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August 19, 2013

Mr. Norm Hepner
Toxics Cleanup Program - CRO
State of Washington – Department of Ecology
15 W. Yakima Avenue, Suite 200
Yakima, Washington 98902-3152

RE: **First Semi-Annual 2013 Groundwater Monitoring Report**
John Michael Lease Site
Adjacent to 5640 Sunset Highway, Cashmere, Washington
BNSF File No: WACAS-05-001
Facility/Site No.: 3154383
Cleanup Site No.: 2149
VCP Project No.: CE0278

Dear Mr. Hepner:

On behalf of the BNSF Railway Company (BNSF), TRC is pleased to provide this First Semi-Annual 2013 Groundwater Monitoring Report documenting the groundwater monitoring activities completed between January and June 2013 at the John Michael Lease Site located in Cashmere, Chelan County, Washington.

Please give me a call if you have any questions regarding this submittal.

Sincerely,

Keith Woodburne, LG
Senior Project Manager

cc: Scott MacDonald, BNSF
Violet Barnard, BNSF
Kristin, Darnell, Farallon

TRC
Results you can rely on

FIRST SEMI-ANNUAL 2013 GROUNDWATER MONITORING REPORT

BNSF John Michael Lease Site
Cashmere, Washington

Prepared for:

BNSF Railway Company
2454 Occidental Avenue South, Suite 1A
Seattle, Washington 98134

Prepared by:

TRC

August 2013

FIRST SEMI-ANNUAL 2013 GROUNDWATER MONITORING REPORT

August 19, 2013

BNSF John Michael Lease Site
Cashmere, Washington

TRC Project No. 196947

Prepared For:

BNSF Railway Company
2454 Occidental Avenue South, Suite 1A
Seattle, Washington 98134

By:

Brandon Reed
Staff Engineer

Keith Woodburne L.G.
Senior Project Manager

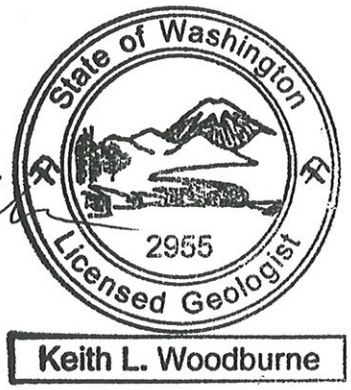

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

1.0 INTRODUCTION

This January to June, 2013 semi-annual groundwater monitoring report has been prepared on behalf of BNSF Railway Company (BNSF) to document the results of the groundwater monitoring conducted by TRC and their subcontractor Farallon Consulting, L.L.C. (Farallon) at the John Michael Lease Property located adjacent to 5640 Sunset Highway in Cashmere, Chelan County, Washington (herein referred to as the Site, Figure 1). The groundwater monitoring events were completed March 20, 2013 and June 19, 2013 in accordance with Chapter 173-350-500 of the Washington Administrative Code (WAC 173-350-500).

The purpose of the groundwater monitoring events was to evaluate the nature and extent of hazardous substances detected above the Washington State Model Toxics Control Act (MTCA) Method A Cleanup Regulation for groundwater. The hazardous substances detected in groundwater at the Site during previous investigations, and collectively referred to herein as the constituents of potential concern (COPCs), include:

- Total petroleum hydrocarbons as diesel-range organics (DRO), oil-range organics (ORO), and as gasoline-range organics (GRO);
- Benzene, toluene, ethylbenzene, and xylenes (BTEX compounds);
- Carcinogenic polycyclic aromatic hydrocarbons (cPAHs); and
- Naphthalene.

The results from the initial groundwater investigations in 2004 (EMR, 2005) and in 2008 (Farallon, 2009) showed that TPHs and BTEX compounds were detected in Site groundwater. However, only DRO, ORO, benzene the cPAH benzo(a)pyrene were reported at concentrations above the MTCA Method A cleanup levels during those initial investigations. The results from the groundwater samples collected during the March and June 2013 monitoring events show that COPCs in Site groundwater are not present at concentrations above the MTCA Method A cleanup levels for groundwater.

2.0 GROUNDWATER MONITORING ACTIVITIES

On March 20, 2013 and June 19, 2013, Farallon recorded groundwater elevations and collected groundwater samples from the four Site monitoring wells (MW-1, MW-2, MW-3 and MW-4). During sample collection, Farallon recorded the dissolved oxygen levels, pH, temperature, conductivity and oxidation reduction potential (ORP) using a YSI multimeter and flow-through cell after parameter stabilization. The groundwater samples were submitted to ESC Lab Sciences of Mt. Juliet, Tennessee for analysis of the following COPCs and natural attenuation and water quality parameters:

- DRO by Northwest Method NWTPH-Dx;
- ORO, GRO, and BTEX by Northwest Method NWTPH-Gx;
- Non-carcinogenic PAHs and carcinogenic PAHs (cPAHs) by EPA Method 8270C-S;
- Nitrate and Sulfate by EPA Method 9056;
- Free carbon dioxide by Standard Method (SM) 4500C;
- Ferrous iron by SM 3500-Fe;
- Sulfide by SM 4500-S2; and
- Iron and dissolved iron by EPA 6000/7000 Series Method.

3.0 GROUNDWATER MONITORING RESULTS

3.1 Groundwater Elevations

Groundwater elevations were consistent from August 2008 to June 2013, with little variation in depth to water between events (Table 1). Groundwater flow direction for March and June 2013 were both analogous with flow direction generally eastward towards the Wenatchee River (Figures 3 and 4). Additionally, groundwater gradient remained stable between March and June 2013, at approximately 0.013 feet per foot.

3.2 Constituents of Potential Concern

DRO concentrations in groundwater samples collected from monitoring wells MW-1, MW-2, MW-3 and MW-4, during the March 2013 and June 2013 monitoring events were primarily below laboratory reporting limits (Table 2, Figure 5). During the March 2013 and June 2013 monitoring events, monitoring well MW-1 had a reported detections of DRO at a concentration of 100 and 110 micrograms per liter (µg/L) respectively, both less than the MTCA Method A cleanup level of 500 µg/L. During the June 2013 monitoring event, DRO was reported in MW-3 at an estimated concentration of 57 µg/L.

Concentrations of ORO in groundwater samples collected from the Site monitoring wells during the March 2013 and June 2013 monitoring events were below the laboratory reporting limit (Table 2, Figure 5).

Concentrations of GRO and BTEX compounds were below their respective laboratory reporting limits in the samples collected during the September 2012 and December 2012 monitoring events (Table 2, Figure 5). During the June 2013 monitoring event, GRO was reported in wells MW-3 and MW-4 at estimated concentrations of 59 µg/L and 50 µg/L, respectively.

No cPAHs were detected at concentrations above their laboratory reporting limits in any of the samples collected during the March 2013 and June 2013 monitoring events (Table 3). During the March 2013 monitoring event, benzo(a)anthracene, and chrysene were reported in wells MW-1 at estimated concentrations of 0.015 µg/L, and 0.012 µg/L there were no other detections for cPAHs therefore the Total cPAH TEQ was 0.037 µg/L. For the remaining wells during the March 2013 monitoring event and all of the wells from June 2013 there were no detections for cPAHs in therefore the Total cPAH TEQ values remain the same at a concentration of 0.038 µg/L (Table 3, Figure 5).

Only one of the non-carcinogenic PAHs analyzed was detected at a result above the laboratory reporting limit during the March 2013 and June 2013 monitoring events. In well MW-1 during the June 2013 monitoring event, pyrene was detected at a concentration of 0.056 µg/L, well below the MTCA Method A cleanup level of 480 µg/L. The remainder of the non-carcinogenic PAHs were below their respective laboratory reporting limits during the March 2013 and June 2013 monitoring events.

3.3 Natural Attenuation and Water Quality Parameters

Natural attenuation is a remediation process that relies on naturally occurring destructive processes (i.e., biodegradation and abiotic degradation) or non-destructive processes (i.e., advection, diffusion sorption, dilution, and volatilization) for the reduction of contaminant mass. Biodegradation is typically the most prevalent destructive mechanism for the natural attenuation of petroleum hydrocarbons and is facilitated via biological oxidation, where electron donors, electron acceptors, and nutrients are combined by microorganisms to produce metabolic by-products and

energy for microbial growth. Petroleum hydrocarbons biodegrade naturally when an indigenous population of hydrocarbon-degrading microorganisms is present in the aquifer and sufficient concentrations of electron acceptors and nutrients are available. Biodegradation of petroleum hydrocarbons can occur under aerobic or anaerobic conditions (i.e., in the presence or absence of dissolved oxygen), where hydrocarbons may be used by microbes as an electron donor in both degradation pathways.

Microbial metabolic processes generate energy via oxidation of the electron donor and reduction of the electron acceptor. Aerobic degradation of petroleum hydrocarbons occurs when dissolved oxygen (DO) is used as a terminal electron acceptor by hydrocarbon-degrading microbes that respire aerobically. Reduction of molecular oxygen is the most energetically favorable oxidation-reduction reaction involved in petroleum hydrocarbon degradation.

Analytical and field monitoring data collected at the Site suggest that site conditions are naturally more aerobic, with DO concentrations in groundwater generally in excess of 1 milligram per liter (mg/L) (Table 5). Positive oxidation-reduction potential (ORP) values, ranging from 66.5 to 316 mg/L further imply aerobic site conditions (Table 5). Groundwater pH and temperature measurements were within a range deemed adequate for hydrocarbon-degrading microbial populations (Table 5).

3.3 Microbial Environment Indicators

To further evaluate the potential for biodegradation, and to quantify the microbial populations present at the Site Bio-Trap® samplers were deployed in wells MW-1 and MW-2. The Bio-Trap® samplers were deployed on September 25, 2012 and retrieved on November 1, 2012 and shipped to Microbial Insights for phospholipid fatty acid (PLFA) analysis. PLFA is a primary component of all microbial membranes; however, some microorganisms produce specific PLFA biomarkers, which enable microbial populations to be classified into specific structural groups.

PLFA data obtained in 2012 indicated Proteobacteria was the most prominent structural group, accounting for 74.08% and 64.55% of the total PLFA population in wells MW-1 and MW-2, respectively (Table 6). A variety of both aerobic and anaerobic microorganisms are classified by the Proteobacteria grouping, including the majority of microbial species capable of degrading hydrocarbons. Proteobacteria are typically characterized as fast-growing, quickly adaptable to a variety of environments, and able to utilize a range of carbon sources.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Concentrations of COPCs in Site groundwater have been below the MTCA Method A Cleanup levels for groundwater since groundwater monitoring has begun, with only two historical exceptions. The results from the initial groundwater investigations in 2004 (EMR, 2005) and in 2008 (Farallon, 2009) showed that TPHs (DRO and ORO) and BTEX compounds were present in Site groundwater at concentrations above their respective laboratory reporting limits. However, only DRO, ORO, benzene, and the cPAH benzo(a)pyrene were reported at concentrations above the MTCA Method A cleanup levels for groundwater during those initial investigations.

The initial, post-installation sample collected from MW-1 during the August 2008 subsurface investigation (Farallon, 2009) had a reported DRO concentration of 1,110 µg/L. Additionally, ORO and BTEX compounds were detected in that initial sample at elevated concentrations (Table 2, Figure 5). Groundwater samples collected a relatively short time following well installation and development are often not representative of true groundwater conditions.

Consistently low results for all COPCs were reported for all Site wells during the March and June 2013 monitoring events with no reported results above the MTCA Method A cleanup levels for groundwater. Based on the 2012 and 2013 groundwater data, the initial 2008 groundwater results do not appear to be representative of groundwater conditions at the Site.

Based on previous discussions with Ecology it was determined it would be beneficial to evaluate groundwater concentrations at the Site with respect to surface water criteria. Utilizing the Cleanup Levels and Risk Calculations (CLARC) database, standard cleanup levels for BTEX, and PAHs were obtained using the Surface Water, Method B, Non-Carcinogen parameter[i] and for cPAHs using the Surface Water, Method B, Carcinogen parameter[ii] (Tables 2, 3, and 4).

Disregarding the dilution effect that groundwater entering surface water would undergo, groundwater concentrations were below Method B standard surface water cleanup levels for both carcinogen and non-carcinogen parameters, with the exception of cPAHs compounds, benzo (a) pyrene and dibenz (a,h) anthracene. The cleanup levels specified in the CLARC database for benzo (a) pyrene and dibenz (a,h) anthracene were 0.03 µg/L and 0.03 µg/L respectively. Over the last four monitoring events, both compounds have not been reported above their laboratory detection limits (0.05 µg/L for both compounds). Although the detection limit for these compounds using the current analytical method is slightly above their surface water cleanup levels, we would not expect that discharge of groundwater with concentrations at or below those detection limits would result in detectable levels of those compounds in surface water at or near the Method B surface water cleanup levels.

The historical and current 2013 groundwater monitoring data demonstrates that the low to non-detect concentrations of COPCs in Site groundwater do not pose a threat to surface waters of the Wenatchee River. Furthermore, the historical and current 2013 groundwater monitoring data clearly establishes that residual impacts in Site soils are not leaching to groundwater or becoming mobilized during limited seasonal groundwater fluctuations.

Based on discussions with Ecology during an on-site meeting on March 12, 2013, there remains a concern regarding residual impacts in Site soils coming into direct contact with the Wenatchee River via long-term erosion of the river bank. Key decisions and subsequent action items from the March 12, 2013 meeting with Ecology include:

- Ecology agreed with the findings of the Simplified Terrestrial Ecological Evaluation (TEE) Exposure Analysis Procedure conducted in accordance with WAC 173-340-7492(2)(a)(ii) and that the Site is excluded from any further TEE analysis.
- Based on the remedial investigation work conducted at the Site, Ecology agreed there is likely no risk to human health and the environment from residual soil impacts located between the railroad tracks and the Wenatchee River and that removal of those soils may not be appropriate due to their potential for mobilization of contaminants or for worsening bank stability resulting from excavation activities.
- Ecology required that soil impacts present adjacent to the commercial side of the tracks be removed to maximum extent practicable to address risks to human health via direct exposure (but not as a result of TEE concerns). Furthermore, Ecology may be willing to consider limited soil removal on the commercial side of the tracks that results in little to no impact to railroad operations.
- BNSF is reviewing the proposed path forward of filing a restrictive covenant for the property for the remaining soils containing concentrations of petroleum hydrocarbons above the MTCA Method A cleanup levels.

- Ecology is going to review the Site conditions with the Yakima Nation to ensure they do not have any concerns with BNSF filing a restrictive covenant on the property.
- Ecology noted concerns about the shoreline bank stability adjacent to Site and that some bank stabilization might be necessary to prevent or limit long-term erosion of the bank.
- BNSF agreed to review the Chelan County Shoreline Master Plan and identify if there are any proposed, ongoing or completed shoreline bank plans and improvements in the vicinity of the Site. Depending on the results of the Master Plan review, BNSF may also discuss possible bank stabilization measures (i.e. plantings) with Ecology's Conservation Corps.

BNSF proposes to address the above-listed concerns and action items from the March 12, 2013 Ecology meeting in the format of Revised Cleanup Plan for the Site.

5.0 REFERENCES

EMR, Inc. (EMR), 2005. Letter Report Regarding Phase II Assessment Report – Leased Property No.: 40,250,477, John Michael, Cashmere, Chelan County, Washington. From Andrea Schiller, Staff Geologist and Jeremy Raye, Environmental Manager. To BNSF Railway Company. January 12.

Farllon, 2009. Subsurface Investigation Report, John Michael Lease Site, 5640 Sunset Highway, Cashmere, Washington, March 3.

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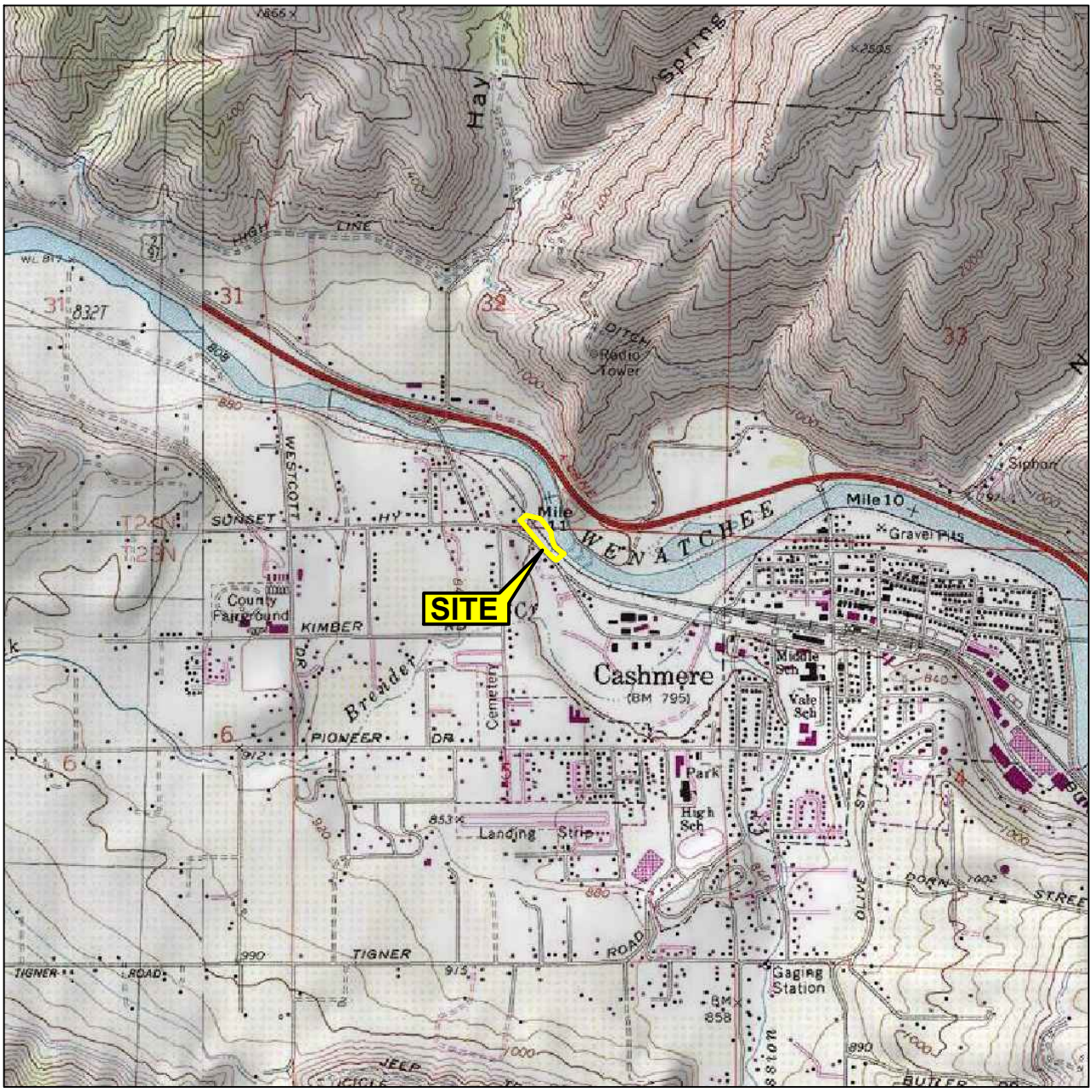
[i] MTCA Method B Cleanup Levels for Surface Water – Non-Carcinogen, Standard Formula Value, 720(4)(b)(iii)

[ii] MTCA Method B Cleanup Levels for Surface Water – Carcinogen, Standard Formula Value, 720(4)(b)(iii)

FIGURES



1 MILE 3/4 1/2 1/4 0 1 MILE

SCALE 1 : 24,000

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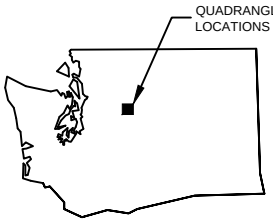
SOURCE:

United States Geological Survey
7.5 Minute Topographic Maps:
Cashmere and Peshastin Quadrangles,
Washington



VICINITY MAP

John Michael Lease Site
Adjacent to 5640 Sunset Highway
Cashmere, Washington

TRC | 196947 | **FIGURE 1**

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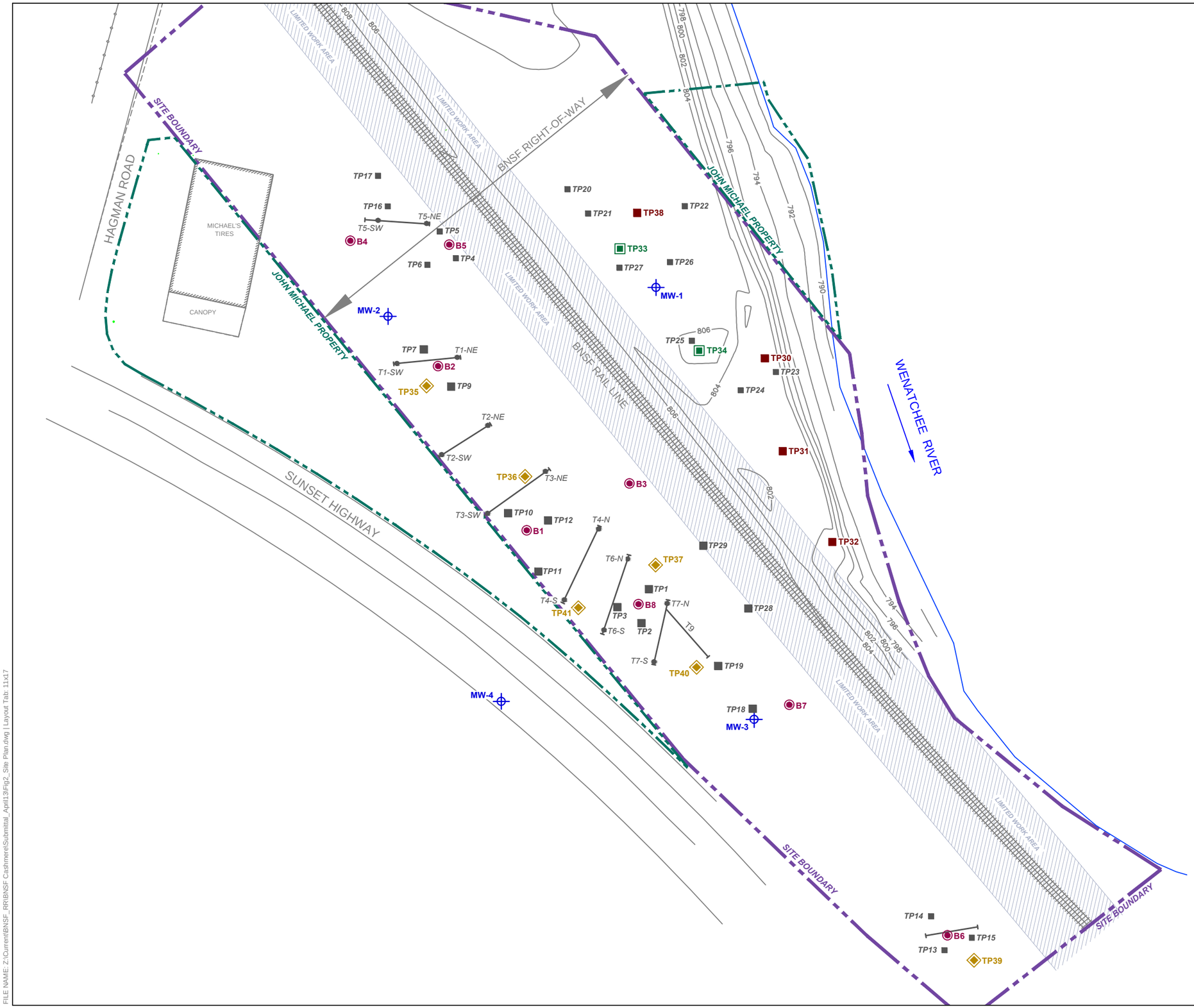


LEGEND

- MW-4 — Monitoring well
- B8 — Boring
- T7-S / T7-N — Trench with soil sample location (Farallon, 2008)
- TP29 — Test pit (historical)
- TP38 — Supplemental investigation, soil sample test pit (Farallon, 2012)
- TP34 — Supplemental investigation, cultural survey and soil sample test pit (Farallon, 2012)
- TP41 — Supplemental investigation, cultural survey test pit (Farallon, 2012)

N

SCALE (FEET)

0 50 100

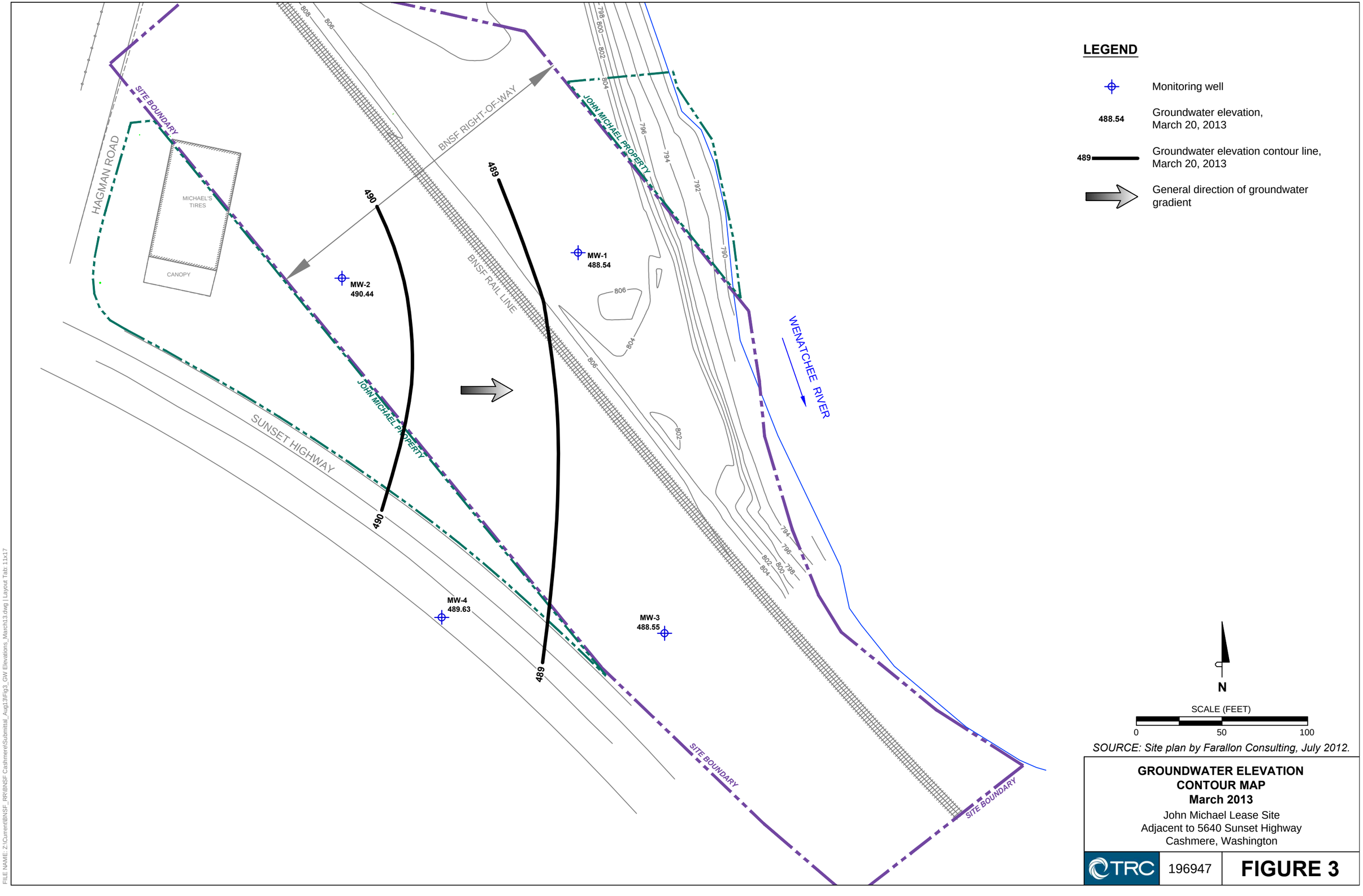
SOURCE: Site plan by Farallon Consulting, July 2012.

SITE PLAN

John Michael Lease Site
Adjacent to 5640 Sunset Highway
Cashmere, Washington

TRC | 196947 | **FIGURE 2**

FILE NAME: Z:\Current\BNSF_RR\BNSF Cashmere\Submittal_April13\Fig2_Site Plan.dwg | Layout Tab: 11x17

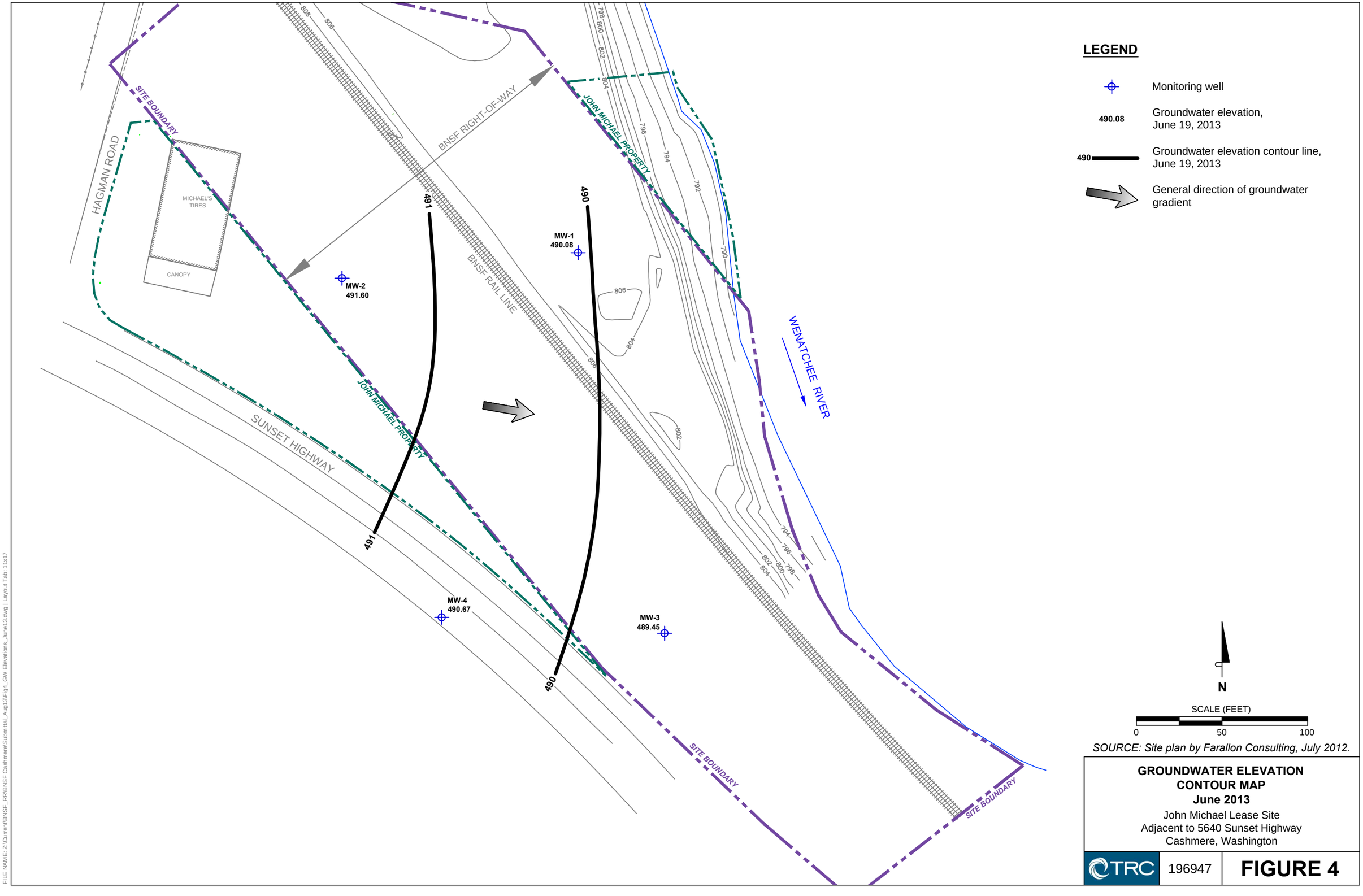


SOURCE: Site plan by Farallon Consulting, July 2012.

GROUNDWATER ELEVATION CONTOUR MAP
March 2013
John Michael Lease Site
Adjacent to 5640 Sunset Highway
Cashmere, Washington

TRC | 196947 | **FIGURE 3**

FILE NAME: Z:\Current\BNSF_RR\BNSF Cashmere\Submittal_Aug13\Fig3_GW Elevations_March13.dwg | Layout Tab: 11x17

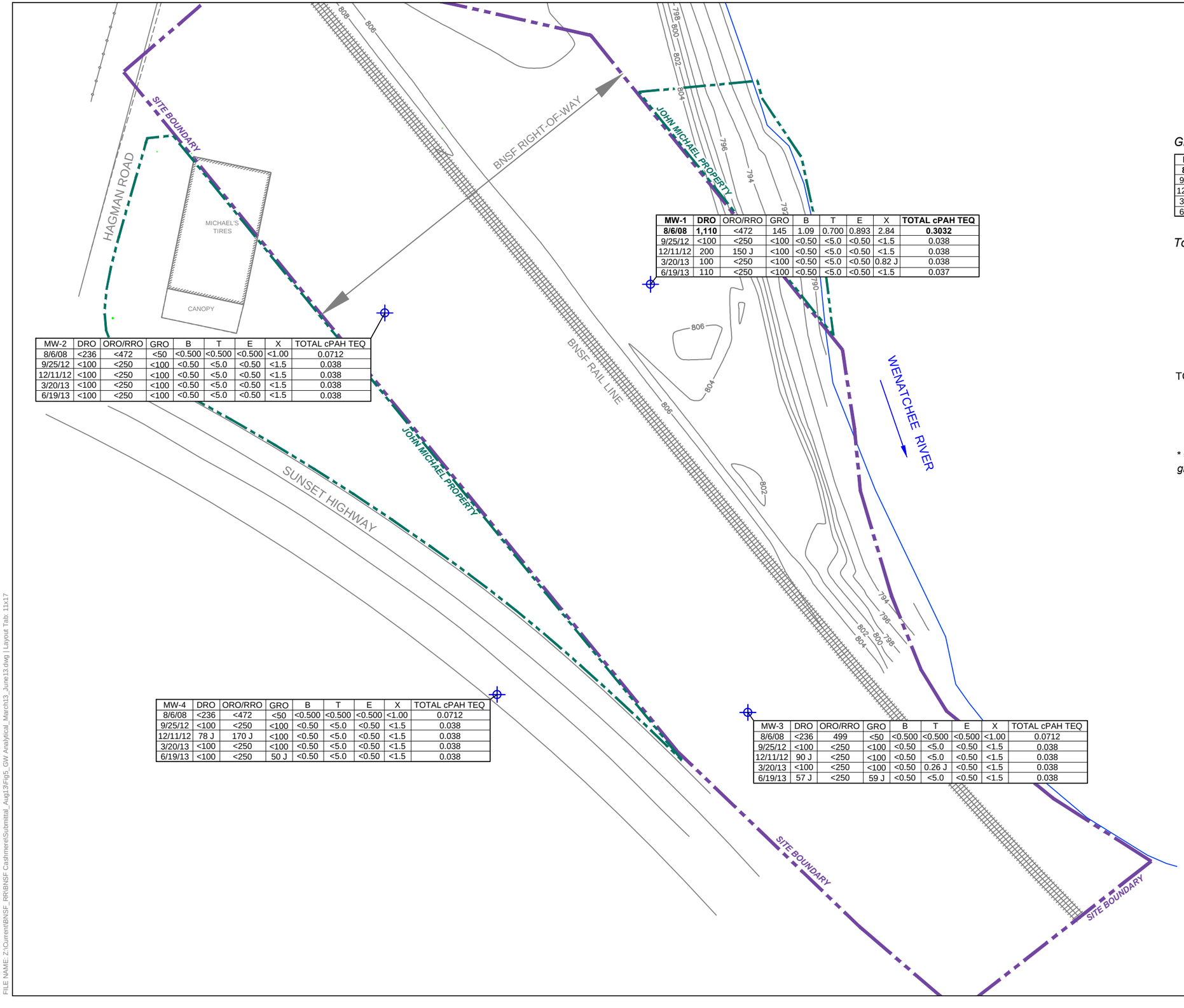


SOURCE: Site plan by Farallon Consulting, July 2012.

GROUNDWATER ELEVATION CONTOUR MAP
June 2013
John Michael Lease Site
Adjacent to 5640 Sunset Highway
Cashmere, Washington

TRC | 196947 | **FIGURE 4**

FILE NAME: Z:\Current\BNSF_RR\BNSF Cashmere\Submittal_Aug13\Fig4_GW Elevations_June13.dwg | Layout Tab: 11x17



MW-1	DRO	ORO/RRO	GRO	B	T	E	X	TOTAL cPAH TEQ
8/6/08	**1,110**	<472	145	1.09	0.700	0.893	2.84	**0.3032**
9/25/12	<100	<250	<100	<0.50	<5.0	<0.50	<1.5	0.038
12/11/12	200	150 J	<100	<0.50	<5.0	<0.50	<1.5	0.038
3/20/13	100	<250	<100	<0.50	<5.0	<0.50	0.82 J	0.038
6/19/13	110	<250	<100	<0.50	<5.0	<0.50	<1.5	0.037

MW-2	DRO	ORO/RRO	GRO	B	T	E	X	TOTAL cPAH TEQ
8/6/08	<236	<472	<50	<0.500	<0.500	<0.500	<1.00	0.0712
9/25/12	<100	<250	<100	<0.50	<5.0	<0.50	<1.5	0.038
12/11/12	<100	<250	<100	<0.50	<5.0	<0.50	<1.5	0.038
3/20/13	<100	<250	<100	<0.50	<5.0	<0.50	<1.5	0.038
6/19/13	<100	<250	<100	<0.50	<5.0	<0.50	<1.5	0.038

MW-3	DRO	ORO/RRO	GRO	B	T	E	X	TOTAL cPAH TEQ
8/6/08	<236	499	<50	<0.500	<0.500	<0.500	<1.00	0.0712
9/25/12	<100	<250	<100	<0.50	<5.0	<0.50	<1.5	0.038
12/11/12	90 J	<250	<100	<0.50	<5.0	<0.50	<1.5	0.038
3/20/13	<100	<250	<100	<0.50	0.26 J	<0.50	<1.5	0.038
6/19/13	57 J	<250	59 J	<0.50	<5.0	<0.50	<1.5	0.038

MW-4	DRO	ORO/RRO	GRO	B	T	E	X	TOTAL cPAH TEQ
8/6/08	<236	<472	<50	<0.500	<0.500	<0.500	<1.00	0.0712
9/25/12	<100	<250	<100	<0.50	<5.0	<0.50	<1.5	0.038
12/11/12	78 J	170 J	<100	<0.50	<5.0	<0.50	<1.5	0.038
3/20/13	<100	<250	<100	<0.50	<5.0	<0.50	<1.5	0.038
6/19/13	<100	<250	50 J	<0.50	<5.0	<0.50	<1.5	0.038

LEGEND

Monitoring well

Groundwater analytical results (ug/L):*

MW-1	DRO	ORO/RRO	GRO	B	T	E	X	TOTAL cPAH TEQ
8/6/08	**1,110**	<472	145	1.09	0.700	0.893	2.84	**0.3032**
9/25/12	<100	<250	<100	<0.50	<5.0	<0.50	<1.5	0.038
12/11/12	200	150 J	<100	<0.50	<5.0	<0.50	<1.5	0.038
3/20/13	100	<250	<100	<0.50	<5.0	<0.50	0.82 J	0.038
6/19/13	110	<250	<100	<0.50	<5.0	<0.50	<1.5	0.037

Total petroleum hydrocarbons as:

DRO	Diesel-range organics
ORO/RRO	Oil-range organics / residual-range organics
GRO	Gasoline-range organics
B	Benzene
T	Toluene
E	Ethyl-benzene
X	Xylenes
TOTAL cPAH TEQ	Total carcinogenic polycyclic aromatic hydrocarbons, toxic equivalence
J	Estimated value below lowest calibration point

** = Concentrations above MTCA Method A Cleanup Levels for groundwater are displayed in* **BOLD**.

N

SCALE (FEET)

0 50 100

SOURCE: Site plan by Farallon Consulting, July 2012.

GROUNDWATER ANALYTICAL RESULTS

John Michael Lease Site
Adjacent to 5640 Sunset Highway
Cashmere, Washington

TRC 196947 **FIGURE 5**

FILE NAME: Z:\Current\BNSF_RR\BNSF Cashmere\Submittal_Aug13\Fig5_GW Analytical_March13_June13.dwg | Layout Tab: 11x17

TABLES

Table 1
Summary of Groundwater Elevation Data
Burlington Northern Santa Fe Railway Company
John Michael Lease Site
Cashmere, Washington

Monitoring Well	Date Measured	Well Head Elevation (feet)[1]	Depth to Groundwater (feet)[2]	Groundwater Elevation (feet)[1]
MW-1	08/06/08	501.94	13.94	488.00
	04/07/09		13.96	487.98
	09/25/12		13.98	487.96
	12/11/12		13.66	488.28
	03/20/13		13.40	488.54
	06/19/13		11.86	490.08
MW-2	08/06/08	499.14	9.00	490.14
	04/07/09		9.12	490.02
	09/25/12		9.30	489.84
	12/11/12		8.88	490.26
	03/20/13		8.70	490.44
	06/19/13		7.54	491.60
MW-3	08/06/08	496.09	7.83	488.26
	04/07/09		7.79	488.30
	09/25/12		7.70	488.39
	12/11/12		7.62	488.47
	03/20/13		7.54	488.55
	06/19/13		6.64	489.45
MW-4	08/06/08	495.85	6.39	489.46
	04/07/09		6.45	489.40
	09/25/12		6.33	489.52
	12/11/12		6.30	489.55
	03/20/13		6.22	489.63
	06/19/13		5.18	490.67

NOTES:

[1] Elevations based on an arbitrary 100-foot datum established at the Site.

[2] In feet below top of well casing.

Table 2
Summary of Groundwater Analytical Results - TPH and BTEX
Burlington Northern Santa Fe Railway Company
John Michael Lease Site
Cashmere, Washington

Monitoring Well	Sample Identification	Sample Date	Analytical Results (micrograms per liter)						
			DRO[1]	ORO/RRO[1]	GRO[2]	Benzene[2]	Toluene[2]	Ethyl-benzene[2]	Xylenes[2]
MW-1	MW1-080608	08/06/08	**1,110**	<472	145	1.09	0.700	0.893	2.84
	MW1-092512	09/25/12	<100	<250	<100	<0.50	<5.0	<0.50	<1.5
	MW1-121112	12/11/12	200	150 J	<100	<0.50	<5.0	<0.50	<1.5
	MW1-032013	03/20/13	100	<250	<100	<0.50	0.23 J	<0.50	0.82 J
	MW1-061913	06/19/13	110	<250	<100	<0.50	<5.0	<0.50	<1.5
MW-2	MW2-080608	08/06/08	<236	<472	<50	<0.500	<0.500	<0.500	<1.00
	MW2-092512	09/25/12	<100	<250	<100	<0.50	<5.0	<0.50	<1.5
	MW2-121112	12/11/12	<100	<250	<100	<0.50	<5.0	<0.50	<1.5
	MW2-032013	03/20/13	<100	<250	<100	<0.50	<5.0	<0.50	<1.5
	MW2-061913	06/19/13	<100	<250	<100	<0.50	<5.0	<0.50	<1.5
MW-3	MW3-080608	08/06/08	<236	499	<50	<0.500	<0.500	<0.500	<1.00
	MW3-092512	09/25/12	<100	<250	<100	<0.50	<5.0	<0.50	<1.5
	MW3-121112	12/11/12	90 J	<250	<100	<0.50	<5.0	<0.50	<1.5
	MW3-032013	03/20/13	<100	<250	<100	<0.50	0.26 J	<0.50	<1.5
	MW3-061913	06/19/13	57 J	<250	59 J	<0.50	<5.0	<0.50	<1.5
MW-4	MW4-080608	08/06/08	<236	<472	<50	<0.500	<0.500	<0.500	<1.00
	MW4-092512	09/25/12	<100	<250	<100	<0.50	<5.0	<0.50	<1.5
	MW4-121112	12/11/12	78 J	170 J	<100	<0.50	<5.0	<0.50	<1.5
	MW4-032013	03/20/13	<100	<250	<100	<0.50	<5.0	<0.50	<1.5
	MW4-061913	06/19/13	<100	<250	50 J	<0.50	<5.0	<0.50	<1.5
MTCA Method A Cleanup Levels[3]			**500**	**500/500**	**800[4]/1,000[5]**	**5**	**1,000**	**700**	**1,000**
MTCA Method B Cleanup Levels - Non-Carcinogen[6]			**NE**	**NE**	**NE**	**2,000**	**19,000**	**6,900**	**NE**

NOTES:

Results in **bold** denote concentrations above applicable cleanup levels.

[1] Analyzed by Northwest Method NWTPH-Dx.

[2] Analyzed by Northwest Method NWTPH-Gx, NWTPH-G, or USEPA Method 5030/8021B.

[3] Washington State Model Toxics Control Act Cleanup Regulation Method A Cleanup Levels for Groundwater, Table 720-1 of Section 900 of Chapter 173-340 of the Washington Administrative Code, revised November 2007.

[4] Benzene present in groundwater

[5] No detectable benzene in groundwater

[6] MTCA Cleanup Levels and Risk Calculations, Standard Method B Values for Surface Water, https://fortress.wa.gov/ecy/clarc/Reporting/ChemicalQuery.aspx

< denotes analyte not detected at or above the reporting limit listed.

DRO = total petroleum hydrocarbons (TPH) as diesel-range organics

GRO = TPH as gasoline-range organics

J = estimated value below lowest calibration point

ORO = TPH as oil-range organics

RRO = TPH as residual-range organics

NE = Not established

Table 3
Summary of Groundwater Analytical Results - Carcinogenic Polycyclic Aromatic Hydrocarbons
Burlington Northern Santa Fe Railway Company
John Michael Lease Site
Cashmere, Washington

Monitoring Well	Sample Identification	Sample Date	Analytical Results (micrograms per liter) [1]							
			Benzo (a) anthracene	Chrysene	Benzo (b) fluoranthene	Benzo (k) fluoranthene	Benzo (a) pyrene	Indeno (1,2,3-cd) pyrene	Dibenz(a,h) anthracene	Total cPAHs TEC [2,3]
MW-1	MW1-080608	08/06/08	<0.0943	<0.0943	0.2890	<0.0943	**0.2550**	<0.0943	<0.0943	**0.3032**
	MW1-092512	09/25/12	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.038
	MW1-121112	12/11/12	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.038
	MW1-032013	03/20/13	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.038
	MW1-061913	06/19/13	0.015 J	0.012 J	<0.050	<0.050	<0.050	<0.050	<0.050	0.037
MW-2	MW2-080608	08/06/08	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	0.0712
	MW2-092512	09/25/12	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.038
	MW2-121112	12/11/12	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.038
	MW2-032013	03/20/13	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.038
	MW2-061913	06/19/13	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.038
MW-3	MW3-080608	08/06/08	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	0.0712
	MW3-092512	09/25/12	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.038
	MW3-121112	12/11/12	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.038
	MW3-032013	03/20/13	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.038
	MW3-061913	06/19/13	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.038
MW-4	MW4-080608	08/06/08	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	0.0712
	MW4-092512	09/25/12	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.038
	MW4-121112	12/11/12	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.038
	MW4-032013	03/20/13	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.038
	MW4-061913	06/19/13	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.038
MTCA Method A Cleanup Levels[4]										**0.1**
MTCA Method B Cleanup Levels - Carcinogen[5]			**0.3**	**30**	**0.3**	**3**	**0.03**	**0.3**	**0.03**	**NE**

NOTES:

< denotes analyte not detected at or above the reporting limit listed.

cPAHs = carcinogenic Polycyclic Aromatic Hydrocarbons

TEC = Toxic Equivalent Concentration

NE = Not Established

[1]Analyzed by U.S. Environmental Protection Agency Method 8270C-S.

[2]Total carcinogenic polycyclic aromatic hydrocarbons derived using the total toxicity equivalency method in Section 708(8) of Chapter 173-340 of the Washington Administrative Code.

[3] For concentrations reported at less than the laboratory reporting limit, half the reporting limit was used to calculate the TEC.

[4]Washington State Model Toxics Control Act Cleanup Regulation Method A Cleanup Levels for Groundwater, Table 720-1 of Section 900 of Chapter 173-340 of the Washington Administrative Code, as revised November 2007.

[5] MTCA Cleanup Levels and Risk Calculations, Standard Method B Values for Surface Water, https://fortress.wa.gov/ecy/clarc/Reporting/ChemicalQuery.aspx

Table 4
Summary Groundwater Analytical Results - Non-Carcinogenic Polycyclic Aromatic Hydrocarbons
Burlington Northern Santa Fe Railway Company
John Michael Lease Site
Cashmere, Washington

Monitoring Well	Sample Identification	Sample Date	Analytical Results (micrograms per liter)[1]								
			Acenaphthene	Anthracene	Fluorene	Naphthalene	1-Methyl naphthalene	2-Methyl naphthalene	2-Chloro naphthalene	Phenanthrene	Pyrene
MW-1	MW1-080608	08/06/08	0.866	<0.0943	1.08	0.975	**4.17**	0.608	NR	<0.0943	0.266
	MW1-092512	09/25/12	0.022 J	0.027 J	0.011 J	0.079 J	0.15 J	0.024J	<0.25	0.0091 J	0.040 J
	MW1-121112	12/11/12	0.026 J	0.016 J	0.014 J	0.11 J	0.31	0.031 J	<0.25	<0.050	0.028 J
	MW1-032013	03/20/13	0.025 J	0.025 J	0.013 J	0.11 J	0.21 J	0.027 J	<0.25	<0.050	0.031 J
	MW1-061913	06/19/13	0.016 J	<0.050	0.013 J	0.11 J	0.14 J	0.018 J	<0.25	0.019 J	0.056
MW-2	MW2-080608	08/06/08	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	NR	<0.0943	<0.0943
	MW2-092512	09/25/12	<0.050	<0.050	<0.050	<0.25	0.0085 J	0.012 J	<0.25	<0.050	<0.050
	MW2-121112	12/11/12	<0.050	<0.050	<0.050	<0.25	<0.25	<0.25	<0.25	<0.050	<0.050
	MW2-032013	03/20/13	<0.050	<0.050	<0.050	0.033 J	0.0086 J	0.012 J	<0.25	<0.050	<0.050
	MW2-061913	06/19/13	<0.050	<0.050	<0.050	0.041 J	<0.25	0.010 J	<0.25	<0.050	<0.050
MW-3	MW3-080608	08/06/08	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	NR	<0.0943	<0.0943
	MW3-092512	09/25/12	<0.050	<0.050	<0.050	<0.25	0.0086 J	0.011 J	<0.25	<0.050	<0.050
	MW3-121112	12/11/12	<0.050	<0.050	<0.050	<0.25	<0.25	<0.25	<0.25	<0.050	<0.050
	MW3-032013	03/20/13	<0.050	<0.050	<0.050	0.028 J	<0.25	<0.25	<0.25	<0.050	<0.050
	MW3-061913	06/19/13	<0.050	<0.050	<0.050	0.038 J	0.012 J	0.0092 J	<0.25	<0.050	<0.050
MW-4	MW4-080608	08/06/08	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	NR	<0.0943	<0.0943
	MW4-092512	09/25/12	<0.050	<0.050	<0.050	0.028 J	<0.25	0.011 J	<0.25	<0.050	<0.050
	MW4-121112	12/11/12	<0.050	<0.050	<0.050	0.028 J	<0.25	<0.25	<0.25	<0.050	<0.050
	MW4-032013	03/20/13	<0.050	<0.050	<0.050	0.031 J	<0.25	<0.25	<0.25	<0.050	<0.050
	MW4-061913	06/19/13	<0.050	<0.050	<0.050	0.040 J	<0.25	<0.25	<0.25	<0.050	<0.050
MTCA Method B Cleanup Level [2]			**960**	**4800**	**640**	**160**	**1.5**	**32**	**640**	**NE**	**480**
MTCA Method B Cleanup Level - Non-Carcinogen[3]			**640**	**2,600**	**3,500**	**4,900**	**NE**	**NE**	**1,000**	**NE**	**2,600**

NOTES:

— denotes sample not analyzed.

< denotes analyte not detected at or above the reporting limit listed.

[1] Analyzed by U.S. Environmental Protection Agency (EPA) Method 8270C-S.

[2]Washington State Model Toxics Control Act Cleanup Regulation (MTCA) Cleanup Levels and Risk Calculations, Standard Method B Values for Groundwater, https://fortress.wa.gov/ecy/clarc/Reporting/ChemicalQuery.aspx

[3] MTCA Cleanup Levels and Risk Calculations, Standard Method B Values for Surface Water, https://fortress.wa.gov/ecy/clarc/Reporting/ChemicalQuery.aspx

J = estimated value below lowest calibration point

NE = Not Established

NR = Not Reported

Table 5
Summary of Natural Attenuation and Water Quality Parameter Results
Burlington Northern Santa Fe Railway Company
John Michael Lease Site
Cashmere, Washington

Monitoring Well	Sample Identification	Sample Date	Nitrate[1]	Sulfate[1]	Free Carbon Dioxide[2]	Ferrous Iron[3]	Sulfide[4]	Iron[5]	Iron, Dissolved[5]	Dissolved Oxygen[6]	pH[6]	Temperature[6]	Conductivity[6]	ORP[6]
			Concentrations in milligrams per liter (mg/L)								(standard units)	(Celsius)	(mS/cm)	(mV)
MW-1	MW1-080608	8/6/2008	—	—	—	—	—	—	—	2.02	7.12	14.78	0.634	194.8
	MW1-092512	9/25/2012	2	16	29 T	<0.050 T	<0.050	0.240	<0.100	0.99	6.42	13.29	0.546	110.2
	MW1-121112	12/11/2012	3	16	< 20 T	0.037 J T	0.030 J	0.210	<0.100	1.19	6.57	11.13	0.481	67.8
	MW1-032013	3/20/2013	3.3	23	< 20 T	0.035 J T	<0.050	<0.100	<0.100	3.22	6.83	10.15	0.595	114.9
	MW1-061913	6/19/2013	3.1	15	64 T	0.053 T	< 0.050	0.079 J	0.130	2.13	6.64	12.79	0.517	70.0
MW-2	MW2-080608	8/6/2008	—	—	—	—	—	—	—	3.69	6.72	17.00	0.550	403.5
	MW2-092512	9/25/2012	3.8	16	22 T	<0.050 T	<0.050	0.170	<0.100	4.31	6.63	14.83	0.530	145.7
	MW2-121112	12/11/2012	3.7	16	< 20 T	0.033 J T	< 0.050	0.050 J	<0.100	4.35	6.38	11.53	0.466	276.1
	MW2-032013	3/20/2013	3.6	15	< 20 T	0.530 T	< 0.050	0.210	<0.100	5.29	6.89	9.68	0.502	146.6
	MW2-061913	6/19/2013	3.8	15	42 T	0.033 J T	< 0.050	0.045 J	0.056 J	5.72	7.26	14.25	0.521	316
MW-3	MW3-080608	8/6/2008	—	—	—	—	—	—	—	2.64	6.23	17.07	0.548	432.7
	MW3-092512	9/25/2012	1.4	9.9	39 T	<0.050 T	<0.050	0.046 J	<0.100	0.81	6.38	16.43	0.534	137.6
	MW3-121112	12/11/2012	4.7	17	< 20 T	0.029 J T	0.028 J	0.041 J	<0.100	2.11	6.89	12.44	0.517	145.1
	MW3-032013	3/20/2013	5.1	16	< 20 T	0.031 J T	<0.050	0.017 J	<0.100	4.05	6.79	9.06	0.560	128.3
	MW3-061913	6/19/2013	2.2	14	62 T	0.031 J T	<0.050	0.062 J	0.039 J	3.08	7.10	14.55	0.560	297
MW-4	MW4-080608	8/6/2008	—	—	—	—	—	—	—	5.37	6.35	16.86	0.504	439.1
	MW4-092512	9/25/2012	4	14	22 T	<0.050 T	<0.050	0.057 J	<0.100	4.14	6.46	14.30	0.532	157.0
	MW4-121112	12/11/2012	4.6	16	< 20 T	<0.050 T	0.026 J	0.028 J	<0.100	4.59	6.99	11.95	0.486	235.0
	MW4-032013	3/20/2013	5.4	16	< 20 T	0.029 J T	<0.050	0.058 J	<0.100	6.18	6.82	10.29	0.580	159.6
	MW4-061913	6/19/2013	6.2	14	45 T	0.036 J T	<0.050	0.051 J	0.040 J	6.50	6.78	13.18	0.559	66.5

NOTES:

— denotes sample not analyzed.

[1]Analyzed by U.S. Environmental Protection Agency (EPA) Method 9056.

[2]Analyzed by Standard Method (SM) 4500CO2.

[3]Analyzed by Conventional Chemistry Parameters by EPA Method/American Public Health Association (APHA) Methods, SM 3500-Fe.

[4]Analyzed by SM 4500-S2.

[5]Analyzed by EPA Method 6010B.

[6]Measured using a YSI multimeter and flow-through cell after stabilization.

J = estimated value below lowest calibration point

mg/l = milligrams per liter; equivalent to parts per million

mS/cm = microSiemens per centimeter

mV = millivolts

ORP = oxidation-reduction potential

T = sample received past/too close to holding time expiration

Table 6
Summary of Molecular Biological Results
Burlington Northern Santa Fe Railway Company
John Michael Lease Site
Cashmere, Washington

Well ID	Sample Date	PLFA Total Biomass cells/mL	Monos %	BrMonos %	MidBRSats %	TerBRSats %	Nsats %	Polyenoics %
MW-1	11/1/2012	128,000	74.08	0.85	1.83	3.90	17.47	1.88
MW-2	11/1/2012	161,000	64.55	0.97	2.28	5.00	26.49	0.72

Notes and Abbreviations

PLFA: Phospholipid Fatty Acid analysis

PLFA Structural Groups

Monos: Monoenoic - Consists of Proteobacteria with a wide variety of aerobic and anaerobic bacteria

BrMonos: Branched monoenoic - anaerobic sulfate and iron reducers

MidBrSats: Mid-chain branched saturated - anaerobic sulfate and iron reducers

TerBrSats: Terminally branched saturated - includes Firmicutes type bacteria; anaerobic fermenting bacteria

Nsats: Normal saturated - high proportions can indicate less diverse populations

Polyenoics: Eukaryotes - can prey upon contaminant-utilizing bacteria

Relative Biomass Cell Concentration (cells/mL)

Low 10^3 to 10^4 cells

Moderate 10^5 to 10^6 cells

High 10^7 to 10^8 cells

APPENDIX A

LABORATORY ANALYTICAL REPORTS
AND

CHAIN OF CUSTODY RECORDS

Farallon Consulting - BNSF Region 1

975 5th Avenue Northwest
Issaquah, WA 98027

Billing information:

Scott MacDonald
2454 Occidental Ave S, Ste 1A

Seattle, WA 98134-1451

Report to: **Kristin Darnell**

Email: **kjdarnell@farallonconsulting**

Project Description: **BNSF - JML - Cashmere, WA**

City/State Collected:

Phone: **(425) 295-0811**
FAX:

Client Project #: **TT9206-M04**

Lab Project #: **BNSF1FAR-CASHMERE**

Collected by (print): Jon Peterson

Site/Facility ID#:

P.O.#:

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day.....100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? __No X Yes
FAX? __No __Yes

Analysis/Container/Preservative

Chain of Custody
Page ___ of ___

ESC LAB SCIENCES
12065 Lebanon Road
Mt. Juliet, TN 37122
Phone: (800) 767-5859
Phone: (615) 758-5858
Fax: (615) 758-5859

E204

Acctnum: **BNSF1FAR** (lab use only)
Template/Prelogin: **T81876 P423794**
Cooler #: 3-14 MB
Shipped Via: **FedEX Ground**

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	***NO3***, SO4 125mlHDPE-NoPres	CO2 40mlAmb-NoPres	Dissolved Iron 500mlHDPE-NoPres	Ferrous Iron 250mlAmb-HCl <2	NWTPHDXLVI 40mlAmb-HCl-BT	NWTPHGXBTEX 40mlAmb HCl	PAHSIMLVI 40mlAmb-NoPres-WT	SULFIDE 500mlHDPE-NaOH+ZnAc 7 12	Remarks/Contaminant	Sample # (lab only)
MW4-032013	grab	GW	N/A	3-20-13	1000	14	X	X	X	X	X	X	X	X	626192	-01
MW2-032013		GW			1100	14	X	X	X	X	X	X	X	X		-02
MW1-032013		GW			1200	14	X	X	X	X	X	X	X	X		-03
MW3-032013		GW			1230	14	X	X	X	X	X	X	X	X		-04
		GW				14	X	X	X	X	X	X	X	X		
		GW				14	X	X	X	X	X	X	X	X		
		GW				14	X	X	X	X	X	X	X	X		
		GW				14	X	X	X	X	X	X	X	X		

*Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

6598

554702346602

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
	3/20/13		
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ _____

Temp: 3.7 Bottles Received: 56

Date: 3/21/13 Time: 0900

Condition: (lab use only) OK N

COC Seal Intact: ___ Y ___ N ✓ NA

pH Checked: <2, >12 NCF:

12065 Lebanon Rd.
Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

Kristin Darnell
Farallon Consulting - BNSF Region 1
975 5th Avenue Northwest
Issaquah, WA 98027

Report Summary

Friday March 29, 2013

Report Number: L626192
Samples Received: 03/21/13
Client Project: TT9206-M04

Description: BNSF - JML - Cashmere, WA

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Mark W. Beasley , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197, FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1, TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.
Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

ESC LAB SCIENCES
YOUR LAB OF CHOICE

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Mt. Juliet, TN 37122
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Est. 1970

REPORT OF ANALYSIS

Kristin Darnell
Farallon Consulting - BNSF Region 1
975 5th Avenue Northwest
Issaquah, WA 98027

March 29, 2013

ESC Sample # : L626192-01

Site ID :

Project # : TT9206-M04

Date Received : March 21, 2013
Description : BNSF - JML - Cashmere, WA

Sample ID : MW4-032013

Collected By : Jon Peterson
Collection Date : 03/20/13 10:00

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Nitrate	5400	23.	100	ug/l		9056	03/21/13	1
Sulfate	16000	77.	5000	ug/l		9056	03/21/13	1
Free Carbon Dioxide	U	6600	20000	ug/l	T8	4500CO2	03/28/13	1
Ferrous Iron	29.	17.	50.	ug/l	JT8	3500Fe	03/27/13	1
Sulfide	U	19.	50.	ug/l		4500S2	03/27/13	1
Iron	58.	14.	100	ug/l	J	6010B	03/28/13	1
Iron,Dissolved	U	14.	100	ug/l		6010B	03/26/13	1
Gasoline Range Organics-NWTPH	U	50.	100	ug/l		NWTPHGX	03/22/13	1
Benzene	U	0.19	0.50	ug/l		NWTPHGX	03/22/13	1
Toluene	U	0.18	5.0	ug/l		NWTPHGX	03/22/13	1
Ethylbenzene	U	0.16	0.50	ug/l		NWTPHGX	03/22/13	1
Total Xylene	U	0.51	1.5	ug/l		NWTPHGX	03/22/13	1
Surrogate Recovery(%)								
a,a,a-Trifluorotoluene(PID)	102.			% Rec.		NWTPHGX	03/22/13	1
a,a,a-Trifluorotoluene(FID)	99.6			% Rec.		NWTPHGX	03/22/13	1
Diesel Range Organics (DRO)	U	50.	100	ug/l		NWTPHDX	03/25/13	1
Residual Range Organics (RRO)	U	120	250	ug/l		NWTPHDX	03/25/13	1
Surrogate Recovery								
o-Terphenyl	103.			% Rec.		NWTPHDX	03/25/13	1
Polynuclear Aromatic Hydrocarbons								
Anthracene	U	0.0076	0.050	ug/l		8270C-S	03/25/13	1
Acenaphthene	U	0.0082	0.050	ug/l		8270C-S	03/25/13	1
Acenaphthylene	U	0.0068	0.050	ug/l		8270C-S	03/25/13	1
Benzo(a)anthracene	U	0.012	0.050	ug/l		8270C-S	03/25/13	1
Benzo(a)pyrene	U	0.012	0.050	ug/l		8270C-S	03/25/13	1
Benzo(b)fluoranthene	U	0.014	0.050	ug/l		8270C-S	03/25/13	1
Benzo(g,h,i)perylene	U	0.011	0.050	ug/l		8270C-S	03/25/13	1
Benzo(k)fluoranthene	U	0.014	0.050	ug/l		8270C-S	03/25/13	1
Chrysene	U	0.011	0.050	ug/l		8270C-S	03/25/13	1
Dibenz(a,h)anthracene	U	0.0040	0.050	ug/l		8270C-S	03/25/13	1
Fluoranthene	U	0.016	0.050	ug/l		8270C-S	03/25/13	1
Fluorene	U	0.0085	0.050	ug/l		8270C-S	03/25/13	1
Indeno(1,2,3-cd)pyrene	U	0.015	0.050	ug/l		8270C-S	03/25/13	1
Naphthalene	0.031	0.020	0.25	ug/l	J	8270C-S	03/25/13	1
Phenanthrene	U	0.0082	0.050	ug/l		8270C-S	03/25/13	1
Pyrene	U	0.012	0.050	ug/l		8270C-S	03/25/13	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL = TRRP MQL
MDL = Minimum Detection Limit = LOD = TRRP SDL
Note:
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REPORT OF ANALYSIS

Kristin Darnell
Farallon Consulting - BNSF Region 1
975 5th Avenue Northwest
Issaquah, WA 98027

March 29, 2013

ESC Sample # : L626192-01

Site ID :

Project # : TT9206-M04

Date Received : March 21, 2013
Description : BNSF - JML - Cashmere, WA

Sample ID : MW4-032013

Collected By : Jon Peterson
Collection Date : 03/20/13 10:00

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
1-Methylnaphthalene	U	0.0082	0.25	ug/l		8270C-S	03/25/13	1
2-Methylnaphthalene	U	0.0090	0.25	ug/l		8270C-S	03/25/13	1
2-Chloronaphthalene	U	0.0065	0.25	ug/l		8270C-S	03/25/13	1
Surrogate Recovery								
Nitrobenzene-d5	106.			% Rec.		8270C-S	03/25/13	1
2-Fluorobiphenyl	104.			% Rec.		8270C-S	03/25/13	1
p-Terphenyl-d14	99.2			% Rec.		8270C-S	03/25/13	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL = TRRP MQL
MDL = Minimum Detection Limit = LOD = TRRP SDL
Note:
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REPORT OF ANALYSIS

Kristin Darnell
Farallon Consulting - BNSF Region 1
975 5th Avenue Northwest
Issaquah, WA 98027

March 29, 2013

ESC Sample # : L626192-02

Site ID :

Project # : TT9206-M04

Date Received : March 21, 2013
Description : BNSF - JML - Cashmere, WA

Sample ID : MW2-032013

Collected By : Jon Peterson
Collection Date : 03/20/13 11:00

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Nitrate	3600	23.	100	ug/l		9056	03/21/13	1
Sulfate	15000	77.	5000	ug/l		9056	03/21/13	1
Free Carbon Dioxide	U	6600	20000	ug/l	T8	4500CO2	03/28/13	1
Ferrous Iron	530	17.	50.	ug/l	T8	3500Fe	03/27/13	1
Sulfide	U	19.	50.	ug/l		4500S2	03/27/13	1
Iron	210	14.	100	ug/l		6010B	03/28/13	1
Iron,Dissolved	U	14.	100	ug/l		6010B	03/29/13	1
Gasoline Range Organics-NWTPH	U	50.	100	ug/l		NWTPHGX	03/22/13	1
Benzene	U	0.19	0.50	ug/l		NWTPHGX	03/22/13	1
Toluene	U	0.18	5.0	ug/l		NWTPHGX	03/22/13	1
Ethylbenzene	U	0.16	0.50	ug/l		NWTPHGX	03/22/13	1
Total Xylene	U	0.51	1.5	ug/l		NWTPHGX	03/22/13	1
Surrogate Recovery(%)								
a,a,a-Trifluorotoluene(PID)	102.			% Rec.		NWTPHGX	03/22/13	1
a,a,a-Trifluorotoluene(FID)	99.7			% Rec.		NWTPHGX	03/22/13	1
Diesel Range Organics (DRO)	U	50.	100	ug/l		NWTPHDX	03/25/13	1
Residual Range Organics (RRO)	U	120	250	ug/l		NWTPHDX	03/25/13	1
Surrogate Recovery								
o-Terphenyl	111.			% Rec.		NWTPHDX	03/25/13	1
Polynuclear Aromatic Hydrocarbons								
Anthracene	U	0.0076	0.050	ug/l		8270C-S	03/25/13	1
Acenaphthene	U	0.0082	0.050	ug/l		8270C-S	03/25/13	1
Acenaphthylene	U	0.0068	0.050	ug/l		8270C-S	03/25/13	1
Benzo(a)anthracene	U	0.012	0.050	ug/l		8270C-S	03/25/13	1
Benzo(a)pyrene	U	0.012	0.050	ug/l		8270C-S	03/25/13	1
Benzo(b)fluoranthene	U	0.014	0.050	ug/l		8270C-S	03/25/13	1
Benzo(g,h,i)perylene	U	0.011	0.050	ug/l		8270C-S	03/25/13	1
Benzo(k)fluoranthene	U	0.014	0.050	ug/l		8270C-S	03/25/13	1
Chrysene	U	0.011	0.050	ug/l		8270C-S	03/25/13	1
Dibenz(a,h)anthracene	U	0.0040	0.050	ug/l		8270C-S	03/25/13	1
Fluoranthene	U	0.016	0.050	ug/l		8270C-S	03/25/13	1
Fluorene	U	0.0085	0.050	ug/l		8270C-S	03/25/13	1
Indeno(1,2,3-cd)pyrene	U	0.015	0.050	ug/l		8270C-S	03/25/13	1
Naphthalene	0.033	0.020	0.25	ug/l	J	8270C-S	03/25/13	1
Phenanthrene	U	0.0082	0.050	ug/l		8270C-S	03/25/13	1
Pyrene	U	0.012	0.050	ug/l		8270C-S	03/25/13	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL = TRRP MQL
MDL = Minimum Detection Limit = LOD = TRRP SDL
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REPORT OF ANALYSIS

Kristin Darnell
Farallon Consulting - BNSF Region 1
975 5th Avenue Northwest
Issaquah, WA 98027

March 29, 2013

ESC Sample # : L626192-02

Date Received : March 21, 2013
Description : BNSF - JML - Cashmere, WA

Site ID :

Sample ID : MW2-032013

Project # : TT9206-M04

Collected By : Jon Peterson
Collection Date : 03/20/13 11:00

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
1-Methylnaphthalene	0.0086	0.0082	0.25	ug/l	J	8270C-S	03/25/13	1
2-Methylnaphthalene	0.012	0.0090	0.25	ug/l	J	8270C-S	03/25/13	1
2-Chloronaphthalene	U	0.0065	0.25	ug/l		8270C-S	03/25/13	1
Surrogate Recovery								
Nitrobenzene-d5	106.			% Rec.		8270C-S	03/25/13	1
2-Fluorobiphenyl	107.			% Rec.		8270C-S	03/25/13	1
p-Terphenyl-d14	103.			% Rec.		8270C-S	03/25/13	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL = TRRP MQL
MDL = Minimum Detection Limit = LOD = TRRP SDL
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REPORT OF ANALYSIS

Kristin Darnell
Farallon Consulting - BNSF Region 1
975 5th Avenue Northwest
Issaquah, WA 98027

March 29, 2013

ESC Sample # : L626192-03

Date Received : March 21, 2013
Description : BNSF - JML - Cashmere, WA

Site ID :

Sample ID : MW1-032013

Project # : TT9206-M04

Collected By : Jon Peterson
Collection Date : 03/20/13 12:00

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Nitrate	3300	23.	100	ug/l		9056	03/21/13	1
Sulfate	23000	77.	5000	ug/l		9056	03/21/13	1
Free Carbon Dioxide	U	6600	20000	ug/l	T8	4500CO2	03/28/13	1
Ferrous Iron	35.	17.	50.	ug/l	JT8	3500Fe	03/27/13	1
Sulfide	U	19.	50.	ug/l		4500S2	03/27/13	1
Iron	U	14.	100	ug/l		6010B	03/28/13	1
Iron,Dissolved	U	14.	100	ug/l		6010B	03/29/13	1
Gasoline Range Organics-NWTPH	U	50.	100	ug/l		NWTPHGX	03/22/13	1
Benzene	U	0.19	0.50	ug/l		NWTPHGX	03/22/13	1
Toluene	0.23	0.18	5.0	ug/l	J	NWTPHGX	03/22/13	1
Ethylbenzene	U	0.16	0.50	ug/l		NWTPHGX	03/22/13	1
Total Xylene	0.82	0.51	1.5	ug/l	J	NWTPHGX	03/22/13	1
Surrogate Recovery(%)								
a,a,a-Trifluorotoluene(PID)	102.			% Rec.		NWTPHGX	03/22/13	1
a,a,a-Trifluorotoluene(FID)	99.1			% Rec.		NWTPHGX	03/22/13	1
Diesel Range Organics (DRO)	100	50.	100	ug/l		NWTPHDX	03/26/13	1
Residual Range Organics (RRO)	U	120	250	ug/l		NWTPHDX	03/26/13	1
Surrogate Recovery								
o-Terphenyl	111.			% Rec.		NWTPHDX	03/26/13	1
Polynuclear Aromatic Hydrocarbons								
Anthracene	0.025	0.0076	0.050	ug/l	J	8270C-S	03/25/13	1
Acenaphthene	0.025	0.0082	0.050	ug/l	J	8270C-S	03/25/13	1
Acenaphthylene	U	0.0068	0.050	ug/l		8270C-S	03/25/13	1
Benzo(a)anthracene	U	0.012	0.050	ug/l		8270C-S	03/25/13	1
Benzo(a)pyrene	U	0.012	0.050	ug/l		8270C-S	03/25/13	1
Benzo(b)fluoranthene	U	0.014	0.050	ug/l		8270C-S	03/25/13	1
Benzo(g,h,i)perylene	U	0.011	0.050	ug/l		8270C-S	03/25/13	1
Benzo(k)fluoranthene	U	0.014	0.050	ug/l		8270C-S	03/25/13	1
Chrysene	U	0.011	0.050	ug/l		8270C-S	03/25/13	1
Dibenz(a,h)anthracene	U	0.0040	0.050	ug/l		8270C-S	03/25/13	1
Fluoranthene	U	0.016	0.050	ug/l		8270C-S	03/25/13	1
Fluorene	0.013	0.0085	0.050	ug/l	J	8270C-S	03/25/13	1
Indeno(1,2,3-cd)pyrene	U	0.015	0.050	ug/l		8270C-S	03/25/13	1
Naphthalene	0.11	0.020	0.25	ug/l	J	8270C-S	03/25/13	1
Phenanthrene	U	0.0082	0.050	ug/l		8270C-S	03/25/13	1
Pyrene	0.031	0.012	0.050	ug/l	J	8270C-S	03/25/13	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL = TRRP MQL
MDL = Minimum Detection Limit = LOD = TRRP SDL
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REPORT OF ANALYSIS

Kristin Darnell
Farallon Consulting - BNSF Region 1
975 5th Avenue Northwest
Issaquah, WA 98027

March 29, 2013

ESC Sample # : L626192-03

Date Received : March 21, 2013
Description : BNSF - JML - Cashmere, WA

Site ID :

Sample ID : MW1-032013

Project # : TT9206-M04

Collected By : Jon Peterson
Collection Date : 03/20/13 12:00

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
1-Methylnaphthalene	0.21	0.0082	0.25	ug/l	J	8270C-S	03/25/13	1
2-Methylnaphthalene	0.027	0.0090	0.25	ug/l	J	8270C-S	03/25/13	1
2-Chloronaphthalene	U	0.0065	0.25	ug/l		8270C-S	03/25/13	1
Surrogate Recovery								
Nitrobenzene-d5	107.			% Rec.		8270C-S	03/25/13	1
2-Fluorobiphenyl	105.			% Rec.		8270C-S	03/25/13	1
p-Terphenyl-d14	103.			% Rec.		8270C-S	03/25/13	1

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REPORT OF ANALYSIS

Kristin Darnell
Farallon Consulting - BNSF Region 1
975 5th Avenue Northwest
Issaquah, WA 98027

March 29, 2013

ESC Sample # : L626192-04

Site ID :

Project # : TT9206-M04

Date Received : March 21, 2013
Description : BNSF - JML - Cashmere, WA

Sample ID : MW3-032013

Collected By : Jon Peterson
Collection Date : 03/20/13 12:30

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Nitrate	5100	23.	100	ug/l		9056	03/21/13	1
Sulfate	16000	77.	5000	ug/l		9056	03/21/13	1
Free Carbon Dioxide	U	6600	20000	ug/l	T8	4500CO2	03/28/13	1
Ferrous Iron	31.	17.	50.	ug/l	JT8	3500Fe	03/27/13	1
Sulfide	U	19.	50.	ug/l		4500S2	03/27/13	1
Iron	17.	14.	100	ug/l	J	6010B	03/28/13	1
Iron,Dissolved	U	14.	100	ug/l		6010B	03/29/13	1
Gasoline Range Organics-NWTPH	U	50.	100	ug/l		NWTPHGX	03/23/13	1
Benzene	U	0.19	0.50	ug/l		NWTPHGX	03/23/13	1
Toluene	0.26	0.18	5.0	ug/l	J	NWTPHGX	03/23/13	1
Ethylbenzene	U	0.16	0.50	ug/l		NWTPHGX	03/23/13	1
Total Xylene	U	0.51	1.5	ug/l		NWTPHGX	03/23/13	1
Surrogate Recovery(%)								
a,a,a-Trifluorotoluene(PID)	102.			% Rec.		NWTPHGX	03/23/13	1
a,a,a-Trifluorotoluene(FID)	99.4			% Rec.		NWTPHGX	03/23/13	1
Diesel Range Organics (DRO)	U	50.	100	ug/l		NWTPHDX	03/26/13	1
Residual Range Organics (RRO)	U	120	250	ug/l		NWTPHDX	03/26/13	1
Surrogate Recovery								
o-Terphenyl	117.			% Rec.		NWTPHDX	03/26/13	1
Polynuclear Aromatic Hydrocarbons								
Anthracene	U	0.0076	0.050	ug/l		8270C-S	03/25/13	1
Acenaphthene	U	0.0082	0.050	ug/l		8270C-S	03/25/13	1
Acenaphthylene	U	0.0068	0.050	ug/l		8270C-S	03/25/13	1
Benzo(a)anthracene	U	0.012	0.050	ug/l		8270C-S	03/25/13	1
Benzo(a)pyrene	U	0.012	0.050	ug/l		8270C-S	03/25/13	1
Benzo(b)fluoranthene	U	0.014	0.050	ug/l		8270C-S	03/25/13	1
Benzo(g,h,i)perylene	U	0.011	0.050	ug/l		8270C-S	03/25/13	1
Benzo(k)fluoranthene	U	0.014	0.050	ug/l		8270C-S	03/25/13	1
Chrysene	U	0.011	0.050	ug/l		8270C-S	03/25/13	1
Dibenz(a,h)anthracene	U	0.0040	0.050	ug/l		8270C-S	03/25/13	1
Fluoranthene	U	0.016	0.050	ug/l		8270C-S	03/25/13	1
Fluorene	U	0.0085	0.050	ug/l		8270C-S	03/25/13	1
Indeno(1,2,3-cd)pyrene	U	0.015	0.050	ug/l		8270C-S	03/25/13	1
Naphthalene	0.028	0.020	0.25	ug/l	J	8270C-S	03/25/13	1
Phenanthrene	U	0.0082	0.050	ug/l		8270C-S	03/25/13	1
Pyrene	U	0.012	0.050	ug/l		8270C-S	03/25/13	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL = TRRP MQL
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REPORT OF ANALYSIS

Kristin Darnell
Farallon Consulting - BNSF Region 1
975 5th Avenue Northwest
Issaquah, WA 98027

March 29, 2013

ESC Sample # : L626192-04

Site ID :

Project # : TT9206-M04

Date Received : March 21, 2013
Description : BNSF - JML - Cashmere, WA

Sample ID : MW3-032013

Collected By : Jon Peterson
Collection Date : 03/20/13 12:30

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
1-Methylnaphthalene	U	0.0082	0.25	ug/l		8270C-S	03/25/13	1
2-Methylnaphthalene	U	0.0090	0.25	ug/l		8270C-S	03/25/13	1
2-Chloronaphthalene	U	0.0065	0.25	ug/l		8270C-S	03/25/13	1
Surrogate Recovery								
Nitrobenzene-d5	106.			% Rec.		8270C-S	03/25/13	1
2-Fluorobiphenyl	104.			% Rec.		8270C-S	03/25/13	1
p-Terphenyl-d14	103.			% Rec.		8270C-S	03/25/13	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL = TRRP MQL
MDL = Minimum Detection Limit = LOD = TRRP SDL
Note:

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Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L626192-01	WG652882	SAMP	Iron	R2597379	J
	WG652378	SAMP	Naphthalene	R2594924	J
	WG653081	SAMP	Free Carbon Dioxide	R2597798	T8
	WG653022	SAMP	Ferrous Iron	R2596499	JT8
L626192-02	WG652378	SAMP	Naphthalene	R2594924	J
	WG652378	SAMP	1-Methylnaphthalene	R2594924	J
	WG652378	SAMP	2-Methylnaphthalene	R2594924	J
	WG653081	SAMP	Free Carbon Dioxide	R2597798	T8
	WG653022	SAMP	Ferrous Iron	R2596499	T8
L626192-03	WG652327	SAMP	Toluene	R2595018	J
	WG652327	SAMP	Total Xylene	R2595018	J
	WG652378	SAMP	Anthracene	R2594924	J
	WG652378	SAMP	Acenaphthene	R2594924	J
	WG652378	SAMP	Fluorene	R2594924	J
	WG652378	SAMP	Naphthalene	R2594924	J
	WG652378	SAMP	Pyrene	R2594924	J
	WG652378	SAMP	1-Methylnaphthalene	R2594924	J
	WG652378	SAMP	2-Methylnaphthalene	R2594924	J
	WG653081	SAMP	Free Carbon Dioxide	R2597798	T8
	WG653022	SAMP	Ferrous Iron	R2596499	JT8
L626192-04	WG652882	SAMP	Iron	R2597379	J
	WG652327	SAMP	Toluene	R2595018	J
	WG652378	SAMP	Naphthalene	R2594924	J
	WG653081	SAMP	Free Carbon Dioxide	R2597798	T8
	WG653022	SAMP	Ferrous Iron	R2596499	JT8

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
J	(EPA) - Estimated value below the lowest calibration point. Confidence correlates with concentration.
T8	(ESC) - Additional method/sample information: Sample(s) received past/too close to holding time expiration.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods,it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.

Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Differrence.

Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromotography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.

TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Summary of Remarks For Samples Printed
03/29/13 at 17:36:15

TSR Signing Reports: 134
R5 - Desired TAT

Sample: L626192-01 Account: BNSF1FAR Received: 03/21/13 09:00 Due Date: 03/28/13 00:00 RPT Date: 03/29/13 17:35

Sample: L626192-02 Account: BNSF1FAR Received: 03/21/13 09:00 Due Date: 03/28/13 00:00 RPT Date: 03/29/13 17:35

Sample: L626192-03 Account: BNSF1FAR Received: 03/21/13 09:00 Due Date: 03/28/13 00:00 RPT Date: 03/29/13 17:35

Sample: L626192-04 Account: BNSF1FAR Received: 03/21/13 09:00 Due Date: 03/28/13 00:00 RPT Date: 03/29/13 17:35

Farallon Consulting - BNSF Region 1

975 5th Avenue Northwest
Issaquah, WA 98027

Billing information:

Scott MacDonald
2454 Occidental Ave S, Ste 1A

Seattle, WA 98134-1451

Report to: **Kristin Darnell**

Email: **kjdarnell@farallonconsulting**

Project Description: **BNSF - JML - Cashmere, WA**

City/State Collected:

Phone: **(425) 295-0811**
FAX:

Client Project #: **TT9206-M04**

Lab Project #: **BNSF1FAR-CASHMERE**

Collected by (print): Jon Peterson

Site/Facility ID#:

P.O.#:

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day. 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? __No X__Yes
FAX? __No __Yes

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	~~Total Iron 500ml HDPE-HNO3~~	~~CO_2 40ml Amb-NoPres~~	***NO_3, SO_4 125ml HDPE-NoPres	Dissolved Iron 500ml HDPE-NoPres <2	Ferrous Iron 250ml Amb-HCl <2	NWTPHDXLVI 40ml Amb-HCl-BT	NWTPHGXBTEX 40ml Amb HCl	PAHSIMLVI 40ml Amb-NoPres-WT	SULFIDE 500ml HDPE-NaOH+ZnAc >12	Remarks/Contaminant	Sample # (lab only)
MW1-061913	Grab	GW	N/A	6/19/13	1100	14	X	X	X	X	X	X	X	X	X	L642701	~~L642390-01~~
MW2-061913	Grab	GW	N/A	6/19/13	1000	14	X	X	X	X	X	X	X	X	X		
MW3-061913	Grab	GW	N/A	6/19/13	1105	14	X	X	X	X	X	X	X	X	X		
MW4-061913	Grab	GW	N/A	6/19/13	1145	14	X	X	X	X	X	X	X	X	X		

*Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Chain of Custody
Page ___ of ___

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Fax: (615) 758-5859

F027

Acctnum: **BNSF1FAR** (lab use only)
Template/Prelogin: **T87077/ P431096**
Cooler #: 5128 MW5
Shipped Via: **FedEX Ground**

5547 0244 3411

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Jon Peterson	6/19/13	1200	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)
			Charles Kovdella

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____
Temp: 3.4 Bottles Received: 56+2TB
Date: 6-20-13 Time: 0930

Condition: OK SF (lab use only)
COC Seal Intact: ✓ Y ___ N ___ NA
pH Checked: <2, >12 NCF:

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Kristin Darnell
Farallon Consulting - BNSF Region 1
975 5th Avenue Northwest
Issaquah, WA 98027

Report Summary

Tuesday July 02, 2013

Report Number: L642401
Samples Received: 06/20/13
Client Project: TT9206-M04

Description: BNSF - JML - Cashmere, WA

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Mark W. Beasley , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197, FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1, TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.
Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

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REPORT OF ANALYSIS

Kristin Darnell
Farallon Consulting - BNSF Region 1
975 5th Avenue Northwest
Issaquah, WA 98027

July 02, 2013

ESC Sample # : L642401-01

Site ID :

Project # : TT9206-M04

Date Received : June 20, 2013
Description : BNSF - JML - Cashmere, WA

Sample ID : MW1-061913

Collected By : Jon Peterson
Collection Date : 06/19/13 11:00

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Nitrate	3100	23.	100	ug/l		9056	06/20/13	1
Sulfate	15000	77.	5000	ug/l		9056	06/20/13	1
Free Carbon Dioxide	64000	6600	20000	ug/l	T8	4500CO2	06/27/13	1
Ferrous Iron	53.	17.	50.	ug/l	T8	3500Fe	06/21/13	1
Sulfide	U	19.	50.	ug/l		4500S2	06/26/13	1
Iron,Dissolved	130	14.	100	ug/l		6010B	07/01/13	1
Gasoline Range Organics-NWTPH	U	50.	100	ug/l		NWTPHGX	06/22/13	1
Benzene	U	0.19	0.50	ug/l		NWTPHGX	06/22/13	1
Toluene	U	0.18	5.0	ug/l		NWTPHGX	06/22/13	1
Ethylbenzene	U	0.16	0.50	ug/l		NWTPHGX	06/22/13	1
Total Xylene	U	0.51	1.5	ug/l		NWTPHGX	06/22/13	1
Surrogate Recovery(%)								
a,a,a-Trifluorotoluene(PID)	101.			% Rec.		NWTPHGX	06/22/13	1
a,a,a-Trifluorotoluene(FID)	101.			% Rec.		NWTPHGX	06/22/13	1
Diesel Range Organics (DRO)	110	50.	100	ug/l		NWTPHDX	06/24/13	1
Residual Range Organics (RRO)	U	120	250	ug/l		NWTPHDX	06/24/13	1
Surrogate Recovery								
o-Terphenyl	104.			% Rec.		NWTPHDX	06/24/13	1
Polynuclear Aromatic Hydrocarbons								
Anthracene	U	0.0076	0.050	ug/l		8270C-S	06/24/13	1
Acenaphthene	0.016	0.0082	0.050	ug/l	J	8270C-S	06/24/13	1
Acenaphthylene	U	0.0068	0.050	ug/l		8270C-S	06/24/13	1
Benzo(a)anthracene	0.015	0.012	0.050	ug/l	J	8270C-S	06/24/13	1
Benzo(a)pyrene	U	0.012	0.050	ug/l		8270C-S	06/24/13	1
Benzo(b)fluoranthene	U	0.014	0.050	ug/l		8270C-S	06/24/13	1
Benzo(g,h,i)perylene	U	0.011	0.050	ug/l		8270C-S	06/24/13	1
Benzo(k)fluoranthene	U	0.014	0.050	ug/l		8270C-S	06/24/13	1
Chrysene	0.012	0.011	0.050	ug/l	J	8270C-S	06/24/13	1
Dibenz(a,h)anthracene	U	0.0040	0.050	ug/l		8270C-S	06/24/13	1
Fluoranthene	U	0.016	0.050	ug/l		8270C-S	06/24/13	1
Fluorene	0.013	0.0085	0.050	ug/l	J	8270C-S	06/24/13	1
Indeno(1,2,3-cd)pyrene	U	0.015	0.050	ug/l		8270C-S	06/24/13	1
Naphthalene	0.11	0.020	0.25	ug/l	J	8270C-S	06/24/13	1
Phenanthrene	0.019	0.0082	0.050	ug/l	J	8270C-S	06/24/13	1
Pyrene	0.056	0.012	0.050	ug/l		8270C-S	06/24/13	1
1-Methylnaphthalene	0.14	0.0082	0.25	ug/l	J	8270C-S	06/24/13	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL = TRRP MQL
MDL = Minimum Detection Limit = LOD = TRRP SDL
Note:
The reported analytical results relate only to the sample submitted.

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REPORT OF ANALYSIS

Kristin Darnell
Farallon Consulting - BNSF Region 1
975 5th Avenue Northwest
Issaquah, WA 98027

July 02, 2013

ESC Sample # : L642401-01

Site ID :

Project # : TT9206-M04

Date Received : June 20, 2013
Description : BNSF - JML - Cashmere, WA

Sample ID : MW1-061913

Collected By : Jon Peterson
Collection Date : 06/19/13 11:00

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
2-Methylnaphthalene	0.018	0.0090	0.25	ug/l	J	8270C-S	06/24/13	1
2-Chloronaphthalene	U	0.0065	0.25	ug/l		8270C-S	06/24/13	1
Surrogate Recovery								
Nitrobenzene-d5	83.0			% Rec.		8270C-S	06/24/13	1
2-Fluorobiphenyl	99.1			% Rec.		8270C-S	06/24/13	1
p-Terphenyl-d14	96.9			% Rec.		8270C-S	06/24/13	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL = TRRP MQL
MDL = Minimum Detection Limit = LOD = TRRP SDL
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REPORT OF ANALYSIS

Kristin Darnell
Farallon Consulting - BNSF Region 1
975 5th Avenue Northwest
Issaquah, WA 98027

July 02, 2013

ESC Sample # : L642401-02

Site ID :

Project # : TT9206-M04

Date Received : June 20, 2013
Description : BNSF - JML - Cashmere, WA

Sample ID : MW2-061913

Collected By : Jon Peterson
Collection Date : 06/19/13 10:00

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Nitrate	3800	23.	100	ug/l		9056	06/20/13	1
Sulfate	15000	77.	5000	ug/l		9056	06/20/13	1
Free Carbon Dioxide	42000	6600	20000	ug/l	T8	4500CO2	06/27/13	1
Ferrous Iron	33.	17.	50.	ug/l	JT8	3500Fe	06/21/13	1
Sulfide	U	19.	50.	ug/l		4500S2	06/26/13	1
Iron,Dissolved	56.	14.	100	ug/l	J	6010B	07/01/13	1
Gasoline Range Organics-NWTPH	U	50.	100	ug/l		NWTPHGX	06/22/13	1
Benzene	U	0.19	0.50	ug/l		NWTPHGX	06/22/13	1
Toluene	U	0.18	5.0	ug/l		NWTPHGX	06/22/13	1
Ethylbenzene	U	0.16	0.50	ug/l		NWTPHGX	06/22/13	1
Total Xylene	U	0.51	1.5	ug/l		NWTPHGX	06/22/13	1
Surrogate Recovery(%)								
a,a,a-Trifluorotoluene(PID)	99.7			% Rec.		NWTPHGX	06/22/13	1
a,a,a-Trifluorotoluene(FID)	101.			% Rec.		NWTPHGX	06/22/13	1
Diesel Range Organics (DRO)	U	50.	100	ug/l		NWTPHDX	06/24/13	1
Residual Range Organics (RRO)	U	120	250	ug/l		NWTPHDX	06/24/13	1
Surrogate Recovery								
o-Terphenyl	120.			% Rec.		NWTPHDX	06/24/13	1
Polynuclear Aromatic Hydrocarbons								
Anthracene	U	0.0076	0.050	ug/l		8270C-S	06/24/13	1
Acenaphthene	U	0.0082	0.050	ug/l		8270C-S	06/24/13	1
Acenaphthylene	U	0.0068	0.050	ug/l		8270C-S	06/24/13	1
Benzo(a)anthracene	U	0.012	0.050	ug/l		8270C-S	06/24/13	1
Benzo(a)pyrene	U	0.012	0.050	ug/l		8270C-S	06/24/13	1
Benzo(b)fluoranthene	U	0.014	0.050	ug/l		8270C-S	06/24/13	1
Benzo(g,h,i)perylene	U	0.011	0.050	ug/l		8270C-S	06/24/13	1
Benzo(k)fluoranthene	U	0.014	0.050	ug/l		8270C-S	06/24/13	1
Chrysene	U	0.011	0.050	ug/l		8270C-S	06/24/13	1
Dibenz(a,h)anthracene	U	0.0040	0.050	ug/l		8270C-S	06/24/13	1
Fluoranthene	U	0.016	0.050	ug/l		8270C-S	06/24/13	1
Fluorene	U	0.0085	0.050	ug/l		8270C-S	06/24/13	1
Indeno(1,2,3-cd)pyrene	U	0.015	0.050	ug/l		8270C-S	06/24/13	1
Naphthalene	0.041	0.020	0.25	ug/l	J	8270C-S	06/24/13	1
Phenanthrene	U	0.0082	0.050	ug/l		8270C-S	06/24/13	1
Pyrene	U	0.012	0.050	ug/l		8270C-S	06/24/13	1
1-Methylnaphthalene	U	0.0082	0.25	ug/l		8270C-S	06/24/13	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL = TRRP MQL
MDL = Minimum Detection Limit = LOD = TRRP SDL
Note:
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REPORT OF ANALYSIS

Kristin Darnell
Farallon Consulting - BNSF Region 1
975 5th Avenue Northwest
Issaquah, WA 98027

July 02, 2013

ESC Sample # : L642401-02

Site ID :

Project # : TT9206-M04

Date Received : June 20, 2013
Description : BNSF - JML - Cashmere, WA

Sample ID : MW2-061913

Collected By : Jon Peterson
Collection Date : 06/19/13 10:00

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
2-Methylnaphthalene	0.010	0.0090	0.25	ug/l	J	8270C-S	06/24/13	1
2-Chloronaphthalene	U	0.0065	0.25	ug/l		8270C-S	06/24/13	1
Surrogate Recovery								
Nitrobenzene-d5	80.2			% Rec.		8270C-S	06/24/13	1
2-Fluorobiphenyl	96.3			% Rec.		8270C-S	06/24/13	1
p-Terphenyl-d14	91.2			% Rec.		8270C-S	06/24/13	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL = TRRP MQL
MDL = Minimum Detection Limit = LOD = TRRP SDL
Note:
The reported analytical results relate only to the sample submitted.

.
Reported: 07/02/13 10:02 Printed: 07/02/13 10:02

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REPORT OF ANALYSIS

Kristin Darnell
Farallon Consulting - BNSF Region 1
975 5th Avenue Northwest
Issaquah, WA 98027

July 02, 2013

ESC Sample # : L642401-03

Site ID :

Project # : TT9206-M04

Date Received : June 20, 2013
Description : BNSF - JML - Cashmere, WA

Sample ID : MW3-061913

Collected By : Jon Peterson
Collection Date : 06/19/13 11:05

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Nitrate	2200	23.	100	ug/l		9056	06/20/13	1
Sulfate	14000	77.	5000	ug/l		9056	06/20/13	1
Free Carbon Dioxide	62000	6600	20000	ug/l	T8	4500CO2	06/27/13	1
Ferrous Iron	31.	17.	50.	ug/l	JT8	3500Fe	06/21/13	1
Sulfide	U	19.	50.	ug/l		4500S2	06/26/13	1
Iron,Dissolved	39.	14.	100	ug/l	J	6010B	07/01/13	1
Gasoline Range Organics-NWTPH	59.	50.	100	ug/l	J	NWTPHGX	06/22/13	1
Benzene	U	0.19	0.50	ug/l		NWTPHGX	06/22/13	1
Toluene	U	0.18	5.0	ug/l		NWTPHGX	06/22/13	1
Ethylbenzene	U	0.16	0.50	ug/l		NWTPHGX	06/22/13	1
Total Xylene	U	0.51	1.5	ug/l		NWTPHGX	06/22/13	1
Surrogate Recovery(%)								
a,a,a-Trifluorotoluene(PID)	101.			% Rec.		NWTPHGX	06/22/13	1
a,a,a-Trifluorotoluene(FID)	101.			% Rec.		NWTPHGX	06/22/13	1
Diesel Range Organics (DRO)	57.	50.	100	ug/l	J	NWTPHDX	06/24/13	1
Residual Range Organics (RRO)	U	120	250	ug/l		NWTPHDX	06/24/13	1
Surrogate Recovery								
o-Terphenyl	105.			% Rec.		NWTPHDX	06/24/13	1
Polynuclear Aromatic Hydrocarbons								
Anthracene	U	0.0076	0.050	ug/l		8270C-S	06/24/13	1
Acenaphthene	U	0.0082	0.050	ug/l		8270C-S	06/24/13	1
Acenaphthylene	U	0.0068	0.050	ug/l		8270C-S	06/24/13	1
Benzo(a)anthracene	U	0.012	0.050	ug/l		8270C-S	06/24/13	1
Benzo(a)pyrene	U	0.012	0.050	ug/l		8270C-S	06/24/13	1
Benzo(b)fluoranthene	U	0.014	0.050	ug/l		8270C-S	06/24/13	1
Benzo(g,h,i)perylene	U	0.011	0.050	ug/l		8270C-S	06/24/13	1
Benzo(k)fluoranthene	U	0.014	0.050	ug/l		8270C-S	06/24/13	1
Chrysene	U	0.011	0.050	ug/l		8270C-S	06/24/13	1
Dibenz(a,h)anthracene	U	0.0040	0.050	ug/l		8270C-S	06/24/13	1
Fluoranthene	U	0.016	0.050	ug/l		8270C-S	06/24/13	1
Fluorene	U	0.0085	0.050	ug/l		8270C-S	06/24/13	1
Indeno(1,2,3-cd)pyrene	U	0.015	0.050	ug/l		8270C-S	06/24/13	1
Naphthalene	0.038	0.020	0.25	ug/l	J	8270C-S	06/24/13	1
Phenanthrene	U	0.0082	0.050	ug/l		8270C-S	06/24/13	1
Pyrene	U	0.012	0.050	ug/l		8270C-S	06/24/13	1
1-Methylnaphthalene	0.012	0.0082	0.25	ug/l	J	8270C-S	06/24/13	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL = TRRP MQL
MDL = Minimum Detection Limit = LOD = TRRP SDL
Note:
The reported analytical results relate only to the sample submitted.

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Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

REPORT OF ANALYSIS

Kristin Darnell
Farallon Consulting - BNSF Region 1
975 5th Avenue Northwest
Issaquah, WA 98027

July 02, 2013

ESC Sample # : L642401-03

Site ID :

Project # : TT9206-M04

Date Received : June 20, 2013
Description : BNSF - JML - Cashmere, WA

Sample ID : MW3-061913

Collected By : Jon Peterson
Collection Date : 06/19/13 11:05

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
2-Methylnaphthalene	0.0092	0.0090	0.25	ug/l	J	8270C-S	06/24/13	1
2-Chloronaphthalene	U	0.0065	0.25	ug/l		8270C-S	06/24/13	1
Surrogate Recovery								
Nitrobenzene-d5	75.4			% Rec.		8270C-S	06/24/13	1
2-Fluorobiphenyl	92.7			% Rec.		8270C-S	06/24/13	1
p-Terphenyl-d14	92.6			% Rec.		8270C-S	06/24/13	1

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REPORT OF ANALYSIS

Kristin Darnell
Farallon Consulting - BNSF Region 1
975 5th Avenue Northwest
Issaquah, WA 98027

July 02, 2013

ESC Sample # : L642401-04

Site ID :

Project # : TT9206-M04

Date Received : June 20, 2013
Description : BNSF - JML - Cashmere, WA

Sample ID : MW4-061913

Collected By : Jon Peterson
Collection Date : 06/19/13 11:45

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Nitrate	6200	23.	100	ug/l		9056	06/20/13	1
Sulfate	14000	77.	5000	ug/l		9056	06/20/13	1
Free Carbon Dioxide	45000	6600	20000	ug/l	T8	4500CO2	06/27/13	1
Ferrous Iron	36.	17.	50.	ug/l	JT8	3500Fe	06/21/13	1
Sulfide	U	19.	50.	ug/l		4500S2	06/26/13	1
Iron,Dissolved	40.	14.	100	ug/l	JP1	6010B	07/01/13	1
Gasoline Range Organics-NWTPH	50.	50.	100	ug/l	J	NWTPHGX	06/22/13	1
Benzene	U	0.19	0.50	ug/l		NWTPHGX	06/22/13	1
Toluene	U	0.18	5.0	ug/l		NWTPHGX	06/22/13	1
Ethylbenzene	U	0.16	0.50	ug/l		NWTPHGX	06/22/13	1
Total Xylene	U	0.51	1.5	ug/l		NWTPHGX	06/22/13	1
Surrogate Recovery(%)								
a,a,a-Trifluorotoluene(PID)	101.			% Rec.		NWTPHGX	06/22/13	1
a,a,a-Trifluorotoluene(FID)	101.			% Rec.		NWTPHGX	06/22/13	1
Diesel Range Organics (DRO)	U	50.	100	ug/l		NWTPHDX	06/24/13	1
Residual Range Organics (RRO)	U	120	250	ug/l		NWTPHDX	06/24/13	1
Surrogate Recovery								
o-Terphenyl	125.			% Rec.		NWTPHDX	06/24/13	1
Polynuclear Aromatic Hydrocarbons								
Anthracene	U	0.0076	0.050	ug/l		8270C-S	06/24/13	1
Acenaphthene	U	0.0082	0.050	ug/l		8270C-S	06/24/13	1
Acenaphthylene	U	0.0068	0.050	ug/l		8270C-S	06/24/13	1
Benzo(a)anthracene	U	0.012	0.050	ug/l		8270C-S	06/24/13	1
Benzo(a)pyrene	U	0.012	0.050	ug/l		8270C-S	06/24/13	1
Benzo(b)fluoranthene	U	0.014	0.050	ug/l		8270C-S	06/24/13	1
Benzo(g,h,i)perylene	U	0.011	0.050	ug/l		8270C-S	06/24/13	1
Benzo(k)fluoranthene	U	0.014	0.050	ug/l		8270C-S	06/24/13	1
Chrysene	U	0.011	0.050	ug/l		8270C-S	06/24/13	1
Dibenz(a,h)anthracene	U	0.0040	0.050	ug/l		8270C-S	06/24/13	1
Fluoranthene	U	0.016	0.050	ug/l		8270C-S	06/24/13	1
Fluorene	U	0.0085	0.050	ug/l		8270C-S	06/24/13	1
Indeno(1,2,3-cd)pyrene	U	0.015	0.050	ug/l		8270C-S	06/24/13	1
Naphthalene	0.040	0.020	0.25	ug/l	J	8270C-S	06/24/13	1
Phenanthrene	U	0.0082	0.050	ug/l		8270C-S	06/24/13	1
Pyrene	U	0.012	0.050	ug/l		8270C-S	06/24/13	1
1-Methylnaphthalene	U	0.0082	0.25	ug/l		8270C-S	06/24/13	1

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REPORT OF ANALYSIS

Kristin Darnell
Farallon Consulting - BNSF Region 1
975 5th Avenue Northwest
Issaquah, WA 98027

July 02, 2013

ESC Sample # : L642401-04

Site ID :

Project # : TT9206-M04

Date Received : June 20, 2013
Description : BNSF - JML - Cashmere, WA

Sample ID : MW4-061913

Collected By : Jon Peterson
Collection Date : 06/19/13 11:45

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
2-Methylnaphthalene	U	0.0090	0.25	ug/l		8270C-S	06/24/13	1
2-Chloronaphthalene	U	0.0065	0.25	ug/l		8270C-S	06/24/13	1
Surrogate Recovery								
Nitrobenzene-d5	77.5			% Rec.		8270C-S	06/24/13	1
2-Fluorobiphenyl	93.4			% Rec.		8270C-S	06/24/13	1
p-Terphenyl-d14	93.0			% Rec.		8270C-S	06/24/13	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL = TRRP MQL
MDL = Minimum Detection Limit = LOD = TRRP SDL
Note:
The reported analytical results relate only to the sample submitted.

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Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L642401-01	WG668193	SAMP	Acenaphthene	R2721061	J
	WG668193	SAMP	Benzo(a)anthracene	R2721061	J
	WG668193	SAMP	Chrysene	R2721061	J
	WG668193	SAMP	Fluorene	R2721061	J
	WG668193	SAMP	Naphthalene	R2721061	J
	WG668193	SAMP	Phenanthrene	R2721061	J
	WG668193	SAMP	1-Methylnaphthalene	R2721061	J
	WG668193	SAMP	2-Methylnaphthalene	R2721061	J
	WG669165	SAMP	Free Carbon Dioxide	R2725089	T8
	WG667771	SAMP	Ferrous Iron	R2717000	T8
L642401-02	WG668998	SAMP	Iron,Dissolved	R2729985	J
	WG668193	SAMP	Naphthalene	R2721061	J
	WG668193	SAMP	2-Methylnaphthalene	R2721061	J
	WG669165	SAMP	Free Carbon Dioxide	R2725089	T8
	WG667771	SAMP	Ferrous Iron	R2717000	JT8
L642401-03	WG668998	SAMP	Iron,Dissolved	R2729985	J
	WG668195	SAMP	Diesel Range Organics (DRO)	R2722790	J
	WG668101	SAMP	Gasoline Range Organics-NWTPH	R2718380	J
	WG668193	SAMP	Naphthalene	R2721061	J
	WG668193	SAMP	1-Methylnaphthalene	R2721061	J
	WG668193	SAMP	2-Methylnaphthalene	R2721061	J
	WG669165	SAMP	Free Carbon Dioxide	R2725089	T8
	WG667771	SAMP	Ferrous Iron	R2717000	JT8
L642401-04	WG668998	SAMP	Iron,Dissolved	R2729985	JP1
	WG668101	SAMP	Gasoline Range Organics-NWTPH	R2718380	J
	WG668193	SAMP	Naphthalene	R2721061	J
	WG669165	SAMP	Free Carbon Dioxide	R2725089	T8
	WG667771	SAMP	Ferrous Iron	R2717000	JT8

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
J	(EPA) - Estimated value below the lowest calibration point. Confidence correlates with concentration.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.
T8	(ESC) - Additional method/sample information: Sample(s) received past/too close to holding time expiration.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods,it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.

Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Differrence.

Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromotography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.

TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Summary of Remarks For Samples Printed
07/02/13 at 10:02:56

TSR Signing Reports: 134
RX - Priority Rush

Sample: L642401-01 Account: BNSF1FAR Received: 06/20/13 09:30 Due Date: 07/02/13 00:00 RPT Date: 07/02/13 10:02
Field Filtered
Sample: L642401-02 Account: BNSF1FAR Received: 06/20/13 09:30 Due Date: 07/02/13 00:00 RPT Date: 07/02/13 10:02
Field Filtered
Sample: L642401-03 Account: BNSF1FAR Received: 06/20/13 09:30 Due Date: 07/02/13 00:00 RPT Date: 07/02/13 10:02
Field Filtered
Sample: L642401-04 Account: BNSF1FAR Received: 06/20/13 09:30 Due Date: 07/02/13 00:00 RPT Date: 07/02/13 10:02
Field Filtered