-120%. LCS recoveries were within limits.

LCS/LCSD RPDs: The laboratory control limits were <24 and <26%. LCS/LCSD RPDs were within limits. values exceeded laboratory control limits as follows:

Reporting limits: The reporting limit goals are 0.1 mg/L for both diesel range hydrocarbons and oil range hydrocarbons. These goals were met.

Laboratory narrative and flags: No additional qualifiers were added based on a review of the laboratory narrative or data flags.

Diesel and oil range petroleum hydrocarbon data are acceptable for use as qualified.

4.0 Validation Qualifiers

Client ID	Analyte(s)	Qualifier	Reason
FWG-WV-101920	#2 Diesel (C10-C24), Motor Oil (>C24-C36)	UJ	Low surrogate recovery
WG-EV-101920	#2 Diesel (C10-C24)	J	Low surrogate recovery
WG-EV-101920 RE	Motor Oil (>C24-C36)	J	Low surrogate recovery

5.0 Abbreviations and Definitions

DV Qualifier	Definition
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample reporting limit or the amount of contaminant detected in the sample.
J	The analyte was positively identified. The associated numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification.
UJ	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The sample result is rejected. The presence or absence of the analyte cannot be verified and data are not usable.
R1	The sample result has been replaced by a more reliable or more conservative result.
R2	The sample result has been replaced by a result from a different analysis method.

Abbreviation	Definition
DV	Data Validation
LCS	Laboratory control sample
LCSD	Laboratory control sample duplicate
MS	Matrix spike
MSD	Matrix spike duplicate
RL	Reporting limit
RPD	Relative percent difference
RSD	Relative standard deviation

6.0 References

USEPA National Functional Guidelines for Organic Superfund Methods Data Review, Office of Superfund Remediation and Technology Innovation, U.S. Environmental Protection Agency. January 2017, EPA-540-R-2017-002.

USEPA Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, January 2009, EPA 540-R-08-005.

APPENDIX B
LABORATORY ANALYTICAL REPORTS
(PROVIDED ON COMPACT DISC IN HARDCOPY REPORT)

2020 ANNUAL HYDRAULIC CONTROL AND CONTAINMENT SYSTEM OPERATIONS REPORT
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Consent Decree No. 07-2-33672-9 SEA

Farallon PN: 683-071

eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

Laboratory Job ID: 580-92993-1
Client Project/Site: Skykomish HCC System
Sampling Event: Skykomish - GAC/HCC

For:
Farallon Consulting LLC
975 5th Avenue NW
Suite 100
Issaquah, Washington 98027

Attn: Peter Kingston

Kristine D. Allen

Authorized for release by:
2/28/2020 9:34:14 AM

Kristine Allen, Client Service Manager
(253)248-4970
kristine.allen@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Job ID: 580-92993-1

Laboratory: Eurofins TestAmerica, Seattle

Narrative

Job Narrative
580-92993-1

Comments
No additional comments.

Receipt
The samples were received on 2/24/2020 1:22 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.8º C.

GC Semi VOA
Method NWTPH-Dx: The following sample contained a hydrocarbon pattern in the diesel range; however, the elution pattern was later than the typical diesel fuel pattern used by the laboratory for quantitative purposes: Before GAC-22120 (580-92993-1).

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

Metals
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.

Client: Farallon Consulting LLC
Job ID: 580-92993-1
Project/Site: Skykomish HCC System

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
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)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
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)

Client: Farallon Consulting LLC
Project/Site: Skykomish HCC System

Job ID: 580-92993-1

Client Sample ID: Before GAC-22120
Date Collected: 02/21/20 10:00
Date Received: 02/24/20 13:22

Lab Sample ID: 580-92993-1
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.52		0.063		mg/L		02/26/20 12:21	02/27/20 13:04	1
Motor Oil (>C24-C36)	0.25		0.093		mg/L		02/26/20 12:21	02/27/20 13:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*78*		*50 - 150*	*02/26/20 12:21*	*02/27/20 13:04*	*1*

Client: Farallon Consulting LLC
Project/Site: Skykomish HCC System

Job ID: 580-92993-1

Client Sample ID: HCC EFF-22120
Date Collected: 02/21/20 10:00
Date Received: 02/24/20 13:22

Lab Sample ID: 580-92993-2
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062		mg/L		02/26/20 12:21	02/27/20 13:24	1
Motor Oil (>C24-C36)	ND		0.091		mg/L		02/26/20 12:21	02/27/20 13:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*83*		*50 - 150*	*02/26/20 12:21*	*02/27/20 13:24*	*1*

Method: 200.8 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010		mg/L		02/25/20 07:11	02/25/20 12:47	1
Lead	ND		0.00080		mg/L		02/25/20 07:11	02/25/20 12:47	1

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

Lab Sample ID: MB 580-323717/1-A
Matrix: Water
Analysis Batch: 323754

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 323717

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.065		mg/L		02/26/20 12:21	02/27/20 11:43	1
Motor Oil (>C24-C36)	ND		0.096		mg/L		02/26/20 12:21	02/27/20 11:43	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*85*		*50 - 150*	*02/26/20 12:21*	*02/27/20 11:43*	*1*

Lab Sample ID: LCS 580-323717/2-A
Matrix: Water
Analysis Batch: 323754

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 323717

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
#2 Diesel (C10-C24)	0.500	0.432		mg/L		86	50 - 120
Motor Oil (>C24-C36)	0.500	0.462		mg/L		92	64 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl	*87*		*50 - 150*

Lab Sample ID: LCSD 580-323717/3-A
Matrix: Water
Analysis Batch: 323754

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 323717

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
#2 Diesel (C10-C24)	0.500	0.440		mg/L		88	50 - 120	2	26
Motor Oil (>C24-C36)	0.500	0.472		mg/L		94	64 - 120	2	24

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o-Terphenyl	*89*		*50 - 150*

Method: 200.8 - Metals (ICP/MS)

Lab Sample ID: MB 580-323557/14-A
Matrix: Water
Analysis Batch: 323671

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 323557

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010		mg/L		02/25/20 07:11	02/25/20 11:54	1
Lead	ND		0.00080		mg/L		02/25/20 07:11	02/25/20 11:54	1

Lab Sample ID: LCS 580-323557/15-A
Matrix: Water
Analysis Batch: 323671

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 323557

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	1.00	1.00		mg/L		100	85 - 115
Lead	1.00	1.01		mg/L		101	85 - 115

Method: 200.8 - Metals (ICP/MS) (Continued)

Lab Sample ID: LCSD 580-323557/16-A
Matrix: Water
Analysis Batch: 323671

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 323557

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic			1.00	1.01		mg/L		101	85 - 115	1	20
Lead			1.00	1.02		mg/L		102	85 - 115	1	20

Lab Sample ID: 580-92988-C-1-C MS
Matrix: Water
Analysis Batch: 323671

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 323557

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic	ND		1.00	1.02		mg/L		102	70 - 130		
Lead	0.0032		1.00	1.04		mg/L		104	70 - 130		

Lab Sample ID: 580-92988-C-1-D MSD
Matrix: Water
Analysis Batch: 323671

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 323557

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	ND		1.00	1.01		mg/L		101	70 - 130	2	20
Lead	0.0032		1.00	1.03		mg/L		102	70 - 130	2	20

Lab Sample ID: 580-92988-C-1-B DU
Matrix: Water
Analysis Batch: 323671

Client Sample ID: Duplicate
Prep Type: Total/NA
Prep Batch: 323557

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Arsenic	ND			ND		mg/L				NC	20
Lead	0.0032			0.00317		mg/L				0.5	20

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: Skykomish HCC System

Job ID: 580-92993-1

Client Sample ID: Before GAC-22120

Lab Sample ID: 580-92993-1

Date Collected: 02/21/20 10:00

Matrix: Water

Date Received: 02/24/20 13:22

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			323717	02/26/20 12:21	T1L	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	323754	02/27/20 13:04	JCM	TAL SEA

Client Sample ID: HCC EFF-22120

Lab Sample ID: 580-92993-2

Date Collected: 02/21/20 10:00

Matrix: Water

Date Received: 02/24/20 13:22

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			323717	02/26/20 12:21	T1L	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	323754	02/27/20 13:24	JCM	TAL SEA
Total/NA	Prep	200.8			323557	02/25/20 07:11	A1B	TAL SEA
Total/NA	Analysis	200.8		1	323671	02/25/20 12:47	FCW	TAL SEA

Laboratory References:

TAL SEA = Eurofins TestAmerica, Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Farallon Consulting LLC
Project/Site: Skykomish HCC System

Job ID: 580-92993-1

Laboratory: Eurofins TestAmerica, Seattle

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

Authority	Program	Identification Number	Expiration Date
Washington	State	C553	02-18-21

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
200.8	200.8	Water	Arsenic
200.8	200.8	Water	Lead

Sample Summary

Client: Farallon Consulting LLC
Project/Site: Skykomish HCC System

Job ID: 580-92993-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
580-92993-1	Before GAC-22120	Water	02/21/20 10:00	02/24/20 13:22	
580-92993-2	HCC EFF-22120	Water	02/21/20 10:00	02/24/20 13:22	

TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424-1317
phone 253.922.2310 fax 253.922.5047

Chain of Custody Record

92993

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.

Regulatory Program: ☐ DW ☑ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: Pete Kingston	Site Contact: Matt Bowser	Date: 2/21/20	COC No:
Farallong Consulting	Tel/Fax: 425-394-4146	Lab Contact: Kristine Allen	Carrier:	2 of 2 COCs
975 5th Avenue Northwest	Analysis Turnaround Time			Sampler: TW
Issaquah, Washington	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
(425) 295-0800 Phone	TAT if different from Below 3 days			Walk-in Client:
(425) 295-0850 FAX	☐ 2 weeks			Lab Sampling:
Project Name: Skykomish HCC System	☐ 1 week			
Site:	☐ 2 days			Job / SDG No.:
WO # TT0100-S03	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	NWTPH-Dx w/o silica gel cleanup	Total As, Pb (EPA 200.8)	Sample Specific Notes:
Before GAC- 22120	2/21/20	10:00	Grab	W	2			X		***See instructions below
HCC EFF- 22120	2/21/20	10:00	Grab	W	3			X	X	***See instructions below

580-92993 Chain of Custody

Therm. ID: IR6 Cor: 0.3 ° Unc: 0.4 °
Cooler Dsc: Lg Blue FedEx:
Packing: Bub UPS:
Cust. Seal: Yes No Lab Cour: 2
Blue Ice, Wet, Dry, None Other:

Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 5=NaOH; 6= Other 2 4 1

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal by Lab ☐ Archive for ____ Months

Special Instructions/QC Requirements & Comments: 1) DxRx requires special limits 0.208 mg/L, cumulative, Final Volume of 2 mL required 2) No silica get cleanup needed for Dx

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:		Cooler Temp. (°C): Obs'd:	Corr'd:	Therm ID No.:
Relinquished by:	Company: Tracer	Date/Time: 2/24/20 9:35	Received by:	Company:	Date/Time: 934 2-24-20
Relinquished by:	Company:	Date/Time:	Received by:	Company: PPTA	Date/Time: 2-24-2020 13:22
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.18, dated 9/5/2018

Login Sample Receipt Checklist

Client: Farallon Consulting LLC

Job Number: 580-92993-1

Login Number: 92993

List Source: Eurofins TestAmerica, Seattle

List Number: 1

Creator: Blankinship, Tom X

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
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.	True	
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").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

Laboratory Job ID: 580-94261-1
Client Project/Site: Skykomish HCC System
Sampling Event: Skykomish - GAC/HCC

For:
Farallon Consulting LLC
975 5th Avenue NW
Suite 100
Issaquah, Washington 98027

Attn: Peter Kingston

Kristine D. Allen

Authorized for release by:
4/27/2020 4:40:00 PM

Kristine Allen, Client Service Manager
(253)248-4970
kristine.allen@testamericainc.com

Table of Contents

Job ID: 580-94261-1

Laboratory: Eurofins TestAmerica, Seattle

Narrative

Job Narrative
580-94261-1

Comments
No additional comments.

Receipt
The samples were received on 4/23/2020 3:30 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.9º C.

GC Semi VOA
Methods NWTPH-Dx: (CCV 580-327307/14) and (CCVRT 580-327307/3) recovers outside drift limits for o-Terphenyl surrogate. All QC and associated client samples recover within control limits; therefore, the data is reported.

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

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

Organic Prep
Method 3510C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with preparation batch 580-327305. An LCS/LCSD have been prepared.

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

Client: Farallon Consulting LLC
Job ID: 580-94261-1
Project/Site: Skykomish HCC System

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
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)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
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)

Client: Farallon Consulting LLC
Project/Site: Skykomish HCC System

Job ID: 580-94261-1

Client Sample ID: Before GAC-42320
Date Collected: 04/23/20 09:00
Date Received: 04/23/20 15:30

Lab Sample ID: 580-94261-1
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.40		0.061		mg/L		04/26/20 14:42	04/26/20 20:03	1
Motor Oil (>C24-C36)	0.20		0.091		mg/L		04/26/20 14:42	04/26/20 20:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*71*		*50 - 150*	*04/26/20 14:42*	*04/26/20 20:03*	*1*

Client: Farallon Consulting LLC
Project/Site: Skykomish HCC System

Job ID: 580-94261-1

Client Sample ID: HCC EFF-42320
Date Collected: 04/23/20 09:00
Date Received: 04/23/20 15:30

Lab Sample ID: 580-94261-2
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062		mg/L		04/26/20 14:42	04/26/20 20:23	1
Motor Oil (>C24-C36)	ND		0.091		mg/L		04/26/20 14:42	04/26/20 20:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*71*		*50 - 150*	*04/26/20 14:42*	*04/26/20 20:23*	*1*

Method: 200.8 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010		mg/L		04/24/20 09:13	04/27/20 14:16	1
Lead	ND		0.00080		mg/L		04/24/20 09:13	04/27/20 14:16	1

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

Lab Sample ID: MB 580-327305/1-A
Matrix: Water
Analysis Batch: 327307

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 327305

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.065		mg/L		04/26/20 14:42	04/26/20 19:03	1
Motor Oil (>C24-C36)	ND		0.096		mg/L		04/26/20 14:42	04/26/20 19:03	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*71*		*50 - 150*	*04/26/20 14:42*	*04/26/20 19:03*	*1*

Lab Sample ID: LCS 580-327305/2-A
Matrix: Water
Analysis Batch: 327307

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 327305

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
#2 Diesel (C10-C24)			0.500	0.486		mg/L		97	50 - 120		
Motor Oil (>C24-C36)			0.500	0.511		mg/L		102	64 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl	*69*		*50 - 150*

Lab Sample ID: LCSD 580-327305/3-A
Matrix: Water
Analysis Batch: 327307

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 327305

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
#2 Diesel (C10-C24)			0.500	0.475		mg/L		95	50 - 120	2	26
Motor Oil (>C24-C36)			0.500	0.512		mg/L		102	64 - 120	0	24

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o-Terphenyl	*67*		*50 - 150*

Method: 200.8 - Metals (ICP/MS)

Lab Sample ID: MB 580-327233/14-A
Matrix: Water
Analysis Batch: 327375

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 327233

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010		mg/L		04/24/20 09:13	04/27/20 13:29	1
Lead	ND		0.00080		mg/L		04/24/20 09:13	04/27/20 13:29	1

Lab Sample ID: LCS 580-327233/15-A
Matrix: Water
Analysis Batch: 327375

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 327233

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic			1.00	1.00		mg/L		100	85 - 115		
Lead			1.00	0.955		mg/L		96	85 - 115		

Method: 200.8 - Metals (ICP/MS) (Continued)

Lab Sample ID: LCSD 580-327233/16-A
Matrix: Water
Analysis Batch: 327375

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 327233

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic			1.00	0.984		mg/L		98	85 - 115	2	20
Lead			1.00	0.944		mg/L		94	85 - 115	1	20

Lab Sample ID: 580-94263-A-1-C MS
Matrix: Water
Analysis Batch: 327375

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 327233

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic	ND		1.00	0.936		mg/L		94	70 - 130		
Lead	ND		1.00	0.889		mg/L		89	70 - 130		

Lab Sample ID: 580-94263-A-1-D MSD
Matrix: Water
Analysis Batch: 327375

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 327233

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	ND		1.00	0.924		mg/L		92	70 - 130	1	20
Lead	ND		1.00	0.884		mg/L		88	70 - 130	0	20

Lab Sample ID: 580-94263-A-1-B DU
Matrix: Water
Analysis Batch: 327375

Client Sample ID: Duplicate
Prep Type: Total/NA
Prep Batch: 327233

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Arsenic	ND			ND		mg/L				NC	20
Lead	ND			ND		mg/L				NC	20

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: Skykomish HCC System

Job ID: 580-94261-1

Client Sample ID: Before GAC-42320

Lab Sample ID: 580-94261-1

Date Collected: 04/23/20 09:00
Date Received: 04/23/20 15:30

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			327305	04/26/20 14:42	JCM	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	327307	04/26/20 20:03	JCM	TAL SEA

Client Sample ID: HCC EFF-42320

Lab Sample ID: 580-94261-2

Date Collected: 04/23/20 09:00
Date Received: 04/23/20 15:30

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			327305	04/26/20 14:42	JCM	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	327307	04/26/20 20:23	JCM	TAL SEA
Total/NA	Prep	200.8			327233	04/24/20 09:13	A1B	TAL SEA
Total/NA	Analysis	200.8		1	327375	04/27/20 14:16	FCW	TAL SEA

Laboratory References:

TAL SEA = Eurofins TestAmerica, Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Farallon Consulting LLC
Project/Site: Skykomish HCC System

Job ID: 580-94261-1

Laboratory: Eurofins TestAmerica, Seattle

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

Authority	Program	Identification Number	Expiration Date
Washington	State	C553	02-18-21

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
200.8	200.8	Water	Arsenic
200.8	200.8	Water	Lead

Sample Summary

Client: Farallon Consulting LLC
Project/Site: Skykomish HCC System

Job ID: 580-94261-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
580-94261-1	Before GAC-42320	Water	04/23/20 09:00	04/23/20 15:30	
580-94261-2	HCC EFF-42320	Water	04/23/20 09:00	04/23/20 15:30	

TestAmerica Seattle
5755 8th Street East

Tacoma, WA 98424-1317
phone 253.922.2310 fax 253.922.5047

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Regulatory Program: ☐ DW ☑ NPDES ☐ RCRA ☐ Other:

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Pete Kingston	Site Contact: Matt Bowser	Date: 4-23-20	COC No:
Farallong Consulting	Tel/Fax: 425-394-4146	Lab Contact: Kristine Allen	Carrier:	2 of 2 COCs
975 5th Avenue Northwest	Analysis Turnaround Time			Sampler: TW
Issaquah, Washington	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
(425) 295-0800 Phone	TAT if different from Below 3 day			Walk-in Client:
(425) 295-0850 FAX	☐ 2 weeks			Lab Sampling:
Project Name: Skykomish HCC System	☐ 1 week			
Site:	☐ 2 days			Job / SDG No.:
WO # TT0100-S03	☐ 1 day			

Loc: 580
94261

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	NWTPH-Dx w/o silica gel cleanup	Total As, Pb (EPA 200.8)	Sample Specific Notes:
Before GAC- 42320	4-23-20	9:00	Grab	W	2			X		***See instructions below
HCC EFF- 42320	4-23-20	9:00	Grab	W	3			X	X	***See instructions below

Therm. ID: 7 Cor: 2.9 ° Unc: 2.7 °
Cooler Dsc: 5 B
Packing: Bub
Cust. Seal: Yes No
Blue Ice, Wet Dry, None
FedEx:
UPS:
Lab Cour: X
Other:

580-94261 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other 2 4 1

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☑ Disposal by Lab ☐ Archive for ____ Months

Special Instructions/QC Requirements & Comments: 1) DxRx requires special limits 0.208 mg/L, cumulative, Final Volume of 2 mL required 2) No silica gel cleanup needed for Dx

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: ____ Corr'd: ____ | Therm ID No.: ____

	Company	Date/Time		Company	Date/Time
Relinquished by:	Gldcler	4/23/20 11:45	Received by:		4/23/20
Relinquished by:	PLX	4/23/20 3:30	Received by:	TASea	4-23-20 1530
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.18, dated 9/5/2018

Login Sample Receipt Checklist

Client: Farallon Consulting LLC

Job Number: 580-94261-1

Login Number: 94261

List Source: Eurofins TestAmerica, Seattle

List Number: 1

Creator: Hobbs, Kenneth F

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.	True	
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.	True	
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").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

Laboratory Job ID: 580-95901-1
Client Project/Site: Skykomish HCC System
Sampling Event: Skykomish - GAC/HCC

For:
Farallon Consulting LLC
975 5th Avenue NW
Suite 100
Issaquah, Washington 98027

Attn: Peter Kingston

Authorized for release by:
7/13/2020 5:00:30 PM

Nathan Lewis, Project Manager I
(253)922-2310
Nathan.Lewis@Eurofinset.com

Table of Contents

Job ID: 580-95901-1

Laboratory: Eurofins TestAmerica, Seattle

Narrative

Job Narrative
580-95901-1

Comments
No additional comments.

Receipt
The samples were received on 7/8/2020 3:10 PM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 6.0º C.

Receipt Exceptions
No COC was received with the samples. COC was provided by client after sample receipt.

GC Semi VOA
Method NWTPH-Dx: The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for preparation batch 580-332618 and analytical batch 580-332713 recovered outside control limits for Motor Oil. Individual recoveries for this analyte are within control limits in the LCS/LCSD; therefore, the data is reported.

Method NWTPH-Dx: The following sample contained a hydrocarbon pattern in the diesel range; however, the elution pattern was later than the typical diesel fuel pattern used by the laboratory for quantitative purposes: Before GAC-62620 (580-95901-1).

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

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

Organic Prep
Method 3510C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with preparation batch 580-332618.

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

Definitions/Glossary

Client: Farallon Consulting LLC
Project/Site: Skykomish HCC System

Job ID: 580-95901-1

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
*1	LCS/LCSD RPD exceeds control limits.

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

Client: Farallon Consulting LLC
Project/Site: Skykomish HCC System

Job ID: 580-95901-1

Client Sample ID: Before GAC-62620
Date Collected: 06/26/20 13:30
Date Received: 07/08/20 15:10

Lab Sample ID: 580-95901-1
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.35		0.062		mg/L		07/09/20 10:17	07/10/20 12:19	1
Motor Oil (>C24-C36)	0.20	*1	0.091		mg/L		07/09/20 10:17	07/10/20 12:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*79*		*50 - 150*	*07/09/20 10:17*	*07/10/20 12:19*	*1*

Client: Farallon Consulting LLC
Project/Site: Skykomish HCC System

Job ID: 580-95901-1

Client Sample ID: HCC EFF-62620

Lab Sample ID: 580-95901-2

Date Collected: 06/26/20 13:30

Matrix: Water

Date Received: 07/08/20 15:10

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062		mg/L		07/09/20 10:17	07/10/20 12:39	1
Motor Oil (>C24-C36)	ND	*1	0.091		mg/L		07/09/20 10:17	07/10/20 12:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*84*		*50 - 150*	*07/09/20 10:17*	*07/10/20 12:39*	*1*

Method: 200.8 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010		mg/L		07/09/20 08:23	07/09/20 15:37	1
Lead	ND		0.00080		mg/L		07/09/20 08:23	07/09/20 15:37	1

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

Lab Sample ID: MB 580-332618/1-A
Matrix: Water
Analysis Batch: 332713

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 332618

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.065		mg/L		07/09/20 10:17	07/10/20 10:58	1
Motor Oil (>C24-C36)	ND		0.096		mg/L		07/09/20 10:17	07/10/20 10:58	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*85*		*50 - 150*	*07/09/20 10:17*	*07/10/20 10:58*	*1*

Lab Sample ID: LCS 580-332618/2-A
Matrix: Water
Analysis Batch: 332713

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 332618

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
#2 Diesel (C10-C24)			0.500	0.346		mg/L		69	50 - 120		
Motor Oil (>C24-C36)			0.500	0.420		mg/L		84	64 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl	*82*		*50 - 150*

Lab Sample ID: LCSD 580-332618/3-A
Matrix: Water
Analysis Batch: 332713

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 332618

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
#2 Diesel (C10-C24)			0.500	0.448		mg/L		90	50 - 120	26	26
Motor Oil (>C24-C36)			0.500	0.580	*1	mg/L		116	64 - 120	32	24

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o-Terphenyl	*91*		*50 - 150*

Method: 200.8 - Metals (ICP/MS)

Lab Sample ID: MB 580-332601/10-A
Matrix: Water
Analysis Batch: 332683

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 332601

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010		mg/L		07/09/20 08:23	07/09/20 15:33	1
Lead	ND		0.00080		mg/L		07/09/20 08:23	07/09/20 15:33	1

Lab Sample ID: LCS 580-332601/11-A
Matrix: Water
Analysis Batch: 332683

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 332601

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic			1.00	0.972		mg/L		97	85 - 115		
Lead			1.00	0.950		mg/L		95	85 - 115		

Method: 200.8 - Metals (ICP/MS) (Continued)

Lab Sample ID: LCSD 580-332601/12-A
Matrix: Water
Analysis Batch: 332683

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 332601

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic			1.00	0.975		mg/L		98	85 - 115	0	20
Lead			1.00	0.958		mg/L		96	85 - 115	1	20

Lab Sample ID: 580-95901-2 MS
Matrix: Water
Analysis Batch: 332683

Client Sample ID: HCC EFF-62620
Prep Type: Total/NA
Prep Batch: 332601

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic	ND		1.00	0.928		mg/L		93	70 - 130		
Lead	ND		1.00	0.901		mg/L		90	70 - 130		

Lab Sample ID: 580-95901-2 MSD
Matrix: Water
Analysis Batch: 332683

Client Sample ID: HCC EFF-62620
Prep Type: Total/NA
Prep Batch: 332601

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	ND		1.00	0.913		mg/L		91	70 - 130	2	20
Lead	ND		1.00	0.886		mg/L		89	70 - 130	2	20

Lab Sample ID: 580-95901-2 DU
Matrix: Water
Analysis Batch: 332683

Client Sample ID: HCC EFF-62620
Prep Type: Total/NA
Prep Batch: 332601

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Arsenic	ND			ND		mg/L				NC	20
Lead	ND			ND		mg/L				NC	20

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: Skykomish HCC System

Job ID: 580-95901-1

Client Sample ID: Before GAC-62620

Lab Sample ID: 580-95901-1

Date Collected: 06/26/20 13:30

Matrix: Water

Date Received: 07/08/20 15:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			332618	07/09/20 10:17	S1S	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	332713	07/10/20 12:19	JCM	TAL SEA

Client Sample ID: HCC EFF-62620

Lab Sample ID: 580-95901-2

Date Collected: 06/26/20 13:30

Matrix: Water

Date Received: 07/08/20 15:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			332618	07/09/20 10:17	S1S	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	332713	07/10/20 12:39	JCM	TAL SEA
Total/NA	Prep	200.8			332601	07/09/20 08:23	A1B	TAL SEA
Total/NA	Analysis	200.8		1	332683	07/09/20 15:37	FCW	TAL SEA

Laboratory References:

TAL SEA = Eurofins TestAmerica, Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Farallon Consulting LLC
Project/Site: Skykomish HCC System

Job ID: 580-95901-1

Laboratory: Eurofins TestAmerica, Seattle

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

Authority	Program	Identification Number	Expiration Date
Washington	State	C553	02-18-21

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
200.8	200.8	Water	Arsenic
200.8	200.8	Water	Lead

Sample Summary

Client: Farallon Consulting LLC
Project/Site: Skykomish HCC System

Job ID: 580-95901-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
580-95901-1	Before GAC-62620	Water	06/26/20 13:30	07/08/20 15:10	
580-95901-2	HCC EFF-62620	Water	06/26/20 13:30	07/08/20 15:10	

TestAmerica Seattle
5755 8th Street East

Tacoma, WA 98424-1317
phone 253.922.2310 fax 253.922.5047

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Regulatory Program: ☐ DW ☑ NPDES ☐ RCRA ☐ Other:

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Pete Kingston	Site Contact: Matt Bowser	Date:	COC No:
Farallong Consulting	Tel/Fax: 425-394-4146	Lab Contact: Kristine Allen	Carrier:	____ of ____ COCs
975 5th Avenue Northwest	Analysis Turnaround Time			Sampler:
Issaquah, Washington	☐ CALENDAR DAYS ☑ WORKING DAYS			For Lab Use Only:
(425) 295-0800 Phone	TAT if different from Below ____3-DAY____			Walk-in Client:
(425) 295-0850 FAX	☐ 2 weeks			Lab Sampling:
Project Name: Skykomish HCC System	☐ 1 week			
Site:	☐ 2 days			Job / SDG No.:
WO # TT0100-S03	☐ 1 day			

Loc: 580
95901

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	NWTPH-Dx w/o silica gel cleanup	Total As, Pb (EPA 200.8)	Sample Specific Notes:
Before GAC-62620	6/26/20	1330	Grab	W	2			X		***See instructions below
HCC EFF-62620	6/26/20	1330	Grab	W	3			X	X	***See instructions below

580-95901 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other 2 4 1

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments: 1) DxRx requires special limits 0.208 mg/L, cumulative, Final Volume of 2 mL required 2) No silica get cleanup needed for Dx

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: _____ Corr'd: _____ | Therm ID No.: _____

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Kenny Hahs | TASeq | 7-8-20 1400

Form No. CA-C-WI-002, Rev. 4.18, dated 9/5/2018

Login Sample Receipt Checklist

Client: Farallon Consulting LLC

Job Number: 580-95901-1

Login Number: 95901
List Number: 1
Creator: Hobbs, Kenneth F

List Source: Eurofins TestAmerica, Seattle

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.	True	
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.	False	
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.	True	
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").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

Laboratory Job ID: 580-97225-1
Client Project/Site: BNSF Skykomish Rush NPDES
Sampling Event: Skykomish - GAC/HCC

For:
Farallon Consulting LLC
975 5th Avenue NW
Suite 100
Issaquah, Washington 98027

Attn: Amanda Meuginot

Kristine D. Allen

Authorized for release by:
9/9/2020 5:18:23 PM
Kristine Allen, Client Service Manager
(253)248-4970
Kristine.Allen@Eurofinset.com

Designee for

Nathan Lewis, Project Manager I
(253)922-2310
Nathan.Lewis@Eurofinset.com

Table of Contents

Job ID: 580-97225-1

Laboratory: Eurofins TestAmerica, Seattle

Narrative

Job Narrative
580-97225-1

Comments
No additional comments.

Receipt
The samples were received on 9/3/2020 2:20 PM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 5.3º C.

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

Metals
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.

Definitions/Glossary

Client: Farallon Consulting LLC
Job ID: 580-97225-1
Project/Site: BNSF Skykomish Rush NPDES

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

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-97225-1

Client Sample ID: Before GAC-82920
Date Collected: 08/29/20 08:30
Date Received: 09/03/20 14:20

Lab Sample ID: 580-97225-1
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.30		0.062		mg/L		09/08/20 17:31	09/09/20 12:16	1
Motor Oil (>C24-C36)	0.18		0.091		mg/L		09/08/20 17:31	09/09/20 12:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*73*		*50 - 150*	*09/08/20 17:31*	*09/09/20 12:16*	*1*

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-97225-1

Client Sample ID: HCC EFF-82920
Date Collected: 08/29/20 08:30
Date Received: 09/03/20 14:20

Lab Sample ID: 580-97225-2
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062		mg/L		09/04/20 10:21	09/05/20 17:52	1
Motor Oil (>C24-C36)	ND		0.091		mg/L		09/04/20 10:21	09/05/20 17:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*62*		*50 - 150*	*09/04/20 10:21*	*09/05/20 17:52*	*1*

Method: 200.8 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010		mg/L		09/03/20 16:18	09/05/20 00:37	1
Lead	ND		0.00080		mg/L		09/03/20 16:18	09/05/20 00:37	1

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

Lab Sample ID: MB 580-337537/1-A
Matrix: Water
Analysis Batch: 337628

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 337537

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.065		mg/L		09/04/20 10:21	09/05/20 16:51	1
Motor Oil (>C24-C36)	ND		0.096		mg/L		09/04/20 10:21	09/05/20 16:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*77*		*50 - 150*	*09/04/20 10:21*	*09/05/20 16:51*	*1*

Lab Sample ID: LCS 580-337537/2-A
Matrix: Water
Analysis Batch: 337628

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 337537

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
#2 Diesel (C10-C24)			0.500	0.372		mg/L		74	50 - 120		
Motor Oil (>C24-C36)			0.500	0.439		mg/L		88	64 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl	*75*		*50 - 150*

Lab Sample ID: LCSD 580-337537/3-A
Matrix: Water
Analysis Batch: 337628

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 337537

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
#2 Diesel (C10-C24)			0.500	0.379		mg/L		76	50 - 120	2	26
Motor Oil (>C24-C36)			0.500	0.465		mg/L		93	64 - 120	6	24

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o-Terphenyl	*77*		*50 - 150*

Lab Sample ID: MB 580-337741/1-A
Matrix: Water
Analysis Batch: 337770

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 337741

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.065		mg/L		09/08/20 17:31	09/09/20 11:16	1
Motor Oil (>C24-C36)	ND		0.096		mg/L		09/08/20 17:31	09/09/20 11:16	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*78*		*50 - 150*	*09/08/20 17:31*	*09/09/20 11:16*	*1*

Lab Sample ID: LCS 580-337741/2-A
Matrix: Water
Analysis Batch: 337770

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 337741

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
#2 Diesel (C10-C24)			0.500	0.372		mg/L		74	50 - 120		
Motor Oil (>C24-C36)			0.500	0.454		mg/L		91	64 - 120		

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

Lab Sample ID: LCS 580-337741/2-A
Matrix: Water
Analysis Batch: 337770

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 337741

Surrogate	LCS %Recovery	LCS Qualifier	Limits
o-Terphenyl	82		50 - 150

Lab Sample ID: LCSD 580-337741/3-A
Matrix: Water
Analysis Batch: 337770

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 337741

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
#2 Diesel (C10-C24)			0.500	0.377		mg/L		75	50 - 120	1	26
Motor Oil (>C24-C36)			0.500	0.448		mg/L		90	64 - 120	2	24

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
o-Terphenyl	83		50 - 150

Method: 200.8 - Metals (ICP/MS)

Lab Sample ID: MB 580-337493/14-A
Matrix: Water
Analysis Batch: 337673

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 337493

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010		mg/L		09/03/20 16:18	09/04/20 23:25	1
Lead	ND		0.00080		mg/L		09/03/20 16:18	09/04/20 23:25	1

Lab Sample ID: LCS 580-337493/15-A
Matrix: Water
Analysis Batch: 337673

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 337493

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic			1.00	0.990		mg/L		99	85 - 115		
Lead			1.00	1.01		mg/L		101	85 - 115		

Lab Sample ID: LCSD 580-337493/16-A
Matrix: Water
Analysis Batch: 337673

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 337493

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic			1.00	0.920		mg/L		92	85 - 115	7	20
Lead			1.00	0.992		mg/L		99	85 - 115	2	20

Lab Sample ID: 580-97173-D-3-C MS
Matrix: Water
Analysis Batch: 337673

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 337493

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic	ND		1.00	0.970		mg/L		97	70 - 130		
Lead	ND		1.00	0.985		mg/L		99	70 - 130		

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-97225-1

Method: 200.8 - Metals (ICP/MS) (Continued)

Lab Sample ID: 580-97173-D-3-D MSD
Matrix: Water
Analysis Batch: 337673

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 337493

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	ND		1.00	1.04		mg/L		104	70 - 130	7	20
Lead	ND		1.00	1.08		mg/L		108	70 - 130	9	20

Lab Sample ID: 580-97173-D-3-B DU
Matrix: Water
Analysis Batch: 337673

Client Sample ID: Duplicate
Prep Type: Total/NA
Prep Batch: 337493

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Arsenic	ND			ND		mg/L				NC	20
Lead	ND			ND		mg/L				NC	20

Lab Chronicle

Client: Farallon Consulting LLC
Job ID: 580-97225-1
Project/Site: BNSF Skykomish Rush NPDES

Client Sample ID: Before GAC-82920
Lab Sample ID: 580-97225-1
Date Collected: 08/29/20 08:30
Matrix: Water
Date Received: 09/03/20 14:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			337741	09/08/20 17:31	S1S	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	337770	09/09/20 12:16	JKM	TAL SEA

Client Sample ID: HCC EFF-82920
Lab Sample ID: 580-97225-2
Date Collected: 08/29/20 08:30
Matrix: Water
Date Received: 09/03/20 14:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			337537	09/04/20 10:21	LEL	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	337628	09/05/20 17:52	JKM	TAL SEA
Total/NA	Prep	200.8			337493	09/03/20 16:18	ART	TAL SEA
Total/NA	Analysis	200.8		1	337673	09/05/20 00:37	FCW	TAL SEA

Laboratory References:

TAL SEA = Eurofins TestAmerica, Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Farallon Consulting LLC
Job ID: 580-97225-1
Project/Site: BNSF Skykomish Rush NPDES

Laboratory: Eurofins TestAmerica, Seattle

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

Authority	Program	Identification Number	Expiration Date
Washington	State	C553	02-18-21

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
200.8	200.8	Water	Arsenic
200.8	200.8	Water	Lead

Sample Summary

Client: Farallon Consulting LLC
Project/Site: BNSF Skykomish Rush NPDES

Job ID: 580-97225-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
580-97225-1	Before GAC-82920	Water	08/29/20 08:30	09/03/20 14:20	
580-97225-2	HCC EFF-82920	Water	08/29/20 08:30	09/03/20 14:20	

TestAmerica Seattle
5755 8th Street East

Tacoma, WA 98424-1317
phone 253.922.2310 fax 253.922.5047

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Regulatory Program: ☐DW ☑NPDES ☐RCRA ☐Other:

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Pete Kingston	Site Contact: Matt Bowser	Date: 8-29-20	COC No:
Farallong Consulting	Tel/Fax: 425-394-4146	Lab Contact: Kristine Allen	Carrier:	1 of 2 COCs
975 5th Avenue Northwest	Analysis Turnaround Time			Sampler: TW
Issaquah, Washington	☐CALENDAR DAYS ☐WORKING DAYS			For Lab Use Only:
(425) 295-0800 Phone	TAT if different from Below 3 day			Walk-in Client:
(425) 295-0850 FAX	☐2 weeks			Lab Sampling:
Project Name: Skykomish HCC System	☐1 week			
Site:	☐2 days			Job / SDG No.:
WO # TT0100-S03	☐1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	NWTPH-Dx w/o silica gel cleanup	Total As, Pb (EPA 200.8)	Sample Specific Notes:
Before GAC- 82920	8/29/20	830	Grab	W	2			X		***See instructions below
HCC EFF- 82920	8/29/20	830	Grab	W	3			X	X	***See instructions below

Therm. ID: IR2 Cor: 5.3 ° Unc: 5.8 °
Cooler Dsc: MB
Packing: Bubble
Cust. Seal: Yes X No
Blue Ice, Wet, Dry, None
FedEx:
UPS:
Lab Cour: X
Other:

580-97225 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other 2 4 1

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.
☑Non-Hazard ☐Flammable ☐Skin Irritant ☐Poison B ☐Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐Return to Client ☑Disposal by Lab ☐Archive for ____ Months

Special Instructions/QC Requirements & Comments: 1) DxRx requires special limits 0.208 mg/L, cumulative, Final Volume of 2 mL required 2) No silica gel cleanup needed for Dx

Custody Seals Intact: ☐Yes ☐No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: ____ Corr'd: ____ | Therm ID No.: ____

Relinquished by:	Company: EGLCLEV	Date/Time:	Received by:	Company:	Date/Time: 9/2/20 1219
Relinquished by:	Company:	Date/Time:	Received by:	Company: EPA SEA	Date/Time: 9/3/2020 1211
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Picked up at EM Lab.
JLS 9/3/2020

Form No. CA-C-WI-002, Rev. 4.18, dated 9/5/2018

Login Sample Receipt Checklist

Client: Farallon Consulting LLC

Job Number: 580-97225-1

Login Number: 97225

List Source: Eurofins TestAmerica, Seattle

List Number: 1

Creator: Vallelunga, Diana L

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.	True	
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.	True	
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").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

Laboratory Job ID: 580-98713-1
Client Project/Site: Skykomish HCC System
Sampling Event: Skykomish - GAC/HCC

For:
Farallon Consulting LLC
975 5th Avenue NW
Suite 100
Issaquah, Washington 98027

Attn: Amanda Meuginot

Authorized for release by:
11/9/2020 3:35:03 PM

Nathan Lewis, Project Manager I
(253)922-2310
Nathan.Lewis@Eurofinset.com

Table of Contents

Job ID: 580-98713-1

Laboratory: Eurofins TestAmerica, Seattle

Narrative

CASE NARRATIVE
Client: Farallon Consulting LLC
Project: Skykomish HCC System
Report Number: 580-98713-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

It should be noted that samples with elevated Reporting Limits (RLs) resulting from a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the RLs are an unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes within the calibration range of the instrument or that reduces the interferences thereby enabling the quantification of target analytes.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 11/03/2020; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was -1.1 C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

DIESEL AND MOTOR OIL RANGE ORGANICS
Samples Before GAC - 103120 (580-98713-1) and HCC EFF - 103120 (580-98713-2) were analyzed for diesel and motor oil range organics in accordance with Method NWTPH-Dx. The samples were prepared and analyzed on 11/04/2020.

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

TOTAL METALS (ICPMS)
Sample HCC EFF - 103120 (580-98713-2) was analyzed for total metals (ICPMS) in accordance with EPA Method 200.8. The samples were prepared on 11/04/2020 and analyzed on 11/06/2020.

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

Definitions/Glossary

Client: Farallon Consulting LLC
Project/Site: Skykomish HCC System

Job ID: 580-98713-1

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

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: Skykomish HCC System

Job ID: 580-98713-1

Client Sample ID: Before GAC - 103120

Lab Sample ID: 580-98713-1

Date Collected: 10/31/20 11:00

Matrix: Water

Date Received: 11/03/20 12:20

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.37		0.062		mg/L		11/04/20 11:05	11/04/20 21:29	1
Motor Oil (>C24-C36)	0.27		0.091		mg/L		11/04/20 11:05	11/04/20 21:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*74*		*50 - 150*	*11/04/20 11:05*	*11/04/20 21:29*	*1*

Client: Farallon Consulting LLC
Project/Site: Skykomish HCC System

Job ID: 580-98713-1

Client Sample ID: HCC EFF - 103120

Lab Sample ID: 580-98713-2

Date Collected: 10/31/20 11:00

Matrix: Water

Date Received: 11/03/20 12:20

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062		mg/L		11/04/20 11:05	11/04/20 21:49	1
Motor Oil (>C24-C36)	ND		0.091		mg/L		11/04/20 11:05	11/04/20 21:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*65*		*50 - 150*	*11/04/20 11:05*	*11/04/20 21:49*	*1*

Method: 200.8 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010		mg/L		11/04/20 18:16	11/06/20 13:39	1
Lead	ND		0.00080		mg/L		11/04/20 18:16	11/06/20 13:39	1

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

Lab Sample ID: MB 580-342383/1-A
Matrix: Water
Analysis Batch: 342453

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 342383

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.065		mg/L		11/04/20 11:05	11/04/20 20:28	1
Motor Oil (>C24-C36)	ND		0.096		mg/L		11/04/20 11:05	11/04/20 20:28	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*78*		*50 - 150*	*11/04/20 11:05*	*11/04/20 20:28*	*1*

Lab Sample ID: LCS 580-342383/2-A
Matrix: Water
Analysis Batch: 342453

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 342383

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
#2 Diesel (C10-C24)			0.500	0.391		mg/L		78	50 - 120		
Motor Oil (>C24-C36)			0.500	0.486		mg/L		97	64 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl	*78*		*50 - 150*

Lab Sample ID: LCSD 580-342383/3-A
Matrix: Water
Analysis Batch: 342453

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 342383

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
#2 Diesel (C10-C24)			0.500	0.335		mg/L		67	50 - 120	15	26
Motor Oil (>C24-C36)			0.500	0.432		mg/L		86	64 - 120	12	24

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o-Terphenyl	*75*		*50 - 150*

Method: 200.8 - Metals (ICP/MS)

Lab Sample ID: MB 580-342442/14-A
Matrix: Water
Analysis Batch: 342646

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 342442

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010		mg/L		11/04/20 18:16	11/06/20 12:47	1
Lead	ND		0.00080		mg/L		11/04/20 18:16	11/06/20 12:47	1

Lab Sample ID: LCS 580-342442/15-A
Matrix: Water
Analysis Batch: 342646

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 342442

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic			1.00	0.989		mg/L		99	85 - 115		
Lead			1.00	0.993		mg/L		99	85 - 115		

Method: 200.8 - Metals (ICP/MS) (Continued)

Lab Sample ID: LCSD 580-342442/16-A
Matrix: Water
Analysis Batch: 342646

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 342442

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic			1.00	1.01		mg/L		101	85 - 115	2	20
Lead			1.00	0.974		mg/L		97	85 - 115	2	20

Lab Sample ID: 580-98759-A-2-C MS
Matrix: Water
Analysis Batch: 342646

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 342442

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic	ND		1.00	0.959		mg/L		96	70 - 130		
Lead	ND		1.00	0.936		mg/L		94	70 - 130		

Lab Sample ID: 580-98759-A-2-D MSD
Matrix: Water
Analysis Batch: 342646

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 342442

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	ND		1.00	0.966		mg/L		97	70 - 130	1	20
Lead	ND		1.00	0.954		mg/L		95	70 - 130	2	20

Lab Sample ID: 580-98759-A-2-B DU
Matrix: Water
Analysis Batch: 342646

Client Sample ID: Duplicate
Prep Type: Total/NA
Prep Batch: 342442

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Arsenic	ND			ND		mg/L				NC	20
Lead	ND			ND		mg/L				NC	20

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: Skykomish HCC System

Job ID: 580-98713-1

Client Sample ID: Before GAC - 103120

Lab Sample ID: 580-98713-1

Date Collected: 10/31/20 11:00

Matrix: Water

Date Received: 11/03/20 12:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			342383	11/04/20 11:05	JBT	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	342453	11/04/20 21:29	TL1	TAL SEA

Client Sample ID: HCC EFF - 103120

Lab Sample ID: 580-98713-2

Date Collected: 10/31/20 11:00

Matrix: Water

Date Received: 11/03/20 12:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			342383	11/04/20 11:05	JBT	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	342453	11/04/20 21:49	TL1	TAL SEA
Total/NA	Prep	200.8			342442	11/04/20 18:16	TMH	TAL SEA
Total/NA	Analysis	200.8		1	342646	11/06/20 13:39	FCW	TAL SEA

Laboratory References:

TAL SEA = Eurofins TestAmerica, Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Farallon Consulting LLC
Job ID: 580-98713-1
Project/Site: Skykomish HCC System

Laboratory: Eurofins TestAmerica, Seattle

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Washington	State	C553	02-18-21

Sample Summary

Client: Farallon Consulting LLC
Project/Site: Skykomish HCC System

Job ID: 580-98713-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
580-98713-1	Before GAC - 103120	Water	10/31/20 11:00	11/03/20 12:20	
580-98713-2	HCC EFF - 103120	Water	10/31/20 11:00	11/03/20 12:20	

TestAmerica Seattle
5755 8th Street East

Tacoma, WA 98424-1317
phone 253.922.2310 fax 253.922.5047

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory Program: ☐ DW ☑ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: Pete Kingston	Site Contact: Matt Bowser	Date: 10/31/20	COC No:
Farallong Consulting	Tel/Fax: 425-394-4146	Lab Contact: Kristine Allen	Carrier:	1 of 2 COCs
975 5th Avenue Northwest	Analysis Turnaround Time			Sampler: JW
Issaquah, Washington	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
(425) 295-0800 Phone	TAT if different from Below 3 day			Walk-in Client:
(425) 295-0850 FAX	☐ 2 weeks			Lab Sampling:
Project Name: Skykomish HCC System	☐ 1 week			
Site:	☐ 2 days			Job / SDG No.:
WO # TT0100-S03	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	NWTPH-Dx w/o silica gel cleanup	Total As, Pb (EPA 200.8)	Sample Specific Notes:
Before GAC- 103120	10/31/20	11:00	Grab	W	2			X		***See instructions below
HCC EFF- 103120	10/31/20	11:00	Grab	W	3			X	X	***See instructions below

Therm. ID: IR8 Cor: -1.1 ° Unc: -0.6 °
Cooler Dsc: GB
Packing: Bubble FedEx:
UPS:
Cust. Seal: Yes No X Lab Cour: X
Blue Ice, Wet, Dry, None Other:

580-98713 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other 2 4 1

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☑ Disposal by Lab ☐ Archive for Months

Special Instructions/QC Requirements & Comments: 1) DxRx requires special limits 0.208 mg/L, cumulative, Final Volume of 2 mL required 2) No silica get cleanup needed for Dx

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:	Cooler Temp. (°C): Obs'd: Corr'd:	Therm ID No.:
Relinquished by:	Company: Glacier	Date/Time: 11/2/20 1:25	Received by:	Company:	Date/Time: 11/2/20 1824
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time: 1324
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company: ETA SEA	Date/Time: 11/3/2020 1220

Form No. CA-C-WI-002, Rev. 4.18, dated 9/5/2018

Login Sample Receipt Checklist

Client: Farallon Consulting LLC

Job Number: 580-98713-1
SDG Number:

Login Number: 98713
List Number: 1
Creator: Vallelunga, Diana L

List Source: Eurofins TestAmerica, Seattle

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.	True	
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.	True	
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").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

Laboratory Job ID: 580-99922-1
Client Project/Site: Skykomish HCC System
Sampling Event: Skykomish - GAC/HCC

For:
Farallon Consulting LLC
975 5th Avenue NW
Suite 100
Issaquah, Washington 98027

Attn: Amanda Meuginot

Authorized for release by:
12/23/2020 4:03:11 PM

Nathan Lewis, Project Manager I
(253)922-2310
Nathan.Lewis@Eurofinset.com

Table of Contents

Job ID: 580-99922-1

Laboratory: Eurofins TestAmerica, Seattle

Narrative

CASE NARRATIVE
Client: Farallon Consulting LLC
Project: Skykomish HCC System
Report Number: 580-99922-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

It should be noted that samples with elevated Reporting Limits (RLs) resulting from a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the RLs are an unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes within the calibration range of the instrument or that reduces the interferences thereby enabling the quantification of target analytes.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 12/18/2020; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 0.1 C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

DIESEL AND MOTOR OIL RANGE ORGANICS
Samples Before GAC-121720 (580-99922-1) and HCC EFF-121720 (580-99922-2) were analyzed for diesel and motor oil range organics in accordance with Method NWTPH-Dx. The samples were prepared on 12/21/2020 and analyzed on 12/22/2020.

The following sample contained a hydrocarbon pattern in the diesel range; however, the elution pattern was later than the typical diesel fuel pattern used by the laboratory for quantitative purposes: Before GAC-121720 (580-99922-1).

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

TOTAL METALS (ICPMS)
Sample HCC EFF-121720 (580-99922-2) was analyzed for total metals (ICPMS) in accordance with EPA Method 200.8. The samples were prepared on 12/18/2020 and analyzed on 12/21/2020.

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

Definitions/Glossary

Client: Farallon Consulting LLC
Project/Site: Skykomish HCC System

Job ID: 580-99922-1

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

Client Sample Results

Client: Farallon Consulting LLC
Project/Site: Skykomish HCC System

Job ID: 580-99922-1

Client Sample ID: Before GAC-121720

Lab Sample ID: 580-99922-1

Date Collected: 12/17/20 09:00

Matrix: Water

Date Received: 12/18/20 11:44

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.26		0.062		mg/L		12/21/20 11:03	12/22/20 16:27	1
Motor Oil (>C24-C36)	0.24		0.091		mg/L		12/21/20 11:03	12/22/20 16:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*83*		*50 - 150*	*12/21/20 11:03*	*12/22/20 16:27*	*1*

Client: Farallon Consulting LLC
Project/Site: Skykomish HCC System

Job ID: 580-99922-1

Client Sample ID: HCC EFF-121720
Date Collected: 12/17/20 09:00
Date Received: 12/18/20 11:44

Lab Sample ID: 580-99922-2
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.062		mg/L		12/21/20 11:03	12/22/20 16:47	1
Motor Oil (>C24-C36)	ND		0.091		mg/L		12/21/20 11:03	12/22/20 16:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*83*		*50 - 150*	*12/21/20 11:03*	*12/22/20 16:47*	*1*

Method: 200.8 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010		mg/L		12/18/20 19:29	12/21/20 18:18	1
Lead	ND		0.00080		mg/L		12/18/20 19:29	12/21/20 18:18	1

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

Lab Sample ID: MB 580-346073/1-A
Matrix: Water
Analysis Batch: 346153

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 346073

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.065		mg/L		12/21/20 11:03	12/22/20 11:09	1
Motor Oil (>C24-C36)	ND		0.096		mg/L		12/21/20 11:03	12/22/20 11:09	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*75*		*50 - 150*	*12/21/20 11:03*	*12/22/20 11:09*	*1*

Lab Sample ID: LCS 580-346073/2-A
Matrix: Water
Analysis Batch: 346153

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 346073

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
#2 Diesel (C10-C24)			0.500	0.510		mg/L		102	50 - 120		
Motor Oil (>C24-C36)			0.500	0.536		mg/L		107	64 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl	*101*		*50 - 150*

Lab Sample ID: LCSD 580-346073/3-A
Matrix: Water
Analysis Batch: 346153

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 346073

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
#2 Diesel (C10-C24)			0.500	0.488		mg/L		98	50 - 120	4	26
Motor Oil (>C24-C36)			0.500	0.517		mg/L		103	64 - 120	4	24

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o-Terphenyl	*103*		*50 - 150*

Method: 200.8 - Metals (ICP/MS)

Lab Sample ID: MB 580-345981/14-A
Matrix: Water
Analysis Batch: 346149

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 345981

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010		mg/L		12/18/20 19:29	12/21/20 18:10	1
Lead	ND		0.00080		mg/L		12/18/20 19:29	12/21/20 18:10	1

Lab Sample ID: LCS 580-345981/15-A
Matrix: Water
Analysis Batch: 346149

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 345981

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic			1.00	1.00		mg/L		100	85 - 115		
Lead			1.00	1.00		mg/L		100	85 - 115		

Method: 200.8 - Metals (ICP/MS) (Continued)

Lab Sample ID: LCSD 580-345981/16-A
Matrix: Water
Analysis Batch: 346149

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 345981

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic			1.00	1.00		mg/L		100	85 - 115	0	20
Lead			1.00	1.01		mg/L		101	85 - 115	0	20

Lab Sample ID: 580-99922-2 MS
Matrix: Water
Analysis Batch: 346149

Client Sample ID: HCC EFF-121720
Prep Type: Total/NA
Prep Batch: 345981

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic	ND		1.00	1.11		mg/L		111	70 - 130		
Lead	ND		1.00	1.10		mg/L		110	70 - 130		

Lab Sample ID: 580-99922-2 MSD
Matrix: Water
Analysis Batch: 346149

Client Sample ID: HCC EFF-121720
Prep Type: Total/NA
Prep Batch: 345981

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	ND		1.00	1.03		mg/L		103	70 - 130	7	20
Lead	ND		1.00	1.03		mg/L		103	70 - 130	6	20

Lab Sample ID: 580-99922-2 DU
Matrix: Water
Analysis Batch: 346149

Client Sample ID: HCC EFF-121720
Prep Type: Total/NA
Prep Batch: 345981

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Arsenic	ND			ND		mg/L				NC	20
Lead	ND			ND		mg/L				NC	20

Lab Chronicle

Client: Farallon Consulting LLC
Project/Site: Skykomish HCC System

Job ID: 580-99922-1

Client Sample ID: Before GAC-121720

Lab Sample ID: 580-99922-1

Date Collected: 12/17/20 09:00

Matrix: Water

Date Received: 12/18/20 11:44

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			346073	12/21/20 11:03	JBT	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	346153	12/22/20 16:27	JKM	TAL SEA

Client Sample ID: HCC EFF-121720

Lab Sample ID: 580-99922-2

Date Collected: 12/17/20 09:00

Matrix: Water

Date Received: 12/18/20 11:44

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			346073	12/21/20 11:03	JBT	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	346153	12/22/20 16:47	JKM	TAL SEA
Total/NA	Prep	200.8			345981	12/18/20 19:29	TMH	TAL SEA
Total/NA	Analysis	200.8		1	346149	12/21/20 18:18	FCW	TAL SEA

Laboratory References:

TAL SEA = Eurofins TestAmerica, Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Farallon Consulting LLC
Project/Site: Skykomish HCC System

Job ID: 580-99922-1

Laboratory: Eurofins TestAmerica, Seattle

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Washington	State	C553	02-18-21

Sample Summary

Client: Farallon Consulting LLC
Project/Site: Skykomish HCC System

Job ID: 580-99922-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
580-99922-1	Before GAC-121720	Water	12/17/20 09:00	12/18/20 11:44	
580-99922-2	HCC EFF-121720	Water	12/17/20 09:00	12/18/20 11:44	

TestAmerica Seattle
5755 8th Street East

Tacoma, WA 98424-1317
phone 253.922.2310 fax 253.922.5047

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory Program: ☐ DW ☑ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: Pete Kingston	Site Contact: Matt Bowser	Date: 12-17-2020	COC No:
Farallong Consulting	Tel/Fax: 425-394-4146	Lab Contact: Kristine Allen	Carrier:	2 of 2 COCs
975 5th Avenue Northwest	Analysis Turnaround Time			Sampler: TW
Issaquah, Washington	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
(425) 295-0800 Phone	TAT if different from Below 3 day			Walk-in Client:
(425) 295-0850 FAX	☐ 2 weeks			Lab Sampling:
Project Name: Skykomish HCC System	☐ 1 week			
Site:	☐ 2 days			Job / SDG No.:
WO # TT0100-S03	☐ 1 day			

Loc: 580
99922

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	NWTPH-Dx w/o silica gel cleanup	Total As, Pb (EPA 200.8)	Sample Specific Notes:
Before GAC- 121720	12/17/20	9:00	Grab	W	2			X		***See instructions below
HCC EFF- 121720	12/17/20	9:00	Grab	W	3			X	X	***See instructions below

Therm. ID: IR8 Cor: 0.1 ° Unc: 0.2 °
Cooler Dsc: WB
Packing: None
Cust. Seal: Yes ___ No X
Blue Ice, Wet, Dry, None
FedEx: ___
UPS: ___
Lab Cour: X
Other: ___

580-99922 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other 2 4 1

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal by Lab ☐ Archive for ___ Months

Special Instructions/QC Requirements & Comments: 1) DxRx requires special limits 0.208 mg/L, cumulative, Final Volume of 2 mL required 2) No silica get cleanup needed for Dx

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: ___ Corr'd: ___ | Therm ID No.: ___

	Company:	Date/Time:		Company:	Date/Time:
Relinquished by:	Glacier	12/17/20 11:55	Received by:	EMLAB	12/17/20 1200
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
				ESA SEA	12/18/2020 1124

Form No. CA-C-WI-002, Rev. 4.18, dated 9/5/2018

Login Sample Receipt Checklist

Client: Farallon Consulting LLC

Job Number: 580-99922-1

Login Number: 99922
List Number: 1
Creator: Hobbs, Kenneth F

List Source: Eurofins TestAmerica, Seattle

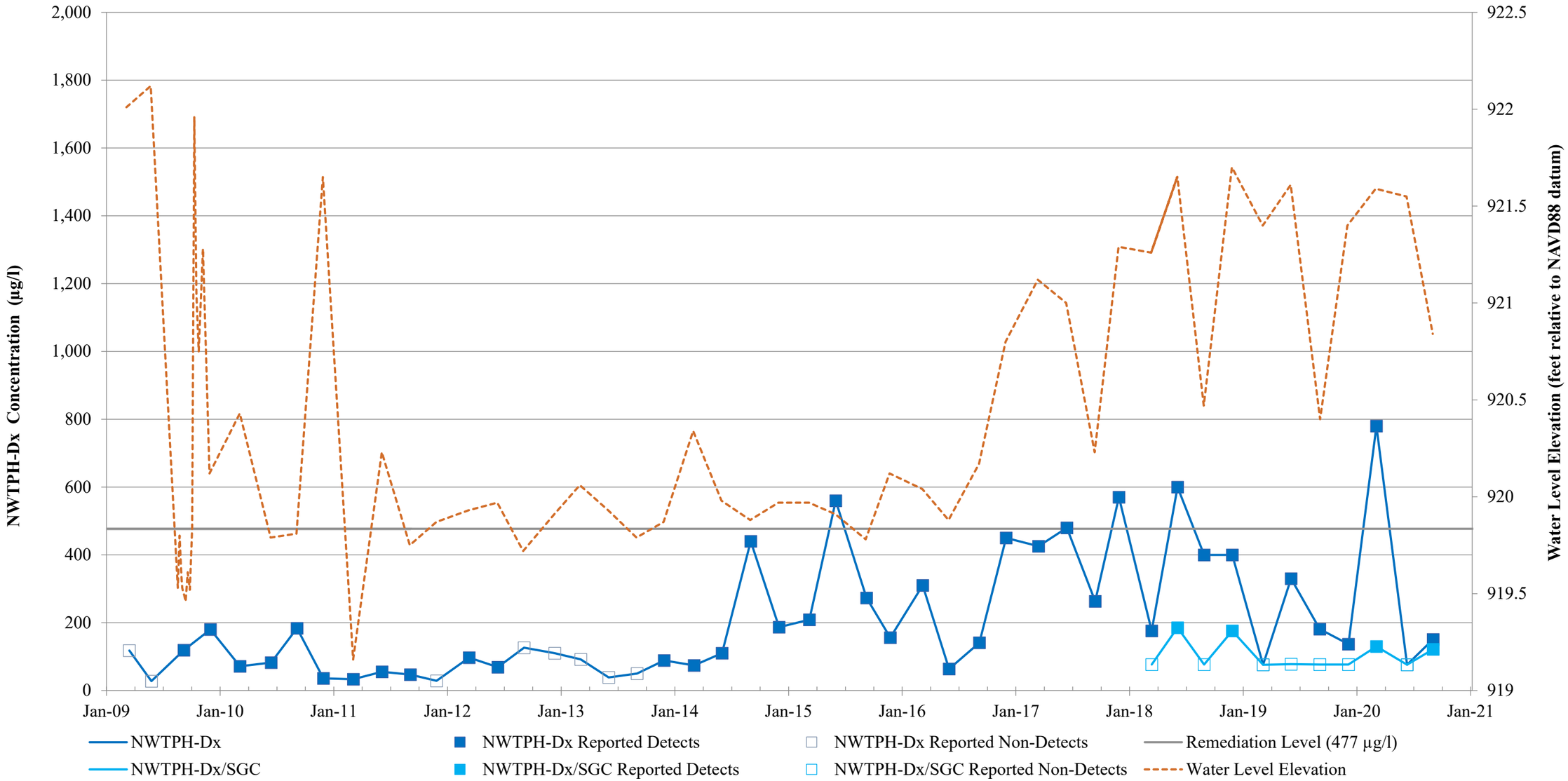
Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
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.	True	
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").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

APPENDIX C
NWTPH-DX AND NWTPH-DX/SGC GW-3 TREND PLOT

2020 ANNUAL HYDRAULIC CONTROL AND CONTAINMENT SYSTEM
OPERATIONS REPORT
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Consent Decree No. 07-2-33672-9 SEA

Farallon PN: 683-071

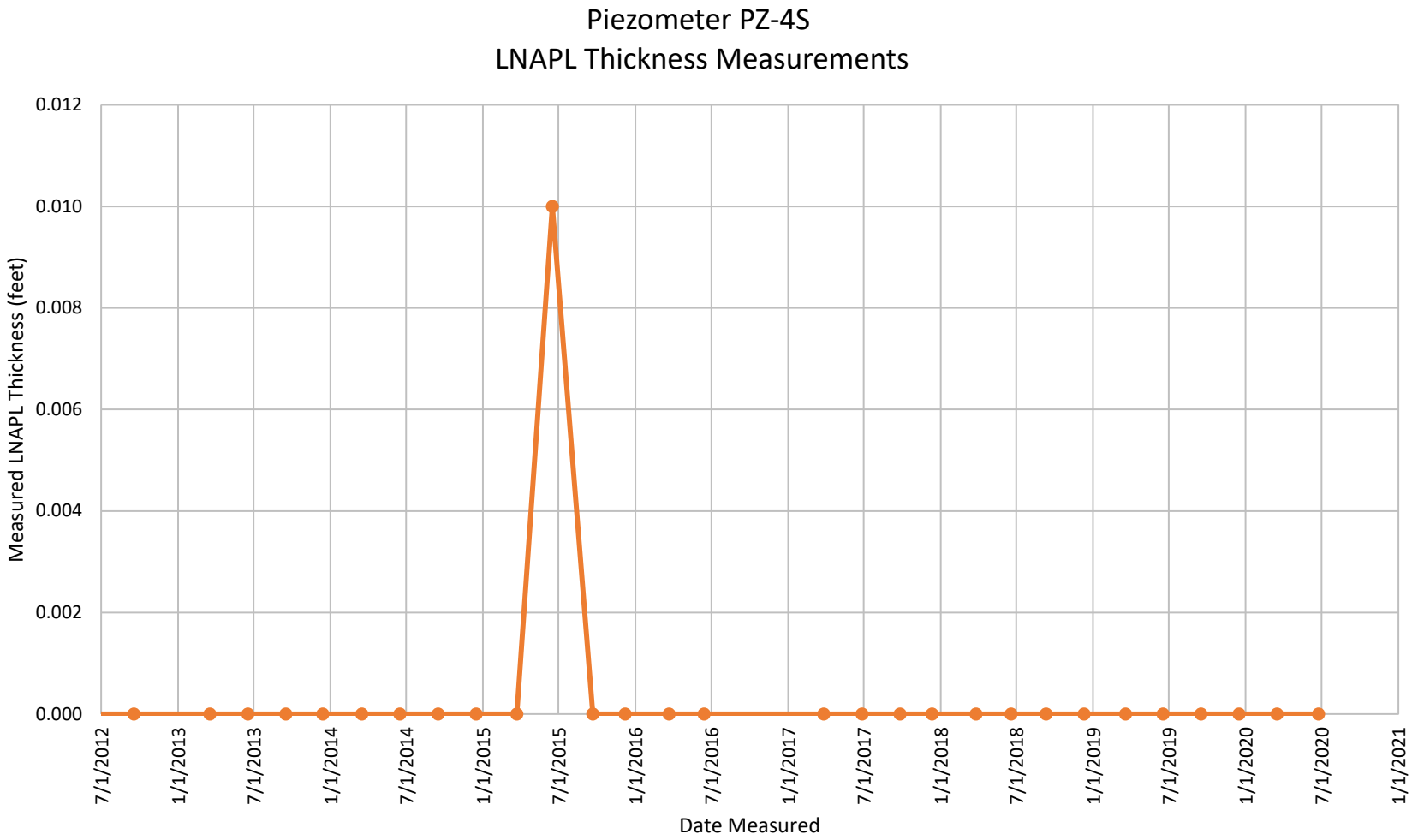
NWTPH-Dx & NWTPH-Dx/SGC GW-3 Trend Plot
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Farallon PN: 683-071

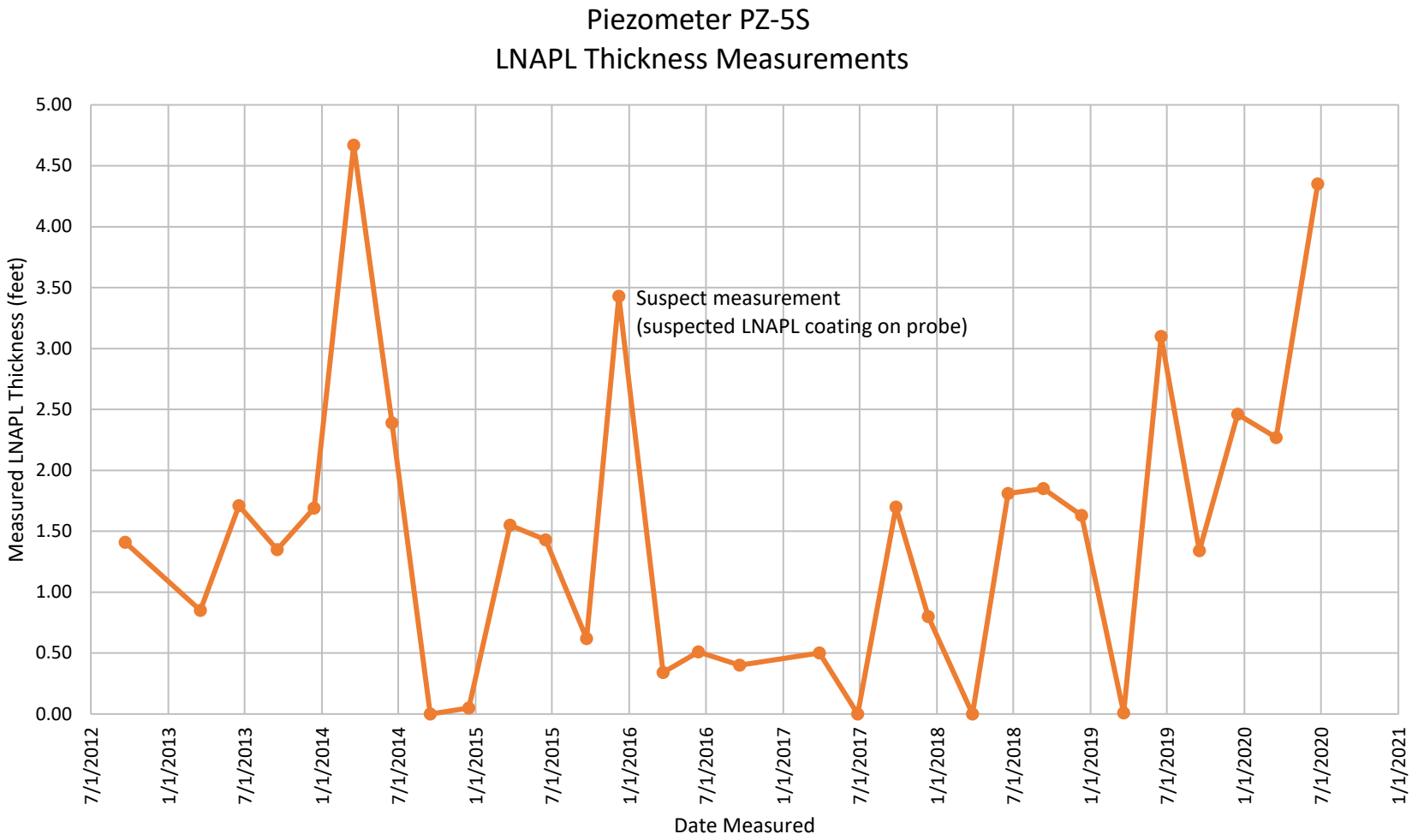


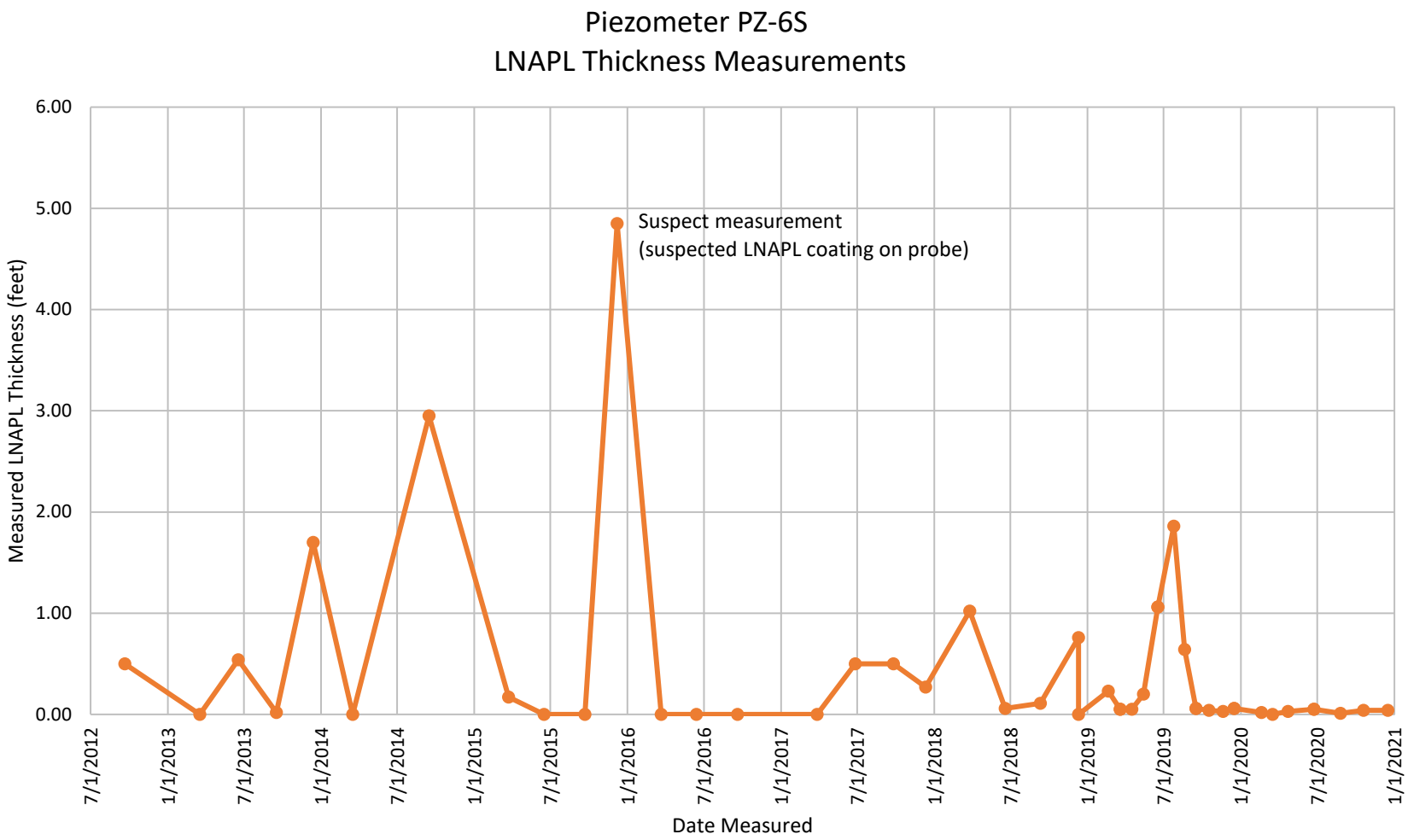
APPENDIX D
LNAPL TREND PLOTS

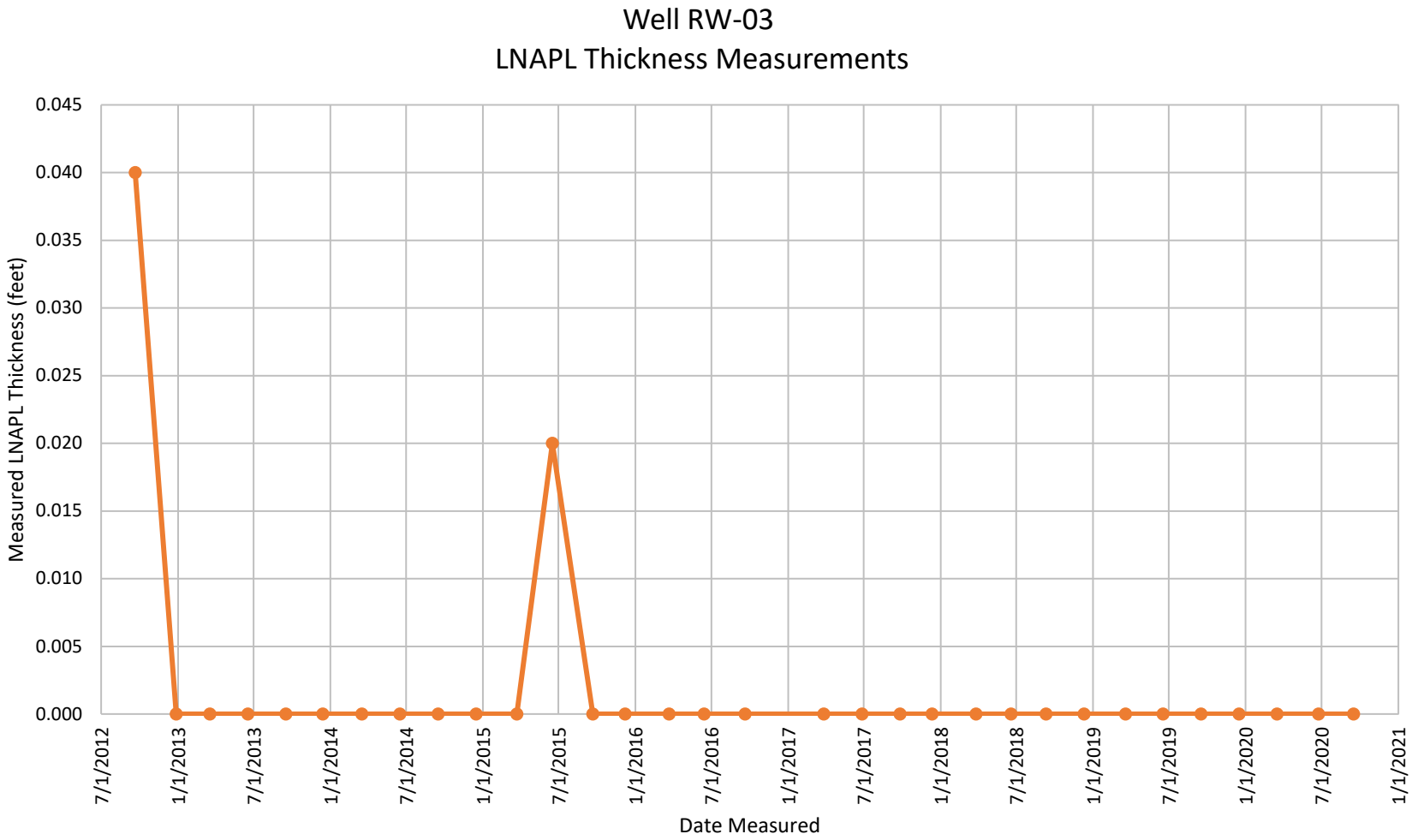
2020 ANNUAL HYDRAULIC CONTROL AND CONTAINMENT SYSTEM
OPERATIONS REPORT
BNSF Former Maintenance and Fueling Facility
Skykomish, Washington
Consent Decree No. 07-2-33672-9 SEA

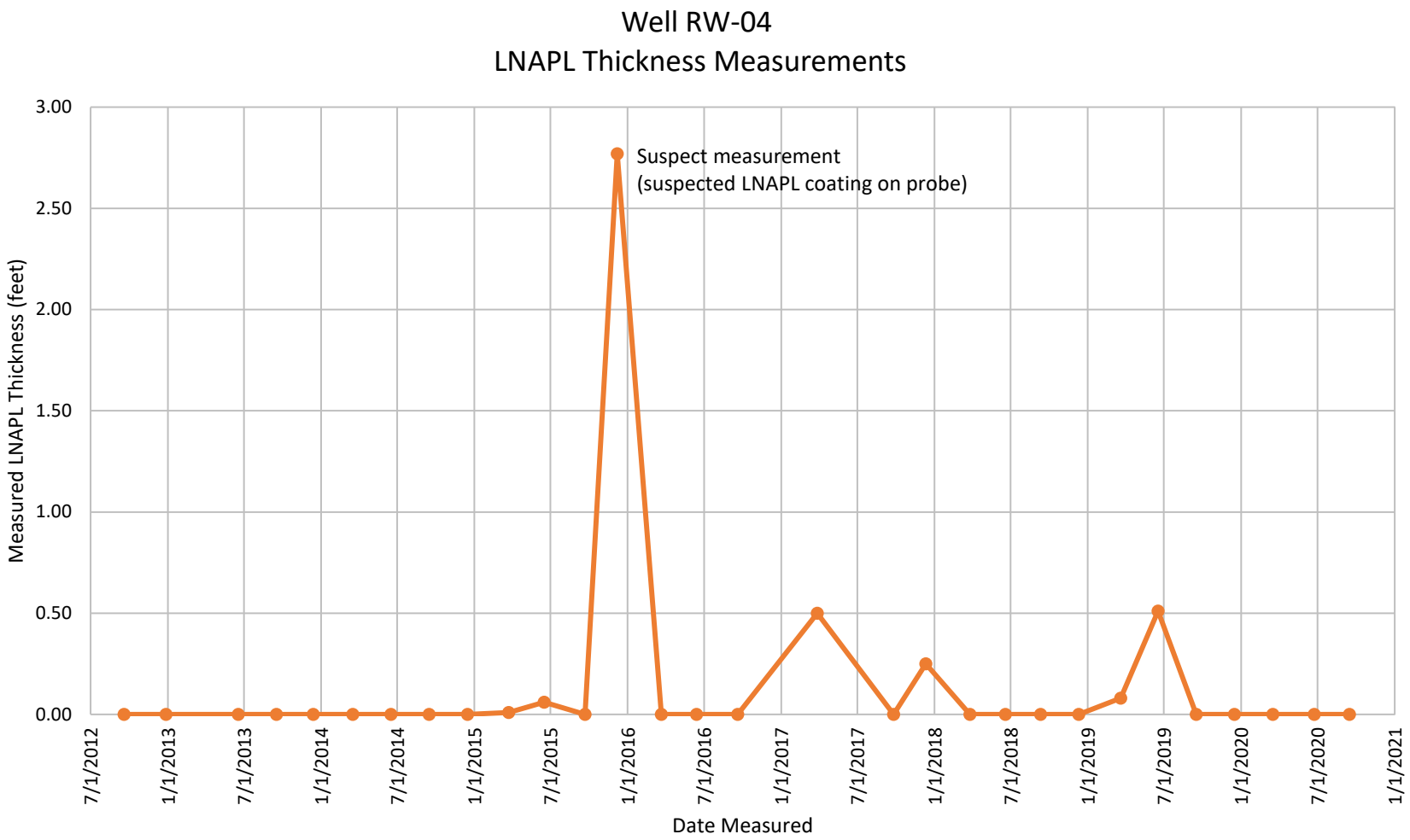
Farallon PN: 683-071

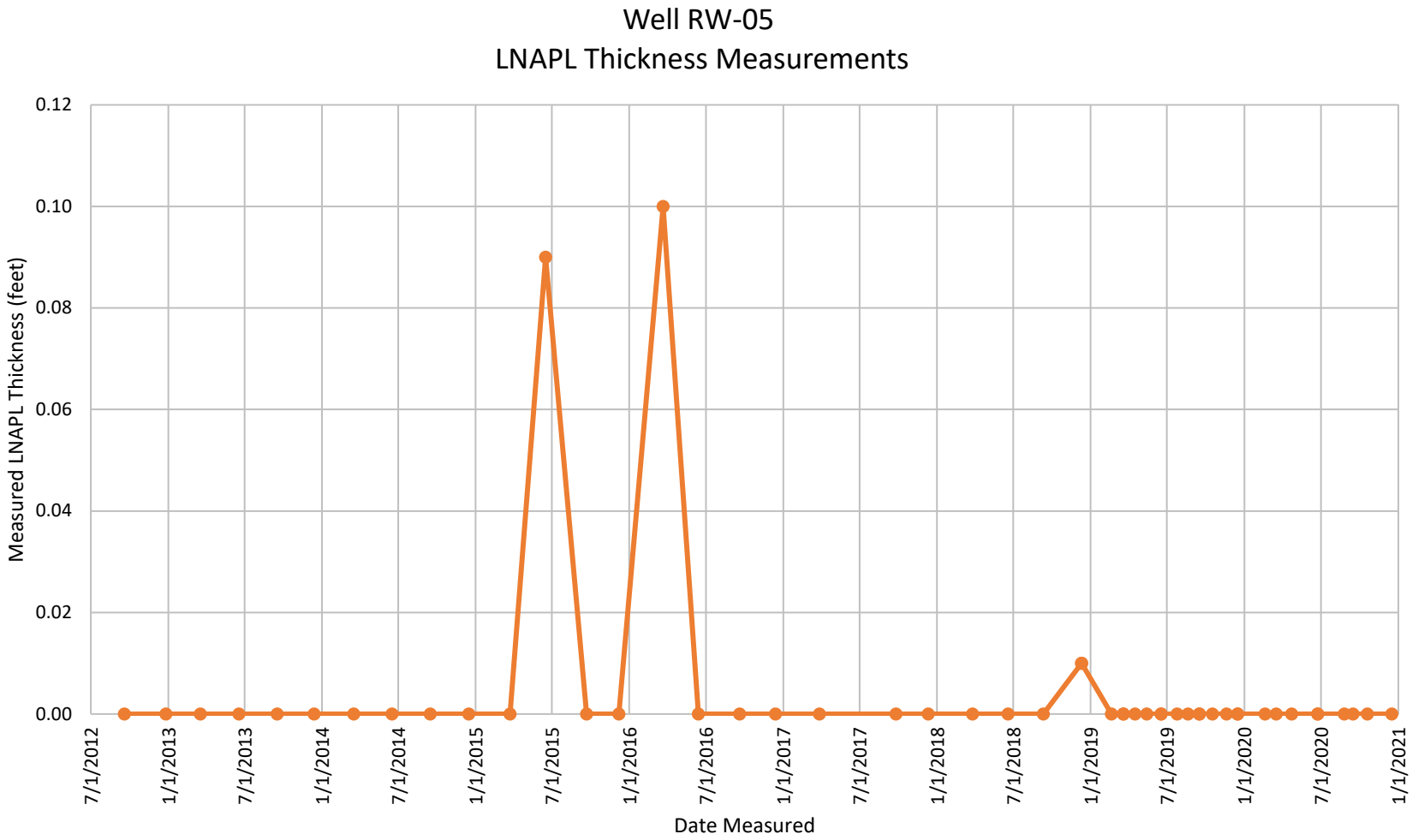

Piezometer PZ-4S
LNAPL Thickness Measurements
Measured LNAPL Thickness (feet)
0.012
0.010
0.008
0.006
0.004
0.002
0.000
7/1/2012
1/1/2013
7/1/2013
1/1/2014
7/1/2014
1/1/2015
7/1/2015
1/1/2016
7/1/2016
1/1/2017
7/1/2017
1/1/2018
7/1/2018
1/1/2019
7/1/2019
1/1/2020
7/1/2020
1/1/2021
Date Measured

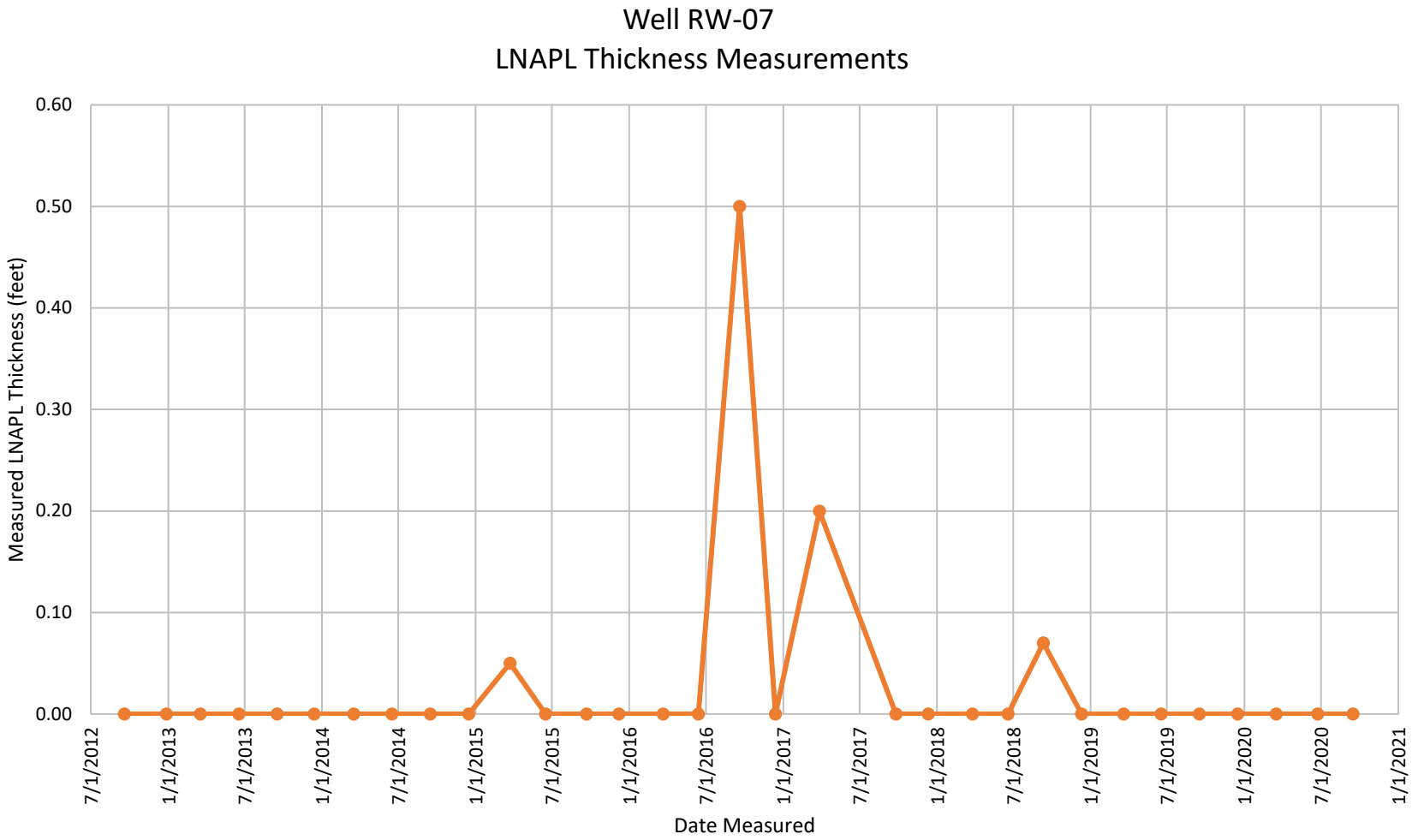

Piezometer PZ-5S
LNAPL Thickness Measurements
Measured LNAPL Thickness (feet)
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
Suspect measurement
(suspected LNAPL coating on probe)
7/1/2012
1/1/2013
7/1/2013
1/1/2014
7/1/2014
1/1/2015
7/1/2015
1/1/2016
7/1/2016
1/1/2017
7/1/2017
1/1/2018
7/1/2018
1/1/2019
7/1/2019
1/1/2020
7/1/2020
1/1/2021
Date Measured

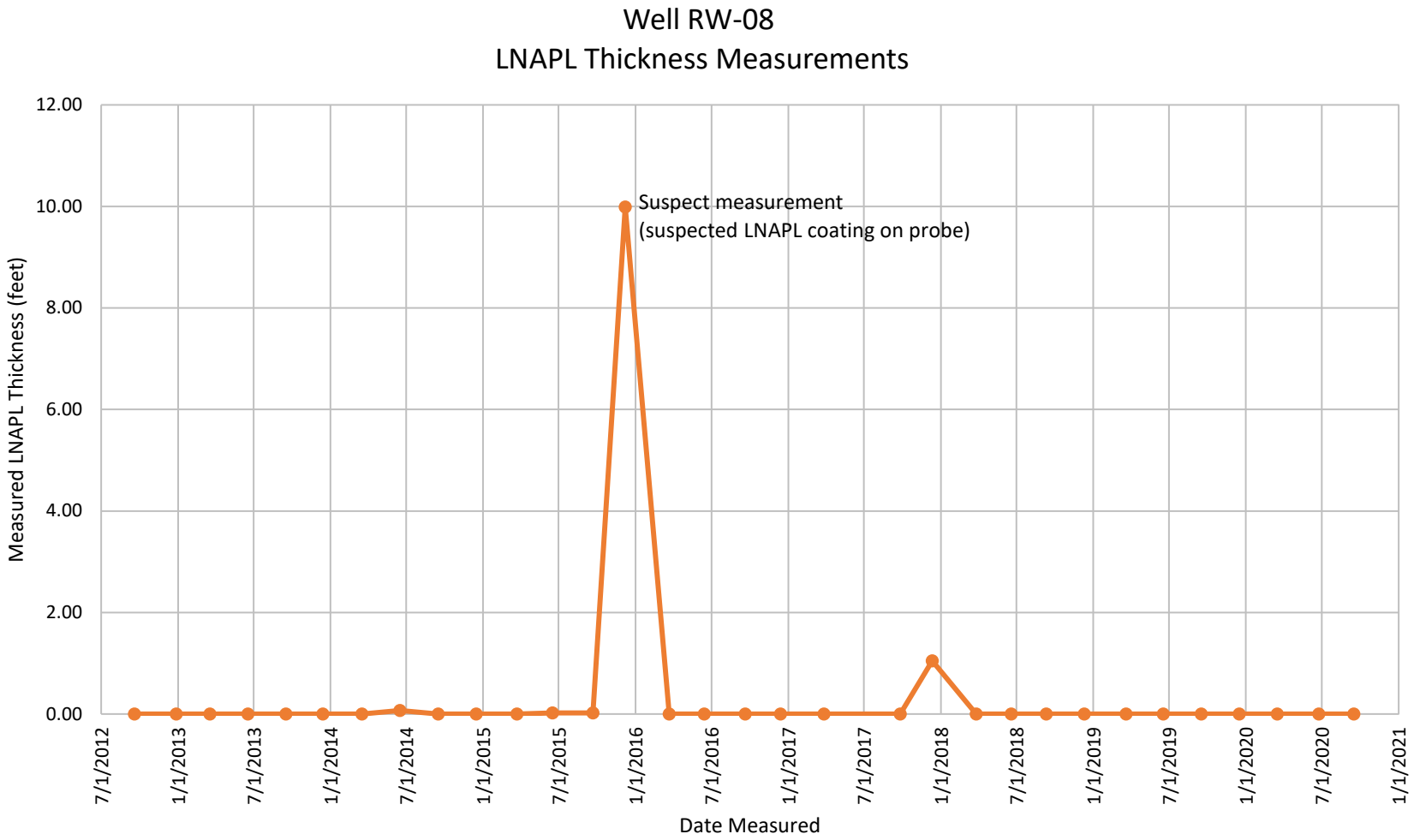

Piezometer PZ-6S
LNAPL Thickness Measurements
Measured LNAPL Thickness (feet)
6.00
5.00
4.00
3.00
2.00
1.00
0.00
Suspect measurement
(suspected LNAPL coating on probe)
7/1/2012
1/1/2013
7/1/2013
1/1/2014
7/1/2014
1/1/2015
7/1/2015
1/1/2016
7/1/2016
1/1/2017
7/1/2017
1/1/2018
7/1/2018
1/1/2019
7/1/2019
1/1/2020
7/1/2020
1/1/2021
Date Measured


Well RW-03
LNAPL Thickness Measurements
Measured LNAPL Thickness (feet)
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
7/1/2012
1/1/2013
7/1/2013
1/1/2014
7/1/2014
1/1/2015
7/1/2015
1/1/2016
7/1/2016
1/1/2017
7/1/2017
1/1/2018
7/1/2018
1/1/2019
7/1/2019
1/1/2020
7/1/2020
1/1/2021
Date Measured


Well RW-04
LNAPL Thickness Measurements
Measured LNAPL Thickness (feet)
3.00
2.50
2.00
1.50
1.00
0.50
0.00
Suspect measurement
(suspected LNAPL coating on probe)
7/1/2012
1/1/2013
7/1/2013
1/1/2014
7/1/2014
1/1/2015
7/1/2015
1/1/2016
7/1/2016
1/1/2017
7/1/2017
1/1/2018
7/1/2018
1/1/2019
7/1/2019
1/1/2020
7/1/2020
1/1/2021
Date Measured


Well RW-05
LNAPL Thickness Measurements
Measured LNAPL Thickness (feet)
0.12
0.10
0.08
0.06
0.04
0.02
0.00
7/1/2012
1/1/2013
7/1/2013
1/1/2014
7/1/2014
1/1/2015
7/1/2015
1/1/2016
7/1/2016
1/1/2017
7/1/2017
1/1/2018
7/1/2018
1/1/2019
7/1/2019
1/1/2020
7/1/2020
1/1/2021
Date Measured


Well RW-07
LNAPL Thickness Measurements
Measured LNAPL Thickness (feet)
0.60
0.50
0.40
0.30
0.20
0.10
0.00
7/1/2012
1/1/2013
7/1/2013
1/1/2014
7/1/2014
1/1/2015
7/1/2015
1/1/2016
7/1/2016
1/1/2017
7/1/2017
1/1/2018
7/1/2018
1/1/2019
7/1/2019
1/1/2020
7/1/2020
1/1/2021
Date Measured


Well RW-08
LNAPL Thickness Measurements
Measured LNAPL Thickness (feet)
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Suspect measurement
(suspected LNAPL coating on probe)
7/1/2012
1/1/2013
7/1/2013
1/1/2014
7/1/2014
1/1/2015
7/1/2015
1/1/2016
7/1/2016
1/1/2017
7/1/2017
1/1/2018
7/1/2018
1/1/2019
7/1/2019
1/1/2020
7/1/2020
1/1/2021
Date Measured